

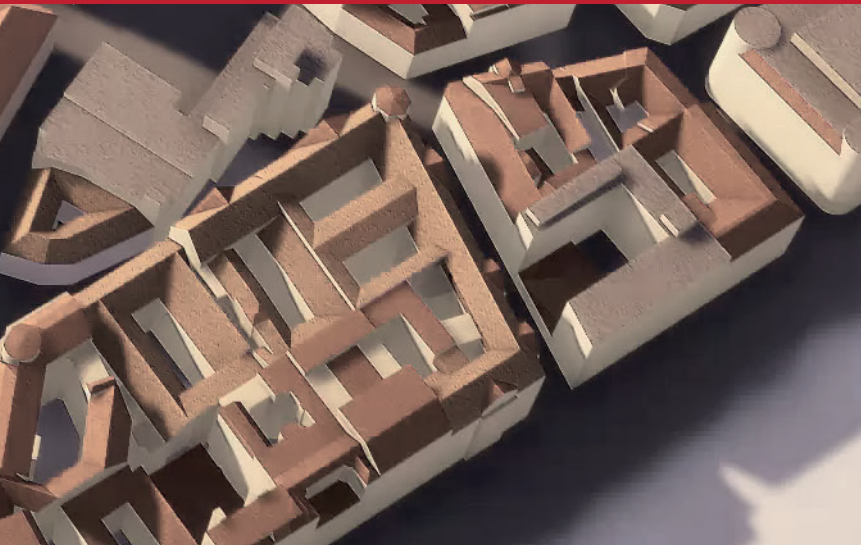


Urban Timemaps

Approach project
Study



Co-funded by the
Erasmus+ Programme
of the European Union





Urban Timemaps

Approach project

Applicable Representation
of City Centres with Heritage
importance

Erasmus+ KA2 Strategic Partnership Project
2015-1-UK01-KA202-013806



Co-funded by the
Erasmus+ Programme
of the European Union

Applicable Representation of City Centres With Heritage Importance
Erasmus+ KA2 Strategic Partnership Project
2015-1-UK01-KA202-013806



Co-funded by the
Erasmus+ Programme
of the European Union

EK Egyesület

Edinburgh World Heritage Trust

City of Lublin

Asociación Centro de Intervención Cultural y Educativa DOCTUM

TEKTUM ARHITEKTURA & ARTA SRL

Rīgas Makslas un mediju tehnikums

Digitális Legendárium Kft



Gabriella Laing english translator

2018

Table of Contents

| | |
|---------------------------|----|
| Our Approach | 6 |
| Research | 10 |
| Edinburgh | 12 |
| Lublin | 36 |
| Budapest | 54 |
| Granada | 70 |
| Modeling and coding | 84 |
| Learning programme | 92 |



Our Approach



Our Approach

Our Approach, Applicable Representation of City Centres With Heritage Importance

For centuries humanity dreamed about time travel. While for now this remains a fantasy, in the meantime we have built a significant body of knowledge about the evolution of our habits, organisation of life, ways of controlling the environment, and finally developing our settlements to accommodate demands of growing populations. The recent technological advancement makes real what 20-30 years ago we could only imagine in sci-fi productions. This significant shift is interlinked with the continuous development of educational resources, which capitalises on new technologies and brings more depth in return.

The Approach project responds to these issues in an imaginative and constructive way by visualising the spatial and architectural evolution of four historic European city-centres: Budapest, Edinburgh, Granada and Lublin. These evolutionary changes are embodied in a series of 3D “time maps” – a term specifically developed for the project to encompass cartography, planning, history, architecture, and 3D modelling. Moreover, each “time map” marks significant periods of social and political changes, which drove architectural and spatial changes. Our aspiration is to provide Approach users with a unique experience involving time travel, exploration, and learning, as well as an opportunity to compare how and where each city evolved in different historic phases. We are proud that the Approach online platform is a free of charge, intuitive, and accessible. The development of the “time maps” was managed by a comprehensive methodology that involved

historic research, transformation of raw data to 3D models, ongoing verification of outputs, and the compilation of a learning narrative. The project was delivered by four groups: researchers, modellers, project managers/coordinators, and students. Each modelled city (namely Budapest, Edinburgh, Granada and Lublin) had its research team collecting historic information, turning them into visual templates that would then be passed onto modelling teams based in Budapest and Cluj. In the next stage the modellers created 3D “white models”; their accuracy was verified by the researchers before the entire model received textures and was turned into the “interactive content”, which involved a fair amount IT engineering.

The new skills I got working in ArchiCAD (working with Morph Tool, to be more precise) had totally changed my comprehension of the program, and facilitated my further professional growth both at school and outside the school. The skills acquired during the project had laid the groundwork for my further projects because my general understanding of the program had become more advanced. Also, I could help my classmates who hadn't taken part in the project which resulted in the professional knowledge increase in my group. We learned all the necessary materials and acquired skills faster than it was specified in the curriculum.

– A. K. Kupse, RMMT student –

A vast amount of historic information was collected throughout the process. The research teams used a wide range of sources including: maps, drawings, paintings, photos, and texts. The

process, in its nature rather than scale, could be compared to the reconstruction of Warsaw's Old Town after the Second World War. "Info-boxes" provide narrative to the models, containing the most relevant learning information. They redirect to external sources for those seeking more detail; Some of the most interesting research discoveries can be found in this comprehensive study, which binds together all outputs of the project.

Following a series of public meetings in all partner cities we have confidence in the educational value of the project's outputs and their future potential for development. It is important to stress that the project involved design students from the Riga School of Art who actively participated in the project delivery and engaged with professional modellers and researchers. The educational aspect of the project is also represented by a series of online modelling tutorials, which can be found on our beautiful website. To understand the full value and potential of the Approach project we would encourage looking into all outputs of the project: the interactive content ("time maps"), the study, the tutorials, and the website. The project was a great learning exercise for our partnership. This unique experience has underlined our confidence in the choices we made along the ups and downs of the project. What you see now is not the final product; our aspiration is to develop the Approach project further in the future.

Krzysztof Jan Chuchra | Gabor Palotas



Research





Edinburgh

Viro Amplissimo
DARCHIBALDO TODO,

Præfæcho Urbis Dignissimo,

EDUARDO EDGARO,

ARCHIBALDO SYDSERFIO,

IOANNI FERMO,

IOANNI IOSSAO,

Scabini Iocundissimi,

Censoribus Senatoribus interpresibus

Patribus Senibus, Consilijs suis

Nunc nomine Civitatis Regis, antequam ad

Notissimum EDUARDUM SEYMOURIUM Archiducem

Leodunensi Curia et Regibus

Dignitate Urbis dicitur

affuerunt

D. D. D. C. 2.



- Una Villa antica sopra*
- a. Chiesa.
 - b. Chiesa capella.
 - c. Chiesa cattedrale.
 - d. Chiesa secolare.
 - e. Chiesa secolare.
 - f. Chiesa secolare.
 - g. Chiesa secolare Santa Maria.
 - h. Chiesa secolare Santa Maria.
 - i. Chiesa secolare Santa Maria.
 - k. Chiesa secolare Santa Maria.
 - l. Chiesa secolare Santa Maria.
 - m. Chiesa secolare Santa Maria.
 - n. Chiesa secolare Santa Maria.
 - o. Chiesa secolare Santa Maria.
 - p. Chiesa secolare Santa Maria.
 - q. Chiesa secolare Santa Maria.
 - r. Chiesa secolare Santa Maria.
 - s. Chiesa secolare Santa Maria.
 - t. Chiesa secolare Santa Maria.
 - u. Chiesa secolare Santa Maria.
 - v. Chiesa secolare Santa Maria.
 - w. Chiesa secolare Santa Maria.
 - x. Chiesa secolare Santa Maria.
 - y. Chiesa secolare Santa Maria.
 - z. Chiesa secolare Santa Maria.



Edinburgh



Edinburgh's urban setting is the portrait of Scottish history. Looking at the cityscape from Arthur's Seat, it is easy to spot many landmarks and ancient buildings which tell interesting town stories to keen observers. What is very evident is the striking contrast between the medieval Old Town and the Georgian New Town, as the testimony of the two faces of the Scottish character. The four time phases modelled were chosen to render this vision.

Timephases

The urban setting of Edinburgh is the portrait of Scottish history. For centuries, the city was confined within protective walls as a result of conflicts with various adversaries, primarily the English to the south. With the buildable area limited, the town started constructing vertically from the beginning of the 17th century. What is now known as the "Old Town" was soon considered one of the tallest cities in Europe. The tenements in Parliament Close, the area between Saint Giles and the Cowgate reached 14 stories high. It is said that in the West Bow, one of the oldest part of the town, the top stories of opposite buildings were so close, that neighbours could drink a cup of tea together without leaving the house.

From the end of the 18th century to the 19th century, Edinburgh turned from a belligerent overcrowded town to an intellectual city. The town walls were torn down allowing the city to spread horizontally, over the Nor' Loch. As such, the New Town emerged. This new urban setting, inspired by Greek architecture, made Edinburgh

the "Athens of the North". Also the bridges and the railway were built in the same period, opening Edinburgh's horizons to the world. Numerous changes were undertaken in the Old Town during the Victorian era. Many monuments of that period were built the typical Victorian neo-Gothic style. Many tenements were completely re-built during that age reusing the stones from the previous construction, making the overall appearance of the Old Town, to the untrained eye, medieval.

Why did you choose
these particular periods for modeling?

The overall urban plan for Edinburgh was shaped in 1124 under the reign of King David I, who developed the medieval "Burgh of Eiden" with the construction of the castle, the cathedral of Saint Giles and Holyrood Abbey connected by the "Via Regia" or Royal Mile. Edinburgh soon turned into a military fortress, complete with city walls. Outside of this was the burgh of Canongate, which remained autonomous until 1856.

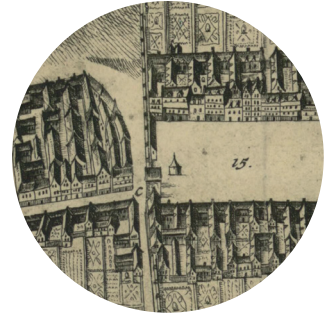
1742
Earliest time

The mature townscape of the earliest modelled phase is well represented in Gordon's bird's eye view map of 1647, where roads, tenements and landmarks are deeply depicted and recognisable. However, it is only from Edgar's map of 1742 that observers can fully understand the dramatic overcrowded and decadent situation that characterised Edinburgh at the time, developing right up to the Flodden Walls.



Walls and Ports

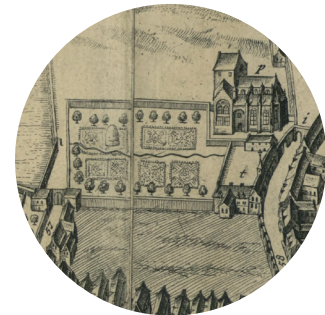
Until the 18th century, the boundary of Edinburgh was defended by the city walls. This dramatically influenced the topography and development of the city. In fact, the city's urban expansion during the 16th and 17th century spread only vertically, within the confines of the city walls, making Edinburgh one of the highest towns in Europe. Only after the failure of the Jacobite rebellion, Edinburgh's aspirations turned from politics to economic ambitions. Subsequently, urban expansion started to spread horizontally rather than vertically, looking north over where once was the Nor' Loch. No longer in use for defence, Edinburgh lost its walls. Bridges and larger streets were built instead, improving the street pattern for better travel connections.



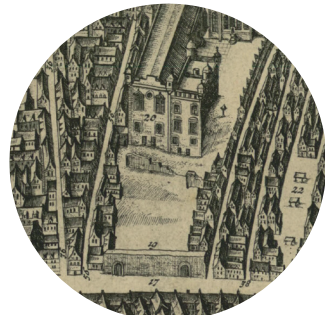
a. West Port
Flodden Wall 1514



e. Potterrow Port
Flodden Wall 1514 | 60



h. Leith Wynd Port
New | St Andrew Port
Flodden Wall 1514



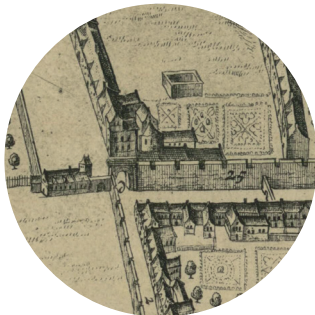
c. Graveyard Ports
King's Wall 1514



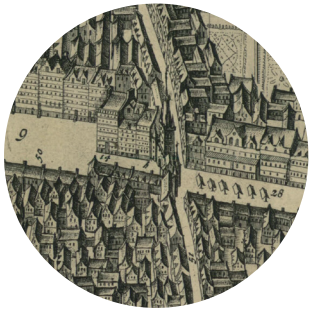
b. Port to Greyfriars
Telfer Wall 1620



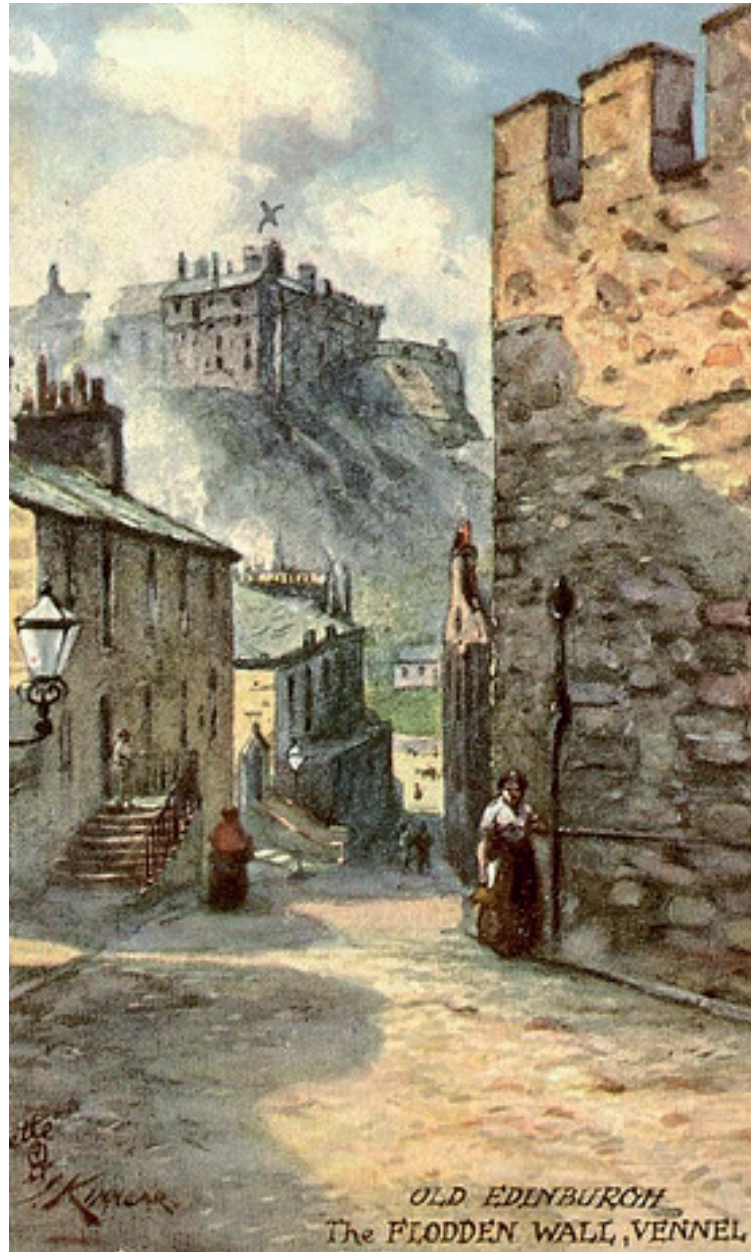
f. Cowgate Port
and St Mary's Wynd Port
Flodden Wall 1514 | 60



