

Mapping Landscapes in Transformation

Multidisciplinary Methods for Historical Analysis

Edited by

Thomas Coomans, Bieke Cattoor, and Krista De Jonge

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Mapping Landscapes in Transformation: Multidisciplinary Methods for Historical Analysis
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POSTFACE

Mapping Historical Landscapes in Transformation: An Overview
John Bintliff

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10.

The Secularisation of Urban Space

Mapping the Afterlife of Religious Houses in Brussels, Antwerp and Bruges

Reinout Klaarenbeek (University of Leuven)

This research aims to investigate the visual and material urban transformations after the suppression of the monasteries and convents in three Belgian towns — Brussels, Antwerp, and Bruges — between 1773-96 and 1860 (Coomans and Klaarenbeek 2014).¹ These towns had a large presence of religious houses: after a first wave of foundation of abbeys from the high Middle Ages, the urbanised Southern Low Countries — more or less the territory of present Belgium — attracted mendicant friaries and nunneries, hospital convents, charterhouses and beguinages in the thirteenth century (Coomans 2018). From the late sixteenth century onwards, a wave of new foundations including the Society of Jesus (Jesuits) resulted from the Catholic Counter-Reformation that was counterbalancing the neighbouring reformed Dutch Republic. At the end of the eighteenth century, the concentration of urban religious houses in the Southern Low Countries exceeded thirty per large town, owning no less than 13-15% of the *intra-muros* urban space.

During the second half of the eighteenth century, religious houses were the target of increasing criticism from the state authorities: they denounced the supranational organisational structures of the religious orders and societies as unwanted interference with state matters. Moreover, the religious properties escaped taxation

1. The research project *Redeveloping the City: urban transformation and 'heritigisation' after the secularization of religious houses in Belgian towns at the dawn of the modern age (1773/96-1860)* is funded by FWO Flanders Research Foundation, no. G.0B0912N. Promotors: Prof. Th. Coomans (KU Leuven, Departement of Architecture), Prof. J. De Maeyer (KU Leuven, KADOC), Prof. I. Bertels (University of Antwerp) and Prof. T. Verschaffel (KU Leuven, KULAK).

and were thought to hinder productivity and the proper functioning of the real property market. Finally, contemplative male and female orders lacked societal interest (Schepper 1942; Laenen 1996). All the religious houses in the Southern Low Countries were suppressed in three successive batches. First, the Society of Jesus was suppressed by Empress Maria Theresa of Austria in 1773. Second, all the contemplative ‘useless’ communities were suppressed in 1784-85 by order of the ‘enlightened monarch’, Emperor Joseph II of Austria. Third, after the French Revolution had conquered the Southern Low Countries, all remaining abbeys, monasteries, convents, beguinages, and other religious houses were abolished in 1796.

The French state confiscated all the real-property belongings of the suppressed religious houses and selected the best ones for its own purposes to accommodate military barracks, workshops, and storehouses. Other former religious complexes responded to the increasing need for educational, judicial, and administrative buildings. Since the number of former religious houses largely exceeded the needs of the state, part of the buildings was conceded to urban authorities. The latter converted religious complexes to accommodate care and educational functions (Antoine 2009), while others were erased to provide space for new urban and architectural developments in the densifying centres (Van de Vijver 2007). Around 1800, all the remaining former religious buildings had been sold on a great scale in public auctions, providing the state with income to finance ongoing wars. The fate of the secularised convents was just as diverging as the intentions of their new owning private individuals or companies.

The ‘afterlife’ of the former religious complexes until *ca.* 1860 is at the very centre of my research. The first step describes and visualises the afterlife: which complexes survived, how were the ensembles divided into parcels and allotted to various owners, which (successive) new functions were attributed to which buildings? The second step aims to find out which mechanisms can explain this afterlife in the context of the transformation of the ancient regime city towards the modern city? During the first half of the nineteenth century, the notion of heritage was nearly absent — in contrast to the current challenge of adaptive reuse of redundant churches. This research subject embarks on a rather unexplored field, mainly as a result of the disinterest of historians in materiality (Bodinier and Teyssier 2000) and of the preference of art historians for well documented architectural and urban masterpieces.

The implementation of a historical GIS is a highly appropriate methodological tool for this research, considering its capacity to visualise and analyse both space

and time and handling large datasets. A total number of 100 former religious complexes were included in the system, comprising all suppressed abbeys, monasteries, convents, charterhouses, and beguinages of Brussels, Antwerp, and Bruges. This contribution shows a practical example of the implementation of the GIS and describes its challenges and benefits. After having defined the spatial units, the sources, and drawing process, and having visualised the urban changes, I will explain how the database was designed and how the sources were implemented.

Defining the spatial units

Every historical GIS requires, for the matter of topographic coherence, a historical reference map to which all other layers adjust, referred to as a 'base map'. Most historical GIS projects in Belgium use the oldest or 'primitive' cadastral plans as base maps. These primitive plans were drawn up following the accurate methods and guidelines of the French *Recueil méthodique*, using the metric system (Zoete 1979). This high degree of standardisation allows one to use the primitive plans comparatively between cities, despite the fact that these plans were created between 1811 and 1834 and involved numerous surveyors. The processing of the primitive cadastral plans into a digital 'base map' will not be elaborated on here, beyond mentioning that it involved scanning, geo-referencing on the current topography, and, finally, vectorising (Gregory 2002; Knowles 2002).

The next step in creating the historical GIS comprised the reconstruction of the ground plans of the religious houses. Indeed, before anything could be said about the transformation of the buildings, a *zero measurement* was needed: a reconstructed ground plan showing the spatial arrangement at the moment of the suppression. The definitions of this spatial arrangement that were represented in the GIS as vector layers were based on religious houses as an *architectural type* (Coomans 2018: 41-83). The common spatial characteristics of the religious houses include:

1. The enclosure (polygons). Perhaps the most determining architectural aim of a religious house was to separate the life of the community from its (urban) surroundings. The enclosure forms a boundary of the domain and separates this space from adjacent public and private properties. Neither its *materialisation* (freestanding walls, blind or only very occasionally penetrated outer walls of buildings facing adjacent public or private properties, etc.), its *use* or *perception* (variations between orders, time of day, etc.), nor adjacent properties in the form of rented houses were included in this boundary.

