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Road network of Crete in Tabula Peutingeriana

Keywords: History of maps; Tabula Peutingeriana; ancient road networks; Crete; digital technologies and historic maps; cartometry.

Summary

In history of cartography and maps the Tabula Peutingeriana it is considered one of the most important cartographic representations of roman itineraria and an important source for the history of late roman antiquity, especially concerning the road networks implying the mobility pattern in the roman era. It represents almost the whole of the Roman Empire, from the Iberian Peninsula to its east end. The map was originally designed in the 4th c. a. C. and is known from its 13th c. copy. In this paper we visit the “peutingerian” Crete as depicted in Tabula Peutingeriana in terms of modern digital image technologies, analyzing the relevance of the road network in association to Cretan toponyms in comparison to modern cartographic counterparts.

Introduction

Tabula Peutingeriana is the most representative piece of cartography of the Roman era, dated in 4th c. A.C. (335-66). It is widely known from a copy of the original manuscript, drawn in 1265 by an anonymous monk of Colmar in Alsace. One of the two preserved samples of roman *itineraria scripta*¹, a cartographic type of geographic and military character, which was popular in ancient Rome, it depicts thoroughly the ancient roman road network from the Iberian Peninsula until Middle East, surrounding the Mediterranean Sea (Figure 1). The original work² was compiled by the Roman Castorius (366)³ and in 1265 an anonymous Alsatian monk, known as the Monk of Colmar, transcribes the original to an exact(?) copy, apparently without any important additions. The manuscript, made up of 11 parchments scrolls about 34 cm high each and 6,74 m. long altogether assembled⁴, was

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¹ In late antique cartography, the main sources are the written documents (*itineraria scripta*, written in Latin) and the depicted documents (*itineraria picta*), both addressed mainly to travelers.

² Probably by assembling individual itineraries. Talbert 2007, Author.

³ Or earlier, around 300 a. C., reflecting the geographic and cartographic tradition of Alexandria, according Talbert 2007, Peutinger’s Roman Map.

⁴ The first parchment, showing Iberian Peninsula and part of England, is missing. If we suppose that there was one more missing parchment at the left end of the map, then the original must had 12 parch-

discovered in 1494 by Konrad Celtes⁵, turned over in 1507/8 to the collector Konrad Peutinger⁶ in Augsburg. After his death was sold by auction in 1714 and it is known since then as *Tabula Peutingeriana*. Today the manuscript belongs to the Austrian National Library (Österreichische Nationalbibliothek) in Vienna⁷.

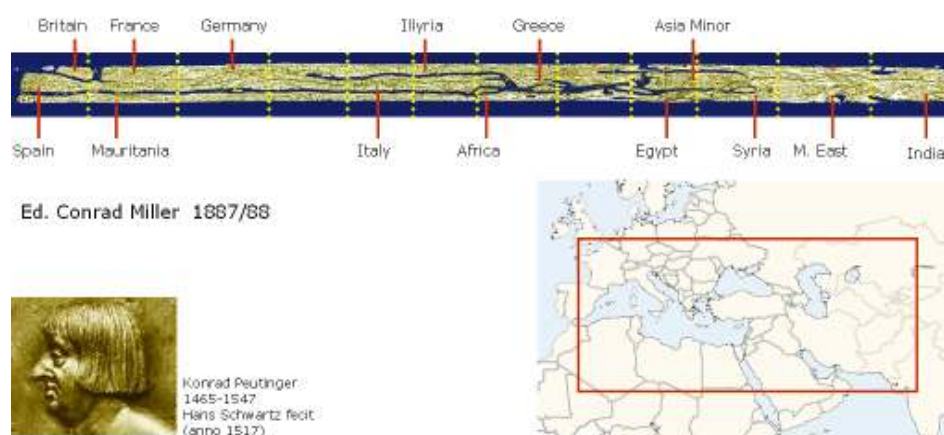


Figure 1. Tabula Peutingeriana, ed. Conrad Miller (1887/88). The map depicts the region between Spain and the Middle East (see guide map).

According to actual cartographic terminology Tabula Peutingeriana is a typical example of a thematic road map preserving mainly the topology of geographic continuity rather than the conventional cartographic representation. The strongly deformed shape, mainly in terms of latitude, does not preserve any rational cartographic scale or orientation in any of Tabula's twelve sheets. Despite its overall deformation, the distances, at least between the main cities, are defined with sufficient accuracy. The map depicts the road network in the Roman Empire, almost 70.000 roman miles⁸ long which equals ca. 104.000 km of

ment-sheets, so that the total length of the map whole would be ca. 7,45 m. Recently, Talbert 2007, in his *Peutinger's Roman map*, pointed that in fact ...*there is no knowing to what further length the map originally extended at its lost lefthand end, nor whether the copy's righthand end was also that of the original*, suggesting that the mapmaker should site Rome at the centre of the map, which leads to the conclusion that there should be 3 missing parchments at the lefthand and of the map, from the Atlantic Ocean to India and Taprobane. See also Talbert 2007, Konrad Miller.

