

Multi-modal passenger security in Israel

Yair Wiseman
Bar-Ilan University
Ramat-Gan
Israel

Yahel Giat
Jerusalem College of Technology
Jerusalem
Israel

1. Introduction

Along its existence, Israel has been the target of numerous terroristic organizations, which in their attempt to achieve political gains and recognition have attacked practically every form of public transportation resulting with thousands of civilian deaths and many more wounded.

Specifically, Arab terrorist organizations, which in their fight against Israel have elevated terrorism to international levels, exploited the vulnerabilities of the civic transportation as a major target of terrorism. For example, Arab terrorist organizations such as the PLO were among the first to use airplane hijackings as a strategic and efficient weapon, endeavoring to put the Israeli-Arab conflict issue at the center of the global agenda. They have carried out merciless attacks against civil aviation targets to shock the world opinion [1,2]. While the aviation security has drawn most of the international attention, Israel has to deal with a more common, albeit less noticeable problem, the problem of public and private road traffic. Although more people die in car accidents than in terror attacks on transportation means, the Israeli government put many efforts in preventing terror attacks; sometimes even more than the efforts of preventing car accidents, even though Israel Defense Forces (IDF) are also involved in car accident analysis and prevention [3,4,5].

In this article we discuss the many dimensions of the problem of transportation security in Israel and how Israel has come off to deal with these threats of terroristic attacks. Special attention is given to Israel's security issues and their solutions in the interface between the different transportation. For example, when passengers transfer between train and bus or when buses cross security posts between Judea & Samaria region and the rest of Israel.

2. Background

Aviation safety has drawn most of the attention of public awareness to transportation security for subjective as well as objective reasons. Aircrafts are particularly vulnerable vehicles for terrorist attacks and therefore the benefits of this type of terrorism are numerous: the special structure of the plane causing it to become very vulnerable. There is a pressure difference between the atmosphere outside of the fuselage and the aircraft interior; therefore even a small mass of explosive is able to blow up the entire plane. From the moment when a plane takes off, the security forces on the ground are detached and their ability to lend a hand in case of necessity does not exist. The planes are used as a protected shelter for the kidnapers as well as a convenient transportation mean to get to various hostile destinations. Countries have come to deal with aviation security in various ways as discussed in [6] with the September 11, 2001 attacks being a major drive in boosting those security measures.

Another development in transportation security is in the rail industry. The world is well beyond the classical western train hijacking and rail security nowadays must deal

with various threats and is a developed field as reported by [7] and [8]. Security of other ground transportation is described in [9].

The hubs are frequently attractive for terror group. As a matter of fact, key transportation hubs in Israel are:

- Aviation: Ben Gurion airport and Eilat airport .
- Rail: Tel Aviv central station and Haifa central station .
- Bus: The bus system is decentralized, with each small to medium sized town having its own central bus station. The major metropolitan areas have each a major central bus station as well as neighborhood “mini” bus stations.

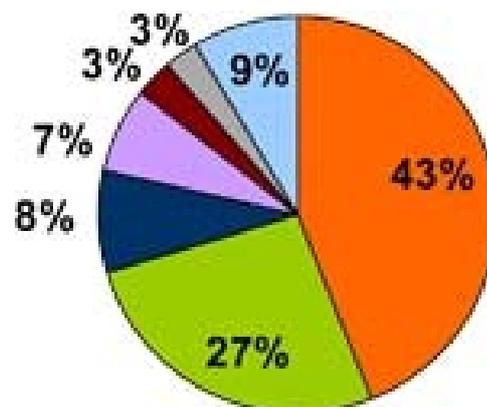
Most transportation hubs are in enclosed areas and are therefore relatively easy to monitor. However, some of smaller central bus stations are open in natures and are just a cluster of stations along a city block and have open access. As passenger density in this location is fairly low the risk posed by these stations is fairly small.

The security of the Transportation is regulated by several authorities:

- Department of Security and Transportation Security in Israel Transport Ministry.
- Israel Police.
- Israel General Security Service.
- IDF's Home Front Command.

