PhD dissertation summary

GREAT CULTURAL PROJECTS AS A TOOL FOR THE DEVELOPMENT OF CONTEMPORARY CITIES

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1. Introduction
The subject of the research presented in this doctoral thesis is the Great Cultural Projects (GCP) and their impact on the transformation of modern cities. The important scientific problem is the possibility to explore the potential of such events for a multi-faceted urban development and the creation of tools to facilitate decision-making taking into account the potential risks, benefits and development opportunities arising from the organization of different types of the GCPs.

The analysis of the research shows that the studies of various GCPs are being carried out. However, in the vast majority of cases these studies are devoted exclusively to one category of events and their impact on the transformation and the development of the city is relatively rarely analyzed.

In the literature, the author has not met the comparisons between the different categories of GCPs covering their spatial scale, time and duration of the organization, the attractiveness for the public and the media, the thematic scope and the impact on the urban transformation of the city in particular. There is also no statement regarding the characteristics of each of the GCPs, which could serve as a tool to help decide on the type of project, as well as more accurate estimate of the possible gains and risks. The sources will provide information about the procedure for candidacy to host a specific project, however, the decision was made to take part in that and not another project previously. The effectiveness of a given type of a project in relation to the strategic objectives realization designated by the city is not checked as well.

The different types of the GCPs were and still are an inspiration for themselves. Comparison of different types of the GCPs is also justified as a possible exchange platform of experience between them.

The aim of the study was to define the possibilities of transformation which each of the analyzed types of GCPs potentially has and to prove the thesis that the Great Cultural Projects have a significant and lasting impact on the functional and spatial structure of the city in which they are held and that their conscious use can be a tool for multi-dimensional development of a city.

The study allowed us to obtain answers to the following questions:
- Are the GCPs a global phenomenon?
- Whether and to what extent can the GCPs be a tool for the development of the modern cities?
- What is the specificity of the different types of the GCPs? What are the differences and similarities of the GCPs?
- What is the impact on the transformation of urban and architectural heritage and what are the image changes of different types of the GCPs?
- What is the relationship of the development of the city and the location of the GCPs?
- What is the relationship between the size of the city, size of the audience, the number of represented countries, the area of the GCP and its duration?

The paper reflects the adopted research method based on the diagram: data collection - analysis - evaluation - synthesis. (See: Fig. 1)

For the research, the author's definition of the Great Cultural Projects has been formulated: The Great Cultural Projects (GCPs) - large scale cultural events with an impactful media strength, which have the following characteristics:
- periodicity,
- international organization making the selection of the organizer -city and having control over the compliance with established procedures,
- an established protocol as a candidate to become the organizer as well as running the event itself,
- several years of infrastructural preparation for the events and transformations associated with it.
- Targets aimed at the popularization of global developments related to the progress of the civilization: cultural, sporting or technological.
• the limited duration of the event,
• defined project realization area (usually strictly limited),
• overtone of the diplomatic event: the participation of celebrities, heads of the state etc.
• the opening ceremony and the closing period of the event having a wide appeal of the media,
• interest of the wide, international audience and the media
• strictly defined symbolism of the event, the logo, the flag, the mascot, etc.,
• official products.

To some extent, the definition of the Great Cultural Projects coincides with the concept of, the so-called, 'mega-events' occurring mainly in the English literature. The difference lies in the fact that the phrase "mega-events" particularly stresses the huge scale of the event and its brevity and the drama, while the term "the Great Cultural Projects", in addition to the scale, stresses the planning process and the factor of the culture, the heritage left after a given project, thereby distinguishing these projects from other purely commercial ones.

In order to define the scope of the research for the needs of the presented work, the GCPs will be limited to the World and International Exhibitions, the Summer and Winter Olympic Games, Horticultural Exhibitions and European Capitals of Culture. The study includes 183 GCPs, which took place in the cities around the world in the period from the mid-nineteenth to the early twenty-first century.

2. Historical and typological outline of the GCPs

Based on the analysis of the bibliographic, cartographic and iconographic sources an outline of the historical and typological GCPs has been made, which traced the evolution of the four main types of the Great Cultural: World and International Exhibitions (WIE), Summer and Winter Olympic Games (SOG and WOG), Horticultural Exhibitions (HE) and the projects of the European Capital of Culture (ECoC). It has been shown that the objectives, results and scale of these events evolve along with the changing priorities of the civilization and that the various types have been used in different ways to achieve the development objectives of the host cities in different historical periods. The spectacular urban planning and iconic structures arising in connection with the organization of different types of the GCPs have also been noted in the following research. The analysis and evaluation of the GCPs was conducted in the cross-sectional and detailed scope.

![Diagram of research methodology](source: A.Biedermann).
3. Cross-sectional studies

In the cross-sectional studies the comparative analysis methods based on the compilation of statistical data were used. 183 cases of the GCPs were examined, including: 72 WIE, 27 SOG and 21 WOG, 19 HE and 44 ECoC. The graphical and tabular data on each type of the GCP in terms of scale, location, architectural and urban heritage allow a comparison and evaluation of the transformation of the host-cities and the strengths and the differences of various types of the GCPs.

The research demonstrated a significant and lasting impact of the GCP on the functional and spatial structure of the host-cities. The Great Cultural Projects contributed to the positive urban transformations in 87.63% of cases including the processes of degraded areas revitalization (the greatest contribution since the 90s: SOG - 100%, ECoC - 69.2% and WIE - 50%) or the development of non-urbanized areas (WOG - 66.7%, HE - 57.1% and WIE - 41.7%). The GCPs were also a catalyst for the areas outside of their location including the creation of new communication infrastructure and green areas in the city. Almost all of the GCPs (96.23%) have left a valuable architectural heritage (buildings of culture and science, buildings of physical culture and sports, building of trade, catering, recreation and entertainment as well as hotels and residential facilities). The iconic buildings have permanently changed the image of the city and significantly contributed to its visibility and increased the tourist attractiveness in 24% of cases.

The illustrations below summarize the scale describing various GCPs. In Fig. 2 it can be seen that on average the largest host-cities of the GCPs were the ones organizing the Summer Olympics. Next in size were the host-cities of the World and International Exhibitions and Horticultural Exhibitions. Averagely smaller cities hosted the European Capital of Culture and, by far, the smallest cities organized the Winter Olympics. Fig. 2 should be compared with Fig. 3 showing the gap between the smallest and largest values that describe the scale of the GCPs. It can be read that virtually all of the GCPs were organized by the cities of varied sizes. This variation is much smaller in the case of the Winter Olympics, because of the obvious, smaller scale of the mountain villages. In the interval between 1992 and 2012 by an average the largest metropolises hosted the World and International Exhibitions and the Summer Olympic, while smaller towns have organized the other three types of the GCPs. In some way, this reflects the rank of events.

A similar trend can be observed in the figures showing the number of audience. While the audience of the World and International Exhibitions far outranks the audience participating in the Summer Olympics, it is the latter that can count on a few billion television audience.

In terms of the duration the analyzed projects can be divided into three groups: the shortest Summer and Winter Olympics, lasting in the last period 17 days on average, events not exceeding six months: World and International Exhibitions and Horticultural Exhibitions; and the longest GCP - ECoC, which program on average closes in less than 12 months.

The GCPs area can only specified in the case of the Exhibitions. The scale here is uniformed and it as an average of less than 100 hectares.

The Summer Olympic Games attract the largest international representations. They are followed by the World and International Exhibitions and the Winter Olympics. The Horticultural Exhibitions and the ECoC achieve similar results by attracting an average of 22 countries. The ratio of the audience to the population of the city is by far the highest in the case of the Winter Olympics. If we compare the average results over the entire history of the GCPs and the last period of 1992-2012, this ratio has not changed substantially. The World and International Exhibitions are in the second place and in the recent years almost on par with them the Horticultural Exhibitions.
Figure 2. Summary data describing the scale of the GCPs in the period of 1850-2012 and 1992-2012 (source: A.Biedermann).
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Figure 3. Summary data representing the largest and smallest values that describe the scale of the GCPs in the period of 1850-2012. The horizontal line represents the mean value (source: A. Biedermann).
The real effort of the city in the adoption of increased tourist traffic shows the ratio of the additional criterion of time. Again, the Winter Olympics have highest value due to the small size of the population of the host-cities and the relatively short duration of the event. Hence the frequent inclusion of nearby towns into the network infrastructure supporting the event. The Summer Olympics have the next highest value. The ratio has increased in the last analyzed period along with the growing interest of the audience and a shorter duration of the event. The World and International Exhibitions and Horticultural Exhibitions reach a similar ratio. The ECoC has smallest ratio, which usually means that the existing hotel infrastructure is able to accommodate an increased number of visitors to the city.

