

重庆交通大学建筑学院 School of Architecture, Chongqing Jiaotong University

ECOLOGICAL ARCHITECTURE AND SUSTAINABLE DEVELOPMENT

CULTURAL APPROACH ON THE EXAMPLE OF POZNAN METROPOLITAN AREA, POLAND

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HIGHLIGHT THE PROBLEM

ECOLOGICAL APPROACH TO CITY DEVELOPMENT

TWO ATTITUDES CAN BE DISTINGUISHED IN THE ECOLOGICAL APPROACH TO URBAN DEVELOPMENT:

1) A naturalistic approach based on a simple analogy to the development of natural ecosystems. Human activity in the urban environment is analyzed from the point of view of socio-economic competition for limited urban resources.

HIGHLIGHT THE PROBLEM

ECOLOGICAL APPROACH TO CITY DEVELOPMENT

2. Cultural approach

Spatial human behavior, its ability to environment creation are independent of the nature and much more flexible than other species. Every area shaped by a man is an expression of his culture:

- reflecting a specific social technical level,
- corresponds to the specific social structure and social customs,
- social groups with specific culture, create functional wholesale,
- every part of landscape is a reflection of culture of inhabited people.

HIGHLIGHT THE PROBLEM

ECOLOGICAL APPROACH TO CITY DEVELOPMENT



Luo Hong Art Museum, Beijing, Photo: W. Bonenberg

HIGHLIGHT THE PROBLEM

ECOLOGICAL APPROACH TO CITY DEVELOPMENT

In terms of contemporary human ecology, culture is an important element of sustainable urban development.

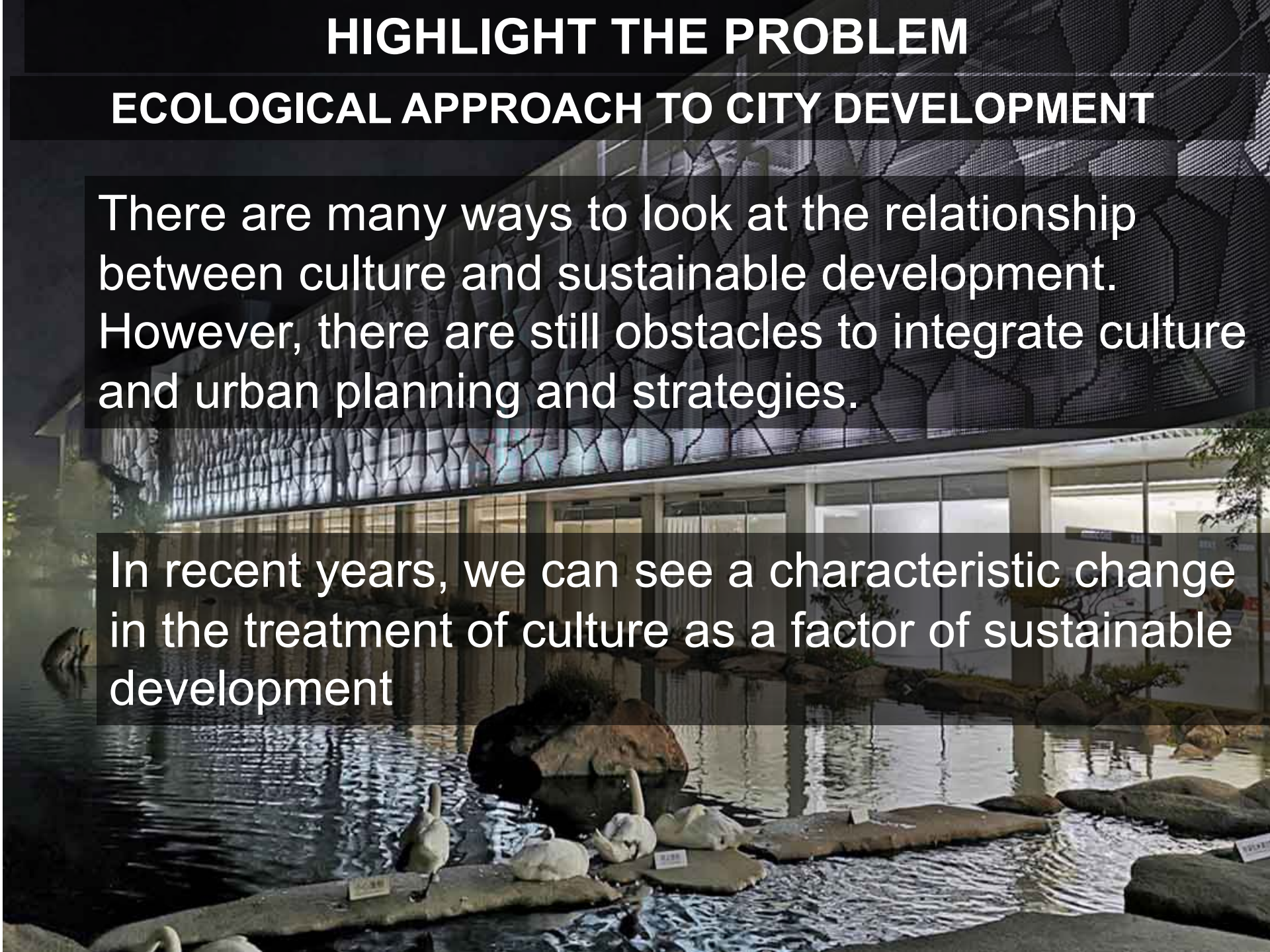
A holistic and integrated approach to development must take into account local tradition and history, local identity, cultural identification of local community. Contemporary problems of cities are not only a matter of economic conditions, transport, quality of the natural environment, but also the lack of local cultural features due to globalization.

HIGHLIGHT THE PROBLEM

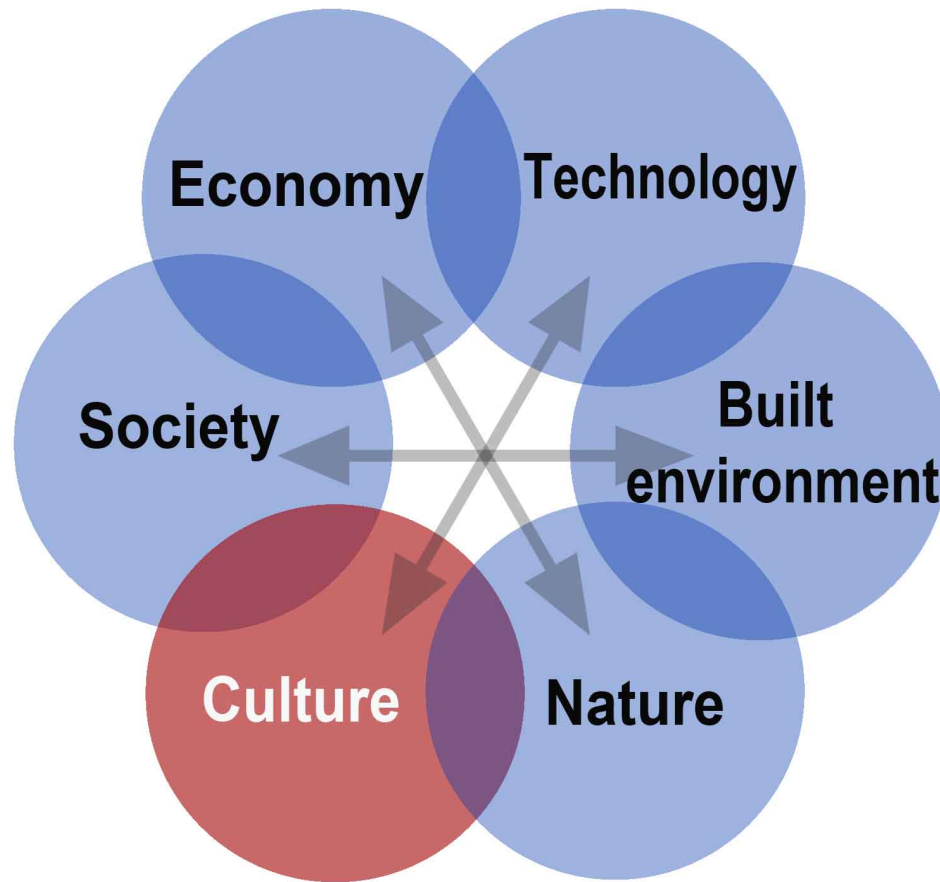
ECOLOGICAL APPROACH TO CITY DEVELOPMENT

There are many ways to look at the relationship between culture and sustainable development. However, there are still obstacles to integrate culture and urban planning and strategies.

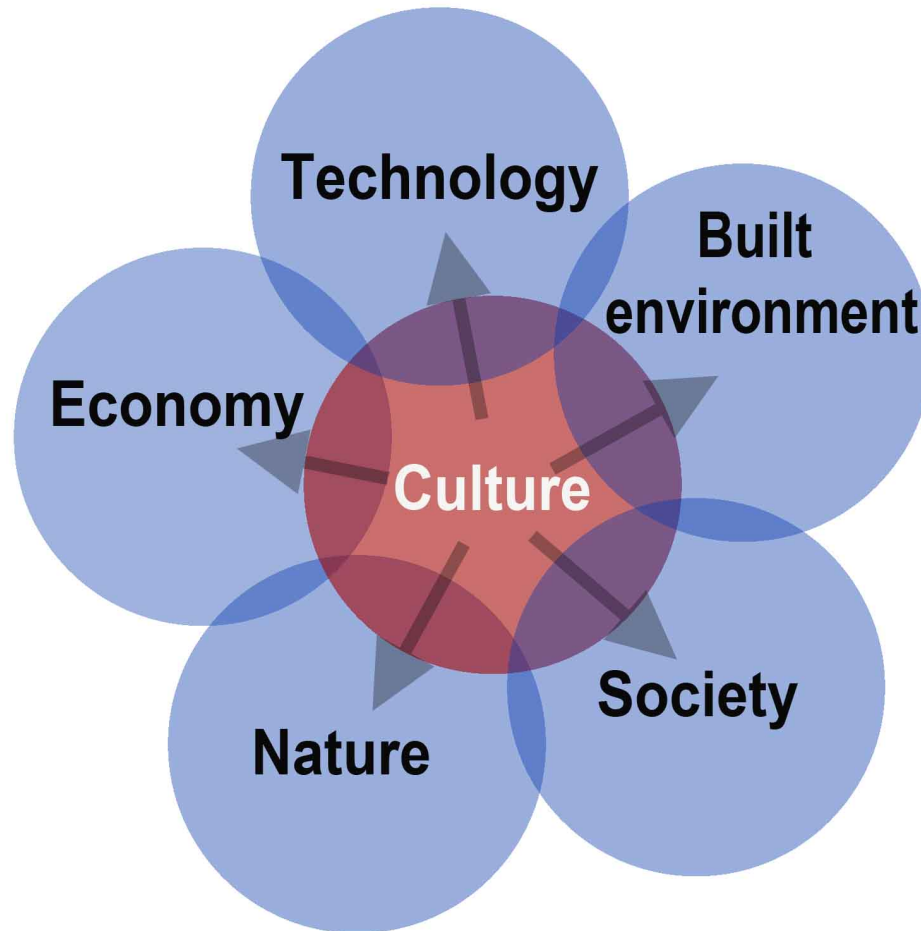
In recent years, we can see a characteristic change in the treatment of culture as a factor of sustainable development



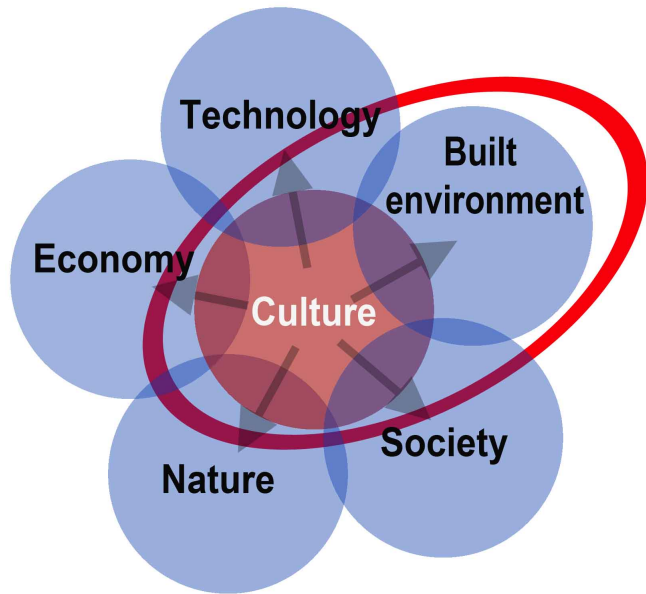
1. Culture added as a sixth pillar of sustainable development



2. Culture mediating between five pillars of sustainable development (culture as the foundation for sustainable development)



In terms of architecture, relations between culture and the built environment are particularly important



The most common problems in this area include:

unification of standardization of buildings, loss of diversity, boredom, repetition, compositional chaos.

These are the effects of uncontrolled globalization of the built environment, leading to characteristic problems: *Anonymity, Alienation, Frustration, Loss of attractiveness, Reduction of the quality of life and satisfaction of people.*

CULTURE



City of Poznań, old downtown

Culturally aimed urban development can inspire participation processes: culture provides knowledge about our existence as inhabitants of our cities. We all need to learn about the past of our city, so that we can “own” it and contribute to its identity and into future.

Local culture allows citizens to gain ownership of the city, and to meet and learn from one another – in short, culture is a mean through which citizens feel that they belong to their city. Interpreted in this way, sustainable development of the city can change the sense of place and self-esteem of its residents.

Cities use local cultural resources and creativity to inspire, catalyze, and drive social and economic change, enhancing local resiliency and development potential. Cultural actions and expressions can also provide environmental reclamation processes and inspire actions to improve environmental quality.

Enhancement of social connections with the ecosystems of local spaces is also important. Cultural activities and means for expression contribute to building capacities.

They aim at greater understanding and generating transformative change in both urban and rural environments.

Cities are also location of cultural industries as well as producers and consumers of cultural goods and services. Cultural services and their degree of diversity are different in large metropolitan centers in comparison with small towns.

In a globalized world, the importance of a distinctive urban identity counteracts rapid homogenization. Culture is used as a lever for economic development and urban regeneration, and also to express a common identity. As a source of new ideas it is widely recognized as a key aspect of the quality of life and well-being of citizens.

