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**Planning Towards a Sustainable Land Transportation System in a  
Future Palestinian State**

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# **Planning Towards a Sustainable Land Transportation System in a Future Palestinian State**

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## **1. Abstract**

The paper at hand briefly touches the geopolitical status that formed the structure of the current Palestinian land transportation system and discusses the Palestinian transportation planning dilemmas, both presently and in the future, that must be addressed by Palestinian physical planners, as a prerequisite for sound control and management of land use and natural resources' utilization.

The paper discusses the unilateral Israeli plans and actions that have been developed in relation to the land transportation system in the Occupied Palestinian Territory (OPT; the West Bank, including East Jerusalem, and the Gaza Strip) during the last 40 years. It also discusses the legitimacy of these plans and actions by the virtue of the International Humanitarian Law and the United Nations' Resolutions. Also, the paper presents International plans and studies dedicated to the creation of a more sustainable land-use policy for a future Palestinian State.

## **2. Key Words**

Geographical contiguity, transport planning dilemmas, bypass roads, terminals, Segregation Wall, dual (Israeli–Palestinian) transportation system, Israeli settlements, safe passages, Gaza Strip, West Bank, East Jerusalem.

### **3. Introduction**

Transportation is important to the Palestinian society's economy and critical to its quality of life. It is clear that the nexus between the Palestinian land and its citizens is unique in its sense and it is different than any other place all over the globe. The uniqueness of the Palestinian case is considered a model of the complex interrelationship between military occupation, environmental degradation and sustainable development.

When Israel occupied the Palestinian Territory (The West Bank, including East Jerusalem, and the Gaza Strip, which since June 1967, became known as the Occupied Palestinian Territory “OPT”), it devised policies and laws to restrict Palestinian movement into certain areas (closed military areas) of the OPT. Many years later (by the signing of the Declaration of Principles (DOP) between the Palestinians and Israelis in 1993), Israel started to circuit Jerusalem with checkpoints and to restrict Palestinians' access to Occupied East Jerusalem and to Israel. Since then, Israel started to operate its on-hold policies and laws to impose restrictions on Palestinians' movement. This, however, is strongly proscribed (denounced, condemned and prohibited) by human rights' organizations and international law, as applied on people under occupation (as in the case of the Palestinian people in the OPT). Such policies of closures and movement's restrictions have badly resulted in a devastating cases of social disintegration and economic depression, which have resulted in almost collapse in the OPT. Accordingly, a policy of 'denial of entry' of Palestinians to Occupied East Jerusalem has aimed to consolidate the illegal annexation of land and to impose a Jewish demographic superiority in the Occupied City of East Jerusalem.

A peace process brokered by the international community in early 1990's, in order to resolve the Israeli-Palestinian conflict, was supported by the majority of Palestinians in the OPT, who perceived the process as a foundation for reconciliation based on justice and parity. Unfortunately, the same peace process has become, since it was signed in September 1993, a punitive course manipulated by the State of Israel to dehumanize and demonize the Palestinian people and to pursue its (Israel's) policies of more control and more fragmentation of the Palestinian population and their territories. Such policies have indeed transformed the OPT into a series of besieged cantons, by confiscating more Palestinian lands that are supposed to be reserved for future developments in a future Palestinian State. The State of Israel has carried out all of these illegal activities to allocate more Palestinian lands, in order to build new settlements and to expand the existing ones; to construct a network of Israeli designated bypass roads and terminals; and in the last few years, to build the illegal Segregation Wall with a total length of 725 km, surrounding the Occupied West Bank from three sides (see [Map 1](#)). It is important to mention that these Israeli illegal activities (including, for instance, the settlements, the bypass roads, the terminals, the permanent checkpoints, the Segregation Wall surrounded by Segregation Zones, the military bases, etc.) have *de facto* confiscated so far about 60% of the OPT, which is under the direct Israeli control (see

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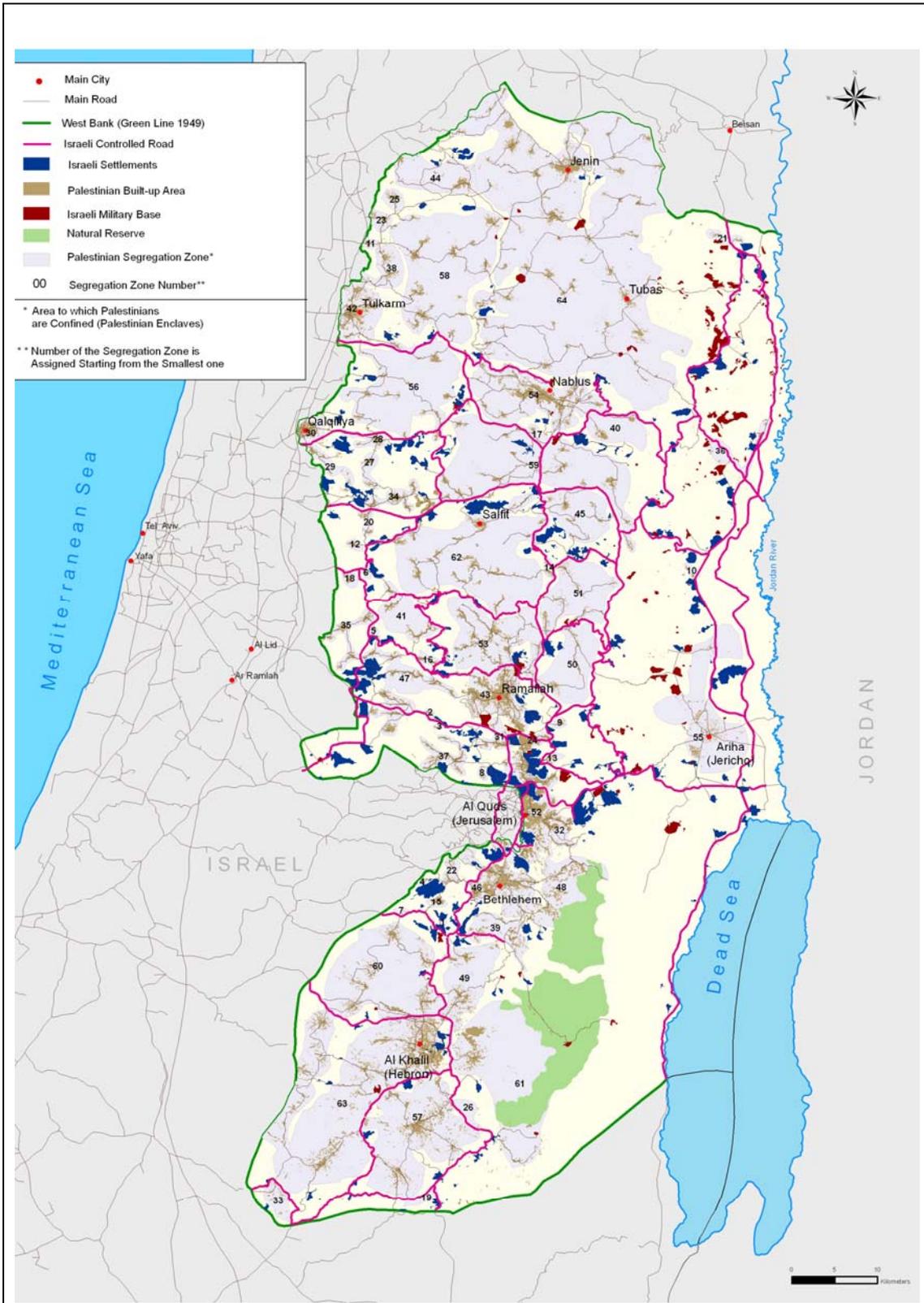
Today, the lack of sovereign control by the Palestinian people over their lands and natural resources (the Palestinian National Authority (PNA) has jurisdiction only over 17.7% of the West-Bank area), along with the inefficient and non-transparent current system of land administration conducted by the PNA, are paramount reasons that hinder and undermine the process of sustainable development in the OPT. This includes the construction and rehabilitation of an adequate infrastructure system that has been severely affected by the Israeli non-stopped and aggressive practices.

#### **4. Unilateral Israeli Plans and Actions, and Land-Use Constrains**

During the first 26 years of the Israeli Occupation (starting from the June-1967's War to the September-1993's Oslo Accords), the State of Israel has treated the OPT (the Gaza Strip and the West Bank, including East Jerusalem) as a single geographic area. However, with the signing of the Oslo Accords, Israel for the first time has cut off the Gaza Strip from the West Bank, and also started to isolate East Jerusalem from the rest of the OPT. Since then, the Israeli closures' policy on the Palestinians' movement has been intensified with Israel operating the permit system for the first time. Adding to this, the establishment of Israeli military checkpoints at access points to Occupied Jerusalem and to Israel (mainly along the 1949-Armistice Line; known as 'Green Line', which is the pre 1967-War's border line between Israel and the OPT) has enabled Israel to strictly control the Palestinians' movement. Accordingly, after the outbreak of the Second Palestinian *Intifada* (People's Uprising) in 2000, the Israeli Occupation placed more physical blockades on the ground, minimizing the movement of the Palestinian people and the flow of their cargo in-between their cities and villages and with the neighboring Arab countries, resulting in large periods of economic 'downturn' in the OPT. It is worth mentioning that during the same period,

the Israeli Army forbade, for the first time, Israeli citizens from entering the OPT, except, of course, the Israeli settlers, who already reside in the settlements built illegally in the OPT.

