COMPARISON OF THE CITY MAPS' CONTENT OF WESTERN, EASTENRN AND CENTRAL EUROPEAN CITIES

AGATA CIOŁKOSZ-STYK

Department of Cartography, Faculty of Geography and Regional Studies, University of Warsaw

ABSTRACT

Significant changes in the wealth, variety and level of graphic form of city maps are noticeable in recent years, particularly those from Central and Eastern European countries. This is a consequence of the political and economic transformation, resulting in the abolition of censorship and introduction of the free market. Such transformations have also brought significant changes to the city maps' content, notably, features whose representation had been forbidden could finally be represented. City maps published in Western Europe have evolved as well during the aforementioned period due to higher political and economic stability. The paper compares city maps content of 21 European countries. Differences in the cartographic representation of Western and Central and Eastern European cities are distinct. The influence of a Soviet cartographic style is easily visible in post-communist countries. This is expressed, among other things, by the presentation of detailed content and the considerable amount of point symbols. By contrast, the content demonstrated in Western European city maps is narrower.

Taking into account importance of city maps among other cartographic products it seems surprising, that there are no analyses, which could help in finding answers to the following questions: which factors have considerable influence on differentiating the content of the European city maps? Which objects and characteristics are common for each city maps? Do city maps reflect character of the presented city, or there are no important regional differences?

Key words: city maps, content analysis, European countries

1. Introduction

City maps are certainly among the most commonly used and widely published cartographic products. The development of mass and individual tourism, as well as ever-increasing migration for non-tourist purposes (industry, business, conferences, etc.) further the purpose and importance of city maps. It should be mentioned that city maps are not only used by city visitors, but also by citizens, particularly in the larger cities.

Significant changes in the wealth, variety, level of graphic form and detail in the content of city maps are noticeable in recent years, particularly those from Central and Eastern European countries[1]. This is a consequence of the political and economic transformation, resulting in the abolition of censorship and introduction of the free market (Kałamucki, 1994). These changes may be considered as a cartographic breakthrough in the representation of cities. In addition, city maps have come to use defined scales, with no distortions and with detailed presentations of built-up areas and their functions. Such transformations have also brought significant changes to the city maps' content, notably, features whose representation had been forbidden could finally be represented. City maps published in Western Europe have evolved as well during the aforementioned period due to higher political and economic stability. These changes, however, have not been as significant (Martyński, Ostrowski, 2003).

European city maps differ in their quality, range of presented content, graphic form and it's level and used scales. Given their unique status and prominence among cartographic products, there is a surprising lack of empirical research into how and why city maps differ between countries.

2. Methodology used in maps' content analysis

For the city maps content analysis 54 different city maps from 21 European large cities, mainly capital cities (see Fig. 1), were selected. This has crucial importance to provide comparability of the analysed city maps. Only cities with the similar objects (such as museums, cinemas, theatres, etc.) might be compared. Conclusions based on a comparison of large and small cities' maps would be erroneous due to various characteristics of the cities.

To conduct analysis from one to four city maps of each city were taken. The number of examined maps

[1] Expression "Eastern and Central European countries", used in the article, has geopolitical meaning. Eastern countries are understood as former USRR countries (except for Baltic Republics, which has broken off with Soviet cartographic style), and Central European ones are understood as countries, which remain under USSR great political influence in the second half of XXth century (to 1990s).

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Fig. 1 Cities which maps were taken into analysis

depends on number of national publishers on the market (in three cases only, where there is one leading national publisher, single map of the city were analysed – "Jāņa Sēta" in Latvia, "Trivum" in Byelorussia and "Capplen" in Norway).

