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Research Paper:

GIS Applications

"International Community Flagship Project: Linking Gaza Strip and the West Bank through the Arc"

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1. Abstract

The paper at hand gives an overview of one of the latest plans that contemplate the building of a viable Palestinian state, by linking both the Gaza Strip and the West Bank through a boulevard-transportation system known as the Arc. The paper provides a critical view of the Arc Plan from a Palestinian planning perspective, using an in-depth mapping approach of Geographic Information Systems & Remote Sensing and thorough study of relevant archived research. The results of this study show the negative impacts of favouring political tendencies over rational social, economical, and environmental ones that usually leads to sustainable solutions.

2. Background and Motive

The Occupied Palestinian Territory (OPT) is composed of two entities; the West Bank and the Gaza Strip. Linking these has always been perceived as an inevitable necessity in building a viable Palestinian state. However, achieving this has always been impeded by the Israeli's under the pretext that a link would threaten its national security. To achieve a compromise between the two parties (i.e. Israel and Palestine), the international community took the responsibility of formulating different proposals for the linking of the two entities as an indispensable character in building a viable Palestinian state in the foreseeable future.

Construction of a secure transportation link between Gaza Strip and the West Bank has been adopted by the international community as a "flagship project" during the last decade, mainly to prove that a viable two-state solution is feasible and enjoys a consensus vision. On the ground, the near total severance of links between the Gaza Strip and the West Bank makes such "flagship project" a matter of irony, where all the plans that have been brokered by the international community and state members of the Quartet are considered worthless as they are confronted by the Israeli "Creeping Apartheid" (Yiftachel, 2005) policy and the *de facto* physical domination in and around the OPT. Gaza Strip stands today as the biggest prison on earth, as Gaza with its 1.5 million

(PCBS, 2008) inhabitants is totally besieged and the movement of people and goods through the border terminals are conditioned to a prior Israeli permission. Knocking on the situation in Gaza, in his trip leading a UN investigation into a 2006 Israeli bombing that killed 19 Palestinian civilians in Gaza, the Nobel Peace laureate and vocal anti-apartheid campaigner in South Africa archbishop Desmond Tutu denounced the international community for what he called "its silence and complicity" over the situation in Gaza and called Israel's blockade of the Gaza Strip an "abomination" (BBC, 2008).

The Israeli Governments find an independent and viable Palestinian state very hard to contemplate on the ground. On one hand, since the Israeli occupation of the OPT in 1967, Israel coerced to undermine any real action toward a comprehensive peace in the occupied territory by creating a *de facto* physical separation of the Gaza Strip and the West Bank. On the other hand, what are referred to as the intellectual strip of the Israeli politics society re-proposed the status quo ante-1967 where the Egyptians and the Jordanians had political control over the Gaza Strip and the West Bank, respectively.

Increasingly, the international community during the last couple of years has proposed several plans such as the five months study conducted in 2006 and entitled: "**AE Services for the Transportation Feasibility for Linking the West Bank & Gaza Strip**" that was undertaken at the bequest of USAID and supported by the World Bank. The study's findings were virtually guided by an Israeli political agenda rather than equitable interests of both parties (El-Atrash, 2007); therefore, it was rejected by the Palestinians. Another plan entitled "**The Arc Plan: A Formal Structure for a Palestinian State**" was introduced by the RAND corporation in 2005, to insure the lawful right of the Palestinian people to live, work, and move freely in a contiguous geographic area and, as well as to satisfy Israeli security interests. In recent retrospect, the latter (i.e. the Arc Plan) is considered more comprehensive than the other presented plans.

However, the researchers would argue that while the introduced international "flagship projects" are welcomed as they solidify the Palestinian stance of resistance against the Israeli occupation in the OPT, they are still not fully satisfactory and neglect in absolute terms the ABC's of logical regional planning, where the economical, social, environmental and cultural interests should dominate political interests, not the contrary. Herein, is a critical perspective of the "Arc Plan," prelude by a descriptive analysis to provide a context to the reader.

