

An Ancient Road Network and Settlements in the Central ash-Sharah Area in the Hinterland of Petra

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Abstract

This paper presents the archaeological evidence for the existence of an ancient road network in the study area of the Central ash-Sharah area. It presents a detailed description of the route and general characteristics of each road, and its relation with the ancient settlement sites in its proximity and with other ancient roads. The paper discusses also other aspects relevant to the topic such the date of the recorded road network, and the nature of the ancient occupation in the study area.

Keywords: Petra, roads, ash-Sharah, settlements, Nabataean.

Introduction

In 2011 and 2014, the authors initiated two field campaigns to record and map ancient road networks in the hinterland of Petra. The ongoing project is called the Petra Hinterland Ancient Roads Project (PHARP), and the study area covers the ash-Sharah mountains between Shoubak and Ras an-Naqeb. The study area was divided into three major areas and each major area was divided into smaller sub-areas. The three major areas, from north to south, are: Shoubak-Petra area, Petra-as-Sadaqa area, as-Sadaqa-Ras an-Naqeb area. This paper presents the archaeological evidence from the sub-area number two (Petra-as-Sadaqa area) or the Central ash-Sharah area. This sub-area is well encircled by the modern road network of the Wadi Musa-Taybeh road, the Taybeh-Ayl road, and the Ayl-Basta-Wadi Musa road (Fig. 01). Several ancient roads were recorded in this sub-area and the discussion below considers them all.

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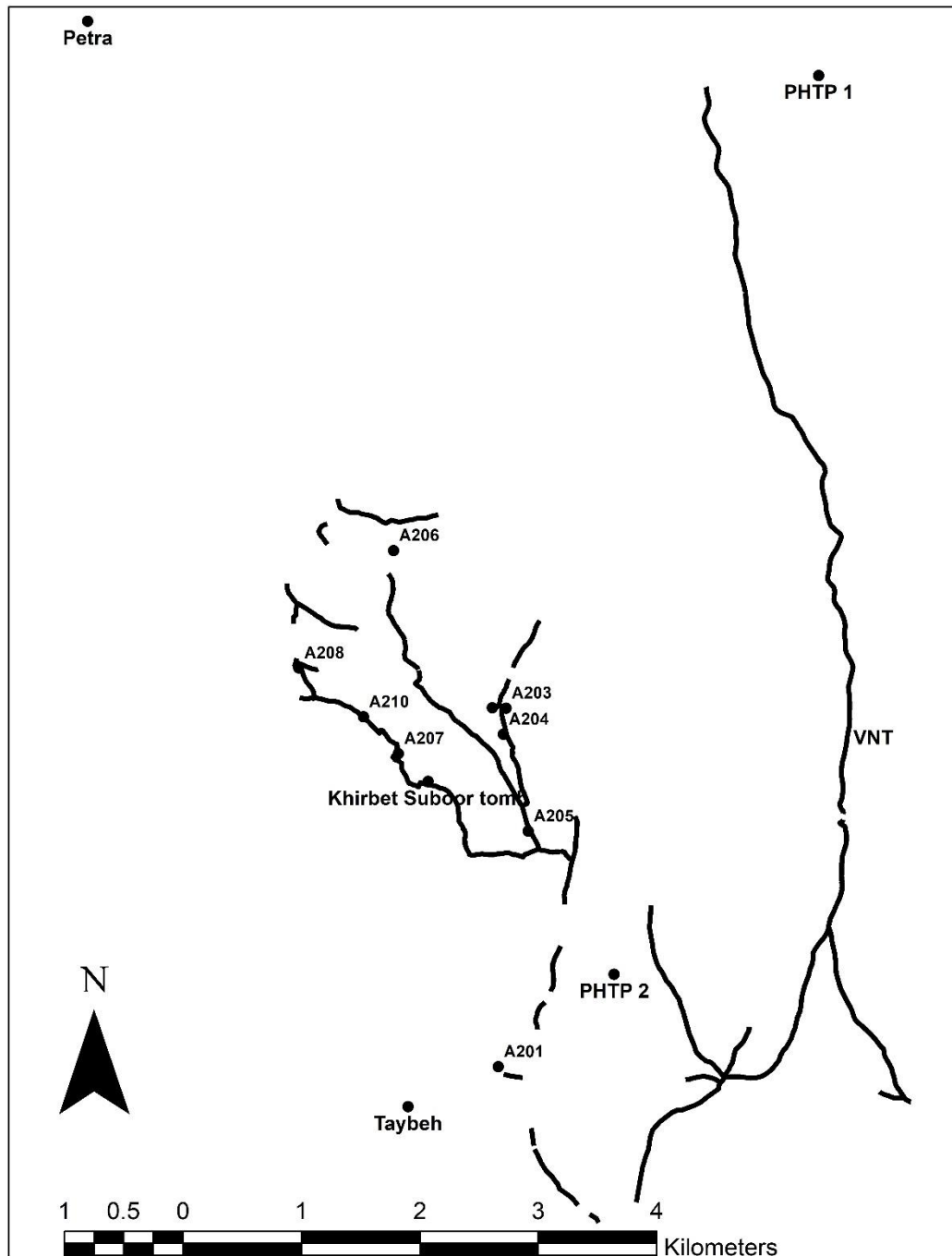


Figure 01: Map of the study area (by F. Abudanah).

Fieldwork Methodology

The team utilized Google Earth and Bing Maps to locate some segments of the ancient roads while other tracts were identified in the field. All of the traceable routes (including major and minor secondary routes, and pathways) were measured, photographed, and recorded. Team members walked down the centre of the road, wherever it was possible, between the two walls defining the route of the road. Unlike the Roman roads, the ancient

roads in the study area are mostly defined by stone walls, rather than by curb stones. For the purpose of mapping the roads, a GPS device was used while walking any stretch of all roads. The device was usually set up to take a point (coordinates) every three metres along the route of the roads. The accuracy was variable, but remained between 1.15 and 2m. The device used for this project was a Sokkia GRX1. The coordinates were then uploaded to ArcMap 10 to draw the paths of the roads and produce a proper map. The majority of roads do not have names and they were therefore given the names of sites they terminate at, serve or pass.