Unless culture is taken into account explicitly as a key factor, sustainable development will not take place. Development interventions may succeed or fail depending on how compatible they are with local culture.

Cultural vitality is an absolute necessity to city life because it permeates all spheres of environment: technology, economy, nature, built environment and lies at the foundation of social wellbeing.

RESEARCH PRESENTATION

RESEARCH AREA: Poznań Metropolitan Area in Poland

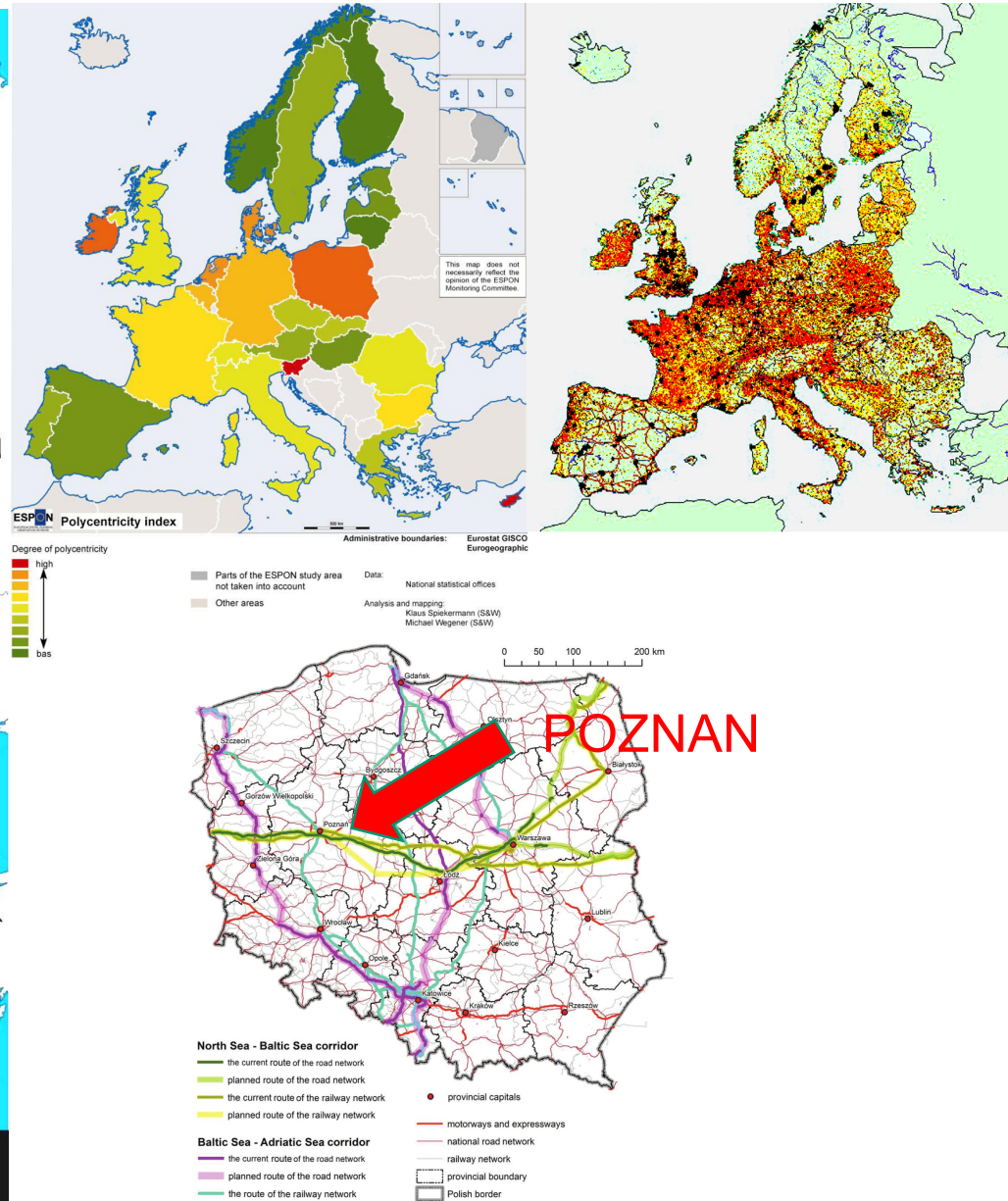
RESEARCH SUBJECT: Analysis of the impact of architecture on the city's cultural attractiveness in terms of sustainable development

RESEARCH METHODOLOGY:

- a) Spatial diversification of the research area
- b) Establishing cultural patterns for individual districts
- c) Fieldwork analysis: quality of architecture in districts in terms of cultural identity
- d) Comparison of field research results with cultural patterns
- e) Conclusions and recommendations