3. Definition of the Arc Plan

An American corporation called RAND introduced after a two year study and US $2 million cost, a set of recommendations serving as a blueprint for a *"viable, independent and self-reliant Palestinian State"* (Rand, 2005) that includes development projects to improve the quality of life for Palestinians in the anticipated Palestinian state.

The study introduced "The Arc Plan", which is a high-speed train and fiber-optic network linking main Palestinian communities in every Palestinian Governorate in the West Bank to each other and with the Gaza Strip. The Arc Plan is a 140 mile corridor (i.e. 225 km), which would include a rail line, highway, aqueduct and an energy network, of which 137 km of the railway crosses through the West Bank; half of this runs through areas "A&B" that fall under Palestinian jurisdiction, while the remaining half runs over area "C" that falls under Israeli jurisdiction (ARIJ GIS-Database, 2009).

3.1. Research Methodology

The adopted research methodology in this paper-study is built through deliberations on the available data sources in the forms of literature reviews, published reports, and mapping interpretations using the state-art-technology of Geographic Information Systems (GIS).

Acknowledging discrepancies is very important when planning in an occupied territory like the OPT. The contemporary architecture and urban theories developed many interesting approaches to the problem of coping with such conditions. Increasingly, one could notice a shift on interest from complexity and contradiction (Venturi, 1966), to interests in accumulation of elements (Rowe and Koetter, 1978).

In our example, using the GIS as an analytical planning tool provided the researchers with the needed flexibility to embark on an in-depth research, where different geographic layers are considered to set the base for research that generated pejorative experiencing of landscape.

3.2. Underlining Assumptions

In the broad sense, the plan is the first international practical initiative that supports the lawful right of the Palestinian people to live, work, and move freely in a contiguous geographic area (West Bank and Gaza). However, the plan does not address, in detail issues of Israeli settlements, Jerusalem and state borders. Thus, the underlining assumptions of the Plan are not clear as they have not been dictated in the crash course of the study. However, following is a scant overview of the main conservations on the Plan that were substantially investigated using GIS.

3.3. Israeli Settlements

As for Israeli settlements, the Arc Plan ignores them as it penetrates major Israeli settlements like Ma'ale Adumim in Jerusalem and Itamar in Nablus. Such a proposal maybe interpreted by the Palestinians as a *de facto* recognition of these settlements and a consolidation for Palestinian subjugation to the Israelis, as illustrated in Sharon's 1991 "Seven Star Settlement Plan," that outlawed the dismantling of major Israeli settlements including Ma'ale Adumim (See Map 1).

Following the 2005-Disengagment Plan (much more redeployment) from Gaza, the Israeli settlement expansionist program is now concentrated in the West Bank, undermining the Palestinians' vision to establish a state of their own.

Today the number of Israeli settlers in the West Bank (including occupied East Jerusalem) exceeds 500 thousands, as the number counted was 240 thousands in 1993. In 1993 at the time when the Oslo Accord was signed, there were 186 Israeli settlements in the occupied Palestinian territory (including East Jerusalem), since then 13 new settlements were added, which makes the number of Israeli settlements today 199 (ARIJ GIS-Database, 2009).

3.4.   State Borders and Right of Return

In June 2002, the Israeli Government unilaterally embarked on its Separation Plan that expropriates about 40% of the total West Bank area (i.e. 5,661 km^2). Almost one-third of expropriated area is located between the Wall and Green Line "Western Segregation Zone." The other two-thirds of the confiscated area are the de-facto created "Eastern Segregation Zone" on the eastern side of the West Bank, which was created without walls or fences, but through its control of access points along the Jordan Valley and the shores of the Dead Sea (ARIJ GIS-Database, 2009) (See Map (1) in annex). However, the researchers would argue that the spoken motive for building the Wall on behalf of the Israelis (i.e. purported for security reasons) is fallacious and entails other tacit dimensions of Jewish geo-demography dominance, which is considerably, affects the rightful social development of the Palestinian communities.

On the political level, the Palestinians feel that the Arc Plan will consequently redraw the West Bank eastern borders with Jordan, as it runs in parallel with the unilateral Israeli declared Eastern Segregation Zone.