Previous Studies

The study area was previously investigated by certain fieldwork projects including the study of the Roman Highway, the *via nova Traiana*, between 1986 and 1989 by Graf and Humphrey (1995). Graf and Humphrey recorded and discussed ancient roads in the study areas, but their main objective was the *via nova Traiana*; they recorded two roads in the study area and suggested that either of them could be part of the *via nova Traiana* between Petra and as-Sadaqa (Graf and Humphrey 1995). In the 1990s, Tholbecq initiated a survey to study the ancient settlements in the hinterland of Petra, including the study area (Tholbecq 2001 and 2013; the sites of his study are preceded by the letters JSS). However, Tholbecq did not consider the ancient road network in the area because "...this question has been adequately addressed in the past..." (2001: 403) and recorded the sites which he managed to pick up from aerial photographs. Tholbecq's study remains quite important since it added new information to our knowledge, particularly the chronology of the settlements which are connected directly and indirectly to the road network under discussion. The study area was partly investigated by the Shammakh to Ayl Archaeological Survey (SAAS) in 2010 – 2012 (MacDonald et al. 2016). In this respect also, Wadeson and Abudanah (2014 and 2016) recorded several Nabataean tombs in the hinterland of Petra in 2012, some of which lie in the study area (i. e. PHTP 2). In 2014, the Petra Hinterland Agricultural Sites Project (PHASP) thoroughly investigated and documented ancient agricultural sites associated with ancient roads (Ladurner and Abudanah 2014).

The Archaeological Evidence

The discussion of the archaeological evidence goes with the assumption that Petra was the main destination and the nexus of many ancient roads in the study area. This assumption is based on the evidence from the hinterland of Petra which indicates that it witnessed significant socio-cultural and economic development during the periods when Petra was prosperous. Thus, roads would have radiated from Petra to its hinterland and beyond in all directions including the study area. Depending on this assumption, the roads were traced from the nearest spots to Petra, wherever a trace or a stretch of a road exists.

The al-Hujaim Road

This road was first traced from a point south of the al-Hujaim spring (SAAS 80) on a hillside overlooking the abovementioned spring. Its path is defined by two low stone walls and its width ranges between 3m and 5m at most without pavement (Fig. 02). The road heads south to southwest passing few ancient sites before it intersects another road approaching Bir Salman from Wadi al-Hariqa. Three walls (probably roads) intersect the al-Hujaim road, one running west and two running east. A minor road branches off it and

terminates at an ancient site (JSS174, A202) located on a high and flat hill (Fig. 03). The main road continues south over flat and high terrain and passes another ancient site, square and slightly smaller than the first site (A203). Not too far from these sites, there is an ancient settlement site (JSS133, A204) which is obviously disturbed by a bulldozer due to the creation of a modern dirt track southeast of the ancient site. It was noticed that the road widens to about 5m, over the long ridge south of the first two sites it passes. The al-Hujaim road is not well preserved throughout its entire path due to recent agricultural activities including the buildup of dirt tracks. No traces of this road were seen anywhere northwest of the al-Hujaim spring on the way towards Petra. In fact, if a road had ever run over that area between Petra and the al-Hujaim spring, it would have been clearly overlapped and disturbed by the modern dirt track. Graf and Humphrey (1995: 248-249) discovered a milestone at Bir Sarah (SAAS 79) northwest of the al-Hujaim spring, which might confirm the presence of an ancient road in the area. He points out that a road from Bir Sarah continues southward via the al-Hujaim spring passing the settlement of Dhaha (A202 and A203), the forts of Khirbet Mirrkab (A204?) and Diqah, Bir Salman (Ibn Saed), and the settlements of Majdal and Mudawara. They obviously refer to a single road, while the evidence collected by the authors of this paper indicates the existence of other roads, before and after Bir Salman. The ancient road passing the al-Hujaim spring does not continue beyond Bir Salman, it intersects the road which runs in the valley northwest of Bir Salman and terminates on it. Graf and Humphrey (1995: 248) called this route “the central route” and nominated it to be a possible path for the *via nova Traiana* between Petra and as-Sadaqa. He based his nomination for this road on the milestone at Bir Sarah, and the distance of 18 RM between Petra and as-Sadaqa marked on the *Tabula Peutingeriana*. Finally, the current authors believe that the al-Hujaim road is only a minor road connecting the rural settlements it serves with Petra. It could have also been used by those who would travel south from Petra since it connects with other major regional roads like the so-called the King’s Highway (Abudanah et al. 2016; Abudanah et al. 2017).



Figure 02: Photo of the al-Hujaim road (by F. Abudanah).

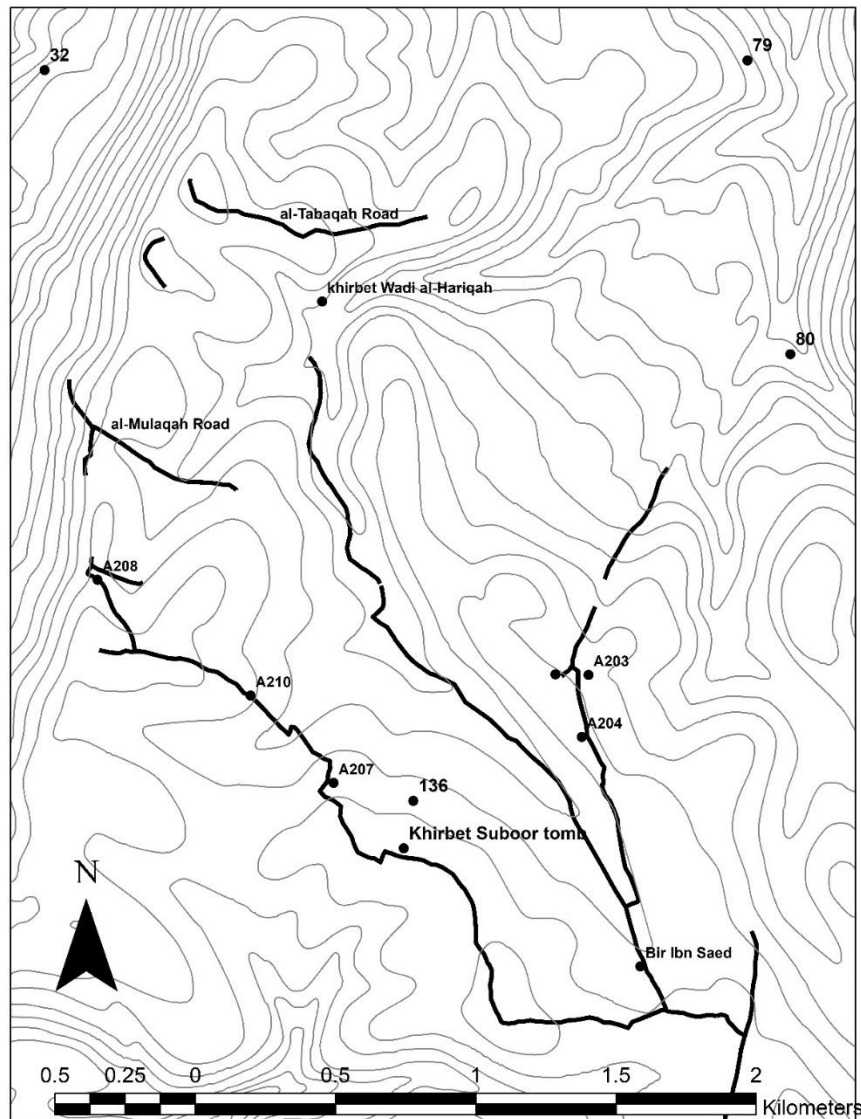


Figure 03: Map of the al-Hujaim road and other roads in the study area (by F. Abudanah).

