

# DEVELOPMENT OF SCIENTIFIC BASES AND METHODS FOR MAKING TOURIST MAPS SHOWING HISTORIC-AND- CULTURAL AND NATURAL HERITAGE SITES

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## Introduction

The world tourism industry is actively developing due to the world tendencies focused on creating society without borders, which results in a heightened interest in cartographic products and special popularity of tourist information maps (atlases).

Tourist maps are mass products intended for a wide range of consumers. They differ in types, production kinds, scales, territorial coverage, formats, are published by various manufacturers of different countries and regions.

The paper deals with the following results of the research: an analysis of tourist maps, a classification of tourist maps suggested by the authors; a system of data, developed by the authors, on objects of natural and cultural heritage to be shown on tourist maps. The authors' map originals are illustrated in the presentation.

## The main part.

1. Modern tourist maps (Russian and foreign ones). Their analysis.

Modern Russian maps are presented by products of state enterprises (*Roskartografiya*), of some private companies or products of joint projects of both state and private companies. The following original series of maps can be called: *Reference Media; For Fishermen, Hunters, Tourists, Motorists; For a Motorist. For a Pedestrian. For a Tourist; For a Pedestrian. For a Motorist; For an International Car Tourist; Atlases of National Motorways*, etc.

General use maps are produced by the aerogeodetic enterprises included in *Roskartografiya*. These are series of maps of some Russian cities, of the most popular tourist places, road atlases and maps, including ones for satellite navigators.

A lot of important and interesting materials directly related to tourism, are collected and presented on maps of the Russian Research Institute for Cultural and Natural Heritage named after D.S. Likhachyov.

We cannot help mentioning the cartographic resources of the Internet and highly qualitative and up-to-date materials prepared from images of the Earth from space.

Foreign publishing houses are represented by *Cartographia* Hungarian firm (Budapest, Hungary); by English *Estate Publication* (London); by German *Carto Travel Verlag* (Germany), the largest in Europe.

Some foreign enterprises and firms as well as Russian ones publish maps in series. We can call *Road Map* by *Freytag Berndt* (Austria); series of *Official Tourist Map*; *Leisure Map*, *Local Leisure Map*, *European Leisure Map* by English *Estate Publication* (London), distinguished by their great tourist information completeness.

A lot of tourist maps are published for the territory of Asia. For example, in Vietnam, maps are designed and published by Departments of various Ministries, like those of Natural Resources and the Environment (Map Publishing House); Science and Engineering; Culture, Sport, Tourism (The Institute for Tourism Research and Development, Computer Centre), as well as in the administrative centers of provinces (there are 64 provinces).

Modern tourism cartography has deep roots. Its sources and development are connected with the necessity of supporting travels and geographical research (discoveries). It was ancient travelers (navigators, merchants, pilgrims collecting data on new lands and peoples) who made the first descriptions and maps, a basis for new travels and scientific studies of territories in terms of geology, ethnography, biology, etc. Therefore postal service (road) maps, travel route maps, maps of regional geographic character; city, palace, monastery complex plans, etc. can be considered to be tourist map prototypes.

Tourist information presented by various producers on modern maps and in atlases of different countries and regions is uniform enough. It focuses, as a rule, on the groups of objects representing: a) communication lines (airports, roads, transport infrastructure); b) tourist service (hotels, motels, restaurants, post offices, banks, etc.); c) official buildings, international organizations; d) notable places, cultural and education centers (monuments, museums, theatres, parks, exhibitions, etc.), without any systematization or strict approaches to their depicting.

Distinctions in map contents are seen only due to the level of the development of the general territory infrastructure, that of the knowledge and popularity of objects of

cultural and historical heritage, other places of interest, special features of particular tourism kinds connected with natural and national regional peculiarities.

Many territories of European and Asian countries are presented with tourist load on numerous atlases of motorways. Historically developed tendencies and national features can be traced in road displaying. Peculiarities are expressed through developed road classifications, ways of their depicting. It is sometimes difficult to make a differentiation between maps close in their themes like road maps with some information for tourists and tourism maps with information on roads.