The overly number of in charge authorities makes no good for the security. The authorities tend to blame each other for the faults and usually demand that other authority will pay the expense of the security measurements [10].

Unfortunately, there is no coherent regulation process for security measurements. Actually, when there is a major terror attack, the authorities set an ad-hoc meeting and decide how to improve the security measurements. When there is a quite period, no new regulation is initiated.



- 43% - Suicide bomb within a bus.
- 27% - Shooting at a vehicle.
- 8% - Roadside explosive charge.
- 7% - Shooting at a station.
- 3% - Booby-trapped car.
- 3% - A rocket hitting a vehicle.
- 9% - Other.

Figure 1. Terrorist incidents by transport mode

In the first decade of the 21st century, the total number of terror on Transportation means was 1,178 and the distribution of historical terrorist incidents was as described in Figure 1.

Attacks on Israeli ground transportation

Road traffic in general and passenger buses in particular, have been the target of attacks even before the inception of the State of Israel, and dozens of times throughout its existence. Some of these attacks have had strong impact on the security operations.

On March 11, 1978, Arab terrorists hijacked a taxi and killed its occupants. They drove the taxi toward Tel Aviv. In the highway they hijacked also a civilian bus. All through the ride, the terrorists shot and threw grenades at other cars in the highway and killed bus passengers. At the end of the assault the terrorists exploded the bus. 38 Israeli citizens were killed in the assault, 13 of them children and 71 were wounded. Nowadays, many Arab places and organizations such as a public square, a computer center, a soccer tournament, and a summer camp bear the name of Dalal Mughrabi who led the assault [11]. That dedication makes the Israeli society believe that the Arabs do not really want a peace and the terror attacks will continue [12]; therefore the security forces of Israel require more security measurements in each transportation infrastructure in Israel.

Security equipment and procedures were gradually installed and implemented, mostly as result of these attacks. For example, in July 6, 1989, Abd-el Hadi Ghanaim got on the 405 bus from Tel-Aviv to Jerusalem. As the bus was climbing the mountains before Jerusalem, he grabbed the bus's steering wheel taking it off the road and into the gorge below [13]. Shortly after, fences blocking access between passengers and drivers were installed in many of the public buses in Israel. The two front seats in each bus are reserved for security forces personnel. This fence together with passenger alertness succeeded in averting similar terroristic attacks.

Ironically, the number of terror attacks on civilian public transportation has increased dramatically after the Oslo accords. Whereas in the twenty years preceding it there were only two major terrorist attacks on buses (the aforementioned March 11, 1978 and July 6, 1989 attacks) in the twenty years following it there were dozens of attacks on buses resulting with more than 300 murdered civilians and more than a thousand severely injured. Buses are clearly the target of choice for these terrorists. In the entire period after the Oslo accords, only one lethal attack was made inside a train station. There was one other attack on July 16 2001 made near the Binyamina trains station. In this case the security post prevented the suicide bomber from entering the station, thus limiting the death toll to two. The attack inside the northern town of Nahariya train station is another example for why tensions exist between the Arab and Jewish population in Israel. The suicide bomber was not the "classical" suicide bomber arriving from Judea and Samarian. In this case the bomber was an Arab Israeli citizen, a fact that facilitated his success to pass the security check and enter the train station.

There were two other notable terroristic events relating to rail transportation. Both happened within less than two months in the summer of 2002. In both cases explosives laid on the tracks were remotely activated [14]. Fortunately, these

incidents resulted with only little injuries and with the heightening of security measures to protect rail lines it seems that terrorists have abandoned this form of attack.