⁵ Konrad Celtes (1459-1508), German poet and scholar at the times of Emperor Maximilian I.

⁶ Konrad Peutinger, German humanist, antiquarian and economist, "homo litteratus, vir doctus", was born in 1465 in Augusta. Intelligent and well educated man of his era, he was Maximilian's I friend and consultant. See Biblioteca Augustana, http://www2.fh-augsburg.de/~Harsch/Chronologia/Lspost16/Peutinger/peu_intr.html

⁷ For this project we used the digital reproduction of Konrad Miller's edition of Tabula Peutingeriana (1887/88), in Biblioteca Augustana, http://www.fh-augsburg.de/~harsch/Chronologia/Lspost03/Tabula/tab_manu.html. There is also modern representations of the Roman World, on which are depicted the routes appearing on the Tabula Peutingeriana, and listed in the Antonine Itinerary and Bordeaux/ Jerusalem Itinerary. This work, *Recueil des Itinéraires Anciens*, by A. Fortia d' Urban, was published in 1845 and was accompanied by ten maps by P. Lapie. According Talbert 2007, A Forgotten Masterpiece, the editor Konrad Miller was aware of Lapie's maps when he was preparing his own edition. See also Talbert 2007, Konrad Miller for details about Konrad Miller's edition. There is at least four articles on the Tabula Peutingeriana, edited by R. J. A. Talbert recently (see bibliography)

⁸ For Gaul the distances are mentioned in leagues, for Persia in parasangs and for India in Indian miles.

roads length and sea routes. In addition, almost 300.000 toponyms are reported on map according the *cursus publicus*⁹.

Depicting in topological consistency the road network and offering travel information to its users (by showing the road network, the settlements, the staging posts, the partial distances, the cities of various type, depending on their size and significance etc. -hundreds of functional place symbols, used with classified differentiation, are used for the depiction of all these features –see Figure 2), the map proves its obvious utility value: showing to the traveller, in a schematic way, what lay ahead of him and how far. The deformations of the coastline course and of the geoshapes in Tabula makes today its reading unfamiliar and complicated for the non-experts, but the thematic information contained is considered of great significance, mostly for the depiction and the semantics of the ancient road networks in late roman antiquity¹⁰.



Figure 2. Samples of symbols used in Tabula Peutingeriana: road, cities (commercial, administrative, military centres), mansiones, mutationes, baths, buildings, pharos, distance between stations, geographical characteristics (mountain, river, sea, gulf, forests).

Crete and the other Mediterranean islands

In Tabula, the area of modern Greece is depicted in 3 map-sheets (Figure 3, 4). The anonymous cartographer seems to consider of special importance the Mediterranean islands, among them the island of Crete. The important geographic position of Crete in the centre of a periphery consisted of Africa, Europe, the insular complex of Cyclades and Asia Minor is shown in Figure 5. At the time Tabula Peutingeriana was constructed, Crete is a separate administrative district in Eastern Roman Empire, with its centre in Gortys, the modern Herakleion.

The cartographer's choice in Tabula was to refer in detail only three major islands of the Mediterranean Sea: Sicily, Crete and Cyprus, with their cities, the road networks, some geographical characteristics and other details. Islands of minor importance at the time, such as the Valearides Islands, Cosrica, Sardenia, Rhodes, are just depicted with their names, without any other detail (Figure 6).

⁹ The roman imperial road office. Drakoulis 2007

¹⁰ Livieratos 1997, 2007.

The relative size of the Mediterranean is really impressive: while Crete is the less extended between the five major Mediterranean islands, after Sicily, Sardinia, Cyprus and Corsica, it is also depicted much bigger than the other islands (Figure 7).

