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The methodology of Roman communication research in the territory of Bosnia and Herzegovina

Abstract: The methods, used in the 19th and 20th centuries, that the research on ancient communications in the Roman province of Dalmatia was based on, differ from those used by present researchers. To better understand the research performed in the past, it is necessary to determine and analyze the methods on which those studies were based. All the methods used in the past are referred to by the common name – traditional methods. On the contrary, currently used methods, which result from the technological development in the 21st century, are called modern methods. Combining traditional and modern methods, one model was offered, the one that can apply to all new studies about Roman communication in the territory of Bosnia and Herzegovina.

Keywords: Roman roads, methodology, Geographic Information System, Roman province of Dalmatia.

There is no unity in contemporary European and world historiography regarding the methods of studying Roman communications. The approach to research often differs not only between the provinces of the former Roman Empire but also between researchers whose scientific activities are related to the same Roman province.[1] In addition, there is a considerable difference in the methods used during the research of Roman communications in the nineteenth and twentieth centuries from those on which modern research is based. For this reason, it is necessary to analyze the method on which past research was based, as well as to look at their advantages and drawbacks.

[1] For different methodological approaches see: Gračanin, 2010, 9-69; Güimil-Fariña, Parcero-Oubiña, 2015, 31-44; Verdu, 2016, 15-29; Pandža, Vukorep, 2016, 25-63; Moreno Gallo, 2017, 55-71; Diwan, Doumit, 2017, 225-241; Zanni, De Rosa, 2019, 27-44.

In the Roman period, most of the territory of present-day Bosnia and Herzegovina belonged to the province of Dalmatia, while the northern regions were part of the province of Pannonia Secunda. Recent discoveries of new Roman communications on the territory of Bosnia and Herzegovina indicate the need to initiate new research, but also to review the results of previous research related to the Roman road network in the interior of the Roman province of Dalmatia and the southern parts of the province of Pannonia.[2]

All the methods used during the 19th and 20th centuries, such as hodological surveys, i.e. reconnaissance of terrain, are considered as traditional methods, while modern ones include all those methods that became available with the development of technology at the beginning of the 21st century.

Traditional methods

To better understand the earlier studies of Roman roads in Bosnia and Herzegovina, as well as the results and conclusions drawn from them, it is necessary to understand the methods on which they were based. Research at the end of the 19th century carried out by A. Evans[3], P. Ballif[4], and Ć. Truhelka[5], were founded solely on the so-called hodological investigations, in other terms, the remains of Roman roads discovered during the reconnaissance of the terrain.[6] The first explorers of the Roman communications were content only with the descriptions of the roadway, as well as the landscapes through which the route led, likewise 19th-century travel writers who, in addition to describing landscapes, also left descriptions of ancient monuments and archeological sites they had seen while travelling. On the contrary, W. Tomaschek[7] and K. Miller[8] attempted to determine the directions of Roman communications, as well as the location of the most important settlements, based solely on *Tabula Peutingeriana* and geographical maps. This way of studying Roman roads is called "cabinet research".[9] A series of misconceptions and wrong conclusions emerged as a result of this approach to exploring Roman roads.[10]

In the second half of the nineteenth century, new research of Roman communications was conducted by D. Sergejevski, E. Pašalić, and I. Bojanovski. Sergejevski was the

[2] See: Pandža, Vukorep, 2016, 25-63; Popović, 2018b, 193-2016.
[3] Evans, 1883.
[4] Balif, 1891, 395-404; Ballif, 1893.
[5] Truhelka, 1891, 239-245.
[6] For a complete history of exploring Roman roads in Bosnia and Herzegovina see: Popović, 2018b, 193-195.
[7] Tomaschek, 1880, 497-528.
[8] Miller, 1916.
[9] See: Bojanovski, 1974, 24.
[10] About that: Bojanovski, 1974, 24-25; Popović, 2018b, 194.

first to point out the importance of determining the methodological procedure when researching Roman roads. In addition, he was the first to list the methods used in the research in his work.[11] When studying Roman roads, Sergejevski relied primarily on field research. "*In short, we will first describe the remnants of that road in the field*" Sergejevski states, "*and only then will we turn to Tabula and Itineraries to reconcile the data from these sources with the situation in the field*."[12] Along with the fieldwork, the aforementioned researcher also resorted to interviewing local people and studying folk traditions.[13] However, when he began researching Roman communications, Sergejevski was already at an advanced age, which made it difficult for him to proceed with that kind of research.[14] In fact, field research is very difficult. It requires serious commitment from the researchers and is quite time-consuming, but it does not always result in the desired outcome. The researcher must be in more than a good physical condition to be able to move through a mountainous, hardly accessible terrain. For this reason, it is uncertain to what extent Sergejevski was really able to conduct field research in a rural, mountainous region such as Herzegovina. In my opinion, Sergejevski relied heavily on information obtained from local people.[15] Interviewing locals is an integral part of any field survey. However, information obtained this way cannot be accepted as accurate without first checking the field.