Bir Ibn Saed or the Bir Salman Road (Fig. 03).

This road was traced from a point south of Khirbet Wadi al-Hariqa (KWH). It evidently runs through Wadi al-Hariqa (Wadi al-Maghar in Tholbecq 2013: 310) and may continue towards Petra via the valley, but no traces of it were seen in the valley below the khirbeh. The latter appears to be a settlement site, farmstead, located on a lower slope and associated with caves on either side of the valley. Moreover, despite the fact that there is no chance to find any traces of this road below the khirbeh, due to recent farming activities, it is quite possible that this road may have intersected the al-Hujaim road at some point. Between Khirbet Wadi al-Hariqa and Bir Ibn Saed, the road is traceable and its path fairly well preserved since it is defined by two retaining walls, 3-5m apart and exceeding 1 m in height in some places (Fig. 04). The western wall, the upper one, is always higher in order to stop

any land-sliding and keep the path of the road clear. It is also bounded, on either side, by agricultural fields, and no milestones or flagstones were found along its route. The road runs over relatively easy terrain to a point east of Bir Ibn Saed where it ascends a gentle slope and heads southward. Bir Ibn Saed is a watering place associated with a small structure, and both are located to the west of this road. A minor road, or a pathway, appears to branch off this road and heads westward a few hundred metres southwest of Khirbet Wadi al-Hariqa. This pathway evidently connects between Khirbet Wadi al-Hariqa and another ancient site (A207) located on a gentle slope between agricultural fields. This minor road or pathway meets the minor road that branches off the Bir Salman road and passes Khirbet Suboor (Abudanh et al. 2011). Other minor roads or pathways, branching off the Bir Ibn Saed road and heading west, were suspected along its path. However, recent and ancient agricultural activities have changed the landscape and make it hard to trace any of these roads or pathways. Such pathways were necessary for farmers to move between their fields and for transportation to their settlement sites, particularly during harvesting seasons. The suspected roads intersect the main road perpendicularly and by this, they define the fields in regular units. A little less than a hundred meters after Bir Ibn Saed, the road splits into two minor roads. One heads southwest and then west, and the second one heads southeast to intersect a major road. The first minor road runs on level terrain for a short distance and then ascends a hillside and runs over a high ridge until it arrives at Khirbet Suboor (Fig. 05). A track heading west off the Suboor road to Ayn Suboor was suspected on a point about 300m south of the khirbeh. A short pathway or a corridor connects Khirbet Suboor, which consists of a Nabataean tomb surrounded by a regular stone enclosure, with the road that passes the site and continues northeast (Abudanh et al. 2011). It descends a gentle slope, winding between fields, passing a rectangular ruined structure (A207), and meets the pathway which emerges from the Bir Ibn Saed road south of KWH. A minor road branches off the Khirbet Suboor road on the slope northeast of site A207. It runs northwest ascending a hillside passing a settlement site A210 and continues further west to intersect another road (the Ridge Road). Another minor road appears to branch off the Suboor road and heads west from a point west of Khirbet Suboor, and it is highly likely the same road recorded over the ridge east of Queen Rania Hospital (the Ridge Road). Finally, it should be noted that Khirbet Suboor road is not well-preserved and only one wall defining its path for a considerable distance can be detected due to recent agricultural activities. It also does not have a consistent width and orientation. It winds between fields and changes course at right angles in some places to avoid the agricultural fields.



Figure 04: Photo of the Bir Ibn Saed (Bir Salman) road (by F. Abudanah).

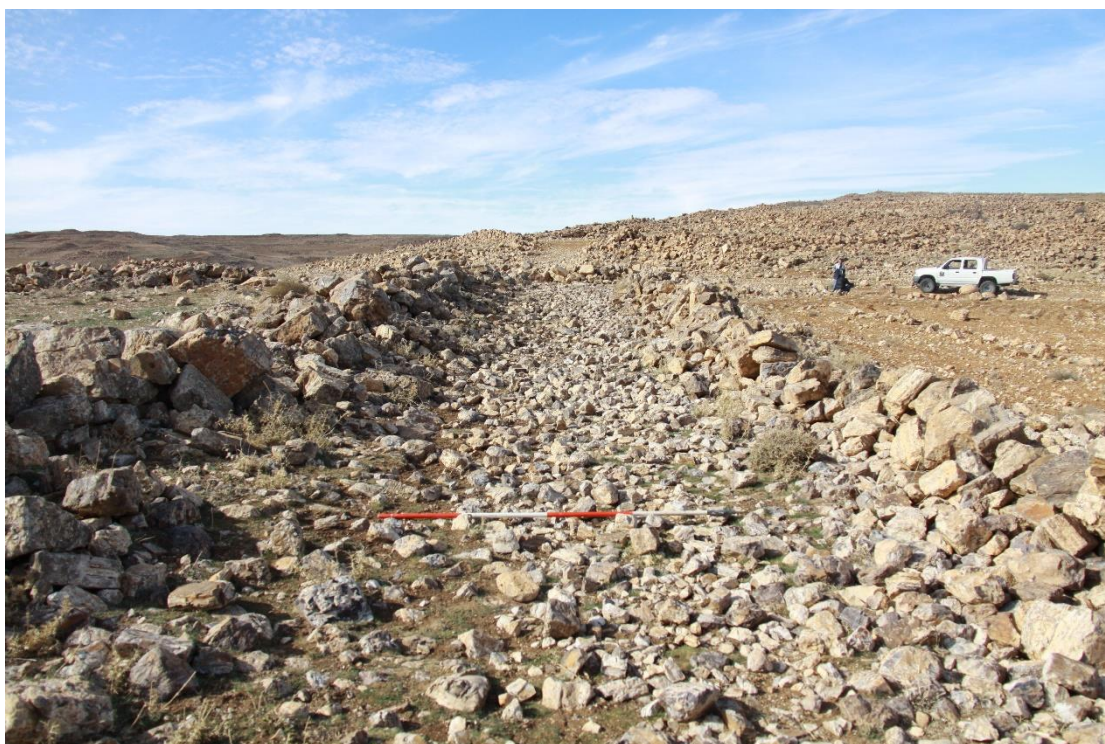


Figure 05: Photo of the Khirbet Suboor road near Bir Ibn Saed (by F. Abudanah).