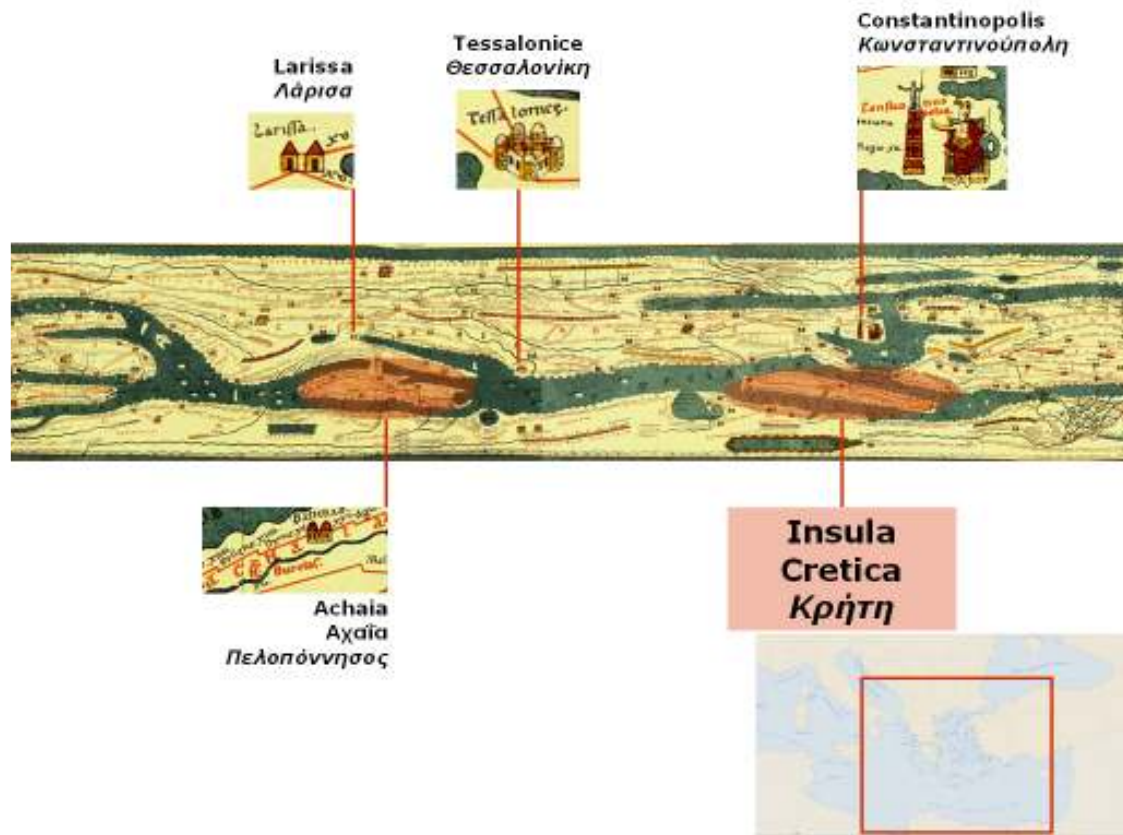


Figure 3. Greece in 3 map sheets of Tabula Peutingeriana (VIII, VI, X).

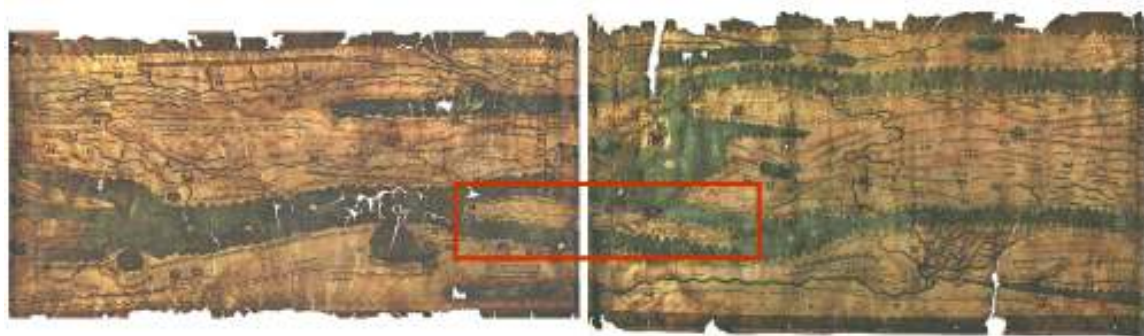


Figure 4. The two parchments depicting Crete.



Figure 5. Crete’s relevant geographic position in between Southern Europe, Northern Africa, Asia Minor and the island group of Cyclades.



Figure 6. Major Mediterranean islands in Tabula Peutingeriana and in modern map.