Pašalić discusses methods for the study of Roman communications in his latest scientific work, published under the title *Problemi istraživanja ilirskih i rimskih cesta u provinciji Dalmaciji* (*Problems of Exploring Illyrian and Roman Roads in the Province of Dalmatia*).[16] According to Pašalić, research on Roman roads should be based on: archaeological data, physical traces of roads in the field, data from ancient writers, as well as epigraphic monuments.[17] "*Of course, one type of source will in some cases have overriding importance over another*", says Pašalić, "*while in certain epochs or regions it will be the other way around*."[18] To all appearances, Pašalić adhered to these methods in his earlier research. However, one of the basic features of Pašalić's research work was his distrust of Roman itineraries, especially *Tabula Peutingeriana*. The exclusive reliance on archeological findings led to incorrect conclusions in some cases. This especially refers to locating road stations.[19]

[11] Sergejevski, 1962, 73-78.
[12] Sergejevski, 1962, 73.
[13] Sergejevski, 1962, 74-87.
[14] Sergejevski was born in 1886. At the time the article *Roman Road from Epidaurum to Anderba* was published, he was 76 years old. For more on Sergejevski: Paskvalin, 1988, 161-162.
[15] "*I have not been to Udrežanj, but in the conversation, the residents of the area explained why there could be no wheel marks to the north of Orlovac*." Sergejevski, 1948, 44; "*I have not been to Morine, but I have asked people who knew Morine well*". Sergejevski, 1948, 44.
[16] Pašalić, 1965, 243-260.
[17] Pašalić, 1965, 244.
[18] Pašalić, 1965, 244.
[19] See: Popović, 2018a, 17-19.

Ivo Bojanovski further refined the methodology of the research by taking over some of his predecessors' methods, but also by using new methods that have not been used before. Like Sergejevski, Bojanovski also emphasized the importance of hodological research. "*In solving the hodological issues, it is necessary to start form the road fixed in nature in the field, and only after there is an attempt to identify the road – based on the written and epigraphic sources – with a certain route and fit it into a unique communication system.*"[20] While determining the direction in which Roman communication was going, Bojanovski used the following criteria: visible remains of pavements, milestones, remains of ancient settlements, routes of medieval and Ottoman roads, local folk traditions and legends, medieval cemeteries, prehistoric mounds, old money, as well as information received from older villagers.[21] According to Bojanovski, any conclusion "*must be the result of a complex examination of all relevant elements.*"[22] However, the question then arises as to what extent the aforementioned researcher indeed adhered to it. Seemingly, both Sergejevski and Bojanovski were in their old age when research into Roman communications began.[23] This certainly had to influence the conduct of field research. The fact that the mentioned researcher did not visit some of the Roman roads, located in hard-to-reach areas, although informed about them during field research, indicates that Bojanovski was reluctant to distance himself from modern communications.[24] In my opinion, Bojanovski, like Sergejevski, relied heavily on data collected from the local population. "*The villagers in Sapna told me that the old road from the Romans, also used by the Turks, used to run through this place*", says Bojanovski.[25] Drawing conclusions on the basis that the locals sometimes name the road as the old road, the Hungarian road, or, as in this case, the Roman road is more than debatable. These names are often used to mark old roads, but this does not necessarily mean that ancient communication is involved. Besides that, some of the elements on which Bojanovski based his research, such as medieval and Ottoman routes, finds of ancient money,

[20] Bojanovski, 1974, 25.

[21] Bojanovski, 1974, 22-26.

[22] Bojanovski, 1974, 24.

[23] Bojanovski was born in 1915. He published his first work on Roman communications in 1974. For more on Bojanovski: Paškvalin, 1988, 63.

[24] While researching Roman communications in eastern Bosnia, Bojanovski heard of archaeological finds in the village of Mramorak, on the Bišini Mountain, but did not visit the site. See: Bojanovski, 1981, 185; In my opinion, the reason for this is the lack of modern roads to reach the village, as well as the steep mountainous terrain. An early Christian basilica has been discovered recently along with the Roman road in the village of Marmorak. For more on this: Popović / Veletovac / Šačić Beća, 2017, 184-202; Popović, 2018b, 193-216. An example is the archeological remains of an ancient settlement and road in the village of Tutnjevac, which Bojanovski learned about while exploring the *Siscia - Sirmium* communication route, but did not visit the village. See: Bojanovski, 1984, 246.

[25] Bojanovski, 1981, 185.

as well as folk traditions, are highly unreliable. This is related to medieval and Ottoman routes in particular. In fact, the research of medieval communications so far has been based solely on data obtained from the Dubrovnik archives.[26] Based on these data, only approximate directions of the movement of medieval Dubrovnik merchants can be seen. Currently, there is no information on the construction and layout of medieval and Ottoman roads, nor the extent to which Roman roads were used in the middle ages and during the Ottoman rule of Bosnia and Herzegovina.