d. Bristo | Greyfriars Port
Flodden Wall 1515

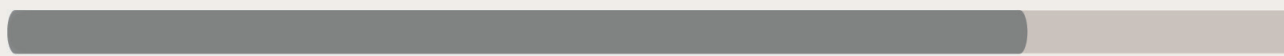


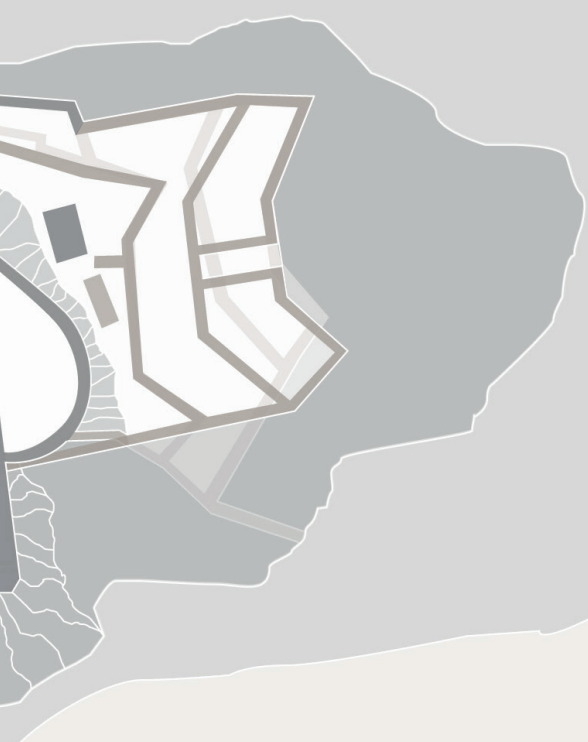
g. Nedderbow Port
King's Wall 1369





1600





1742

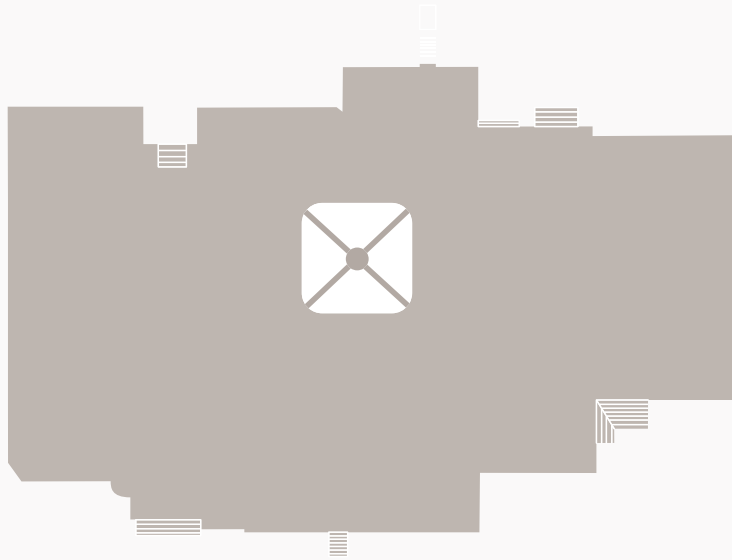


The castle

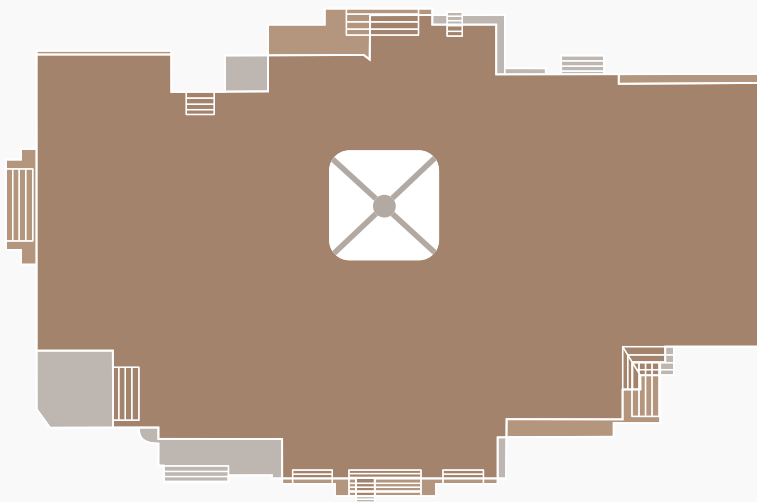
The historic fortress of Edinburgh castle stands at the top of castle rock since the Iron Age. It was mainly used as a military fortress. The last battle at the castle took place during the second Jacobite rising in 1745. After the defeat of the Jacobites, the castle was used to hold prisoners of war until 1811 when a mass prison break highlighted the inadequacy of the structure. During the 19th century, several schemes were put forward for rebuilding the whole castle as a Scottish Baronial style château. It began to be opened up to visitors during the 1830s. Since then, the castle is the most-visited tourist attraction in Scotland. It also hosts the Royal Military Tattoo during the annual Edinburgh International Festival.

Saint Giles Planimetry

Medieval > 1830 > 1911



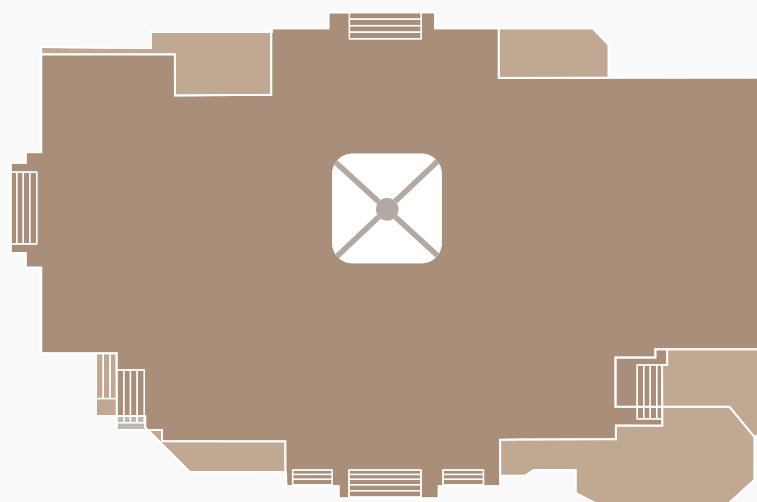
1490 | 1829
Lantern Tower



1830
William Burn
restoration



- Extension
- Main body
- Demolition



1911
Robert Lorimer
Thistle Chapel



- Extension
- Main body
- Demolition



The cathedral of Saint Giles

The cathedral of Saint Giles is one of the oldest buildings of Edinburgh. Its massive presence on the Royal Mile dates back to the reign of King David I, in 1124. Over the centuries, it has witnessed many religious reforms and architectural changes, most of them carried out during the 19th century, when the Luckenbooths and the Old Tolbooth were demolished, by William Burn and William Chamber. The Thistle Chapel was finished in 1911.





ELEVATIONS OF HOUSES EAST SIDE

EAST SIDE WEST



ELEVATIONS OF HOUSES WEST SIDE

WEST SIDE WEST



B O W 1 7 0 0 | 1 8 2 0



B O W 1 7 0 0 | 1 8 2 0

West Bow

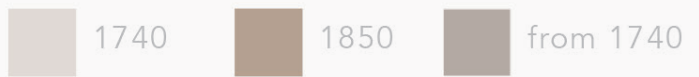
The West Bow was a steep and narrow zig zag lane, which provided the main western entrance to the town, linking the Grassmarket with the Lawnmarket. This street was a mix of timber fronted houses with an upside-down pyramid form, typical 17th century tenements with crow-stepped gables, towers and merchants' shops. This was the location of Major Weir's house, a man notorious as 'the Wizard of the West Bow', who was executed for witchcraft in 1670.



1836
Georgian Time

After the Act of Union in 1707, Edinburgh became consumption-oriented. This produced a urban revolution: not only was the "New Town" built and the area outside the Flodden Walls was developed, but most of the earliest tenements of the medieval town, now known as the "Old Town", were destroyed to allow for the innovative construction of the bridges and the new street patterns. This deeply modified the townscape, as is well represented in Key's map of 1836.



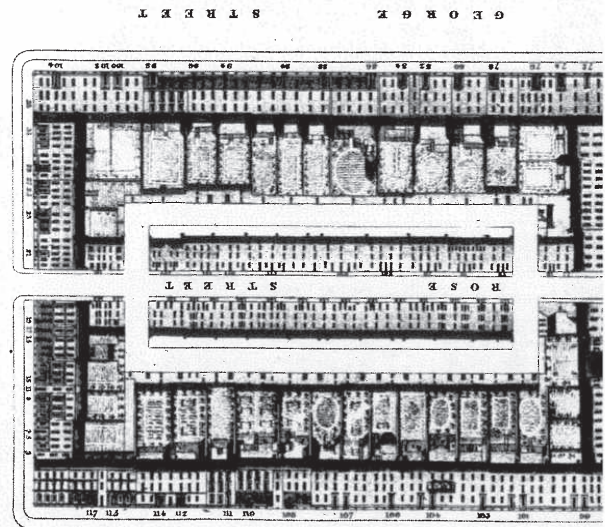
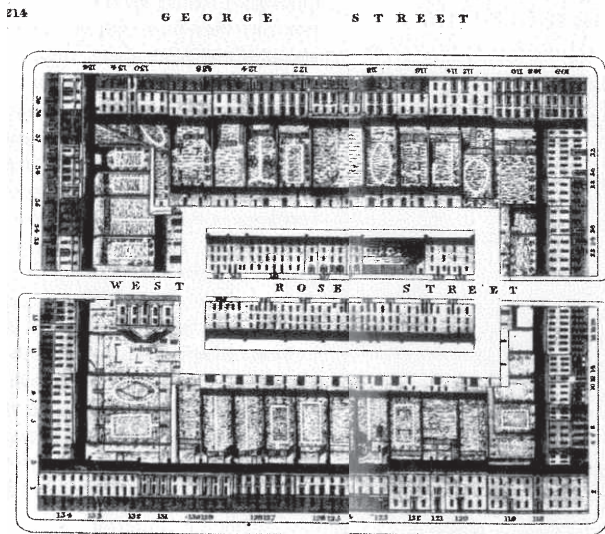
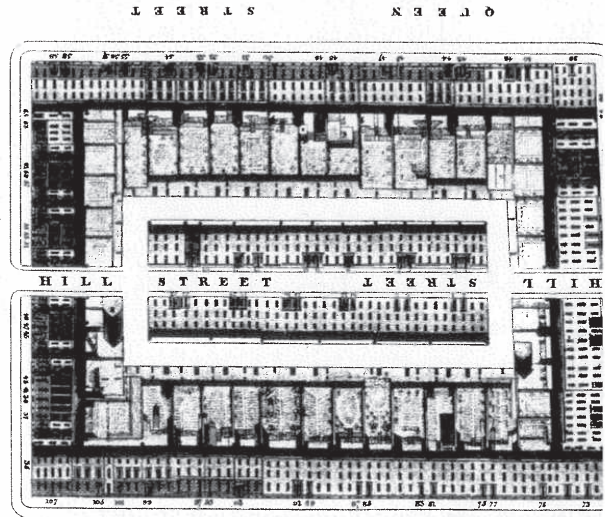
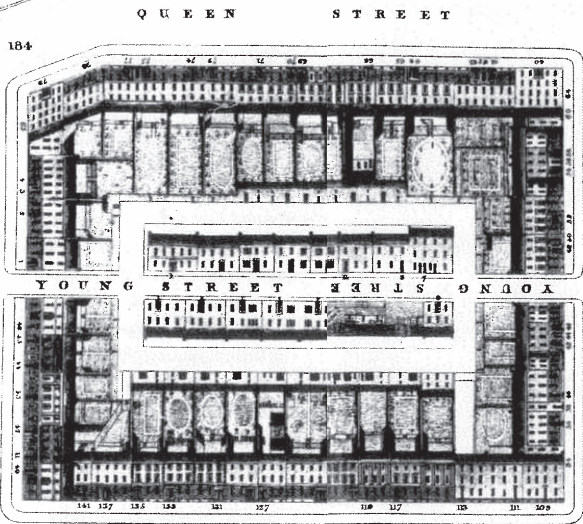




New Town

The designer of the New Town was 26-year-old James Craig. His proposal of a simple and rational design consisted of three main parallel streets crossed by two minor streets crowned by two main squares. The name of these roads was inspired by the union of Scotland with England and the civic Hanoverian British patriotism.

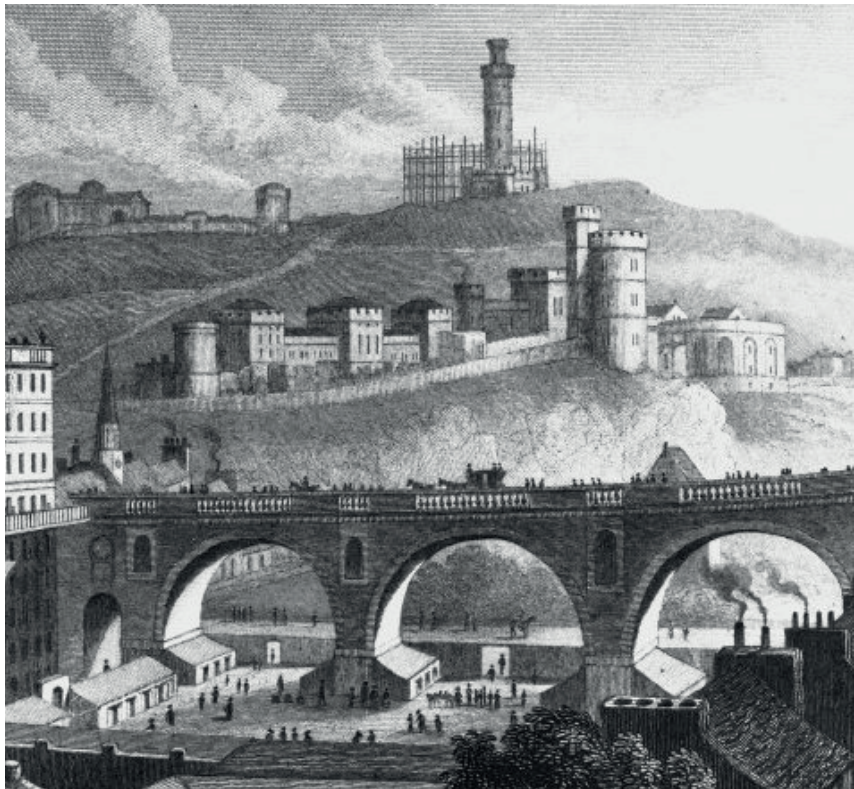
Charlotte Square, placed in Craig's plan to mirror St Andrew's Square at the west end of George Street, was designed by the famous Scottish architect Robert Adam. The houses were treated as unified blocks, to give the impression of a palace-like frontages. This particular style is considered one of the most important representations of Georgian architecture.

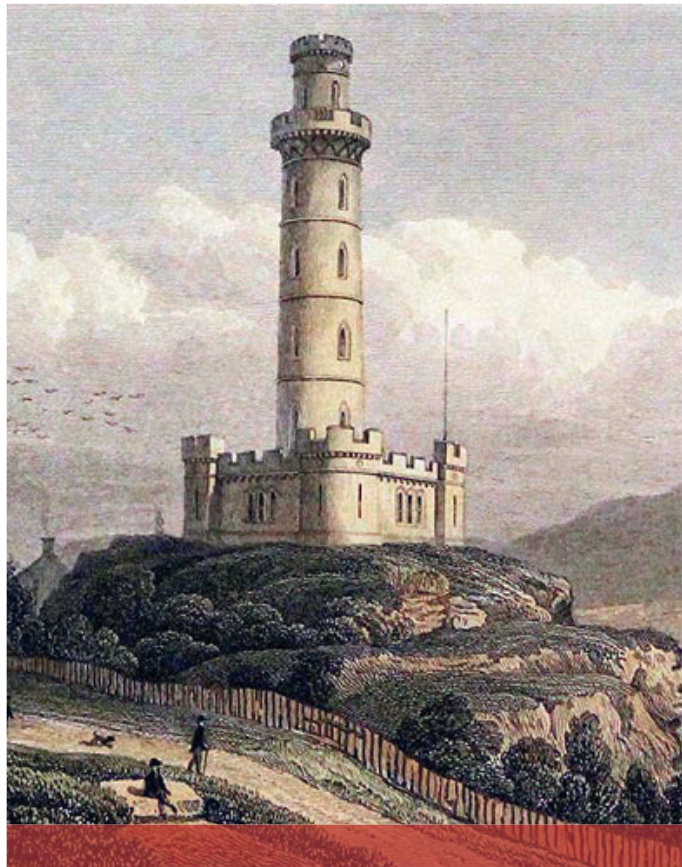


STRI

PRINCES







Calton hill

Calton Hill is a popular gathering spot for locals and tourists, where you could enjoy views of Edinburgh's cityscape. The evident Greek style of the buildings, principally inspired by the Acropolis, represents the sense of achievement felt in the city after the failure of the Jacobite Rebellion. For this reason, Edinburgh gave itself the title of Athens of the North, opposite of London, which was defined as the Rome of the North. This idea came in 1822 inspired by an exhibition of artist H. W. Williams' watercolours of Athens displayed alongside views of Edinburgh, inviting visitors to see the likeness in the setting of the two cities.



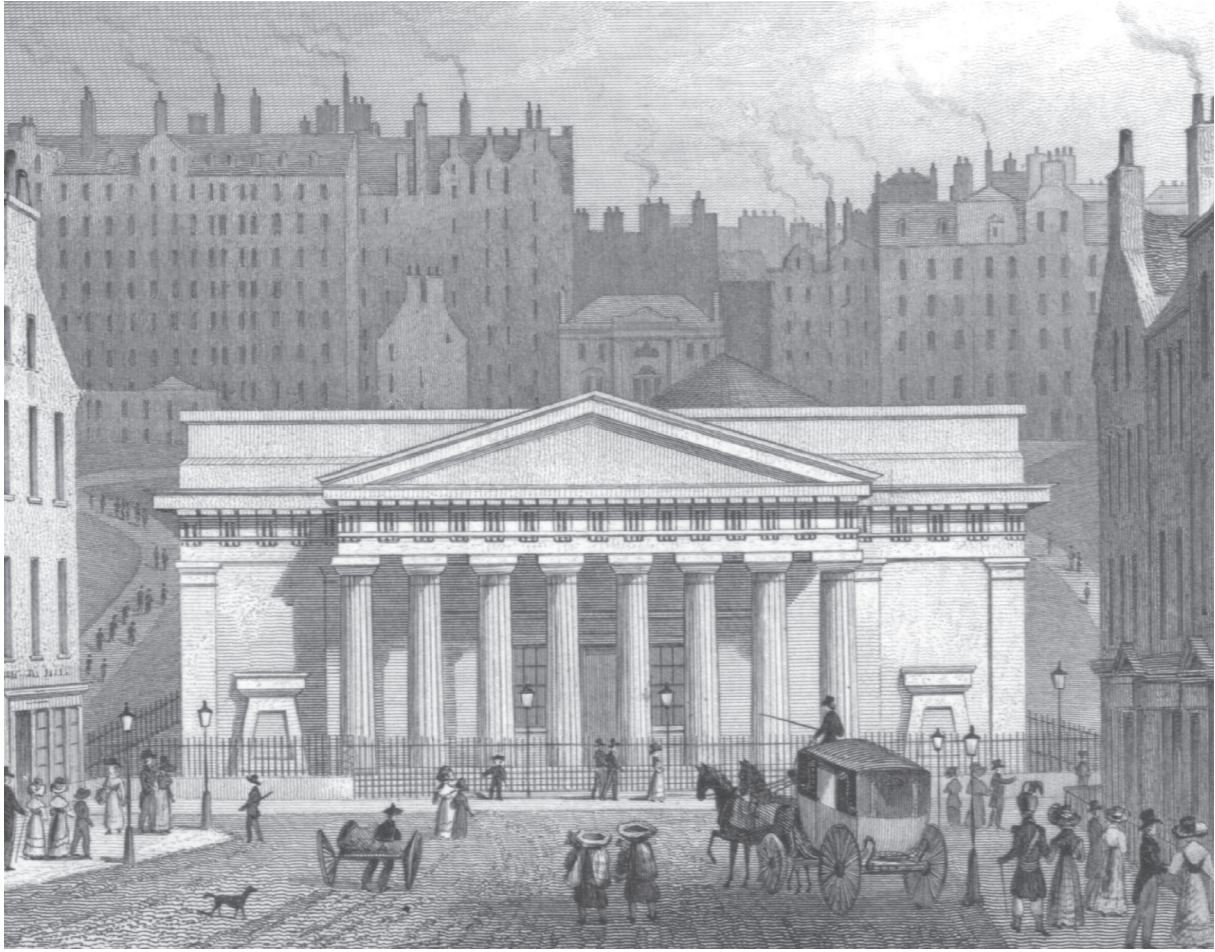
1924 Victorian Time

As shown in Bartholomew's map of 1924, the urban planning revolution of Edinburgh was completed during the Victorian era, giving the city most of its present-day appearance, despite the common belief that Neo-Gothic Victorian landmarks, like the Hub, the Scott Monument or the New College, date back to medieval times. The area that reports the biggest changes during the 19th century was the Canongate, where 38 industrial breweries were built, replaced at the end of the 20th century by offices and the new parliament.