During the Oslo accords, attacks typically involved either a suicide bomber or explosive devices placed by terrorists. The most important tool against these attacks was citizens' awareness and alertness. The second layer of security was security personnel randomly boarding buses to examine it for unattended bags or suspicious passengers. Any person who wanted to enter a central bus station had to go through security check with bags examined. However, despite these procedures the system was flawed as passengers boarding buses in regular bus stops could not be examined. Such a loophole in the system allowed a Hamas suicide bomber to board a bus packed with 50 passengers and denote a bomb killing nine and injuring thirty eight. This incident further stretched tensions between the Jewish and Arab population of Israel when it was found out that the bomber informed an Arab passenger of his intentions and she, with her friend got off the bus without warning any of the other passengers nor informing the police.

Bearing such that in mind, and the fact that many of the terroristic attacks in Israel are executed with the active help of Israeli-Arabs, the Israeli security procedures allow race to be considered. Therefore, whilst any Israeli will have his bag briefly checked before entering a central bus station, Arab Israelis are typically subject to a more thorough search of their bag. This profiling has been approved by the court system. In order to minimize the negative effects on the innocent Arab population, security personnel are trained to be as professional and cordial as possible.

3. Security of Transportation Means and Infrastructures

Aviation Security Issues

Arab terrorist organizations such as the Palestine Liberation Organization (PLO) were among the first to use airplane hijackings as a strategic and efficient weapon, endeavoring to put the Israeli-Arab conflict issue at the center of the global agenda. An aircraft is a very vulnerable object [15,16,17]; therefore terrorists now and again have preferred to attack it. They have carried out merciless attacks against civil aviation targets to shock the world opinion. This activity was sponsored by a number of Arab countries, which provided them a variety of measures including training camps, diplomatic means and forged documentation. These countries allowed the hijacked planes to land in their territory and to grant protection to the kidnappers after the dubious mission has been accomplished.

Israel's aviation activity is very concentrated with its biggest airport handling more than 98% of international travel (by passengers and by planes). In total, Israel has 7 active civilian airports. Most of the domestic travel is between the center of Israel (Ben Gurion and Tel Aviv airport) and Eilat (more than 95% by passenger). There is one other major international airport servicing Eilat (Ovda airport). Three more airports have only residual international travel (Eilat, Tel Aviv and Haifa airports). In Table 1 we describe 2012's statistics for the five largest airports [18].

Table 1: Aviation traffic for the five largest airports during 2012

	Planes International	Passengers International	Planes Domestic	Passengers Domestic
Ben Gurion	89,737	12,400,479	8,087	733,513
Eilat	122	1,259	18,116	1,447,110
Ovda	1029	118,826		
Tel Aviv	1709	7,008	25,084	728,879
Haifa	1947	11,283	10,090	66,750

Israel security regulation's center of attention is the human factor. Israeli security officers interrogate passengers with the aim of finding their ethnic group. By looking at the name or physical appearance of the passenger the security officers aim at finding the ones who appear to be Arabs. In the international airport, each and every passenger, even those who are not Arab are questioned as to why they take a trip to Israel, in addition to some other questions about the trip. The idea is that these questions might be nerve-racking for terrorists and a potential terrorist might say incoherent answers. In addition, passengers leaving Israel are inspected against a computerized list. The list is made by the Israeli Ministry of Interior, Israel police and the list also has data from the Interpol. The purpose of the list is to facilitate spotting of distrusted passengers.

While various civil rights groups have pleaded to stop the ethnic group seeking out, Israel insists that it is inevitable as affirmed by Rafi Sela, a security officer of Ben-Gurion International Airport "The Arabs are going through a much tighter investigation-interrogation because of threat they pose than an Israeli who served in the army who is going on vacation. How many blond, blue-eyed ladies have brought down planes in the last 20 years? They were all fanatic Muslims. So, if you are a Muslim, we have to find out if you are a fanatic or not." [19].

Recently, Israel asks U.S. to postpone the new security regulations for cargo inspection arriving from Israeli airports. The new regulations possibly will increase the cost of the merchandise and threaten to hurt the exports between the two countries. Director General of the Ministry of Transport, Uzi Yitzchaki sent a letter to the U.S. Transportation Security Administration (TSA) to delay by six months the new security procedures.