Aerial photography may also be included in traditional research methods. Although its use in the territory of Bosnia and Herzegovina has not been registered yet, aerial photography has been used for decades in Roman communications research. It is very significant in geographical areas where the remains of the Roman road are not visible above the Earth's surface. Changes in vegetation in the form of a straight line clearly indicate the remnants of the Roman road below the surface.[27] However, aerial photography is mainly used in lowland areas, and it could be difficult to use this method on mountainous areas, covered with dense forests, as is the case with most of the territory of Bosnia and Herzegovina.[28]

Modern methods

Modern methods of Roman communications research consist of satellite photography, Geographic information system (GIS) and archaeomorphological analysis. The emergence and development of these methods is inevitably linked to the development of modern technology in the 21st century.

Satellite photography has progressively taken the place of aerial photography in recent years. The advantage of satellite photography over aerial photography is that they are easily accessible on the Internet, through the satellites like WorldView-2, OrbView, QuickBird, Sentinel-2, as well as Google Earth services.[29] A notable disadvantage of satellite remote sensing analysis is that it cannot provide any chronological information on the time when the road was built. Besides that, as in the case of aerial photography, the use of satellite photos is restricted to the lowlands and is difficult to apply in precipitous, wooded areas.

The method that dominates the study of Roman communications today is based on the use of the Geographic Information System (GIS), i.e. the least-cost path (LCP).[30] Least-cost path analysis "*allows the modeling of route directions considering*

[26] Dinić, 1937, 119-146; Kovačević, 1961, 158-160.
[27] Verdu, 2016, 18.
[28] Bekker-Nielsen, 2000, 3.
[29] About using satellite photos in research Roman roads see: Panaite / Miu, 2016, 201-220.
[30] See: Breier, 2013, 215-226; Güimil-Fariña, Parcero-Oubiña, 2015, 31-44; Fonte et al, 2017, 163-189; Diwan, Doumit, 2017, 225-241.

different features of the landscape and parameters of movement through the geographical environment".[31] The advantage of using the least-cost path model is the possibility of using written historical sources, old maps, and archaeological sites to determine the route of the Roman road, in addition to calculating the slope of the terrain. Nevertheless, great caution is required when using the results obtained with the aforementioned model. To be specific, the Roman route obtained with the "least-cost path" model is not completely reliable.[32] The geodetic datum used for the above-mentioned model, are taken from the landscape layout nowadays.[33] However, it is certain that the appearance of the landscape now cannot be identical to how it looked like 2000 years ago. It is also highly questionable whether Roman communications take the path of least resistance. So far, field research we have conducted in eastern and northeastern Bosnia has shown that the remnants of Roman roads appear where we would least expect them, on high and hardly passable mountain ranges. That indicates that the slope of the terrain was not crucial to Roman builders to determine the direction of the road.

The archeomorphological approach to Roman communication research is not as dominant as the application of the least-cost path model, but is still prevalent among individual researchers. As part of landscape archeology, archeomorphology analyzes the morphological features that contribute to the shaping of the landscape.[34] Archaeomorphological analysis, however, has not been accepted by other Roman communication researchers and today is only related to the *Català d'Arqueologia Clàssica Institute*.

The study of Roman communications based on modern methods bears much resemblance to what was called "cabinet research" in the past. It is common for the researchers in both fields to study Roman communications from their cabinets without sufficient knowledge of the geographical area which they study. Namely, the geographical maps used by the proponents of the so-called "cabinet research" has now been replaced by satellite images of the Earth's surface. No matter how realistic this display is, no modern internet service and software can replace the knowledge of the geographical area gained by visiting the terrain. It is certain that the application of modern methods significantly shortens the time required for a single survey, but the results obtained in this way are highly debatable.

There is no doubt that satellite photography and GIS technology give historians various approaches and techniques to studying the past. However, these techniques should be used critically and only as a complement to traditional methods of

[31] Vermeulen et al, 2001, 190.
[32] Branting, 2012, 212; Breier, 2013, 225; Schmid et al, 2017, 311-312.
[33] Schmid et al, 2017, 310.
[34] Matteazzi, 2017, 83.

studying the past.[35] In my opinion, when exploring Roman communications, satellite photography and the least-cost path model can merely serve as a complement to classical research methods, and not at all as the only means of determining the location of a Roman route.