Fig. 4 presents a summary data describing the location of various GCPs in the period of 1850-2012 and 1992-2012. In the case of World and International Exhibitions and Horticultural Exhibitions and the Winter Olympics the location in the city center in the last
time period is characterized by a lower frequency than in the entire history of the GCPs. The number of Summer Olympics which benefited from infrastructure located in the city center has increased; however, also in this case the vast majority of this type of projects was located on the outskirts of the city. The ECoC is the kind of the GCP, which in 100% takes an advantage of the cultural infrastructure of the city center. Still, most of the GCPs are organized outside of the city center, contributing to the development of the peripheral areas.

The existing green areas have played a huge role in situating the Winter Olympics, being a natural place for them to take place. Their importance has also increased in the case of the Summer Olympics and remained at 50% for the ECoC. The existing green have been used less likely in recent times as locations for the World and International Exhibitions and Horticultural Exhibitions. The waterfront areas in the entire history of the GCPs have had great popularity, exceeding in all types 60%. The GCPs were the catalyst of the revitalization processes in one third of the cases, while the rate is two times higher in the case of ECoC. In the last of the analyzed periods the importance of revitalization of areas serving as the location of the GCPs has considerably increased in the case of World and International Exhibitions and Summer Olympics and decreased in the case of Winter Olympics and the Horticultural Exhibitions. The new location in the period of 1850-2012 was characterized by a particularly popularity for the Winter Olympics - 76% and least frequently performed as the location for the ECoC where the cultural infrastructure in the new location was established in about 5% of cases. The importance of the new location associated with the spatial development of the city has slightly increased in the case of the World and International Exhibitions and Horticultural Exhibitions in the last period of time. The scattered locations in different parts of the city have been characteristic for the Summer and Winter Olympics and for the ECoC. They occur in a much smaller percentage of cases when it comes to Exhibitions. The importance of urban transformation carried out beyond the borders of the GCPs in the recent period increased significantly with the exception of the Horticultural Exhibitions which recorded a slight decline. This may mean that the cities even more consciously use the GCPs as a tool to transform not only the area of the location of the event, but also other functional elements or spatial urban infrastructure which is apparently not related to the area of the GCPs.

The heritage left by the GCPs presented in Fig. 5 and Fig. 6 show a visible impact of the events on the spatial and functional structure of the city. The buildings of culture and science were created primarily for the Exhibitions and the ECoC, having a much less important role on the occasions such as the Olympic Games. The latter contribute to the formation of the buildings of physical culture and sports. Yet, in the case of buildings of recreation, entertainment, trade and catering they were established on average in one third of the cases. Residential buildings in the form of the Olympic Village are a distinctive heritage of the Summer Olympics. They occur to a lesser extent in other categories of the GCPs of which the least occurs during the organization of the ECoC. Host cities symbols during the period of 1850-2012 were created by the occasion of all the GCPs. However, designing an element that would become a permanent icon in the image of the city is not an easy task; therefore it is rarely a success. Interestingly, in the last period the increase in the number of symbols of the city created on the occasion of the Summer Olympics is probably connected with a flourishing architecture of sports and the meaning that the modern society gives them.

In the recent years, in more than 80% of cases the changes in the road infrastructure and public transportation have grown in importance appearing in all of types of the GCPs except for the ECoC. These changes were often planned for a long time and the GCP has served as a catalyst for their implementation. These changes were accompanied by the creation of communication services facilities - especially for the Summer Olympics and the World and International Exhibitions.

Park areas are an inherent heritage of the Horticultural Exhibitions, as well as a common heritage of the Summer Olympics acting as recreation areas associated with the Olympic Village and sports infrastructure. They are the legacy of about 40% of organized projects in the case of the World and International Exhibitions and the ECoC.
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4. Detailed Study

In the detailed study the case studies method was used in order to determine the effect of the GCP on the development of the city of Zaragoza and indicate the relationship between the organization of the GCP and the strategic goals realization of the city.

Expo 2008

Expo 2008 Project was designed for the urban transformation of the city. Strategy was to first plan the changes necessary for the future development of the city and then integrate them into a single and compact candidacy project of Zaragoza in competition to host the Expo 2008.

EXPO 2008 objectives related to the developmental strategy of the city of Zaragoza:
- „Reversal” of the city so that it faces the river – the river valley development and revitalization of the waterfronts,
- public transport system modernization and improving traffic transit,
- increasing the amount of the green space in the city
- Improvement of the tourist attractiveness of the city and its image in the international arena.

The project itself coincides with the creation of a new railway station serving the AVE high-speed trains. It is very important that both developments are located within a short distance of each other and the newly designed environment with road infrastructure is planned so as to provide communication service for both the station and the sites of the Expo. The combination of both of these areas makes Ranillas meander to actually connect to the rest of the urban structure. Also, the separation of Delicias, Almozara and Actur districts is eliminated.

The Expo’s project has been treated as a kind of open strategic project, not focusing on the strict definition of an area, but as a set of variables necessary to define, which included various problematic areas. This project can also be called a metaproject - a strategic and operational project containing many smaller projects and developmental plans. From the point of view of the planned changes, the Expo project was a clear catalyst which has significantly improved the dynamics of the changes needed for a long time.
The exhibition project was prepared from the outset in parallel with the **Accompanying Plan** which included the necessary projects for the overall success of the exhibition and solutions for the urban problems regarding the grounds located outside of the exhibition.

**Revitalization of the river Ebro** is the starting point of the Expo project. *It was an important factor in choosing the location of the exhibition in the city as well as the consequence of choosing the water theme of the exhibition.* It has been broadened to three other revitalization projects regarding watercourses: river Gallego, river Huerva and the Imperial Canal which together form a system of open spaces in the city. The project was estimated to be 155 million euros out of which 80% of the costs were funded by the Department of Environmental Protection and 20% by the City of Zaragoza. Overall, 60 km of the revitalized edges within the administrative boundaries of the city were included into the project. It has also enabled the integration of the southern and northern parts of the city.

In order to connect open, public and green spaces running along the watercourses a green north - south Oliver - Valdeferro axle was created as well as numerous natural paths and green spatial elements connecting park areas into a coherent structure. The revitalization of the coastal areas along with the necessary infrastructure is a substantial part of the investment accompanying the exhibitions. It should be noted that the revitalization of these areas was mentioned at numerous planning contests organized in the 90s, which moved public opinion. However, they have failed to go beyond projects and debates until the organization of the exhibition. The exhibition was an impulse that enabled coherent implementation of plans, which have been prepared for a long time, on a scale so far unprecedented in Zaragoza.
Not only did the program of revitalization of the coastal areas changed the area of urban green areas which were directly adjacent to the river, but it also equipped the space with urban furniture, small architecture, hardened or active diverse bioactive surfaces and it even remodeled the streets adjacent to these areas. It also constructed the dam stabilizing the water level, which provided navigability and a series of 22 bridges and footbridges for pedestrians which makes the water in the city to be seen as a connecting element and not as a dividing one.

As a result of the work related to the organization of the exhibition which involves ordering of riverside areas and giving them recreational functions there has been a long-awaited reversal of the city towards the river. The river areas received new functions and they were enthusiastically accepted by the community. During the process of revitalization, a compromise between the river with a highly urbanized urban environment was sought. The aim was not to subjugate of the river, but to establish a dialogue with the river and to incorporate the variable being in the landscape of the city.

One of the most important elements of this new structure of green spaces in the city is a newly established Water Park because of its importance in the anti-flood system of the city as well as for the scale and applied innovative solutions for the treatment and water purification.

The exhibition grounds

The primary investment objective was to prepare the exhibition area with the exhibition buildings, integrate it with the Water Park equipped in cultural and sports infrastructure so that the area after the exhibition can be transformed into a new cultural, office and recreational center.

The exhibition grounds are divided into two levels:

- A buffer area, which is indispensable taking into consideration the changes in water levels and flood character of that area along with its temporary building facilities
- A higher platform with permanent buildings established on a large car park, which creates that elevated terrace that connects to the original height of the terrain from the northern side. Two additional, publicly available levels were created within the upper level. One of them is the level of open terraces running at the height of the first floor entangling the buildings and connecting them together forming common spaces and elevated squares. The second is the green roof level available to the public in a significant portion which has areas dedicated to the organization of closed events, such as open air reception, which were organized by the given countries on their day or events organized by the companies or sponsors of the exhibition.