Output of the project

What made Edinburgh worthy of UNESCO's recognition is connected with its urban planning. The striking juxtaposition of the organic Old Town and the planned Georgian New Town is reminiscent of the internal conflict between instinct and rationality of the Scottish character and the country's history. The architectural heritage of Edinburgh keeps the memory of Scotland alive.

This is why there are already many projects showing how Edinburgh could have looked in ancient times. What makes the APPROACH project unique is that it is the first one that visually renders the flow of the passing of time. Through the interactive urban time-map model of Edinburgh, the user will be able to easily compare the different time phases. In this way, they will acquire knowledge about Scottish history and character just by learning how to read the townscape. The interactive model of Edinburgh could be also used to support other exhibitions or events regarding the city. Edinburgh World Heritage staff can use the catalogue and templates produced by the research team as an archive of information about many major buildings and urban areas of the city.



Research

UNESCO World Heritage site area of Edinburgh covers more than 1000 buildings, divided in two different sites: the historic Old Town and the neoclassical New Town. The two contrasting areas contain a rich and varied architectural heritage. Even though Edinburgh is full of landmarks, which clearly define the skyline and townscape, the research was focused not on each single building, but on the urban changes through time, analysing the overall movement of the urban landscape through the flow of history. It was therefore considered counterproductive by the research team to get all the information concerning each building and its changes through four different time phases.

How did you organise and carry out the research?

The research started from the comparison between the selected maps of the four periods of time, highlighting how the most meaningful urban changes, like the construction of the town walls, the bridges or the industrial area of Canongate, had influenced the urban planning of Edinburgh. The second step was to create a time map catalogue, where the main landmarks and buildings were profiled, showing the foundation date, when the main changes were carried out and the demolition date when necessary. This catalogue was extremely useful for the modelling team to understand how many buildings or areas they had to develop or change in each time phase.

For each landmark, building or area present in the catalogue, a specific template was created to help modellers easily visualise its appearance and its changes through centuries. Each template contains a little map with the position of the building, area or landmark in the present day, a timeline, where the dates indicated in the catalogue were clearly highlighted, some images or engravings showing its development through time, some technical drawings with measurements when available and a short description of its architectural style and history.

What were the main challenges and how you managed?

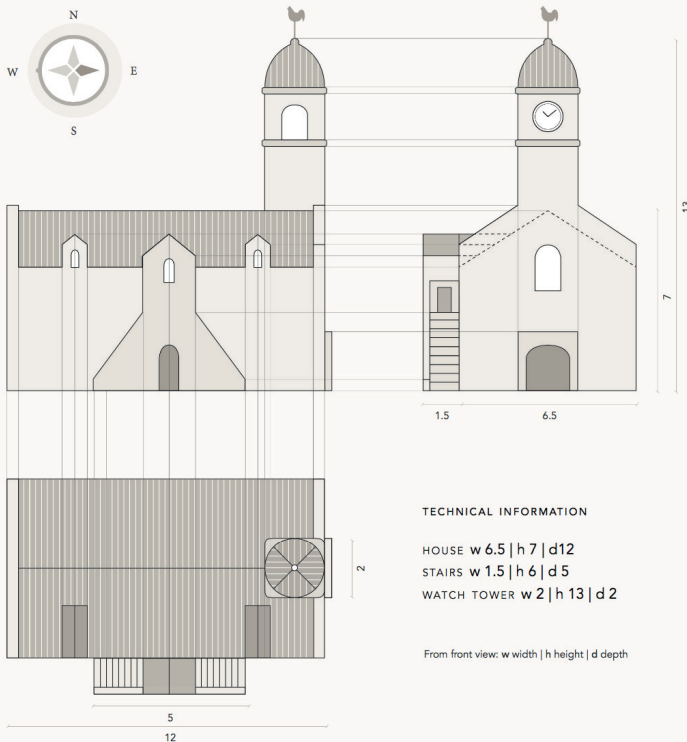
The urban area of Edinburgh covered by the UNESCO's recognition is large and varied, especially compared to the other cities modelled for this project. Fortunately, people in Edinburgh are really passionate about their city and they have eagerly kept histories of their town. It was therefore easy to find a lot of interesting research material, archives and online catalogues that showed the city of Edinburgh in different time phases. The work was to display all the information collected in a way that they could help the modellers to visually render the flow of urban history through time.

It was also hard to reconstruct the aspects of many buildings or roads of the earliest time period. It was possible to outline their general appearance only after comparing engravings drawn by different artists at the beginning of the 19th century, which were usually used as newspaper illustrations or in academic texts. Fortunately, the focus of the research was on the selected urban area and the level of detail required for each building had to be functional to render the main purpose of the project.

how the research is helping your work outside the Approach project?

The level of content written into the templates created to support the modelling team in Budapest is best suited to the general public and for schools' resources, rather than as a higher level conservation resource. The potential of the interactive content created by the APPROACH project's team is that they will visually explain to a common user more than 135 pages of research about the urban changes of the town in few clicks. Thanks to the interactivity of the model, it is very easy and enjoyable to explore the city through the centuries and to learn the hidden stories of Edinburgh's townscape.

Since the material produced by the modelling team in Budapest about the city of Edinburgh will be mostly graphic, many of the illustrations and



TECHNICAL INFORMATION

HOUSE w 6.5 | h 7 | d 12
 STAIRS w 1.5 | h 6 | d 5
 WATCH TOWER w 2 | h 13 | d 2

From front view: w width | h height | d depth

Weigh House

1614 | 1650

In 1614 the Council decided to renovate and enlarge the Butter Tron. The order that all cheese, butter, any other country produce and all merchandise weighing more than two pounds should be weigh here.

The Weigh House was bigger than the previous one and it was the only one which had a tower with a clock. From that, we can assume that the commerce was an important economical sector of Edinburgh.

It was destroyed by Oliver Cromwell during the Castle siege, leading the english army.



Parliament Square

Old Town, St Giles

Parliament Square in Edinburgh is situated immediately to the north of the former Parliament House, now home to the Court of Justiciary and the Court of Session. It was formed along with Parliament House around 1640 on the site of Saint Giles. This burial ground, which largely fell out of use in the mid-seventeenth century, is the resting place of the prominent religious reformer John Knox. The appearance of the buildings surrounding the square was substantially altered in the 19th century by the addition of façades designed by Robert Reid.

Charles II Statue

The statue of Charles II depicts the merry monarch in Roman costume and mounted on a horse. It is one of the earliest equestrian statues in Britain, dating from around 1685, the year of the king's death, and was erected by the town council. It is now thought likely that the famous Dutch sculptor Giovanni Stanetti was responsible for the statue.



1640 | 1807 | 1830

Heriot's Hospital

Lauriston Place

The construction of George Heriot's Hospital, a charitable school for poor and parents' children of Edinburgh, started in 1628 by George Heriot's will. Its renaissance architecture, as a sandstone's turreted building with a quadrangle layout, was designed by Sir William Wallace, who directed the work till his death in 1631.

It was finished only in 1650, but it was immediately conquered by the English Army's commander Oliver Cromwell, who used the building as a barracks for soldiers and horses. It was probably during this occupation, that the main tower of the north facade and the capitals over the two towers on both sides of the south facade were damaged.

A new design of the north facade was accomplished in 1693, created by Sir William Bruce in 1676.



1628 | 1650 | 1630

Balmoral Hotel

East End of Princes Street

The Balmoral Hotel, originally known as North British Station Hotel or simply N.B.H., was a traditional railway hotel built for the North British Railway Company adjacent to their newly rebuilt Waverley Station.

Its Victorian style, influenced by the traditional Scottish Baronial style and is said, influenced also by Charles Jenkinson, whose Princes Street department store was also designed by him, was designed by the architect William Hamilton Binnie, who won the competition in 1895. It was officially opened on 15th October 1902.

The hotel has ornate architecture and a large clock tower. It was designed by John Binnie, with floors by Stuart Grantham. In front of the Hotel there is a formal garden, laid out with pathways and flowerbeds. The north side of Princes Street is lined with buildings containing shops with canopies.

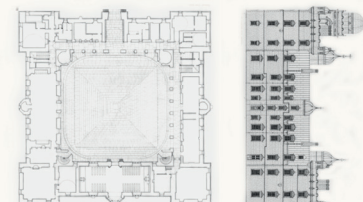


1895 | 1902

George Heriot's Hospital was the first building, which was founded outside the Rotten Wall (1541/1542). It could be originally reached from the Grassmarket, where there was the main gate. It was surrounded by the Telfer Walls (1620), which included also Grayfriars Kirk and its graveyard.

In 1822 the main entrance was moved to Lauriston place, so a new gate was designed by William Henry Playfair and the three rubble facades were refaced in ashlar stone.

Nowadays, George Heriot's Hospital is an independent primary and secondary mixed school.







pictures could be used for future studies, posters or publications by Edinburgh World Heritage . Another interesting application of the results of the project is by supporting school teacher as a gamification tool. It could be more effective for young people to discover the history of Scotland using the Approach project's interactive content, rather than a common school book.

In a world that is getting increasingly more graphics-focussed such as with the use of infographics, the potential of a digital interactive urban time map that visually renders the flow of Scottish history through time carried out by the Approach projects is endless.

Any major discoveries?

There were not any major discoveries concerning the city of Edinburgh. The work of many researchers and intellectuals carried through centuries have revealed most of the town secrets, treasured in the memories of its citizens. The material already

available about Edinburgh, regarding its history, engravings, paintings, photos, technical drawings and 3D models, is extraordinarily rich and accurate.

The main achievement of carrying out the research was consolidating so much disparate information explaining the urban development of Edinburgh's World Heritage Site into one document. Much of the previous research was in fact focused on only one period of time, one architectural style or one particular area of the city. Despite the more general level of detail contained in the templates and the main focus being on urban changes rather than on single buildings, the overall image of the city coming out from this document is complete and comprehensive, ready for use as a general catalogue or archive to consult.

Marianna Carazzai Researcher

TIPVS CIVITATIS
IN REGNO POLONIAE
PARTIBVS MVDI
AÑO CELEBRARI

Lublin



CVLTVS LVBLINĒSI.
CVLTVS EX OMNIBVS
CVLTVS EMPORIO TER. IN
CVLTVS CŌSVE TOCLARĒ.

T. S. Iohannis Baptistae.





Lublin



The selected area of Lublin is partly located within the boundaries of the Historic Monument, which marks the area of the most valuable historic sites rich in both tangible and intangible heritage. The area covers architecture from different historical periods, including churches, monasteries, tenement houses, examples of defensive architecture and public utility buildings. The proposed boundary of the historic city area includes four basic units in the spatial development of the historic city: the city within the walls, the castle with the castle grounds (up to the Czechowka river), Krakowskie Przedmiescie in the area of fortification dated the end of the 16th century to the early 17th century, and the Zmigrod Hill. The boundary of the area for modelling was prepared using the 'Map of the Great Lublin' from 1928, which includes historic borders of plots which are still in use today to a significant degree.

Timephases

The City of Lublin focused on the most significant phases of a spatial development. They were chosen based on preserved and available archival materials, particularly written material (inventories, descriptions, illustrations), iconographic and cartographic materials. Architectural and archaeological evidence was also analysed.

The proposed boundary of the historic city area includes four basic units in the spatial development of the historic city: the city within the walls, the castle with the castle grounds (up to

the Czechowka river), Krakowskie Przedmiescie in the area of fortification dated the end of the 16th century to the early 17th century, and the Zmigrod Hill. The specified area is approximately 0.75 km². The most precious and symbolic monuments of the highest historical value are located within the area, dating from the end of the 13th century to the first half of the 20th century.

The middle of the 14th century – a period after receiving settlement rights –

The period of the 13th and early 14th century marks a time of significant transformation in Lublin. These changes proceeded in spite of external threats, such as raids of Ruthenian, Lithuanian and Mongol tribes pestering Lublin and its surroundings. At that time in the Old Town Hill, a gradual process of establishing a new urban settlement under German law was initiated. The first stage of the process was completed in the second half of the 13th century. The change was reflected spatially in the south-west area of the previous settlement along Grodzka Street. The area was distinguished with the following features: a trapezium-shaped market square and the network of streets adapted to terrain conditions and the existing layout. This resulted in the characteristic semicircular and radiating street plan, which is divided in sections filled with bigger plots, some of which are recognizable today. After the Mongol invasion of 1341, the city was surrounded by walls with two gates: Cracow and Grodzka Gates, due to King Casimir the Great. The king also erected a stone hill fort on Castle Hill. The Dominican monastery complex located within the city walls was also extended at this time.



City walls

The city walls of the medieval town were 6 meters high and 2 meters wide. The walls were reinforced by 15 bastions. They were made of limestone with brick battlements, topped with wooden galleries. The walls were surrounded by a deep, dry moat. The city had two main city gates – Krakowska Gate from west and Grodzka Gate from north-east. Each gate had a wooden bascule bridge.

By 1650 the bastions became higher and the dry moat was filled-up. By 1790 the city walls were demolished. The only remains are the Rounded Bastion in Jezuicka Street.



VS CIVITATIS LVBLINĒSI.
GNO POLONIAE EX OMNIBVS
TIBVS MVDI EMPORIO TER. IN
O CELEBRARI CŌSVE TOCLARĒ.