The subjects of the debate are El Al's dedicated cargo flights directly to the U.S. and a combined cargo and passenger flight of commercial American airlines like United - Continental Airlines, Delta Airlines. Disagreements between the Ministry of Transport, the General Security Service of Israel and the Airport Terminals regarding who should finance the additional expenditure involved in implementing the new U.S. regulation hinders the actual implementation.

Rail Security

In the past decade Israel's passenger train system has experienced tremendous growth, more than doubling passenger volume. As of 2013 Israel's rail systems comprises 1100 km with 47 passenger stations and 30 freight stations. In year 2011 the train system carried 40 million passengers and shipped more than 6.2 million tons. Approximately 340 passenger trains travel daily in the system with approximately 80 more freight trains [20].

Despite this growth, the railroad layout of the train system is quite basic with a long single north-south line and few short west- east lines branching of it. Since trains are clearly a more "attractive" target than buses, the security protocols are much stricter and in fact the train system is viewed as a "closed system" in the sense that no passenger should be able to access it without having to pass through security checks. This approach is fairly easy to implement, as there are few train stations (a total of 47).

However, rail tracks are not monitored, but since there was an attempt to put a demolition charge on a railway, so the Israeli parliament legislated this amendment to the railways law at 2011 [21]:

A person who does one of these without an authority - is liable to one year in prison:

- (1) Puts or throws on a railway wood, stone or any material or another thing;
- (2) Picks up, removes, looses or displaces rail, the railway sleeper or any material or other thing belonging to railways;
- (3) Turns, moves, opens or diverts switch or any other machine belonging to railways;
- (4) Activates, shows, hides, removes or turns light signaling device on or near a railway;
- (5) Makes to a railway everything else that interferes with its activities or holding it or endangering the safety of a passenger or any other person in the railway; makes anything stated or trying to do so.

Due to its limited coverage of the passenger rail system in Israel many passengers must combine the train travel with bus. It seems as though there is not enough coordination between the two security systems. For example, passengers between bus and train stations may leave a secure zone only to have to pass a redundant security check. In our opinion there is much room for improvement in this aspect.

Scheduled Bus system

Until the last 1990's, only two major bus companies operated in Israel. Egged, the largest of the two, was (and still is) one of the largest bus companies in the world with more than 3,000 buses operating 25,267 daily route travels covering 720,073 km per day [22]. In the 1990's government decided to reform the transportation system and encouraged the entry of more bus companies into the public system. Today, there are about 18 different official public bus companies with many more operating in the private sector. Buses on scheduled routes cover a distance of more than 500 million km annually [23].

Whereas the security approach to aviation and rail transportation systems is to sterilize them, this approach is not applicable to the bus system due to geographic spread. The bus system is decentralized, with each small to medium sized town having its own central bus station. The major metropolitan areas have each a major

central bus station as well as neighborhood “mini” bus stations. Most transportation hubs are in enclosed areas and are therefore relatively easy to monitor. However, some of smaller central bus stations are open in nature and are just a cluster of stations along a city block and have open access. As passenger density in this location is fairly low the risk posed by these stations is fairly small. Nevertheless, as mentioned above, terrorists use these accessible stations to board buses which eventually take them into the more central bus stations. To counter these attempts, bus drivers and passengers alike must be alert to any suspicious behavior and especially baggage left behind. This civic behavior has helped avert numerous attacks.

Due to the different nature of the transportation systems, each transportation mode has its own security system. Except for the light rail (in Jerusalem) there is no single ticket service between rail and bus. Therefore, even for proximate bus and rail stations transferring passengers need to pass through the security and ticketing systems of each of the transportation systems.

Road blockages:

Israel has an undersized road system. As a matter of fact, the paved road system contains only 10,489 km (6,518 miles) of urban road, 6,582 km (4090 miles) of non-urban roads and 1,626 km (1,010 miles) of access roads. The total paved road are just 18,697 km (11,618 miles) [24]; however even such an undersized road system cannot be completely protected.