A new approach to research

Research on Roman communications on the northern slopes of Mount Bišina, conducted during 2016 and 2017, was based on the application of traditional methods.[36] This allowed for a better understanding of all the advantages and disadvantages of research based on the aforementioned methods. Firstly, the route of the road in the field was explored, and then there was an attempt to integrate it into the unique system of Roman communications known so far. Sergejevski, Pašalić, and Bojanovski used the same method in the study of Roman roads.[37] "*Given the vastness of the field and its poor communication, such a method would be difficult to apply because it takes time, physical effort, a lot of resources, as well as great teamwork*", Bojanovski points out.[38] In addition, a major weakness of this way of research is that it is based on a case factor. Specifically, the discovery of the remains of a Roman road is the result of an accidental finding rather than an organized and planned research. This method mainly relies on interviewing locals. However, much of the mountainous and hard-to-reach areas today are either completely uninhabited or sparsely populated. Besides, the change in the structure of the population at the end of the 20th century in most of the territory of Bosnia and Herzegovina presents an additional difficulty. Not only was it impossible to interview the local population in certain situations, but the information thus obtained was often incomplete and, in some cases, incorrect.

As can be seen from the previous chapters, there are various methods and techniques for conducting the research on Roman communications. Several methods can cause some confusion for modern researchers about the choice and use of these methods. Furthermore, the choice of methods can be influenced by various external factors, such as the structure of the terrain and its distance from modern communications. In order to facilitate future research, it is necessary, in my opinion, to establish a model that should contain relevant methods and the order to apply them. It is a model that can be applied not only in the territory of Bosnia and Herzegovina, but also geographically much wider.

[35] Gregory, 2003, chapter 1, part 4.
[36] See: Popović, 2018b, 193-2016.
[37] Sergejevski, 1962, 73; Bojanovski, 1974, 25.
[38] Bojanovski, 1974, 25.

The initial phase of any new study of Roman communications should be the determination of the geographical space in which those investigations are to be conducted.[39] Research in a larger geographical area requires more time, as well as more material resources. For this reason, micro-research, that is, research limited to a smaller geographical area, is far more effective. The researchers should then consult the relevant literature. The studies on Roman communications may have already been previously carried out in the area planned for research. For this reason, it is necessary to get acquainted with their results.

The next stage of the research is the study of local monographs, reports from archaeological excavations, as well as scientific works related to the same geographical area in the Middle and New Age. The advantage of local monographs is that their authors are well aware of the geographical area they write about. In their works, they often cite archeological and historical sites about which no relevant scientific literature is available. Scientific works representing the results of the archaeological excavation allow the researcher of Roman roads to gain insight into the locations and distribution of ancient settlements. The presence of the remains of an ancient settlement clearly indicates the existence of one or more roads on the basis of which the settlement was connected to other ancient settlements. In addition, they can contain very meaningful information, such as the mention of an old road near the site.[40] Also, mention of old roads can be found in scholarly works that deal with medieval and modern times.[41] Although it does not mean that it is certainly a remnant of Roman communication, the mere mention of old roads in the literature certainly provides a good starting point when conducting field research.

An important research method when it comes to Roman roads is the study of medieval and Ottoman period travel literature. As early as the mid-nineteenth century, J. Ristić noted that "*no land was visited by foreigners as much as the southeastern parts of Europe*."[42] This is particularly true, especially for the territory

[39] It goes without saying that the researcher must be familiar with historical sources, especially ancient itineraries. *Tabula Peutingeriana* and *Itinerarium Antonini* are relevant for the area of today's Bosnia and Herzegovina. In addition, four epigraphic monuments discovered in Split citing Roman communications built during the appointment of Publius Cornelius Dolabella (Publius Cornelius Dolabella) reveal significant information. For more details on this see: Bojanovski, 1974, 16-18; Glavaš, 2016, 7-12.

[40] A report from the excavation of an early Christian basilica in the village of Zaklopača, east of Vlasenica, mentions the fact that the remains of the old road are located in the immediate vicinity of the basilica. Gabričević states that "*the old Ottoman road is probably on the Roman route*", but he did not say what led him to that conclusion. See: Gabričević, 1973, 74.

[41] An example is the description of the medieval town of Zvornik in Đ. Mazalić's study. It mentions the remains of an old cobblestone road on Mount Bišina, which, about 60 years later, turned out to be road dating from the Roman period. See: Мазалић, 1956, 267; Popović, 2018b, 203.

[42] Ристић, 1854, 209.

of present-day Bosnia and Herzegovina. With the exception of Bojanovski, who mentions old travelogues on two occasions, foreign travel literature has not been used so far in the study of Roman communications.[43] Considering that Bojanovski does not mention travel literature when discussing research methods, we can conclude that the aforementioned researcher is not concerned with the standard use of travel literature in the methodological procedure, only with isolated examples. In addition to many significant pieces of information that can be found in travelogues, such as descriptions of geographical areas and cities, folk costumes and customs, some foreign travelers also left records of Roman roads that they saw during their travel or found out about them otherwise.[44]

Following the above methods, the researcher now has some knowledge of potential Roman communications and is ready to become more familiar with the geography of the terrain where the research is conducted. For this reason, the next phase in the research is represented by old geographical and topographic maps, aerial and satellite photographs.