2. The gates (points). Even for religious houses with the strictest enclosure as for contemplative nuns, connections between inside and outside were needed. This was achieved in gates in walls or buildings, which included main gates in carefully designed urban settings as well as simple back doors to the gardens.
3. The footprint of the buildings within the enclosure (polygons), including all the buildings regardless their function.
4. Basic functional zones (polygons). All enclosures, regardless of their origins and order, could be divided into three most basic functional zones: the church or chapel, the buildings of the community, and the garden. Despite the fact that religious houses had more architectural and spatial elements in common (sacristy, chapter house, dormitory, refectory, kitchen, parlours, library, etc.), it was decided not to descend to the level of buildings because the unequal sources do not allow themselves to be systematic. Also for this zone, aspects of *use*, *perception*, and *materialisation* are not included in the definition.

This set of four spatial definitions reduced the religious complexes to their most basic urban characteristic, regardless of their identity, origin, gender, mission, history, etc. The inevitable loss of information through the use of aggregated units is considered a necessary and reasoned concession to lever the analysis beyond individual religious houses to a comparative analysis. The defining took place in an iterative process with the sources available, which ultimately, determined the boundaries of the data categories.

The sources and the drawing process

The era of the secularisation of the religious houses in the Southern Low Countries coincided with significant improvements in the domain of cartography: maps lost increasingly their symbolic connotations through rationalisation (Boutier 2005). Within this context, an outstanding corpus of cartography comprised ground plans of individual religious houses. Anticipating sale, subdivision, or reuse, state-appointed surveyors and architects measured the sites and drew large-scale ground plans (around 1:500 – 1:1.000). These plans appeared in the years following the suppression (1773, 1784-85 and 1796), displaying the state of the complexes at the moment of their secularisation. Georeferencing these maps on the base map revealed their high geometric accuracy. It is mainly thanks to the availability of this outstanding corpus of cartography that most religious houses could be reconstructed.

The source *par excellence* for research into monastic architecture in the Southern Low Countries are the printed bird-eye views from the books of Antonius

Sanderus (1586-1664) and Jacques Le Roy (1633-1719) (Fig. 1). These bird's-eye views depict the (predominantly prestigious male) religious houses and are a product of the regained confidence of the counter-reformed Catholic Church. Art-historical literature duly points to the symbolic aspects of these representations, which urges us to consider deviations such as an over-dimensioning of the church, decreasingly accurate dimensioning towards the edges of the image, false suggestions of symmetry, erroneous reliance on older images or unexecuted plans, omission of information, etc. (Coomans 1988). Nevertheless, the volumes and enclosure boundaries depicted in the bird's-eye views can — through their form, relative positioning, and dimensions — be identified on the primitive cadastral plans. In these cases it seems perfectly justified to assume that both refer to the same building and, consequently, to assign the cadastral footprints to the reconstruction map. More problematic are the cases when the available bird's-eye views show drastically changed urban situations with little or no points of reference with the primitive cadastral plans.

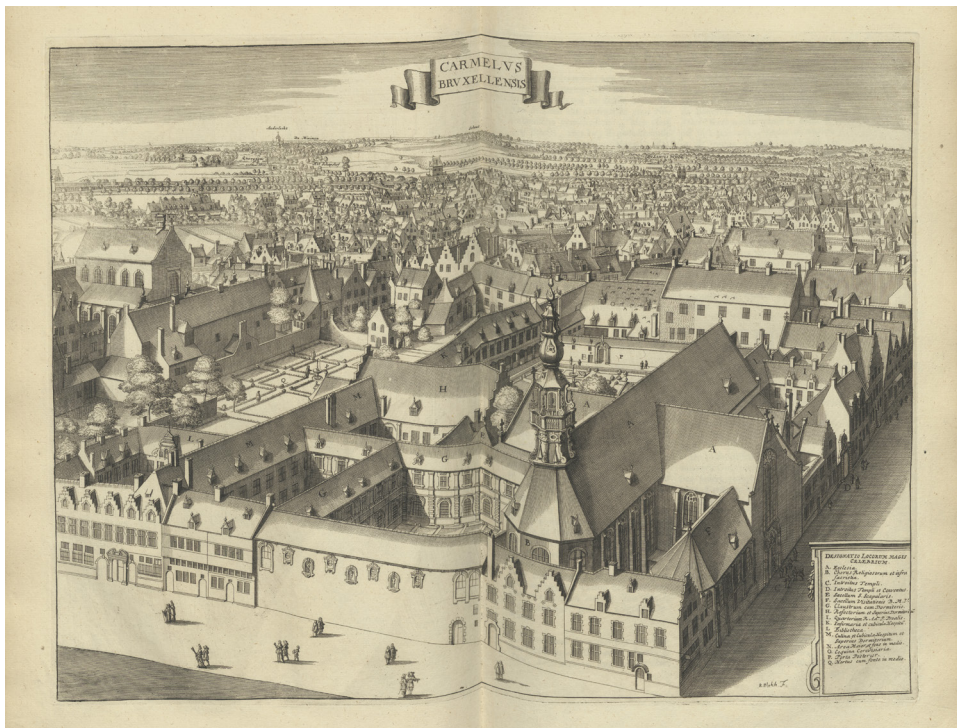


Fig. 1: Reinier Blockhuizen (ca 1650), the Carmelite friary in Brussels depicted in bird's-eye view [Le Roy 1727]. *Groot Kerkelyk Toneel des Hertogdoms van Brabant*, 80-81: digitised by Utrecht University, MAG: MAZ 731].

This bird's-eye view depicts the Carmelite friary in its full splendour. Its most prominent feature are the large church with a finely decorated bell tower and the square cloister directly to the left. Further, a conglomeration of buildings is organised around courtyards and gardens. A legend in the right corner specifies the functions of these buildings, which include: parlours, guestrooms, a refectory, kitchens, a chapter house, a library, an infirmary, a brewery, etc.