One remarkable phenomenon in the roads of Judea and Samaria happening daily is the coexistence of Jewish Israelis and Muslim Arabs on the roads. This daily meeting of these two populations who are otherwise usually physically separated usually does not create any notable story. However, these meetings are opportunities to see the human condition at its best and at its worst, with the latter requiring special attention from security forces. It is not uncommon to see an Arab being helped by a Jew and the other way around. Unfortunately, there are also many stories of tragic experiences, with one of the most infamous cases the 2000 Ramallah lynching. On the 11th of October, two IDF drivers were on their way from home to their base. Instead of surrounding Ramallah using the bypass road, they passed through a security check without being stopped and entered the city of Ramallah. Once they were identified as Israelis they were attacked by a mob until a few Arab officers took them into a police station. What came next was “murder of the most barbaric kind”[25].

The way Israel deals with these problems is multi leveled:

First, Israelis are not permitted to drive in A or B areas (defined as areas where the Arab police has security control). Moreover, it is considered a felony for Israeli citizens to enter the A areas (enforced only against Jewish citizens, as Arab citizens are de-facto allowed to enter these areas).

Second, to allow the mobility of Jewish residents in these areas, Israel has invested heavily in the construction of “circumventing” roads, that is, roads that do not go through the Arab cities, but rather surround it so that Jewish traffic is permitted only in C areas. For example, had the soldiers used the Ramallah circumventing road, they would have arrived safely to their base. It should be stressed that these “circumventing” roads are typically open to the use of both the Jewish and the Arab populations. The only security advantage they afford the Jews is the fact that they do

not need to enter Arab cities. Therefore, Jews driving in these roads are not immune from the aforementioned danger of passing car shootouts.

Third, as a means to prevent Jews from entering those areas they are not allowed to enter, roadblocks are placed in central junctions. These roadblocks have a double purpose. The first of which is to prevent the entry of Jews and the second is to control the Arab population especially in light of intelligence information with regard to possible security threats. In the horrific case of the Ramallah lynching, the soldiers had crossed such a roadblock but were not stopped by the soldiers manning it. This could happen because unless there is specific intelligence about a terroristic activity, soldiers are instructed to allow traffic to flow with as little interference as possible.

The final level of security is the mobile or temporary road blocks. These road blocks are designed to deter terroristic activity by creating uncertainty and surprise. Usually, delay to Arab drivers is minimal unless specific intelligence about terroristic activities is available.

Shooting from Cars:

Another use of vehicles for terrorist attacks is the following attack technique. Terrorists driving a car pass a car with Israeli license plates and while passing it shoot at it from with an automatic gun. On August 31, 2010, four Israeli citizens went in a private car near Hebron intended to return their home. As they passed one of the intersections there, an Arab car bypassed them and fired at least 50 bullets at them. Since the attackers feared that some of the Jewish passengers may have survived the attack, they continued with “death checking”, i.e. approached the Israeli car and shot each of the Jewish passengers point blank.

Such cases have induced Israel Ministry of Defense to turn over all the public transportation vehicles that go through Arab populated area to bulletproof vehicles. The Israeli government also subsidizes the travel fare in the public transportation with the aim of inducing more Jewish citizen to leave behind the unprotected private cars and to use the bulletproof public transportation buses.

Hitchhikers:

Until the Oslo accords it was common practice in Israel to hitchhike. This practice was all but eliminated in Israel, except for very few groups. The event most associated with the elimination of hitchhiking was the kidnapping and eventual murdering of Nachshon Wachsman at Oct. 9, 1994. Nachshon was trying to get home from his base when he boarded a car that was driven by Arabs disguised as Jews. He was killed by them at Oct. 14, 1994 and at 2009 a federal US court in Washington granted a \$25 million judgment against the government of Iran for its role in training the Hamas terrorists who kidnapped and murdered Nachshon Wachsman.

As result, the IDF has prohibited soldiers from hitchhiking, practically eliminating this form of transportation. There are still some groups who do hike, most notably Orthodox Jews, and indeed there are many attempts by terrorists to kidnap such a soldier or civilian in order to either murder him or use him as a bargaining chip for the release of jailed convicted terrorists.