The Ridge Road

This road was given this name because it runs over the ridge east of Queen Rania Hospital and parallel to the modern road between Wadi Musa and Taybeh. It, as mentioned above, branches off the Khirbet Suboor road and runs westward before it recourses northwest and extends along the ridge (Fig. 03). This road, despite running for a considerable distance and being defined by two stone walls, one on either side (Fig. 06), is not well preserved and is hard to trace throughout its entire length. As usual, recent farming activities and building dirt tracks by bulldozers caused this destruction. However, unexpectedly a short stretch of this road is still fairly well preserved on the northwestern upper slope of the ridge near Wadi Musa. The Ridge Road is intersected by a few secondary roads and pathways, running mostly east-west connecting settlement sites with each other or with water sources. The east-west minor roads and pathways also give access to agricultural fields and connect between the north-west major roads. The first minor road intersecting the Ridge Road was seen northwest of Khirbet Suboor and extends southwest to the ancient and traditional settlement site at Dar Abu Saadah. The latter site was located on a high ridge overlooking the town of Taybeh and consists of a traditional house built on ancient structures and a large ancient rectangular structure (winepress) east of the traditional house (Abudanah and Hasanat 2020: 4). The surface material at the site indicates its importance and the intensive and long use of the site up to the twentieth century AD. The minor road does not terminate at the site but continues further south and southwest to a water source associated with some ancient structures. About 0.5 km to the northwest, another minor road intersects the Ridge Road from the east and continues further west to the edge of the ridge where it terminates. This minor road, as mentioned above, emerges from the Khirbet Suboor road. Not too far from the previous junction, a short minor road branches off the Ridge Road and heads east to southeast connecting a small ancient site (A208) with the main road. It follows the same contour line between two terraces avoiding the agricultural fields. The small ancient site is associated with a cistern or a winepress; of which just a rectangular basin covered with waterproof plaster can be seen (for the winepress see Abudanah and Hasanat 2020). The fourth minor road intersecting the Ridge Road is located on a spot southeast of Khirbet al-Muallaqa (SAAS 32) (Kh. al-Mu‘allaq in Tholbecq 2013: 310). It is not well preserved and can be hardly traced due to the construction of a dirt track, and the latter overlaps considerable segments of its path. This minor road approaches the Ridge Road from the east and continues westward over the sheer slopes of the high ridge. Its starting point is not clear in the east but it appears to terminate at some ancient sites located on the middle and lower slopes, overlooking Wadi Araba to the west. Ancient sites, small and large, including the famous Khirbet al-Muallaqa and Khirbet Braq can be found on either side of the modern road between Wadi Musa and Taybeh (Graf and Humphrey 1995: 250, Tholbecq et al. 2018, Al Farajat et al. 2021). The existence of an ancient major road, following the route of the modern road between Wadi Musa and Taybeh (Graf and Humphrey 1995: 250), is quite possible and is will be discussed in this paper. Finally, the last minor road intersecting the Ridge Road was seen first in the al-Tabaqa area and from there it heads westward towards the ridge. However, it is not clear where this road exactly meets the Ridge Road because both roads are not preserved at the assumed intersection point. This minor road appears to branch off the al-Hujaim road at a point southwest of Bir Sarah (SS95; SAAS 79). It runs over a hilly area ascending gentle slopes west of the al-Hujaim spring and northwest of Khirbet Wadi al-

Hariqa. It is defined by two low stone walls and is about 3-4m wide without pavement. Two small structures (SS109 Kh. at-Tabaqa; Tholbecq 2013: 310), the function of which is not known, significantly flank the road at a certain point. A short distance west of the two structures, a wall/road, extending almost north-south, intersects this road perpendicularly.



Figure 06: Photo of a short segment of the Ridge Road (by F. Abudanah).

The al-Mudawara-al-Majdal Road (Fig. 07).

In their discussion of the route of the Roman highway, the *via nova Traiana*, Graf and Humphrey (1995: 248-250) refer to one road in the area between Bir Sarah and the modern road between Taybeh and Ayl. In contrast, this study presents new evidence confirming the existence of other ancient roads as discussed above. Bir Salman road splits into two minor roads; one heading west and called the Khirbet Suboor road and the other one runs southeast. The latter connects with a major road running almost north-south and can be traced at several places. The study of Graf and Humphrey (1995: 249) revealed a road heading south from Bir Salman (Bir Ibn Saed) and passing the settlements of al-Mudawara and al-Majdal, but for some reasons Graf could not notice that this road is not the same road passing Bir Salman. Unfortunately, neither the field investigations nor the aerial images could help in deciding the start of this road despite its obvious monumentality. However, judging from the topography where the last stretch of it was traced, it appears that this road emerges from a point somewhere near the al-Hujaim spring. It should have continued north through the valley it runs in, but the annual, heavy cultivation of the land may have caused its disappearance. The general layout of this road is not so different from the roads discussed above except in its width and length. It is defined by two stone walls, 1m high in some places, and its width significantly ranges between 4 and 8m in some places

without pavement. In terms of its length, this road is a major one and extends for several kilometers beyond the southern limit of the study area, the modern Taybeh-Ayl road. It is still traceable despite the fact that a modern road overlapped its path and took considerable parts of it (Fig. 08). A number of minor roads run mostly northwest-southeast or west-east, branching off this road in the study area. These roads either terminate at settlement sites or pass them to connect them with other sites, with major roads and water sources. A careful investigation of these minor roads, from north to south, led to the discovery of three roads. Other minor roads, branching off the al-Mudawara-al-Majdal road, may exist or used to exist but cannot be traced due to the change in the landscape over time, and by recent human activities such as agriculture. Three minor roads, branching off this road, were recorded during the fieldwork. The first one was seen east of Bir Ibn Saed and it runs southeast from a point very close to the northernmost end of the al-Mudawara-al-Majdal road. It crosses a valley to ascend a hillside and splits into two minor roads (A and B) on relatively flat terrain. The minor road A heads southeast and passes the ancient site of Khirbet Samra which is just located on the edge of this road (Fig. 07). It continues further beyond the site between fields in low land until it meets another minor road below Khirbet Qunaifdeh. The latter road branches off the possible route of the Roman Highway, the *via nova Traina*, in the area of al-Bitahi and runs for a considerable distance until it arrives at Khirbet Qunaifdeh. From the point where the two roads intersect each other, a pathway or a minor road ascends a hilly area and extends southwest to Ayn Mabrak. The Minor Road B heads southeast and east in a small valley passing a settlement site, located on the upper slope and overlooking the road. This road continues southeast and then east until it intersects the assumed path of the *via nova Traina* in the area of al-Bitahi. All of the abovementioned roads are defined by two walls, approximately 3m apart, and without pavement. However, the annual, heavy cultivation of the area, by villagers from Basta and Taybeh, and the construction of modern dirt tracks negatively affected the state of preservation of these roads. Therefore, it is quite difficult to trace these roads in some places without being familiar with the layout of ancient roads in the study area. The second minor road branching off the al-Mudawara-al-Majdal road is not well preserved and can hardly be traced. It is a short one and connects Khirbet al-Majdal, which is a large settlement site associated with a spring (Graf and Humphrey 1995: 248), with the major road. The third minor road branches off the al-Mudawara-al-Majdal road and heads eastward to Ayn and Khirbet Mabrak. The latter is a settlement site located on the upper slopes of the famous mountain of Mabrak ('Amr and al-Momani 2001) overlooking the spring in the gully. This road appears to continue eastward to Ayl and intersect the *via nova Traiana* which has long been suspected to pass Ayl (Graf and Humphrey 1995; 'Amr and al-Momani 2001; Abudanah et al. 2016). Paved stretches of an ancient road and a milestone have been long reported at Ayl. A water channel was also recorded between Mabrak and Ayl ('Amr and al-Momani 2001). This road is also defined by two stone walls, 3m apart and without pavement. It is not well preserved east of Ayn Mabrak but fairly well preserved west of it.