T. S. Iohannis Baptistae.

Porta



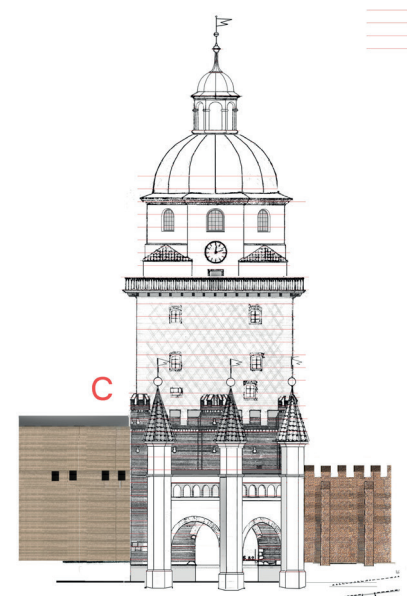
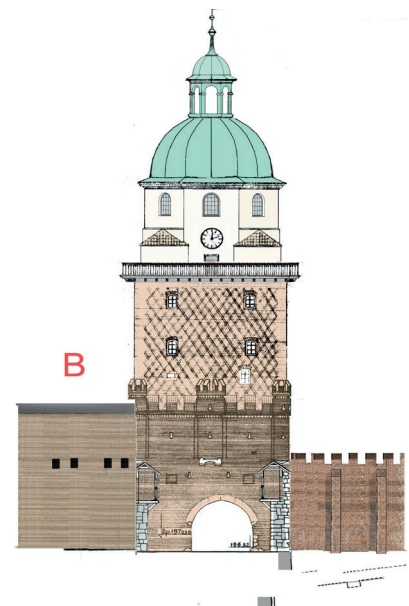
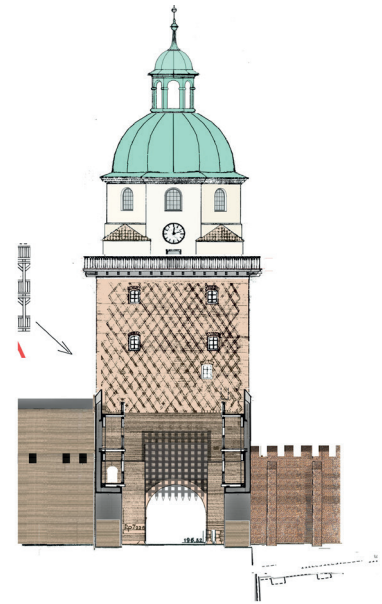


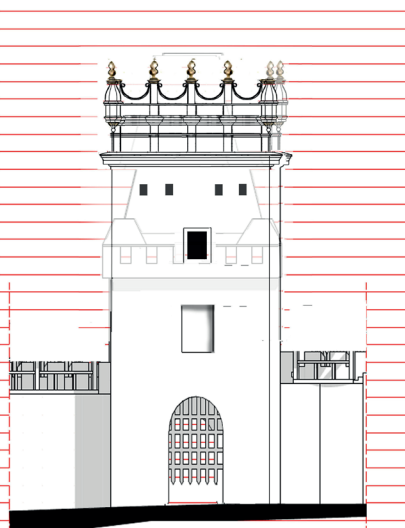
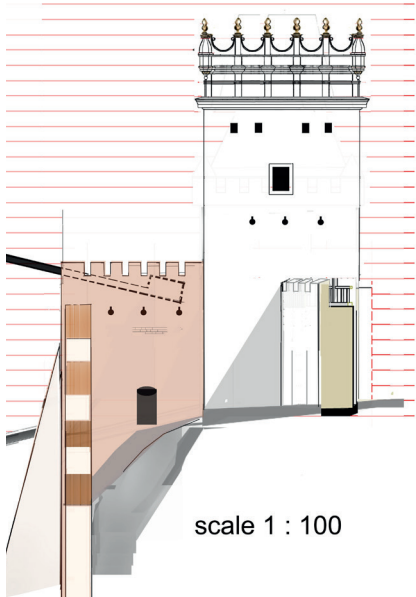
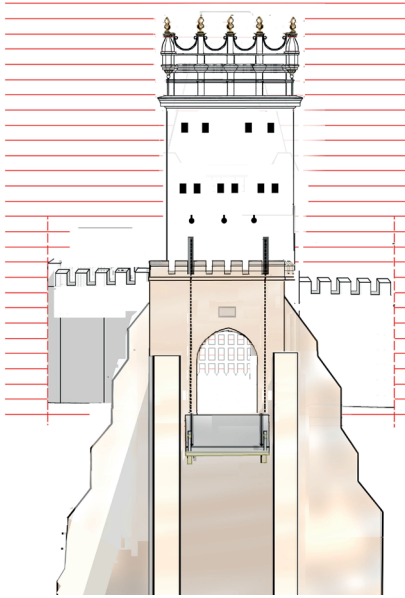
Lokietka square

The square was created as a fair in the early 17th century at the crossroads of the main route to Kraków replacing destroyed fortification parts. The main product on offer was grain so the place was called "Korce" from the name of an old unit of measurement. We know how the place looked due to the one of the oldest map of Lublin - 'The Krakowska Gate Area' by Karol Bekiewicz, dated ca. 1650. Today's square was created after World War II.

Cracow gate

Built after 1341 as an entrance gate from the direction of Cracow, it served defensive, commercial and housing functions. The restoration carried out in the years 1959-1964 gave the gate its current appearance. The wall facing the Old Town has the painting of St. Anthony, the city's patron saint since 1839. Presently the building is home to the Lublin History Museum.





Grodzka gate

Built in the 14th century together with the city walls, the gate owes its present appearance to the 1785 reconstruction designed by Domenico Merlini, during which it lost its defensive function and became a residential building. Nowadays it is home to the Grodzka Gate - NN Theatre.

Po Farze square

Po Farze square was created next to the Saint Michael parish church in 1857. In the 1930's the foundations of church were discovered and used in 1991 as a model for a reconstruction which reflects the original layout of walls.



The Castle

Together with the 13th century keep and the 14th century Holy Trinity Royal Chapel, the castle forms a historic complex on Castle Hill. The castle's brick building was erected during the reign of King Casmir the Great (14th century). In the years 1823-1826 it underwent reconstruction gaining its present neo-Gothic structure. As a result, the castle become a prison. Today the it houses the Lublin Museum.

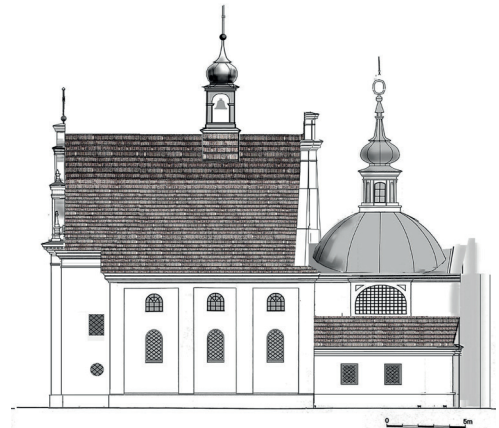


Church of the Holy Spirit

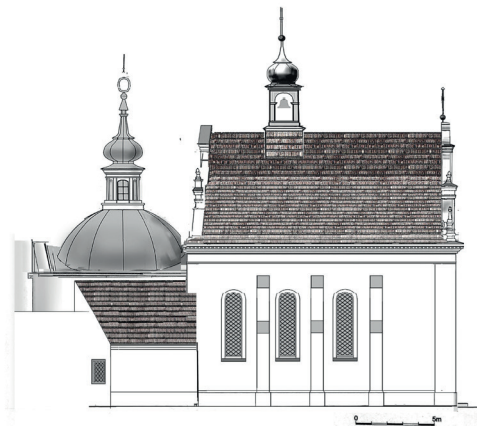
According to most researchers, the construction of the church of the Holy Spirit was completed in 1419. The original layout and furnishing of the church remains unknown; according to some sources from the very beginning it was a brick building. Fires of 1575 (the Great Fire of Lublin) and 1602 contributed to the poor condition of the church and hospital. The church was restructured architecturally after 1623, probably thanks to Jan Cangerle, a Lublin mason, who is also credited with part of the stucco decoration and covering the chancel with a dome on the oval plan. Further reconstruction of the church took place after another fire in 1733. At that time, the walls of the central nave were heightened, transforming the hall church into a basilica. In addition, the towers were heightened and a baroque gable with pilasters curving inwards was added.



SOUTH SIDE



NORTH SIDE





Saint Michael Parish Church

According to most researchers, the church was built at the end of the 13th or in the beginning of the 14th century. In any case, it was one of the oldest and most important churches in the city. The building changed shape through the ages: the tower was demolished several times due to the war damages (1341), fires (1575, 1653, 1719) and current renovation works. Despite these works, the church was in a very bad condition, so in 1846 it was scheduled for demolition.



Kościół pw. św. Michała A.D. 1790
© Krzysztof Mucha, Lublin 2017



Kościół pw. św. Michała A.D. 1840
© Krzysztof Mucha, Lublin 2017



The middle of the 17th century – the modern period –

Lublin became an attractive destination for newcomers due to the trade privileges obtained by the burghers. For example, in 1392 and 1448, four fairs a year were established. Moreover, the city was situated on the trade route between Eastern and Western Europe, on the way from Cracow to Vilnius. Together with new settlers of various nationalities, Jews arrived in Lublin around the middle of the 15th century and resided at the foot of the Castle Hill, within or close to Podzamcze – the already existing settlement supplying the castle. The influx of newcomers affected the development of suburbs, especially its western part, the so-called Krakowskie Przedmieście. Within its limits new churches and municipal institutions were founded: the Church of Our Lady of Victory along with the Brigittine Convent (a votive offering of King Ladislaus Jagiello for the victorious battle of Grundwald), the Church of Holy Spirit with an adjacent hospital, and the Bernardin church and monastery. Development in this area was irregular and scattered at the time. Within the suburbs, mostly in agricultural areas situated by the Czechówka and Bystrzyca Rivers, operated royal and alderman's mills, breweries and malting facilities. New land for development was designated along Krakowskie Przedmieście, from the Cracow Gate towards the new defensive line. At the foot of the Old Town Hill and castle, a small settlement grew inhabited both by Jews and Christians (Podzamcze).

The end of the 15th century and the 16th century is known as the Golden Age of Lublin. In 1578 Lublin became the seat of the Crown Tribunal – the supreme court of appeal for the nobility of Malopolska. This fact largely influenced the development of the city, especially its suburbs. In the subsequent two centuries the inner city did not undergo any fundamental changes, however it slowly began to decline. The city walls fell into disrepair and there were no funds to improve their condition. In the first quarter of the 17th century, the earth-and-wood fortifications were extended. The new line of embankments, including a new

gate, was moved 200 meters westward. At the end of the 17th century, another line of city fortifications with a number of earth-and-brick bastions were located further west, along today's Lipowa Street.

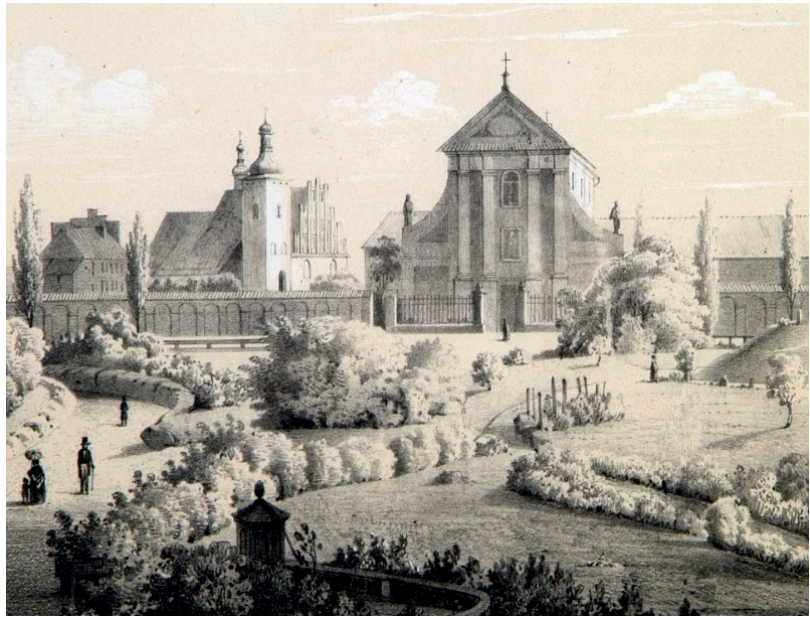
Lublin in the 17th century was a densely populated settlement composed of the inner city and the suburbs with boroughs and farms. The suburban development was encouraged by the nobility and magnates attracted to Lublin by the institutions of the Crown Tribunal. Their residences were mostly detached minor houses built on sizeable parcels of land surrounded by gardens.

The end of the 18th century – the city after a fall of the First Republic of Poland –

In the second half of the 17th century, new houses and several churches were built in the suburbs: the Reformed Franciscans, Brothers Hospitallers of St. John of God, and the Carmelite Order. In the early 18th century, Lublin experienced warfare, fires, the plague, and a precipitous decline in trade. Despite hardship, the nobility kept on founding new religious buildings: the Capuchin and Visitandine churches in Krakowskie Przedmieście, the church of Missionary Brothers in Żmigród, and the Trinitian church in the inner city. At the end of the 18th century, the medieval defence walls were demolished.

The middle of the 19th century – a city of the Kingdom of Poland era –

In the 1820s, the urban street system in the old suburbs was redeveloped. The routes to Lubartów, Warsaw and Zamość, which converged in front of the Cracow Gate, provided a skeleton structure for the new system. The Warsaw route, created by the extension of the existing Krakowskie Przedmieście, became the heart of the future city centre and significantly influenced the formation of the newly developed urban layout. New city squares emerged outside the medieval city walls, including one in front of the Jesuit church, by the new town hall, and the military square, a forerunner





of today's Litewski Square. To the west, past the line of 17th century fortifications, the axis of the central street ends at a municipal park called the Saxon Garden which was created in 1837. In the first half of the 19th century, industrial sites were scattered around the city as most factories and small plants were located in built-up suburbs. The intensive growth of industry in the second half of the 19th century was concentrated in areas outside Lublin's historical boundaries, in the vicinity of the railway line which opened in 1877 on the right side of the Bystrzyca River. Only the scales factory of W. Hess was located in the northern part of Lublin, along the Lubartów route, at the considerable distance from the railway.

How outputs of the project will be used by your organisation in the future?



The Historical Preservation Office activities can be divided into several areas, including:

- education,
- formal activities including administration procedures with issuing adequate permits and opinions,
- dissemination and concern for urban spatial order with particular attention paid to historical urban landscape.



Therefore outputs of the project will be useful in all above activities. Educational activities will focus on work in schools and the preparation of a special syllabus using 3D models and possibly other IT communication tools. Decisions concerning issuing permits and opinions will be proceeded through examination of materials collected during the project's implementation. The available models and other materials may be a reliable source for any decision making processes that will include changes in a spatial layout of the city.

Research

The middle of the 14th century was the most difficult period to research due to the lack of available data and completed research. The city has some scientific sources referring to the Early Medieval city; the material was prepared by two archaeologists and one art historian, but their research concerned:

- general characteristics of topography;
- reconstruction of a primary morphology of hills where settlements developed;
- reconstruction of the primary housing development of the castle and old town hills and settlements near the castle;
- the size of the historic city, identification of plots for development intra muros and garden plots together with fields outside the city walls.

How did you organise and carry out the research?

The team of archaeologists was responsible for collecting the data from different sources which are the result of excavation works and create the reconstructions of most important elements of the city, i.e. city walls with gates and bastions, typical housing, first churches. Due to the current excavations in the area of the Krakowska Gate and Krakowskie Przedmieście Street, there was the opportunity to refresh and update the knowledge about the Early Medieval and modern city.

For the modern period (the middle of the 17th century) there are the first, detailed preserved iconographic sources for this period, such as 'A view of Lublin' by Abraham Hogenberg, *Tipus Civitatis Lubline(n)si(s) in Regno Poloniae ex Omnibus Partibus Mu(n)di Emporio Terties in Anno Celebrari Consueto Clarae*, in the work *Civitates Orbis Terrarum* of G. Braun dated 1618, together with cartographic materials. However, these sources only provide guidelines. They need to be analysed, compare the possible reconstructions with buildings still existing or compare them with similar buildings in other cities.

Relatively good cartographic documentation is available for the next phase – the end of the 18th century – in particular a plan by Jan Nepomucen Lecki from 1852 and Austrian maps stored in Kriegsarchiv in Vienna. The 18th iconography allows for quite an accurate reconstruction of the forms of historic buildings together with architectural details. The sources included, among others, a painting *Fire of the city of Lublin in 1719* and an engraving, *Lublin Vera Effigies Imaginis S. Antonii Thaumaturgi in Ecclesia Lubliniensi Ordinis Minorum S. Francisci Observantui Miraculis Commendata* by Jan Maszewski, where architectural forms and details are visible. It is still possible to recognize some parts with 18th century origin in the existing buildings.

The middle of the 19th century was a time of intense spatial development of the city, as evidenced in remaining archival and iconographic sources. One of the most important iconographic sources is a painting by Filip Dombeck *Entry of general Zajaczek to Lublin (1826)* which gives a precise view of forms of particular public utility and religious buildings together with a view of Zamosc route, and a lithograph by P. E. Hackert *View of Lublin from Piaski tollgate (approximately 1840)*.

The project allowed the Municipal Office for Historic Preservation had an opportunity to engage an art historian responsible for looking through the available archival sources and copy the data concerning the APPROACH area of the city.

What were the main challenges and how you managed?

Preparing the 3D models and research was different for each partner involved in the project, due to the diversity of the available information and the different time periods being modelled. However while trying to reconstruct urban development of the city throughout the centuries, the following work phases have to be considered:

1. Choosing historical periods which demonstrate interesting urban changes and development





within the boundary of the area

2. Analyses of previous research that will aim to consolidate already existing materials. It is crucial that two first phases should take place simultaneously because available research analysis may influence a choice of urban development phases.
3. Collection of available iconographic and cartographic materials and their later preparation to be used for construction of 3D model.
4. Obtaining new materials during archives queries and construction of databases for the area identified for the project.
5. A reconstruction of the most important elements of the city's urban development such as city walls, towers., typical housing, public utility buildings, churches, landforms based on results of archaeological works, source materials, available archive materials and comparison analyses.
6. Execution of drawings that include dimensions of buildings, projections, sections, elevations, type of roofing, material and technique of making particular architectonic details, colours etc. These drawings will be used at construction of 3D models.

In the case of Lublin the APPROACH project was the first such complex exercise connected with research on urban development of the city. For the first time a network of professionals was built – archaeologists, art historians, historians, and IT specialists whose knowledge and experience allowed an extremely valuable wealth of material to be collected, allowing for the construction of reliable models and visualisation of specific buildings without too much fantasy involved. The biggest obstacle for reconstructing old Lublin was still insufficient knowledge about its past. The city has never been fully examined by archaeologists; excavation works are conducted accidentally with construction works made in the city, their results are disparate. Collecting and analysing this knowledge was one of the biggest challenges during APPROACH implementation.

Preparation of drawings reconstructing old developments and facilities which still are within the city but changed immensely was done for the first time at such a scale. The collection of a huge

number of archive materials and the construction of a database that facilitates and enhances the quality of every day work of the Historical Preservation Office was added value in itself.