In June 2002, the Israeli Government launched its policy of unilateral segregation between Israel and the OPT, by creating Segregation Zones on Palestinian lands in the Occupied West Bank. The Segregation Zones cut through the western part of the West Bank and run from north to south, grabbing the most fertile agricultural lands, isolating Palestinian communities in enclaves (calculating 64 communities during the period of 2000-2002) ([see](#)



**Map 2:** The West-Bank during the Second *Intifada* (2000-2002)

), undermining the territorial contiguity between the Palestinian villages and cities, grasping the natural resources, and capturing most of the Israeli settlements. The western Segregation Zone, in particular, as planned by the Israeli Government, has already isolated 555 km<sup>2</sup> (close to 10% of the West-Bank geographic area) ([ARIJ's GIS Database, 2006](#)).

In addition, Israel has *de facto* created another Segregation Zone on the eastern side of the West Bank ([see Map 1](#)) without walls or fences, but through its control of access points along the Jordan Valley and the shores of the Dead Sea. This Zone has a total area of 1,555 km<sup>2</sup> (representing close to 27.5% of the West Bank), which includes 43 Israeli settlements and 42 Palestinian localities ([ARIJ's GIS Database, 2006](#)).

## **5. Bypass Roads**

### ***5.1 Philosophy of Construction***

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" (BRN), built in Israeli-controlled areas of the Occupied West Bank. The construction of this extensive system (BRN) 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 (BRN) was not only developed to maintain an 'internal fabric of life' ([B'Tselem, 2002](#)) for the West-Bank

Israeli settlers, calculating 480,000 inhabitant in 2006, but, also to ban the Palestinian traffic flow from passing through or by the Israeli settlements in the West Bank (which counts 207 settlements), and certainly to stifle Palestinian urban development in the OPT ([ARIJ's GIS Database, 2006](#)).

The idea of constructing designated Israeli roads was first introduced during the settlements' push in the late 1970's. However, the implementation phase of these plans came later in the early 1980's and reached a peak in 1994. Israel then intensified its efforts to increase the magnitude of the Bypass Roads in the OPT, as part of its policy to coerce facts on the ground. That was to ultimately affect the outcome of any political negotiations with the Palestinian people, including the establishment of a viable contiguous Palestinian State.

The Israelis, since they occupied the Palestinian Territory in 1967, have used mainly two approaches to confiscate the privately-owned Palestinian lands that met the Israeli planners' aspiration, regarding where the Bypass Roads should be located. The first was the requisition of land for military purposes, and the second was the expropriation of lands for public use. On the one hand, the Israelis introduced both of the approaches as legal rights of the Israeli settlers to commute in secure and private routes. On the other hand, the Palestinians argued this legitimacy by the virtue of international law, including the "*International Humanitarian Law (IHL)*", to which Israel is a signatory. Though the IHL consents to the Occupying Powers to seize temporarily private property of residents in Occupied Territory to provide military needs, it also obligates them (Occupying Powers) to protect freedom of movement for the population of any Occupied Territory, as well as their (Population under Occupation) political, economic, cultural and social rights.

*"Everyone lawfully within the Territory of a State shall, within that Territory, have the right to liberty of movement and freedom to choose his residence."* (Article 12.1, International Covenant on Civil and Political Rights (ICCPR) (OHCHR, 1966).

The Israelis, however, contended that the Bypass Roads were built to meet "military needs", by which they considered the construction of the Israeli settlements an important cornerstone in providing security to their state. Later, they added a new meaning to the "military needs" contention, where they considered the construction of the Bypass Roads as a military necessity, defined as supplying safe roads for the civilian population, in contrast to their previous considerations of providing an aid to the army. Whatever the contention the Israelis have adopted, all measures taken by Israel to change the physical character, demographic composition, institutional structure, or status of the Palestinian Territory occupied since 1967 (including East Jerusalem) have been described by the United Nations' Security Council's Resolution No. 465 (1980), as having *"No legal validity."* The Resolution also states that, *"Israel's policy and practices of settling parts of its population and new immigrants in those territories constitute a flagrant violation of the Fourth Geneva Convention, relative to the protection of civilian persons in time of war, and also constitute a serious obstruction to achieving a comprehensive, just and lasting peace in the Middle East."* (UN Security Council Resolution No. 465, 1980).

## ***5.2 West-Bank Territory Classification***

The Oslo Accords (signed in September 1993) classified the West-Bank Territory into three jurisdictions. These are: *Area "A"*, where the Palestinians have full control over the land (security and administrative-wise); *Area "B"*, where the Palestinians have only an administrative control, while security is in the hands of the Israelis; and *Area*

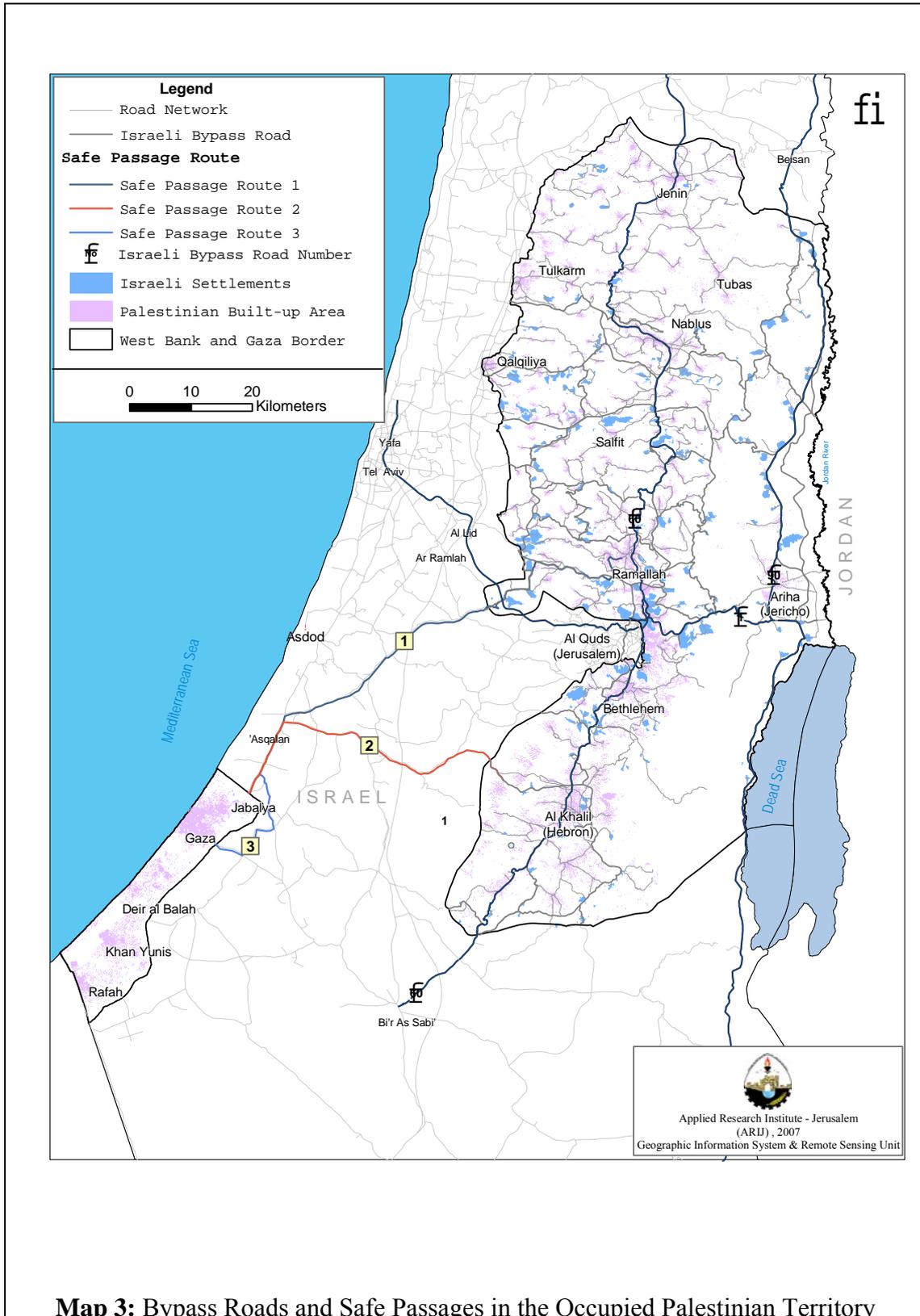
"C", where the Israelis have complete control (security and otherwise) and the Palestinians has none ([see Map 1](#)).

The majority of the West-Bank Territory is considered, according to the Oslo Accords, as *Area "C"*, which holds all Israeli settlements and, consequently, the Israeli Bypass Roads that pierce at many classified zones of the "*A*" and "*B*" areas. It must be clear that the Israeli settlements and bypass roads in the *Area "C"* strongly constitute physical obstructions in front of any possibility for a sustainable development in a future Palestinian State.