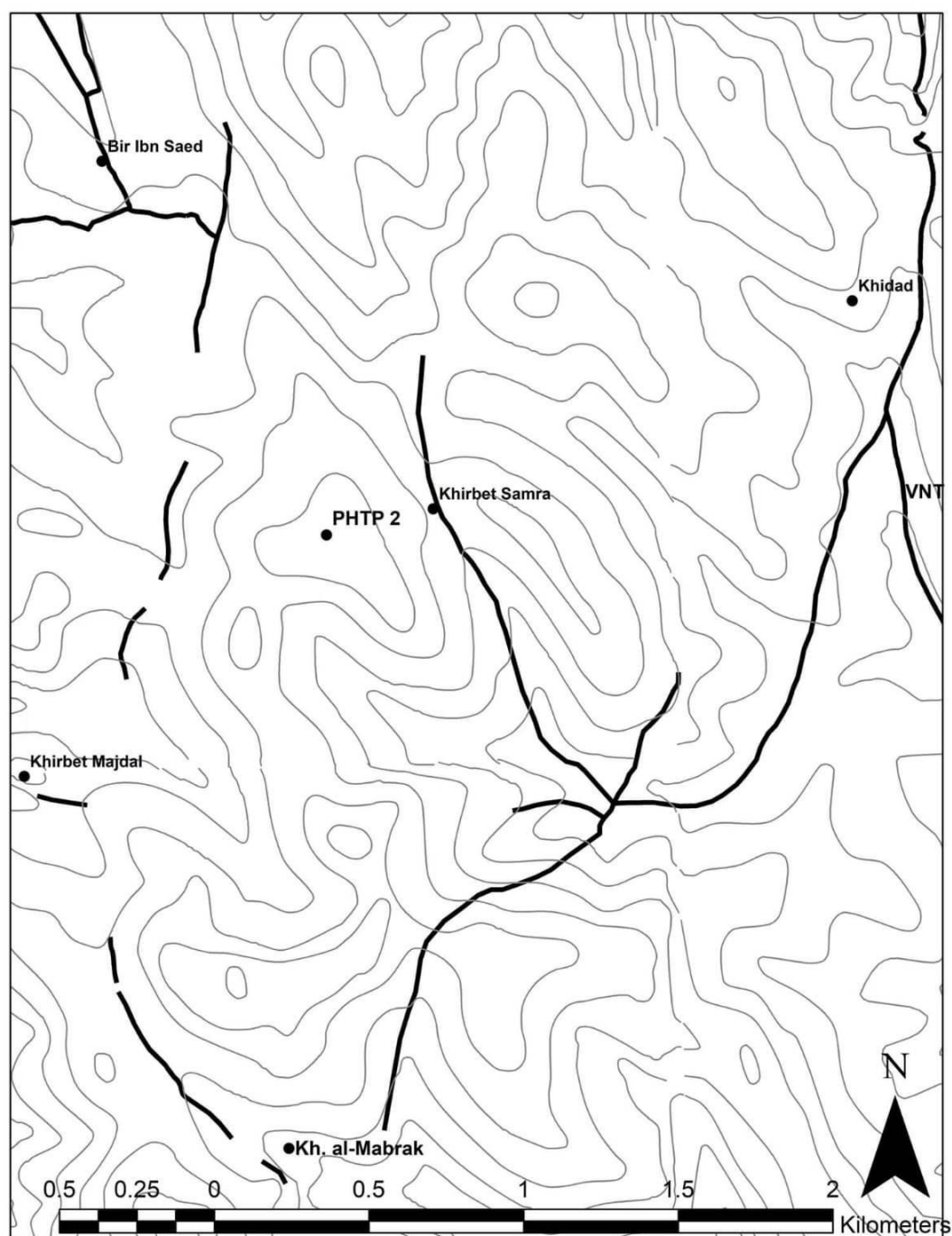


Figure 07: Map of al-Majdal road and other ancient roads in the study area (by F. Abudanah).

The layout and dimensions of the al-Mudawara-al-Majdal road point to its importance and its functions as a major road in the hinterland of Petra. It was traced south of the modern Taybeh-Ayl road and west of Mabrak as it runs over a high ridge with a clear view towards Wadi Araba. It also overlooks the villages of Taybeh and ar-Rajif and runs parallel to the