In general, the plan neglects development of territorial lands on the western side of the West Bank and directs Palestinian development to the east; presumably to accommodate the return of
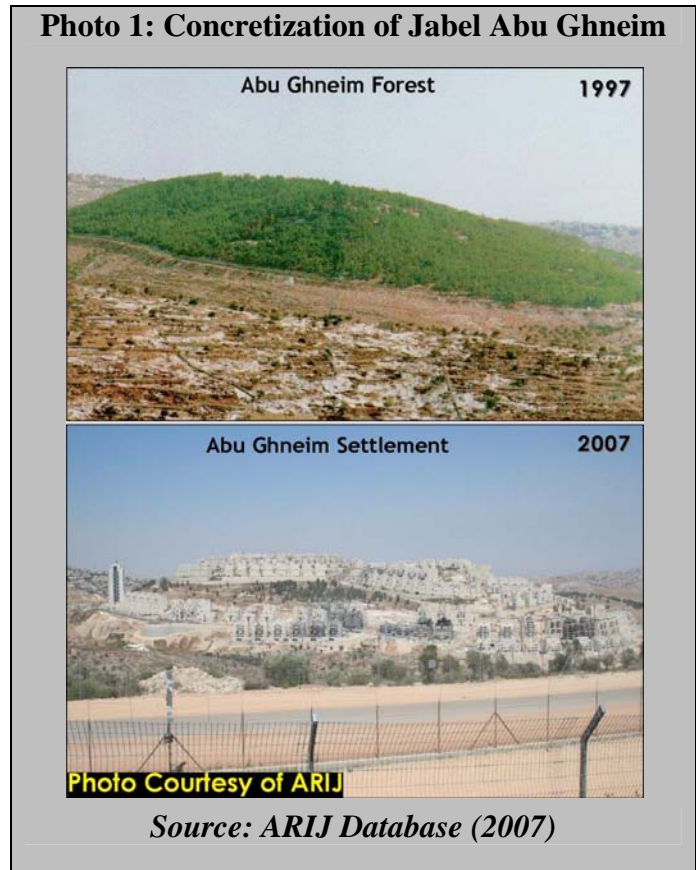
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refugees to new Palestinian cities away from the Green Line and consequently away from the western Segregation Wall, which constitutes the *de facto* border of Israel.

The plan dedicated a full chapter entitled "Sociopolitical Challenges" to address the issue of refugee absorption in Palestine. In this chapter, the planners of the Arc accentuated on that the return of Palestinian refugees to their homes inside 1948 is neither sensible nor pragmatic, and the return should only be limited inside the [will be] Palestinian state. Thus, the Plan simply indulges into a rhetoric rather than scientific statement of argument. By, refuting the right to return of Palestinians to their homelands and confiscated properties inside today-Israel, the plan contribute to what Mick Dumper (2008) call the "Constructive Ambiguity" that framed the Israeli *de facto* policies since its occupation of the OPT. Therefore, a big and denouncing question mark is raised, as the Plan proposes tacitly to refute the international humanitarian law and the pertinent United Nations General Assembly Resolution (UNGA) 194 of 1949, as the base for reconciliation between the Israelis and Palestinians.

3.5.   Ecological Landscape

Palestinian environmentalists perceive the current path of the Arc as ruinous to the Palestinian landscape and a waste of the Palestinian natural reserves along the eastern West Bank terrains. For instance, the Nature Reserve area (See Map 1) that overlooks the eastern side of Hebron and Bethlehem Governorates is not even identified in the Plan and the Arc trajectory goes by it, thus undermining the sustainability of the area, which is the home of rare species and dozens of flora and fauna (Issac *et. al.*, 2007).

This contributes to the developed theory of "agoraphobia; the fear of space" (Hanafi, 2004) that was developed by the Palestinian sociologists Sari Hanafi, where he outlines that the crux of the Israeli colonial politics relays on not only the division of territory but its abolition. The Israelis strategically abolish the Palestinian landscape by its concretization with illegal exclusive Jewish settlements, such as Har Homa Settlement that was built on Jabel Abu Ghneim south of Bethlehem (See Photo 1).