RESEARCH AREA

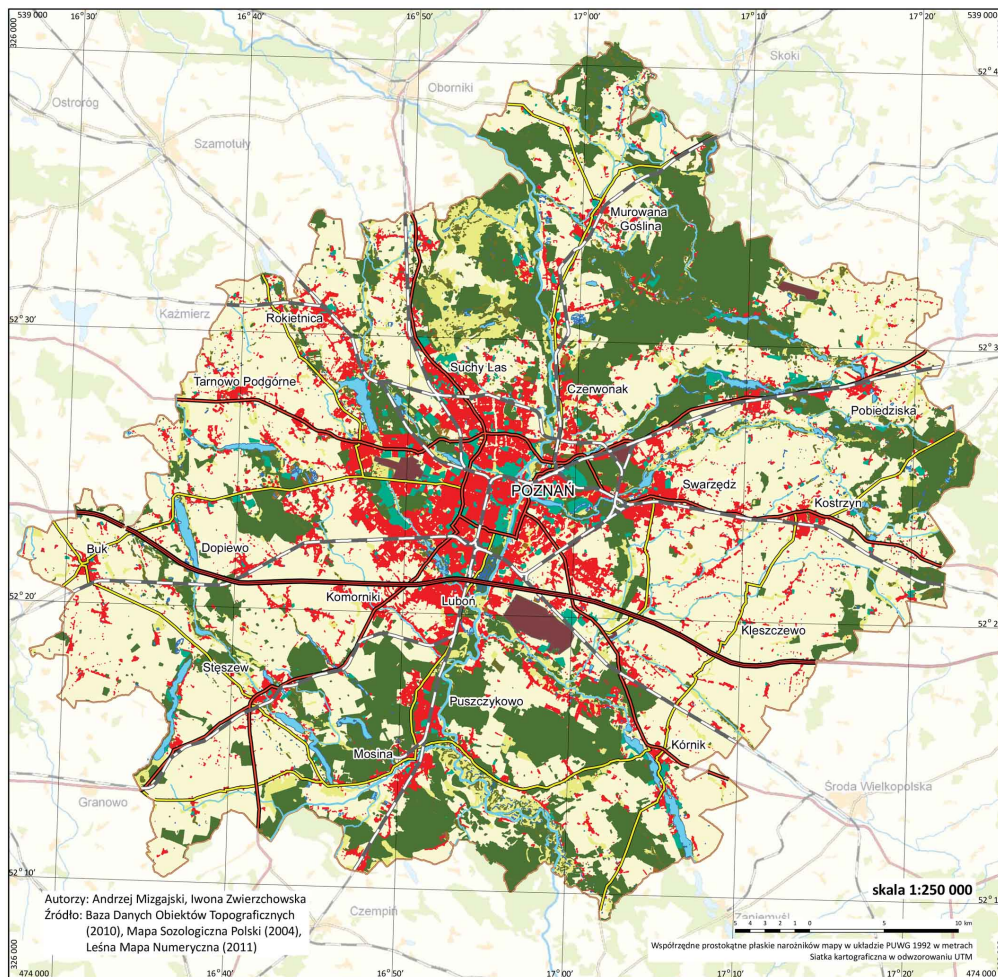




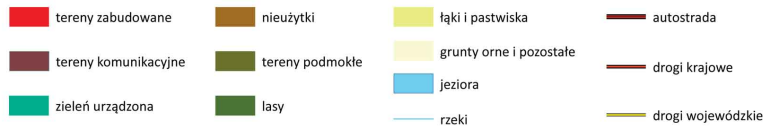
RESEARCH AREA

Główne typy pokrycia terenu

land cover

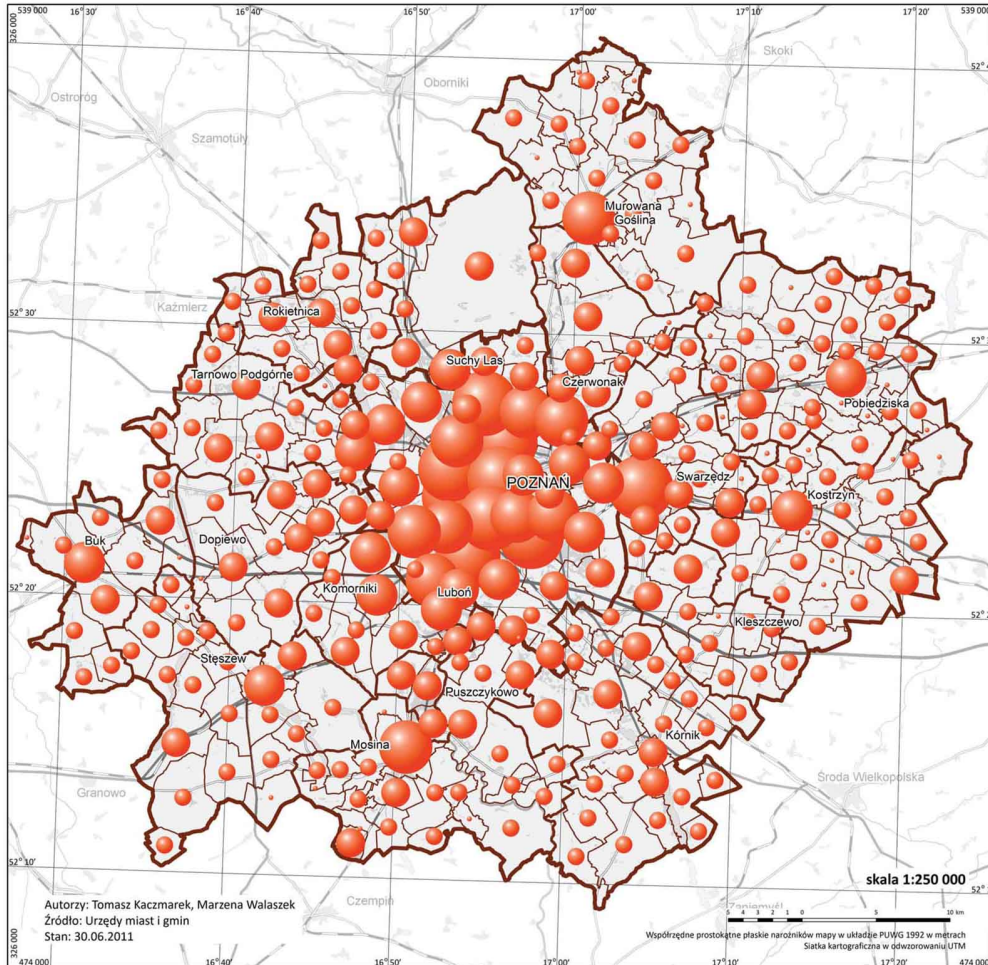


Typy pokrycia terenu

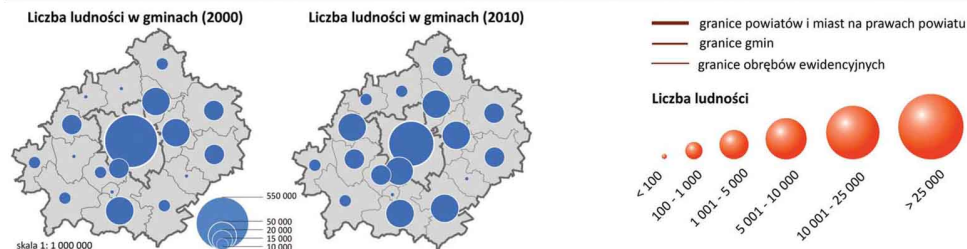


RESEARCH AREA

Rozmieszczenie ludności



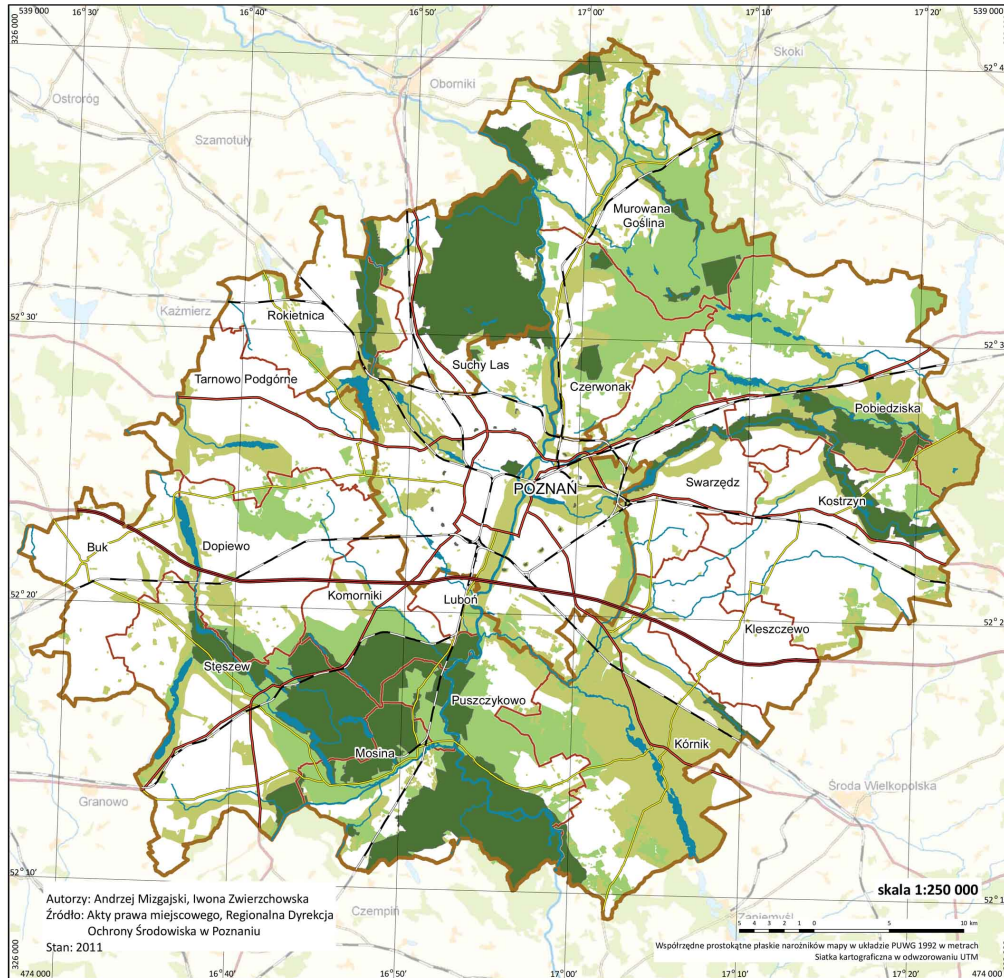
population distribution



RESEARCH AREA

Waloryzacja osnowy przyrodniczej

valorisation of nature

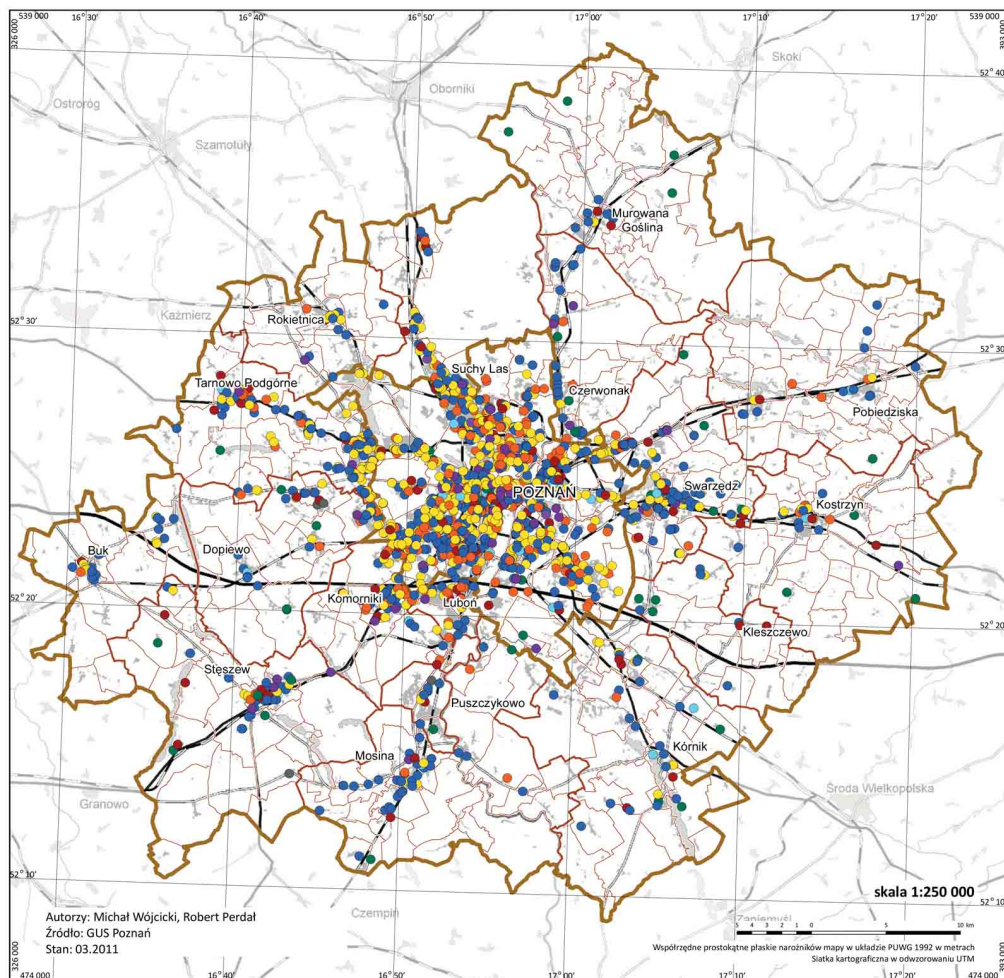


Waloryzacja obszarów

- obszary o najwyższych walorach przyrodniczych (najwyższy poziom restrykcyjności)
- obszary o wysokich walorach przyrodniczych (średni poziom restrykcyjności)
- obszary o ponadprzeciętnych walorach przyrodniczych (podstawowy poziom restrykcyjności)
- jeziora
- rzeki

RESEARCH AREA

Podmioty gospodarki materialnej wg sekcji PKD

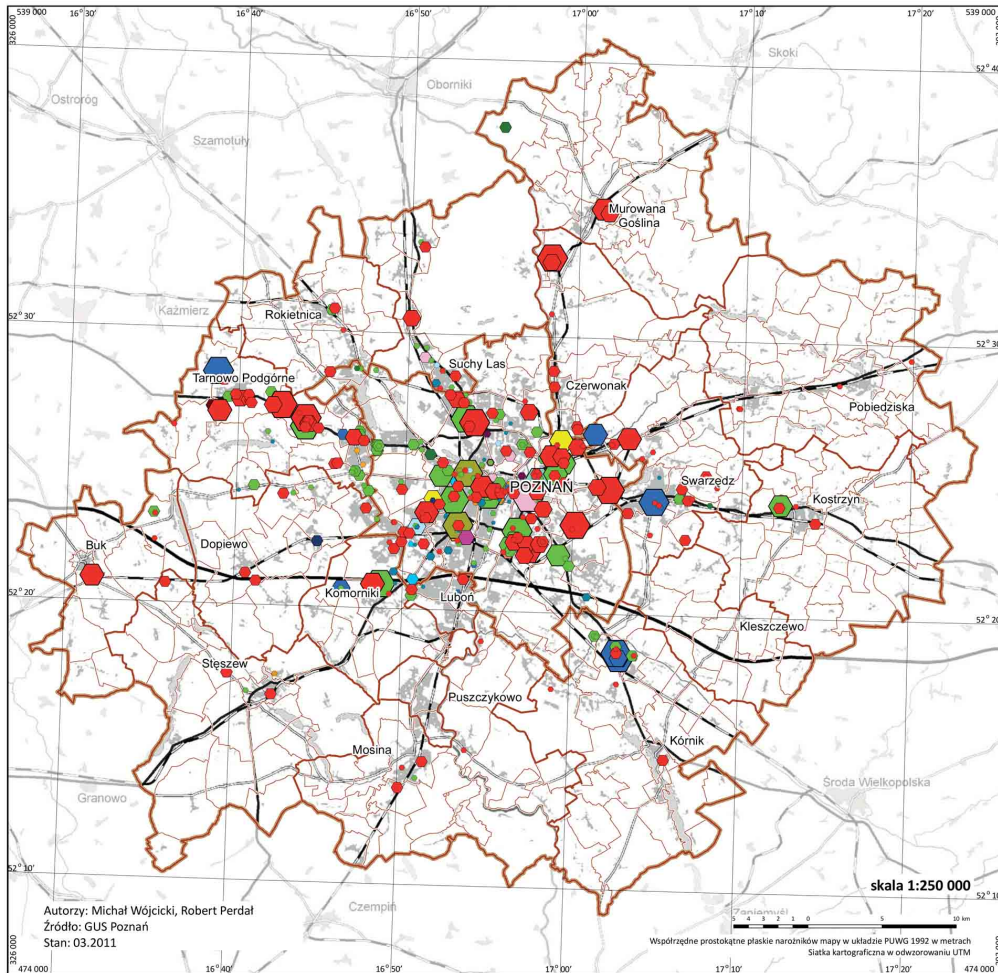


economy

RESEARCH AREA

Podmioty gospodarcze z udziałem kapitału zagranicznego wg wielkości i sekcji PKD

international companies



Sekcje PKD:

- A - Rolnictwo, leśnictwo, rybactwo
- B - Górnictwo i wydobywanie
- C - Przetwórstwo przemysłowe
- D - Wytwarzanie i zaopatrywanie w energię elektryczną, gaz, parę wodną, gorącą wodę i powietrze do układów klimatyzacyjnych
- E - Dostawa wody; gospodarowanie ściekami i odpadami oraz działalność związana z rekultywacją
- F - Budownictwo
- G - Handel hurtowy i detaliczny; naprawa pojazdów samochodowych włączając motocykle
- H - Transport i gospodarka magazynowa

- I - Działalność związana z zakwaterowaniem i usługami gastronomicznymi
- J - Informacja i komunikacja
- K - Działalność finansowa i ubezpieczeniowa
- L - Działalność związana z obsługą rynku nieruchomości
- M - Działalność profesjonalna, naukowa i techniczna
- N - Działalność w zakresie usług administrowania i działalność wspierająca
- P - Edukacja
- Q - Opieka zdrowotna i pomoc społeczna
- R - Działalność związana z kulturą rozrywką i rekreacją
- S - Pozostała działalność usługowa

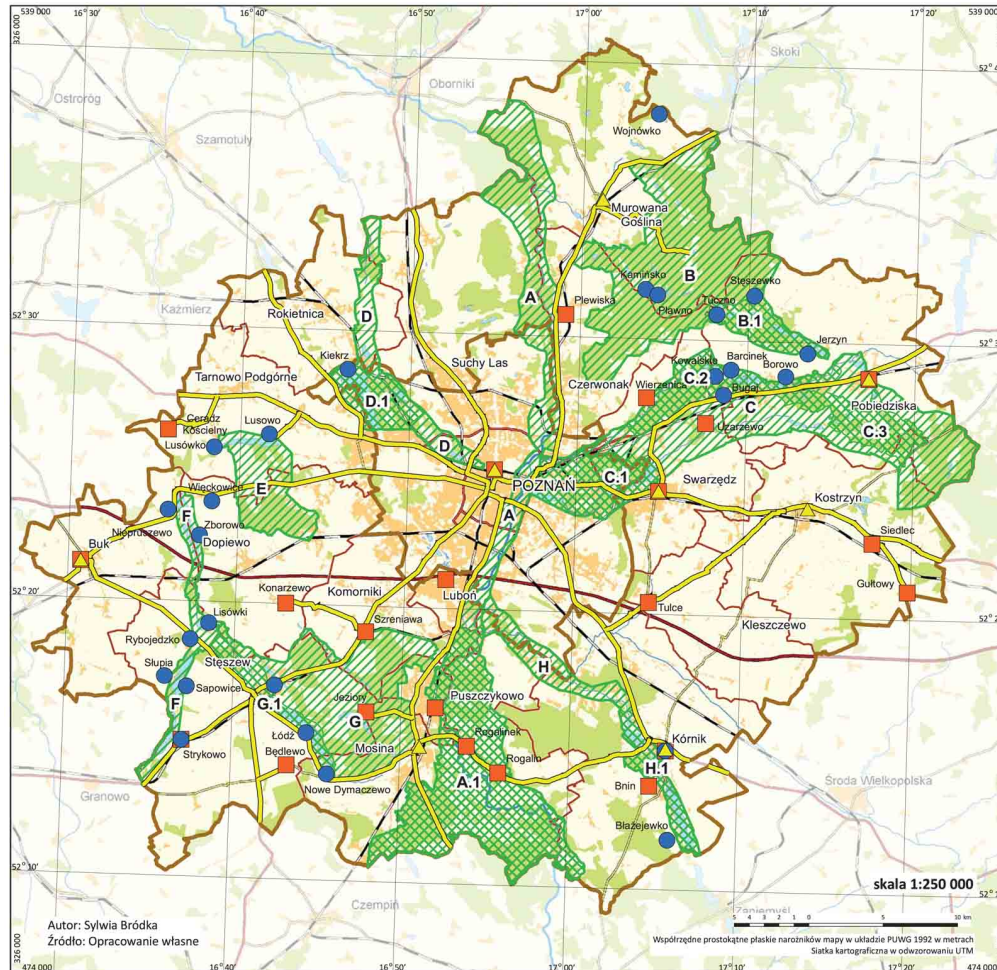
Podmioty gospodarcze z udziałem kapitału zagranicznego wg liczby zatrudnionych

- 20 - 49
- 50 - 249
- 250 - 499
- 500 - 999
- 1000 i >

RESEARCH AREA

Przestrzen turystyczno-wypoczynkowa

tourist attractions



Obszary turystyczno-wypoczynkowe

A. Obszar Doliny Warty:

A.1. Kompleks Rogalińskiego Parku Krajobrazowego

B. Obszar Parku Krajobrazowego Puszcza Zielonka:

B.1. Kompleks jezior Stęszewskiego i Wroneńskiego

C. Obszar dolin rzek Główniej i Cybiny:

C.1. Kompleks Jeziora Maltańskiego

C.2. Kompleks Jeziora Kowalskiego

C.3. Kompleks Parku Krajobrazowego Promno

D. Obszar dolin rzek Samicy i Bogdanki:

D.1. Kompleks jezior Kierskiego i Strzeszyńskiego

E. Obszar Jeziora Lusowskiego

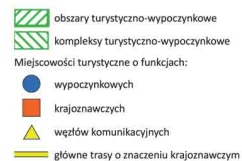
F. Obszar jezior Niepruszewskiego i Strykowskiego