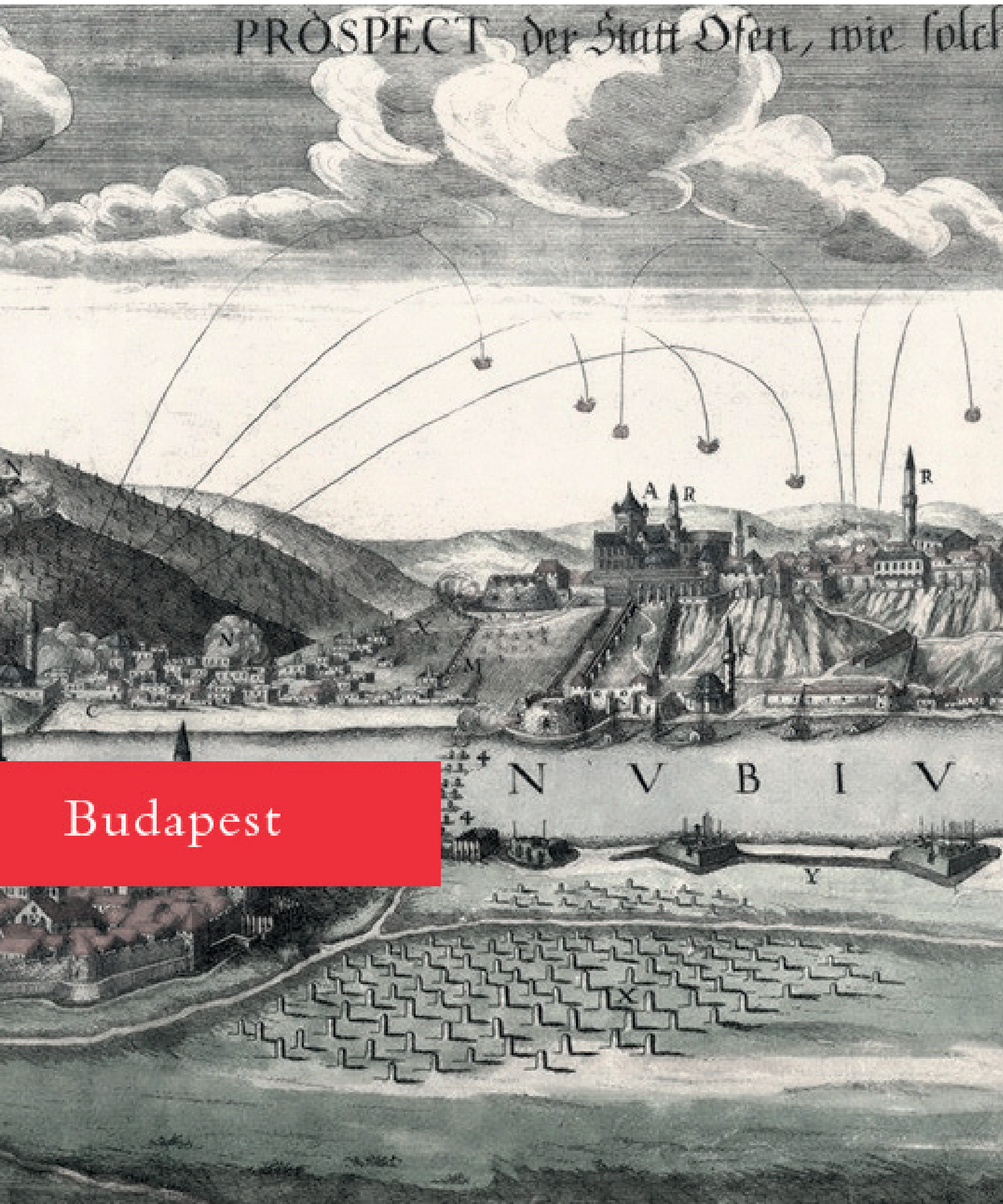
How the research is helping your work outside the Approach project?

The Municipal Office for Historic Preservation is one of the offices operating within the Municipality of Lublin. Its scope of responsibilities includes preservation of historic buildings and areas, setting standards of historic restoration, dissemination of knowledge concerning heritage issues, educational activities directed at different groups of stakeholders, and heritage awareness-raising campaigns. The everyday work of the Office is based mostly on historic cartography and iconography, archival documents, written sources and results of research work. Due to participating in the APPROACH project, the Office had an opportunity to significantly update the database concerning the heritage of the city.

With this refreshed knowledge we can work more efficiently, have a better understanding of the spatial development of the city through ages, and can be more aware of possible development threats that interfere with historical areas and particular protected buildings. The Office implemented several actions concerning dissemination of heritage issues focused on the young people. They included exhibitions, open meetings with professionals, co-operation with art schools and engineering universities. We plan to spread the APPROACH project achievements during further meeting and activities.

Municipal Office for Historic Preservation

PRÖSPECT der Statt Ofen, wie solch



Budapest

ne von der Statt Best an zu sehen





Budapest



The model and study of Budapest focuses on the inner city of Pest, specifically the southern area of Pest City which existed as a separate town since the medieval times. The examined area was originally bordered by the city walls which formed a half-circle shape and now this form has been inherited to the present day, being defined by the surrounding ring roads. The time periods of the research span more than 1,500 years: from the Roman fortification to the metropolitan city centre of the later capital. The city evolved from the second half of the 19th century with its strong and wide axis towards the first permanent bridge of this area (Elisabeth Bridge) and with the newly developed urban blocks of Revival and Art Nouveau styles.

Timephases

The selection for Pest City's time phases tried to capture the most important turning points of the city's developmental history: each phase chosen represents the apex of one building period before new styles were introduced.

The City of Pest still keeps the remains of a Roman fort from the 4th century and upon these former foundation walls a parish church was later erected in Romanesque Style, called the Innercity Parish Church (Church of the Blessed Virgin Mary). Because of this interesting continuity year 350 AD was selected first.

Regarding the medieval period the iconic year of 1541 was selected being one of the greatest

turning points in Hungarian history. In this year the Ottoman Empire occupied the middle part of the country together with Buda and the city of Pest. For 150 years there had been no developments connected to Hungarian culture, but many of the churches were converted to mosques. When retaking the city from the Turks in 1686, it was nearly completely destroyed by the battle, so the state of 1541 means the end of an era, politically and urbanistically.

Starting from the 18th century the city was rebuilt with many new Baroque monuments. From the 19th century the classical style also appeared with the Reform age, the peak of which was the revolution of 1848 against the Habsburg rule. During the battle for Buda in 1849 a lot of buildings were destroyed by the cannon balls shot from the castle towards the Hungarian forces in the city.

The revolution failed, but 19 years later the Compromise heralded a new era by forming the Austro-Hungarian Monarchy. In 1873 Budapest was formed from Buda, Óbuda and Pest and became the twin capital of the dual state. As a result the city was completely transformed and reshaped in the following 50 years, developing new broad avenues and replacing many one- and two-storied houses with buildings of 5 or 6 levels. The reigning style of the metropolitan city became Eclecticism (revival styles) continuing with the appearance of Art Nouveau in the early years of the 20th century. With the end of the First World War in 1918 also ended this important era, both politically and culturally.

How the chosen time phases
represent the history of your city?

When looking at Budapest and at the selected area for the project- the area of medieval Pest - we can mainly see those developments which were raised between the 1870's and the first decades of the 20th century. The greatest changes between 1918 and 2015 are mainly the results of the bombings of the Second World War which created a considerable amount of space for new developments, finalised in the later 20th century.

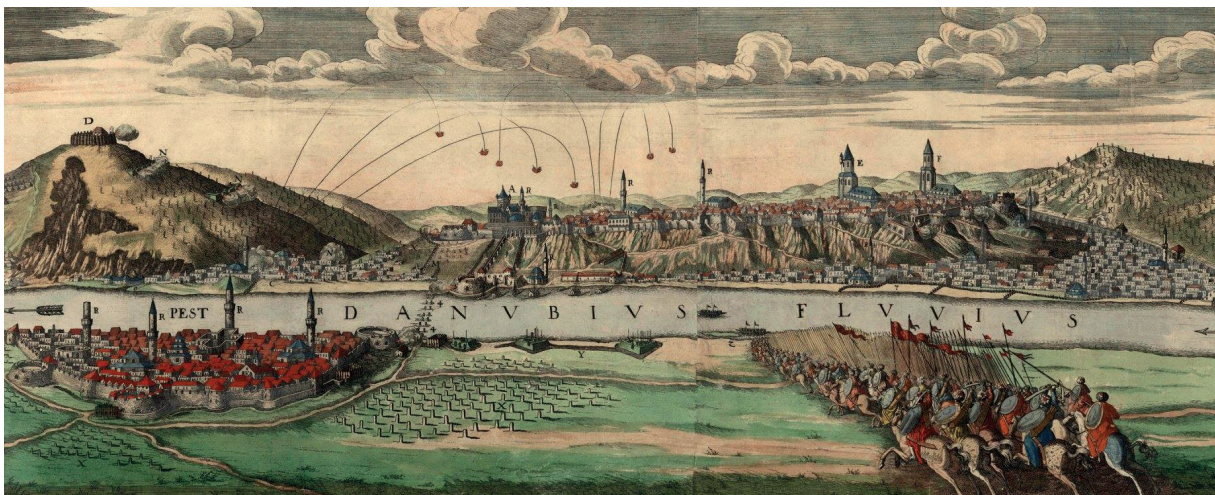
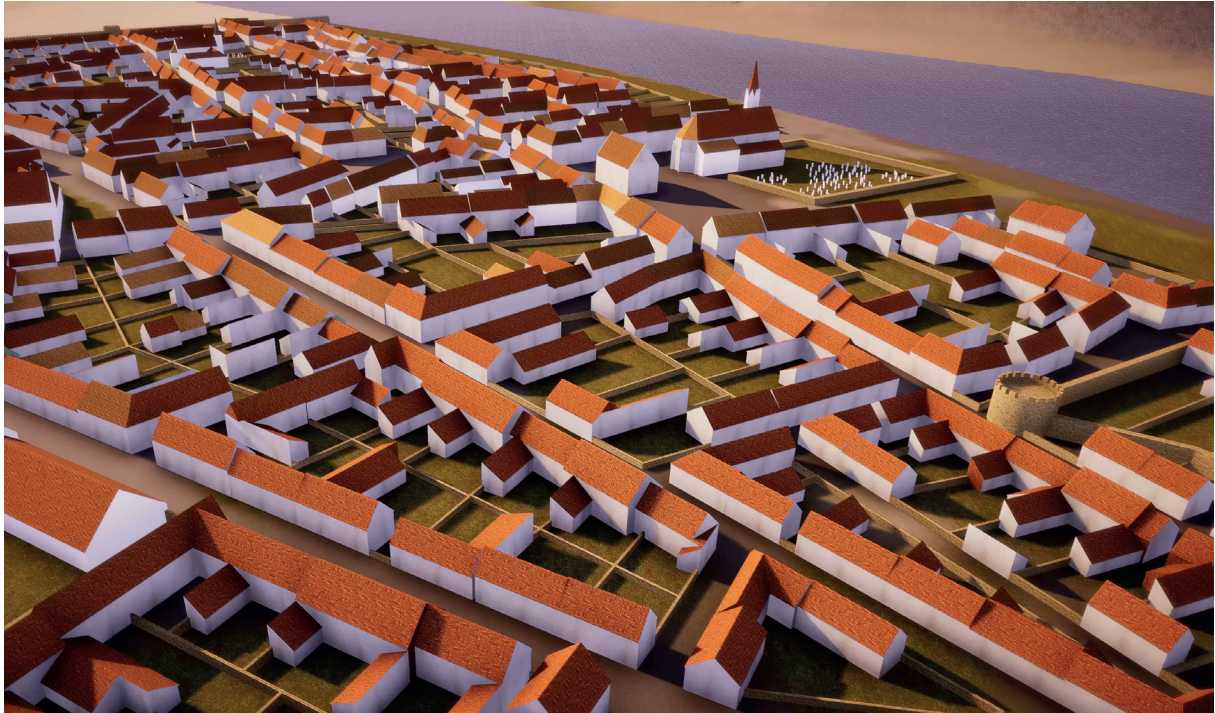
Medieval city
– 1541 –

When going further back in time and comparing the state of 1918 (and today) with 1848, we can discover that the list of common parts is quite short. Many tenements and villas of the Baroque and Classicism periods were removed and those which could survive were only the most important and oldest monuments: churches and administrative buildings amongst only a few tenements. There are only a few remnants of the 1541 time period which exist in the later periods. The most important connection is the sanctuary part of the Innercity Parish Church (Church of the Blessed Virgin Mary) which shows the Gothic form of the building, while the front part received a new Baroque representation and two towers during its reconstruction after the Turkish occupation. Finally when talking about the Roman period, today the ruins of the Contra Aquincum fortress can be seen in the Március 15 Square or within the Innercity church, through the glass floor.

19th century
– 1848 –

But it's not only the buildings which were redesigned in the second half of the 19th century, but also the street network inherited from the medieval times when they were mainly defined by the gates of the city walls and the overrunning city roads. The city itself was originally formed by many small squares and narrow streets, but this was greatly changed with the introduction of a great new axis from the former Hatvani Street which was continued by a new connection to the Buda side over the Danube, the Elisabeth (Erzsébet) Bridge. This new city plan reconfigured everything around, demolishing even the former City Hall of Pest, and eliminating the Hal (Fish), Sebestyén and Városház (City Hall) Squares.

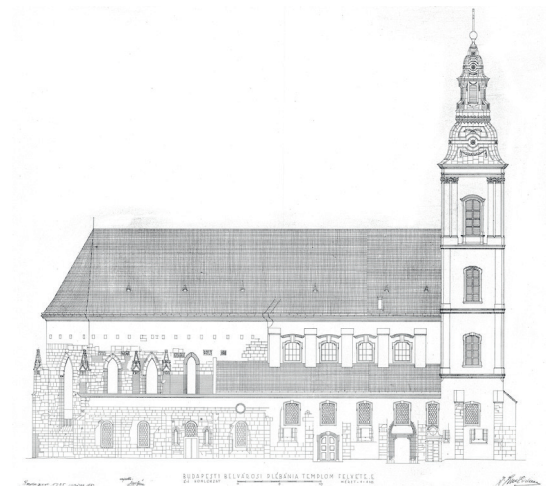
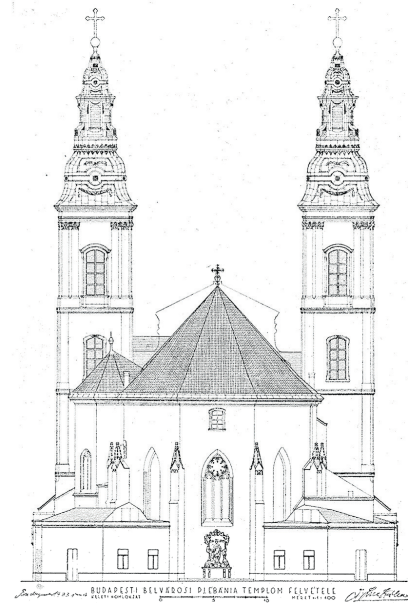
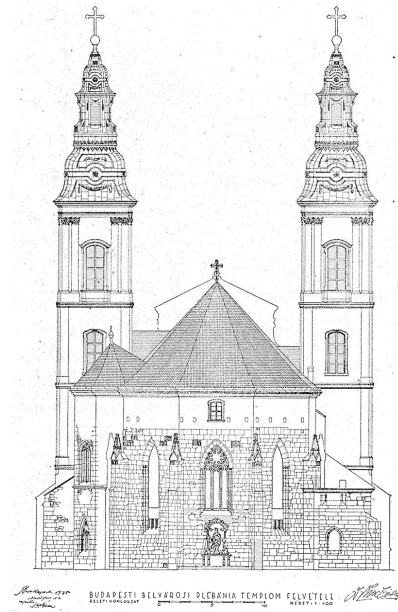


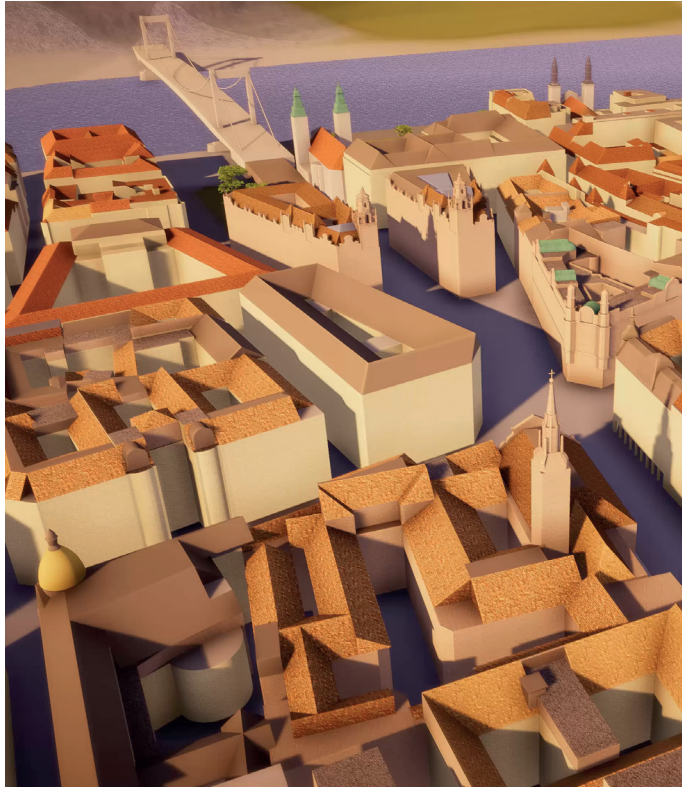




Màrcius 15 Square

The square in its current form is a novel development (from the turn of the 20th century) as its buildings now occupy the former Városháza (City Hall) and Eskü Squares. It also hosts the remains of a Roman fortress, popularly called Contra Aquincum, which was built around 350 AD on the hostile side of the Limes which was here marked out by the Danube River. Its most important buildings are the Blessed Mary Parish Church, the Piarist Secondary School, the Péterffy Palace (1797), the Elisabeth Bridge (1903) and until 1900 the former City Hall.