To emphasize the open nature of the exhibition area and even more explicitly link it functionally with the existing nearby neighborhoods two buildings have been planned, which, although they are a part of the exhibition, physically exceed its limits set by the third ring road and the river Ebro. It is the Bridge Pavilion located on the south - overlooking a way to greet passengers getting out of the Delicias station. This pavilion in a symbolic and literal way connects the two banks of the river emphasizing the coherence of the project implemented in the bend of the revitalized banks of the Ebro. The Water Tower is the second building located outside the line drawn by the third ring road. It is connected to the exhibition grounds with a pedestrian footbridge stretched over the road. Thus, the exhibition grounds are connected with the Water Park which is the most important area subjected to revitalization changes within the river valley. It defines a new approach to the development of the floodplains. (Fig. 8).
The main element of the exhibition grounds was the building combining exhibition pavilions of the participant countries, the Autonomous Communities of Spain and the companies. The coherent project was possible due to the fact that in the case of an International Exhibition, the organizer is responsible for creating the exhibition space for all countries. Three parts of this building are located along the third ring road to form a built-up façade which at the same time allows visual contact with the park extending over the third frame. Another part is arranged at a right angle to the previously mentioned buildings along Avenida de Ranillas. The other 5 elongated rectangle organic buildings with rounded ends were established in an irregular manner although they are hardly perpendicular in proportion to the previously mentioned three modules. All these buildings were connected at the first floor with terraces, walkways and a common roof.

Their structures were designed to ensure that in future it would be able to add additional floors and increase useable floor space. After the exhibition the buildings have been converted into office blocks. The exhibitions of the individual countries are ranked according to the climatic zones in which these countries are located, so that they could form a view of a variety of ecosystems. Not only had each country a given surface to its disposal, but also a part of the façade.

Figure 8. Location of the key elements of the buildings (source: A.Biedermann).
<table>
<thead>
<tr>
<th>Name of the object, architect</th>
<th>Useable area</th>
<th>Function</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant Countries Pavilion. Number 7 on Fig.8.</td>
<td>During Expo - 64.355 m² After Expo - 96.000 m² Together with pavilions for the Autonomous Communities of Spain and Participant Countries located at the underground car park with an area of 80.000 m²</td>
<td>During Expo: exhibition function After Expo: - Partially converted into an already running office block - Dinamiza, space devoted to retail and entertainment partially utilized.</td>
<td>This installation consists of three pavilions located along the third ring road and 5 elongated rectangle organic buildings with rounded ends established in an irregular manner, although they are hardly perpendicular in proportion to the previously mentioned three modules. All these buildings were connected at the first floor with terraces, walkways and a common roof. After the exhibition part of the balconies linking various buildings were dismantled and a part of the building demolished to get a well-ventilated and lighted interior with natural light. To increase the surface intended for rent, the outline of the first floor was increased equating it with the contour of the ground floor (during the exhibition it had to be smaller in order to provide sufficient space for external communication). Additional floors were rested on a specially designed construction which changed the exhibition building from a 2-storey one into a 4-storey building. Pavilions located along the third ring road were transformed into Dinamiza office center with a total usable area of 77.000 m². Four of the exhibition pavilions located freely were intended to function as a Center of Commerce and Entertainment- Fluvia of a total area of 19.000m² which until five years after the end of the exhibition is still not being used.</td>
</tr>
<tr>
<td>Autonomous Communities of Spain Pavilion. Number 11 on Fig.8.</td>
<td>65.000 m²</td>
<td>During Expo: exhibition function After Expo: - judicial administration offices - Ciudad de Justicia.</td>
<td>The Exhibition Pavilion is located along Avenida de Ranillas. After the end of the Expo one of the modules belonging to the Pavilion of the Participant Countries located on the east has been adapted for the purposes of judicial administration - Ciudad de Justicia – 65.000 m². These installations are visited by about 6 thousand people every day.</td>
</tr>
<tr>
<td>Spain Pavilion Patxi Mangado and the National Centre for Renewable Energy Number 10 on Fig.8.</td>
<td>8.000 m²</td>
<td>During Expo: exhibition function After Expo: - unused building, intended for the Climate Change Research Center.</td>
<td>Spain was the only country with its own pavilion. The inspiration for the project jointly developed by the Patxi Mangado architectural office and the National Renewable Energy Centre are the poplar forests growing on the coast of the river Ebro. Not only the exhibition placed inside but also the building itself are a manifest of symbiosis between ecology and technology, as the creators ensure. The main criterion taken into account during the design was the low power consumption and the use of renewable sources and environmentally neutral materials. The idea for the &quot;Science and creativity&quot; exhibition in this pavilion was to create a special microclimate ensuring optimal temperature using a minimal amount of energy.</td>
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</tbody>
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### Great Cultural Projects as a Tool for the Development of Contemporary Cities

| Aragon Pavilion | Olano y Mendo | Number 12 on Fig.8. | 11,900 m² | During Expo: exhibition function and restaurant. After Expo: - unused building, intended for the seat of the Council of Education and Culture of Aragon. | The Aragon Pavilion is located at the intersection of two major thoroughfares in the eastern part of the Exhibition, housing the exhibition “Aragon, water and future.” The decision about this prestigious location was made because of the function, which the building was to act when converted after the Expo into the Council of Aragon Education and Culture (a local branch of the Ministry of Education and Culture). It is envisaged that there will be additional floors inside of this facility in the future. The Architects, Alberto Olano and Daniel Olano, were inspired by traditional crafts such as plaited wicker baskets which is a plant typical for the wetlands and riverbanks. Glass (opaque in the lower part, upward gradually becomes completely transparent) and ceramic panels form a giant (45 x 50) ‘basket’ hovering 7m above the ground. The entrance based constitutes of 3 concrete pillars-sculptures. The rest of the ground floor was designated for an open square - a place for various cultural initiatives. Photovoltaic panels mounted on the roof completely cover the energy demand of the building. Additionally, the roof is a public space that allows admiring the exhibition grounds and the city skyline. The façade during hot summer months serves as an “umbrella” filtering the sun’s rays and during the remainder of the year, along with 6 differently colored patios, provides natural lighting inside the building. |
| Congress Palace | Fuensanta Nieto and Enrique Sobejano | Number 5 on Fig.8. | 22,850 m² | During Expo: The exhibition center and conference facilities. | The Congress Palace’s location near the western border of the exhibition makes it accessible not only for the audience of the Expo, but also for the guests who wish to participate only in the events held inside the building. Through highly articulated towers-skylights, the building’s silhouette during the day reveals the order of interiors filled with light, whereas during the night it creates a fascinating landscape of luminous lanterns. Functionally, palace with an area of 9,000 m² was divided into two parts - the exhibition part and the congress part which were connected with a great common entrance hall. It is built on stilts, like most buildings on the Expo area. |
| Pavilion Bridge | Zaha Hadid | Number 6 on Fig.8. | 6,415 m² | During Expo: exhibition function and communication. After Expo: - sporadically used as the cultural uses of Ibercaja. | The so-called Zaha Hadid Pavilion Bridge design, which with its gently curved form connects the river banks was the biggest challenge (it is worth mentioning that in the beginning of her career in 1976, the architect designed a never realized “residential bridge” on the river Thames) On the right bank of the river it forms an ending boulevard leading to the main railway and bus station, which is at the same time one of the main entrances to the Expo area. It does not serve to only pass through the river. The exhibition ‘Water’ was arranged in the middle of it, which is a unique material divided into 3 different thematic spaces (uniqueness of water, crisis and water management and water as a human right). The structure of the building provides a choice of different route passages allowing participation in a selected or in all of the exposures, spread over two levels on the surface of 65,000 m². The Expo Pavilion Bridge had to remain an exhibition space managed by one of the largest regional banks upon completion. The famous English Ove Arup office was responsible for the steel structure design of the building. The bridge is supported in three places: on both sides of the river and on a naturally shaped island. It is supported by 22 piles. 10 are established on the center island, 4 on the right and 8 on the left bank of the river. It is worth noting that with this very building the Spanish record for the depth of foundation was beaten - the piles are sunk at 72.5 m. The cross-sectional geometry, resembling the form of a diamond causes the bridge to poses little resistance to the strong winds in the Ebro valley. Its height varies from 15 to 30 m and the span is 260 m. The coating system resembles shark scales, providing natural ventilation through the openings in the shell. A small building with the equipment that supports the object was established on the left bank of the river, under a small hill covered with greenery. |
| **Water Tower**  
| Enrique de Teresa and Julio Martínez Calzón.  
| **Number 4 on Fig.8.**  
| During Expo, available for the audience - 10,400 m²  
| During Expo: exhibition function and restaurant  
| After Expo: - unused building, intended for the cultural uses of CAI.  
| The Water Tower stands out not only because of the height (76 m) but also because its shape resembles a drop of water, therefore it is the most visible among the buildings of the Expo. The building is called the Ebro lantern due to its high and empty interior space and a glass façade. Ranillas meander, which is situated in the center, forms the northern entrance from the Metropolitan Park. Since it is located outside the Expo grounds a connection was provides by a footbridge built over the road. Huge mechanical stairs, inside of the bridge, leading to the inclined ramp located on the inner circumference of the façade show the direction of exploring. A variety of vertical lines of communication make it possible to admire the panoramic view stretching over the horizon of the city as well as the equipment located inside: the Rain, the Splash and the Cloud. The architect Enrique de Teresa and engineer Julio Martínez Calzón are the authors of the Water Tower. Prepared by a Program Collective international team, the "Water for Life" exhibition was presented inside. The modern technologies allowed viewers to feel with all their senses and create their own exploring scenarios, as opposed to the linear museum patterns. The building was originally used for cultural purposes, yet to this day it remains practically unused.  
| **Freshwater Aquarium**  
| Álvaro Planchuelo.  
| **Number 9 on Fig.8.**  
| 7.850 m²  
| During Expo: Freshwater Aquarium, working continuously to this day.  
| The Freshwater Aquarium is currently the largest building of this type in Europe. The ecosystems of five important rivers in the world, i.e. the Nile, the Amazon, the Mekong, the Garling and the Ebro, was reconstructed inside. The Rivers of the World Reservoir was built in the middle. The concept of the building takes us millions of years ago back, when all the continents were still joined to form one called Pangea. Dynamically fragmented façades of stone and ceramics and water flowing down the glass curtain are to show, according to the architect, the moment of division, the "fight" of the individual elements creating the world as we know it today. After the closure of the Freshwater Aquarium exhibition it became the property of the city and a magnet for tourists.  
| **Theme squares**  
| Extreme water,  
| Thirst,  
| Water City,  
| Home: water and energy,  
| Common water.  
| **Number 8 on Fig.8.**  
| 1.204 m² +1.647 m² +1.240 m² +1.231 m² +1.240 m²  
| During Expo: exhibition function  
| Temporary object, currently non-existent.  
| 6 structures with a temporary character were established in the so-called thematic squares on the floodplains. They were the exhibition installations erected directly on the banks of the Ebro (between the Pavilion Bridge and the Spain Pavilion). They were dismantled after the Expo. Each of the squares was related with the water issues. The first, the Thirst, one of the engines of the development referred to the lack of water due to all human activities. The inflatable structure was covered with salt so that it was synonymous with the feeling of thirst. The extreme water was an installation which showed the power of water and its dramatic manifestations: tsunamis and tropical storms. Tsunami wave crashing onto the shore was made of glass and metal. The Home Exhibition displayed a water and energy transformations involving our homes in the near future, i.e. the eco-energy generation using minimal resources. Common water was an installation which was a polemic against the current division of competing countries, offering a look onto the Earth as a collection of individual river valleys - catchment areas not separating but connecting the different territories. The city location on the riverbanks, sea or lake presented the urban opportunities in The Water Cities Exhibition. The Aquatic Inspirations was the last of the themed squares which provided the space for organizing chamber theater performances.  
| **Non-Governmental Organizations Pavilion**  
| Ricardo Higueras.  
| **Number 15 on Fig.8.**  
| 988,2 m²  
| During Expo: exhibition function.  
| Temporary object, currently non-existent.  
| The Lighthouse - Civic Initiatives Pavilion - despite its location and similar shape was not a thematic square. 30 non-governmental organizations presented their actions here. Straw and clay were used to build it and the form resembling a clay pitcher was to ensure excellent ventilation.  
| **Third Millenium Bridge**  
| Juan José Arenas de Pablo.  
| **Number 3 on Fig.8.**  
| 270m long and 43 m wide  
| Infrastructure operating continuously since June 2008.  
| The largest concrete arch bridge (span of 216m) from which a roadway containing a bicycle path and glass walkways was suspended on 64 cables. Weight: 5,000 tons.  