The Use of Ambulances

Many critics of Israel complain that Israel does not provide safe transfer to people of medical assistance. While most of the criticism is factually wrong, Israel does indeed have to, at times, delay ambulances for the fear of explosives or suicide bombers. For example, on January 22nd 2002, Wafa Idris, a female Arab who worked for the Arab Red Crescent in the city of Ramallah was permitted to cross a security checkpoint because she was driving a Red Crescent ambulance. Hidden inside the ambulance was an explosive device, which Wafa originally was supposed to deliver to a designated suicide bomber. For some reason, Wafa decided to blow the device herself amongst civilians in a busy street and succeeded in murdering an 81 year old Jew. The case of Wafa Idris using an ambulance for terroristic activities was not isolated. Only two months later (March 27, 2002) security forces arrested a Arab Red Cross driver who was driving an ambulance with an 18 pound explosive device.

Since Israel admits every year hundreds of Arab patients to its hospitals for humanitarian reasons, the need for addressing the use of ambulance by terrorists is critical [26]. The most commonly used solution is that the Red Crescent ambulance transports the patient to a security checkpoint in which an Israeli Magen David ambulance is waiting to continue the transfer into the Israeli hospital. Unfortunately, this solution is possible only in certain cases – where the need of the extra ambulance is known upfront. Sadly, when the Red Crescent ambulance itself needs to go through security forces must thoroughly examine it despite the resulting delay. In October 2004 a plan to use an ambulance full of explosives as a bomb was thwarted with the arrest of the plotters. This, and intelligence about planned “unconventional” use of ambulances, instigated a temporary policy, which lasted for a few weeks, of prohibiting the pass of Red Crescent ambulances inside the Green line.

4. Security by Attacks and Strikes

In [27] the author claims that the best way to successfully confront a terror campaign is by eliminating the terror group’s leaders. The example she uses to demonstrate her assertion is the case of the *Sendero Luminoso* (Shining Path) terror group, which has been involved in terror assaults in Peru since 1980. The leader of the group was Abimael Guzman who was wanted by the Peruvian government on charges of terrorism and treason. Guzman was imprisoned by the Peruvian police in 1992 for the rest of his life. After the imprisonment of Abimael Guzman, Sendero Luminoso failed to fully recover. Consequently, the level of the terror violence and the number of the terror incidents carried on by this group has dramatically decreased.

In Israel the number of the terror attacks on transportation means has steadily decreased during the last decade as can be seen Figure 2.

Considering, the decline of the number of attacks one may be led to believe that the procedures that were taken by the Israeli government and its defensive attitude is effective and successful. However this is only a partial picture and does not provide us with a complete understanding of what has really happened. The terrorists’ motivation to act did not decline and while this motivation did not translate into suicide bombings, it is manifested in the increasing number of rockets fired into Israel.