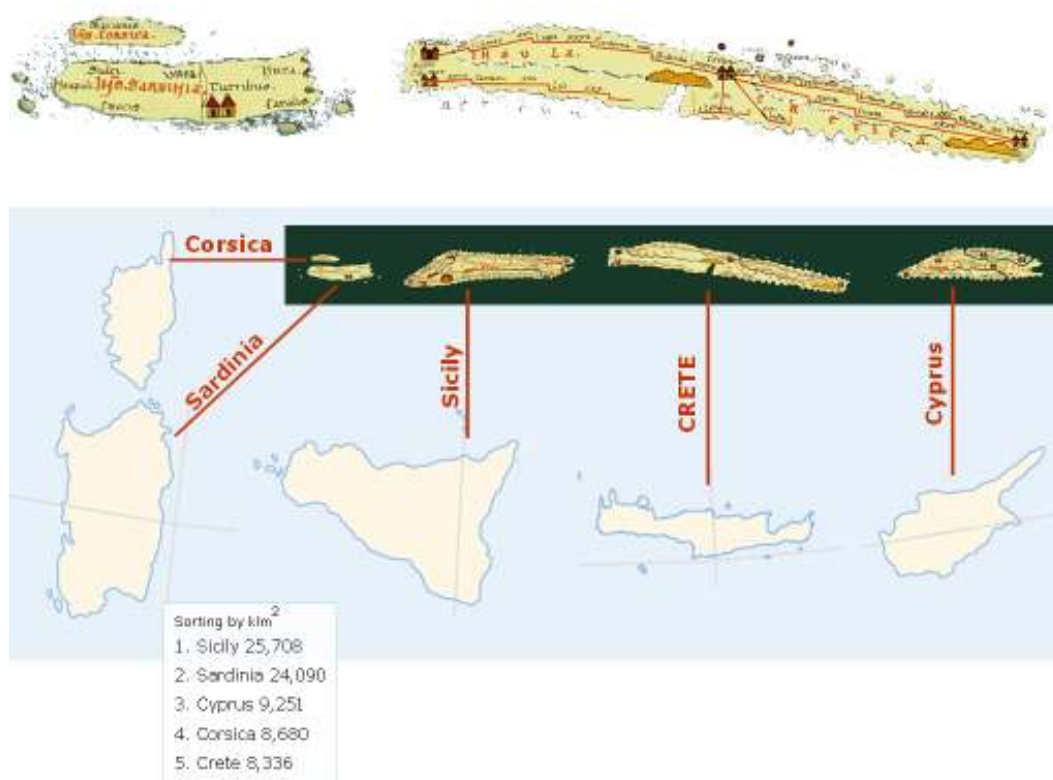


Figure 7. The major Mediterranean islands. Crete is depicted bigger than all the other islands, although its area is the least extended.

It seems that Tabula's cartographer chooses to focus on Crete, in terms of surface exaggeration while at the same time recognises that in the other islands there are more places worth to refer, e.g. six major cities and bath complexes in Sicily and five major cities in Cyprus instead of the four major cities depicted in Crete. Moreover, Corsica and Sardinia, whereas bigger in area than Crete, they are depicted much smaller in Tabula almost without any other characteristic except their name, without any road network at all. It is obvious that the cartographer's choice reflects the minor importance of these two islands in travelling and sea routing at that time¹¹.

The road network, the cities, the geophysical characteristics of Crete

All eighteen Cretan cities reported in Tabula Peutingeriana, four major and fourteen minor, are identified thanks to archaeological evidence related to known cities of late antiquity, more or less important (Table 1). Some minor cities of the roman period, still existing at the time Tabula was designed, but not depicted on it, are Aptera, Polyrenia, Horion, Dreros, Apollonia (Figures 8¹², 9).

¹¹ Talbert is also wondering about Sardinia's obvious extreme deformation and disorientation comparing to Sicily, Crete and Cyprus, pointing that the *presentation of Sardinia's network might be thought to pose more difficulty than those of Sicily, Crete or Cyprus*. See more in Talbert 2007, Peutinger's Roman Map

¹² In this study all modern maps of Crete (Figs. 8, 11, 12, 15) are from Boutoura et al. 1999

The map depicts the road network with a red curved line (without any alteration of roads), with each intersection marking a staging point, a city or simply the distance corresponding to one day route¹³. The distances between the stations are indicated in roman miles, in Latin writing. Before making any conversion in kilometres, we should keep in mind that we are dealing with a disaccord between the written sources and the archaeological evidence: while according the literary tradition 1 roman mile equals 1,48 km, the archaeological research and the identification of known distances give us the equivalence of 1 roman mile to 1,52 km (Table 2).

No	Peutinger	Ancient name	Modern name (GR)	Modern name (EN)
1	Cydonea	Κυδωνία	Χανιά	Chania
2	Cortys	Γόρτυς/Κόρτυς	Γόρτυνα	Gortyna
3	Cisamos	Κίσαμος	Καστέλι Κισάμου	Kasteli Kisamou
4	Hiera	Ιεράπυτνα	Ιεράπετρα	Ierapetra
5	Cisamos	Κίσαμος	Καλάμι	Kalami
6	Lappa	Λάππα	Αργυρούπολη	Argyroupoli
7	Eleuterna	Ελεύθερνα	Ελεύθερνα	Eleftherna
8	Subrita	Σύβριτα	Θρόνος	Thronos
9	Cnoso	Κνωσός	Κνωσός	Knosos
10	Cresonesso	Χερσόνησος	Χερσόνησος	Hersonisos
11	Littum	Λυττός/Λύκτος	Λυττός	Lytos
12	Arcade	Αρκάδες	Αφράτι	Afrati
13	Blenna	Βιέννα	Άνω Βιάννος	Ano Vianos
14	Cantano	Κάντανος	Κάντανος	Kantanos
15	Liso	Λισός	Άγ. Κήρυκος	Agios Kirikos
16	Ledena	Λεβήν	Λέντας	Lentas
17	Lisia	Λασαία	Λασαία	Lasea
18	Inata	Ίνατος	Τσούτσουρος	Tsoutsouros

Table 1. Ancient Cretan cities and their identification with modern toponyms.



Figure 8. Modern Cretan cities identified with ancient cities.