### ***5.3 Classification of Bypass Roads***

B'Tselem divided the BRN into three categories, as outlined in their published report of "The Discriminatory West-Bank Road Regime, 2004." The three categories are as follows: Completely prohibited, partially prohibited, and of restricted use. This classification is only applicable on the Palestinian vehicles that hold Palestinian green plates. Perhaps Route 60, which runs in parallel with the mountain spine of the West Bank all the way from the north to the south, is a practical explanation of this categorization. The Route 60 is 223-km long and it starts from the city of Beer-Sheva, heading north through most of the city of Nazareth, bypassing in some parts and crossing in others the various Palestinian Governorates in the West Bank. So, the Route 60, with 82.5% of its total length, passes through the Palestinian Governments of Hebron, Bethlehem, Jerusalem, Ramallah, Salfit, Qalqiliya, Nablus, and Jenin. It ends in Afula behind the Green Line in the north ([see](#)



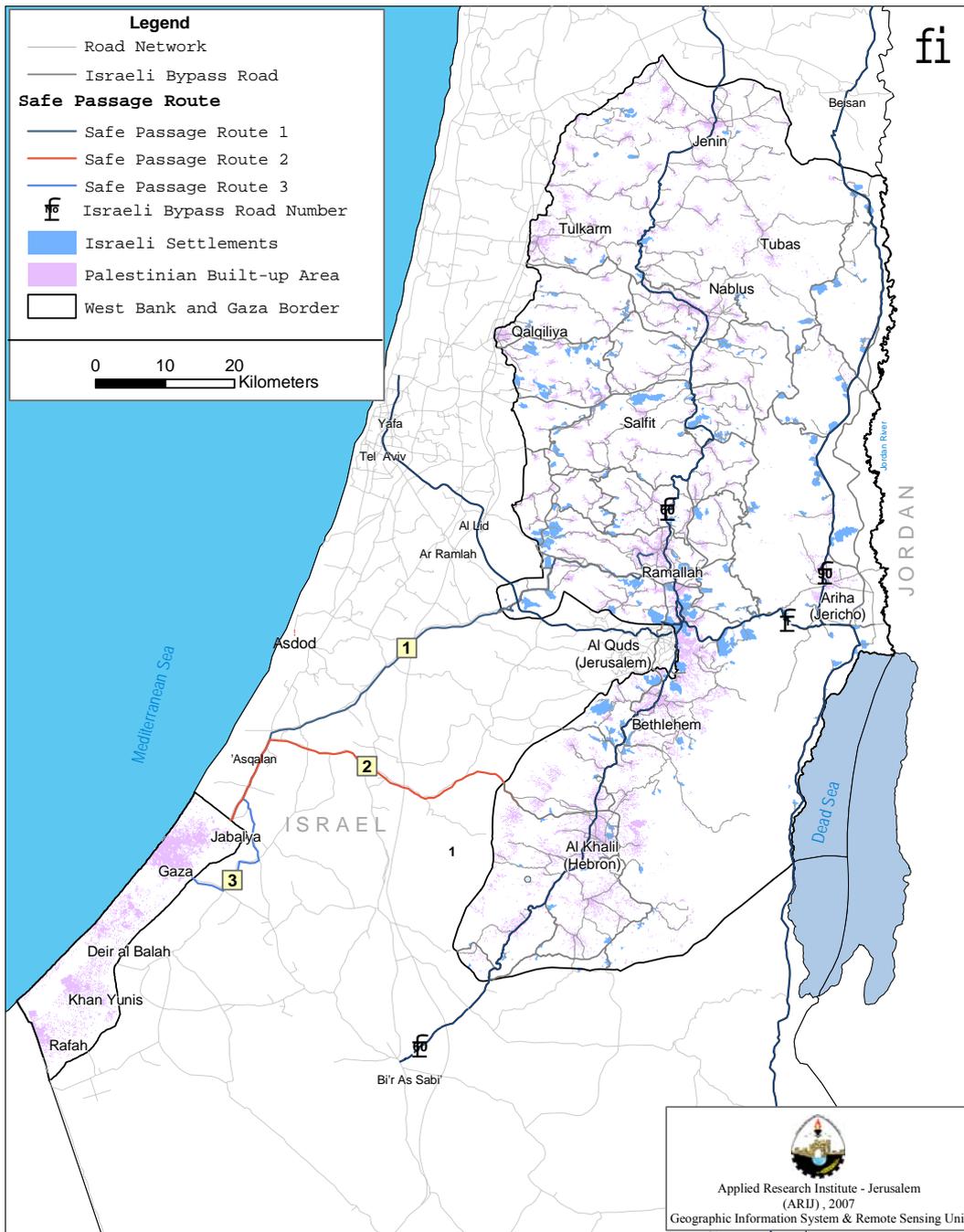


). Despite the fact that more than 80% of the Route passes through the Palestinian Territory, it is completely prohibited for Palestinian use at some parts in the middle of

the West Bank. This is namely at the Gilo intersection and the Sham'a checkpoint (both in the peripheries of the Bethlehem Governorate in the south of the West Bank). Additionally, the Route is partially prohibited, starting at the Jitt intersection and ending at the Huwwara intersection (both intersections are in the Nablus Governorate in the north of the West Bank). Moreover, the Route is of restricted use at the Dotan intersection, in the Jenin Governorate in the north of the West-Bank (B'Tselem, 2004)

(see



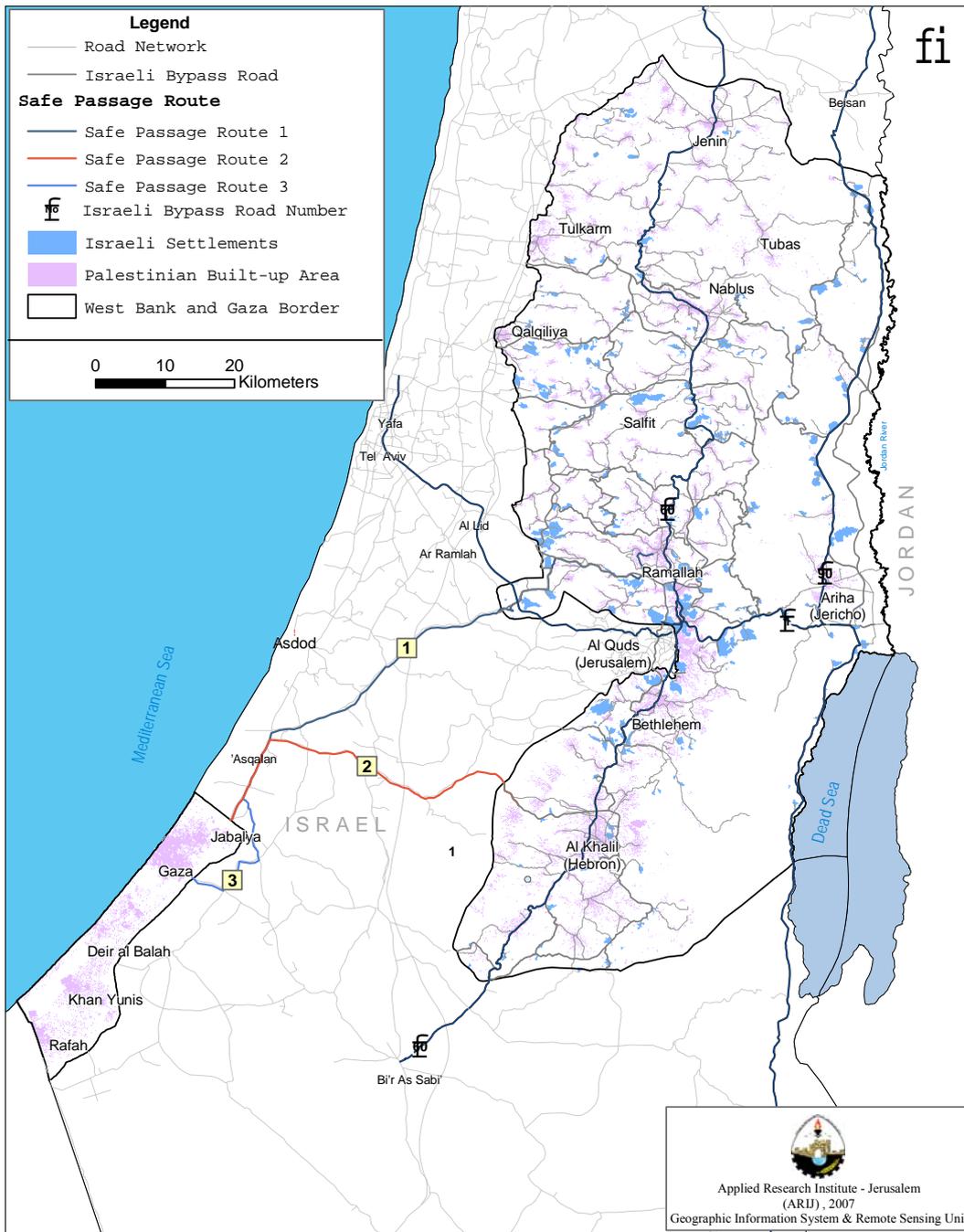


**Map 3: Bypass Roads and Safe Passages in the Occupied Palestinian Territory**

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As far as the Route 60 ruptures the landscape of the West Bank in the middle, and crosses it in the most fertile agricultural lands, another route, which is the Route 90 (the longest road in Israel), does the same thing in the eastern parts of the Occupied West Bank. The Route 90 crosses the Jordan Valley (which is considered the food basket of the OPT), with a total length of 119 km. On the other hand, the Israeli paved Route 1, which crosses the West Bank laterally with a 46-km length, connects the Routes 60 and 90 to each other, forming an "H" link to establish a wide unremitting system of Bypass Roads ([see](#)





**Map 3: Bypass Roads and Safe Passages in the Occupied Palestinian Territory**

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Today, ARIJ (the Applied Research Institute – Jerusalem) counts 800 km of bypass roads in the West Bank, with an average width of 20 m and an average buffer zone of 120 m around the roads, delineated for security purposes. It is worth mentioning that Israel within the last 10 years has confiscated more than 2% of the total West-Bank area (representing a 100% increase since 1997), in order to pave the Bypass Roads, permitting Israeli settlers to travel by the shortest route possible across the Green Line.

The impact of rapid, momentous, and unsettling changes expansion or the layout of bypass roads in the West-Bank area is a major disruption to the Palestinian economy, autonomy and society, which will undoubtedly feature prominently as a formidable challenge to the emerging Palestinian State in the coming years.