Photo 1: Concretization of Jabel Abu Ghneim

Source: ARIJ Database (2007)

3.6.   Economy of Travel

The plan, as it stands, limits the opportunities and alternatives of Palestinians who wish to commute from the north to the south, or vice versa, creating a land transport development dilemma. The plan suggests rebuilding the airport in Gaza to be the only air navigation facility for the OPT that allows Palestinians to travel abroad. Such a case would, at least, double the time and cost for travelers. According to the Plan, a Palestinian living in the north of the West Bank who wishes to access Jordan via plane must travel to the southernmost part of Gaza to get to Jordan; a journey that takes 90 minutes on the train plus 30 minutes on a plane compared to an estimated 30 minutes air trip from the center of the West Bank if using the closed Qalandyia airport since 1967 (See Map 2).

Additionally, the Arc Plan will diminish and restrict the movement of Palestinians to a trickle. This means to move or proceed slowly or bit by bit, especially between adjacent towns, where an

individual is forced to head to the central business district, in order to commute to the destination following specific time lines.

The Israeli consecutive governments, since 1967 until now, have taken on their shoulders the responsibility of construction of a multi-road network, which became known later (after 1993) as the Bypass Roads' Network (See Map 1), built in Israeli-controlled areas of the Occupied West Bank. The construction of this extensive system intended to bypass Palestinian communities and population centers in the West Bank, in order to provide direct contacts between the Israeli controlled areas in the Occupied West Bank (including settlements and military bases, which are deemed to be illegal under international laws and United Nations' Security Council and General Assembly resolutions) and Israel. Moreover, according to B'Tselem (an Israeli human rights' organization), this transportation grid was not only developed to maintain an "internal fabric of life" (B'Tselem, 2002) for the West-Bank Israeli settlers, but also to ban the Palestinian traffic flow from passing through or by the Israeli settlements in the West Bank and certainly to stifle Palestinian urban development in the OPT.

3.6.1. Case Study on Israeli Restrictions: Hebron-Ramallah Trip

During the first 20 years (1967-1987) of the Israeli Occupation of the West Bank, traveling between the Hebron and Ramallah Governorates used to be a traditional trip for Palestinians, especially for merchants, students and employees, who traveled the road on a daily bases. This was when the Palestinians were allowed to go through the center-life city of all the Palestinians, which is the Jerusalem City, as the trip (50 km) used to take 1 hour and 15 minutes. With the eruption of the First Palestinian *Intifada*, back in 1987, and with the imposing more Israeli restrictions on the Palestinian people in the OPT, all the rules have changed. These include the entire Palestinian transportation system and the Palestinians' access to the Occupied City of Jerusalem. Consequently,

the Hebron-Ramallah trip that used to take 75 minutes has turned to double the time (2 hours and 30 minutes = 150 minutes) and, of course, with new roads to drive on.