¹³ Talbert 2007, Author... : *By the third century, if not long before, there were frequent stopping-points established at least along the empire's main routes [...] in a day's journey of 20 to 25 miles travelers could expect to encounter one [stopping point], if not two.*



Figure 9. Ancient Cretan cities in Tabula Peutingeriana, their identification with modern toponyms and the distances between them in roman miles.

It is not easy at all to compare the distances in ancient road networks with their modern counterparts. In some cases, where the distance is not great and the geomorphology leaves no space for alternative routes, we have an almost accurate coincidence: e.g. the distance of ca. 48 km in Tabula between Tsoutsouros / Inata and Hieria / Ierapetra corresponds to 50 km today. The distance of ca. 12 km in Tabula between Cydonia / Chania and Cisamos / Kalami corresponds to 18 km today. The same holds for the distance Cortina / Gortyna to Ledena / Lentas, ca. 18 km in Tabula, 20 km today, or Cantano / Kantanos to Liso / Agios Kirikos, ca. 24 km in Tabula, 20 km today. In most of the cases the differences seem to exceed 10%, while in some cases the modern road distances seem to be longer than the ancient (Figure 10, 11, Table 2).

In Tabula Peutingeriana four major and fourteen minor cities are placed in Crete. The major are: 1. Cortina¹⁴, 2. Cydonea¹⁵, 3. Cisamos¹⁶, 4. Hieria¹⁷, 5. Cisamos¹⁸ and the minor: 6. Lappa¹⁹, 7. Eleuterna²⁰, 8. Subrita²¹, 9. Cnosos²², 10. Cresonessa²³, 11. Littum²⁴, 12. Arcade²⁵, 13. Blenna²⁶, 14. Inata²⁷, 15. Lisia²⁸, 16. Ledena²⁹, 17. Liso³⁰ and 18. Cantano³¹.

¹⁴ Γόρτυνα or Γορτύνη or Cortina / Κόρτυς=κραταιά, strong (Gortyna). Modern region of Aghioi Deka and Metropolis, province Kainourgios. Built in the banks of the river Lithaios, modern Mitropolianos, ~45 km. From modern Herakleion, the ancient city was extended in Messara valley, close to the village Aghioi Deka. Ancient tradition refers to the city as Ελώτις, Λάρισα, Κρημνία (Helotis, Larissa, Krimnia). According Strabo (1, 478), Gortys was the second major Cretan city, following Knossos, and was laying in a valley, with two ports in Libyan Sea, Matalos and Levin (Μάταλος, Λεβήν).

¹⁵ Κυδωνία (Kydonia), modern Chania, one of the most important Minoan cities (ku-do-ni-ja in the Linear B boards). According literary sources, it was one of the three cities founded by king Minoas (Diodorus V, 78.2).

¹⁶ Κίσσαμος (Kisamos), modern Kasteli Kissamou. Seaport of Polyrhena, in modern gulf of Kissamos.

¹⁷ Ιεράπιτνα (Ierapetra), modern Ierapetra, 36 km away from Agios Nikolaos.

¹⁸ The second city with the same name mentioned in Tabula Peutingeriana. Ptolemy mention the cape Kisamos and the city Kisamos. Probably we have here a second Kisamos, seaport of Aptaera (near Lappa, modern Kalami Apokoronou, between Chania and Rethymnon).

¹⁹ Λάππα, Λάπιη ή Λάμπη (Lapa), modern Argyroupolis, 27 km away from Rethymn, built on a hill in little distance from the sea, between the rivers Mousela and Petre. Foinix was its seaport.

²⁰ Ελεύθερνα (Eleftherna), North-West of modern Prines of Mylopotamos, elevation 380 m.

Despite the deformation, it is not difficult to identify some geographical features: Without giving any names, we recognize two mountains, probably Idi (or Lefka Ori?) and Dikti. The first at the top of a gulf (Ormos Mesaras) in the South and the second in the East part of the island. A river flows from each mountain, the first from Idi / Lefka Ori westwards to the sea next to Cydonia and the second from Dikti also westwards flowing to the sea near Knosos, crossing the roads from Gortys to Inatos and from Gortys to Knosos.



Figure 10. Distances (km) between the Cretan cities depicted in Tabula Peutingeriana.

²¹ Σύβριτα or Συβρίτα or Σίβυρτος or Σούβριτος or Σούβριτα and Σύβριτος (Sybritos), modern Thronos. It was built in the main road, connecting north (Messara valley) and south coast. Its seaport was Soulia, modern Aghia Galini..

²² Κνωσός (Knosos), 5 km south from Herakleion.

²³ Χερρόνησος or Χερσόνησος (Hersonisos), modern Hersonissos Pediados, seaport of Lyktos, between Herakleion and Olous.

²⁴ Λυττός or Λύκτος (Lyktos), North-East of modern Xydas and South-East of Knossos, 39 km. away from Herakleion, near Libyan Sea. Its seaport was Hersonissos.

²⁵ Αρκάδες or Αρκαδία (Arkades), modern Profitis Ilias, near Afrati Pediados.