modern Petra-Aqaba road westward on the lower slopes of the ridge. Graf and Humphrey (1995: 249) recorded this road and discussed its route as a possible path of the *via nova Traiana* between Petra and as-Sadaqa. They rightly located its route south of the modern road as it passes the large site of Khirbet Tuliyah and continues southward passing other ancient sites. However, Graf and Humphrey (1995: 249 and Fig. 2), for some reason, did not mention a large settlement site located on the edge of the road north of Khirbet al-Sa'ud. Graf and Humphrey (1995: 249) precisely noticed a fork in the road at Khirbet al-Sa'ud where two roads emerge at that point, one heads southeast to as-Sadaqa and the second runs south. They described the former road as the main branch while the latter road was described as *Darb al-Rasif* (Graf and Humphrey 1995: 249-250). For them, the main branch is part of the Roman Highway, the *via nova Traiana*, and the second one is an alternative to it. Meanwhile, the authors of this paper challenge this explanation and suggests that the "main branch" from Khirbet al-Sa'ud is not an extension for the "Central Route" of the Roman Highway. It is rather a minor road branching off the major road, *Darb al-Rasif*, which runs over the ridge in a north-south direction. Major roads in the hinterland of Petra, including the study area, extend almost north to south in harmony with the topography of the area, particularly along the ash-Sharah Plateau (Abudanah et al. 2016). Moreover, the evidence from the area after Khirbet al-Sa'ud shows a great deal of similarity between the different segments of this road, particularly its monumentality. Graf and Humphrey (1995: 248-250) did not mention any road branching off or intersecting the road before Khirbet al-Sa'ud, and none is also plotted on their map. In contrast, the authors recorded several minor roads branching off this road and heading to nearby sites or connecting with other major and minor roads. The secondary or minor roads were recorded before and after Khirbet al-Sa'ud, and one of them heads eastward to Khirbet al-Hajareen (Abudanah 2006). In fact, the al-Mudawara-al-Majdal road and its extension southward beyond the modern Taybeh-Ayl road, and Graf's "*Darb al-Rasif*" road are stretches of one road (Fig. 09). This road is better known among the locals and on modern road signs as the King's Highway. The southernmost existing stretch of this road was thoroughly investigated by the authors and twenty-four secondary roads were recorded on either side of its route (Abudanah et al. 2015). Graf and Humphrey (1995: 249-250) managed to trace this stretch but slightly dislocated some sites along its route and reported that it joins the *via nova Traiana* at Ras al-Qana. However, the data the current authors collected from the field clearly revealed that the so-called King's Highway meets the Roman Highway on a point west of Khirbet Bir Turki (Abudanah et al. 2015; Abudanah et al. 2016).



Figure 08: Photo of the al-Majdal road overlapped by a modern road (by F. Abudanah).

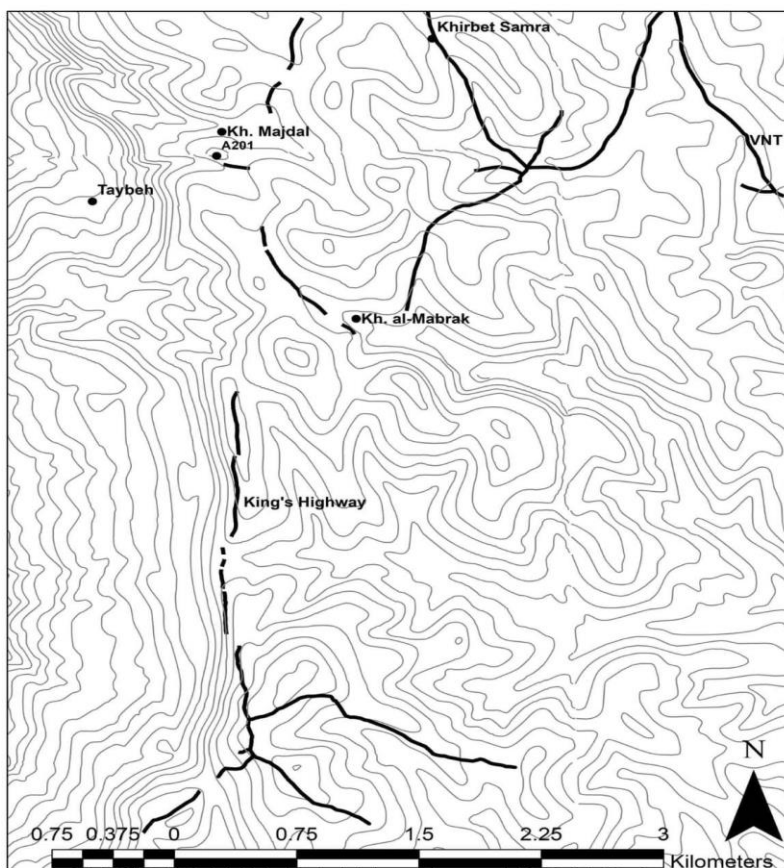


Figure 09: Map of the King's Highway south of the al-Majdal and al-Mabrak sites and roads (by F. Abudanah).

The *Via Nova Traiana* (Graf's Eastern Route) (Fig. 01).

One of the major and important roads recorded in the study area is the Roman Highway, the *via nova Traiana* (VNT). Graf and Humphrey (1995) suggested two possible routes for this major road between Petra and as-Sadaqa. The first route was described as the "Central Route" (the al-Hujaim road in this study) while the second was described as the "Eastern Route" (Graf and Humphrey 1995: 248). The discussion here considers the "Eastern Route" which according to the current authors is the true route of the *via nova Traiana* (Abudanah et al. 2016). However, the discussion only considers the parts of the road located within the study area. Some parts of this road were recorded in 2003 by Abudanh in his survey of the region of Udhruh (2004 and 2006). In 2014, the entire route of this road was thoroughly investigated in the area between Petra and Ras al-Qana (Abudanah et al. 2016). In the study area, this road was traced from a point south of Ayn Musa to a point northwest of Basta just on the edge of the modern Petra-Basta road. In the area of al-Biq'ah, it is hardly traceable except in some places where flash floods exposed part of the road in 2013 near Ayn Musa. Further south, a wide line of shrubs and an alignment of stones define the path of the road which appears to be bounded by curbstones in that area. Beyond the modern football ground, the road can be easily traced since it is defined by two retaining walls, one on either side, in Wadi al-Jamaleh and at Kafr Asham (Tholbecq 2013: 311). However, in the latter area, its path was overlapped by a modern agricultural road since the path of the ancient road was used in the twentieth century for transportation between Basta and Petra. Its width at some preserved segments does not exceed 5m with pavement at some spots. In the area of al-Bitahi, northwest of Basta, its route is fairly well preserved and can be easily traced. No milestones were found along its path within the study area. A milestone, was discovered at Ayl in 1930s by Glueck (1935), and published by Graf and Humphrey (1995: 246-248) who dated the painted text to the fourth decade of the third century AD. A number of minor roads branch off this road in the study area, some of which connect with other roads or terminate at settlement sites. However, many of them cannot be easily traced due to recent development and agricultural activities. Moving southward from Ayn Musa, the first minor road could have been suspected in the area of al-Biq'ah and could have connected Khirbet al-Biqah (Tholbecq 2001: 404 site JSS90) with the *via nova Traiana*. On the way towards Basta, other ancient sites can be seen on either side of the road, particularly west of it. Among these sites is Khirbet Kafr Asham which is associated with a well and threshing floors (JSS 158 in Tholbecq 2001: 403 and site no. 317 in Abudanh 2006). At a level spot, before the road starts running through the fields of al-Bitahi, two small structures can be found. The structures appear to be road stations or check points for security or taxation as they were located right on a point where other roads intersect the major road (Abudanah et al. 2016). A minor road, heading west to a nearby site, appears to separate the two structures. A network of ancient roads was previously recorded east of the modern Petra-Basta road, and one major road runs almost parallel to the Roman road (Abudanh 2006). A few hundred meters south of the two structures, a minor road branches off the *via nova Traiana* and heads southwest to Khirbet Qunaifdeh. Before the major road runs through Wadi Basta and just on the edge of the modern Petra-Basta road, a minor road branches off it and heads west for a short distance to terminate at an ancient site (site no. 175 in Abudanh 2006). The major road (arguably the *via nova Traiana*) continues to Basta and then to Ayl, al-Fardhak, as-Sadaqa, and Dor. Passing the area west of Qurayn and Swiemreh, it heads to the ancient sites of Umm Baradie and Bir Turki to the escarpment overlooking the Hisma desert (Graf and Humphrey 1995: 240-