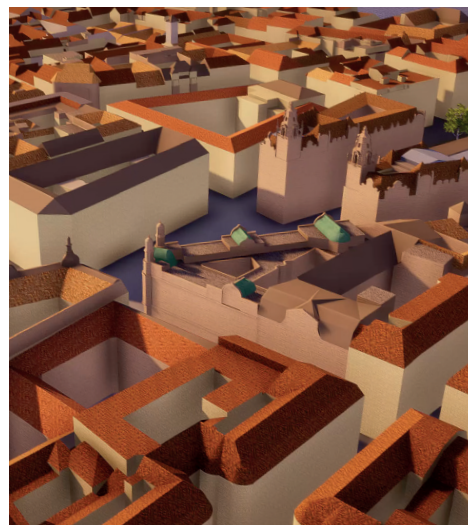






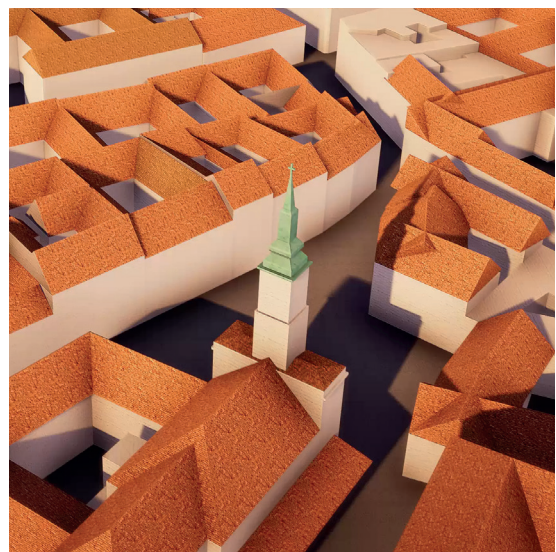
Ferenciek Square

Ferenciek Square was named after the Franciscan Church and Monastery that has been standing on its eastern side for more than seven centuries. The name and current use however is a novel feature. Originally - similarly to Egyetem Square - it was only a wider segment of the Úri Street, while the perpendicular road was called Hatvani Street. After the redevelopment processes the newly formed square on the axis of the Hatvani Street which is now defined by the Klotild Palaces, the Brudern House and the Royal Tenement House was named after count Apponyi. Nowadays Ferenciek name refers to both the place in front of the church and the wider open space of the main Boulevard (Kossuth Street).



Szervita Square

Szervita Square is quite a new formation of Pest's urban space. The Servite Order bought several plots in the area after retaking the city from the Turks. The centre of the square was also a building plot originally, but the city only allowed the acquisition if the order would never sell it nor would they build anything to there. In agreement with this, it was only the Baroque Mary statue that was placed to here by the Order, which is still one of the main features of the triangular square.





Egyetem Square

Egyetem Square was originally just a wider segment of the Úri Street that crossed the city from the Kecskeméti Gate to Budai (Váci) Gate. Its current name refers to the ELTE University, the predecessor of which was moved to here at the end of the 18th century. The square can be identified by the University Church, the main building of the ELTE University and the Károlyi Palace.





How outputs of the project will be used by your organisation in the future?

The outputs will help the educational work of our architectural association. With the help of the research materials on Budapest's past and the interactive content of Pest we will be able to keep organising thematic events to show the spatial development and vivid history of the city, while the virtual materials will be permanently available on our websites.

The research allowed us to meet a number of art historians, archeologists and historians who are especially interested in the history of the selected area and so we believe that we will be able to further develop our models and interactive content as soon as there are any new discoveries in connection with the history of some individual buildings.

The models as resources can also serve as the basis for further interactive content, following different virtual pathways or focusing on different locations or individual buildings. Among the thematic reuse of the available materials another possible continuation of the project is to extend the area, which would make sense urbanistically. The model which reveals the city centre of Pest in a very illustrative way can also help in the debates about any new developments, helping to measure the impact of any controversial intervention that may occur to in the urban space.



Finally it is not only the interactive content of Pest that can be useful during our architectural educational mission, but all four cities can be interesting resources for analyzing similar trends and differences in the urban development of European cities.



Research

The research was carried out with different teams for the different time phases. Regarding the ancient and medieval periods, which were the most difficult ones as the amount of available

information is very small and there is lots of room for theorising, our association cooperated with the Budapest Historic Museum. For the ancient period, which is mainly characterised by the Roman fortress Contra Aquincum, our consultant was archaeologist József Beszédes, while the realisation of medieval Pest was helped by archaeologist Eszter Kovács (+2018). Formerly there were only reconstructions available for the fortress and the Gothic Church, both in the location of current Március 15 Square, but there has not been a single attempt until now to at least sketch the possible look of the medieval city of Pest with the city walls around it. So our model for this period became the first reconstruction ever produced to become an open resource for the public.

How did you organise and carry out the research?

For the later periods of the interactive 3D maps there were enough materials available online and in printed form to distribute the research works internally. Fortunately there are great databases available with old photographs starting from the mid 19th century and also some graphics and paintings to help to fully imagine the time period of 1848. The book titled 'Atlantis of Budapest' needs to be mentioned here, which collects the complete history of the city's transformation in the second half of the 19th century, when the city centre was completely demolished and rebuilt by urban planners and developers to raise the general floor levels up by three and to form a metropolitan capital out of a town with a moderate level of urbanism.

The most fundamental elements of the research work were the series of perfectly overlapping and matching CAD maps which were drawn after historic maps, often being originally produced very far in time from our selected moments of time. For instance, the CAD map of 1541 was made after the first real map of Pest City published only in 1758, exactly 210 years later. With the help of the available historic data and professional consultants this time span could be bridged and with the help of possibly relevant

references the medieval city could be built as a 3D model. Naturally for the later time phases it was much easier to find perpendicularly projected maps, close to the periods of the research. In case of 1848 the delay in time became only 24 years (1872), closing a period with only a few amount of developments delivered but right before the great boom arrived with the new master plan of the city.

What were the main challenges and how you managed them?

When the research was started our team tried to collect as much information as possible about the theme of the project and the materials seemed to be endless for a very long time. Only coming across the same data (photos, drawings) again and again in different sources could start giving us confidence that we could soon get somewhat close to a complete understanding of the city's history. Therefore one of the greatest challenges regarding the research was to consider if we might ever have the chance to gain exact knowledge about different buildings and locations in different time phases or not. This was instrumental to the overall effectiveness of the research, as different parts of the research needed to be finalised earlier so that the modelling work could run in parallel. As a result there was time pressure to make such decisions as early as possible. Finally we needed to process the collected data in such a way that hypothetical reconstructions would only be used as a last resort.

How the research is helping your work outside the APPROACH project?

The developed solutions in the research and in the realisation of the models are great resources for the future and our association plans to exploit this potential and expertise by undertaking similar urban scale timemap projects in the future. We believe that such projects can help the public to understand the layers of the city structure and to better appreciate the old monuments and monadnocks (buttes) of their own time, some of which are the only remains of certain historic periods in the city.

Gabor Palotas Vice chairman



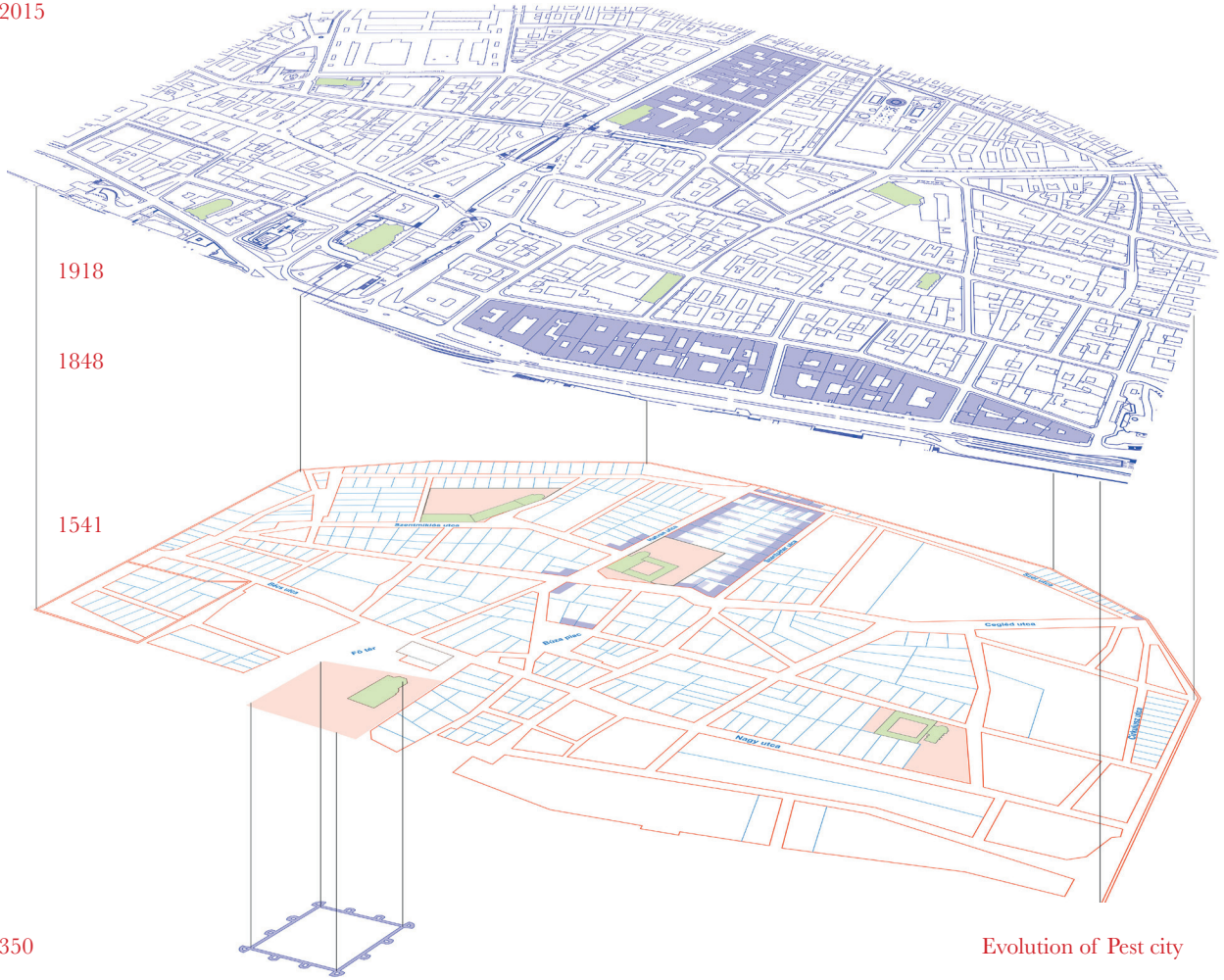
2015

1918

1848

1541

350



Evolution of Pest city





Granada



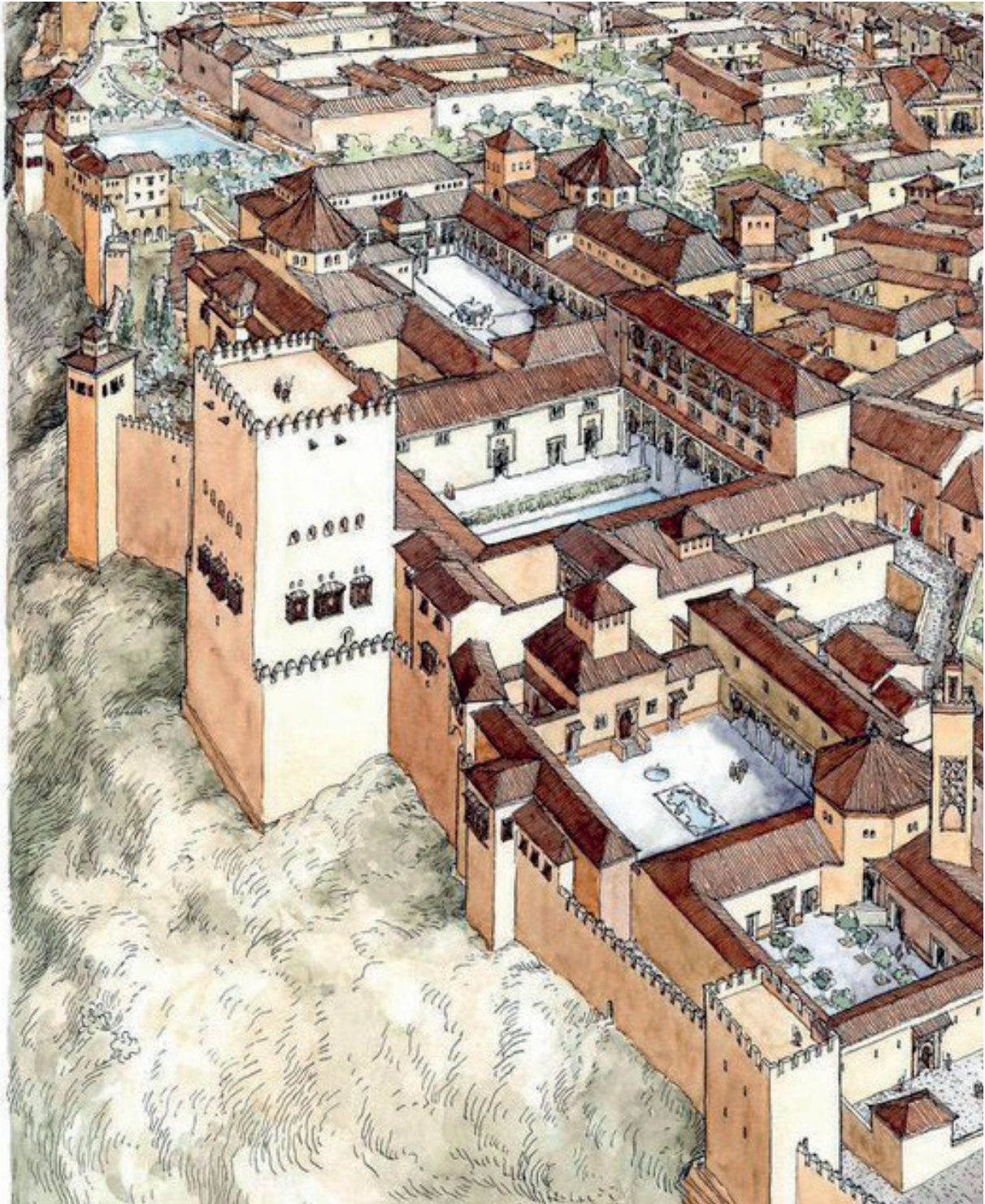
GRANADA
URBA



GRANADA
AN TIMEMAP



Granada





José María Gonzalez Castillo

Asociación Centro de Intervención Cultural y Educativa

Granada was the capital of the Zirí Kingdom of Granada during the 11th century, and of the Nasrid Kingdom of Granada between the 13th and 15th centuries. After the capture of the city by the Catholic monarchs, it remained the capital of the Castilian Kingdom of Granada, which was already a simple territorial jurisdiction. It remained so until 1833, at which time there was a new provincial division in Spain which is still in force today. Among its historical buildings, the Alhambra is one of the most important monuments in the country, declared a World Heritage Site by UNESCO in 1984, next to the Generalife garden and the Albaicín. Its cathedral is considered to be the first Renaissance church in Spain.

Timephases

The periods modelled are most representative of the city of Granada because they mark the history and the expression of the city today. The first period of 1490 marks the city of Granada as the last occupation of Muslim domination in Europe, with the Nazari kingdom. The 700 years of occupation marked the city through culture and architecture, such as the Madraza, the Corral del Carbón or the Alhambra. Moreover, the network of streets and alleys is typical of a Muslim medina, which were reflected in neighborhoods like the Albaicín. The second period of 1650 was chosen for being representative of the city after the Muslim domination, heralding in the great Christian era. This era produced a number of Renaissance and Baroque buildings which still survive today.

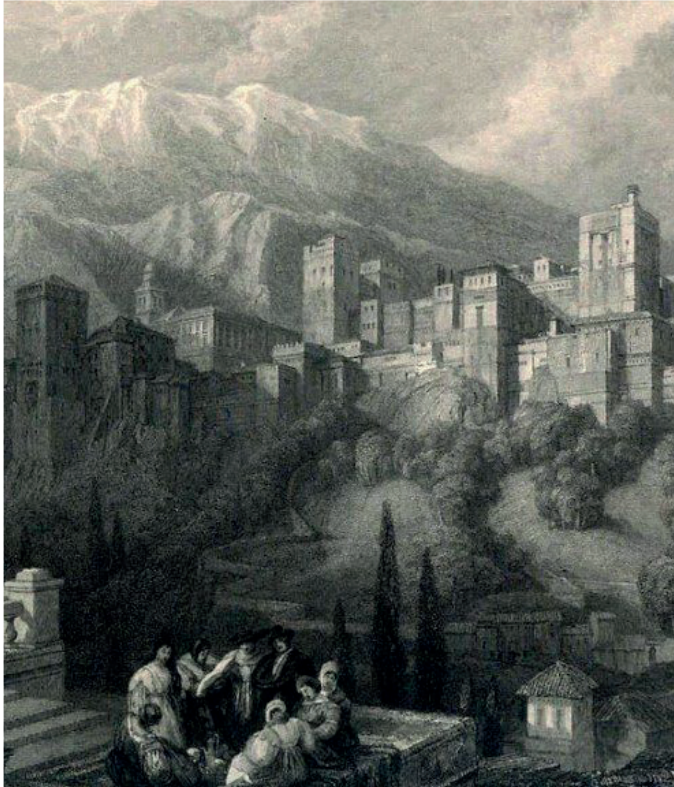
How the chosen time phases

represent the history of your city?