²⁶ Βιάννος or Βιέννος (Vianos), today near Epano Viannos.

²⁷ Ίνατος or Είνατος (Inatos), seaport of Priansos, near modern Tsoutsouros Monofatsiou, at the debouchement of the river Midris. Inatos is mentioned in Linear B boards (wi-na-to).

²⁸ Λασαία (Lasaia).

²⁹ Λεβήν (Levin), modern Lenta Kainourgiou, seaport of Gortyna.

³⁰ Λισός (Lisos), modern Aghios Kirykos (Ai-Kyrkos). Religious centre of the cities in southeasteran Crete.

³¹ Κάντανος (Kantanos), modern Kantanos Selinou.



Figure 11. Distances (km) between the major Cretan cities in Tabula Peutingeriana and today's approximate distance.

With its centre in Gortys, the road network of Crete according to Tabula Peutingeriana is developed³² radially in the following pattern (Figure 12, Table 2):

1. A road in the East, connecting Gortys with Ierapytna, through Knosos, Hersonisos, Lyttos, Arcades and Bienna.
2. A second road³³ connecting Gortys with Ierapytna, through Inatos.
3. A road in the North-West, connecting Gortys with Cydonia and the port of Cisamos, through Sybrita, Eleftherna, Lappa and Cisamos.
- 4-5. Two independent roads, connecting Gortys with Lentas and Lasaia (We should mention here that the position of the two ports is reverted than their identification from the archaeological research).
6. A road appearing not to be connected with the rest of the network, in the West, connecting Cisamos with Lisos through Cantanos (The road ends at an anonymous station, giving the distance from Lisos). Although it seems in the Tabula Peutingeriana that this road develops at the South-West, it is obvious in the modern map that it develops along the West coast of the island³⁴.
7. Finally, without depicting any road, the distance between Cydonia (Chania) and Cisamos (Kasteli) is indicated 32 roman miles, ca. 48 km, whilst this distance today

³² In other cases, the road networks are consisted from "backbone" routes, accompanying by a variety of routes in a comprehensible sequence. See Talbert 2007, Author

³³ It appears that it was not rare to include two or more alternative routes between a pair of points, with or without indication for the reasons. See more on Talbert 2007, Author

³⁴ According Talbert 2007, Konrad Miller, there is also other places where the mapmaker seems to avoid laying out routes "vertically" for any great distances [...] the mapmaker wants to present routes "horizontally".

is 39 km along the motorway). It is interesting to point out the deformed depiction of the West part of the island. In Tabula Peutingeriana the cities are set out in a way that Cisamos is collocated in the South West extreme end of the island, while the archaeological research identifies it with modern Kasteli, at the North West extreme point³⁵.

Road	T. P. Cities	T.P. Distance to next city		T.P. Distance to next city		Modern distance to next city (km)			Modern Cities
		Roman miles	23	km 1 m=1.48 km	km 1m=1.52 km	Motorway	+ /or	Non paved road	
1	Cortina	XXIII	23	34,04	34,96	51		-	Gortyna
	Cnosos	XVII	17	25,16	25,84	31	+	-	Knosos
	Cresonesso	XVI	16	23,68	24,32	11	+	7	Hersonisos
	Littum	XVI	16	23,68	24,32	70	or	17	Lytos
	Arcade	XXX	30	44,4	45,6	18	+	13	Afrati
	Blenna	XX	20	29,6	30,4	-		46	Ano Vianos
	Hiera								Ierapetra
2	Cortina	XXIII	24	35,52	36,48	102	or	48	Gortyna
	Inata	XXXII	32	47,36	48,64	-		50	Tsoutsouros
	Hiera								Ierapetra
3	Cortina	XXXII	32	47,36	48,64	-		56	Gortyna
	Subrita	VIII	8	11,84	12,16			23	Thronos
						38	+	34	
	Eleftherna	XXXII	32	47,36	48,64	37	+	35	Eleftherna
	Lappa	VIII	9	13,32	13,68	25	+	10	Argyroupoli
	Cisamos	VIII	8	11,84	12,16	18		-	Kalami
	Cydonia							Chania	
4	Cortina	XII	12	17,76	18,24	42	or	20	Gortyna
	Ledena								Lentas
5	Cortina	XVI	16	23,68	24,32	22	+	11	Gortyna
	Lisia								Lasea
6	Cisamos	XXIII	24	35,52	36,48	-		28	Kasteli
	Cantano	XVI	16	23,68	24,32	-		20	Kantanos
	Liso	XXX	30	44,4	45,6	-		-	Ag. Kirikos
	?								
7	Cydonia	XXXII	32	47,36	48,64	39		-	Chania
	Cisamos								Kasteli

Table 2. Distances between cities in roman miles and kilometres [m: Roman miles; T.P.: Tabula Peutingeriana].

³⁵ Moreover, the geomorphology in the South west part of the island were it appears to be marked the road between Cisamos and Lisos in Tabula Peutingeriana, still does not allow the creation of a modern road network.