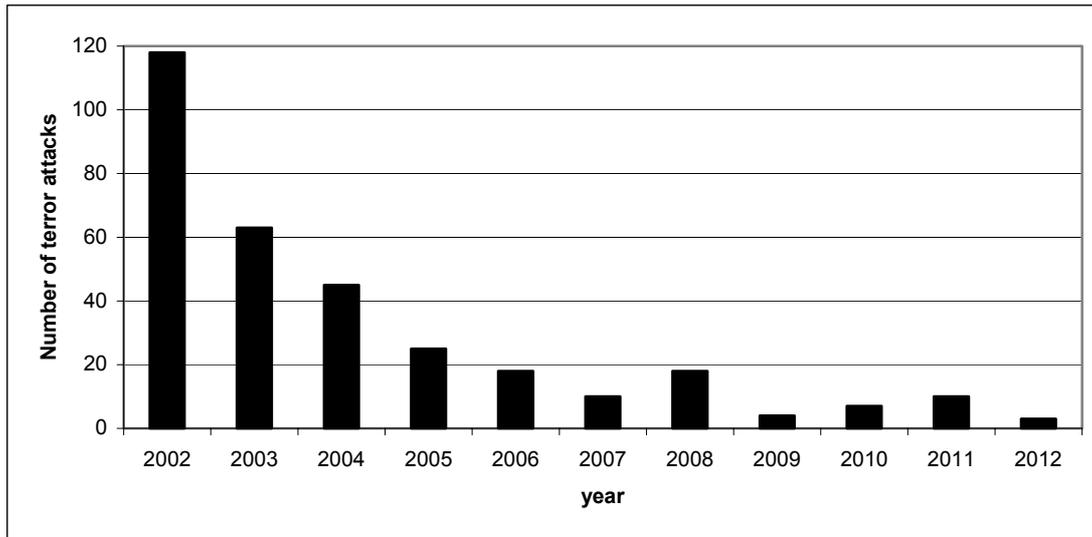


Figure 2: Number of terror attacks on transportation means from 2002 to 2012

Figure 3 shows the number of rockets that hit Israel during the same decade. It can be easily seen that from 2002 to 2009 the terror efforts of the Arab militant groups were changed. The terror assaults on transportation means was replaced by terror assaults of firing rockets at Israeli cities.

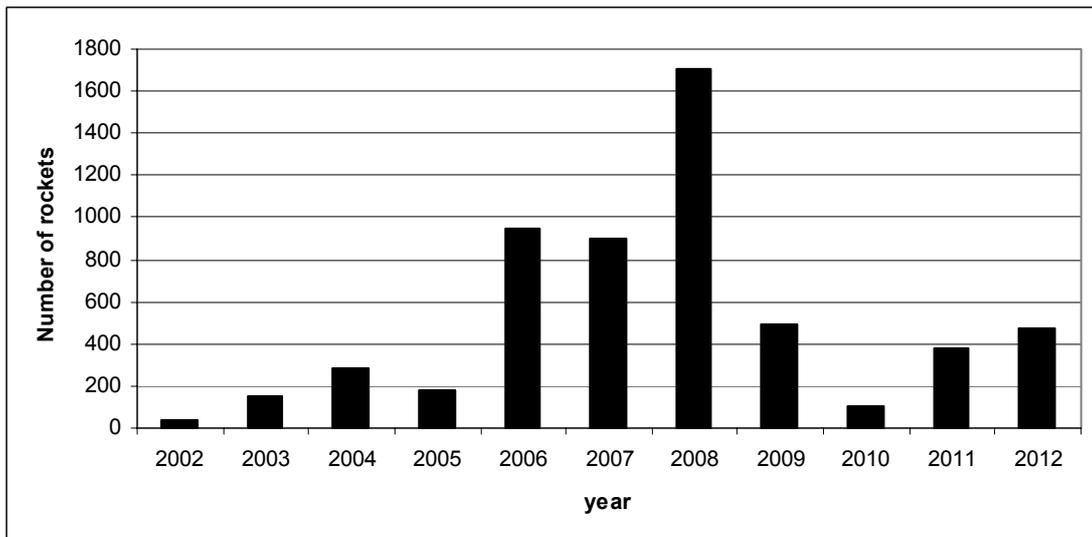


Figure 3: Number of rockets that had been fired at Israel from 2002 to 2012

The war *Opheret Yezuka* (Cast Lead) began on December 27, 2008 and ended on January 18, 2009. At this war Israel Defense Forces entered Gaza. Israel captured and killed 1166 Arabs; most of them were terror activists. The strike for the terror groups in Gaza was substantial, but not incurable and the terror group heads are still alive and free. As a result of the war the level of the terror was significantly reduced both in transportation means and in all the other terror issues including rocket firing. This can be also seen at Figure 2 and Figure 3.