250). The Roman road splits into two roads before it starts descending the escarpment to Humaima. One road heads southeast to the spring and site of al-Qana and the other road runs southwest, descending the escarpment to Humaima on its way to Aqaba (Abudanah et al. 2016). The road, throughout the abovementioned areas, is not well preserved except in some places and only the traceable stretches were recorded and mapped.

A possible “western” ancient road between Petra, Taybeh and ar-Rajif

The existence of this road was first suspected by Graf and Humphrey (1995: 250) who rightly based their view concerning this road on the evidence from the ancient sites located along its assumed route. Following the path of the modern road from Petra to Taybeh and ar-Rajif, one would pass a number of ancient sites and water sources located just west of the modern road. Among these sites are: Khirbet Braq (Tholbecq et al. 2018), Ayn Amun (spring and traditional houses), Khirbet al-Mualaqah (Lindner et al. 1996), a small structure site after the Movenpick Hotel, the traditional villages of Taybeh and ar-Rajif and other sites. Traditional villages in southern Jordan, generally speaking, were established on spots associated with ancient settlements in order to reuse the masonry material, particularly dressed stones (Twaissi et al. 2016a and 2016b). Judging from the archaeological evidence in the region, it is quite safe to support Graf's suggestion. The abovementioned sites are almost located in a north-south axis, and an ancient road should have connected them with Petra like many other sites in the study area. The presumed road appears to have been overlapped by the modern road which is about 20m wide, and there seems to be no chance to find any parts of the ancient road. However, two short stretches of an ancient road were seen after ar-Rajif. One stretch can be seen on the eastern foot of the hill which accommodates a royal palace, and the second one can be seen further south, heading to Dilagha after the modern Islamic cemetery east of Rujm ar-Rajif. Graf and Humphrey (1995: 250) suggested “a branch of this route descended to Dilagha and Gharandal in the Wadi ‘Arabah”. A very short stretch of an ancient road was also seen north of ar-Rajif on the lower slopes west of the route of the King's Highway. Finally, minor roads, branching off the Ridge Road, and heading westward to the assumed route of this road may confirm its existence.

Nabataean occupation in the study area

The current road map of the central ash-Sharah (the study area) shows the area encircled by the modern road network from Wadi Musa to Ayl via Taybeh and back to Wadi Musa via Basta. It shows a very complex road network serving an area with high density of settlement and constituting a very dynamic area. This area is also considered as the immediate periphery of Petra, the capital and the main urban center of the Nabataean Kingdom. The central ash-Sharah includes important Nabataean sites, such as Wadi Musa, a candidate for a Nabataean elite quarter (Twaissi 2001). Many other Nabataean sites dot the area surrounding Wadi Musa, but unfortunately, their nature has not been determined yet and they are mostly described as unspecified architectural sites like Khirbet Suwakha (Glueck 1935: 87), and Sha'bat edh-Dhab' (Tholbecq 2001: 404), or a hamlet like Khirbet el-Beq'a (Glueck 1935: 74; Tholbecq 2001: 404), or as a settlement like Khirbet Dahaha (Glueck 1935: 78; Tholbecq 2001: 402). In his survey of the vicinity of Wadi Musa, an area covering about 72km.², L. Tholbecq (2001) recorded about 86 Nabataean sites including many cisterns, most of which connected with agricultural areas, especially

northwest of Wadi Musa, where wine presses and other agricultural installations were recorded (Tholbecq 2001: 402-404). In the extreme east of the central ash-Sharah area is situated a more substantial Nabataean site, Udhruh. Archaeological work in the site revealed an extensive Nabataean town dated by pottery and numismatic evidence from the early first century BC to the early second century AD (Killick 1983a: 231; 1983b: 118, 237; McQuitty 1987: 9; Bowsher 1987: 12). The botanical (Neef 1987: 16), epigraphical (King 1987: 14) and other archaeological evidence from the site all attest to a more complex sedentary mode. Furthermore, the area between Udhruh and Petra had been connected with the Ayl-Taybeh area and the Rasif road to the southwest by a complex net of paved roads all connected at the Qa' region ('Amr et al. 1998: 543). This road network had, most probably, continued playing its role through the early Byzantine period judging from the surface pottery that dated from Nabataean through Early Byzantine ('Amr et al. 1998: 543).

Other Nabataean settlements were recorded in the area between Udhruh and Wadi Musa such as Khirbet el-Far' (Glueck 1935:78; Tholbecq 2001: 400) and site Qa' 8 ('Amr et al. 1998: 542), and the Nabataean village at Umm et-Tiran ('Amr et al. 1998: 541). Several Nabataean sites were recorded from the Qa' region, and most of them were described as "*Isolated complex structure with internal division*" ('Amr et al. 1998: 540-542). Comparatively, they are all associated with water systems and large agricultural fields indicating its farming purposes. For example, site Qa' 3 is a large structure with a central courtyard surrounded by many rooms with a total area of about 700m² ('Amr et al. 1998: 540). The whole building is well planned and could not be assumed to be a rural house, more probably this site related either to a formal project in the area or represented private enterprise for one of the Nabataean elite.