Old maps can be very useful in exploration. This is especially true of the Austro-Hungarian maps created in the second half of the 19th century and the beginning of the 20th century. For the territory of present-day Bosnia and Herzegovina, especially significant are the cadastral maps created shortly after this area fell under Austro-Hungarian rule. They recorded all the travel communications found by Austro-Hungarian officials in the territory of Bosnia and Herzegovina, as well as those built later. If an ancient communication was in use by the local population in the second half of the 19th century, it was very likely that it would appear in the mentioned maps.[45]

In the case of aerial photographs, it should be noted that older photographs made before or in the mid-20th century are of greater value. The reason lies in the fact that the natural landscape has gone through changes, caused by human activity. Satellite photographs allow the registration of Roman roads that are not visible above the Earth's surface, based on changes in vegetation.

In addition, satellite photographs are very important for getting to know the features and the geography of the terrain, as well as the direction of modern communications that the researcher intends to use when conducting a reconnaissance of the terrain. These methods are the last ones to be used before the field research begins.

However, unlike the case with travelogues, the use of old maps and satellite photographs does not end here, but continues in the course of field research.

[43] See: Bojanovski, 1974, 175; Bojanovski, 1981, 132-133.

[44] See: Fosses, 1822, 24; Skene, 1854, 201-202; Arbuthnot, 1862, 215-216; David, 1924, 149.

[45] Remains of Roman road on Mount Bišina are found on one such Austro-Hungarian map created in 1882. See: Popović, 2018b, 210.

According to Moreno Gallo, "*the reiteration between these two steps will be as frequent as deemed necessary.*"[46]

Going out in the field is the penultimate phase of Roman communications research. It is a process that is repeated on several occasions over a particular time period. Field surveys are conducted in early spring or late fall, while the surveys carried out during the summer yield very limited results due to the lush vegetation. The primary role of the field survey is to confirm or reject, the previously acquired assumptions about the direction of presumed Roman communications, obtained from previous research phases. Carrying out a field survey without prior preparation may not produce the desired results. Interviews with local people, in areas where possible, are necessary during field research. However, as pointed out earlier, the information thus collected must be verified on the ground.

Roman milestones, especially those discovered *in situ*, are also very important for the determination of ancient communications direction.[47] As Bojanovski correctly observes, prehistoric mounds and medieval necropolises, often located near ancient communications, may also be helpful.[48] Archaeological excavations are undertaken in the case of the well-founded assumption that Roman communication exists, even if the remains of the road are not visible on the ground.[49]

Map production and the input and processing of all the data collected in the Geographic Information System, should be the final stage of the research. The use of the "least-cost path" is conditioned by the results of field research. In case the remains of the Roman road are not discovered and if the determination of the direction is made on the basis of the remains of ancient settlements and the milestones, the "least-cost path" makes it possible to calculate the direction of the supposed Roman communication route. However, the results thus obtained must be carefully used.

Conclusion

The differences between traditional and modern methods have led us today to divide researchers according to the methods they use in their work. When referring to different models in the study of the past, Richard Evans pointed out "why do we have to rigidly stick to one model?"[50] We can ask the same question regarding the

[46] Moreno Gallo, 2017, 67.

[47] For more information about the importance of milestones: Sergejevski, 1962, 93-95; Samardžić, 2018, 179-191; Popović, 2019, 201-211.

[48] Bojanovski, 1974, 26.

[49] For more information about the techniques of archaeological excavation of Roman communications: Verdu, 2016, 20-21.

[50] Еванс, 2007, 177.

study of Roman communications. Why do we have to adhere to only one approach or one method in research? All the methods on which Roman communication studies in the past were based, as well as those used in contemporary research, have certain advantages and disadvantages. Contemporary Roman communication research should be based on the application of both traditional and modern methods.

A model that would be applied in the future explorations of Roman roads in the Roman province of Dalmatia has been proposed in order to simplify research and allow greater achievements. The aforementioned model introduces the order of methods on which all new research should be based.

A total of six phases of Roman communication research are envisaged. The first phase consists of determining the geographical area where the research will be conducted, as well as consulting the relevant literature. The second phase consists of the study of local monographs, the reports from archaeological excavations, and the scientific publications relating to a predetermined geographical area in different epochs of the past. The third phase of the research consists of the study of medieval travelogues, as well as travel books created during the Ottoman rule which are considered to be an important source of information on Roman communications. The fourth phase consists of studying old maps, aerial and satellite photographs. Concerning the research based on traditional methods in which going into the field is undertaken at the outset of the survey, the fieldwork is represented as the penultimate, fifth phase of research in the aforementioned model. The final, sixth phase of the survey consists of entering and processing the data, as well as the production of relevant maps.