## **6. Terminals**

The Israeli successive governments have adopted a policy of physical domination on the Palestinian-Israeli borders, through a series of terminals with the purpose of controlling the commercial flow of the Palestinian goods, merchants and workers from the OPT to Israel.

Up to this moment, the Israeli governments, through a series of military orders, have declared the construction of 24 terminals, including 17 in the West Bank and 7 in the Gaza Strip (see [Map 1](#)). The Israeli terminals' policy has served as a collective punishment strategy and as a source of impediments to Palestinians' movement along the snaky path of the Segregation Wall.

A thorough understanding of the locations of the terminals (see [Map 1](#)) reveals that these terminals are located in sensitive areas to block the usual routes that were used

by the Palestinians until recently, creating a group of besieged Palestinian communities. These terminals are opened for Palestinians to access other adjacent Palestinian communities only at specific times and under ambiguous, harsh and inhuman Israeli procedures. Movement of people and flow of goods between towns and cities, farmlands and towns, and between the OPT and the world outside have been reduced to a trickle.

The international community, including the Quartet (UN, USA, EU and Russia) shares a mutual consensus with the opposing parties (the Israeli Government and the PNA), in the context of how to ensure Israeli security, as well as the restoration of Palestinians' movement. It is important to mention here that the Israeli Segregation Wall has cost the Palestinian economy, according to the World Bank's estimates, some 2–3 percentage points of the Palestinian Gross domestic Product (GDP) per annum ([World Bank, 2006](#)). This made the Quartet (during its Committee Meeting in December 2004) to recommend the dismantling of the Israeli closures' regime imposed on the OPT. In parallel, after one year of that Meeting, the Israelis and the Palestinians signed an Agreement on Movement and Access (AMA) brokered by the present US Minister of Foreign Affairs (Condoleezza Rice). The Agreement incorporates elements of proposed modern management techniques and new scanning technologies that could provide a high level of security for the Israelis, commercial efficiency, and free movement for the Palestinians.

However, in contrary, facts on the ground speak louder than words. This means that Israel continues with its unilateral actions with little of what was agreed upon to be implemented, as the Segregation Plan has become more tangible. This has made the

flow of Palestinian cargos through the crossings decline even further prior to the signing of the AMA in 2005.

## **7. Israeli–Palestinian Road Systems: Two Competing Schemes**

The Palestinian people in the Occupied West Bank do not have many choices, as regarding the means of transportation. The means of transportation in the West Bank are restricted to the traditional transit modes (urban and para transit modes). The urban transit mode, which is considered a highly specialized mode, includes traditional mass of transit means, such as buses and streetcars. The para transit mode includes shared taxi services. By virtue of the principles of Rio Declaration (1992) (Principles 4, 7 and 8), these traditional transit modes, as used in the OPT, are not sustainable forms of transport for social, environmental, health, and otherwise reasons, affecting the local Palestinian communities, in terms of social disintegration, environmental degradation, public health deterioration, and pressure on land.

The current Palestinian road network in the West Bank runs at approximately 12,000 km in length, connecting 667 residential communities that spread on almost 5,660 km<sup>2</sup> patch of land ([ARIJ's GIS Database, 2004](#)). More than 90% of this network is classified as main roads, main urban roads, and secondary roads. Approximately 53% of these roads are suited in the *Areas "A" and "B"* that fall under the PNA's jurisdiction, regarding "Transport Sector Management."

The main road network in the OPT, connecting major cities and providing access to nearby villages, runs in total at almost 1,740 km in the West Bank and at 185 km in the Gaza Strip. This shows an increase of about 38.5% compared to the year 1993 in the West Bank and an increase of 76% through the period 1996-2001 in the Gaza

Strip. The analysis of aerial photos (for the year 2004) of the West Bank shows high increase in length of the secondary roads, which reached 9,076 km, representing an increase of 3.6 times of that in the year 1993. Also the data shows that about 6.8% of the total road-network length in the West Bank is Bypass Roads ([ARIJ's GIS Database, 2004](#)).

Most of the West Bank's existing main roads are 10-12 m in width. They were constructed during the British Mandate and the Jordanian Administration of Historical Palestine, during the period 1917-1967, in order to link Palestinian urban areas ([ARIJ, 1999](#)). The secondary roads in the OPT, which are densely constructed in the Palestinian urban peripheries, are typically 4-8 m in width. Most of these secondary roads are in a state of despair, as they host more than their designed operational capacities. Unfortunately, the volatile political situation in the OPT has reflected its negative impacts on every facet of the Palestinian life. Since the outbreak of the Second *Intifada*, Palestinian cities were besieged and the access inter-cities, using main roads, have become more difficult, because of the Israeli Army's restrictions. This has made the Palestinian population turn to the secondary roads as an alternative, which has amplified the utilization of these roads, as they have become primary travel arterials.

Most Palestinian cities have witnessed rapid growth in transport demand, but because of insufficient public transport services, there has been an excessive reliance on private vehicles. The Palestinian Central Bureau of Statistics (PCBS) says that 69.2% of the current registered vehicles are private ones ([PCBS, 2005](#)). Moreover, after the outbreak of the Second *Intifada*, there has been a shift away from the public transport services, such as buses, in favor of shared taxi services. The shared taxi services in the

OPT have become a more favorable option for their ability to move easier on the secondary roads. This is because the main roads are either blocked or hassled by the Israeli Army for hours at times, as trips of a few kilometers take many hours, following lengthy detours to avoid the areas surrounding the Israeli settlements and settlers' roads (Bypass Roads). It is also because of the Israeli checkpoints and placed physical barriers that are spread all over on the OPT. Accordingly, the Israelis are trying to implement their strategy of "Disinfected Road System", where they are trying to create two road systems. These are one for the Israeli settlers and the other for the Palestinian indigenous population, putting in the first place and as top priority, the needs and aspirations of the Israeli settlers. Such an Israeli on-ground strategy clearly demonstrates the Israeli racial discrimination and apartheid attitudes and practices against the country's indigenous population (i.e., the Palestinian people).

The prolonged Israeli Occupation of the Palestinian Territory has impaired much of the Palestinian plans to develop a more suitable and advanced transportation system. Since 1967, the Palestinian people in the OPT have been left with an only one open land link between the West Bank and the rest of the world, which is the Jordan-River Bridge (Allenby Bridge). Other means of transportation are highly restricted too. The Qalandyia Airport, which is the only airport in the West Bank, located only 9.5 km north of Jerusalem, has been inaccessible to the Palestinian population since 1967. This has left the Palestinian travelers with no choices other than using the Israeli International Airport, when it is permissible. At the present time and since the eruption of the Palestinian Second *Intifada* in 2000, Palestinian residents of the OPT are not allowed to use the Israeli airport. However, after the eruption of the Second *Intifada*, all Palestinians were prohibited from using all Israeli air navigation facilities, except under certain conditions and in a few cases. In addition, following the Oslo

Agreement signed in 1993 and the agreed-upon Arafat International Airport (constructed in 1998; 36 km east of Rafah city in the Gaza Strip, and 2.8 km<sup>2</sup> in area), residents of the Gaza Strip enjoyed just two years' freedom of travel before Israel ordered Palestinian aerospace closure in October 2000. Following this, in December 2001, Israel decided on the complete de-capacitating of the Palestinian Airport, by bulldozing the main runway. Thus, the Israelis have restricted the choices for the residents of the Gaza Strip, who are only able from then on, to travel abroad through the Rafah border's terminal, which is located on the southwest of the Gaza Strip, as a cross passage between the Strip and Egypt. However, the Rafah border's terminal is totally closed now in the face of the Palestinians due to the recent events in the Strip. Israeli violations against the Palestinian Airport contravene and breaches the Airport Operation Protocols signed with the Israeli Government, which was based on the Wye-River Accord that considered the Airport a civilian one. Meanwhile, Palestinian transport officials estimated the grand total cost for re-constructing and re-operating the Airport to reach \$US 27 million (about 1/3 of the original cost of constructing the Airport).

Likewise, sea transport is restricted in the Gaza Strip. For instance, the Palestinian proposed seaport in the Gaza Strip has never been translated into a reality, because of Israeli's reservations, forbiddances and attacks, which resulted in the destruction of the temporarily placed infrastructures' project. In addition, Israel is currently preparing for a floating Segregation Fence along the coast shores of Gaza. This Segregation Fence is 800 m long, and comes as an extension to the 150-m long sea wall segregated by the Israeli Army in the Mediterranean Sea, which will deprive more than 3,000 of the Gaza's fishermen from their livelihood on the long run.