**PHD DISSERTATION SUMMARY**

**Anna Maria Biedermann**
- Infrastructure related to the transport

Figure 9. The road system of Zaragoza. The red roads finished under the Accompanying Plan. (source: A.Biedermann).

The basic element of modification design and road infrastructure additions was to ensure the availability of a convenient transport to the exhibition grounds and their connection to the newly opened railway station. It was possible through a connection of the land located on the northwestern edge of the city with the third and fourth bypasses which were completed on the occasion of the Expo. For this purpose, Third Millennium Bridge and the street separating the exhibition grounds from the Water Park are formed, closing the third bypass.

In order to close the fourth bypass, the eastern part between the Castellon outlet (A68) and the Barcelona outlet (A2) was formed. It comprised of a 400 m long viaduct over the Ebro and 660 m long tunnel under the Santa Isabel district. At the same time, a connection with the fourth bypass exit road is formed leading north towards the town of Huesca (7.5 km road with a bridge over the Gallego river). The existing northern part of the fourth bypass has been extended by a third lane in both directions.

During the development of the road infrastructure plans of Zaragoza there was the first tram line planned (launched in 2011) and a suburban commuter train connecting the western Casetas village with the eastern Mirafl ores village and, therefore from the center of Zaragoza (16.6 km, 6 stops, 3 connections with other regional rail lines).
Architectural and urban transformation after the Zaragoza 2008 Expo.

After the exhibition, the Expo Agua public company had been working still for 6 months, leading out the participating countries, closing the contracts and terminating all the commitments. After this period, the company changed its name to the Expo Zaragoza Empresarial Co. and as such had to transform the exhibition grounds into the Business Park. By the end of 2009 the thematic squares have been removed and a riverside park devoted to public use was built in their place. Then, the exhibition pavilions located parallel to Ruiz Picasso street (the street that separates the southern exhibition grounds from the northern Water Park grounds) and Ranillas street were transformed (the street which limits the exhibition area from the east). A business park was to be built in the original design of these buildings and so was the remodeling project executed. However, in the face of the economic crisis, which particularly hit the real estate sector in Spain, there has been a change of plans so that the newly created surface was to be overtaken by the public sector offices. The buildings on Ranillas street collected all the judicial administration, which previously occupied rented space in various districts of the city. A similar thing happened with several departments of the City Hall, which have been moved to the building at Ruiz Picasso street. In this way, city residents gained new a administrative center enabling handling many issues in one place and at the same time functions for the newly converted buildings were found. It should also be emphasized that such a solution significantly burdened the public budget and provoked a lot of vacant space in the former premises of the administrative offices.

The four invited countries pavilions as well as Aragon and Spain Pavilions still have no permanent use after 5 years after the exhibition. Pavilion Bridge and Water Tower are used extemporarily and also need constant functions to be introduced. A common problem discussed primarily in the media is that the creation of a great area of the new infrastructure, which by virtue of its oversize may be difficult to further commercialization or maintenance. Although the GCP is planned ahead of time and it is difficult to predict in such a perspective the market conditions and the economic situation which will accompany the transformation area of the GCP after organizing the event, it seems that thanks to the logical layout of the newly established building and designing it with a view to the possible target use, entering it in the city structure will take, in the example of the Zaragoza event, more time than expected. Yet, today it is already an irreversible and positive process, which served the renewal of the city and creating new and attractive public spaces.

The above breakdown (see Table 2.) shows that on the occasion of the Expo 2008 the development of the city at the spatial level occurred as well as improvement of the quality of functional and spatial structure of the city, the city’s transport infrastructure and changes in the landscape quality. In terms of the mentioned changes, the changes can be explicitly evaluated as a positive and permanent (see photo 1). In terms of the development of buildings and public spaces of the city, although there is no doubt about its creation, in the case of the building its evaluation cannot be unequivocally positive due to the high rate of the development, which is not used. This assessment in the long term will probably change.

In the case of the city’s image change and the impact on the economic development of the GCP there was a positive trend of a temporary nature. An additional marketing campaign was required for the construction of the image of the city as well as changes in the image type of the city and the city will probably require additional promotional campaigns in the future.

In the case of the GCP’s impact on the economic development of the city it can be observed that it is not able to prevent the influence of the global economy transformations.
Table 2. The impact breakdown of the development of Zaragoza Expo 2008