This model is a combination of the best elements of traditional and modern methods, as well as the so-called cabinet research. Research based on this is the result of scientifically based and planned research aimed at acquiring a more comprehensive knowledge of the Roman road network in Bosnia and Herzegovina, and no longer relies solely on the luck factor in reconnaissance the terrain. In addition, the aforementioned model can be applied to all explorations of Roman roads in the former Roman province of Illyricum.

Translation: Kristina Petrešević, BA with Honours in Philology

Sažetak: Metodologija istraživanja rimskih komunikacija na teritoriji Bosne i Hercegovine

Sve metode istraživanja rimskih komunikacija mogu se podeliti na tradicionalne i moderne. Pod tradicionalnim se podrazumevaju sve one metode korištene u toku XIX i XX veka, koje su se, pre svega, oslanjale na hodološka istraživanja, odnosno, rekognosciranja terena. U moderne metode istraživanja rimskih komunikacija spadaju: satelitske fotografije, Geografski informacioni sistem (GIS) i arheomorfološka analiza. Nastanak i razvoj ovih metoda neizostavno je povezan sa razvojem moderne tehnologije u XXI veku.

Veliki broj različitih metoda i tehnika na osnovu kojih se mogu obavljati istraživanja rimskih komunikacija može da izazove određene zabune kod modernih istraživača oko izbora metoda i njihove upotrebe. Pored toga, na izbor metoda mogu da utiču različiti spoljni činioci, kao što je struktura terena i njegova udaljenost od modernih komunikacija. Da bi se omogućilo lakše izvođenje budućih istraživanja neophodno je ustanoviti jedan model koji treba da sadrži relevantne metode, kao i redosled njihove primene.

Ukupno je predviđeno šest faza istraživanja rimskih komunikacija. Prva faza sastoji se u određenju geografskog prostora na kome će se izvoditi istraživanja, kao i konsultaciji relevantne stručne literature. Drugu fazu čini istraživanje lokalnih monografija, izveštaja sa arheoloških iskopavanja i naučnih publikacija koji se odnose na prethodno određen geografski predeo u različitim epohama prošlosti. Treća faza istraživanja sastoji se u proučavanju srednjovekovne i novovekovne putopisne literature, kao važnog izvora informacija o rimskim komunikacijama. Četvrtu fazu sačinjava proučavanje starih karti, aerosnimaka i satelitskih fotografija. U odnosu na istraživanja zasnovana na tradicionalnim metodama u kojima se obilazak terena obavlja na samom početku istraživanja, pomenuti model predviđa terenski rad kao pretposlednju, petu fazu istraživanja. Završna, šesta faza istraživanja sastoji se od unosa i obrade podataka u Geografskom informacionom sistemu, kao i izrade relevantnih karti.

Navedeni model predstavlja kombinaciju najboljih elemenata tradicionalnih i modernih metoda, kao i tzv. kabinetskog istraživanja. Na ovaj način zasnovano istraživanje ne oslanja se više samo na faktor sreće prilikom rekognosciranja terena, već je rezultat naučno zasnovanih i planski vođenih istraživanja, koja za cilj imaju sticanje celovitijeg saznanja o rimskoj putnoj mreži na teritoriji Bosne i Hercegovine. Pored toga, prethodno pomenuti model je moguće primeniti na sva istraživanja rimskih puteva na prostoru nekadašnje rimske provincije Illyricum.

Ključne reči: rimski putevi, metodologija, Geografski informacioni sistem, rimska provincija Dalmacija

BIBLIOGRAPHY

Literary Sources

– Arbuthnot G. 1862, *Herzegovina; or Omer Pacha and the cristian rebels*, London 1862.

– David P. 1924. *Extraits du journal de Pierre David*, Revue d'histoire diplomatique, Société d'histoire diplomatique XXXVIII, Paris 1924, 141-169.

– Fosses C. 1822, *Voyage en Bosnie, dans les année 1807 et 1808*, Paris 1822.

– Skene J. H. 1854, The Danubian Principalities, *The Frontier Lands of the Christian and the Turk*, Vol. 2, London 1854.

Literature

– Balif F. 1891, *Rimska cesta od Prologa preko Donjeg Unca i Petrovca u dolinu Sane*, Zemaljski muzej Bosne i Hercegovine, Glasnik III, knj. 4, Sarajevo 1891, 395-404.

– Ballif P. 1893, *Römische Strassen in Bosnien und der Hercegovina*, Wien, 1893.

– Bekker-Nielsen T. 2000, *New Approaches to the Study of Roman Roads***,** 19th International Congress of Historical Sciences, Oslo 2000, 1-6.

– Bojanovski I. 1974, *Dolabelin sistem cesta u rimskoj provinciji Dalmaciji*, Akademija nauka i umjetnosti Bosne i Hercegovine, Djela XLVII, CBI 2, Sarajevo 1974.