The reliability of this bird's-eye view that dates to about 150 years before the time of the friary's suppression was tested through a comparison with other cartographic sources. The bird's-eye view turned out to be very similar to the detailed surveys of the friary that were drawn up in 1798 (not depicted). The combination of a bird's-eye view and a detailed survey from 1798 resulted in a reliable reconstruction of the ground plan of the Carmelite friary in GIS.

When an individual ground plan as well as a bird's-eye view is missing, reconstructions could exclusively be based on the primitive cadastral plans to which a *retrogressive* value was attributed. Considering that suppression preceded the cadastral enterprise by only two or three decades, it seems a fair assumption that spatial characteristics of the former religious houses are still, to a varying degree, identifiable on the primitive cadastral plans. Religious houses that are mapped in individual ground plans and depicted on bird's-eye views confirm this assumption. This is not equally true for all four defined spatial characteristics: the enclosures (groups of significant larger parcels) and to a lesser extent the buildings grouped around courtyards turned out to have fairly reliable indicators. Obviously, this retrogressive analysis of projecting information backwards with scarce or even a complete lack of testifying cartographic or iconographic evidence results in a lower reliability of the reconstruction and presents a risk of biasing continuity when compared to the 1834 situation.

The process of drawing the reconstruction maps, in conclusion, involved a historical triangulation of cartographic and iconographic sources. Insofar as time and sources allowed, the sources mentioned above were complemented by additional evidence such as city-maps, photos, drawings, paintings, and field visits. The resulting maps — inclined to suggest a rather unjust objectivity and indisputability — were in need of references to uncertainties in 65% of the cases; 2) a bird's-eye perspective (10%); 3) a detailed urban city map (10%); 4) a retrogressive projection (15%). Furthermore, insecure spatial elements obtained solely through retrogressive analysis were depicted in dotted lines.

Visualising change through superposition

Aspects of the evolution of the religious house could be revealed by confronting the reconstruction layer (1773-96) with cadastral layers of the same area at different times. For this purpose, in addition to the primitive cadastral plans (1811-34), a third time layer was added to the historical GIS. This layer was created by updating the base map (formed by the cadastral plans from 1811-34) to the cadastral situation around 1860. For this purpose, the city plans published by Philippe Christian Popp (1805-79) were used, which were derived directly from the so-called ‘mutation sketches’, the cadastral system for registering changes in parcel boundaries and buildings (Vrielinck 2018). As such, the layer of 1860 was, both geographically and temporarily, to a large extent compatible with the first two time-layers.

A comparison of the three consecutive maps offered useful means for studying the transformation of the former religious houses. The maps reflect the results of spatial solutions concerning the redistribution and reorganisation of the properties of the former religious houses [Maps 3a and 3c]. Furthermore, the maps reveal the evolution of the footprints of the buildings, which allowed a detailed visualisation of the gradual disappearance of the built substance of the religious houses. To enhance the readability of this evolution of buildings, so-called ‘transformation maps’ were created that depict the evolution in one sight [Maps 3b and 3d]. With the help of the registers, the parcels on the former religious houses could be further populated with owners and uses [Map 4 and Map 5].

The reliance of this method on the cadastral plans is perhaps both its strength and its weakness. On the one hand, cadastral plans provide research into the nineteenth-century spatial urban history with a very solid cartographic backbone. On the other hand, cadastral plans — suggesting objectivity through uniformity and rationalisation — are subject to source critics, as is any other historical source. With regard to the reliability of the cadastral plans, corruption, under-capacity of the services, or lack of skilled employees could cause incorrect or delayed processing. Furthermore, the scope of the afterlife is limited to the cadastral categories related to land taxation (parcels and buildings), omitting topographical aspects such as fencing, elevation, circulation, and architecture. Ideally, the maps serve as a subject of discussion and as a basis for further refinement, complementation, and possible correction through comprehensive case studies.

The design of a database

A second track of this study consisted of a functional analysis. To this end, the main characteristics of the afterlife of the 100 religious houses were registered in a database, the design of which needed to address both space and time. With regard to space, the level of data-gathering was formed by the functional zones, which included the church, community buildings, and the garden of each former religious house. Consequently, for each zone a ‘timeline’ was constructed: a subsequent range of time-slots — each defined by a begin- and end-year — covered the period from the suppression to 1860. For each time-slot a set of three variables became apparent:

1. Preservation. The diverging degree of preservation is expressed in three attributes: a) ‘reuse’, the preservation of building(s) and scale; b) scale, a dissolution of buildings but preservation of scale; c) subdivision, a dissolution of both buildings and scale.
2. Function. Based on definitions of existing heritage thesauri, seven main categories were formulated: military, education, industry, care, religious, parish church, and redevelopment.
3. Actor. Distinction between: state, city, private, and religious.

To illustrate the main layout of the database, Table 1 presents a simplified extract that relates to the afterlife of the Dominican friary in Antwerp.

The implications of using the *zones* as the main level of data-gathering are very similar to the spatial characteristics. The spatial aggregation resulting from the database’s inability to register on a finer spatial scale is considered a necessary and reasoned concession, to lever the analysis beyond the individual religious houses to a comparative analysis. The defining took place in an iterative process with the sources at our disposal.

The sources and their implementation

The input for the database mostly relied on existing research. In particular, the accounts on urban history dating from the second half of the nineteenth century — products of the first waves of scientific historical research — proved to be very instructive sources on the afterlife of the religious houses (Stynen 1998: 73-117). Indeed, urban chroniclers such as Alexandre Henne and Alphonse Wauters for Brussels (Henne and Wauters 1848) and Augustine Thys for Antwerp (Thys 1893) supply the database with ample information. Cartographic evidence

Table 1: Afterlife of the Dominican friary in Antwerp.

SPACE: ZONE	TIME: TIMESLOT	VARIABLES: PRESERVATION	FUNCTION	ACTOR	SOURCE
CHURCH	1796-1802	reuse	unknown	state	absent in sale records, scenario and actor deduced from period 1803-1860
	1803-1860	reuse	parish church	city	Thys, 1893: 129; confirmed by cadastral maps
FRIARY	1796-1802	reuse	unknown	state	assumed, see church
	1803-1812	reuse	military barrack	state	Thys, 1893: 130
	1813-1818	reuse	military barrack	city	Thys, 1893: 130
	1819-1861	reuse	parish church	city	used for parish church cadastral 1830 — military still present on urban maps Jouan (1855)
GARDEN	1796-1850	reuse	unknown	unknown	some division on cadastral maps
	1851-1860	subdivision	new street	city/ private	Thys, 1893: 130

such as cadastral maps, the accompanying registers, and urban maps comprised cross-sectional evidence. Additionally, despite the fact that monographs on religious houses and archival repositories tend to stop at the suppression, some of them give some interesting clues about the afterlife of buildings. Finally, a number of surviving and ‘heritagised’ religious houses were dedicated to more substantial (building) historical research.