<table>
<thead>
<tr>
<th>Development Criterion</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>The spatial development</td>
<td>150 hectares of the meander Ranillas urban wasteland were utilized and waterfront areas of the city were restored (60 km).</td>
</tr>
<tr>
<td>Improving the quality of functional and spatial structure</td>
<td>Urban compactness in the north-western part of the city was increased and a structural and functional combination of previously separated areas of Delicias and Almozara was implemented.</td>
</tr>
<tr>
<td>The development of the transport infrastructure of the city</td>
<td>Along with the construction of the missing part of the third ring road the traffic in the center decreased by 15% (about 40,000 of vehicles uses it daily) and individual districts got better connection. Along with the newly formed part of the fourth ring road (9.64 km + 12.9 km + 13.8 km) the transit traffic improved. A new international airport was established (an area of 13,500 m²). Expansion of suburban infrastructure. Realization of the bicycle paths network (30km along the green areas).</td>
</tr>
<tr>
<td>The development of buildings and public spaces</td>
<td>Installation of public functions - Judicial Administration – 65,000 m², Congress Palace 22,850 m², Labor Office, police station, Municipal Sports Facility - Siglo XXI, two buildings with a potential cultural function (Pavilion Bridge and Water Tower). Public spaces along the banks of the Ebro river (20 km long) have gained new paving sidewalks, bicycle lanes, new street furniture and equipment (playgrounds, fountains, etc). 20 artistic interventions were introduced in these spaces 19 of which remained on the banks of the river.</td>
</tr>
<tr>
<td>Changes in the landscape quality</td>
<td>Doubling of the green areas in the city, 60 km of revitalized edges inside the administrative borders of the city and a combination of green spaces in a coherent system.</td>
</tr>
<tr>
<td>City's image construction</td>
<td>During the Zaragoza Expo 28,836 publications appeared, including 2,475 in the international media. Nevertheless, foreigners were only a 3.6% of the visitors. During the GCP an increase of tourism by 18% was noted and the increase in the average length of stay changed from 1.8 to 2 days.</td>
</tr>
<tr>
<td>Economic development</td>
<td>Work related with Expo and accompanying projects caused the demand for products and services of Aragon at an estimated at 349.2 million euros, which corresponds to the creation or maintenance of 4,499 jobs. Smaller than expected ticket sales and concessions made by the Expo management company generated 54.47 million euros loss. Direct and indirect impact of the gross domestic product was estimated at 1.754 million euros.</td>
</tr>
</tbody>
</table>
Great Cultural Projects as a tool for the development of contemporary cities

PHD DISSERTATION SUMMARY

Anna Maria Biedermann


1. View of the main street during the Expo and 4 years after (photo by the author, July 2008 and July 2012)
2. Riverbank transformed into terraces.
4. The path on the bank of the Ebro.
5. Vadorey river harbor.
Submission of candidacy for the GCP - intangible heritage

Paisajes Expo 2014 (EP 2014) was to symbolize the commitment of Spain in new challenges of the agricultural production, renewable energy and biodiversity in the face of climate change and the announcement of the economic crisis. Faster than expected the crisis announcement turned into a real, existing and difficult economic situation which in a particularly painful way hit Spain. The lack of financing planned urban transformation guarantee, changes and conflict in the political arena and sudden social needs meant that the project ultimately did not pass the implementation phase.

However, the unrealized EP 2014 project left a trail, a legacy that is worth of presenting, analysis and evaluation. The preparation of the project sparked discussion on the urban planning which contributed to shaping the consciousness of the city’s inhabitants. It also did not remain without influence on the political and technical decisions concerning the development of the city.

The project, assuming the creation of the urban gardens and a horticultural education of the interested residents of the city (though much slower than expected and on a smaller scale) is being implemented by the Zaragoza Verde y Azul institution, operating at the City Hall.

Therefore the Expo Paisajes Heritage is immaterial and constitutes from:
- development plan of the eastern districts of the city,
- the idea of sustainable development promoting,
- Popularization of outdoor recreation and healthy lifestyle.

The conclusions from the detailed study on the example of the city of Zaragoza

The detailed study was carried out in order to analyze the impact of the GCP on the development of Zaragoza and to indicate the relationship between the organization of the GCP and the realization of the strategic goals of the city. The analysis of planning documents and the development strategy as well as a detailed study in situ of the effects of the transformation under the influence of the Zaragoza Expo 2008 and the bid to host the Horticultural Expo Paisajes in 2014 showed that the organization of the GCP as well as the process of a candidacy can be a tool for a multi-dimensional development of the city and strengthening its image, provided they are integrated with the implementation of long-term strategic development goals. This is achieved by an appropriate choice of type, topic and location of the GCP.

On the occasion of Expo 2008 the strategic objectives for improving the quality of coastal areas along the four waterways of the city in Zaragoza came into life as well as flooding protection the city was implemented while offering the residents new recreational areas. The objectives of improving the spatial structure of the city, consisting of the combination of two previously separated areas of the newly built Ranillas meander area have been achieved, although the improvement in the structure of the functional connections will end only with the full usage of the newly established buildings which so far is only partially accomplished. Realizing the strategic objectives for improving communication such as the new international airport terminal, bypasses, suburban railway stations and numerous bicycle paths have changed the communication infrastructure of the city beyond recognition. There was a positive change in the image of the city of Zaragoza from a provincial city into a medium-sized metropolis that can boast with recognizable icons of modern architecture. The social objectives were achieved through activation of residents and incorporating them into the voluntary service program which is still running as a well-organized group (3,000 people) five years after the exhibition implementing social activities and cultural events.

Comparing the impact which Expo 2008 and Expo Paisajes candidacy for 2014 had on the development of the city, it can be noted that that heritage of the realized GCP is tangible and quantifiable, measurable in various categories of development (see Table 2). The heritage candidacy is intangible and will become measurable only when the candidacy plans to transform the eastern districts of the city will be realized. Only then will it be able to measure
and evaluate that heritage. At the same time, it has been shown that the objectives pursued by the preparation of candidates of the different types of the GCPs may be similar, focusing largely on the implementation of structural and functional transformation of the city.

5. Synthesis of the research results
The synthesis of the research results allowed to define possibilities (opportunities) and risks associated with the organization of the GCP and the comparison of the different types of the Great Cultural Projects. The differences between them are multi-leveled and relate to both the procedural issues and the financial impact they have on the various sectors of the economy of the city as well as key opportunities and threats. As a result of the detailed analysis of the different types of the GCPs (their specificity, scale and effects) the summary was created to facilitate the host cities decision making about choosing the given type of a GCP that best fits in their strategy development.

Comparison of the characteristics of the different types of the GCPs
As shown in the detailed studies results, four of the GCPs analyzed, despite that they have much in common to allow them to include to the GCPs, they are in many aspects different from each other. These differences are multi-leveled, and relate to both the procedural issues (the time required to propose candidacies and preparation of the GCP and the criteria to be met) and the financial impact they have on the various economic sectors of the city as well as various opportunities and threats listed in the previous breakdown, which, however touch upon different degrees of different types of the GCPs. The analyzed examples allow concluding that the size of the city is not a key criterion for the possibility of the organization of any of the types of the GCP, because in each of them there are examples of cities of different sizes. The average number of audiences that different types of the GCPs are able to attract is varied and depends on the type of the GCPs. Necessary infrastructure, such as: hotel accommodation, transportation, etc., is linked with the number of audience and the duration of the GCP.

As evidenced by the example of Zaragoza’s candidacy to host the Horticultural Expo Paisajes in 2014, even the unrealized candidacy leaves an ideological and planning legacy, which can be continued and implemented on a smaller scale and in the long term. This legacy is also dependent on the type of the GCP to which the city candidated for.