The selection of the city maps was made by taking into consideration the following criterions:

- city area – only city maps showing large cities were selected;
- publisher – the city maps can be elaborated by local, national or international publishers. For conducted analysis city maps elaborated by the companies of at least national range and the same country of origin as the analysed city were selected. This approach allows identifying the national styles, whereas the international corporations uses, except some regional differences, standardized content. Analysis of national companies' cartographic products shows the influence of political and economic situation on the city image presented on city map and, moreover, gives the information on the essential data that the user requires;
- city maps up-to-dateness – taking into account the dynamic changes encountering cartographic market contemporary city maps, published after 2000 year (most of the analyzed city maps are published even after 2005), were only selected.

City map content analysis was performed taking into consideration, not only the map legend, but the whole map canvas. Analysis of the map legends would lead to incorrect conclusions as, commonly, they do not contain the whole list of used symbols. In order to examine weather features appear in selected cities and are only not presented on city maps or they do not appear at city space at all, additional research were undertaken (search via internet, guidebooks, etc.).

Because of the high diversity of the collected cartographic data, it was necessary to create a content classification allowing to unify objects meanings, as the name of selected features varies according to the publisher. This unification process allows obtaining reliable results as every analysis is referred to a homogenous scale. Consequently 360 different features in 18 subcategories were selected. Next these 18 subcategories were grouped into 6 categories (see Tab. 1).

Tab. 1 European city maps' content divided into thematic categories and subcategories

Categories	***Subcategories***	***Number of selected features***
Road network and infrastructure	Road network	47
	Road infrastructure	17
	Services for motorized users	9
Public transport	Public transport	44
Built-up areas, land use and landmark objects	Buildings and built-up areas	18
	Land use/Land cover	29
	Topographical & orientation features	28
Sport and recreation facilities	Sport and recreation facilities	38
Services	Religious facilities	12
	Cultural features	9
	Catering facilities	5
	Tourist accommodation	10
	Health service	10
	Education	6
	Other services	14
	Trade facilities	27
Civil service and administrative division	Civil services	29
	Administrative division	8

3. Range of content analysis

City maps content analysis was based on number of features presented on maps. The analysis performed was to show, whether the number of presented features differs significantly between countries and it is possible to select specific features, characteristic for each country.

By analyzing the bar graph (see Fig. 2), showing the average number of features in each country (number of features in each category were summed and then divided by the number of examined city maps in each country), distinguished for selected countries, it is distinct that European city maps range of content varies significantly in terms of the amount of provided information. Trend showing the division between Central and Eastern European and Western European city maps can be observed. The former ones characterize with the number of selected features exceeding the average, whereas, the latter ones characterize with the number of selected features far below the average. The highest number of selected features is met on Byelorussian (119), Russian (85), Polish and Ukrainian (both 73) city maps. Norwegian city maps may serve as an exception. They do not belong to Central or Eastern city maps category, nevertheless, provide high amount of information (103 features can be distinguished). Austrian (59), British (60) and Czech (62) city maps belong to the group with the features number closest to the European average, which is 59.

3.1 Road network and infrastructure

Road network and infrastructure category is mostly represented on Norwegian (24 different features), German and Slovak (both 20) as well as Polish and British

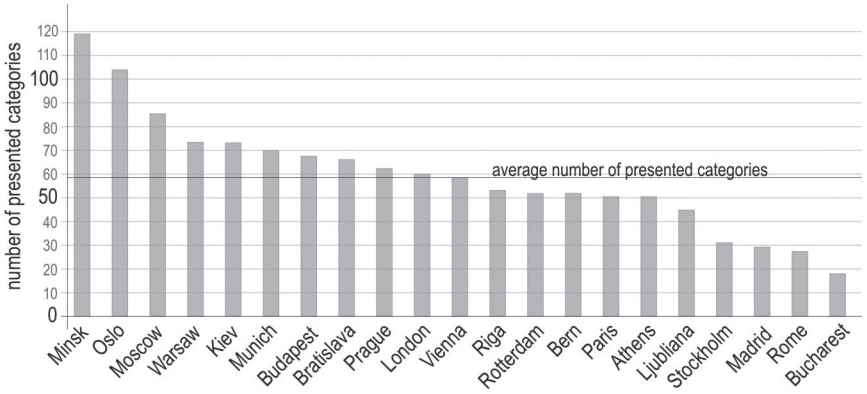


Fig. 2 Average number of features presented on the city maps

(both 19) city maps, whereas the smallest number of features can be met on Italian (10), Spanish and Swedish (both 9), and Romanian (only 3) ones.