The most serious disadvantage of applying these different sources into a single database with predefined categories is perhaps the risk of ‘decontextualisation’. A critical use of the sources and persistently providing references to the origin of the data do not entirely take away the fact that the juxtaposition of sources can be problematic. Yet, the alternative of going back to the original sources themselves was impossible in the context of this research project: after the suppression, the

historic evidence became scattered over a wide range of archives (state, urban, clerical, and private) and the extensive sample-size itself would be too large to perform such a comprehensive analysis.

Another aspect that needs to be addressed is gaps in information: for some time periods no or only very scarce evidence could be found. These gaps are registered as ‘unknown’. Yet, in order to boost the analysable sample, using hypotheses filled these gaps. About the church of the Dominican friary in Antwerp (Table 1), no evidence was found prior to 1802. However, the fact that the church became a parish church proves that: 1) the building was in the earlier time still existing and ‘reused’ (preservation) in one way or another (function: ‘unknown’); 2) in all likelihood the church had not been sold and still belonged to the state (actor). Eventually, the afterlife between 1773/1796-1860 of each of the three categories (preservation, function and actor) could be determined for over 70%, providing a critical mass for analysis of the data.

The database offered a tool for statistical analysis in itself, as in relation to their location. Querying allowed one to focus the analysis in many directions, whether it was by (combinations of) grouping functions, actors, preservation, or the religious houses’ characteristics (gender, era of foundation, year of suppression). Through the use of identical identifiers of the enclosures and zones in both the database and the GIS-tables, the information about afterlife could be mapped [Map 6]. By relating them to layers containing characteristics of the historic towns, such as building blocks, rivers, former urban walls, and gates, implicit locational choices could be revealed. Cautious interpretation and verification of the sources (if available) were needed, since geographic fallacy — an overestimating of the role of space — is not inconceivable.

Conclusion

This contribution has addressed the benefits and the issues of using GIS in visualising and explaining the afterlife of secularised religious houses in urban contexts in transformation. In this research, GIS allowed one to lift the research into the afterlife of religious houses — until now the exclusive domain of case studies — to a new, urban, scale. As was pointed out throughout this contribution, research at this level implied the definition of comparable spatial and database units at the price of spatial aggregation and generalisation. These inevitable shortcomings were responded to by a clear defining, a critical use of the sources, and, above all, traceability of the sources. With regard to the sources, this study presents

an example of a full use of the cadastral mapping system in GIS. The cadastral maps were used not only for creating cross-sections, but also for retrogressive analysis, transformation mapping through time, and intra-urban comparisons. The cartographic essay illustrates the GIS and anticipates some results, starting from the Carmelite friary in Brussels.

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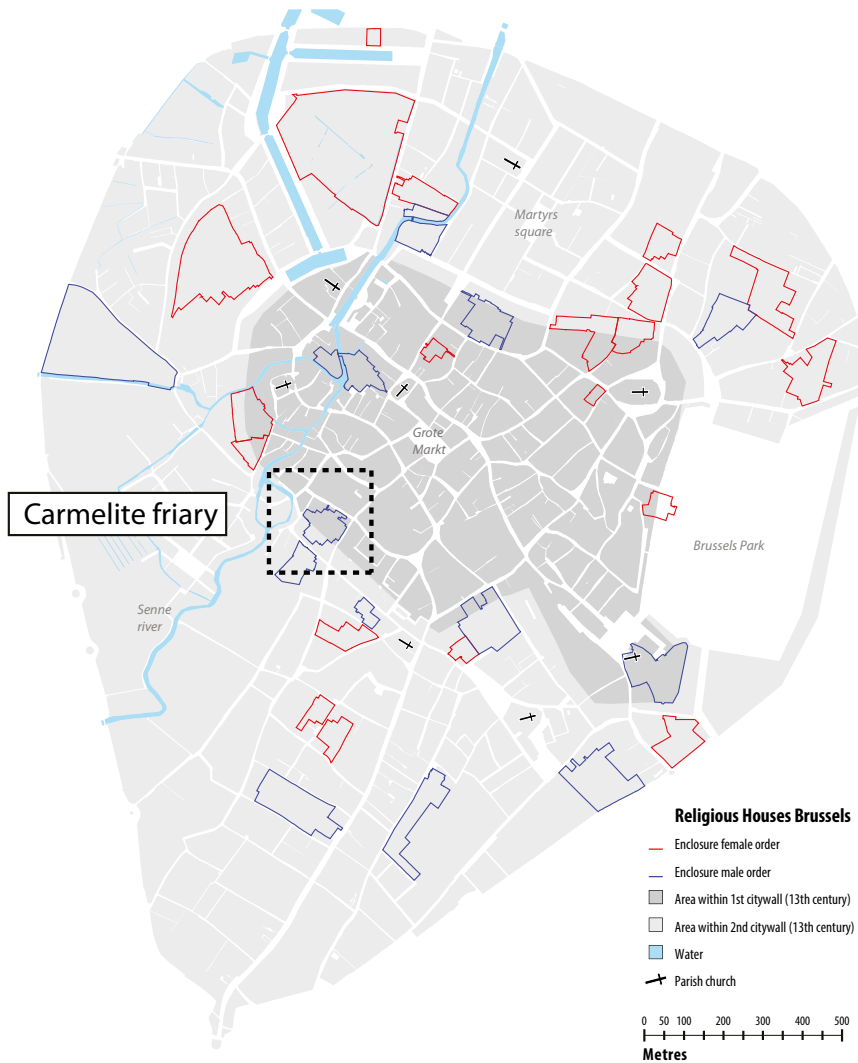
Maps

Introduction to the case study

Flocks of tourists stroll around the famous Brussels attraction *Manneken Pis*. The other side of the street used to be the location of an urban monastery from 1249 to the end of the eighteenth century. The Carmelite friary belonged to one of the major mendicant orders in the Middle Ages. Shifting relations between state and church led to its suppression in 1796. After the religious complex was sold in a public auction, new streets were established through the grounds of the former friary and the buildings were gradually replaced by new houses. Today, no remains of the former friary are visible in the urban landscape.