– Bojanovski I. 1981, *Prilozi za topografiju rimskih i predrimskih komunikacija i naselja u rimskoj provinciji Dalmaciji* (*s posebnim obzirom na područje Bosne i Hercegovine*), III – Prilog proučavanju antičkih naselja i komunikacija u istočnoj Bosni, Akademija nauka i umjetnosti Bosne i Hercegovine, Godišnjak XIX, CBI 17, Sarajevo 1981, 125-199.

– Bojanovski I. 1984, *Prilozi za topografiju rimskih i predrimskih komunikacija i naselja u rimskoj provinciji Dalmaciji* (*s posebnim obzirom na područje Bosne i Hercegovine*), IV – Rimska cesta Siscia – Sirmium (Tab. Peut.) i njena topografija, Akademija nauka i umjetnosti Bosne i Hercegovine, Godišnjak XXII, CBI 20, Sarajevo 1984, 146-266.

– Branting S. 2012, *Seven Solutions for Seven Problems with Least cost pathways*, in: Least Cost Analysis of Social Landscapes, A. D. White / S. L. Surface-Evans (eds.), Salt Lake City 2012, 209-224.

– Breier M. 2013, *Getting Around in the Past: Historical Road Modelling*, in: Understanding Different Geographies, K. Kriz et al. (eds.), Springer Science & Business Media 2013, 215-226.

– Динић М. 1937, *Дубровачка средњевековна каравански трговина*, Југословенски историјски часопис 3, Београд 1937, 119-146.

– Diwan G. A. / Doumit J. 2017, *The Berytus-Heliopolis Baalbak road in the Roman Period: A Least Cost Path Analysis*, Mediterranean Archaeology and Archaeometry 17/3, Rhodes 2017, 225-241.

– Fonte J. / Parcero Oubiña C. / Costa-García J. M. 2017*, A gis-based analysis of the rationale behind roman roads. The case of the so-called via XVII* (*NW Iberian Peninsula*), Mediterranean Archaeology and Archaeometry 17/3, Rhodes 2017, 163-189.

– Evans A. 1883, *Antiquarian researches in Illyricum*, part I and II, The Archeologia vol. XLVIII, Westminster 1883.

– Еванс Р. 2007, *У одбрану историје*, Београд 2007.

– Gabričević M. 1973, *Izvještaj sa probnog iskopavanja ranohrišćanske bazilike u Nikolićima kod Vlasenice*, Muzej Istočne Bosne, *Članci i građa* X, Tuzla 1973, 73-75.

– Moreno Gallo, I. 2017, *Roman roads in Castilla y Leon: from the identification to the WebGIS*, in: La route antique et médiévale: nouvelles approches, nouveaux outils, Sara Zanni (ed.), Bordeaux 2017, 55-71.

– Glavaš I. 2016, *Zabluda o petoj Dolabelinoj ploči iz Salone – natpis CIL 3, 3199-10157*, *Tusculum* 9, Solin 2016, 7-12.

– Gračanin H. 2010, *Rimske prometnice i komunikacije u kasnoantičkoj južnoj Panoniji*, Scrinia Slavonica 10, Slavonski Brod 2010, 9-69.

– Güimil-Fariña A. / Parcero-Oubiña C. 2015, *Dotting the joins: A non-reconstructive use of Least Cost Paths to approach ancient roads. The case of the Roman roads in the NW Iberian Peninsula*, Journal of Archaeological Science 54, February 2015, 31-44.

– Gregory I. N. 2003, *A place in history: A guide to using GIS in historical research*, Oxford, chapter 1, part 4, (http://hds.essex.ac.uk/g2gp/gis/index.asp), Pristupljeno 9. 5. 2019.

– Kovačević D. 1961, *Trgovina u srednjovjekovnoj Bosni*, Naučno Društvo NR Bosne i Hercegovine, Djela XVIII, Odeljenje istorijsko-filoloških nauka 13, Sarajevo 1961.

– Мазалић Ђ. 1956, *Звоник* (*Зворник*) *стари град на Дрини* (*крај*), Земаљски музеј Босне и Херцеговине, Гласник XI, нова серија, Сарајево 1956, 243-278.

– Matteazzi M. 2017, *All the Roads to Patavium*: *Morphologz, Genesis and Development of the Roman Road Network Around Padua*, Open Archaeology 3, 2017, 83-100.

– Miller C. 1916, *Itineraria romana*, Römanische Reisewege an der Hand der Tabula peutingeriana, Stuttgart 1916.

– Panaite A. / Miu C. 2016, *Roman roads identified on aerial and satellite images within the territory of the city of Tropaeum Traiani* (*Moesia Inferior*), Academie Roumaine, Dacia LX, București 2016, 201-220.

– Pašalić E. 1965, *Problem istraživanja ilirskih i rimskih cesta u provinciji Dalmaciji*, Filozofski fakultet u Sarajevu, Radovi 3, Sarajevo 1965, 243-260.