The area encompassed by the Wadi Musa-Taybeh-Ayl-Wadi Musa roads revealed more evidence for Nabataean sedentary life on an intensive agricultural basis as appear at Khirbet Ayl (Glueck (1935: 74-75); Taybeh ('Amr et al. (1998: 532. site Tayyiba 5); Khirbet Emun (Glueck 1935: 79); Khirbet al-Hama ('Amr et al. 1998: 534); Khirbet al-Hubays ('Amr et al. 1998: 534); Khirbet ar-Ruways ('Amr et al. 1998: 534-535) and site Ayl 3 ('Amr et al. 1998: 538). Khirbet al-Hama, for example is a very large ruined site associated with a roofed cistern and large field terraces. Another similar site in that area is Khirbet al-Hubays which also could be described as an agricultural village with terraced fields. Nabataean occupation in the Ayl region was also of a permanent nature represented by the extensive site of Khirbet Ayl. Other sites e.g. site Ayl 3 is parallel in its nature and plan to those discovered at the Qa' area, i.e. a "very large isolated structure with internal division" ('Amr et al. 1998: 538, site Ayl 3). These structures retain a more Near Eastern fashion represented by a central courtyard surrounded by rooms. Agricultural activities in this part of the Sharah and mainly the Taybeh region were, most probably, promoted by formal involvement. For example, the water supply was brought into the area via a complex water project. A Nabataean water channel (14 x 25cm) between Ayl and Taybeh was revealed running for a distance of at least 5km with several cisterns associated with it ('Amr and al-Momani 2001: 277-278). Besides, these settlements and agricultural villages were all connected to a complex road network (Abudanah et al. 2017).

Historical and epigraphic evidence concerning the ancient road network in the study area is absent. Therefore, the argument here is solely based on the archaeological evidence from two levels. The first level utilizes the ceramic evidence from sites located directly on the route of the major road, the King's Highway, and from sites where minor roads terminate. The second level examines the ceramic evidence from sites located in the

proximity of both the major and minor roads, particularly those sites recorded by MacDonald et al. (2016). MacDonald's study was the most systematic in the 21st century, and he collected dateable materials, if available, such as pottery sherds and lithics from all sites, in addition to recording the majority of the sites identified here. However, pottery sherds were collected from some sites in order to cross-reference and verify his dating evidence.

The second level of evidence comes from sites located in the proximity of the roads, particularly those hitherto recorded by other field projects. The authors of this paper believe that these sites are also connected to the road network of the area but a thorough investigation is still required. Two systematic studies are consulted below for this purpose: Hart's survey in Edom (Hart and Falkner 1985, 255–277) and MacDonald's Shammakh to Ayl survey (MacDonald et al. 2016), which partially overlap each other. Hart recorded 115 sites in the area between Tafilah and Ras en-Naqab (Hart and Falkner 1985, Map I and 269–271). His sites were categorized into three major groups; Iron Age, Classical, and Islamic, and the majority of sites dated to the Classical period (Hart and Falkner 1985, 259–261). Despite the fact that Hart (Hart and Falkner 1985, 256), following many scholars, accepted the traditional conclusion that the region declined after AD 106, he rightly concludes *"the [classical] period seems to have been one of a great prosperity and the countryside is covered with farms, hamlets and villages."*

This result does match the outcomes of previous research in the same area (i.e. Hart and Falkner 1985; Twaissi 2007), but the drastic increase of Roman and Byzantine sites challenges earlier conclusions that suggest a decline in settlements following the Roman annexation of Arabia Petraea in 106 AD (Hart 1986, 51–58; Hart and Falkner 1985: 256, 258 and 268, against this hypothesis see Tholbecq 2001, 400–405; Findlater 2003, 234). MacDonald's conclusion concerning the continuity of prosperity in the post-annexation period is very reasonable, but the number of Nabataean sites is likely understated. Archaeological and historical evidence suggest significant and unprecedented settlement in the area during the Nabataean period. There was even high demand on agricultural lands to the extent that Nabataean settlements expanded to dry areas (Twaissi 2007). However, taking into account that MacDonald, like many other scholars, sometimes includes the Nabataean period within the Roman period, his interpretation seems acceptable.

The continuity of Nabataean material culture is evident throughout the region and at different levels (e.g. Parr 1970; 'Amr 2004, 237–245). Archaeological projects in the area show that the area was densely populated by mainly rural and agricultural-based communities, supported by sophisticated water control and water harvesting systems, during the Nabataean period. Published evidence from the area strongly indicates a continual increase in the number of the settled sites from the first century BC through the first century AD (Glueck 1935; Tholbecq 2001; Hart and Falkner 1985; Hart 1986). Evidence, in form of a late second–early first century BC olive press from Petra (Kolb and Keller 2001, 317–319) and a 150 BC domesticated grape pip (Jacquat and Martinoli 1999, 26–29) suggests intensive agricultural practices since the beginning of the first century BC, at the very latest.

Furthermore, the majority of sites recorded from the area are unwallled villages. More recent studies, with a general view towards southern Jordan during the Nabataean period, suggest population growth, regional specialization, and an inter-regional dynamics model (Twaissi 2007: 8). These socio-regional dynamics could not be imagined without a

complex road network. This development must have required certain tools, including roads to fulfil and maintain the new standards of life. Roads were used to connect rural sites, villages, and towns with urban centres or capitals. Their existence reflects the level of development the region experienced during the suggested periods. Considering the apparent prosperity of the region throughout the three historical periods, it is safe to suggest that the ancient roads in the study area may belong to the three periods. However, it is quite difficult to specify which roads belong to each period, although the Iron Age II and Nabataean periods present the best candidates. In brief, some roads appear to have been constructed in Iron Age II. The majority of roads were built in the Nabataean period, which witnessed the second wave of settlement expansion. Sherds from all sites, directly connected with the major road through secondary or minor roads, indicate that the Nabataean period is the earliest and predominant, but the road network's state of preservation and the archaeological evidence strongly suggest the continuous use of roads throughout the Roman, Byzantine and probably Late Islamic periods.

Conclusion

Although this area is in a close proximity to the main Nabataean urban centre, their capital Petra, the whole area lacks a settlement hierarchy but with intensive agricultural activities and a complex road network. The available evidence shows that the complex road network in the area was built to serve the active intra-regional movements between the centre (Petra) and its periphery. The study area, like other areas in the hinterland of Petra, flourished significantly in the Nabataean period according to the archaeological evidence. Material culture, mainly pottery sherds, reflects the cultural development that the entire hinterland of Petra witnessed in other historical periods. The major ancient roads recorded in the study area appear to predate and postdate the Nabataean period and remained in use for a long time. The minor roads seem to have had a local function, and therefore may have not been used when the sites they served were abandoned.

شبكة طرق قديمة ومستوطنات في منطقة جبال الشراة الوسطى في ريف البترا

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ملخص

تقدّم هذه الدراسة الدليل الأثري على وجود شبكة من الطرق القديمة والمستوطنات الأثرية المرتبطة بها في منطقة جبال الشراة الوسطى، ووصفاً تفصيلياً لمسار كلّ طريق ومواصفاته العامة، وعلاقته بالمستوطنات القريبة من مساره وبالطرق القديمة الأخرى، كما تناقش جوانب أخرى مرتبطة بموضوعها، من مثل: تاريخ الطرق الموثقة فيها، وطبيعة استيطانها القديم.

الكلمات الدالة: البترا، الطرق، الشراة، مستوطنات، الأنباط.

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