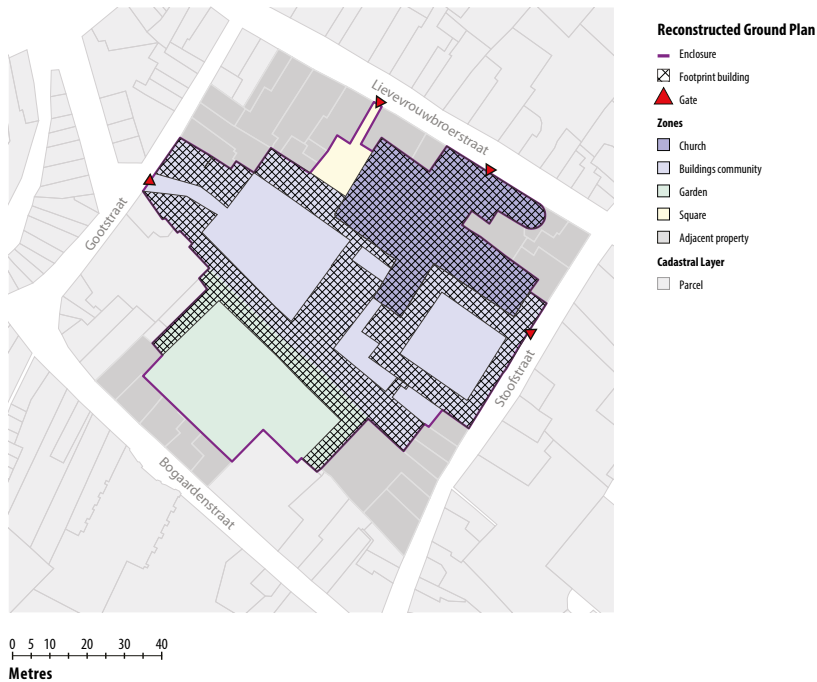
The Carmelite friary is one of the hundred religious houses in Brussels, Antwerp, and Bruges that were suppressed at the end of the eighteenth century. This research sets out, first, to describe and visualise the 'afterlife' of these suppressed religious complexes. Which former religious complexes survived, how were the ensembles divided into parcels of various owners, which new functions were attributed to which religious houses? Secondly, the research aims to find out which mechanisms can explain this afterlife in the context of the transformation of towns from the end of the ancient regime city towards the industrialised society. In contrast to present-day challenges of finding adaptive reuses for an increasingly number of unused religious buildings, the notion of heritage was nearly absent.

At the core of my methodological approach is the implementation of a historical GIS. The GIS proved to be a vital method of conducting a comparative synthesis on the urban level. Using iconographic, cartographic, and, more specially, cadastral plans allowed us to elucidate the evolution of the secularisation of urban space. The following maps of the Carmelite friary of Brussels, illustrate this methodology.



Map 1: Reinout Klaarenbeek (2018), *Location of the Carmelite Friary and the other Suppressed Religious Houses in Brussels.*

The Carmelite friary was founded in 1249 within the first city wall of Brussels (early thirteenth century). Land at the periphery of the town was typical for the settlement of religious houses. The Carmelites' location in the lower part of Brussels is in line with a major distinction of the local monastic landscape: nearly all the medieval religious houses were situated in the western lower part of the valley of the Zenne river, while the seventeenth-century religious houses almost exclusively occupied the higher eastern part of the city. Following the expansion of Brussels and the construction of a second wall in 1357-1373, the Carmelite friary gained a central location.