– Pandža Ž. / Vukoper S. 2016, *Rimska cesta od Vida* (*Narona*) *u doline Neretve do sela Cicina – Hum kod Trebinja*, Hercegovina, 2 – 2016, serija 3, Mostar – Zagreb 2016, 25-63.

– Paškvalin V. 1988, *Bojanovski*, *Ivo*, u: Arheološki leksikon Bosne i Hercegovine I, Borivoj Čović, (ur.), Sarajevo 1988, 63.

– Поповић М. Ст. 2013, *Да ли су класична историјска географија византијског света и ГИС технологија противречност? О употреби савремених технологија у хуманистичким наукама*, Српска академија наука и уметности, Зборник радова Византиолошког института L/1, Београд 2013, 1025-1039.

– Popović G. / Veletovac E. / Šačić Beća A. 2017, *Recently discovered Basilica from Late Antiquitz and a Tombstone Stela from Mramorak near Osmaci*, Akademija nauka i umjetnosti Bosne i Hercegovine, Godišnjak 46, CBI, Sarajevo 2017, 184-202.

– Popović G. 2018a, *Putna stanica Ad Drinum*, Institut za historiju, Prilozi 47, Sarajevo 2018, 11-30.

– Popović G. 2018b, *Rimske komunikacije u sjeveroistočnoj Bosni sa posebnim osvrtom na novootkrivenu dionicu puta na planini Bišini*, Udruženje za proučavanje i promoviranje Ilirskog naslijeđa i drevnih i klasičnih civilizacija *Bathinvs*, *Acta Ilyrica* II, broj 2, Sarajevo 2018, 193-216.

– Popović, G. 2019, *Milestones from the Roman Road Drinjača - Sarajevsko Polje*. Zbornik radova Filozofskog fakulteta u Prištini 49/3, Kosovska Mitrovica 2019, 201-211

– Ристић Ј. 1854, *О историчной важности успомена стариі путника неки, кои су крозъ srbiю прошли*, *а осовито Бертрандона де ла Брокіера*, Друштво Србске Словености, *Гласникъ* VI, Београд 1854, 209-226.

– Samardžić G. 2018, *Epigrafski miljokazi i njihov značaj za proučavanje rimskih komunikacija na jugu provincije Dalmacije*, Udruženje za proučavanje i promoviranje Ilirskog naslijeđa i drevnih i klasičnih civilizacija *Bathinvs*, *Acta Illyrica* II, Sarajevo 2018, 179-191.

– Schmid D. / Popović M. St. / Breier M. 2017, *From the Via Egnatia to Prilep, Bitola and Ohrid*, in: *Space, Landscapes and Settlements in Byzantium*, A. Külzer – M. St. Popović (eds.), Vienna – Novi Sad 2017, 289-317.

– Sergejevski D. 1948, *Rimska cesta na Nevesinjskom polju,* Zemaljski muzej Bosne i Hercegovine, Glasnik III, Nova serija, Sarajevo 1948, 43-61.
– Sergejevski D. 1962, *Rimska cesta od Epidauruma do Anderbe*, Zemaljski muzej Bosne i Hercegovine, Glasnik XVII, Nova serija, Sarajevo 1962, 73-105.
– Tomaschek W. 1880, *Die vor-slawische Topographie der Bosna, Herzegowina, Crna Gora und der angrenzenden Gebiete*, Mitteilungen der Kaiserlich-Königlichen Geographischen Gesellschaft in Wien, Band XXIII, Wien 1880, 497-528.
– Truhelka Ć. 1891, *Rimska cesta u kotaru srebreničkom*, Zemaljski muzej Bosne i Hercegovine, Glasnik III, sv. III, Sarajevo 1891, 239-245.
– Verdu A. S. 2016, *Unearthing the Roads of Roman Hispania: Evolution of Theories, Methodologies and Value Enhancement Techniques*, International Journal of Student Research in Archaeology 1, No 1, march 2016, 15-29.
– Vermeulen F. / Antrop M. / Hageman B. / Wiedemann T. 2001. *Ancient Roads and Fields in Northwestern Gaul – A GIS-Based Analysis*, in: Computing Archaeology for Understanding the Past, Stančič, Z. and T. Veljanovski (eds.), Computer Applications and Quantitative Methods in Archaeology, Proceedings of the 28th Conference, Ljubljana, April 2000, Archaeopress, Oxford 2001, 187-196.
– Zanni S. / De Rosa A. 2019, *Remote Sensing Analyses on Sentinel-2 Images: Looking for Roman Roads in Srem Region (Serbia)*, in: Earth Observation, Remote Sensing and Geoscientific Ground Investigations for Archaeological and Heritage Research, Deodato Tapete (ed.), Basel 2019, 27-44. (Reprinted from: *Geosciences* 2019, 9, 25, doi: 10.3390/geosciences9010025).