Topographic maps have been often used as a geographic basis for tourist maps, especially in recent years, which promotes, on the one hand, their high accuracy and partial unification, but levels down contents specialization and graphic means. Tourist maps are too approximated to their basis.

In a considerable number of the tourist maps and atlases analyzed, we could not encounter any logical and consecutive display of natural and cultural heritage objects.

Maps of the recreational potential of landscapes, maps of the degree of usefulness (comfort) of territories for tourism by various conditions – climatic, medical-and-geographic, sanitary-and-hygienic ones; maps of the risk of dangerous natural phenomena, maps of tourist resources as a whole – all these maps can be labeled as tourism maps of rather new contents.

Examples of such maps are available in regional atlases, in thematic GIS-projects devoted to recreation and tourist activities, in regional publications. The problems of tourist-and-recreation mapping are discussed in some articles of [2].

Showing natural, natural-and-climatic indicators, sometimes in a combination with economic ones, on tourist-and-recreation maps approximates them to ecological maps that are of great importance for planning the trade and complex development of regions.

A great number of maps in the volumes of *A National Atlas of Russia* [3] are devoted to the theme of tourism, especially to the recreational resources and functions of recreational areas.

As a whole, the list of tourism publications is long enough and rather rich. A majority of tourist maps within map series or among products of a particular publisher are distinguished by an empirical approach to their designing and compilation, a lack of unification, with few exceptions. On the list of cartographic products, atlases in line with the principles of consistency and interrelationship in depicting natural, social, and cultural-and-educational objects possess a clear advantage (for example, *An Atlas of the Traveler. Europe*, which is being developed by Karpovich L.L., 2008 [2]).

A map analysis made has given a good basis for further studies and corroborated the necessity for working out and developing scientific bases for tourism maps.

## 2. Classification of maps

A classification of tourism maps can become a methodological basis for their design, GIS creation, and the system formation of corresponding spatial data.

Let us consider an option classification offered (Table 1).

While working out our classification we assumed the tourist map to be a geographic map intended for the purposes of tourism. In turn, tourism [French *tourisme* from tour – a walk, a travel] is considered as an organized or independent (backpacking) travel across the native country (internal tourism) or in foreign countries (international tourism), made on holidays with information purposes and also of sports character.

The first step of the classification offered shows the levels of mapping, i.e. maps of various scales (or ranges of scales), representing territories of different spatial coverage; these maps have a uniformity of approaches to designing, a common directivity and measure of information selection. The levels of mapping are interconnected, but each has its own peculiarities, which show up in their mathematical, general geographic bases and the classification of objects displayed on maps as well as in map design, etc.

In maps for tourism, we should point out world maps, continent maps, maps of countries, administrative or geographical regions, cities, separate kinds of tourist objects (like natural and architectural ensembles, national parks, etc.). The administrative or geographic approach to establishing the levels results from the degree of dependence of tourism development on the economic and political conditions or on the specific geographic character of tourist zones and areas. As the basic information "is tied" to political and administrative borders, a majority of map-makers prefer the simplest way – to operate by administrative units.

The scales (from the largest one – 1:2 000 – to the smallest one – 1:50 000 000) are closely connected with the territorial coverage and they are the function of the map purpose. They determine the information volume, in other words, the detail of maps.

Tourism, on the one hand, is the most effective means of satisfying recreational and informative requirements of the population, and on the other hand, is a branch of non-productive sphere of economy, whose enterprises and organizations fulfill tourists' requirements of material and non-material services, like those of transport, hotel industry, trade, excursions, culture-and-entertainment, sport, health-improving. It has caused the division of maps into two big blocks:

- 1) tourism proper maps (for organized and independent tourists);
- 2) maps of tourism organization and planning.

Topographic maps (they are also basic ones) and transport maps can be classified as auxiliary maps.