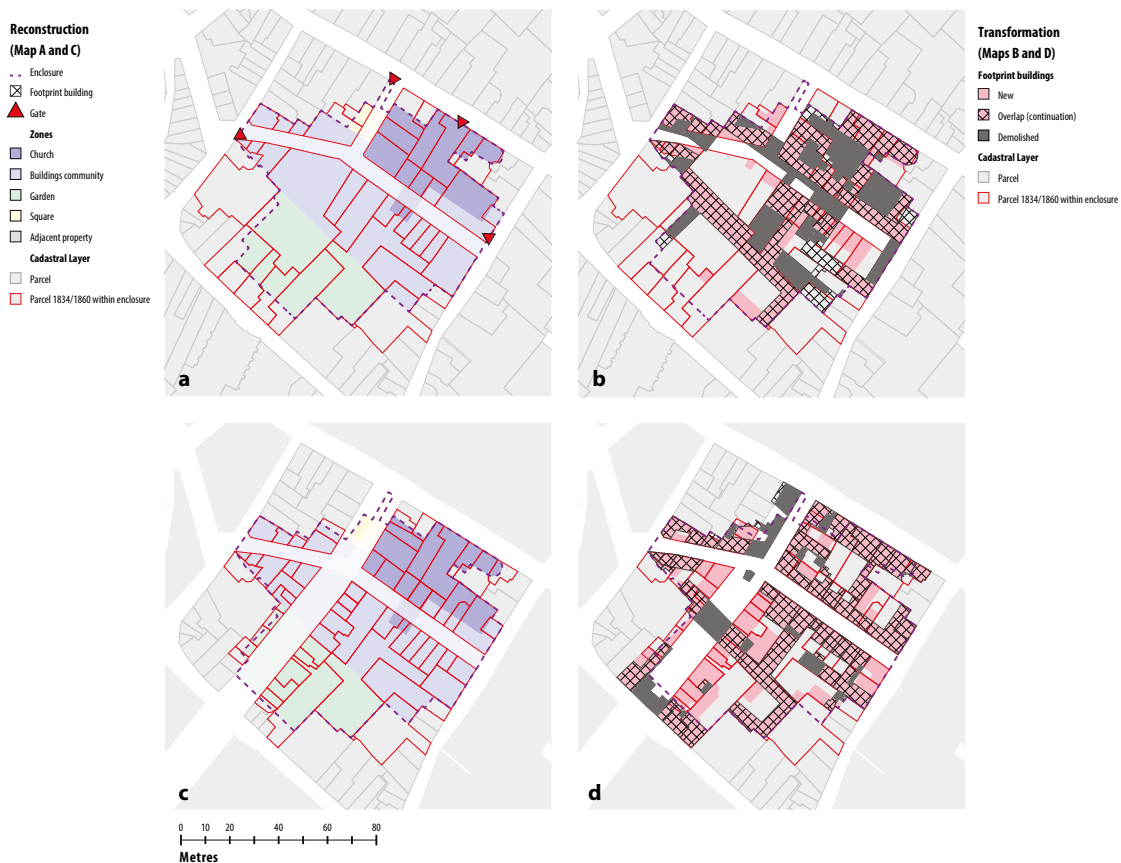


Map 2: Reinout Klaarenbeek (2018), *Reconstruction of the Ground Plan of the Carmelite Friary in Brussels before its Secularisation in 1796.*

Before anything could be said about the transformation of the building complex, a *zero measurement* was needed: a reconstructed ground plan representing the spatial arrangement at the time of suppression. For this reason the available cartographic and iconographic sources were related (georeferenced if possible) to the base map, which was composed of the oldest or ‘primitive’ cadastral plans from around 1811-34.

The mapping was based on four spatial definitions that reduced the religious houses — regardless of the religious orders’ origin, gender, or mission — to their most basic urban characteristics:

- The enclosure (purple line) forms a boundary of the domain of the community, and separates this from adjacent public and private properties. The friars also owned houses outside the enclosure (dark grey) that were rented and were a source of income.
- The gates (red triangles) form the connections between the enclosure and the public sphere.
- Three zones presenting the basic functions of the friary: the church (dark purple) with chapels and sacristy; the buildings of the community (light purple); the garden (green).
- The footprint of the buildings (cross-hatching) is independent of the zones. By the alternation between built and unbuilt space, the organisation of space through courtyards becomes visible.



Map 3: Reinout Klaarenbeek (2018), *Transformation Maps of the Site of the Former Carmelite Friary in Brussels*.

The evolution of the buildings and the parcels of the friary is shown, by overlaying the reconstructed ground plan with layers of cadastral maps from 1834 and 1860. Map a contains the layer with the parcel boundaries of 1834, that is projected on top of the layer of the reconstructed ground plan (without the buildings). It shows the far reaching division of the terrain into small parcels created along new streets. The location of the new streets drew very much on the structure of the suppressed friary: the eastern and the northern branches of the new streets were plotted against the (demolished) church. Map b contains the buildings in three categories: demolished after 1796 (black), built after 1796 (pink), and existing buildings/new buildings on former demolished buildings (cross-hatched pink). Map B was obtained by 'overlaying' the buildings of the reconstructed ground plan with the primitive cadastral plans from 1834. It reveals that most parts of the friary were replaced by housing. Map c contains a layer with parcel boundaries of 1860, that is projected on the layer of the reconstructed ground plan. It reveals the construction of a new, wide, street. Map d contains the evolution of the built areas between 1834 and 1860, obtained by the same overlay process as described in Map b. The new street implied both demolition of houses and construction of new houses alongside the new street.



Map 4: Reinout Klaarenbeek (2018), *Spatial Logics of Reallocation of the Carmelites Friary in Brussels: Directions and Access to Water.*

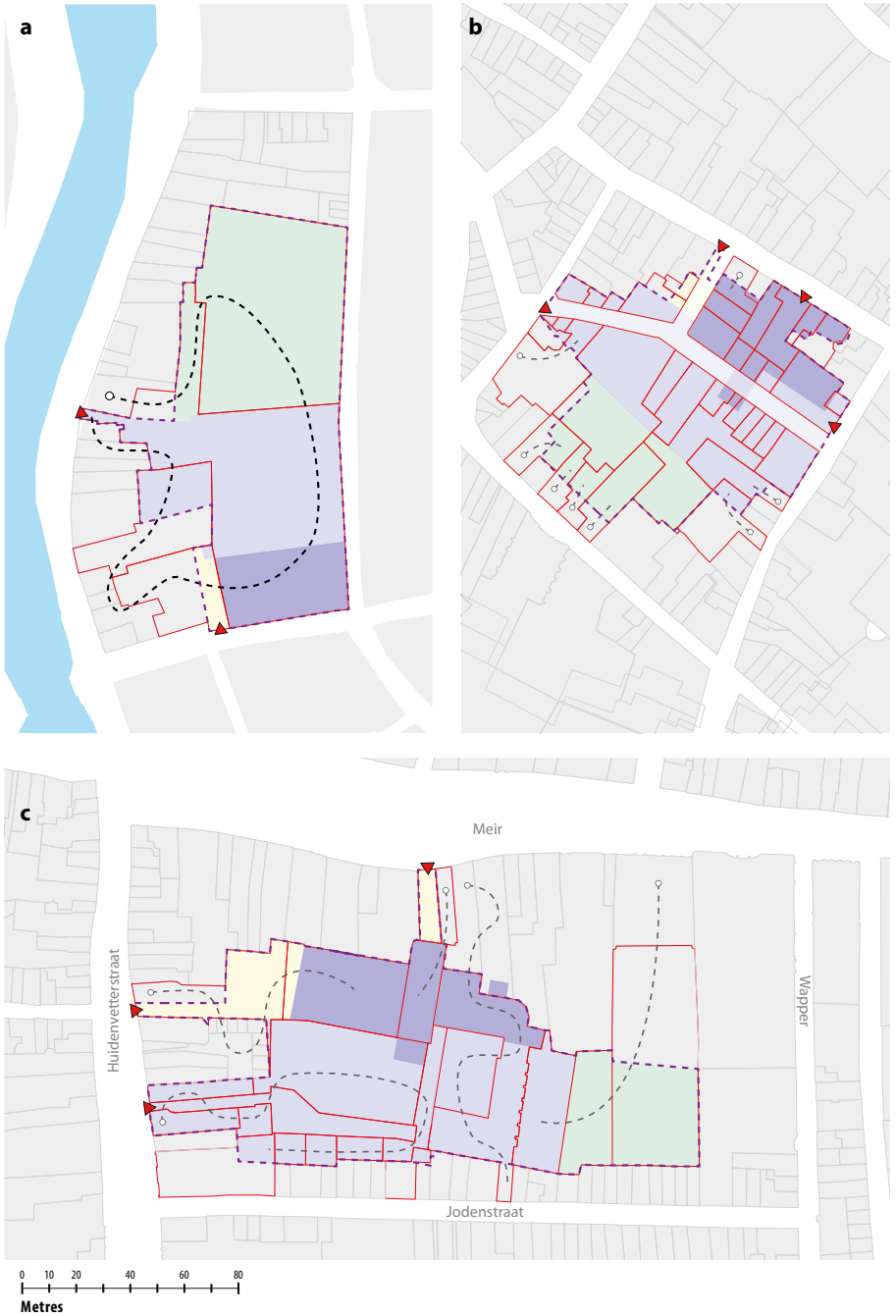
The logic of reallocation of the terrain of the former Carmelite friary is further explored by creating thematic maps and combining the maps with additional map layers.