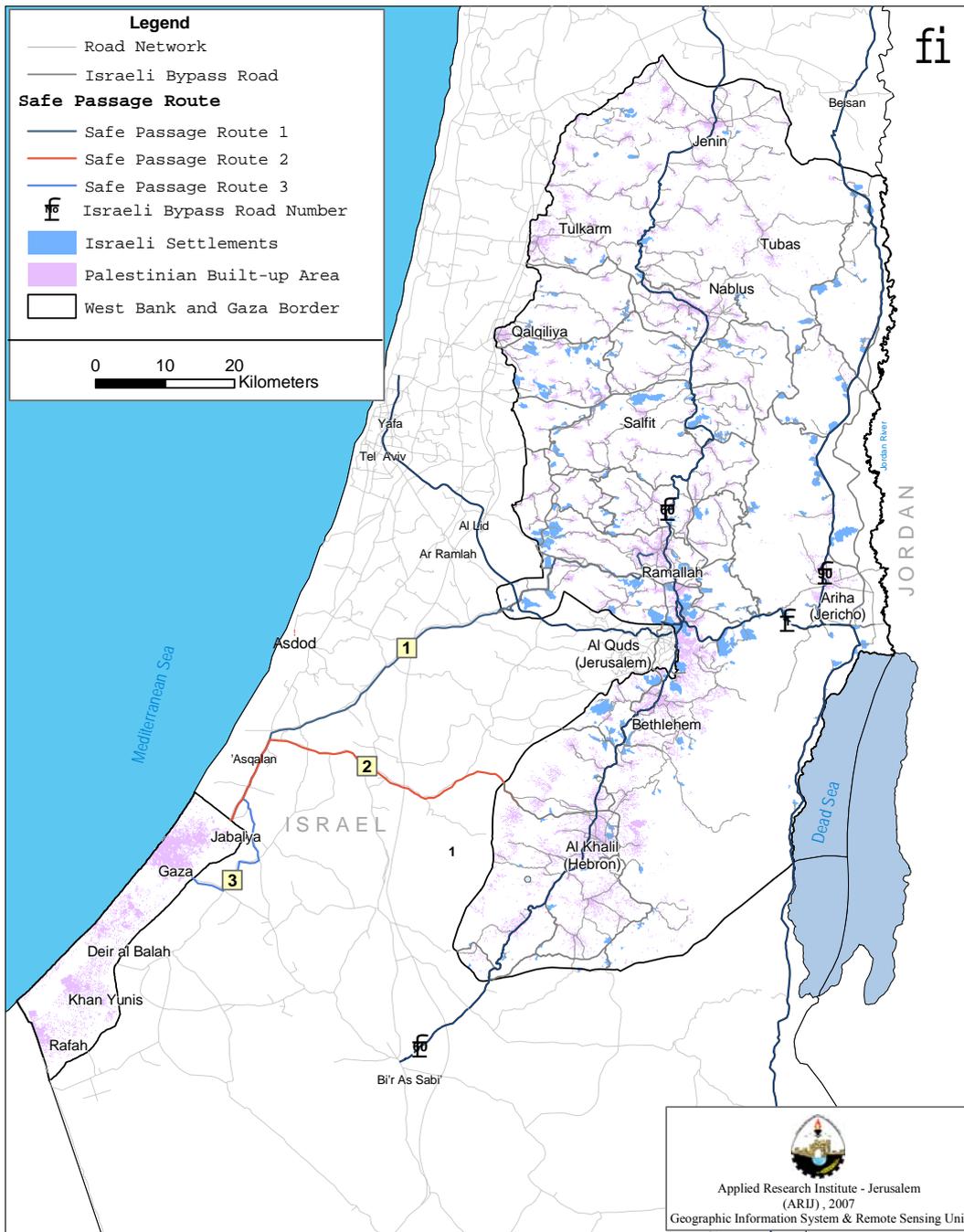
Furthermore, the floating Segregation Fence will represent as a formidable challenge in the development of future significant infrastructure facilities (i.e., seaport) for an emerging Palestinian State.

## **8. Safe Passages between the West Bank and the Gaza Strip**

The political discourse of the importance of "safe passages" between the West Bank and the Gaza Strip rests on the premise asserted in the 1993-DOP that “[the Government of Israel and the Palestinian Authority] view the West Bank and the Gaza Strip as a single territorial unit.” (Lonergan, 2004). However, after the Israeli so-called disengagement (much more a redeployment) from the Gaza Strip in 2005, the idea of "safe passages" floated on the surface once again, to help contribute positively to upgrade the harsh economic conditions in the OPT, especially in the Gaza Strip.

According to the Israeli-Palestinian signed protocol, concerning "Safe Passages between the West Bank and the Gaza Strip" in 1999, the safe passages shall be maintained via the Erez crossing point (for persons and vehicles only), the Karni crossing point (for goods only), the Tarkumya crossing point (for persons, vehicles and goods), and an additional crossing point around Mevo Horon in Ramallah (JMCC, 1999) (see





**Map 3: Bypass Roads and Safe Passages in the Occupied Palestinian Territory**

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These semantic exercises of "Safe Passages" and "Transportation Contiguity", rather than "Safe Roads" and "Territorial Contiguity", have helped the Israelis to mask their plans and actions conducted on ground. These plans and actions include, for instance, the bridging between the Israeli aspirations to illegally control the Palestinian land and to increase the Israeli settlers' population in the OPT, on the one hand, and the focus on their demographic interests, on the other hand. This is regardless of the main concerns and aspirations of the Palestinian people in a credible Palestinian State with geographical contiguity.

The Palestinian civil society has listed several reservations on issues that shall prejudice the use of the "Safe Passages", which are already hindered by the Israeli obstacles and delays. Among the Palestinian reservations are the following: 1) The Passages will only operate during the daylight hours (from sunrise to sunset), including shuttle buses which will operate only from 7:00 am to 2:00 pm on two days of every week; 2) The possibility of Israeli authorities to interference in passagers flow by inspecting the commuters, which means that Palestinian passengers may be subject to arrests; 3) The fact that the Safe Passages are regular roads used by the public Israeli traffic and pass by Israeli towns and cities can be used as an excuse by the Israelis to force entry denials on Palestinians or their goods. In other words, this may help the Israelis to fulfill their desires of Palestinian subjection and total dependency on Israel.

Instead of enforcing the operation of the safe passages, the Israelis have developed obstacles and formidable challenges, through old and recent Israeli governmental instructions, to begin developing new railways connecting the West Bank with the

Gaza Strip. Examples on this are the 100-km long railway that connects the Gaza-Asdood harbors; the Tulkarm railway that was first introduced in 2001 and then reintroduced in 2005 with a call for the World Bank to help finance half of the cost.

With the above-mentioned Israeli plans in mind, the Israelis have been essentially shaping non-contingent territorial entities of the Gaza Strip, and have been besieging Palestinian areas in the West Bank. These are separated by the Israeli main settlement blocks that include Ariel, Modin, Illite, Givaet Za'ev, Ma'ale Adumim, Gush Etzion, and Qiryat Arba. Though the Israelis have been arguing until this minute that the Palestinians will have territorial contiguity using tunnels and/or bridges, there will be no real sovereign control for Palestinians over their territories or over external borders with the Arab neighboring countries, as long as the Palestinians are compelled to go through Israeli controlled areas.

## **9. Proposed Arc Plan for Palestinian Transportation System**

The Israeli Occupation of the West Bank (including East Jerusalem) and the Gaza Strip has always aimed to hinder any kind of development within these territories, particularly with regard to what might constitute an infrastructure base for a future Palestinian State. For any country in the world, an infrastructure base includes primarily adequate transportation system.

Certainly an adequate Palestinian transportation system is one of those targets that the Israeli Occupation Authorities have considered a taboo issue for the potential of

establishing a Palestinian State in the OPT. Furthermore, during the Israeli Military Occupation of the West Bank and the Gaza Strip, the Israelis have disregarded any developmental schemes that have been introduced and dedicated to the Palestinian physical infrastructure layout, especially for the construction of new roads and/or for the rehabilitation of the existing ones, particularly the roads that have served the Palestinian communities.

At the time the PNA came to control in parts of the OPT; it inherited a chaotic and inefficient framework for every aspect of life in the society. This includes a worn-out transportation network system, as a result of the 40 years and counting of the Israeli Military Occupation of the Palestinian Territory. As seen on the ground, this Occupation has very badly affected the process of development, which grounds much of the political pandemonium on the Palestinian arena.

The majorities of both peoples (Palestinians and Israelis) share a consensus vision for two neighboring states, living side by side in what is known as Historical Palestine. However, the situation on the ground indicates otherwise, as the Israeli activities have undermined every effort to realize this shared vision, and as the destruction of the Palestinian economy and infrastructure are going unabated and are not subject to a specific timeframe. Still a plan of action for the development of a future Palestinian State stands as inevitable challenge and destiny to the Palestinian people, as such an aspiration plan has already gained financial and political, as well as moral support from the international community.

So, parallel to an international level of commitment to see the two-state vision work, an American corporation (called RAND) introduced, after a two-year study with a

cost of \$US 2 million, a set of recommendations serving as a blueprint for a "*Viable, Independent, sovereign and Self-reliant Palestinian State*." The study included development projects to improve the quality of life on different facets of the anticipated Palestinian State. For example, the study introduced "*The Arc Plan: A Formal Structure for a Palestinian State*", which is a high-speed train and fiber-optic network, linking main Palestinian cities at every Palestinian Governorate in the West Bank with each other and with the Gaza Strip. The Arc Plan is a 225-km (140-mile) corridor, which would include a rail-line, highway, aqueduct and an energy network, of which 137 km of the railway crosses through the West Bank, whereby half of that runs over the *Areas "A" and "B"*, and the remaining half runs over the *Area "C"*.

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 on a contingent geographic area (West Bank and Gaza Strip). However, the plan deals vaguely with complex issues, such as the Israeli settlements, Occupied East Jerusalem, and the future State's borders. As for the Israeli settlements, the Arc ignores them as it penetrates major Israeli settlements, like Ma'ale Adumim in Jerusalem and Itamar in Nablus. Such a proposal may be interpreted by the Palestinian people as a *de facto* recognition of these illegal settlements and as a consolidation for the Palestinian subjugation to the Israelis ([see Map 1](#)).

On the political level, the Palestinian people feel that the Arc Plan will consequently redraw the West Bank-Jordan borders, as the Arc Plan will run in parallel with the Israeli Segregation Zone on the eastern side of the Occupied West Bank. Nevertheless, Palestinian environmentalists perceive the current path of the Arc Plan

as a rupture of the Palestinian landscape and as a waste of the Palestinian natural reserves along the eastern terrains of the West Bank.