The two major periods chosen represent the history of the city because they are the most urban and architectural changes which contributed to the current city of Granada occurred during these periods. Many of these changes remain a symbol for the city, as the fortress Alhambra with the Nazari kingdom that will mark the economy and society of Granada until 1492, with all its typical houses, streets, mosques, cisterns, walls, doors, squares, with a large network of water supply and drainage, etc., and that will mark districts of Granada that still they last with the Realejo, Albaicin, Sacromonte, etc. The following period marks the current city of Granada, with the beginning of the first Christian constructions, when the Moorish uprising was finally crushed in 1571, after the death of Aben-Humeya. This period marked political stability for the city, where the Catholic religion expanded strongly with the construction of churches, convents and monasteries throughout the city, in many cases adapting the old mosques.

How outputs of the project will be used by your organisation in the future?

The results of this project will be used to explain the history of the city among its inhabitants, and especially among the visitors who visit the city of Granada daily. The information generated can be distributed among the many companies of tour guides who freely teach the city of Granada and all its cultural and artistic manifestations through time. We believe it will be a good product that can graphically show the evolution of the city of Granada, to understand its history and architectural evolution.



Alhambra

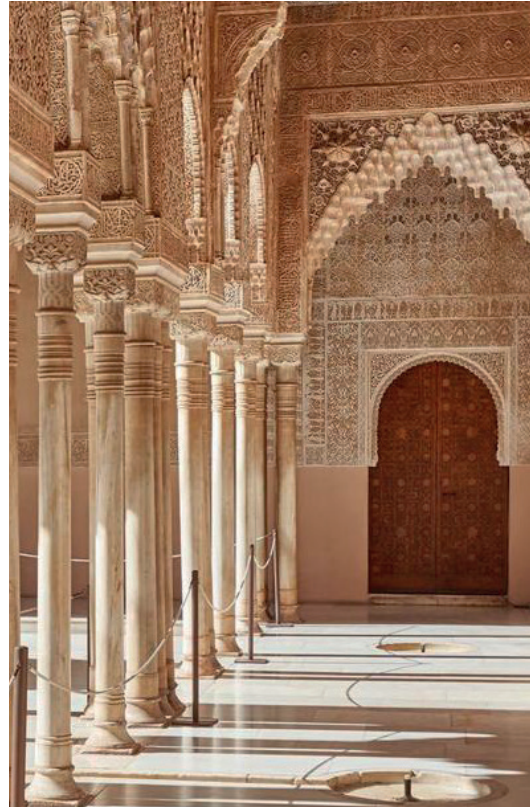
The Alhambra Complex (which includes the Alcazaba and numerous palaces) has a long and extensive history of modification, with the general consensus understanding that the earliest foundations of the Alcazaba (fortified military structure) date from the Roman era. Then, the first Arab constructions of the fortified military enclosure date from the Umayyad Caliphate period and was expanded by the Zirids in the 11th century. However, the main construction on this site was the Alhambra Complex of the Nasrid era, which saw the Alhambra become one of the most symbolic icons of power, prestige and beauty, as well as being illustrative of Islamic presence and influence.

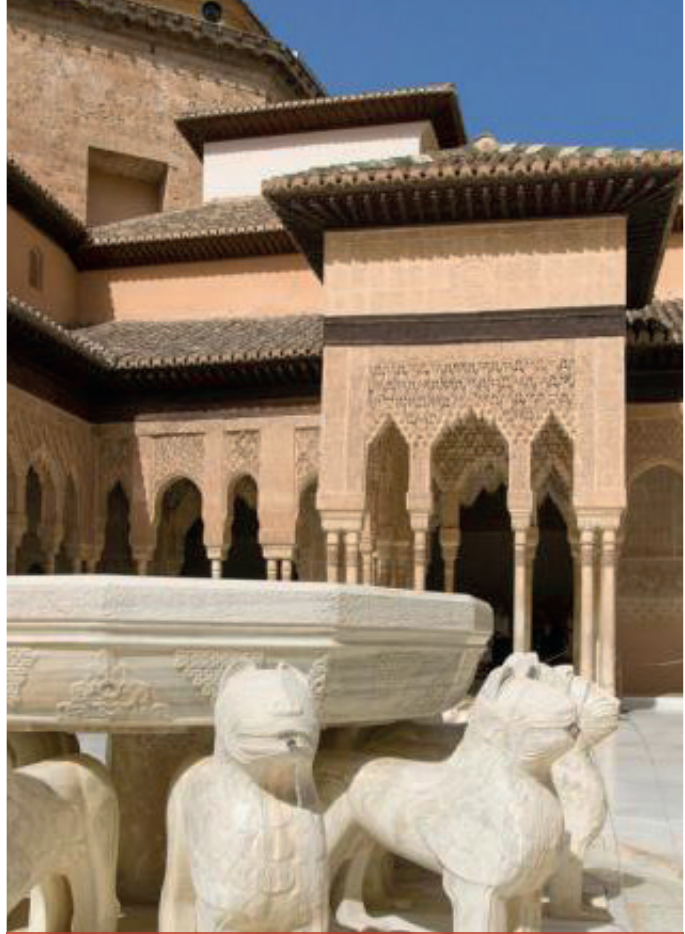
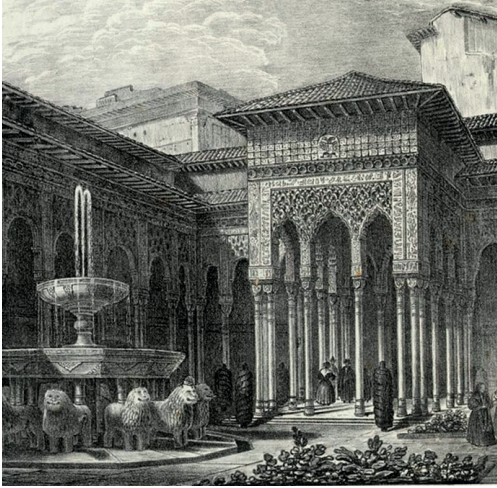




Alhambra Nazari Palaces

The Nasrid palaces are the set formed by the Palace of Comares, constructed first, and the Palace of the Lions. Chronologically they were raised after the citadel, the Generalife and the Partal, being constructed in the first third of the fourteenth century. It was the seat of the administrative functions of the court, protocol and retirement, and private entertainment.

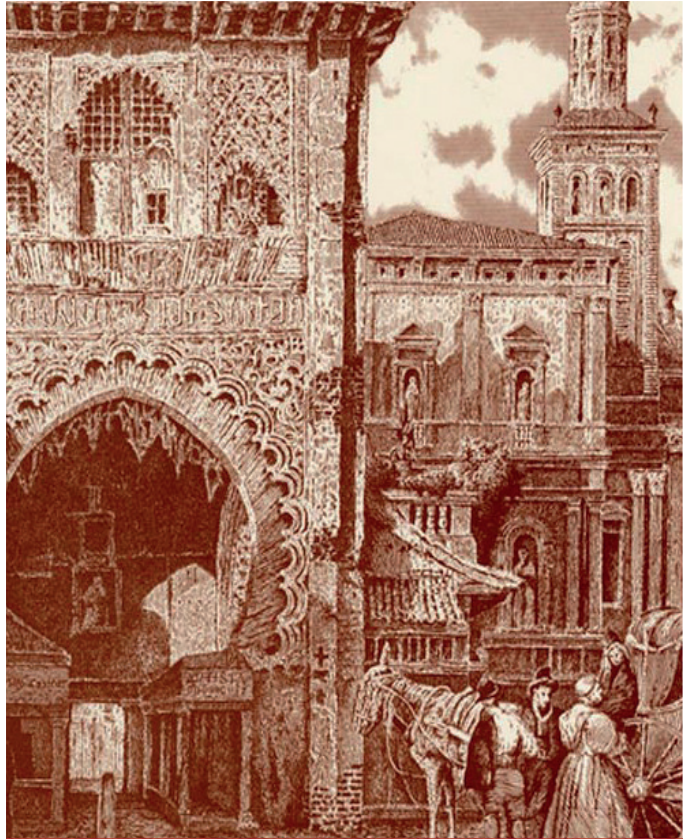
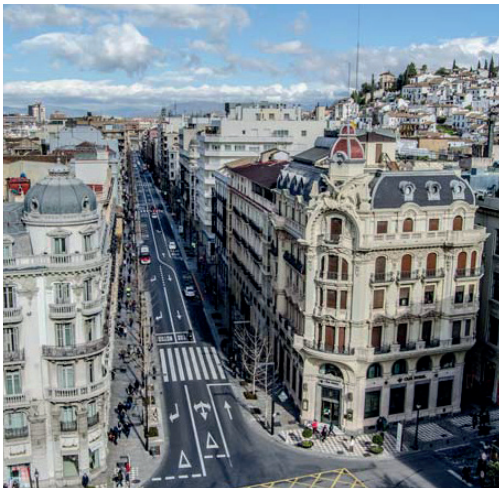




Palace of the Lions

When Mohamed V succeeded his father Yusuf I, he did not just finish the reforms he had begun, but he started to build what would be his great work, the magnificent legacy he left us in the Alhambra: the Palace of the Lions. This palace constituted the private rooms of the royal family, and was built in the angle formed by the Baths and the Patio de los Arrayanes.

The palace is composed of a central courtyard surrounded by galleries of columns like a Christian cloister, allowing access to different rooms: west of the Mocarabes, east of the Kings, north of Dos Hermanas, Ajimeces and Mirador de Daraxa and to the south that of the Abencerrajes and the Harem.



Plaza de Isabel la Católica

The sculpture of Queen Isabel and Christopher Columbus on Calle Reyes Catholicos is of monumental scale not only due to the size of the sculpture, but also its central location within the city. It was created in 1892 by a Valencian sculptor (born in 1862) at the height of artistic Realism. It was made as a commemorative monument for the 400th anniversary of the Discovery of America by Christopher Columbus. The work was made in Rome and later transferred to Granada, with the original location being in Paseo de Salon, however the City Council had later decided to relocate it to its current location in Plaza de Isabel La Católica. There is a real sense of realism in the sculpture. One of the key modifications of this historical structure was the remodelling of the plaza surrounding it.



Plaza Nueva

The current configuration of the Plaza Nueva is the product of successive transformations initiated with the widening of the Alhachimín Bridge or the Bath of the Crown, built in the Zirí period throughout the eleventh century. The widening, carried out by the master Alí de Medina in 1499, consisted of the addition to the old bridge of flagstones and stone from a brick arch of 1.92 meters wide. Six years after these works, the Cabildo of Granada asked the Crown for permission and funds to develop a plaza in this place that ennobled the city. The works, begun in 1506 and completed in 1515 by the stonemason Miguel Sánchez de Toledo, consisted of embedding seventy-two meters of the course of Darro River. In 1531, the vault was expanded again covering fifty meters more, upstream of the river, in front of the facade of the Chancilleria Palace. Thus it was configured Plaza Nueva until 1835, the year in which the pillar of the Nymphs, which separated it from the Plaza de Santa Ana, was destroyed by an overflow of the Darro River, leaving both spaces together.

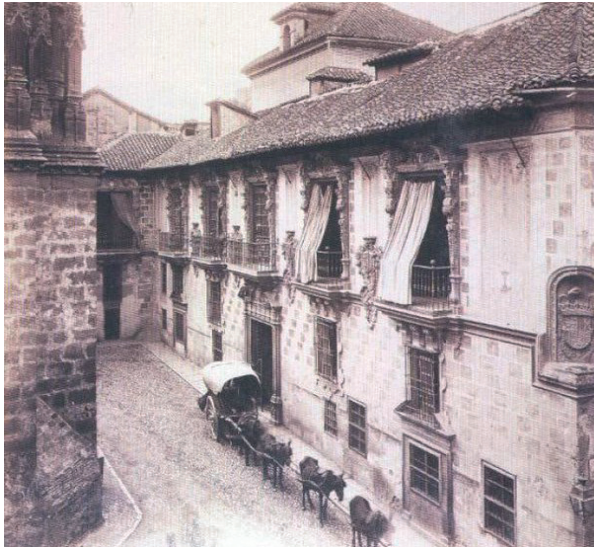




Bib-Rambla and Cathedral

The Bib-Rambla and Cathedral date back to the Nasrid period, and plays an important role due to its proximity to the commercial core of the city located in the Alcaicería and Zacatín. After its remodeling in the late sixteenth century, its size was similar to the current one. Around the middle of the 20th century, Príncipe Street was opened to connect the Bib-Rambla square with the street of Reyes Católicos. In its current configuration it is a rectangular square presided over by the fountain of the Giants of pagan motifs and bucolic details typical of a commercial plaza. The ends of the square is decorated by late 19th-century iron fernandine lampposts from a foundry of Seville.





Research

These time periods chosen are well-researched from a historical and archaeological point of view. Therefore, to carry out the research on these different buildings in the city of Granada, we have consulted the numerous publications that exist, carried out by researchers from the University of Granada (Vilchez Vilchez C., Puerta Vilchez JM, Barrios Rozua JM; Seco de Lucena Escalada L.; etc). These documents provide us with data and dates of the most important buildings in the city, and in some cases they show us plans and surveys of the floors of the buildings.

They give us some interpretations of the most complete "Plan of the Arab Granada" that is known of the Muslim Granada of Luis Seco de Lucena made in 1910, based on the archaeological remains that still exist in the city and many others that today they have lost.

What were the main challenges and how you managed them?

One of the biggest challenges was to make the street maps and to match the old plans according to the location of the buildings built in the first period that are still standing today. Some of the oldest plans consulted as the Platform of Vico that belongs to an engraving drawn and drawn by Ambrosio de Vico in the last decade of the sixteenth

century and recorded by Francisco Heyla towards 1613 and by Félix Prieto in 1795, and although it is a detailed and faithful representation, it does not have the accuracy required to match it with a current 2015 plan.

To give a solution to make representations faithful to the current plans, we had to do a lot of fieldwork to locate and place exactly the buildings that are still standing, and make them coincide with the current maps.

How the research is helping your work outside the APPROACH project?

Outside the project, this research is helping to create a better understanding of the history and development of the city of Granada. The urban structure of the different eras is the result of established cultures, which are reflected in the current character of the inhabitants of Granada.

Any major discoveries?

One of the contributions that this project has given us is to be able to verify the way of working of architects, draughtsmen and cartographers of past centuries, that in spite of not having the tools that we have today, carried out magnificent works of representation of the urban structures of the cities.

Teresa Moleón Researcher





Generalife

ALHAMBRA

ALBAIZIN

GRANADA

ANTEQUERU

DARRO

500 600 YARDS

An aerial perspective of a 3D architectural model of a city. The buildings are rendered in white with red-tiled roofs. A large, detailed cathedral with a prominent dome and spire is the central focus. The scene is lit from the upper left, casting long, soft shadows on the ground. A red rectangular overlay is positioned in the lower-left quadrant, containing the word "Modeling" in white serif font.

Modeling





What were the main challenges in modeling and how did you resolve them?

Ödön Hajnal

Digitalis Legendarium

The main challenge in modelling was to reconcile the desire for accuracy with the amount of information we had for each time phase. How deep should we represent the details, and how we should handle them, with textures or simple shapes? It was also a challenge modelling buildings which no longer exist, and for which there is no data as to what they used to look like.. The research teams and the meetings helped a lot, since we received a lot of prepared information, and in the meeting we could speak face to face. In that way it was much easier to find solutions.

Gabor Tothfalusi

Tektum Architectural Office

The main challenge in modelling was to build up the earlier phases of the cities because it was not as straightforward as the modern period but thanks to the research team this challenge was resolved by providing a lot of information and pictures in advance. The meetings also helped since we were able to see the cities and spend a few days in their atmosphere discussing the guidelines for modelling. At the beginning it was a challenge to model the more complicated and detailed buildings but at the end of the project there was a lot of progress while working with the 3D software.

Gabor Palotas EK Association

APPROACH itself is a very complex project as it planned to realise a number of difficult ideas at once. Starting from a thorough research of

historic time periods to provide the basis for the modeling, the complex modeling work itself and all the coding questions added together made it a real challenge to provide the main product in a way that it functions online and gives access to the complex 3D materials on all main platform types.

The complexity of modeling was mainly down to the fact that for a proper representation of the different time phases and the shifts between these phases, there was a need for the existence of a detailed layer structure in the model files, so that the buildings which connected the time periods could appear in the same exact positions, showing the real continuity between the different time phases and for a specific moment of time unrequired elements could be switched off and only relevant ones could be kept active.

The basic requirement for the previous issue was to have a series of CAD maps drawn in the same projection system and scale starting with the modern period that primarily fixed the positions of the monument buildings for all previous time phases. Even though some early maps of the cities may be considered as precise and accurate, when trying to match them with their modern versions, it often turned out that they could never fully fit. Based on this experience the modeling of the cities always had a zero step: to redraw the historical maps upon the modern edition and matching all possible elements while travelling backwards in time.