Map a depicts parcels in 1834 within the former enclosure. Arrowed lines indicate the direction of the parcels. Partly, existing parcels were extended, especially at the location of the former garden (dark arrows). New parcels were rather rational, rectangular in different sizes (yellow). The parcels created from the existing streets and turn out to be slightly more dominant (grey arrows). Two parcels deviate from the other parcels, by both their size and form (Map a, n°1 and n°2). The first represents a large urban house, which was most probably situated in the former library wing of the friary. The second represents a dead-end street: a small passage leads to a backyard where small houses were created in the remnants of the former friary buildings.

Map b represents the underground water infrastructure of the friary, as mentioned a historical map. The map points to the significance of the accessibility of water: both large parcels had access to wells.

Comparison of Three Carmelite Friaries

- - - Enclosure
- ▲ Gate
- Zones**
- Church
- Buildings community
- Garden
- Square
- Background Layer (1834)**
- Parcel
- Parcel within enclosure
- Parcels common owner
- Water



Map 5: Comparison of the Carmelite Friaries' Development in Brussels, Bruges and Antwerp.

Map 5: Reinout Klaarenbeek (2018), *Comparison of the Carmelite Friaries' Development in Brussels, Bruges and Antwerp.*

The Carmelite friary's evolution in Brussels (a) could be compared to that of those in Antwerp (c) and Bruges (b). The use of GIS allowed, above graphic software, the convenient creation of comparative maps with corresponding legends, orientation, and scale.

Map b contains the layer with the parcel boundaries of 1834 that is projected on top of the layer of the reconstructed ground plan. Like the Carmelite friary in Brussels, the friary in Bruges was largely demolished after it got into private hands. However, whereas the former was extensively divided into many parcels, the latter was split up into only three large parcels, owned by a single person (indicated by the dotted line). The difference is illustrative of the different dynamics on the real-property markets between the cities in the early nineteenth century.

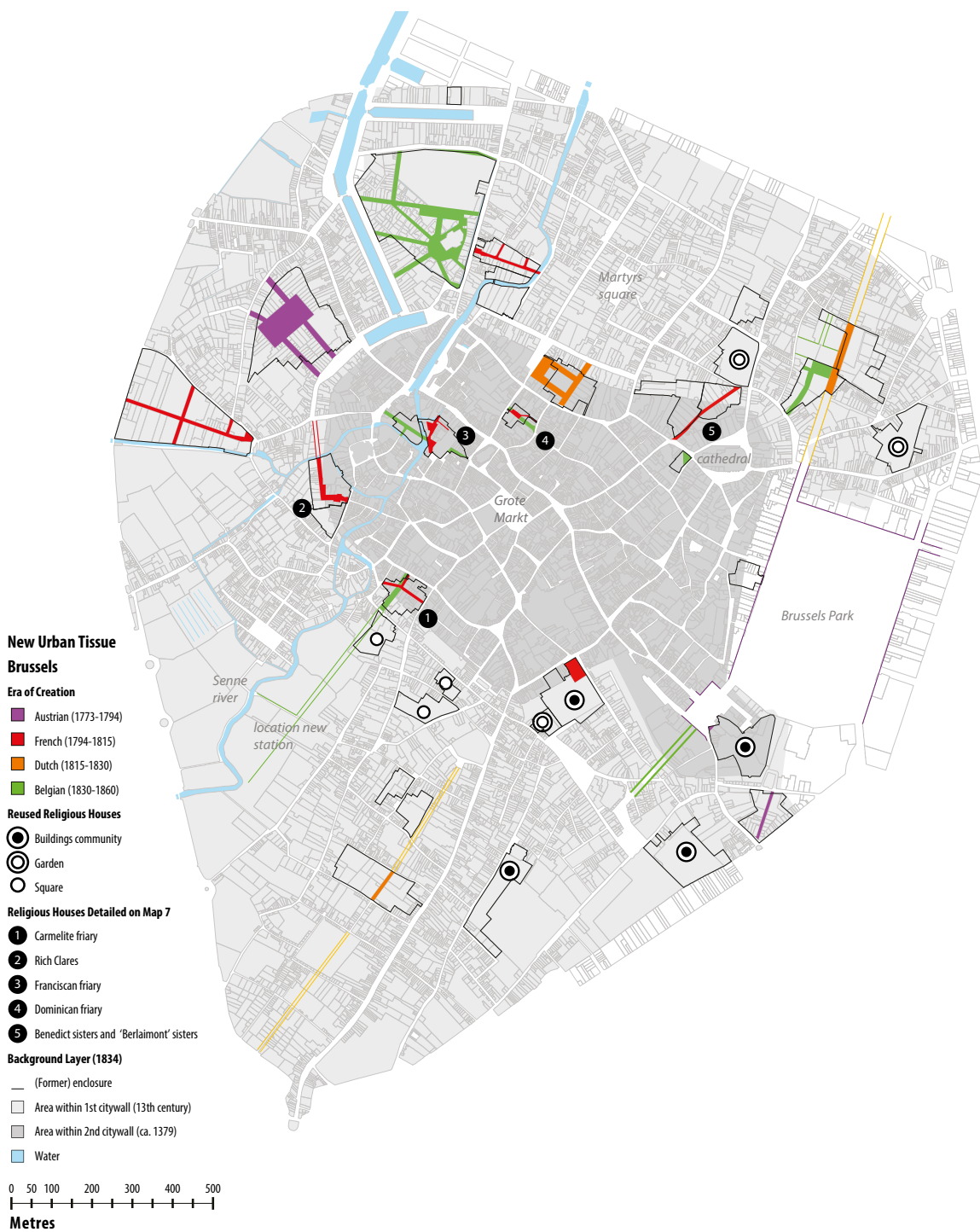
Map c, the Carmelite friary in Antwerp (founded 1498), was, like the Carmelite friary in Brussels, split into a considerable number of parcels. By contrast, the parcels were reached by the existing streets. For one part, the parcels were connected to the street west of the former friary. For another part, they were added to the gardens of the prestigious houses at the street to the north (Meir). Remarkably, the nave, the transept, and the choir of the former church were split into different parcels and belonged to different owners.