Road network and infrastructure category is divided into three subcategories: *road network, road infrastructure* (e.g. different types of parking places, road barriers – rush hour closures, toll road stations, and traffic lights) and *Services for motorized users* (e.g. petrol and LPG stations, vehicle diagnostic and service stations, vulcanization etc.). Certainly, road network subcategory contains the highest number of features as the street network serves as a basis (background information) for every city map construction. The most extended routes and streets classification can be found on British and Norwegian (both 17 features) and Polish and German (both 15 features) city maps. Contrary to them, Ukrainian, Swedish or Romanian city maps presents only the necessary minimum (which varies between 7 and 10 features).

Despite the content wealth or factual level of every analyzed city map, features such as primary, secondary and other roads were always presented. The majority of analyzed city maps show also motorways, dual carriage ways and main through roads. The same remark concerns footpaths and lanes. Important information, especially for motorized city map users, about pedestrian zones and one way streets are often added. It is worth to turn attention to the features that are unique for selected countries. Private roads and congestion charge zones on British, flood-lit track on Norwegian, paid parking zones on Polish city maps and pavements on Czech city maps may serve as examples.

Another subcategory within analyzed category is *road infrastructure*. It is very well presented on the German and Swiss city maps, contrary to Romanian ones, where it does not exist at all. It should be noted that "park and ride" feature is one of objects among the whole subcategory that appears on the city maps more frequently. This feature is a perfect example on how the city changes are imaged on the city maps. Showing traffic lights is characteristic of Polish and Czech city maps, whereas speed cameras are placed only on British ones.

Services for motorized users subcategory is mostly presented on Central and Eastern European city maps. Petrol stations are the most frequently appearing feature within this subcategory. They are placed at almost every Central and Eastern European city maps and, moreover, at the Norwegian ones as well. This feature, however, is completely omitted at the Western European city maps. The reason for this situation may be explained as follow: petrol stations in Central and Eastern Europe before political and economic transformation were rather seldom therefore the information about their locations were highly required thus placed on the city maps. Consequently, it becomes a tradition to put this feature on the maps even after sudden increase of their number after the political transformation. Vehicle diagnostic and service stations features are met also at the Central and Eastern European city maps only.

3.2 Public transport

Public transport category is presented the most precisely on Hungarian city maps, where the number of features within the category covers 30% of the whole map content. The detailed presentation of railways divided into groups such as: national, suburban, industrial, funicular, rack and children railways can be found. Moreover city transport (bus, tram, trolleybus and underground lines) and river boats have been added. Also Austrian and German city maps present public transport category very broadly, contrary to the Bulgarian, Slovenian and Italian ones, where the category is limited to railways and stations (both railway and underground ones). It is worth to mention some exotic objects that may be found in the category: platforms on Byelorussian and ticket offices on Ukrainian city maps.

3.3 Built-up areas, land use and landmark objects

Analogically to *road network and infrastructure* category, *built-up areas, land use and landmark objects* category is divided into three separate subcategories. It may be stated that *land use* category contains also *built-up areas*. In these analyses, however, the latter subcategory was treated as a separate one due to its great importance to the urban areas as well as unique status in cartographic presentation.