However the greatest challenge arrived with the final representation, the coding part of the project. While our team was searching for the most effective and in the meantime the most eye-appealing solution, it was also a great question how detailed the different models could be, so





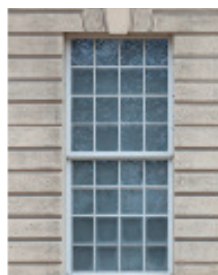
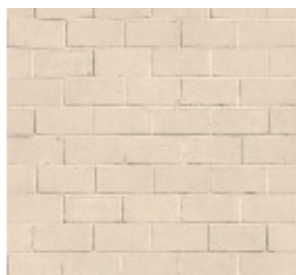
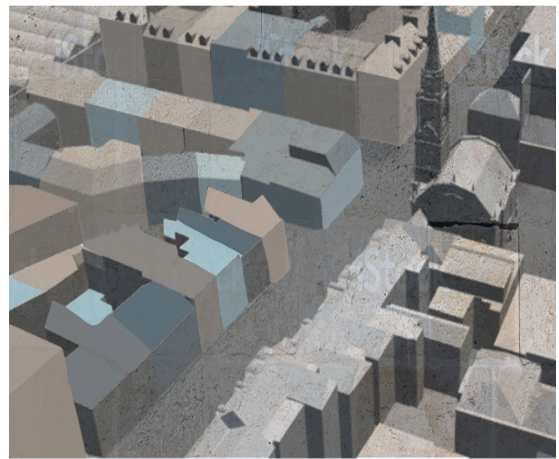
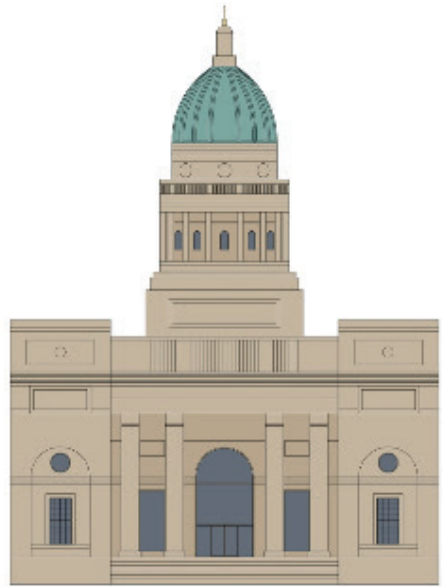
1



2



3



that the users' devices had the chance to render the results in a smooth way. The same applied to the use of quality textures, appearance of urbanistically important vegetation or to the representation of all time phases of a city in one single framework. Technical partners could finally develop a method that could achieve all the mentioned targets at once while being able to provide a smooth cross-platform solution, that can reach the largest possible audience.

What did you learn during the project?

Ödön Hajnal

Digitalis Legendarium

We learnt in this project the many ways of approaching the same question and providing different solutions. Working together with teams of different nations from Europe was really interesting, and broadened our horizons. It was also interesting to see how these cities evolved during our common history, and how different or similar these were in the centuries, both architecturally and historically. Again, the meetings were very useful in that matter too, because travelling to the cities we could discover, or rediscover, these places, and with the help of the local team we could see the hidden beauties of the European culture.

Gabor Tothfalusi

Tektum Architectural Office

During the project we learnt about collaboration and communication with different teams and managing time in order to make progress efficiently. Nonetheless, it was also a good learning experience to look through different time periods of the cities from a historical and architectural perspective and also by visiting them during the meetings. By drawing the facades one by one we also learnt a lot about the structure of the cities and we discovered their beauty and how important it is to protect them and save their heritage for the years to come.

Gabor Palotas EK Association

The project gave us the possibility to find out and develop a methodology that can be effectively used for representing 3D models in an interactive way, even if they are large scale and complex. The technology used can function on different platforms with some certain limitations and with this feature the packed content can easily reach a large audience, providing an interesting experience by interacting with the buttons which provides contextual information. We believe that we will be able to use the same technology as part of many other interesting projects later on.

Among the IT solutions the use of detailed layering systems, the harmonisation of different modeling and software types, our team became really effective in building city models in a productive way. A great part of this knowledge is naturally transferred to any learners who will watch our tutorials on modeling with ARCHICAD and coding with Unity3D.

With the help of the researchers and archeologists we were able to learn a lot about the cities and their history, and especially about their typical building forms. It also became clear how important it is to have architects on board and that the architectural knowledge and experience might also help in thinking about buildings which no longer exist. Such conversations between archeologists and architects helped to realise some of these buildings realistically.

What would be the main message for those who would like to carry out a similar project in their cities?

Ödön Hajnal

Digitalis Legendarium

The most important thing to focus on is continuous communication. Any group which carries out such a project, should constantly exchange thoughts, ideas and results about the work. It is also like a long distance race, which is why constant communication can keep the team enthusiastic over time. The meetings are very good tool for refreshing the team, and for gaining new

motivation for this long term work. We have to admit, that in such a complex project one not only would create a complex, and meaningful result, but meet new friends, recognize correlations, and enjoy the multicultural beauty of this continent.

Gabor Tothfalusi

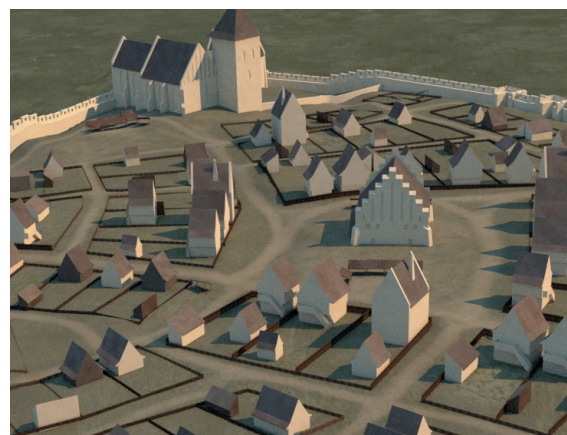
Tektum Architectural Office

The main message for those who would like to carry out a similar project in their cities would be that the final product is worth the long term work which includes researching, collaborating, modelling and collecting the relevant bits and pieces of information. We consider it is educational not only for the ones who will learn from this project but also for the creators of it, including our part in modelling as well. This project is also important because it connects different cultures and perspectives and lets us work with history in a way that is significant for educational purposes.

Gabor Palotas EK Association

A well-developed pre-set system for modeling and coding is highly recommended for anyone who would like to realise similar projects. There is a need for well-cooperating teams, proper coordination and naturally a good amount of enthusiasm towards the subject. Among historians it is important to involve architects as well, and finally it is highly recommended to set the standards high, only making compromises when it is impossible to avoid them.

As a result of our project, we believe that any project that deals with similar time shifts as the Urban Timemaps does, it is highly important to start from the series of maps drawn into one system with perfect overlappings and matches at the required points and using a common projection system preferably derived from the modern age.







Learning



“Participating in the project I got the hang of 3D building structuring based on real-life measurements, as well modeling in ArchiCad. Also, I learned to make surface textures what could be added to 3D buildings. The project also gave me some travelling experience. Got the knowledge about the history of Lublin and Polish culture in general. I liked the environment which we changed almost every day to see, learn and experience more. I enjoyed working in team with different people.”

– Liga Vetra –

What did students learn in the project?

Andra Ulme Riga School of Art

Our institution in close partnership with Riga School of Art & Media provided two series of tutorials as the main learning resource of the trainings. Both modeling and coding tutorials were tested by the learners who could gain the required knowledge to assemble similar interactive content on their own. To test this, both teams were involved to the realisation of the models directly, following newly learnt techniques with ARCHICAD’s Morph objects. Their involvement resulted in important contributions to the model of Pest and Lublin in their modern time periods, but it was also important through the fact that it provided real work experiences for them and the requirements of proper teamwork in a large scale project.

With the evaluations of the students and their teachers it was only feasible to finalise the structure and exact working of the tutorials which might be the learning tool for several further classes in architecture, interior design or in any of the connecting areas. The seven chapters of the modeling tutorials mainly deal with Morph modeling in ARCHICAD, starting with the basic

editing options to more complex operations in order to provide the required geometry. Besides these one can learn how to create complex 2D drawings with the help of guidelines and how to apply such graphics on the faces of the Morphs. The proper handling of layer combinations, the advantages of the Profiler tool and the quick creation of terrains after height maps or teamworking possibilities with hotlinked modules are all essential skills and competences of any person working with CAD and BIM software in the future.

The coding series also provides knowledge that can be highly useful in learners’ future work: how to create interactions with the models they built before, how to build a menu, a navigation system etc. For some of the learners this series might be their first encounter with coding, which might inspire further plans to broaden their skills and competences in the IT field.

“What I definitely got from the participation in the project were the knowledges of IT programs, for example, the way how to make a 3D model from 3D reality. Also, I learned a bit about the Hungarian culture and the city. Of course, met some new people in the international environment. The most important thing which I acquired is team work in an international project which will help others to know the history of Budapest.”

– Krista Paula Zake –

What was the feedback of the students after their participation in the project?

The students became very motivated to continue studying their professions. After graduating Riga Art and Media School eight of the nine first group students entered the universities. Now they



are studying architecture, interior and applied design, graphic design and building engineering. One of the students continued an international internship in Erasmus + KA1 project in Hungary and returned back to Latvia very enthused about her achievements which were possible owing to the project. Those students who are to graduate this school year are preparing for entrance exams to continue their studies in higher education institutions. All the project participants are very satisfied with the knowledge and skills they acquired during the project.

The feedback we got after both trips was exceptionally positive. For some students it was the first time abroad, while all the participants got a deep insight into other cultures, observing professional architects, IT specialists, historians, and urban heritage specialists, learning the professional norms, standards and ethics. For many students the experience of participation in the project and overcoming certain difficulties turned out to be helpful in communication and using their newly acquired language skills, as well as in their studies since they were able to finish school tasks faster and organise their individual work schedule better.

“First of all, the most important experience in Lublin was working and communicating in English in another country. I have mastered my English and got to know the history of the city. The most I liked staying in another country being aware that you are a cog in a big project. Participation in the project made me realize my abilities, that I could do more than I thought. That’s why I wish to try myself in different fields.”

– Andris Baltuško –

The students were happy about the activities organised during both trips: getting to know the city and its architectural traditions, interior designs of historical buildings and history of culture. It was very useful for them to see how jobs were organised during the project sessions. The participants also were very pleased to learn about other partner organisations, meet professional architects, especially Gabor Palotas, the project’s idea author and tutor. The students were

interested to witness the work of professionals, the opinion exchange between colleagues from different countries, decision making processes, and just to feel that they are part of this big and significant project.

How the learning side of the project could be improved in the future to help the students with career development?

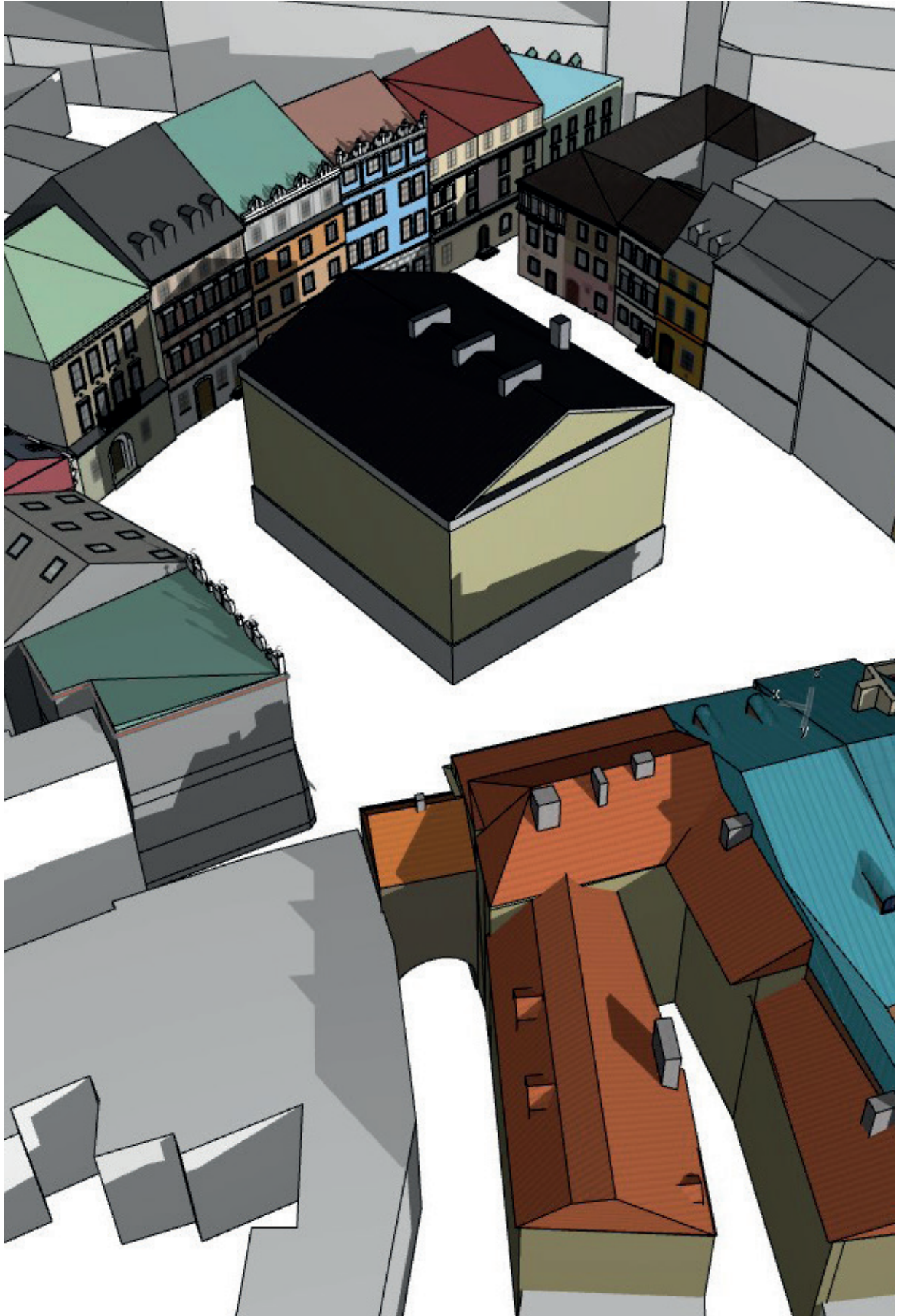
“The new skills I got working in ArchiCAD (working with Morph Tool, to be more precise) had totally changed my comprehension of the program, and facilitated my further professional growth both at school and outside the school. The skills acquired during the project had laid the groundwork for my further projects because my general understanding of the program had become more advanced. Also, I could help my classmates who hadn’t taken part in the project which resulted in the professional knowledge increase in my group. We learned all the necessary materials and acquired skills faster than it was specified in the curriculum.”

– Anna Katrina Kupse –

It is possible that for helping students’ career development it would be better to involve more tutors in training activity, so that one tutor could work with two to four students which would make tutoring approach more individual. Not all the students managed to open up in the new environment, some of them were quite slow in grasping technical details and only at the end of the training activity got hold of things. Also the school should revise its English as a second language curriculum leaving more time for professional terminology.

The participants had to adapt themselves to the new environment in a very short time, react quickly and make decisions, which was not always easy. Teachers had to give them encouragement and moral support. In the future, before teaching/ training activity it would be useful to give students psychological tests, games, ice-breaking activities, which would first of all help introvert students to open up, and secondly would train all the students to work in teams in the international context.





What did students learn in the project?

The students involved in the project were aged 18 to 24, and had different previous training, knowledge and experience in technical graphics and computer programs, as well as different general work experience. All of them are currently studying interior design and architecture in the Visual design department of the school. Working in the project they gained some international experience, team-work experience in goal achievement, and also professional skills such as urban planning, architecture, projection methods in CAD, architectural terminology in English, communication skills in international environment, formulating and presenting own concepts and projects, distance communication, and programming terminology in English.

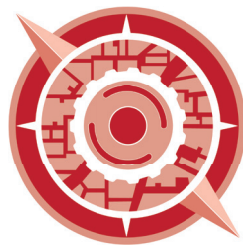
“I took part in Training Activity in Budapest. During the project I got to know about architectural styles and traditions in Hungary, got practical knowledge in building measurements, also mastered my skills in teamwork both in real life and virtually. I had received a good training in ArchiCad already before my participation in the project, so the project tasks seemed interesting and quite manageable. Of course, the experienced gained in the project cannot be compared with school tasks, as it is a real project with further development. So it is nice to realize that I have been part of it. I was very pleased that during the project we had a chance to see Budapest, meet young people and discover Hungarian culture, which helped us to adapt to the new environment easier.”

– Laila Neidere –

Although the students had a good theoretical background before going to another country and a new cultural environment, they realized that learning theoretical aspects of urban environment observation, preservation and design is not the same as doing everything in real-life conditions. During the trip all the students admitted that they became more aware of many professional issues such as access to the objects, buildings' dimensions and their modelling using CAD, project management according to recognised international standards, field sketching, taking

photos in city in different light conditions, taking into account people in the streets and respecting their rights. The students learned very quickly all the things necessary for project planning and data processing, as well as mastering their knowledge of ArchiCad and other IT programs such as Adobe Photoshop, Microsoft PowerPoint, Excel and Corel Draw. Also, the students enriched their knowledge in interior design, history of architecture, graphics, drawing, modelling of architectural details, environmental design, history of culture and foreign languages.

Besides the students acquired some skills of expressing their opinion, communication with their peers and professionals, presentation skills, job organisation skills, as well as time management since the projects terms were strictly limited. The experience acquired in the project time was very valuable for the students in many aspects: following the course of the project, collaboration with high-level professionals in various fields, completing the tasks offered to them.



“As my personal goal is to get a degree in architecture, the project task which was closely related to architecture and urban planning gave me an overview of one part of this profession and made me stronger in my choice of career. In the frame of APPROACH project, for the first time in my life I worked in a big team, at the same time keeping the individual responsibility for my part of the block. However, we all were responsible for the final result.”

– Anna Katrina Kupse –

Applicable Representation of City Centres With Heritage Importance
Erasmus+ KA2 Strategic Partnership Project
2015-1-UK01-KA202-013806



Co-funded by the
Erasmus+ Programme
of the European Union





design: Marianna Carazzai