The comparison between different types of the GCPs presented in a tabular breakdown may be used for cities considering the possibility of preparing the GCP to choose the one that best fits in their strategy development.
<table>
<thead>
<tr>
<th>WORLD EXPO</th>
<th>INTERNATIONAL EXPO</th>
<th>OLYMPIC GAMES</th>
<th>HORTICULTURAL EXHIBITION A1</th>
<th>EUROPEAN CAPITAL OF CULTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Controlling institution</strong></td>
<td>BIE</td>
<td>IOC</td>
<td>APIH, BIE</td>
<td>13 experts selected by the European Commission and the country's Ministry of Culture</td>
</tr>
<tr>
<td><strong>Duration of the event</strong></td>
<td>Max. 6 months</td>
<td>Max. 3 months</td>
<td>Typically 0.5 months (16 days)</td>
<td>From 3 to 6 months</td>
</tr>
<tr>
<td><strong>The necessary period to prepare the candidacy and the GCP</strong></td>
<td>9-6 years - candidacy, 5 years - preparation</td>
<td>6-5 years - candidacy, 4 years - preparation</td>
<td>About 10 years of candidacy, 7 years - preparation</td>
<td>The country must be represented in the APIH at least 2 years before submitting the candidature, the candidature lasts 12-6 years before the exhibition, on average 4.5 years of preparation.</td>
</tr>
<tr>
<td><strong>Event frequency</strong></td>
<td>Every 5 years (at least 15 years between exhibitions in the same country).</td>
<td>Exhibitions organized between world exhibitions - 2 in a decade (at least 15 years between exhibitions in the same country).</td>
<td>Every four years, summer and winter olympics alternately every two years.</td>
<td>Every 2 years</td>
</tr>
<tr>
<td><strong>Geographical scope</strong></td>
<td>Theoretically the whole world</td>
<td>Theoretically the whole world</td>
<td>Theoretically the whole world</td>
<td>Europe</td>
</tr>
<tr>
<td><strong>Participating countries - members of the controlling institutions international coverage of the GCP</strong></td>
<td>BIE - 167 countries.</td>
<td>BIE - 167 countries.</td>
<td>APIH - 19 countries.</td>
<td>European Union countries and countries cooperating with the EU or preparing to join the EU.</td>
</tr>
<tr>
<td><strong>Criteria for assessing candidates</strong></td>
<td>Theme of the exhibition, The date and duration of the exhibition, Location of the city, Expo's area for participants, The expected number of visitors, Financial guarantees the credibility of the project, Estimated cost of participation in the exhibition, Support of the authorities, Support for the residents of the city, The impact on the environment.</td>
<td>Theme of the exhibition, The date and duration of the exhibition, Location of the city, Installations intended for participants, The expected number of visitors, Financial guarantees the credibility of the project, Estimated cost of participation in the exhibition, Support of the authorities, Support for the residents of the city, The impact on the environment.</td>
<td>The importance of the exhibition for the horticultural sector, Horticultural sector involvement in the organization of the exhibition Transparent and equal for all rules of participation in organized competitions Full opportunity to exhibit products from all participating countries without restrictions, Fulfillment of all requirements concerning size of the area and the building, Financial guarantees.</td>
<td>- Strengthening the cooperation in every sector of culture between operators in the field of culture, artists and cities of the European Union - Highlighting the wealth of cultural diversity in Europe - Bringing out the common aspects of European cultures, Promoting the participation of the inhabitants of the city and its surroundings and raise their interest in the city of the parties and from citizens living abroad, Durability and an integral part of the long-term cultural and social development of the city.</td>
</tr>
<tr>
<td><strong>Declared objectives</strong></td>
<td>Presentation of the idea, cultural goods, scientific achievements, projects regarding the future of the world. One of the main objectives is education carried out in an accessible and attractive way.</td>
<td>Presentation of the idea, cultural goods, scientific achievements, projects regarding the future of the world. One of the main objectives is education carried out in an accessible and attractive way.</td>
<td>Original: physical and moral renewal of society, today promotion of sport and competition. Dynamisation of international trade in flowers, plants and services in the field of landscaping. Popularization of knowledge about the landscape.</td>
<td>Mutual understanding, rapprochement and dialogue between Europeans, nurturing of the cultural wealth of Europe. ECoC is an important part of the search for a new identity of a united Europe. Creating a sense of belonging to the European community.</td>
</tr>
<tr>
<td><strong>Participants</strong></td>
<td>National teams in their own pavilions, the international organizations, NGOs, corporations and other institutions.</td>
<td>National teams in the pavilions prepared by the organizer, international organizations, NGOs, corporations and other institutions.</td>
<td>Sports national teams.</td>
<td>Associations and companies representing the given country.</td>
</tr>
<tr>
<td><strong>Host cities size</strong></td>
<td>0.5-23.0 million inhabitants. On average in the last 20 years: 8 million inhabitants.</td>
<td>0.003-7.4 million On average in the last 20 years: 1.8 million inhabitants.</td>
<td>SOG - 0.1-11.0 million WOG - 0.002-1.0 million On average in the last 20 years: SOG - 4.27 million, WOG - 0.35 million.</td>
<td>01 - 3.5 million inhabitants. On average in the last 20 years: 0.67 million inhabitants. 0.06-12 million inhabitants. On average, in the last two decades: 0.88 million.</td>
</tr>
<tr>
<td><strong>Audience -numbers</strong></td>
<td>On average, in the last 20 - year period: 4.03 million. Number of inhabitants in the month increased by an average of 5.84 times.</td>
<td>On average in the last 20 years: 10.21 million. Population of the city in the month increased by an average 3.46 times.</td>
<td>On average in the last 20 years: 6.03 million WOG - 2.55 million. Population of the city in the month increased by an average: SOG - 8.08 times, WOG - 7.12 times.</td>
<td>On average in the last 20 years: 4.39 million. Number of inhabitants in the month increased an average of 4.3 times. On average in the last 20 years: 3.1 million. Number of inhabitants in the month increased by an average of 1.26 times.</td>
</tr>
<tr>
<td><strong>Tourism</strong></td>
<td>A noticeable increase in the international tourism during the exhibition and in the following years.</td>
<td>A noticeable increase mainly in domestic tourism during the exhibition and an increase in international tourism during the exhibition and in the following years.</td>
<td>The increase in tourism in the short term, audience interested in sports, following with a growth in tourism due to the image recognition of the city.</td>
<td>The average increase in tourism - 12% during the ECoC.</td>
</tr>
<tr>
<td>The project area</td>
<td>Unlimited space, fenced area, restricted access.</td>
<td>Area of 25 hectares, the area fenced, restricted access.</td>
<td>Typically, the Olympic village and sports facilities in the city, the area defined by the organizer.</td>
<td>Over 50 hectares, of which 10% can be used for buildings, the area fenced, restricted access.</td>
</tr>
<tr>
<td>------------------</td>
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<td>---------------------------------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>The characteristics of the location in the city (last twenty years)</td>
<td>Few data available. World Exhibitions are usually localized at the periphery of the city, which is associated with the use of the GCPs within the processes of expansion (new localization). Waterfront areas are used, accompanied by the urban transformation of the terrains outside the localization of the exhibition.</td>
<td>International Exhibitions are usually localized at the periphery of the city, which is associated with the use of the GCPs within the processes of expansion (new localizations) or revitalization processes located on the outskirts of postindustrial localizations. Waterfront areas are used, accompanied by the urban transformation of the terrains outside the localization of the exhibition.</td>
<td>Summer Olympics - mainly localized in peripheral areas, different locations in the city are used, the transformation of areas not directly related to the organization of the Olympic Games occurs, in half of the cases existing green areas and water areas are used; revitalized areas are used as well. Winter Olympics - mainly localized in peripheral areas, different locations in the city are used, the transformation of areas not directly related to the organization of the Games occurs; use existing green areas and waterfront areas.</td>
<td>Horticultural Exhibitions are located on the periphery of the cities, which often results in the creation of new green areas in areas previously undeveloped or not urbanized. They are located in waterfront areas.</td>
</tr>
<tr>
<td>The interest of the media and the impact of the event on the image and recognition of the city</td>
<td>Strong international and domestic interest. Ability to promote the city and change its image in the international area.</td>
<td>Large domestic interest. Moderate international interest. Ability to promote the city and change its image in the country.</td>
<td>The greatest interest of the international media, events broadcasts around the world, not just relations or references. A significant increase in the brand awareness of the city and change its image in the international area.</td>
<td>International interest mainly in trade in the horticultural sector, locally treated as an entertainment option. Ability to promote the brand of the city and change its image in the country.</td>
</tr>
<tr>
<td>Budget</td>
<td>A small number of data. 700-4,000 million euro in the last 20 years.</td>
<td>A small number of data. 25-2,500 million € in the last two decades.</td>
<td>In the last two decades: Summer Olympics 10-10.000.000 million Euro. Winter Olympics 10-2.650 million euro.</td>
<td>A small number of data. 50-100 million in the last 20 years.</td>
</tr>
<tr>
<td>Direct income sources</td>
<td>• Sponsoring. • Ticket Sales. • Official products. • The subsequent sale of the property. • Catering and other services licenses in the exhibition area.</td>
<td>• Sponsoring. • Ticket Sales. • Official products. • The subsequent sale of the property. • Catering and other services licenses in the exhibition area.</td>
<td>• TV and radio broadcast license sales. • Sponsoring. • Ticket Sales. • Official products. • Catering and other services licenses in the exhibition area.</td>
<td>• Sponsoring. • Ticket Sales. • Official products. • Catering and other services licenses in the exhibition area.</td>
</tr>
<tr>
<td>Architectural heritage</td>
<td>• Buildings of science and culture - museums, exhibition centers, conference centers, cultural centers, opera, school buildings, research institutes, technology parks. • Buildings of trade, catering, recreation and entertainment - exhibition centers, theme parks, arenas, aquariums, concert stages, shopping centers. • Communication service hubs – railway stations, subway stations, airports. • Hospitality and Residential - the development of residential areas. • The symbol of the city - observation towers. • Buildings of physical culture and sports - stadiums.</td>
<td>• Buildings of science culture - exhibition centers, conference centers, opera, theaters, churches, school buildings, museums. • Buildings of trade, catering, recreation, and entertainment – aquariums and oceanariums, restaurants, exhibition centers, theme parks, arenas, concert stages, cinemas, casinos. • Communication service hubs – railway stations, subway stations, airports. • Hospitality and Residential - the development of residential areas. • The symbol of the city - observation towers, bridges. • Buildings of physical culture and sports – stadiums, swimming pools, ice rinks, pavilions.</td>
<td>• Buildings of physical culture and sports-SOG: stadiums, welodromy, swimming pools, sports halls, playing fields. WOG: ice skating rinks and stadiums, ski jumps, sports centers, ski lifts. • Hospitality and Residential - Olympic villages, mostly converted into residential areas, hotels. • Communication service hubs – railway stations, airports, bus stations. • Buildings trade, catering, recreation and entertainment - restaurants, entertainment centers, spas, amusement parks, shopping malls, zoo. • Buildings of science and culture - conference centers, museums, cultural centers. • The symbol of the city - SOG: stadiums, swimming pools, observation and telecommunications centers, WOG: ski jumps, ice stadiums.</td>
<td>• Buildings of science and culture - exhibition centers, conference centers, planetarium, theaters, exhibition centers, and telecommunications towers. • The symbol of the city - observation and entertainment - greenhouses, amusement parks. • Communication service hubs - subway stations, bus stations. • Hospitality and residential - residential neighborhoods, hotels.</td>
</tr>
<tr>
<td>The scope and nature of urban transformation</td>
<td>• Transformation of the road infrastructure and public transport-contruction of new highways, roads, bypasses, bridges, railways, metro and marinas. • The emergence of new and transformation of the existing parks. • Industrial areas revitalization. • Development of the new areas of the city - mostly wastelands.</td>
<td>• Transformation of the road infrastructure and public transport-contruction of new highways, roads, bypasses, bridges, railways, metro and marinas. • The emergence of new and transformation of the existing parks. • Postindustrial areas revitalization. • Development of the new areas of the city - mostly wastelands.</td>
<td>• Transformation of the road infrastructure and public transport-contruction of new highways, roads, bypasses, bridges, tunnels, railways and metro. • Postindustrial areas revitalization – WOG traditionally. • Development of the new areas of the city - mostly wastelands - SOG especially. • The emergence of new and transformation of the existing parks – SOG especially.</td>
<td>• The emergence of new and transformation of the existing parks. • Development of the new areas of the city - mostly wastelands. • Transformation of the road infrastructure and public transport construction of new roads, bypasses, bridges, tunnels, railways and metro.</td>
</tr>
<tr>
<td>Intangible cultural heritage</td>
<td>The main risks</td>
<td>The main benefits</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>City’s development strategy discussion.</td>
<td>Terrorist threats.</td>
<td>Dynamisation of the cultural life of the city.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social activation (volunteers).</td>
<td>Focusing the development resources on only one part of the city.</td>
<td>Involvement of volunteers - social activation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technological innovation popularization.</td>
<td>Often difficult to manage pavilions of different countries.</td>
<td>Social integration, the creation of public spaces.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The internationalization of the city brand.</td>
<td>The property value increase leading to gentrification.</td>
<td>Tourism promotion and the development of tourism infrastructure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>City’s development strategy discussion.</td>
<td>Influence of the political and economical changes on the GCP planning.</td>
<td>Strengthening or establishing new international contacts.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social activation (volunteers).</td>
<td>The GCP can be used as a propaganda tool of political power.</td>
<td>Creating a development vision of the city.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technological innovation popularization.</td>
<td>• High costs of public green spaces maintenance.</td>
<td>Accelerating the implementation of planned investments by launching special financial and administrative procedures.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The internationalization of the city brand.</td>
<td>• Terrorist threats.</td>
<td>• Urban, structural and spatial transformation and a change in the structure of land ownership.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sport and Olympic values popularization.</td>
<td>• Difficult to manage specialist sports facilities heritage.</td>
<td>• Revitalization, comprehensive project realization of changing the structure and function of the problematic parts of the city.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social activation (volunteers).</td>
<td>• The property value increase leading to gentrification.</td>
<td>• Innovative and experimental architectural solutions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The internationalization of the city brand.</td>
<td>• Influence of the political and economical changes on the GCP planning.</td>
<td>• Creation of a new functional-economic profile of the city, such as: the city of congresses, the city of trade fairs and business.</td>
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<td>Promotion of a healthy lifestyle in harmony with nature.</td>
<td>• The GCP can be used as a propaganda tool of political power.</td>
<td>• Stimulating economic activity, new jobs.</td>
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<td>Popularization of placing green areas in the city, both in public and private spaces.</td>
<td>• Influence of the political and economical changes on the GCP planning.</td>
<td>• International Increase in the brand awareness of the city.</td>
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<td>Cultural life dynamisation in many areas related to dispersed locations.</td>
<td>• Terrorist threats.</td>
<td>• Better public transportation in the city.</td>
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<td>Projects and cultural festivals initiation that take place regularly once the ECoC has finished.</td>
<td>• Difficult to manage specialist sports facilities heritage.</td>
<td>• Popularization of knowledge and innovation in the horticultural sector.</td>
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<td>Promotion of a new image of the city and cultural tourism.</td>
<td>• The property value increase leading to gentrification.</td>
<td>Creating a vision for the development of the horticultural industry and the importance of green spaces in the city.</td>
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**SUMMARY**