Significant differences in modern city maps built-up areas presentation is observed – one can meet various degrees of their generalization, next their differentiation and finally various forms of graphic presentation. According to degree of generalization city maps can be divided into 3 basic groups. First group contains city maps, which comprise all individual buildings (Russian and Byelorussian city maps). The second group includes city maps, in which individual buildings within high-density zones are joined into built-up areas, whereas separate buildings or their small groups are usually enlarged (Polish or Czech city maps). The last group comprises city maps, which are characterized by the highest degree of generalization. On these maps all urban areas, also with low density (block or residential) are presented as homogeneous built-up areas with highly simplified shapes (Ciołkosz-Styk, 2009). Such presentation is typical for most of Western European countries. On British and French city maps only public buildings are presented. On British city maps public buildings are further classified according to their functional classes (education, health and welfare, administration and law, etc.). They are also graphically emphasized in order to their easy identification. Lately, house numbering appeared on most of the European city maps.

The broadest classification of land use subcategory was found on Norwegian (9 features), Polish, Ukrainian and

Romanian (8 features each) city maps. On the other hand the smallest amount of information is provided by Swedish (2 features) and Italian (3 features) ones.

The most frequently appearing features within land use subcategory on European city maps are parks, woods and cemeteries. Central European city maps (Polish, Czech, Hungarian) present cemeteries with further division into Christian and Jewish ones. Industrial areas, orchards and allotments are shown on Central and Eastern European city maps.

Generally landmark objects (typically used on topographic maps) such as forester's lodges, towers, transmitting stations rocks, etc. are characteristic for German city maps.

3.4 Sports and recreation facilities

An unquestionable record of *sports and recreation facilities* presentation belongs to Norwegian city maps, where 20 different features (approximately 20% of the whole city map content) under this subcategory were selected. Despite of common objects, such as swimming pools, pitches, sports halls, tennis courts and riding grounds appearing also on different city maps, the features such as golf courses and mini-golf, sledging hills, slalom slopes, shooting ranges, go-cart centres, skateboard ramps or bowling are additionally shown. Different type of sport and recreation features, e.g. casinos, circuses or even night clubs are presented on Eastern European city maps.

Sport and recreation facilities are also placed on Swiss, Dutch and Polish city maps, whereas on Swedish, Latvian, Spanish, Italian, Greek and Romanian city maps this category is omitted.

3.5 Services

This category holds seven subcategories, namely religious, cultural and catering facilities, tourist accommodation, health service, education, trade and other services.

Religious facilities

In terms of detailed classification of religious facilities Hungarian city maps play a leading role, as seven different features have been selected. On these city maps Catholic, Greek Catholic, Orthodox and two different Protestant churches as well as synagogues and mosques have been presented. Slightly less information within this subcategory is provided on Polish and Eastern European city maps. Remaining group of analyzed city maps limits religious facilities subcategory to the presentation of Christian Churches (with no division into Catholic, Orthodox or Protestant).

Cultural facilities

Central and Eastern European city maps contains the detailed classification of cultural features, contrary to majority of Western European city maps on which museums are only shown. The highest number of cultural facilities objects is presented on Slovakian (7), Ukrainian, Russian and Byelorussian (6) as well as Norwegian, Polish and Greek (5) city maps. It should be mentioned that Eastern European city maps contain important places of national history and identity such as martyrological places, monuments and war memorials or commemorate plaques.

Catering facilities

Restaurants are the most frequently presented object among all others within catering facilities subcategory. They are presented on Byelorussian (together with additional information on cafés and bars location), Ukrainian and selected Czech (with additional information on vineyards) city maps. One of analyzed British city maps provides information on pubs location, whereas Austrian one shows self-service bars. The rest of analyzed European city maps show no information in discussed subcategory.

Tourist accommodation

Hotels, camps and youth hostels are the most frequently presented objects among all others within tourist accommodation subcategory. Norwegian city maps provides the highest rate of information showing not only the objects listed above, but also regular hostels and tourist huts. Taking into account the number of presented objects, Swiss, German and Polish city maps with 3 selected features are right after Norwegian ones. Czech and Slovakian characterize with providing information on botels (hotels located on water), while German with inns.

Health service

The most extended information within this subcategory is provided by Byelorussian and Russian (both 7 objects) city maps. Hospitals have been presented on each analyzed map, while emergency ambulance services only on Polish, Latvian and Norwegian ones. Scandinavian, Czech, Slovakian and East European city maps gives additional information on pharmacies. An interesting fact of veterinary clinic indication on Russian and Ukrainian city maps should be noted.