From that time on, the existing road-network system has become an inadequate means to travel between the northern and southern parts of the West Bank, where access through the Jerusalem City is denied for most of the Palestinians. The Occupied City of Jerusalem, as the center of religious, social, commercial and political life for all of the Palestinians, and as the only connector of Palestinian cities and towns of the West Bank, was the first target of the Israeli imposed restrictions. In 1993, just prior to the signing of the Oslo Accords, the Israeli Government at that time launched an organized campaign to isolate the City of Jerusalem. That was and is still to the present day by restricting the movement of Palestinians to the City; by establishing checkpoints and physical barriers around the City's entrances; and by hindering access to places of worship, employment, education, institutions, and families. This Israeli attempt to seize and isolate the Jerusalem City was perceived by the Palestinian people, living under Occupation, as a calculated step by the Israelis to extricate the City from the heart of the Palestinian people, as the capital of their future State of Palestine. That was and is still to tip the City's demographic and geographic balances to the favor of the Israeli residents.
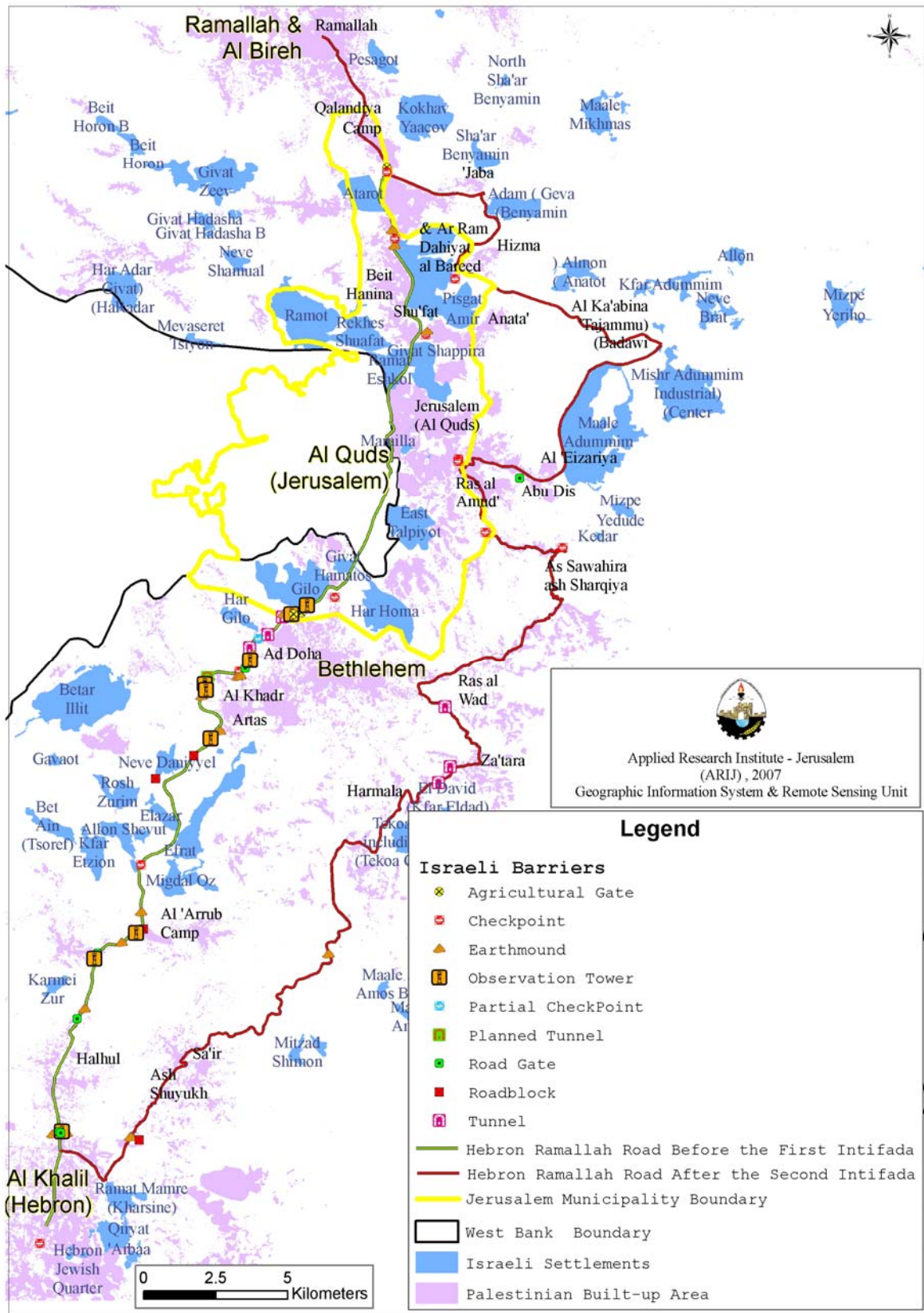
Another dramatic alteration on the traveling road between Hebron and Ramallah happened with the eruption of the Second Palestinian *Intifada* in September 2000, when the Israeli Army started to establish checkpoints on the Palestinian roads (currently estimated at 500 checkpoints throughout the OPT). As a result of these additional restrictions on the Palestinian movement, the Hebron-Ramallah trip (only 50 km) that used to take 75 minutes during the first 20 years (1967-1987) of the Israeli Occupation of the Palestinian Territory, and then used to take 150 minutes (1987-2000), it takes now 180 to 240 minutes (this is 3 to 4 hours). Imagine that a student, a patient, a merchant or otherwise, who needs to make this trip, he/she will need to spend 6 to 8 hours just to reach his/her destination, and imagine if that person needs to make this trip (for whatever reason) on a daily basis. It is

important to mention that the time consumed to complete this trip reached its peak in 2003, where it took Palestinians, who traveled either in their private cars or public transportation, 4½ to 5½ hours (this is 5 full hours in average). The UN Office for the Coordination of Humanitarian Affairs (OCHA), located in the OPT, estimated that 15-20% of Palestinians' daily work time is lost on account of internal closures.