## TOURISM MAPS

Mapping levels  
(territorial coverage and scales\*)

World Maps, Continent Maps, a specific Country Map, an (administrative, geographical) region map, a city map, a separate object map

Tourism proper maps (for organized and independent tourism**)				Tourism Organization and Planning Maps (International, country, regional tourism)	Base Maps, Auxiliary Maps
General Maps (Area) Coverage Maps		Travel Route Maps		Tourism Advertising and Propagating Maps Historical Development and its Dynamics Maps Tourism Infrastructure Maps Maps of Territory Dividing by: Tourism and regime kinds; Intensity of tourism development; natural, anthropogenic conditions and hazards; the stability of natural complexes to the tourism load; preservation of natural, historical and cultural objects; the representativeness and status of the tourism objects, etc.	Topographic Maps Transport Maps
Walking Route Maps; Horse Route Maps; Sid Route Maps; Water Route Maps; Mountain Route Maps;					
Bicycle Route Maps; Automobile Route Maps; Railway Route Maps; Combined Route Maps; Bus Route Maps; .....					
The Contents (kinds of maps) highlighting objects of natural and cultural heritage***					
Informative Maps					
General Maps	Nature Maps	History and Culture Maps	Maps for health-improving and recreation tourism	Maps for sports tourism	Special Maps
Country Maps; Specific Area Local Maps; City Plans	Cave Maps; Biological Maps; Hydrological Maps; Maps of Separate Specially Preserved Natural Territories Ecological Tourism Maps;	Historical Maps; Military-Historical Maps; Archaeological Maps; Maps of Town-planning and Architecture; Maps of Remarkable Man's Lives; Ethnographic Maps; National Trades and Crafts Maps	Maps of Therapeutic and Health-Improving Places; Resort Maps.....	Sports Orientation Maps; Route Complexity Maps; Maps of Areas where various competitions are to be held; Maps for Hunters and Fishermen	Cult (Site) Maps; Esoteric Maps; Business, Scientific Tourism Maps.....
Planning and economic appraisal maps Maps of Recreation and Tourism Potential; Maps of Material and Technical Basis; Maps of Tourist Service Kinds and Volume					

### Representation forms

Paper maps; Digital, electronic maps; Multimedia-products; Navigation and tourist trackers (GPS-cards), etc.

\* Depend on the purpose and territorial coverage

\*\* Maps for independent (backpacking forms) tourism contain more information on transport facilities, tourism infrastructure and its safety

\*\*\* See the separate classification below

Table 1. Classification of tourism maps

Organized tourism is understood as a travel under a program planned by tourist establishments, with a complex of services provided. Independent tourism (backpacking) is a travel under the plan drawn up by the tourist, with a considerable share of self-service. Maps for independent forms of tourism should have more information on transportation services, tourism infrastructure, and tourism safety.

Cartographic support is needed by various tourism kinds and forms, such as informative, recreational, natural, historical-and-cultural, event-trigger, ethnographic, collecting, adventure, health-improving, sports, extreme, religious, ecological ones as well as walking, horse riding, bicycle travels, and so on and so forth.

Therefore, in our classification of maps (and it also means: in their subsequent production), we have tried to reflect very diverse (wide and single-purpose oriented) requirements that should meet themes and kinds of tourist maps.

**Tourism proper maps** can be *general ones*, they have territorial (areal) coverage, the objects of tourists' interest being shown across the whole territory; or *route ones* – they are designed along a certain route (and objects are shown along this route strip). Among route maps, we can see walking, bicycle, horse-riding, automobile, railway, ski, water, mountain, combined route maps. This map list by kinds of excursion routes can be continued.

Further, tourism proper maps are divided according to their contents into: a) informative maps; b) maps for health-improving and recreational tourism; c) maps for sport, non-professional tourism; d) special maps.

In *informative* maps, we have general ones; nature; history and culture ones.

General maps depict the basic locality panorama (general geographic elements) and general tourist information, such as service facilities (accommodation, public catering, communication, health service, resting establishments, etc.); tourist information centers; vocation and amusement places, places for various sports entertainment; information on the location of sights, objects of cultural heritage. As a rule, these are tourist plans of cities and popular maps sometimes with expanded country-specific or regional geographic contents for region-study specialists, tourists, schoolchildren, and all those who are interested in studying their native land. They are useful for getting acquainted with a particular area, for choosing a travel route, obtaining general information.