Education

Norwegian city maps provide the most detailed information on education category showing as much as 4 different features. Despite universities, presented on most of analyzed maps (except Slovenian and Ukrainian ones), the features such as schools and playschools are also shown. Libraries are presented on the Eastern European city maps and some British ones. Schools are also indicated on German, Slovakian and in some Polish city maps. Planetariums are characteristic feature presented on Ukrainian city maps.

Trade

Presentation of trade subcategory objects is typical for Eastern European city maps. The highest number of selected features can be found on Byelorussian city maps, where 20 different objects (e.g.: 4 types of department stores, 5 types of bazaars, 8 types of shop – groceries, clothes shops, toy shops, etc.) are distinguished. On the Central European, Greek and British city maps the hypermarkets are presented, whereas on French covered markets are shown.

Other services

In this subcategory the various services' features, that do not match the aforementioned subcategories, are located.

Byelorussian city maps play leading role in this subcategory, presenting the highest amount of features. Among them laundries (with division to dry cleaners and others), hairdressing or beauty salons may be quoted. Norwegian city maps are also wealthy in content within this category. The range of content of presented objects, however, is absolutely different. The features such as banks, conference halls or homes for older people have been shown.

Toilets are presented on Byelorussian, Swedish, British, Czech and Swiss city maps. In addition toilets for handicapped have been presented on British ones.

3.6 Civil service and administrative boundaries

Civil services

Detailed classification of civil services is typical for Eastern European city maps, contrary to the remaining part of analyzed city maps, where this subcategory is limited to post offices or police stations or is generally omitted. Eastern European city maps present also the features such as diplomatic missions, international organizations seats, seats of government, tax offices or passport bureaus.

Administrative division

Central and Eastern European city maps present various levels of administrative division: administrative boundaries, district boundaries or even housing estate boundaries, whereas Western European city maps limit their presentation in selected category to city boundaries.

4. Conclusions

City maps content of Central and Eastern Europe is usually wealthier and more detailed comparing to their western equivalents (Fig. 3 and 4). It is noticeable especially in broad information concerning services, presented mainly as point symbols. It may be explained as a legacy of the Communist era, when built-up areas or even single buildings could not be presented on the city maps in certain countries, so point symbols had to replace topographic presentation of objects (e.g. churches, hotels or railway stations). Such way of presentation was censored to less extent (Konopska, 2007).

Political transformation, resulted in censorship abolishment, gave map editors freedom in planning map content and level of detail. When showing built up areas and their functions was finally allowed, the point symbols set was not reduced, but extended to include previously forbidden features, such as hospitals or police stations (Ostrowski, Ostrowski, 1992). It was natural psychological consequence to former restrictions.

Political transformation caused also changes in cities landscapes and their functional structure, which was well reflected on the city maps. A lot of new features, such as supermarkets, cash machines or internet cafes appeared in the cities and automatically on the city maps. Number of features in some categories has significantly increased as well (banks, hotels, catering facilities).

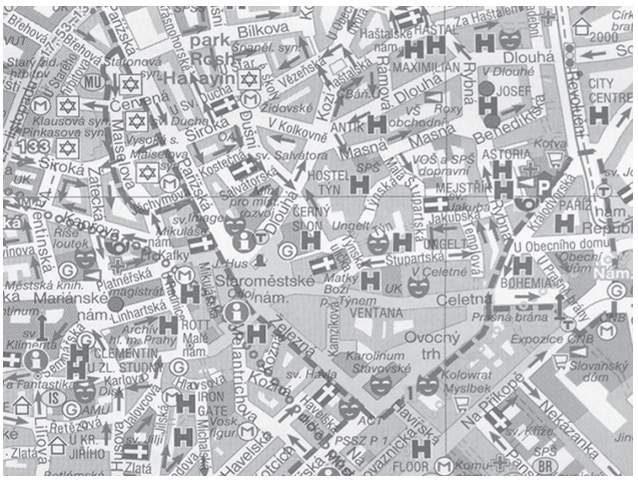
Content of the Western European city maps differ between countries, but generally is narrower comparing to Central and Eastern city maps. An exception to the rule are Norwegian and German city maps. One can say that there is some resemblance in the content of German and Central-European city maps. It is determined by two factors. Firstly, connections in cartography between Central and Eastern Europe and German-speaking countries existed for a long time. Secondly, modern German cartography bases to some extent on achievements of former East German cartography.