G. Obszar Wielkopolskiego Parku Narodowego

G.1. Kompleks jezior Witobelskiego i Łódzko-Dymaczewskiego

H. Obszar doliny rzeki Głuszyńki

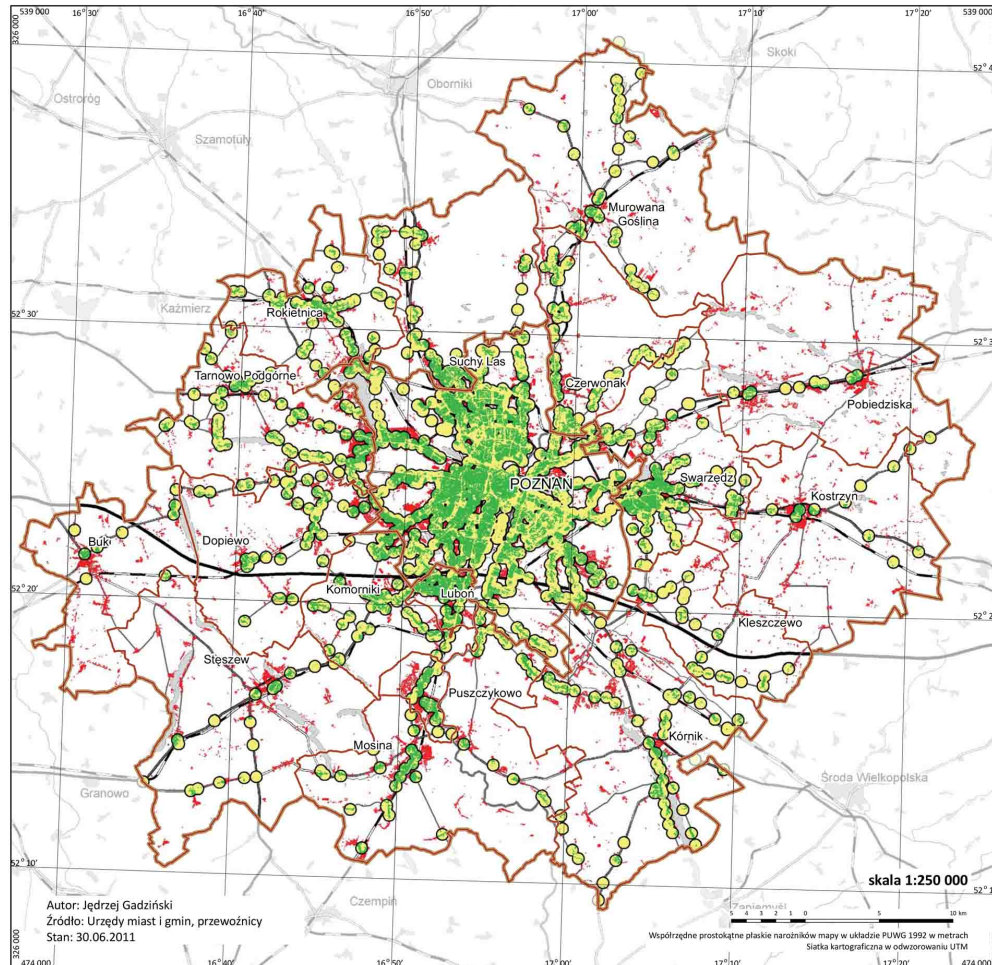
H.1. Kompleks jezior Kórnickiego i Bnińskiego



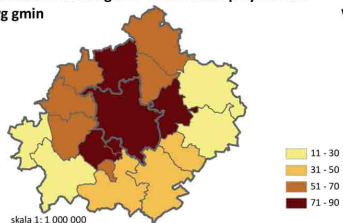
RESEARCH AREA

Zasięg oddziaływania transportu publicznego

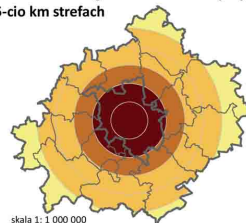
public transport



Zabudowa w odległości do 500 m od przystanków wg gmin



Zabudowa w odległości do 500 m od przystanków w 5-cio km strefach



Odległość zabudowy od węzła przystankowego

do 500 metrów
powyżej 500 metrów

linie transportu publicznego
zasięg węzłów przystankowych

RESEARCH AREA

Obręby ewidencyjne wg nazw

what about the cultural value of the area



Liczba obroby ewidencyjnych w gminach

Powierzchnia obroby ewidencyjnych w km²

ESTABLISHING CULTURAL PATTERNS FOR INDIVIDUAL DISTRICTS

IDENTITY OF CULTURAL PATTERNS

The most important features which create the identity of cultural patterns include:

C1) *Uniqueness* – differentiating local architecture from its competitive equivalents. Promoting features such as tradition of a place, urban interiors atmosphere, unique expression. An example includes individualisation of an architectural detail, characteristic flags in urban interiors, small scale, interesting location within local context.

Uniqueness connected with local tradition is a potential source of new creative inspirations which can be interpreted in an innovative way while enriching contemporary appearance of the space, providing it with an individualised character.

ESTABLISHING CULTURAL PATTERNS FOR INDIVIDUAL DISTRICTS

IDENTITY OF CULTURAL PATTERNS

C2) *Familiarity* – shaping architectural surroundings from the point of view of recipients' (consumers') habits and experiences. Familiarity is significant for social approval of architecture, brings about strong residents' relations with home, street, settlement and a city.

The feeling of familiarity plays a positive role in improving social bonds, security and looking after common goods.

ESTABLISHING CULTURAL PATTERNS FOR INDIVIDUAL DISTRICTS

IDENTITY OF CULTURAL PATTERNS

C3) *Personification* – ability to make use of architectural surroundings which depict individual taste and systems of values. It represents distinctiveness and original likings of residents. Characteristic appearance of architectural elements such as fences, entrances to buildings and flats, pedestals, cornices, balcony decorations, facade colour, etc. is a manifestation of architectural personification, expression of aspirations, taste and ambitions of residents, and owners of houses, shops and coffee shops.

Personification is visible in:

- style referring to residents' preference,
- architectural forms referring to the likings and sensitivity of local community.

ESTABLISHING CULTURAL PATTERNS FOR INDIVIDUAL DISTRICTS

IDENTITY OF CULTURAL PATTERNS

C4) *Prestige* – subjective feeling of satisfaction related to the contact with significant architecture which is a source of pride, significance and respect.

C5) *Legibility* – the most important point of the legibility is to provide people with clear and precise image of the space, thanks to architectural forms which combine compositional and functional values in an orderly way. In this meaning, architectural objects constitute recognisable elements of spatial structure. Legibility determines good orientation in the surroundings and makes it possible to recognise the role and significance of particular architectural forms in urban structure.

ESTABLISHING CULTURAL PATTERNS FOR INDIVIDUAL DISTRICTS

IDENTITY OF CULTURAL PATTERNS

C6) *Cultural identification* – a system of symbolic and emotional values which come from an identification with culture, tradition, history and collective memory of the location. Cultural identification is an important element of stylistic autonomy in architecture.

ESTABLISHING CULTURAL PATTERNS FOR INDIVIDUAL DISTRICTS

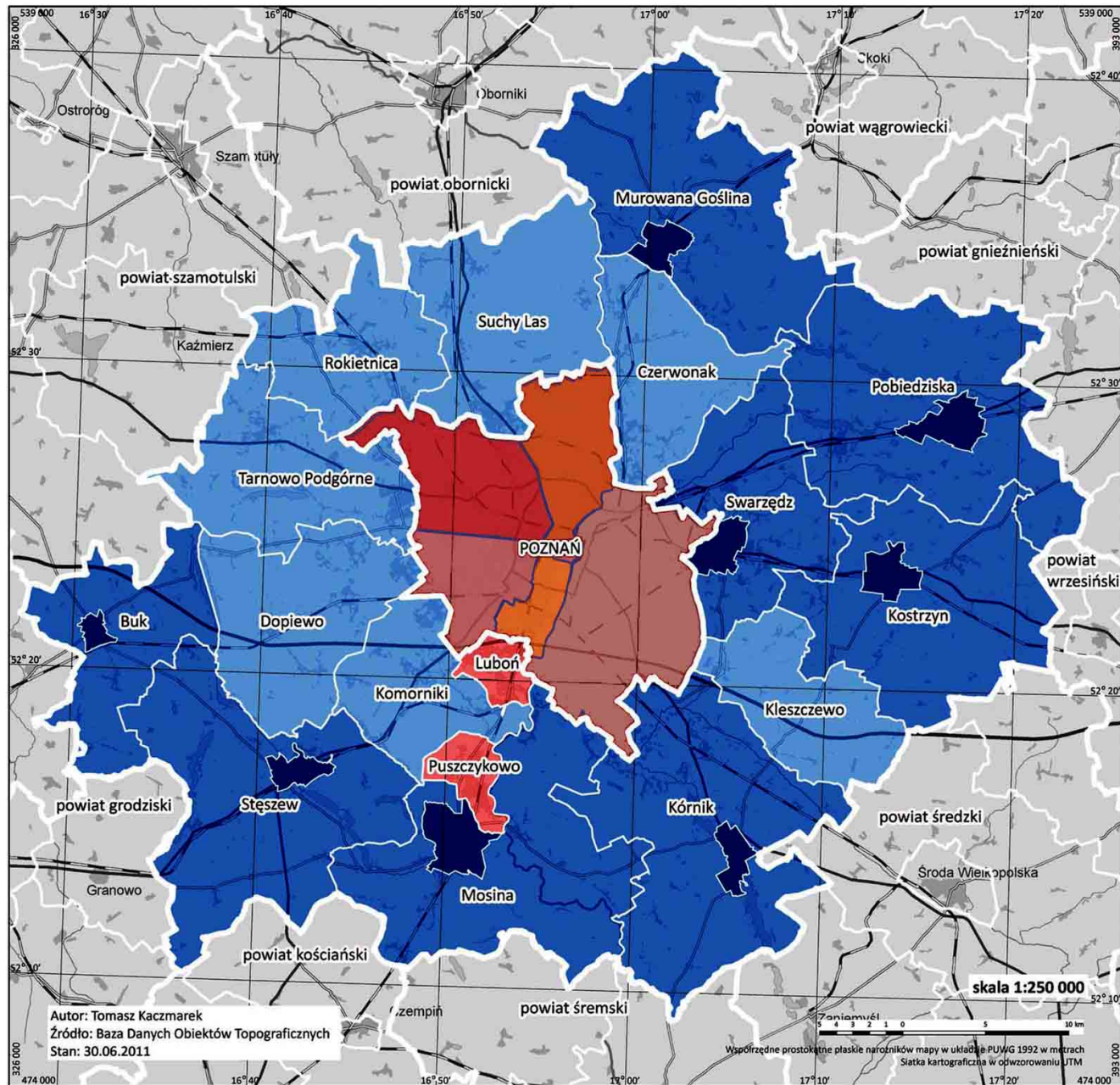
IDENTITY OF CULTURAL PATTERNS

C7) *Fashion* – desire to attract attention by “keeping up”. At the beginning fashion in architecture is created by desire to distinguish from the surroundings. In global world it includes a small group of works designed by world’s elite star architects. Thanks to them some architectural forms become fashionable. Then, elite fashion is more and more widely reproduced. Imitation is a result of subconscious desire to identify with fashionable models. Finally, mass fashion “becomes outdated”, people go back to previously popular models and look for new trends.

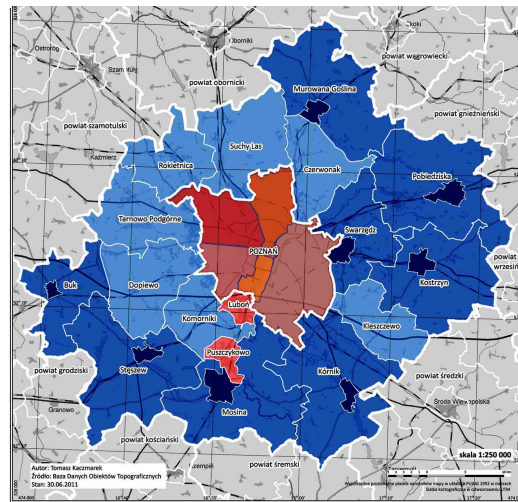
The significance of the above mentioned factors while building the identity of local culture in Poznan metropolitan area was determined in a survey research. The research was carried out among 40 respondents: architects, developers, estate agents. The questions referred to factors which give *competitive advantage* and therefore influence stable increase of the value of the space. Each expert was to indicate three most important factors out of seven options, which in his/her opinion create an architectural identity. The research followed standard methods of qualitative measurements. Table shows the results of the research.

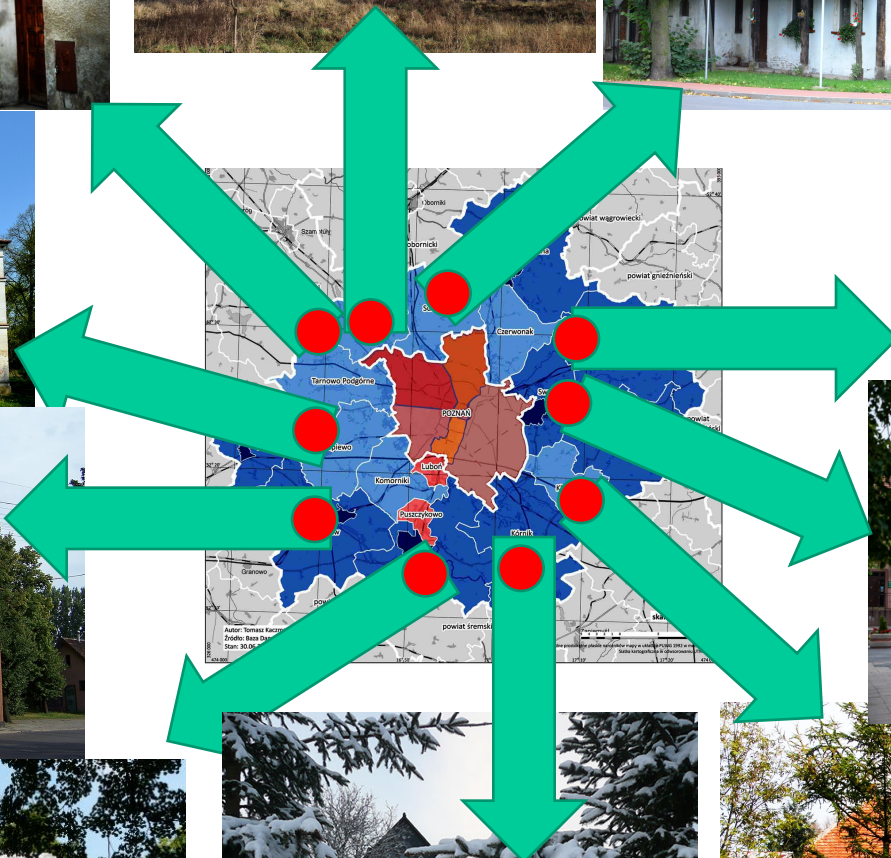
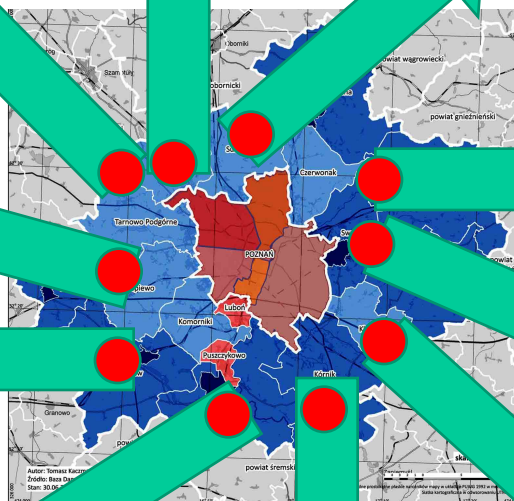
Feature that builds the cultural identity an architecture		Number of indications	Feature significance
C1	UNIQUENESS	109	0.909
C2	FAMILIARITY	65	0.545
C3	PERSONIFICATION	44	0.364
C4	PRESTIGE	98	0.818
C5	LEGIBILITY	76	0.636
C6	CULTURAL IDENTIFICATION	120	1.000
C7	FASHION	33	0.273

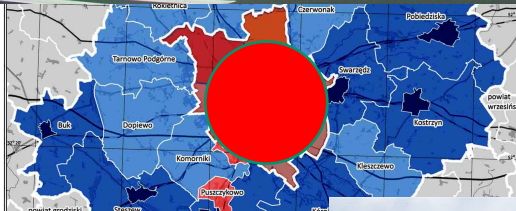
SPATIAL DIVERSIFICATION OF THE RESEARCH AREA















Visual identification of a cultural identity is meant to provide an answer to the question why some architectural objects can be thought of as “culturally important” whereas other cannot? Which compositional features decide whether a given building can be referred to as distinguished by its uniqueness, familiarity and identity? Why does it improve the legibility of the surroundings and evoke local likings, personifying the space? In other words, which attributes of architectural form decide that a building can play a role of a cultural hub in a particular location?