Nature maps show full complexes of scenic landscapes, specially preserved natural territories, natural sights of a certain character (volcanic, hydrological, biological and cave formations). In recent years, territories (water areas) possessing a lot of exotic features, like a landscape nature variety, have become extremely popular. Travels connected with transition from one season into another one (for example, from winter to

summer, or vice versa), caused by a sharp change of climatic conditions, belong there too.

Informative maps of history and culture either deal with a wide range of themes or are single theme-oriented, they are devoted to historical, military-historical events and monuments, remarkable men's lives, archaeological, ethnographic topics, town-planning and architecture monuments, national trade and craft places, their profile and characteristics.

Maps of ecological tourism can enter both the class of natural maps and that of historical and cultural maps, they facilitating ecological education of people, protection of the natural and cultural-and-historical environment, ecosystem integrity preservation, observance of ecological regulations and wildlife management modes.

*Maps for health-improving and recreational tourism* are intended to show resources of health-improving tourism, such as resorts of different profiles, therapeutic recreation zones.

*Maps for sports tourism and non-professional one* are aimed at displaying, accordingly: sports routes of different kinds and categories of complexity, sports orientation routes and venues, venues for holding sports competitions of different kinds; their results; attractive hunting and fishery places, etc.

*Special maps* are cult, mystical, esoteric guidebooks for pilgrims and tourists visiting 'energetically strong' places, 'bottomless wells of life-giving space energy', maps of 'power anomalies', they including local legends and customs too.

***Maps for tourism organization and planning*** are not less important than tourism proper maps as tourism industry occupies one of the leading places in the economy of many countries. In some areas, tourism is the only industry influencing significantly their development. We have the following kinds of maps in this group.

*Maps for tourism advertising and propagation.* They are designed for popularizing vacation spots, various sights as well as for attracting domestic and foreign tourists.

*Maps of the historical development and dynamics of tourism* reflect historically different aspects of tourism movement development, its material resources, organizations, service volumes, recreational resources. Changes in the number of tourists, in the social structure of tourist streams, cost indicators, tourist concentration degree in different places, tourism dynamics and its geographic distribution can be the themes of these maps. The maps are important for solving some technical, scientific, organizational problems, for revealing promising areas and directions of tourism development.

*Tourism infrastructure maps* are used for representing the whole set of constructions, buildings, systems and services providing organization and services for tourism.

The tourism material-and-technical basis includes enterprises with different functions, tourist bases, boarding houses, other accommodation types, transport, special post offices serving only tourists. There are special tourist centers and establishments making their service programs in view of the peculiarities of specific tourism kinds, travel ways, the age, professional and other features of their clients.

Tourism infrastructure maps should be distinguished from maps of the industrial and social infrastructure of a region, showing the services the local population is provided with, although these enterprises participate in performing tourist services too (city and international transport, trading enterprises, public health services, cultural-entertainment establishments, sports facilities, etc.). As a whole, infrastructure maps reflect the development level of territories for tourism.

*Zoning districts and zone maps* have the basic purpose to display the complex information and specificity of tourist zones for territorial tourism organization and optimal use of recreational resources. The region specificity may be caused by geographical, biological characteristics, economic ties, local traditions, system of mutual relations between human cultures and conditions of the environment.

The below factors can act as criteria for the division into districts (and for map themes): a) tourism kinds; b) the intensity of its development; c) the stability of natural complexes to tourist loads; d) the preservation level of natural and historical-and-cultural objects; e) the representativity and status of tourism objects, natural, anthropogenic conditions and hazards, other signs (grounds for the division).

Zoning districts and zone maps can show the results of various estimations and functional zoning of territories. For example, there might be displayed zones of short-term mass tourism, transit, all-the-year-round, seasonal, trade-connected tourism (like hunting, fishery), zones of therapeutic recreation, zones of various comfort (usefulness) levels of natural and man-triggered conditions of tourism (climatic, medico-geographical, sanitary-and-hygienic ones, pollution indicators, etc.).