A statistical analysis of the relationship between rockets and terror attacks is very revealing. Until 2008, the correlation between the two is negative at -0.65. This is a very high correlation (in absolute terms) and signifies the trade-off effect between the

two. Indeed, Oferet Yetzuka operation has succeeded (at least temporarily) in reducing both dimensions of terror, but without continued pressure on the infrastructure and the leadership of the terror, this effect will fade. Figure 4 demonstrates this trade-off effect. In Figure 4 we plot the number of rockets fired at Israel in each year against the number of attacks on transportation means during the same year. We then plot the quadratic approximation of this scatter plot. The resulting trend line is provides a stark picture of how the reduction of attacks result with an increase of rockets.

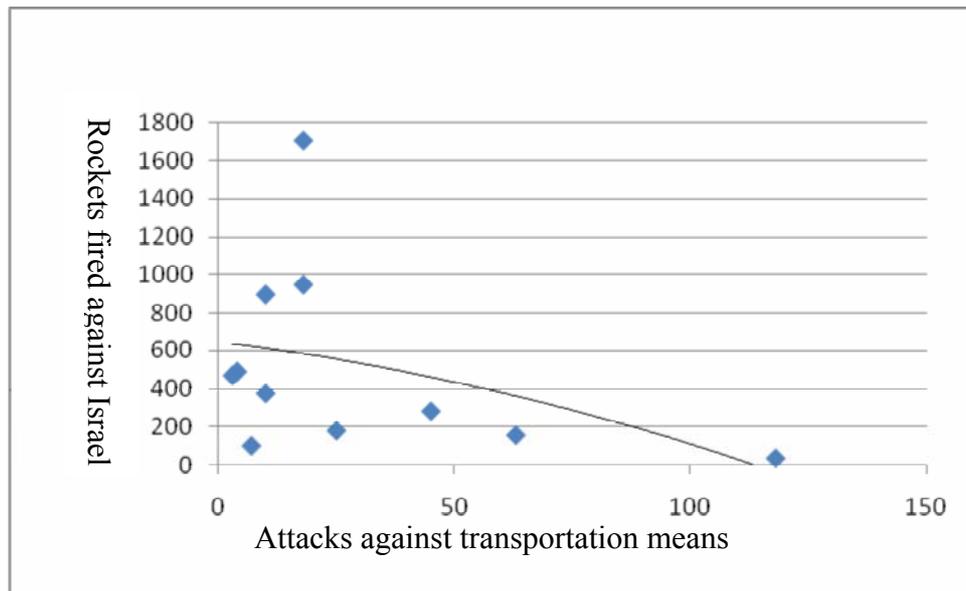


Figure 4: Number of rockets that had been fired at Israel in each year against the number of terroristic attacks carried against transportation means during the year.

It is therefore surprising that, on the October 18, 2011, Israel has chosen to release many terroristic leaders in exchange for the release of Gilaad Shalit, an IDF soldier who was taken captive by the Hamas on June 25, 2006. This release goes counter to the thesis of [27] and the result may be a dramatic increase in terror. Past massive releases of Arab terrorists have resulted with the increase of terror activities, most notably the Jibril agreement, the release of 1,150 Arab prisoners on May 21, 1985 by the Israeli government (see analysis of these releases in [28]).

In order to reduce the negative effect of this release, Israel developed a UAV called "Sky Rider" which is an unarmed, unmanned reconnaissance drone used to collect intelligence. It was only recently introduced into active service and has been used extensively in counterterrorism operations, especially over Gaza [29].

So it appears that the Peruvian precedent should teach Israel that the measures that have been taken so far are not sufficient. Security officers and other defense means can be just partially effective. The best way to assure a secure transportation for the passenger is decapitation the heads of the terror groups.

Conclusions

Israel has experienced many terror attacks in the past. These terror attacks have pushed Israel to implement various security measures in transportation infrastructures and means. Although more people die in car accidents than in terror attacks on

transportation means, the terror attacks have a higher psychological effect [30]; therefore the Israeli government put many efforts to prevent terror attacks; sometimes even more than the efforts of preventing car accidents; however as we indicated above, the best way to make the transportation means and infrastructures safer is eliminating the terror groups' leadership.

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