An answer to this question can be found in the theory of a structure of architectural forms, and research that combines these forms with their location. There are 20 standard attributes of architectural forms distinguished based on subject literature, which are related to the structure, articulation, integrity, similarity, compositional balance, urban context, scale, material, colour, texture, and architectural detail. Further on, the relation between the attributes of architectural forms and factors which shape the identity of a place was measured. Expert assessment included 155 relations between the factors. The research used standard methods of qualitative measurements based on Likert scale. **The results are shown in Diagrams which indicate which attributes of the forms have the largest impact on the cultural identity of an architecture located in each district. It is a type of a model (pattern) of an architectural identity determined for every district of the Poznan Metropolitan Area.**

CITY OF POZNAN: VISUAL FEATURES OF ARCHITECTURE WHICH CRAFT CULTURAL IDENTITY



Visual attributes of local culture

The following visual features of buildings were taken into account:

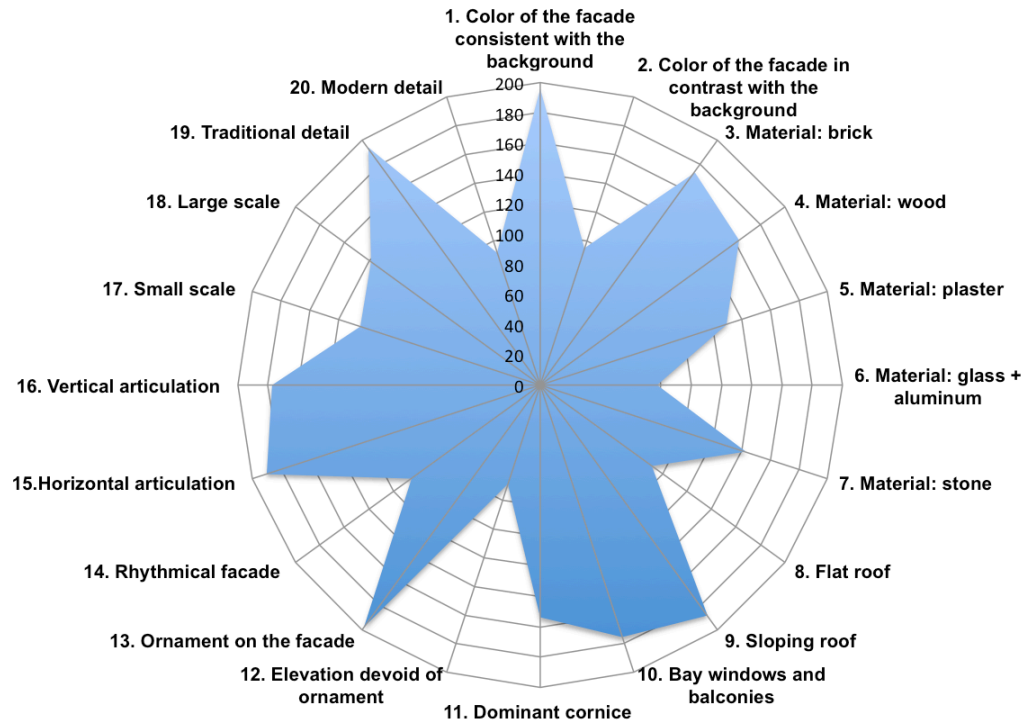
1. color of the facade consistent with the background,
2. color of the facade in contrast with the background,
3. material: brick,
4. material: wood,
5. material: plaster,
6. material: glass + aluminum,
7. material: stone,
8. flat roof,
9. sloping roof,
10. bay windows and balconies,
11. dominant cornice,
12. elevation devoid of ornament,
13. ornament on the façade,
14. rhythmical façade,
15. horizontal articulation,
16. vertical articulation,
17. small scale,
18. large scale,
19. traditional detail,
20. modern detail

**CITY OF POZNAN:
VISUAL FEATURES OF ARCHITECTURE WHICH CRAFT
CULTURAL IDENTITY**



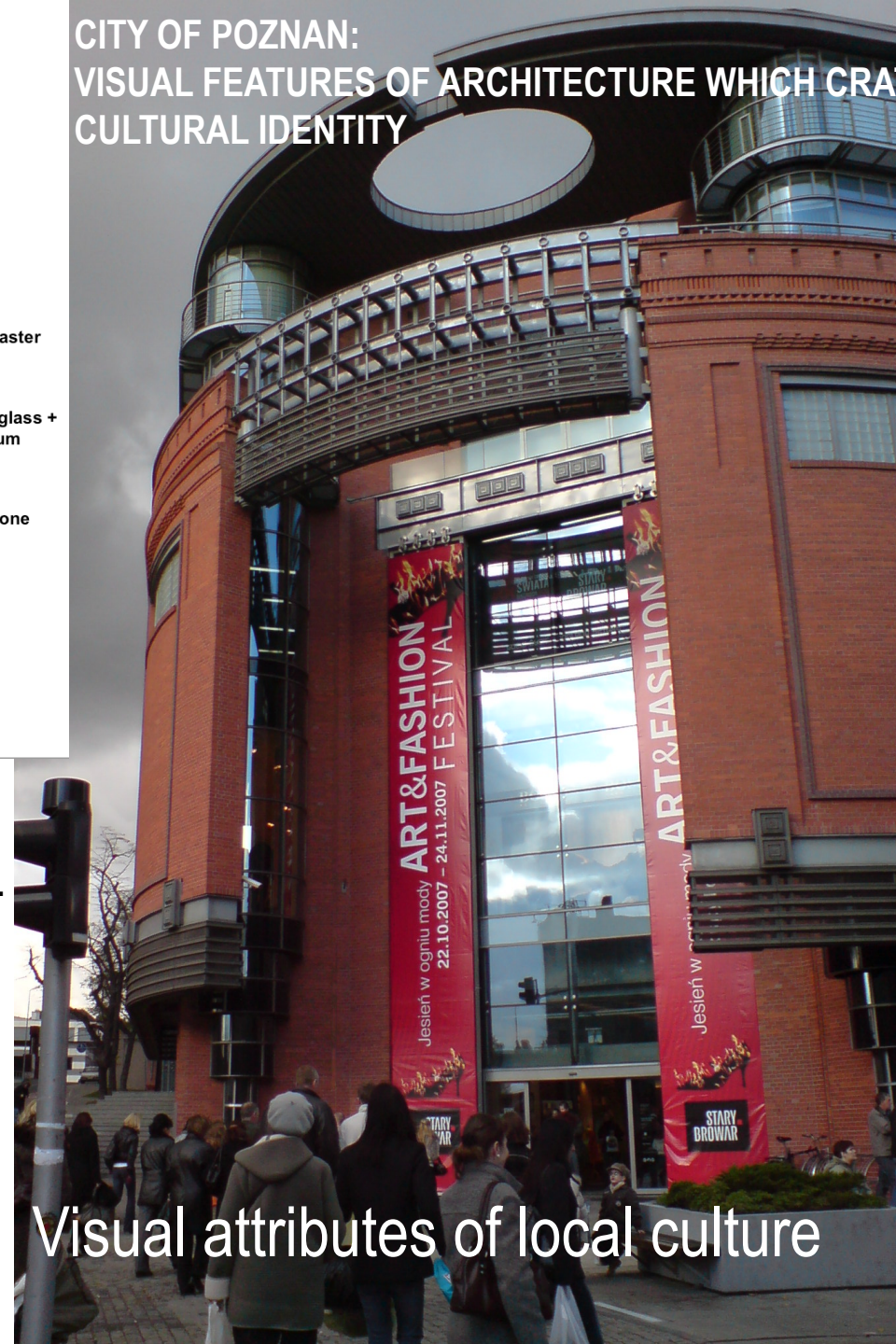
Visual attributes of local culture

CITY OF POZNAN: VISUAL FEATURES OF ARCHITECTURE WHICH CRAFT CULTURAL IDENTITY



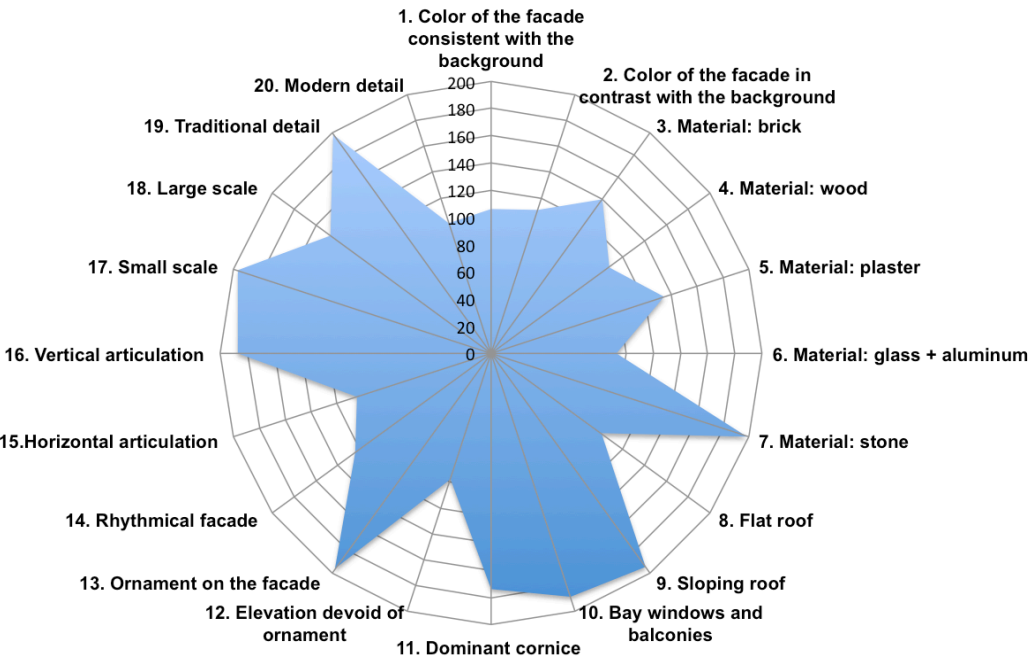
1. Color of the facade consistent with the background	195,89
2. Color of the facade in contrast with the background	94,894
3. Material: brick	173,853
4. Material: wood	162,579
5. Material: plaster	129,508
6. Material: glass + aluminum	77,217
7. Material: stone	143,127
8. Flat roof	91,654
9. Sloping roof	188,112
10. Bay windows and balconies	175,619
11. Dominant cornice	153,868
12. Elevation devoid of ornament	68,883
13. Ornament on the facade	197,934
14. Rhythmical facade	105,45
15. Horizontal articulation	189,986
16. Vertical articulation	177,295
17. Small scale	124,986
18. Large scale	138,584
19. Traditional detail	193,76
20. Modern detail	191,661