In view of the above, the Israeli restrictions and abusive actions against the freedom of movement of the Palestinian people living under the Israeli Occupation have created a case of non-stopping pressures on the used roads and vehicles, making the rates of depreciation and operation costs of vehicles to escalate progressively during the last few years. For the present case, the increase in length between the old traveling road and the new one between Hebron and Ramallah is 35 km per single trip (see Map 1). It is noteworthy to mention that every liter of diesel in the West Bank costs $US 1, and the average diesel consumption of public transport taxis (7 passengers; 2000 CC) reaches 1/6 liter/km. By taking these facts into consideration, a trip from Hebron to Ramallah will need an additional cost of $US 25.2 per month (to the monthly average of $US 97 spent on transportation means and telecommunications). Such an increase constitutes 26% of the monthly average spent in favor of transportation means and telecommunications per family (PCBS, 2004).

To clarify the nexus between the Israeli abusive actions of physical barriers and environmental degradation, one may employ empirical formulas to quantify amounts of accrued damages. For instance, the increase in the amounts of black smoke (soot) released due to the increase in the road network between the Hebron and Ramallah Governorates calculated 1.01 tons per annum[1].

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[1] *Amount of pollutants was estimated by using the Australian Ministry of Environment empirical formula (Amount of pollutants = pollutant factor × difference in distance in kilometers) (NPI, 2003), where the pollutant factor of diesel working vehicle = 0.000494 kg/km, difference in distance/year = 22,000 km, and number of vehicles working on the trip from Hebron to Ramallah = 100.*

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Legend

Israeli Barriers

- ⊗ Agricultural Gate
- ⊟ Checkpoint
- ▲ Earthmound
- ⊞ Observation Tower
- ▭ Partial CheckPoint
- ▣ Planned Tunnel
- ◉ Road Gate
- ▪ Roadblock
- ▣ Tunnel

Hebron Ramallah Road Before the First Intifada
Hebron Ramallah Road After the Second Intifada
Jerusalem Municipality Boundary

West Bank Boundary
Israeli Settlements
Palestinian Built-up Area

3.7. Social Fabric and the New Proposed Cities

The Arc plan calls for building new cores of the existing Palestinian cities in the West Bank (See Map 3), mainly to the east of the existing ones. In-depth research using GIS and interpretation of such a proposal seems to lack the perception of the anticipated social and economic consequences on the old cores. The plan didn't thoroughly discuss this issue, as the new cores come on less developed-rural areas that are the majority of agricultural nature. Such a proposal will defiantly re-define the categorization of real state in the old and new cores and consequently affects the business-as-usual industry of the land market. Furthermore, the plan didn't mention on what criteria the new cores will be developed, nor what is the adopted architectural style and its affect on the "lifescape" (Anani, 2007) of adjacent Palestinian towns and hamlets.

3.8. Concluding Notes

The obvious question at this stage would be; why spend such a hefty budget on studies to assess new alternatives to link the Gaza Strip and the West Bank, when the obvious and most feasible choice (regarding time as well as economic considerations) is at hand; the renovation and upgrading of the existing and proven best functional route.