**ANNA MARIA BIEZEMANN**
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<th>URBAN PLANNING</th>
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<th>SOCIETY</th>
<th>ADMINISTRATION</th>
<th>ENVIRONMENT</th>
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<td>MAP OF THE CITY NEEDS</td>
<td>The needs of spatial and functional transformations: - Public buildings. - Development of recreational and entertainment. - Housing development. - Road infrastructure and public transport. - Green areas.</td>
<td>The needs of economic restructuring (e.g. diversification, strengthening and revival of a particular economic sector).</td>
<td>Needed social transformations. Participation program in the definition of the needs of the residents of the city.</td>
<td>Required modifications of the environment and the requirements for its protection.</td>
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<td>CITY DEVELOPMENT STRATEGY - Prioritization</td>
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<td>Short and long term economic goals.</td>
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<td>The definition of the desired financial state and activities leading to the development and dynamization of certain economic sectors.</td>
<td>The definition of the modification in administrative procedures and the role of administration in the objective transformation.</td>
<td>The definition of the desired state of the environment in the city.</td>
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<td>THE ANALYSIS OF TYPES OF THE GCPs IN TERMS OF THE EFFECTIVENESS OF THE DESIRED TRANSFORMATION</td>
<td>The efficiency and the type of urban planning transformation related to the organization of the type of the GCP.</td>
<td>The costs of implementing the GCP Possible sources of funding and income. The impact of the GCP on the achievement of the economic goals.</td>
<td>Social and cultural dimension of the GCP and its adequacy in the implementation of planned social and cultural programs.</td>
<td>Identification of the necessary administrative measures and procedures for each type of the GCP, reality and credibility of conducted candidacy check and implementation of the given GCPs from the standpoint of administration.</td>
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<td>CANDIDACY PROJECT OF THE SELECTED GCP</td>
<td>Selecting the location of the GCP in the city (which areas are in need of revitalization and whether they have a chance to turn into a dynamically active centers even after the GCP). The advantages of the existing and planned communications. Definition of priority projects.</td>
<td>Financing guarantee The definition of the desired income-tickets, sponsorship, merchandising, the definition of acceptable costs and funding sources.</td>
<td>The involvement and support of the local community. The attractiveness of culture and tourism for domestic and foreign audience. The definition of social, cultural and imagery programs on the occasion of the GCP.</td>
<td>Institutional support. Cooperation between the administration and the committee preparing the candidacy of the GCP.</td>
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<td>PROJECT OF THE SELECTED GCP</td>
<td>Adjusting of the Concept of the Urban Development Plan for spatial development to the needs and requirements of the GCP. The overall development plan of the GCP, the detailed design of land development, executive project, operations project (including the duration of the exhibition) building transformation project for the redevelopment of the GCP’s building as defined in the plan target.</td>
<td>Funding: -budget and its application. -definition of shares necessary to achieve planned revenue.</td>
<td>Participation program of residents. Volunteering. The program of cultural events during the GCP. The image campaign, branding the GCP and the city.</td>
<td>Starting special administrative procedures to enable the implementation of the GCP.</td>
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<td>EVALUATION - ASSESSMENT OF PERFORMANCE EXPECTED. MEASURE OF SUCCESS.</td>
<td>Evaluation of the implementation of priority projects, the effectiveness of structural and functional transformation.</td>
<td>Assessment of financial performance, assessment of compliance of the investment with the adopted budget, the added value of the GCP.</td>
<td>Rating of satisfaction expressed by participating in the GCP and satisfaction of city residents from occurred transformations, cultural program and communicated city’s image.</td>
<td>Evaluation of the effectiveness of the administration activities and special procedures introduced on the occasion of the GCP.</td>
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The above is the author's organization chart of the GCP, in which (in contrast to the current practice) it is proposed to first design the desired spatial and functional changes in the selected area of the city and then analyze which type of the GCP can effectively accelerate the implementation of these objectives (see Table 4). The suggested organizational procedures of the GCP takes into account, inter alia, diagnosis of the state of the city (its problems and needs, opportunities and constraints), analysis of the development priorities and strategic objectives as well as the strengths of the selected GCP and evaluation methods in different spheres of city's functioning: urban planning, economic, social, administrative, and environmental sectors.
6. Summary and conclusions

The study allowed obtaining answers to key questions:

- **Whether and to what extent can the GCP be a tool for the development of modern cities?**

  On the basis of the cross-sectional and detailed case studies of Zaragoza it has been demonstrated that the GCPs can be used as a tool for the development of modern cities, for the development of spatial and functional urban structures in particular. New districts are created along the GCPs (for example, on the occasion of the Expo 2008 in Zaragoza 150 ha of wastelands were utilized), communication infrastructure is transformed (e.g. SOG in Tokyo - creation of 22 new highways, 18 expressways, 2 metro lines and high-speed train connecting Tokyo and Osaka) the coastal and river fronts (e.g. the ECoC in Glasgow in 1990 or the ECoC in Liverpool in 2008) and industrial areas (eg LIO in Barcelona in 1992) are revitalized.