A factor, which has considerable influence on differentiating the content of the European city maps, is the political situation[2]. The situation has also played an important role in shaping style of European cartographic publishers. Cities specificity and character are reflected insufficiently on the city maps. There is no relation between city size or tourists attractiveness and city maps content. A case in point is London and Oslo – comparing to the Norwegian city maps British city maps content is narrower, though London is few times bigger then Oslo. Rome, which is classified high in the ranking of most attractive cities in the world, has city maps with relatively poor content.

Analyzed European city maps differ in scales, used in city maps presentation. Applied scales vary from 1:10,000 up to 1:30,000. There is tendency that western city maps are presented rather in large scales, while Central and Eastern ones in smaller scales. It can be explained by the fact that city maps of western European cities are developed mostly for tourist purposes and they very often they cover only central districts, while Central and Eastern city maps have no particular audience in mind. They can be used by city visitors as well as

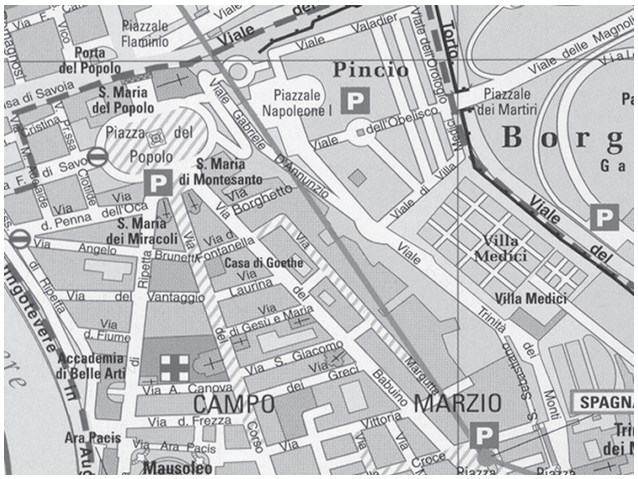
[2] All characteristics (average numbers etc.) are based on current city maps, nevertheless Author has examined European city maps published after the second world war.

Minsk, no information about the scale, Trivum, 2002

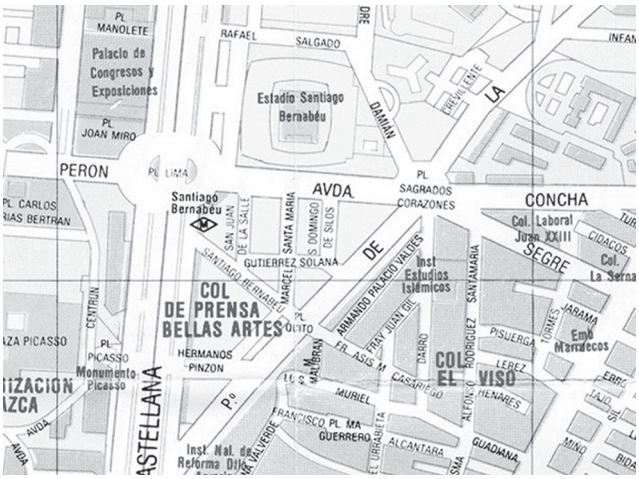


Prague, 1:16,000, SHOCART, 2007

Fig. 3 Samples of the city maps published in Eastern and Central Europe



Rome, 1:13,000, Instituto Geografico DeAgostini, 2006



Madrid, 1:15,000, Distrimaps telstar, 2005

Fig. 4 Samples of the city maps published in Western Europe

city citizens, that is why they cover whole cities to their administrative borders and present universal content. One would expect that city maps in larger scale would have more detailed content than the ones in smaller scales, but conducted analysis of European city maps do not let us draw such conclusion.