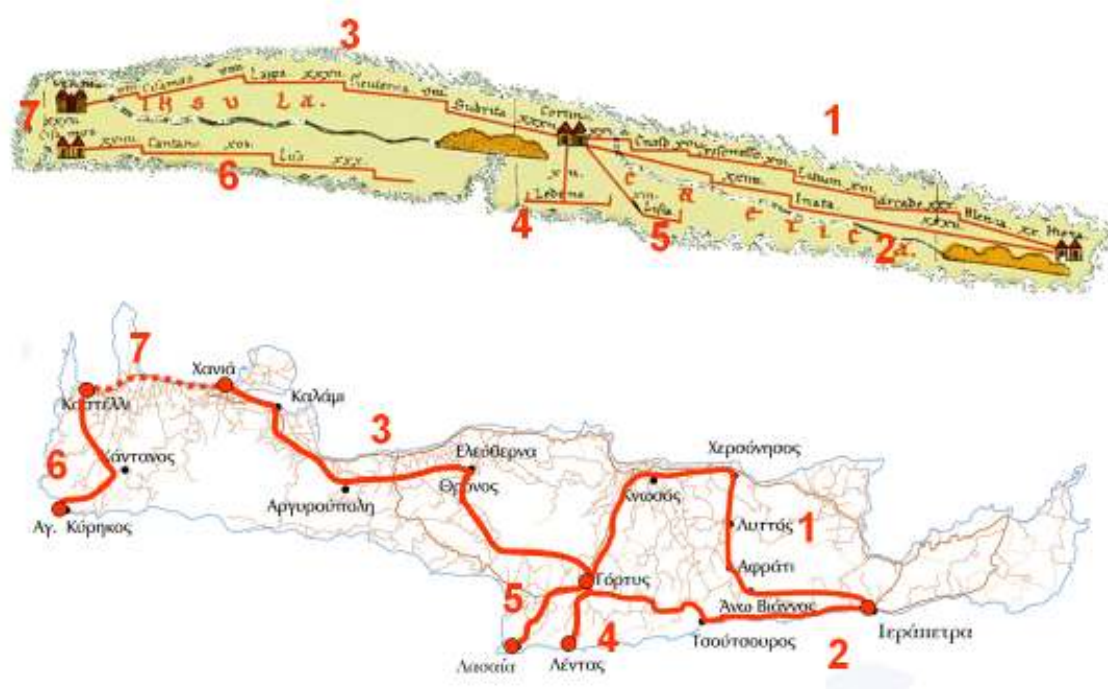


Figure 12. Crete's road network in Tabula Peutingeriana and the relevant road network in a modern map.

To its biggest part, the road network in Tabula Peutingeriana seems to follow the same roads that are in use still today, mostly because the main mountains in the centre of the island do not allow many more alternative routes. It is interesting although that the distances of Tabula Peutingeriana's roads lead us to search and find in most cases modern non paved roads (of approximate same length), while the modern motorways follow other directions: only a small part of the ancient road network is identified with motorways, in most cases it seems that the ancient road network followed roads still existing, but still not paved (Figure 13, 14, 15). For example, even today there is no direct connection of Ierapetra with the other cities mentioned in Tabula Peutingeriana except via non paved roads: e.g. between Hersonisos and Lyttos or Lyttos and Afrati or Afrati and Ano Viannos or between Ano Viannos and Ierapetra, a big part of the route should be done through the mountains, via non paved roads. In some cases the motorway forces us to make a much more kilometres –see for example the case of the route between Gortyna and Tsoutsouros (Inata), 102 km by motorway, 48 via non paved roads. Following the modern motorway rather than a non-paved road could result much more kilometres: the route between Lytos (Littum) and Afrati (Arcade), 30 roman miles [= ca. 45 km], counts 70 km via the modern motorway and 31 km via non paved roads (Figure 14). There is only one point where we should note a great –and for that interesting– variance: the road connecting directly Eleftherna and Sybrita (Figure 15), with the indication of 8 roman miles [= ca. 12 km], while there is no such a short modern road, even non-paved, connecting directly the two cities.



Figure 13. The part of the modern motorway network identified with parts of the ancient routes mentioned in Tabula Peutingeriana. The connection between the rest networks is done through non-paved roads.