PATTERN OF ARCHITECTURAL IDENTITY FOR "STARE MIASTO" DISTRICT



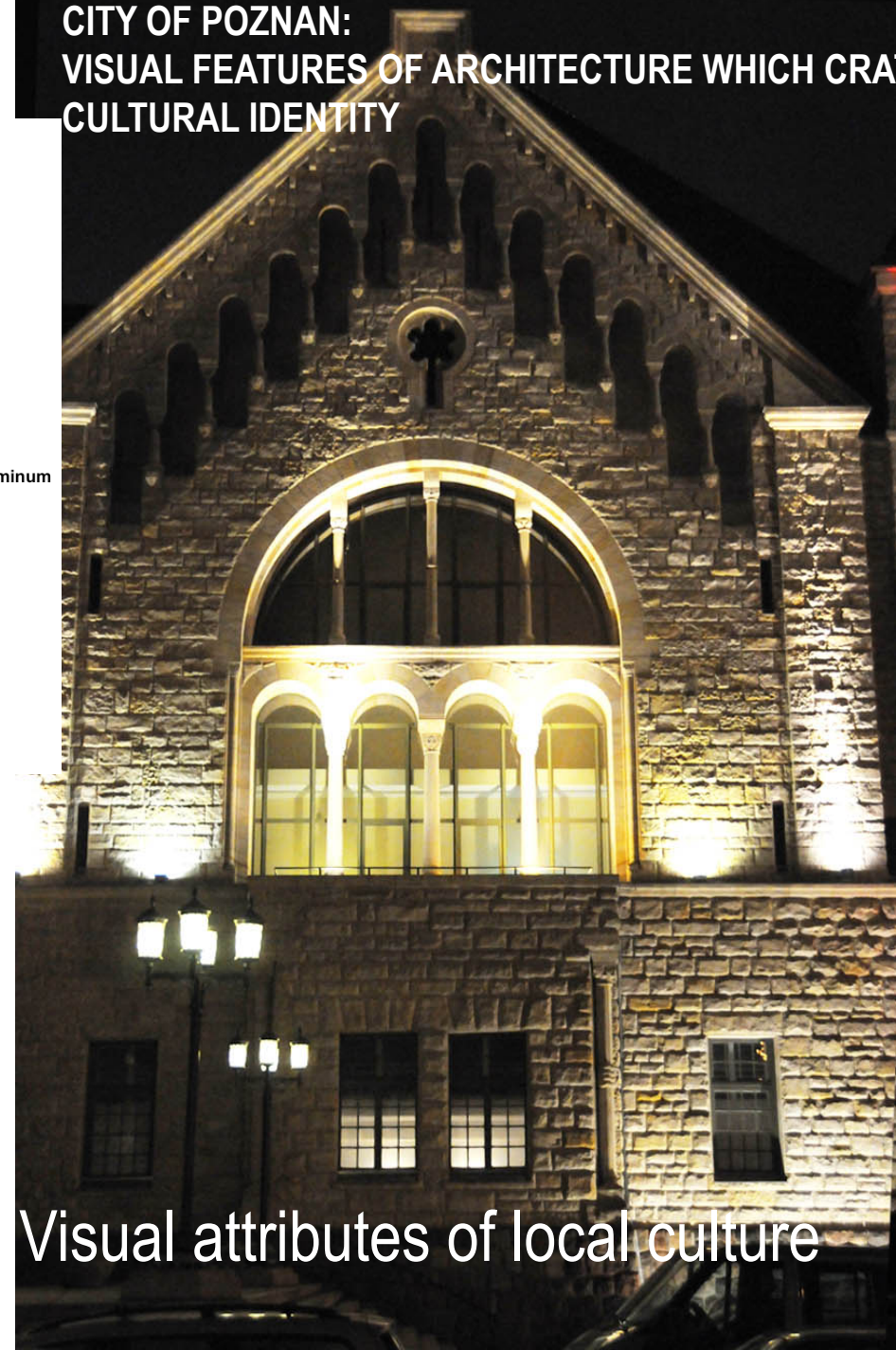
Visual attributes of local culture

CITY OF POZNAN: VISUAL FEATURES OF ARCHITECTURE WHICH CRAFT CULTURAL IDENTITY

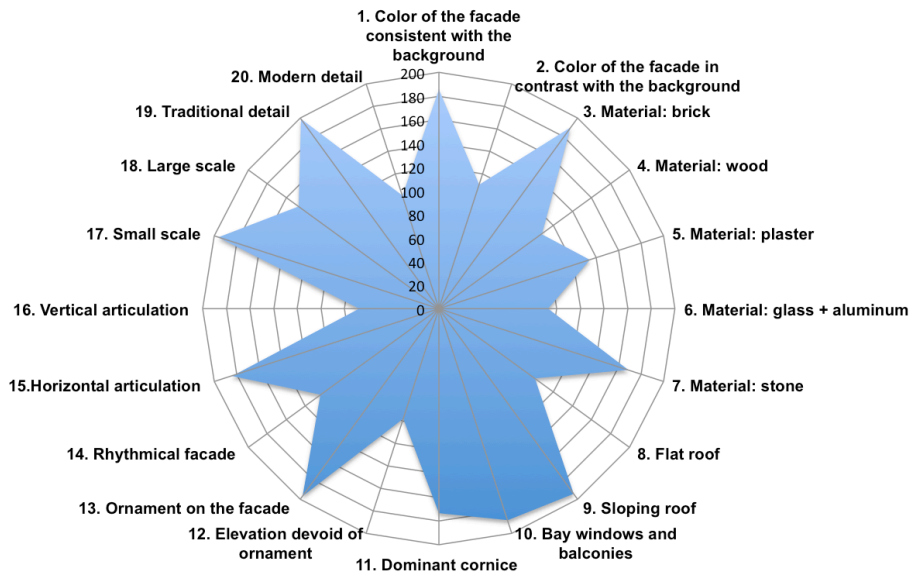


1. Color of the facade consistent with the background	106,102
2. Color of the facade in contrast with the background	110,802
3. Material: brick	139,952
4. Material: wood	107,617
5. Material: plaster	134,367
6. Material: glass + aluminum	92,819
7. Material: stone	198,787
8. Flat roof	100,402
9. Sloping roof	194,219
10. Bay windows and balconies	188,668
11. Dominant cornice	173,536
12. Elevation devoid of ornament	97,985
13. Ornament on the facade	196,336
14. Rhythmical facade	124,386
15. Horizontal articulation	104,301
16. Vertical articulation	187,519
17. Small scale	196,518
18. Large scale	147,069
19. Traditional detail	198,585
20. Modern detail	100,736

PATTERN OF ARCHITECTURAL IDENTITY FOR "CENTRAL" DISTRICT



CITY OF POZNAN: VISUAL FEATURES OF ARCHITECTURE WHICH CRAFT CULTURAL IDENTITY



PATERN OF ARCHITECTURAL IDENTITY FOR "NOWE MIASTO" DISTRICT

1. Color of the facade consistent with the background	186,102
2. Color of the facade in contrast with the background	110,802
3. Material: brick	189,952
4. Material: wood	107,617
5. Material: plaster	134,367
6. Material: glass + aluminum	92,819
7. Material: stone	168,787
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9. Sloping roof	194,219
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17. Small scale	196,518
18. Large scale	147,069
19. Traditional detail	198,585
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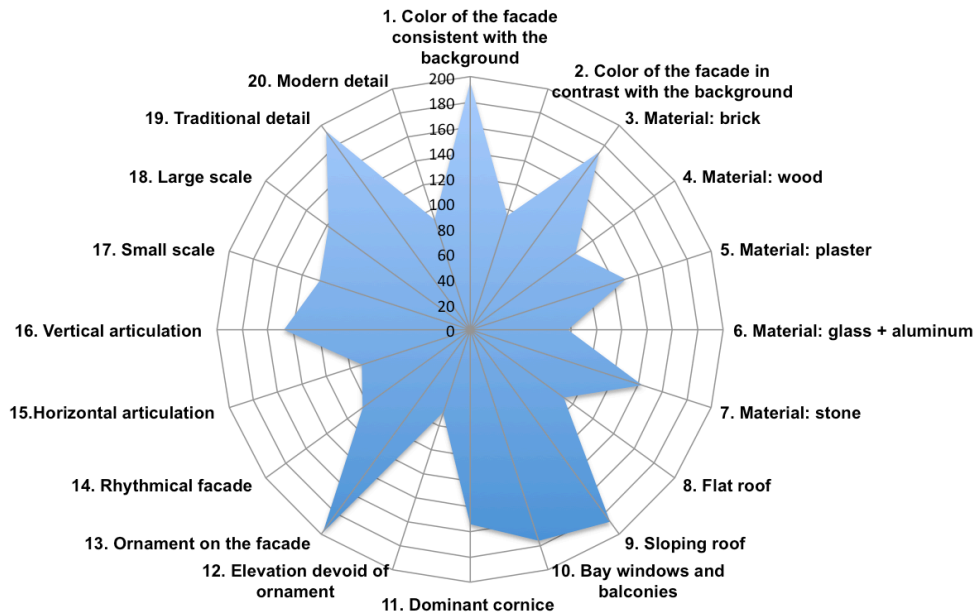


Visual attributes of local culture

CITY OF POZNAN: VISUAL FEATURES OF ARCHITECTURE WHICH CRATE CULTURAL IDENTITY



Visual attributes of local culture

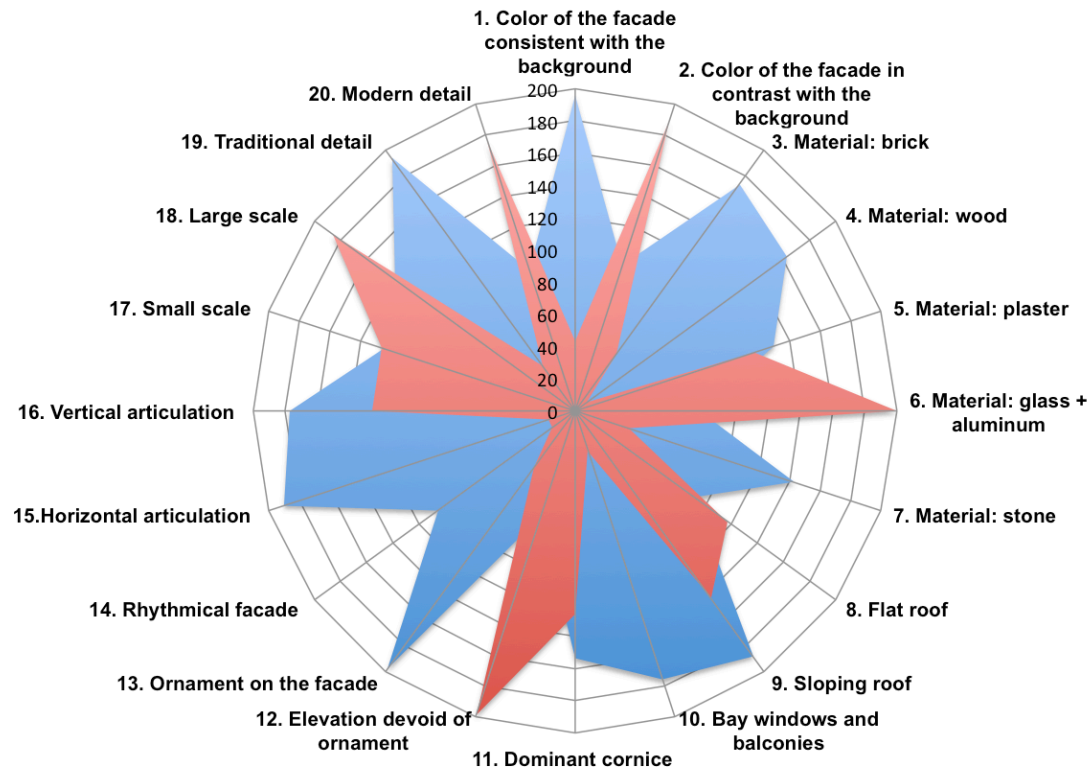


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3. Material: brick	173,853
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11. Dominant cornice	153,868
12. Elevation devoid of ornament	68,883
13. Ornament on the facade	197,934
14. Rhythmical facade	105,45
15. Horizontal articulation	89,986
16. Vertical articulation	147,295
17. Small scale	124,986
18. Large scale	138,584
19. Traditional detail	193,76
20. Modern detail	91,661

PATERN OF ARCHITECTURAL IDENTITY FOR "WILDA" DISTRICT

New developments – LACK OF CULTURAL IDENTITY

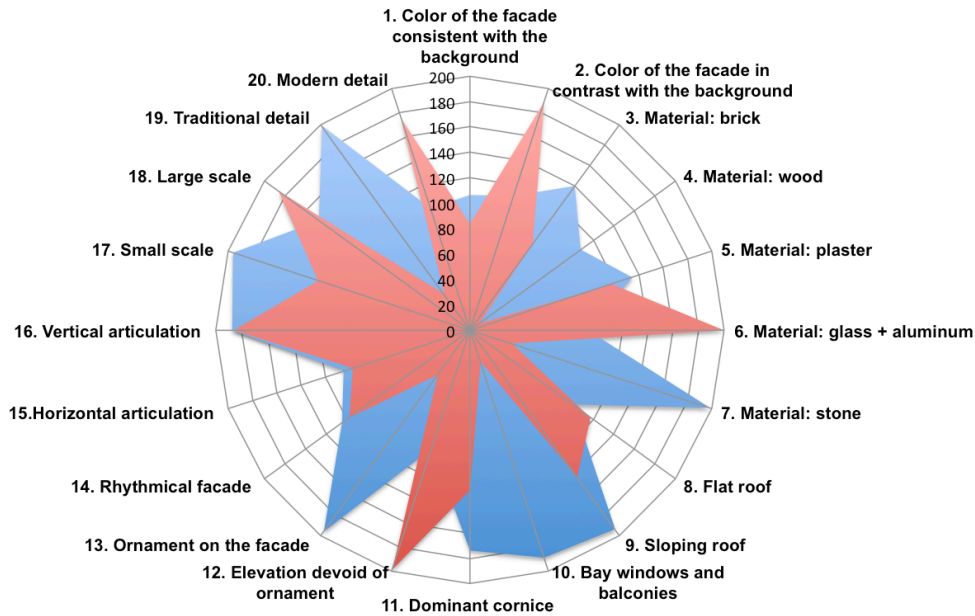
"STARE MIASTO" DISTRICT



Difference between the model and new development in terms of the cultural identity (result of the research)