- **Are the GCPs a global phenomenon?**

  Participation in the GCP is a global phenomenon; it concerns the World Exhibitions (BIE membership includes 167 countries) and the Olympic Games in particular (204 countries have National Olympic committees). The GCP organization, although theoretically possible for all countries in the world, is associated with the need to meet strict requirements, which in fact is not a limitation only for the developed countries or dynamically developing ones.

- **What are the differences and common features of the GCP? What is the specificity of the different types of the GCP?**

  Most common characteristics were specified in their definition of the GCP. These are:
  - periodicity,
  - international organization making the selection of the host-city and having control over the compliance with established procedures,
  - an established protocol as a candidate to become the organizer as well as running the event itself,
  - several years of infrastructural preparation for the events and transformations associated with it,
  - Targets aimed at the popularization of global developments related to the progress of civilization: cultural, sporting or technological,
  - the limited duration of the event,
  - overtone of the diplomatic event: the participation of celebrities, heads of the state etc.

  The different types of the GCPs differ in the scale of interest which they arouse with the public and the media, the scale of the urban transformation that produce and the architectural heritage they leave behind. These features formed the basis of selection of the research sample. The different types of the GCPs significantly different from each other. These differences relate both to procedural issues, the financial impact they have on the various sectors of the economy of the city and the key opportunities and threats. A detailed comparison of the various types of the GCPs was the subject of the cross-sectional studies which results are shown in a table 3.
• What are the opportunities and risks associated with different types of the GCPs?

The summary of opportunities and threats related to the organization of the GCPs can be an important factor in deciding on an entry to the organization of the GCP and the selection of the type of the project. Different types of risks and opportunities associated with such events were analyzed and characterized. Table 3 highlights the ones that are specific to particular types of the GCPs.

• What is the impact on the urban transformation, architectural heritage and image changes of the given GCPs?

The answer to this question was a key element of this thesis and the theme of the cross-sectional and detailed studies. The result proved that the Great Cultural Projects in 87.63% of cases contributed to the positive transformation of the urban development including the processes of revitalization of the degraded areas (in the last 20 years WIE - 50%, SOG -100%, WOG - 33.3%, HE - 14.3% ECoC - 69.2% of cases), or through the development of non-urbanized areas (in the last 20-year WIE - 41.7% WOG - 66.7%, HE - 57.1%, ECoC - 5.1% of cases). There have also been a catalyst for the outside areas of their location (in the last two decades WIE - 56.3%, SOG - 100%, WOG - 100%, WO - 28.6, ECoC - 46.2% of cases) in the emergence of new communication infrastructure and green areas in the city. Almost all of the GCPs (96.23%) have left a valuable architectural heritage (buildings of culture and science, buildings of physical culture and sport, buildings of trade, buildings of catering, buildings of recreation and entertainment, hotel and residential facilities). In the cases of the WIE there are mainly cultural and scientific buildings, trade buildings, catering building, recreation and entertainment buildings, hotel and residential facilities, communication services and facilities, in the case of SOG and WOG are mainly buildings of physical culture and sports and hotel facilities and residential. In the cases of the HE and the ECoC mainly buildings of culture and science arose (Fig. 6). In 24% of cases there were iconic buildings such as the Eiffel Tower in Paris (WE, 1889), the Atomium in Brussels (WE, 1958), the ski jump in Innsbruck (WOG, 1964), and the Euromast in Rotterdam (HE, 1960), which permanently changed the image of the city and contributed significantly to its visibility and increase in the tourist attractiveness. Image changes were also associated with the formation of new graphic city identifiers.

• What is the relationship of the development of the city and the location of the GCP?

Choosing the right location is of strategic importance in the preparation for the GCP and determines the directions of development of the city. The location decisions of the GCP in the city center since the second half of the twentieth century were most often associated with the necessity of carrying out the processes of revitalization. The most spectacular examples of the revitalization on the occasion of the GCP include revitalization of Glasgow (ECoC 1990), revitalization of the port area in Lisbon (ECoC 1994, continued during Expo 1998) and the revitalization of the city center of Liverpool (ECoC 2008). Location on the outskirts of the city associated with these processes to a much lesser extent but it contributed to the enlargement of the urban areas or their activation and transmission of a new identity. The GCP location can serve as a tool for expansion of the city to new areas or increase in the intensity of development and the creation of clear connections between existing neighborhoods as happened in the case of Expo 2008 in Zaragoza. The GCPs also exert a significant influence on the transformation of the city outside the areas close to the location of the event. These interventions are usually associated with the improvement of transport infrastructure and the creation of appropriate accommodation facilities and services.
Great Cultural Projects as a tool for the development of contemporary cities

What is the relationship between the size, number of audience, number of represented countries, GCP’s location and duration?

The GCPs are organized by the relatively small towns (e.g. WOG in Squaw Valley – 2,000 residents) as well as by large metropolitan areas (e.g. Expo in Shanghai - 23 million inhabitants). The largest audience in the history of the GCPs was gathered at the World Exhibition in Shanghai in 2010 - 73 million and Osaka in 1970 - 64.2 million. In the case of SOG and WOG growing interest in audience and viewers was found; as for the WIE and SOG and WOG - an increasing interest in the countries participating in the GCP was found. The need to provide accommodation and support a large number of visitors in a short time and in a relatively small area may be the reason for oversizing the hotel's base as it was during the Expo in Seville in 1992. There have been cases where the number of audience exceed the number of permanent residents of the city by several dozens (e.g. IE in Tsukuba in 1985. The ratio of public to the number of inhabitants (PM) =101.5, SOG in Lake Placid in 1980 - PM = 186.7, ECoC in Weimar in 1999 – PM = 116.7) . The biggest disparity between the number of the audience and the number of inhabitants of the city, taking into account the time factor, was noted for the Winter Olympics (e.g. WOG in Lake Placid in 1980 - the number of audience 560,000 people vs. the number of inhabitants 3,000, the PMC ratio = 466.7) which usually take place in the small mountain town, for which the organization of the GCP is not only a platform for the promotion of tourism and winter sports but also a very serious logistical challenge.

During the study the auxiliary hypotheses were also confirmed:

The organization of the Great Cultural Projects leaves a lasting legacy in the form of tangible urban structures transformation, architecture and urban infrastructure of the host cities and often architectural symbols, which become recognizable trademarks of cities and contribute to the construction of their identity.

The location of the GCP in the center or on the outskirts of the city has a significant relationship with the developmental objectives related to the revitalization of city centers or spatial expansion of cities.

The scale and the effects of the functional and spatial transformations of the cities are different for different types of the GCPs and their specificity can be used in planning development strategy for the city.

The city’s candidacy to host the GCP’s has a positive impact on the planning of urban development as it allows to define the long-term strategic objectives and suggests ways to achieve them.

For example, Expo Paisajes has shown that the preparation of developmental plans and exhibition areas has helped to define the directions of Zaragoza's development.

The results confirm the thesis, that the Great Cultural Projects have a significant and lasting impact on the functional and spatial structure of the city, in which they take place. Their deliberate use can be a tool for the multi-dimensional development of the city.

The study mainly focuses on those aspects of urban development that involve the transformation of the urban structure and architectural heritage. It has been proved that the GCPs are a catalyst and tool for:

- revitalization of postindustrial and inner city areas,
- building new neighborhoods and new directions for the city’s development activation,
- development of green areas and improvement of the quality of public spaces,
- changes in the structure of land ownership,
- infrastructure modernization, including the creation of new communication networks (trams, buses, subways, railways, waterways, bicycle paths, public bike rental systems, etc.) and communication services and facilities of the city (bus stations, railway stations, ports and harbors, airports, etc.)
• creation and transformation of new public, recreation and entertainment buildings,
• landmarks construction - objects that have become business cards of the cities and have significantly influenced the development of its image, identity and tourist attractiveness.

As a result of cross-sectional and detailed studies studies of Zaragoza, it has been demonstrated that the GCPs can be used as a tool for the development of modern cities. In particular, they serve the spatial and functional development of the urban structures and the appropriate choice of the type of the GCP and its location can contribute to acceleration of the realization of the strategic objectives of the city.