Map 6: Reinout Klaarenbeek (2018), *New Streets on the Sites of Former Religious Houses in Brussels.*

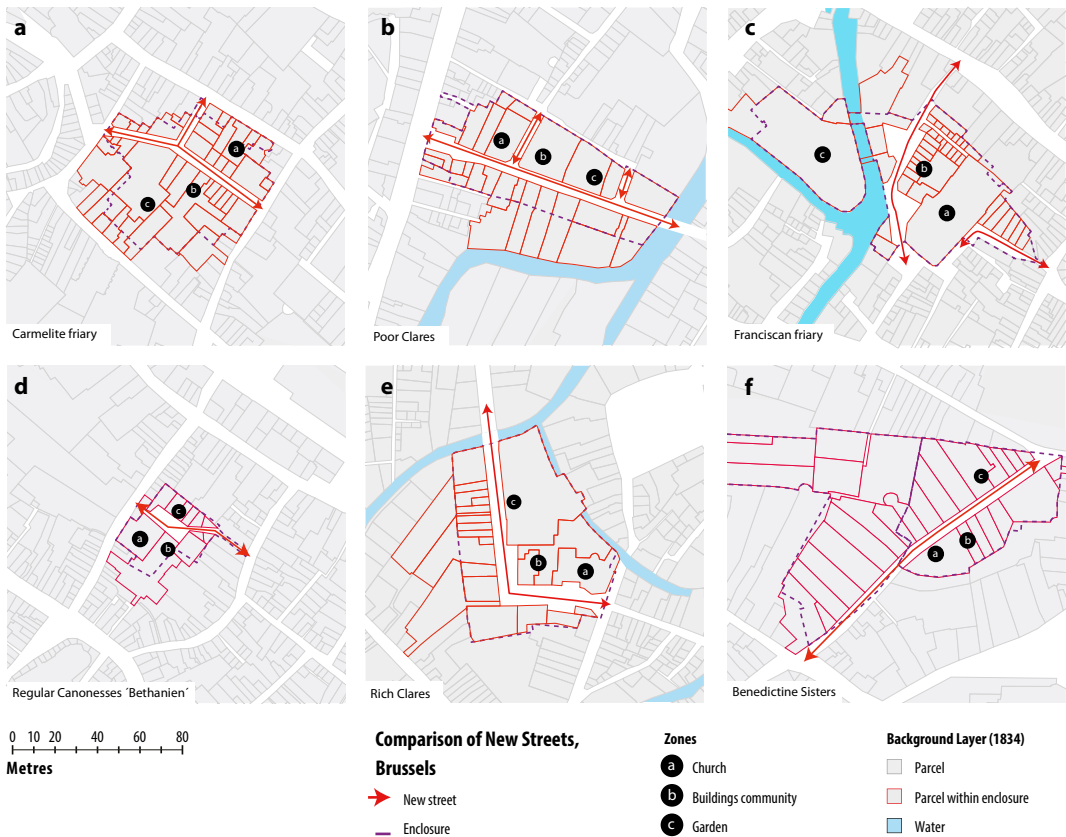
The creation of new streets proved to be characteristic for Brussels. The database of 'afterlife' indicates that Brussels counted eighteen former religious houses with one or more new streets. In Antwerp, with eight cases, the number was significant lower, whereas in Bruges the phenomenon was absent. The new streets — through corresponding identifiers — could be plotted on a city map, to study the scenario in a wider urban context.

Placing the new streets (coloured by their time of creation) in a larger urban setting basically reveals two patterns:

- A clear east-west distinction. At the west side, the availability of large religious houses played a crucial role in three major urban projects. At the east side, reuse by military and other state functions prevailed. This east-west distinction subscribed to a division of 'high Brussels' with the palace and most aristocratic residences, and 'low Brussels' in the Senne valley.
- A distinction between the area within and outside the oldest centre. Within the area of Brussels' first city wall, all the religious houses were subject to subdivision and new streets. Notably in the French time (1794-1815) street building peaked.



Map 6: New Streets on the Sites of Former Religious Houses in Brussels.



Map 7: Reinout Klaarenbeek (2018), *Comparison of New Streets on the Sites of Former Religious Houses in Brussels.*

The new street through the Carmelite friary (a) can be compared to other former religious houses where new streets were created. This allows one further to differentiate between different street building projects and urban results. On map a, the new streets do not connect to existing streets and are relatively small. This finding seems to suggest a dominance of real-property development, rather than improving traffic. The convent of the Poor Clares (b) is comparable, although the east-west junction could be considered as an improvement to the traffic. The Franciscan friary (c) is illustrative of the ad hoc creation of a new public space. On the location of the demolished church a new indoor butter market was created. To achieve better access to this new facility, existing alleys and the open space within the friary's enclosure were turned into public space. The small convent of contemplative Regular Canonesses (d) was turned into an open market. The convents of the Rich Clares (e) and the Benedictine Sisters (f) are examples of combined traffic and real-property development. Interestingly, the new street on Map e was laid out in such a way that monastic buildings were preserved. The church was turned into a parish in 1805.