New developments – LACK OF CULTURAL IDENTITY

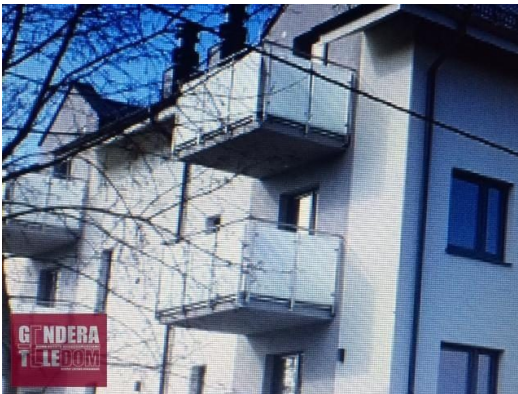
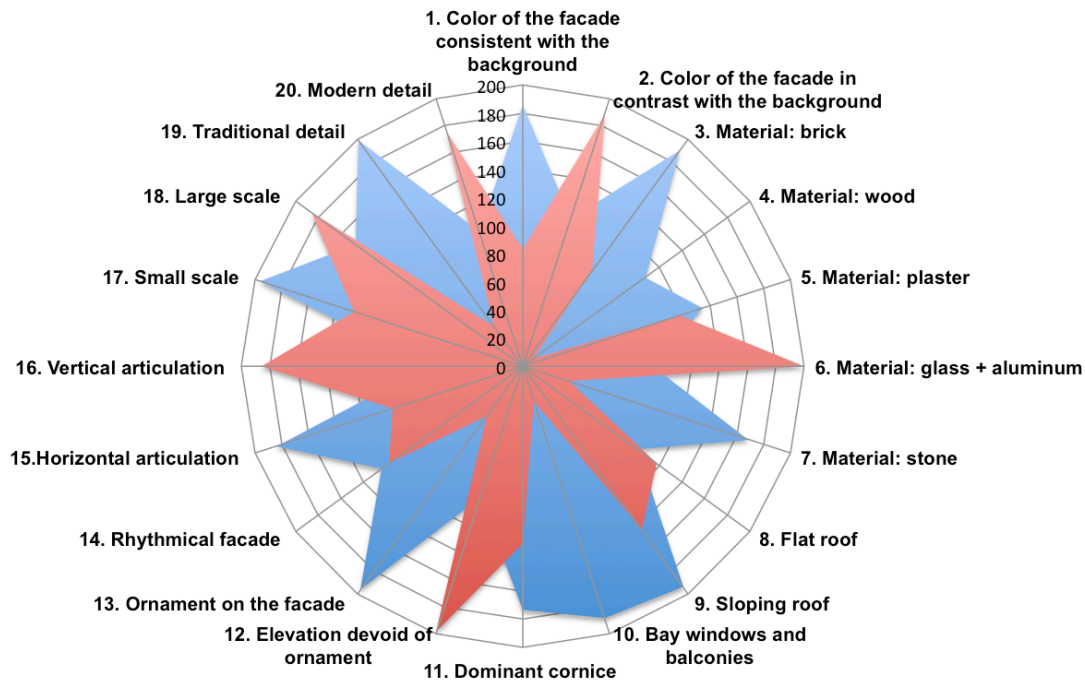
"CENTRAL" DISTRICT



Difference between the model and new development in terms of the cultural identity (result of the research)

New developments – LACK OF CULTURAL IDENTITY

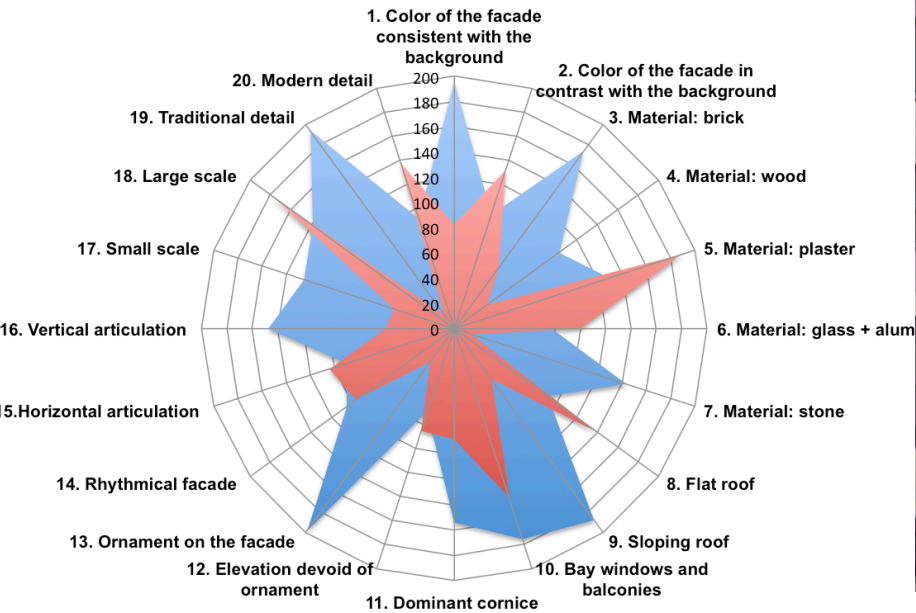
"NOWE MIASTO" DISTRICT



Difference between the model and new development in terms of the cultural identity (result of the research)

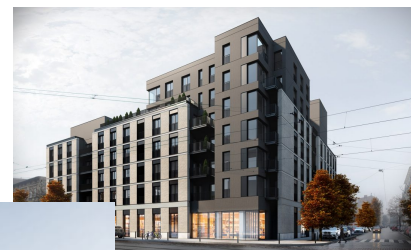
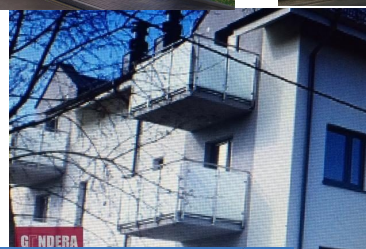
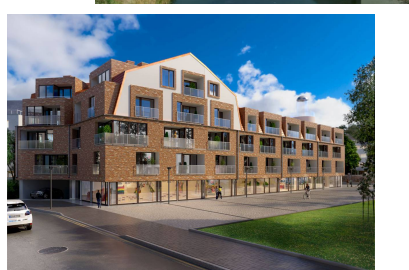
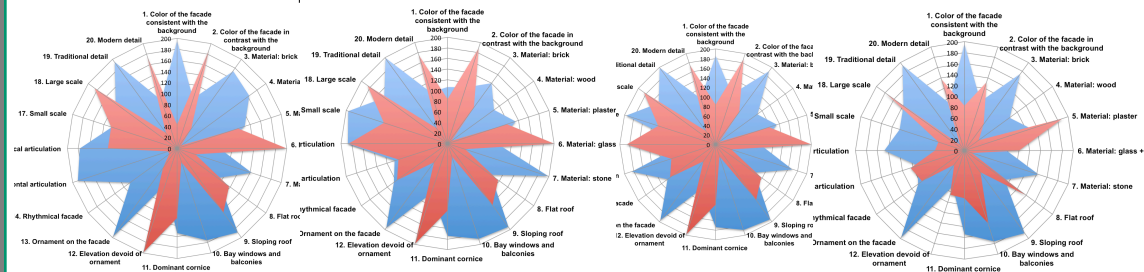
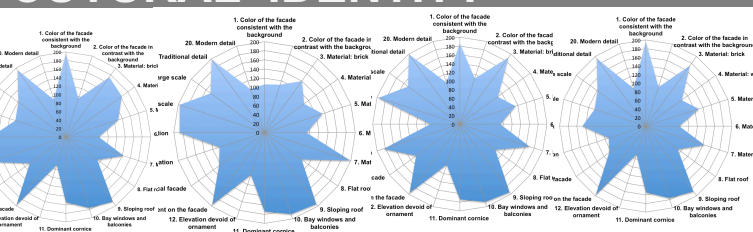
New developments – LACK OF CULTURAL IDENTITY

"WILDA" DISTRICT

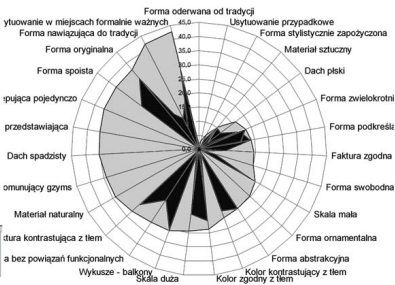
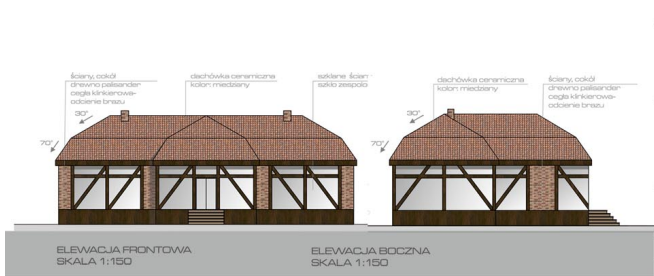
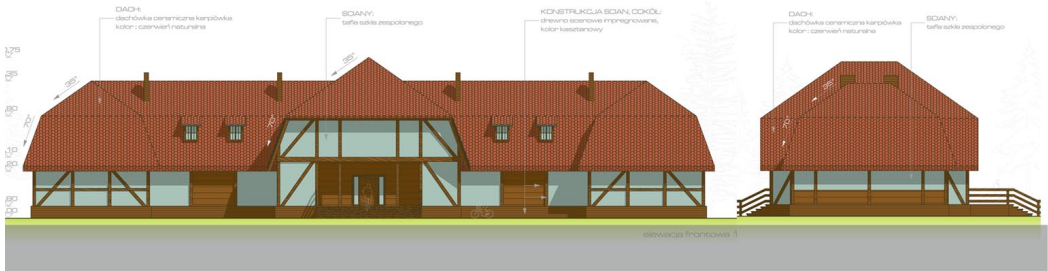
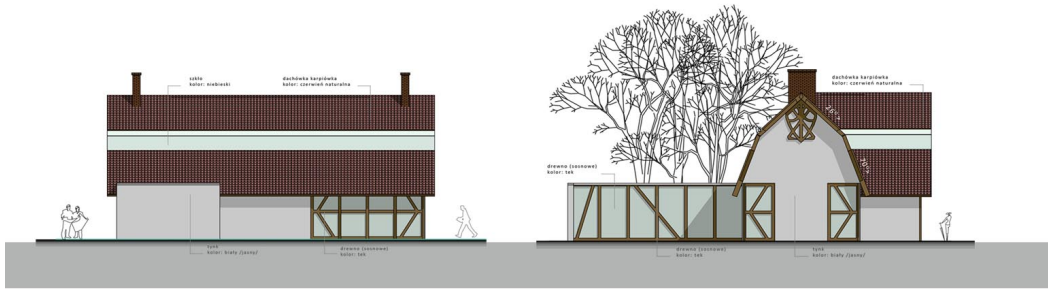


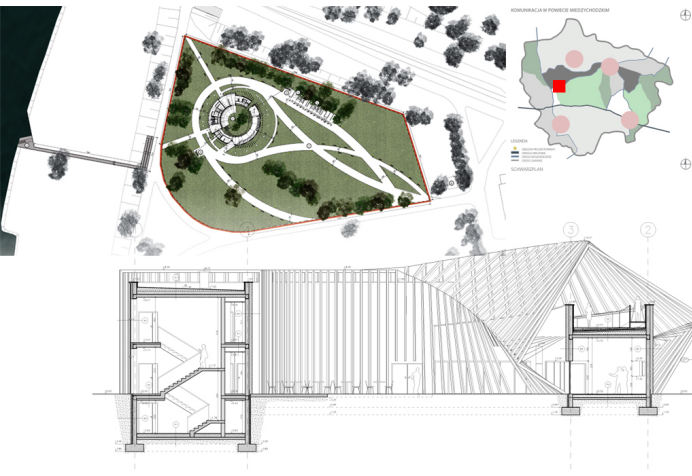
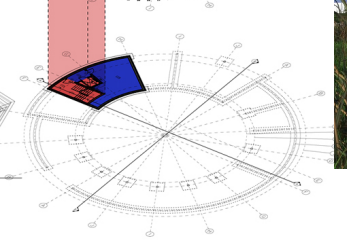
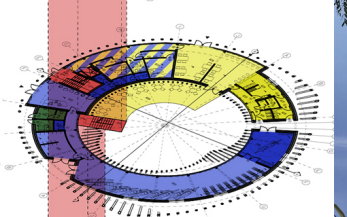
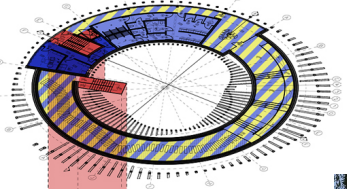
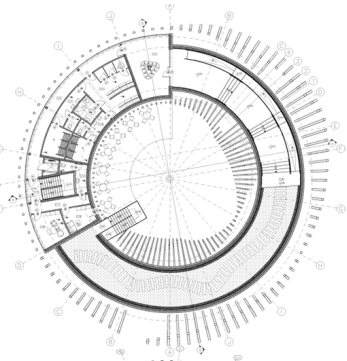
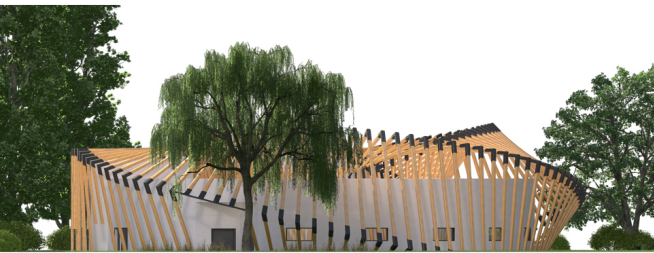
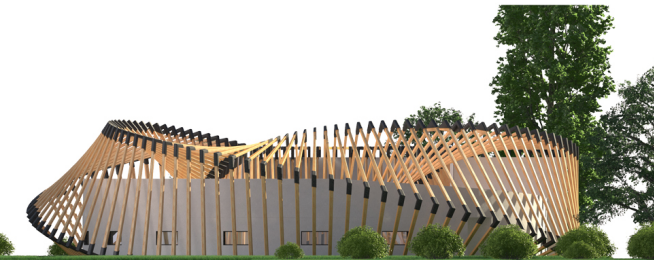
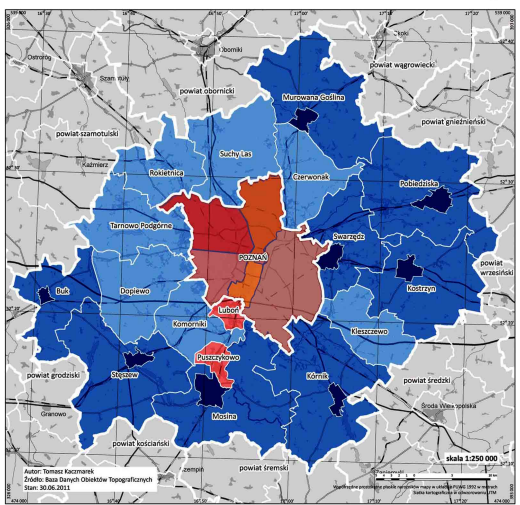
Difference between the model and new development in terms of the cultural identity (result of the research)