In general, the Arc Plan neglects development of territorial lands on the western side of the West Bank. In addition, the Plan encourages and directs the Palestinian development to the east; presumably to accommodate the proposed returns of Palestinian refugees to new Palestinian cities that may be created in case of the establishing of a Palestinian State on the OPT. This will be away from the Green Line and, consequently, away from the western Segregation Wall, which constitutes the *de facto* border of Israel with the Occupied West Bank.

The Arc Plan, as presently proposed, will limit the opportunities and alternatives of Palestinians who wish to commute from north to south of the West Bank or vis-à-vis. This will certainly create a land transport development dilemma. However, the Arc Plan suggests rebuilding the airport in the Gaza Strip, to be the only air navigation facility for the OPT, which will allow Palestinians to travel abroad. Such a case (though it is a step forward towards improving the transport conditions of the Palestinian people) would, in minimum terms, double the time and cost for Palestinian travelers. According to the Arc Plan, a Palestinian living in the north of the West Bank, who wishes to access Jordan (the neighboring country), must travel to the far most southern part of the Gaza Strip to get to Jordan. In other words, this is a trip that consumes 90 minutes in the train plus 30 minutes in the plane (2-hour trip altogether), compared to an anticipated 20 minutes air trip if launched from the center of the West Bank, using the closed Qalandya Airport directly to the Queen Alia International Airport in Amman, Jordan.

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.

## **10. Impacts of Palestinian Transportation on the Environment**

The transport sector is one of the most important sectors that constitute the backbone of the Palestinian economy. In 2004, the transportation and communication sectors contributed 5.4% of the total job opportunities in the OPT. The average monthly working days in this sector were 24.3 days, which is slightly higher than that of the total economic sectors (23.7 days) (PCBS, 2004). The Palestinian Economic Council for Development and Reconstruction (PECDAR) estimates that 70% of the transportation sector's contribution (estimated at 5.4% prior to the Second *Intifada*) to the Palestinian GDP was set back (PECDAR, 2002).

Because of the volatile geopolitical situation in the OPT, road transport has been highly restricted as a result of permanent and temporal Israeli checkpoints, as well as physical barriers. For example, in 2007 the number of the Israeli checkpoints is recorded, so far, at 576 (ARIJ's GIS Database, 2007) throughout the West-Bank area. Thus, road freight and passenger transport operations are highly restricted within the OPT in general. In the Occupied West Bank, in particular, the Israeli Army has enforced cumbersome back-to-back transportation system. Recent studies by the Palestinian Ministry of Transportation (MOT) estimated losses of the transport sector through the period 2000–2005 to exceed \$US 343 million.

Unfortunately, the existed transport sector has caused sever negative impacts on the Palestinian environment. The inadequate transport system has caused unprecedented increase in the noise level, habitat loss, water pollution, and waste generation. Natural resource's depletion and negative (direct, indirect and cumulative) effects are other consequences of a defective transportation system, which have serious upset on people's health and safety.

Road transport accounts for more than 60% of the overall energy consumed in the OPT (UNEP, 2004), which makes the transport sector a target field for future energy and environmental research. It is estimated that transport infrastructure (mainly roads) consume 7.4% of the built-up area, and about 3.7% of the total land of the West Bank. Increased land use for transport infrastructure may lead to irreversible impacts on land and natural resources. According to spot analysis of the available aerial photos on the 2004-ARIJ Database, there was in the West Bank 2.1 km of road length per one km<sup>2</sup> of area, as compared to 0.8 km of road length per one km<sup>2</sup> of area in Israel. The West Bank has 5.2 km of road length per thousand inhabitants, as compared to 2.6 km of road length inside Israel. These trends show the extent of the pressure on the local Palestinian environment, noting that though the figures indicate better influences for the Palestinians than for the Israelis (concerning, in particular, the pressure on road networks), they are really not. In this regard, it is important to mention that the population density in the OPT is 7 times greater than that in Israel. The West Bank has, on average, a population density of approximately 432 capita/km<sup>2</sup> of the total area, while in the Gaza Strip the average population density is equal to 3,981 capita/km<sup>2</sup> of the total area, and in Israel the average population density equals 300 capita/km<sup>2</sup>. Moreover, the urban areas in the West Bank and the Gaza Strip suffer from higher population densities. There is a density of 6,842 capita/km<sup>2</sup> in the total

built-up area in the West Bank (ARIJ's Database, 2002), while the population density is 7,485 capita/km<sup>2</sup> in the total built-up area in the Gaza Strip (ARIJ's Database, 2004). These trends reflect, in general, the real inter-relationships among the Palestinian population, built-up areas, open areas, parking areas, and the environment, on the one hand, and the transportation network in the OPT, on the other.

### **11. 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

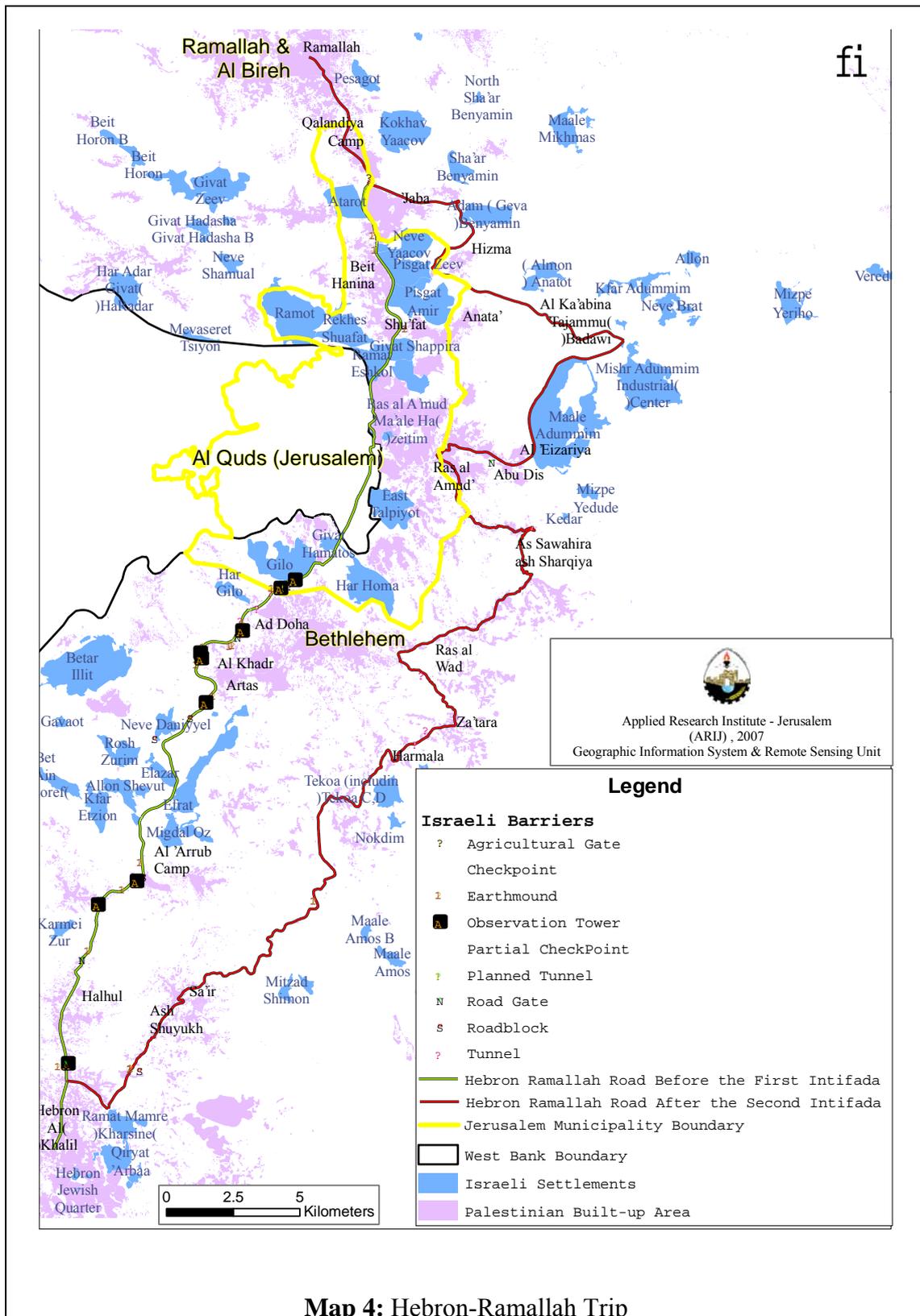
Bank, was the first target of the Israeli imposed restrictions. In 1993, just prior to the signing of the DOP, the Israeli Government at that time started off an organized campaign to isolate the City of Jerusalem. That was and is still to the present day by restricting the movement of Palestinians to 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

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). 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 taxi (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<sup>1</sup>.

## **12. Conclusion**

The Israeli Occupation practices have resulted in resource depletion, increases in unemployment rates, increases in poverty, decreases in agricultural production and an incapacity for the PNA to adequately fund and develop public infrastructure. If the current situation persists, it will be increasingly difficult for the PNA to implement sustainable development and address the many social, demographic, economic, environmental challenges, which the OPT faces. Unless, the Israeli Occupation ends in the Palestinian Territory the debate of envisioning a sustainable and a consistent transportation developmental process will remain out of question and far from reality. However, Palestinians in charge of planning and management for transport sector are called to carry out with the already adopted plans and schedules, because planning for

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<sup>1</sup> 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.

future is equally important to the emergence needs delivered to the Palestinian society. It is never known, when and where Israelis will allow for Palestinians to access their trade corridors, regional linkages and ports. Palestinian planners must include these measures, acts and other imposed geopolitical constrains in their future plans to ensure that the Palestinian transport infrastructure has the capacity and characteristics to not only support but promote economic activities.