To conclude, economic development and physical security are both indispensable if the peace process is to continue and progressively bring benefits that are ever more tangible to Israeli and Palestinian residents. Furthermore, agreements signed between the Palestinian Liberation Organization and Israeli Government resolved the issue of an established route between the Gaza Strip and West Bank. This did function for some time before Israel shunned its internationally recognized legal responsibilities under the pretext of security.
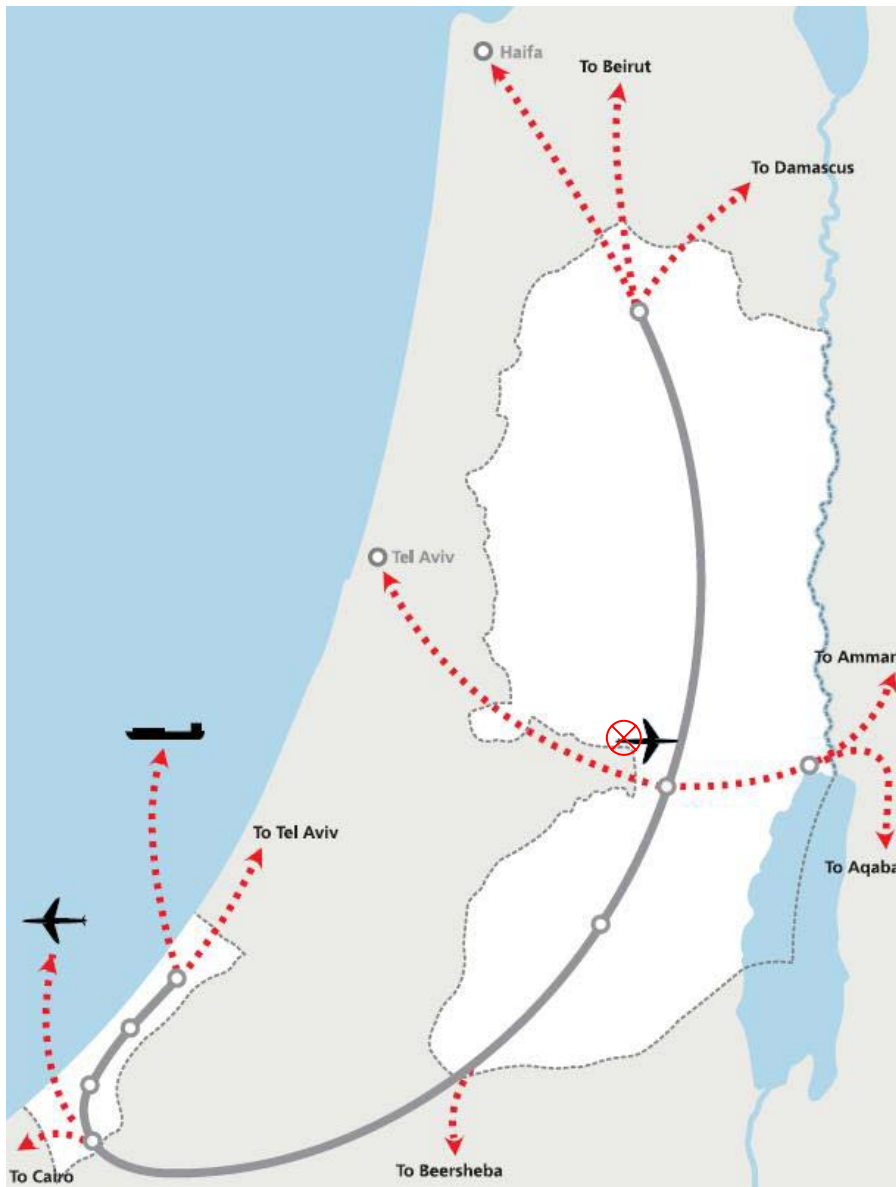
The bottom line is that the Arc Plan may be a base for further deliberation in the future of the Palestinian state, only when the Israeli occupation is ended.

Finally, the capacity for GIS to clearly articulate spatial phenomena and accept user input is vital to the on-going democratic management of the Palestinian cities. That being said, geospatial technologies are just tools, not answers. The GIS doesn't in itself solve wicked problems, but make the process of working them smoother (Barton, 2008). One of the strengths of the computer is its ability to rapidly generate a series of options for humans to assess. If all the factors combine to generate a set of likely outcomes, the spatial decision-making process becomes more transparent and sustainable.

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Map 2: Proposed Transportation Terminals – The Arc

Source: Rand, 2005

Map 2: Proposed New Cities (White Dots) – The Arc

Source: Rand, 2005