As a whole, tourist district zoning is a kind of territorial differentiation, the basis for it reflecting the peculiarities of the environment, those of its development and the formation of socio-cultural systems. Maps of these themes can serve long enough provided that certain parts of their contents are periodically updated.

*Maps for planning and economic appraisal.* International, state, regional tourism planning is directly connected with the general territorial planning of lands, with an appraisal of the recreational potential of landscapes, tourist resources and tourist district zoning.

Besides, tourism is characterized by a system of indicators through which we can appraise it economically and make maps of corresponding themes. Let us give a few examples of the most common indicators. They characterize: the development of the material basis; quantity of accommodation (including the division according to the comfort level); tourist density factors (quantity of per capita accommodation); service volume (the quantity of tourists who visited the district, city, country); stay duration in a certain district; the volume of tourist services, which means the total monetary receipts from tourists; the data showing the place of tourism in the system of economy industries (the quantity of the population directly and indirectly occupied with tourist services, the share of tourists in the sum of all receipts from the population (the sum of sales); the share of receipts from foreign tourists in the country's balance of payments (currency receipts).

In addition to dividing the maps considered by their contents they can be differentiated by their representation form: *paper, digital, electronic, multimedia maps, navigating GPS-cards, Internet-maps*. The map design is of great value for their perception. They employ bright art design, panoramic images, various indexes, photos, and descriptions.

### **3. Natural and cultural heritage.**

In all kinds of maps, especially tourism proper ones, it has been offered to display objects of natural and cultural heritage. But unlike a majority of domestic and foreign tourist maps where sights are represented as a set of monuments of different kinds available in some territory without estimation of their statuses and rankings, the authors have worked out a strict system of heritage data, regulated by legislative and standard documents (Table 2).

The concepts of 'natural and cultural heritage' are adopted in accordance with the UNESCO Convention (1975) and the laws operating in the world's countries, for example, in Russia, one of them is the Federal law *On Cultural Heritage Objects (History and Culture Monuments) of the Peoples of the Russian Federation* (2002).

In the system offered, the basis for *natural* heritage is formed by specially preserved territories, making their complete list, and separate monuments and phenomena of nature, which are to be established in the course of mapping each particular region.

*The cultural heritage* includes monuments of history, archeology, town-planning, architecture; ensembles (palace, landscape, gardening ones, etc.); places of concentration of non-territorial forms of heritage (in museums, archives, exhibition halls, etc.); nature-history-culture territories; historical cities and other settlements.

Each heritage object is shown according to the decision setting up the protection regime, with the object profile and the protection establishing date given.

Each object is shown with its value - of world (under the UNESCO registers), federal, regional, local value (under documents of the corresponding level). From the ranks (statuses) listed, objects of world value are the most important ones, especially at global, federal levels.

The increasing mass character of tourism and high level of interest to places and monuments of outstanding universal value (included on the world heritage list) involve the problem of competent organization and directing of tourist streams. It is no coincidence that the UNESCO has adopted a program whose strategy is directed at perfecting tourism management and finding ways to preserve monuments at high levels of safety. One of the methods for deepening public understanding of the world heritage importance is to support natural and cultural tourism with the corresponding cartographic products having considerable priorities over other information types.