Moreover, Palestinian society, especially the major urban centers are in need for more transport structures, including road construction and pavements. Ring roads development is welcomed, but mostly may not be a complete solution to congestion related issues. Transportation in the OPT needs qualified and skilled laborers to meet forecasted growth and to maintain Palestinian competitive advantages.

In addition, the Palestinian Ministry of Transportation and the other related ministries and authorities have to continue to lead in adopting policies and regulations that would foster the Palestinian competitive edge, by providing an environment of increased, stabilized and alternative financing options through a participatory public-private partnership.

Finally, strategies that call for reducing fuel consumption and gas emissions are highly recommended, especially in the Central Business Districts. These strategies must adopt a dual concept of reducing the vehicles fleet used and of improving the vehicle efficiency of fuel consumption (increasing the distance traveled per one liter (km/l)). This call for achieving a balance between demands (discouraging the usage of uni-passenger vehicles) and supply (improving the traffic flow through enhancing vehicles efficiency of fuel consumption and/or gas emissions).

### 13. List of Abbreviations

AMA	Agreement on Movement and Access
ARIJ	Applied Research Institute – Jerusalem
BRN	Bypass Roads' Network
DOP	Declaration of Principles
EU	European Union
GDP	Gross Domestic Product
GIS	Geographic Information System
ICCPR	International Covenant on Civil and Political Rights
IHL	International Humanitarian Law
JMCC	Jerusalem Media and Communication Centre
MOT	Ministry of Transportation
NPI	Australian National Pollutant Inventory
OCHA	UN Office for the Coordination of Humanitarian Affairs
OHCHR	UN Office of the High Commissioner for Human Rights
OPT	Occupied Palestinian Territory
PCBS	Palestinian Central Bureau of Statistics
PECDAR	Palestinian Economic Council for Development and Reconstruction
PNA	Palestinian National Authority
UMU	Urbanization Monitoring Unit
UN	United Nations
UNEP	United Nations Environment Program
USA	United State of America