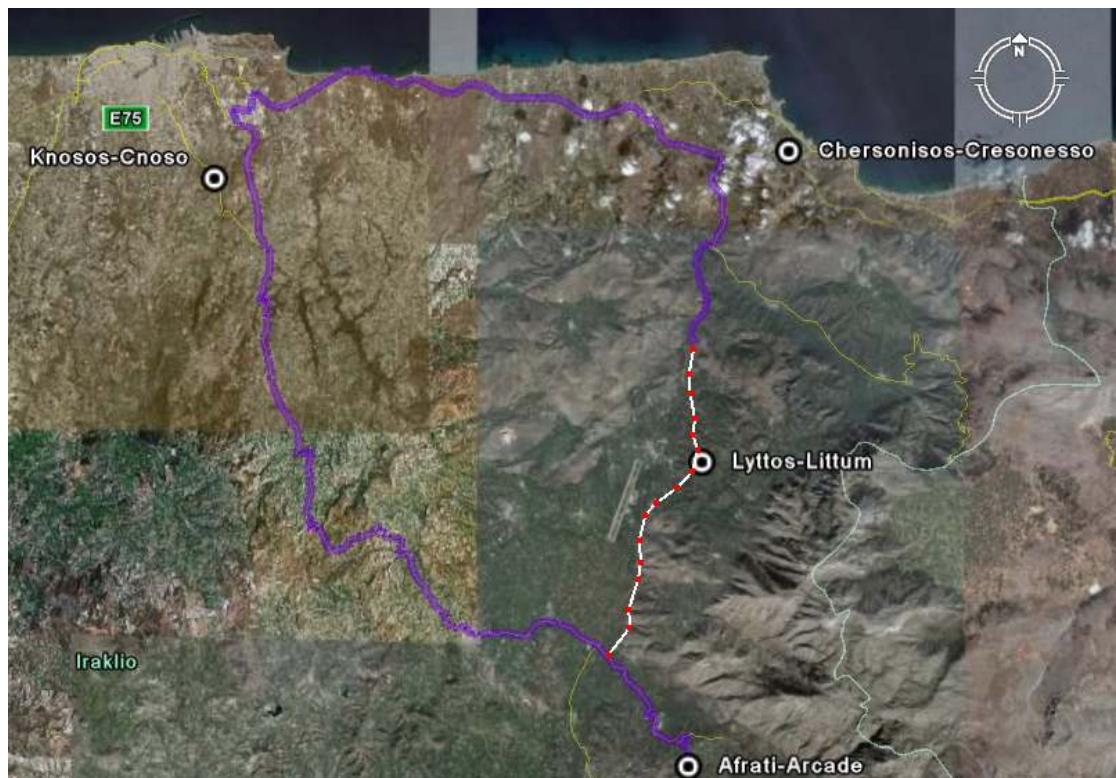


Figure 14. Following the modern motorway to go from Lyttos (Littum) to Afrati (Arcade) results with ~70 km, while the direct connection through non-paved road is ~31 km and Tabula Peutingeriana indicates ~45 km.



Figure 15. According to Tabula Peutingeriana, the distance between Sybrita and Eleftherna is ~12 km. To the modern road network, the visitor has to travel 34 km of non-paved road + 38 of motorway or cover ~24 km through the mountains.

Conclusions

Introducing literary sources, archaeological and modern evidence in the study of historical maps applying modern digital technologies and a relevant methodology (Figure 16), one could draw useful information about:

1. the importance of the specific island at the time the Tabula Peutingeriana was constructed (4th century)
2. its relative significance with respect to the rest of the major Mediterranean islands

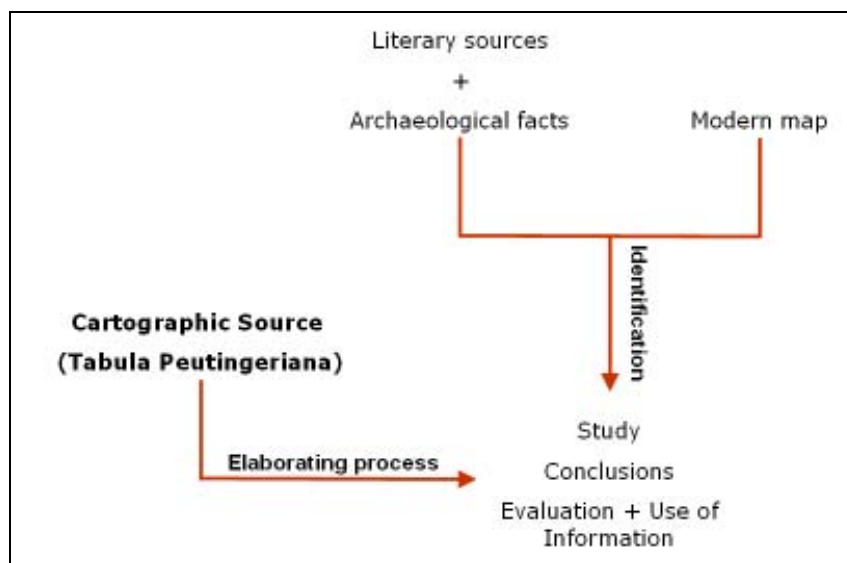


Figure 16. The methodological scheme in studying the road networks in Tabula Peutingeriana.

3. the function of the road network and the unveiling of its functionality
4. the identification of significant cities, in relation to the road network, and their classification according to their importance in the network (1st level - 2nd level - simple stations)
5. the relative distances between cities
6. the identification and comparison with modern networks
7. the portrayal and evaluation of the Cretan road network during late antiquity.

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