*UNESCO World Natural Heritage Objects, UNESCO World Cultural Heritage Objects*

<b>Natural and Cultural Heritage</b>	
<b>1. Natural Heritage</b>	<b>2. Cultural Heritage</b>
<p><b>Specially preserved natural territories (existing ones and planned to be)</b>            National reserves, their affiliations, sites            National biosphere reserves            National parks            Natural parks            National wildlife areas            Nature monuments            Dendrology parks            Botanic gardens            Therapeutic health-improving areas and resorts            Forests of scientific value (wood wildlife reserves)            Water-marsh grounds of international value            Restricted areas</p> <p>Separate monuments, nature phenomena (geological, hydrological, botanical ones, etc.*)</p> <p>*the List of objects is to be established while mapping a specific area</p>	<p><b>History, archeology, town-planning and architecture monuments</b>            Compact monuments (buildings, barrows, ancient burial grounds, parks, gardens, squares, etc.)            Linear monuments (streets, embankments, roads, canals, fortification works)            Minuments localized in areas - with protection or clear-cut borders (kremlins, quarters, monasteries, etc.)</p> <p>Places of concentration of non-territorial forms of heritage (pictures, sculptures, books and so forth) in:            museums,            exhibition halls, archives,            libraries</p> <p>Nature-history-culture territories,            landmarks            Historical cities and other settlements</p>
<b>Value (status) of the Heritage</b>	
<b>1</b>	<b>2</b>
World heritage	World heritage
Federal heritage	Especially valuable heritage
Regional heritage	Federal heritage
Local heritage	Regional heritage
	Local heritage

Table 2. A data set necessary to represent objects of natural and cultural heritage

electronic maps have been compiled and made in compliance with these goals. Lists of objects/sites of the world heritage (both natural and cultural one) with their characteristics have been generated. A reference search website containing prompts, map images, lists of objects with a search system, pages of textual and graphic reference information has been developed.

The legends of the world natural and cultural heritage maps (correspondingly, on the maps and lists) show: a) the state ownership of sites (owned by one country, by several countries); b) their preservation state (good, satisfactory, non-uniform, great maintenance resources are required, under the threat of disappearance); c) sites possessing a unique characteristic peculiarity; d) the cultural importance of sites (a creation masterpiece, unique for some cultural tradition (civilization), an example of the culture of some significant period of history and the interaction of man and the environment;) e) origin time (7 gradations).

Natural monuments are represented, besides the state ownership, with the characteristics of the nature protection profile (paleogeographical, hydrological, botanical ones, etc.); the protection regime (5 gradations); the value (a nature phenomenon, an outstanding example of wildlife, its evolution, inanimate nature, the Earth's history, and geographical names).

The maps made are examples of global level products.

## **Conclusion.**

A generalization of tourist cartography issues around the world at present is not only of independent interest, it has allowed the authors to reveal both immediate directions for further development of tourism cartography theoretically as well as methodologically and approaches to scientific organization of map manufacturing. The classification of tourism maps offered for the first time; raised and never expanded before, the problem of systems display of natural and cultural heritage, taking into account the tendencies of international tourism; and a complex of experiments on designing and drawing up map originals – all these serve the above purposes. The research has been based on the systems cartographic approach, the theoretical and methodological fundamentals of thematic, complex, topographic mapping, atlas cartography. It has taken into consideration the legislative base in the field of geodesy, cartography, ecology; the international standard documents and (UNESCO) programs in the field of science, culture, communications and information.

## References

1. Vereshchaka T.V. Topographic Map: Scientific Bases for its Contents. - M: MAIK *Nauka / Interperirdika*, 2002. – 319 pp.
2. Cartography - to Tourism. - Materials of scientific and practical conference. St.-Petersburg, September 21-24, 2008. - *Maps Publishing House*, St.-Petersburg, 2008, 184 pp.
3. A National Atlas of Russia. - 4 volumes. - Volume 1. 'General Characteristics of the Territory.' - M: Federal Service of Geodesy and Cartography of Russia, 2007. - 496 pp.
4. A National Atlas of Russia. - 4 volumes. - Volume 2. 'Nature. Ecology'. - M: The Ministry of Transport of the Russian Federation. Federal Agency of Geodesy and Cartography, 2007. - 496 pp.
5. A National Atlas of Russia. - 4 volumes. - Volume 3. 'Population. Economy.' - M: The Ministry of Transport of the Russian Federation. Federal Agency of Geodesy and Cartography, 2007. - 496 pp.
6. A National Atlas of Russia. - 4 volumes. - Volume 4. 'History. Culture'. - M: The Ministry of Economic Development of the Russian Federation. Federal Agency of Geodesy and Cartography, 2008. - 496 pp.