### 14. Acknowledgments

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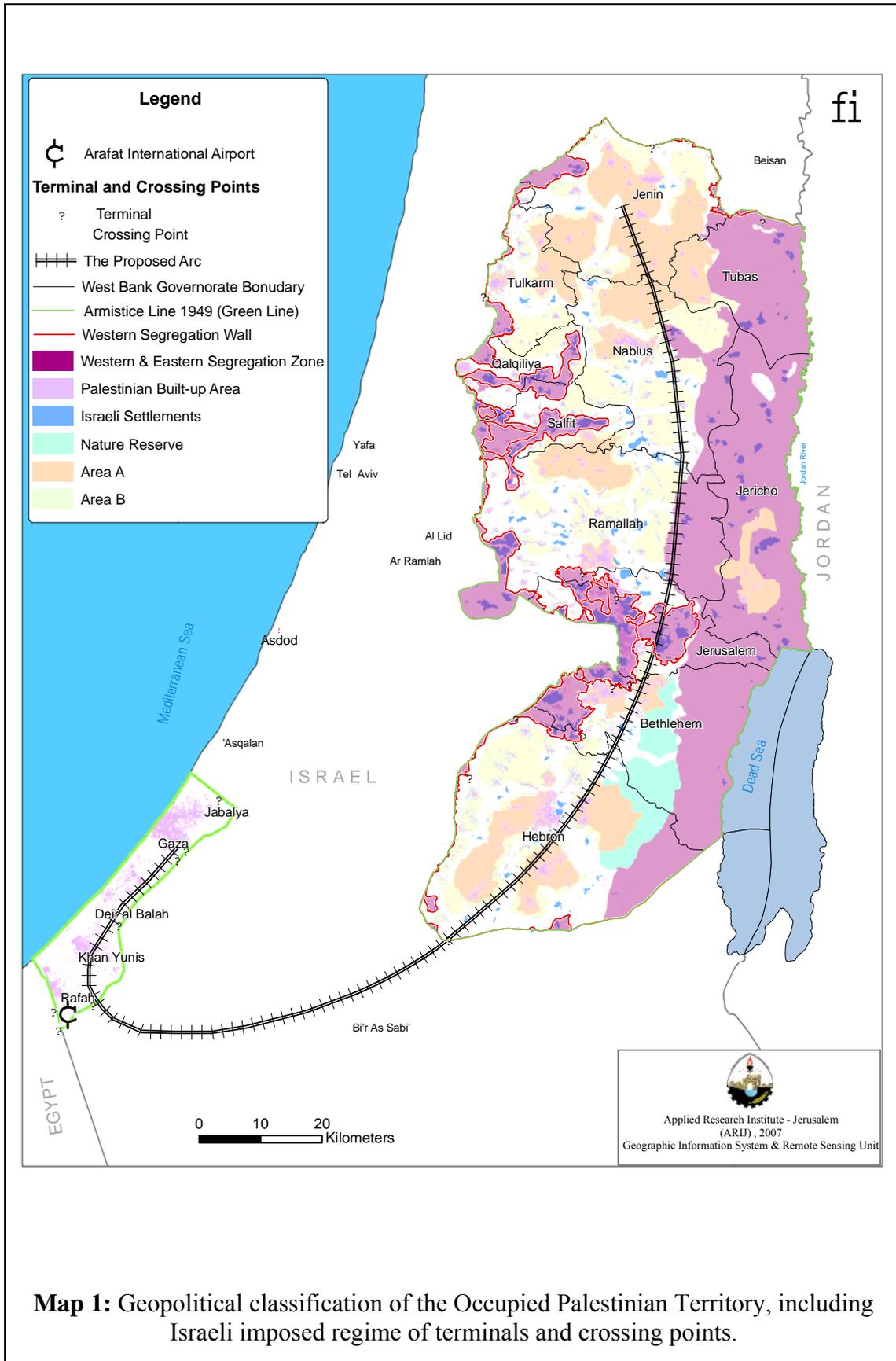
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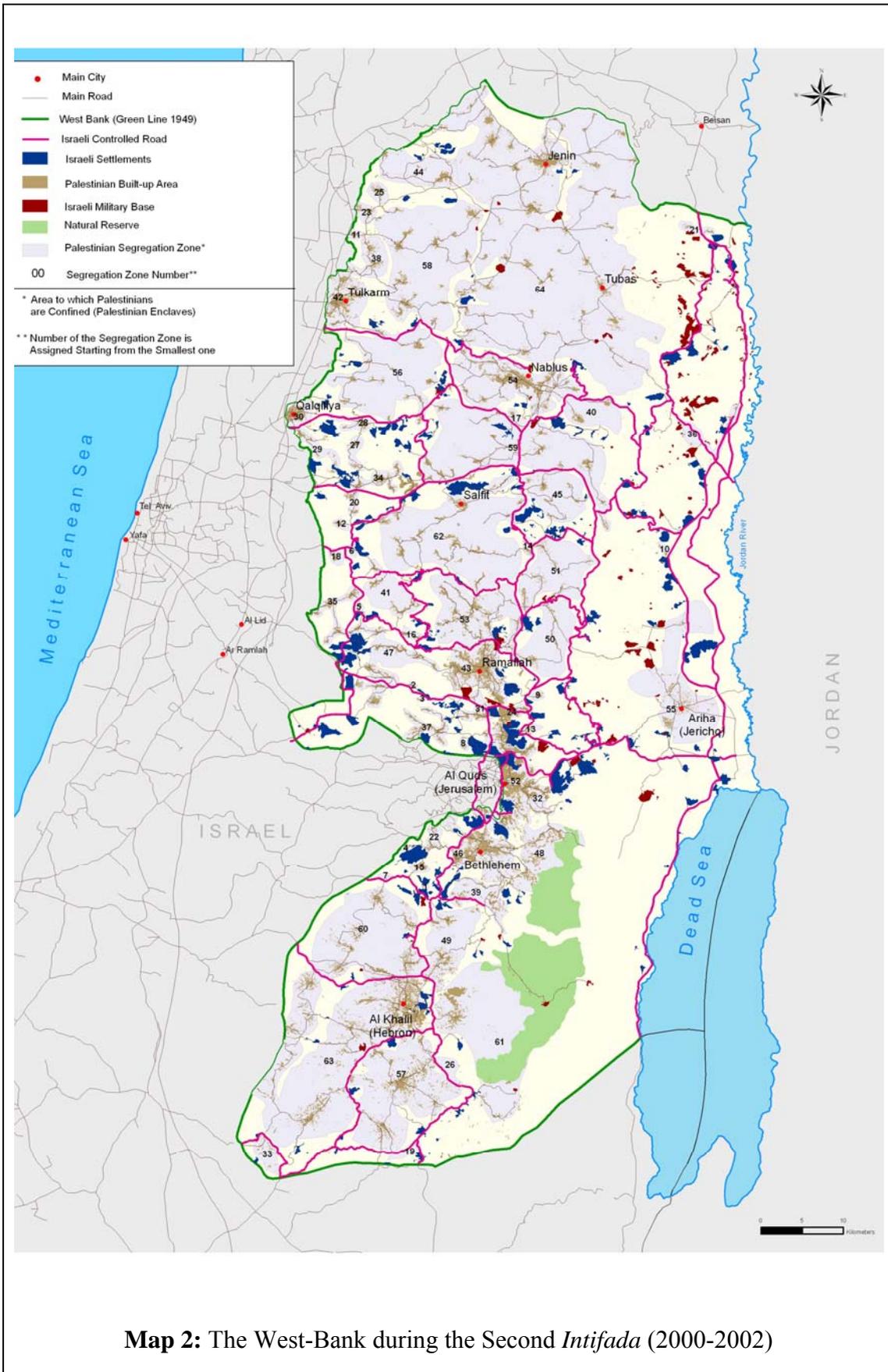
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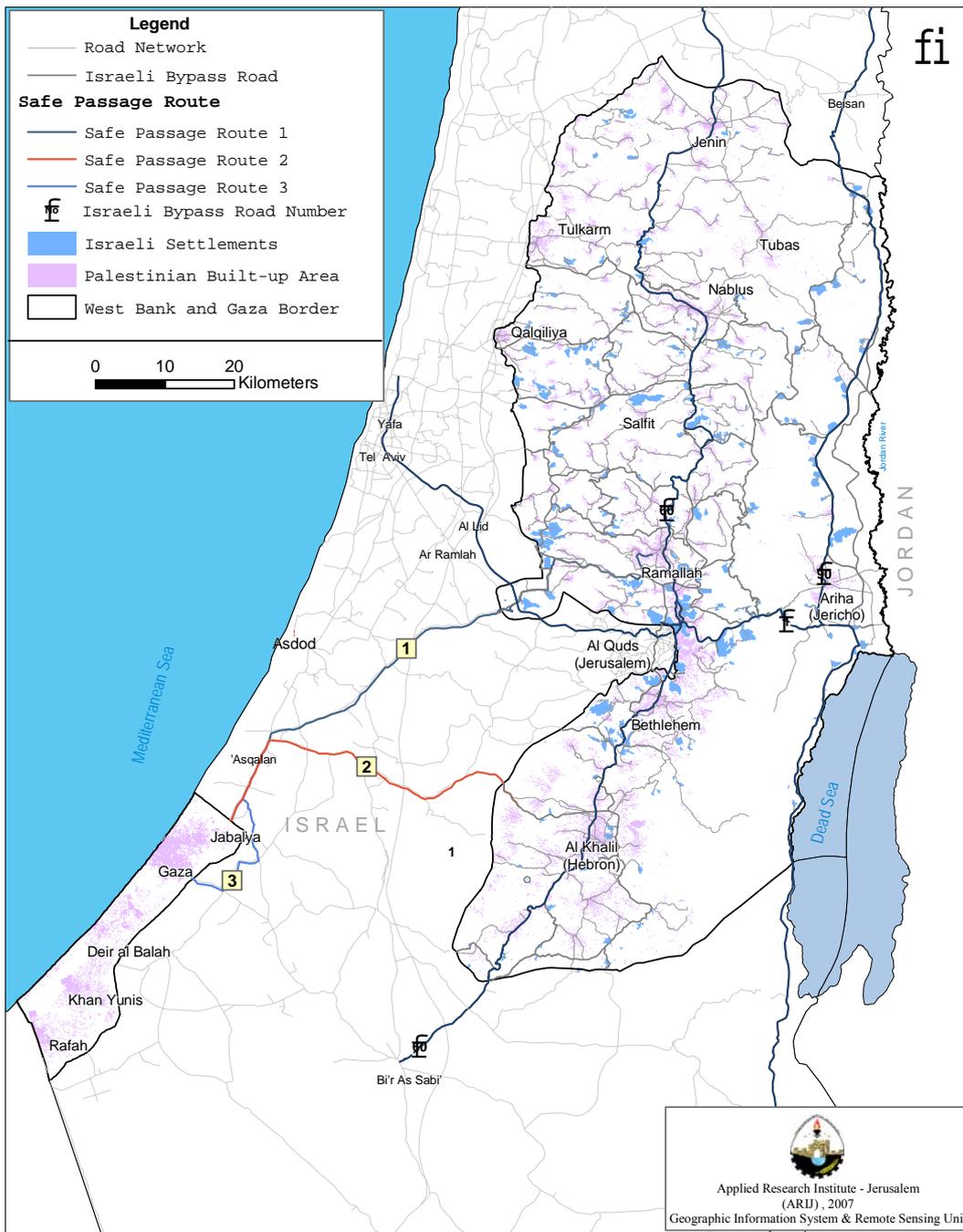
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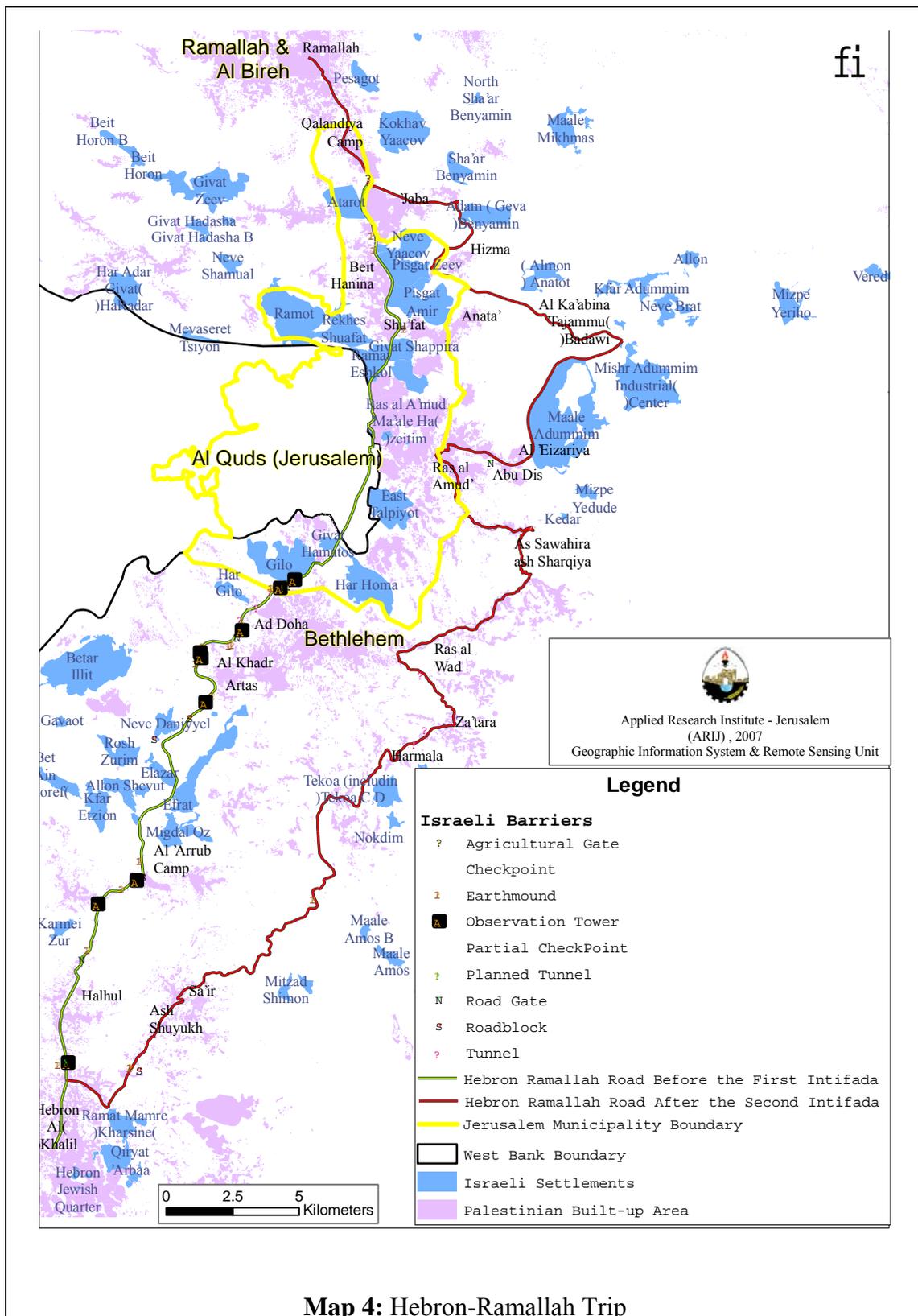


**Map 1:** Geopolitical classification of the Occupied Palestinian Territory, including Israeli imposed regime of terminals and crossing points.





**Map 3: Bypass Roads and Safe Passages in the Occupied Palestinian Territory**



<b>Table 1: Facts and figures on the Israeli illegal activities in the Occupied Palestinian Territory, directly affecting the land transportation system</b>	
Number of Israeli settlements	207
Total number of Israeli settlers	> 500,000
Total masterplan area of Israeli settlements	453 km <sup>2</sup>
Number of Israeli outposts	217
Total length of designated Israeli bypass roads	~ 800 km
Number and area of Israeli military bases	>210, occupying 38 km <sup>2</sup>
Number of Israeli various physical obstructions (various kinds)	576
Total area of Israeli closed military zones	990 km <sup>2</sup>
Total length of the segregation wall	725 km
Grand total area of isolated lands in the western Segregation Zone	555 km <sup>2</sup> (9.8% of the West-Bank area)
Number of Israeli settlements in the western Segregation Zone	103
Number of Israeli settlers in the western Segregation Zone	408,000
Grand total area of isolated lands in the eastern Segregation Zone	1664 km <sup>2</sup> (28% of the West-Bank area)
Number of Israeli settlements in the eastern Segregation Zone	42
Number of Israeli settlers in the eastern Segregation Zone	12,000
Number of terminals circumventing Jerusalem City and the Segregation Wall	18
Number of existing and under construction tunnels	25
Area of confiscated lands since the eruption of the Second <i>Intifada</i>	≥ 600 km <sup>2</sup>
Imposed Israeli security zone along the northern and eastern borders of Gaza Strip	61 km <sup>2</sup> (17% of the Gaza-Strip area)
Number of Israeli controlled terminals along the imposed Israeli security zone	7