Road network, public transport and land use are common for all city maps and only detail of their presentation diverse among the countries, whereas showing all kind of services and civil service is typical of Central and Eastern Europe. It is evidenced by examples of religious, cultural, catering or trade features, which are well represented on Central and Eastern Europe city maps, and do not appear on western ones.

The most extensive content among all analysed city maps have city maps of Minsk and Oslo. Though they both show broad information, the range of presented content varies significantly. It is mainly caused by different users needs.

If cartography is recognized as a language, one can say that nations introduce and express themselves through the maps, including city maps. They show what is crucial from their point of view and what has less importance (Dorling, Fairbairn, 1997).

REFERENCES

CIOŁKOSZ-STYK, A. (2009): Influence of the city maps' content on their legibility. Kartografické Listy T. 17, 13–20.

DORLING, D., FAIRBAIRN, D. (1997): Mapping: Ways of Representing the World. Harlow: Longman.

KAŁAMUCKI, K. (1994): Próba oceny ewolucji planów miast na przykładzie wybranych opracowań. Polski Przegląd Kartograficzny 26(4), 202–218.

KONOPSKA, B. (2007): Cenzura w kartografii okresu PRL na przykładzie map do użytku ogólnego. Polski Przegląd Kartograficzny 39(1), 44–57.

MARTYŃSKI, P., OSTROWSKI, W. (2003): Polskie plany miast na tle planów zagranicznych. Materiały Ogólnopolskich Konferencji Kartograficznych 24, 72–79.

OSTROWSKI, J., OSTROWSKI, W. (1992): Koncepcja treści i rozwiązania graficznego polskich planów miast na przykładzie planu Łukowa. Polski Przegląd Kartograficzny 23(3), 85–95.

Madrid., Plano de la ciudad, 1:15,000. Barcelona: Distrimaps Tristan, 2001.

Minsk. Segodnja. Minsk: Trivium, 2001/2002.

Praha. Plán města, 1:16,000. Vizovice/Brno: ShoCart (GeoClub), 2007.

Roma. Pianta di citta, 1:13,000. Novara: Instituto Geografico De Agostini, 2006.

SUMMARY

City maps are ones of the most often published and used cartographic publications. They are used by many groups of readers with various requirements and preparation to map reading. In the last two decades particularly significant changes in richness, variety, graphic level and detail took place in the maps of cities in East and Central Europe. They followed the political transformation of the early 90-ties which abolished censorship and introduced free-market economy. In Western Europe situation was quite different because cartography developed continuously, with no distractions by external factors, such as censorship.

In order to compare the range of contents of European city maps 54 maps of 21 cities had been chosen, mainly capitals, published by leading private cartographic publishers from the same country as the city itself.

Thematic content was divided into thematic 6 categories (road network and infrastructure, public transport, built-up areas, land use and landmark objects, sport and recreation facilities, services, civil service and administrative division) and on that base comparative analysis were undertaken.

The analyses shows differences between the contents of city maps published in East and Central Europe and those published in West Europe. Thy shows, which elements are presented on city maps published in each country, which elements are characteristic for particular publications and point out, what is the reason for that. The contents of maps published in East and Central Europe is usually much richer than in those from the West. This results from different conditions which influenced the development of city cartography in different parts of Europe.

MSc. Agata Ciołkosz-Styk
University of Warsaw
Faculty of Geography and Regional Studies
Department of Cartography
30 Krakowskie Przedmiescie St
00-927 Warsaw
Poland
Phone: +48 552 15 11
E-mail: aciolkosz@gmail.com