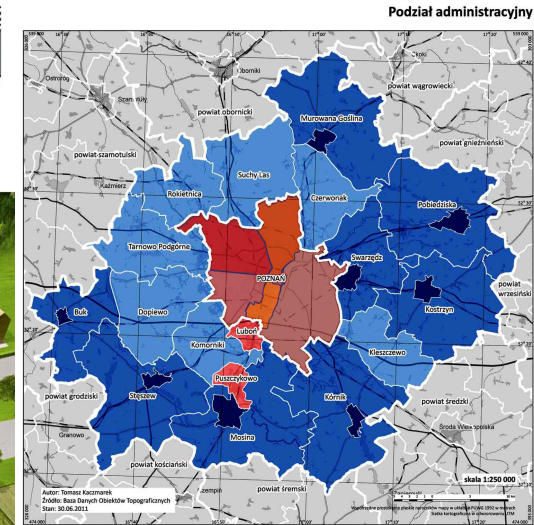
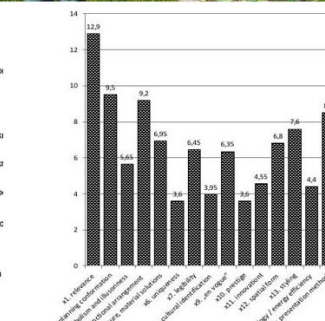
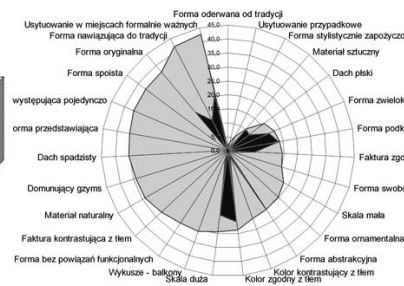
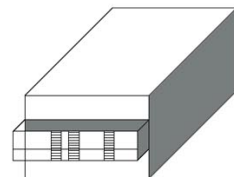
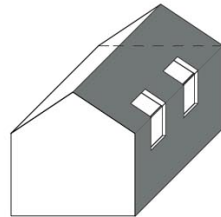
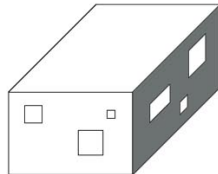
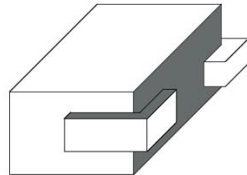
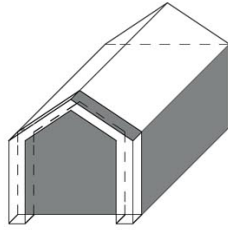
New developments – LACK OF CULTURAL IDENTITY



Map of the Greater Poznań area showing voivodeships and counties. The map is color-coded: blue for voivodeships, red for counties, and orange for the city of Poznań. The map includes labels for various voivodeships (e.g., Wielkopolskie, Łódzkie, Mazowieckie) and counties (e.g., Poznański, Łódzki, Mazowiecki). A scale bar at the bottom right indicates a scale of 1:250,000.





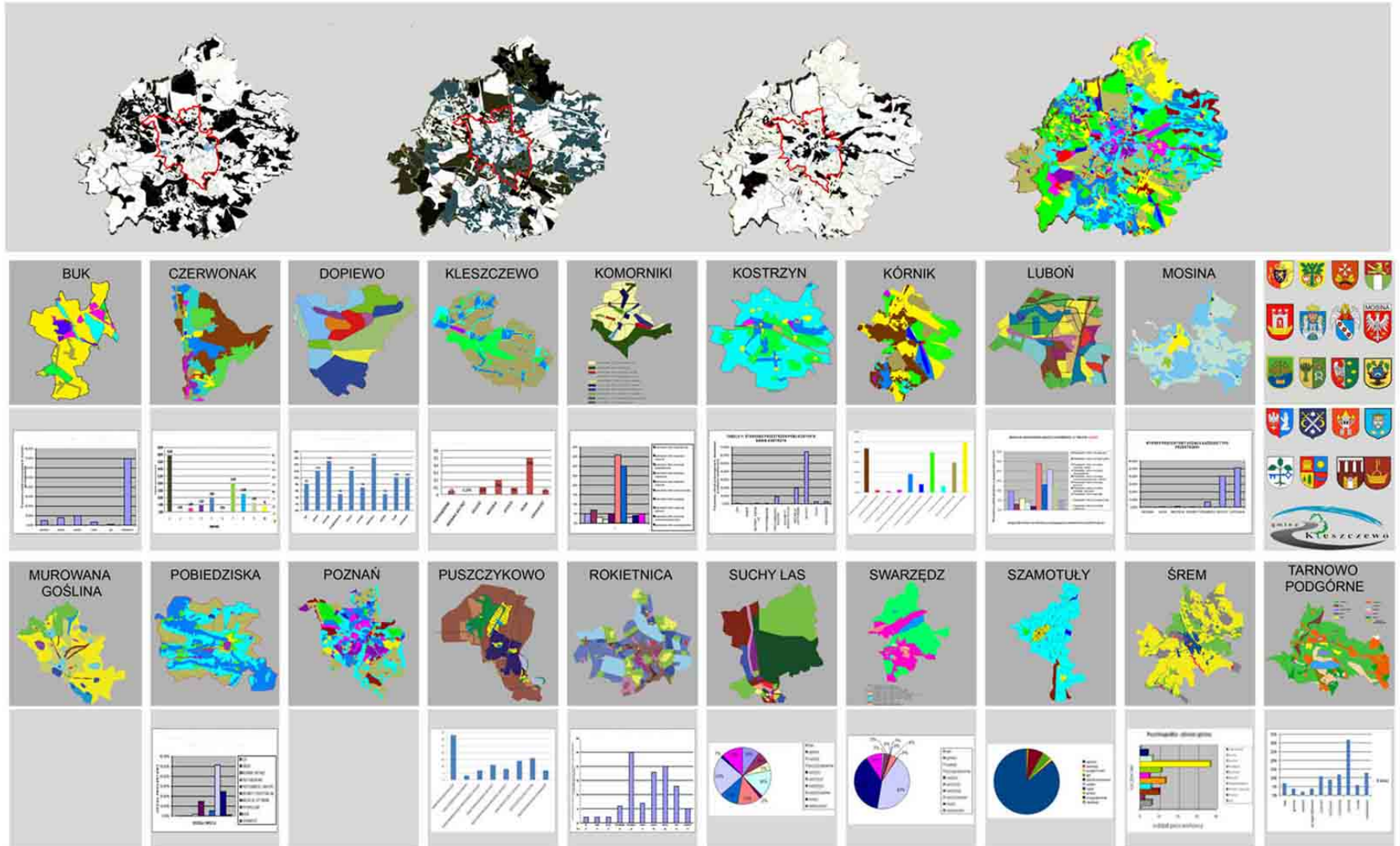




Poznan Metropolitan Area.

Research results on cultural sustainability

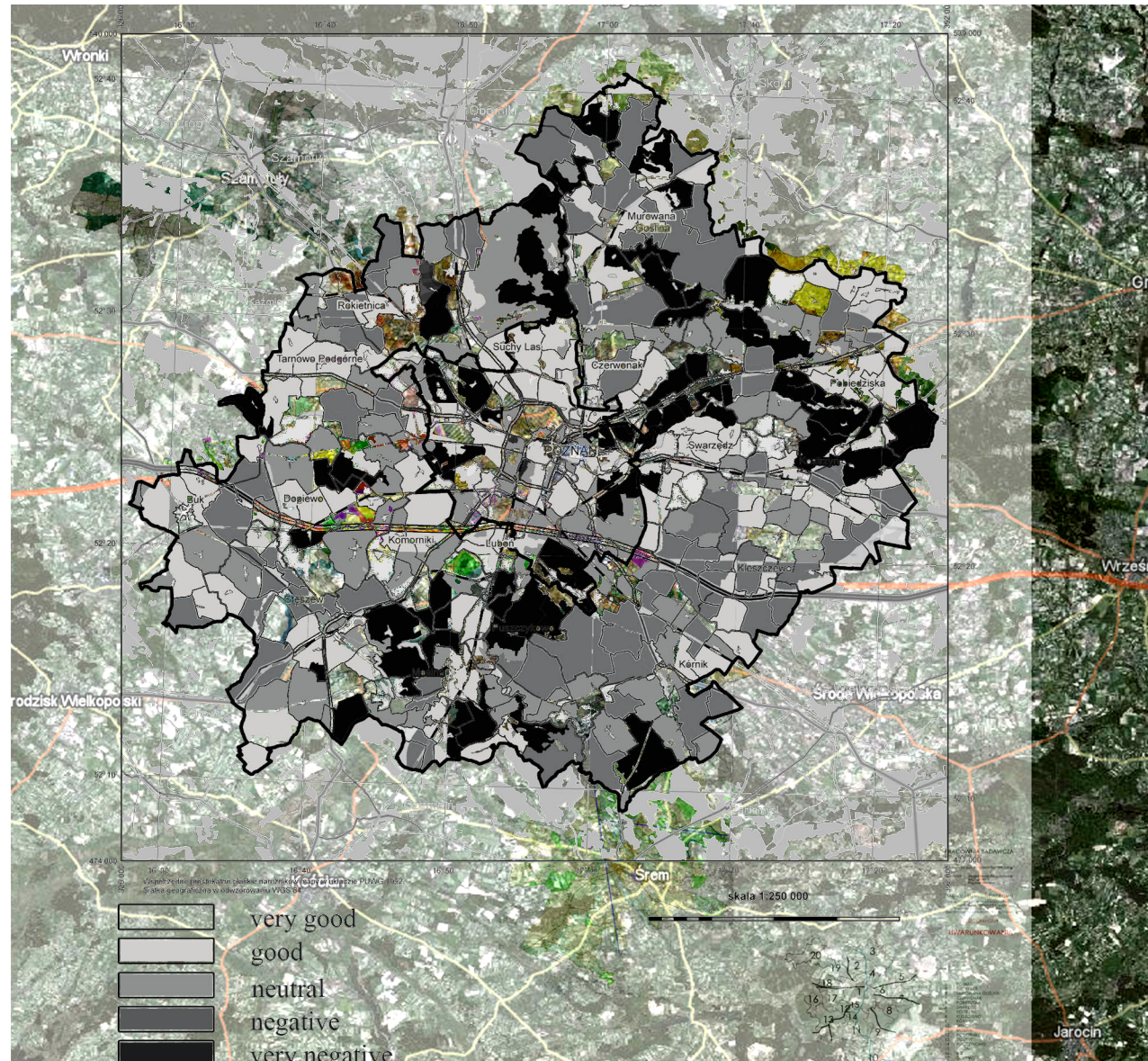
ARCHITECTURE QUALITY ASSESSMENT IN DISTRICTS IN TERMS OF CULTURAL IDENTITY



Poznan Metropolitan Area.

Research results on cultural sustainability

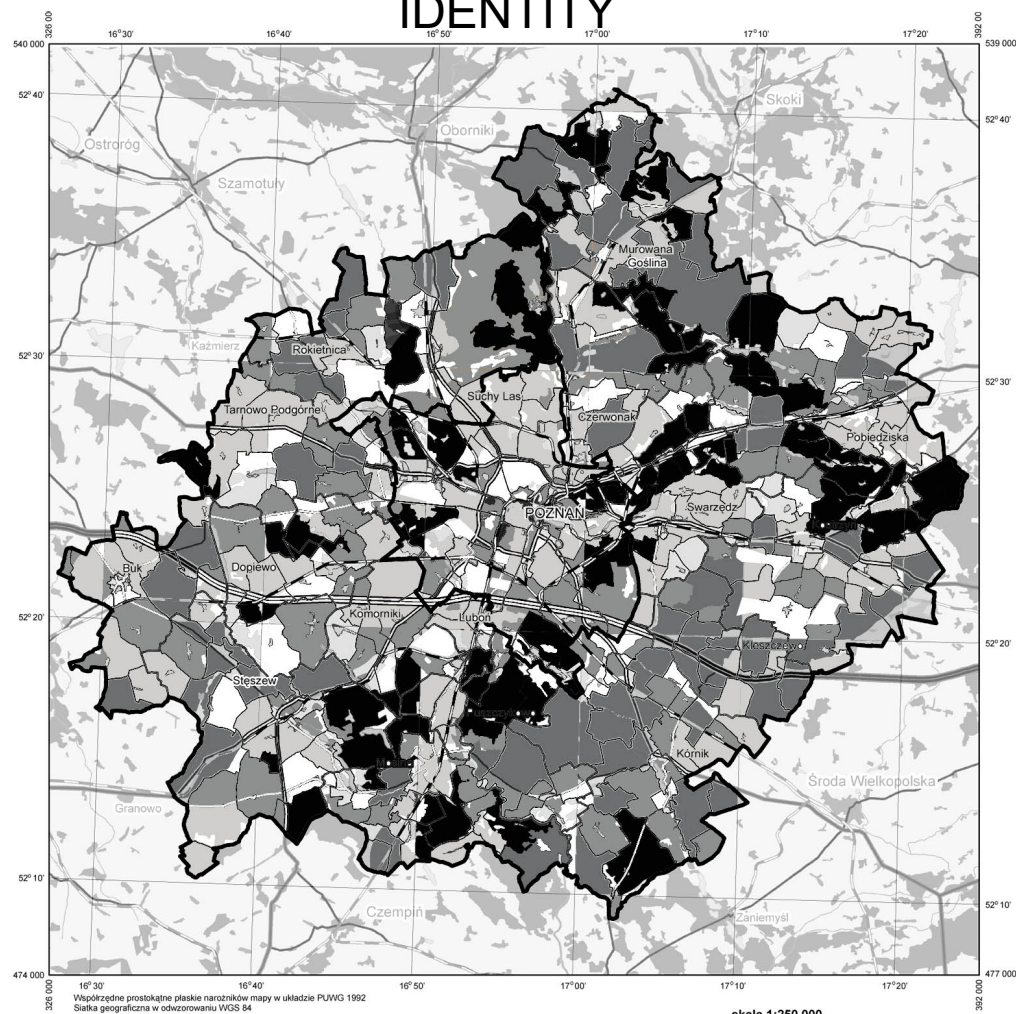
ARCHITECTURE QUALITY ASSESSMENT IN DISTRICTS IN TERMS OF CULTURAL IDENTITY



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The cultural value of the area

Conclusions

→ Ecological architecture is not only self-sufficient in energy terms and focused on effective water and waste management.

Ecological architecture is one that creates human environment in harmony with its culture and tradition.

→ In Poznan Metropolitan Area one can notice a significant diversity of the built environment in the aspect of respecting cultural identity.

→ New buildings represent weak cultural identity due to standardized architecture. They show no respect to specific visual features connected with **local traditions, characteristic colours and unique materials.**

→ New investments cause loss of cultural identity and thus do not support sustainable development

THANK YOU FOR YOUR ATTENTION