

The Tunnels in Gaza
Testimony before the UN Commission of Inquiry
on the 2014 Gaza Conflict

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The list of questions is a bit repetitive so I have decided to answer not directly to each question but in a comprehensive topical manner. After that I will answer specifically a few of the questions that deserve special emphasis. At the end of the text is an appendix of photographs, diagrams and maps.

Sources of Information

1. Access to information on the tunnels is limited.
2. I am an independent academic researcher and I do not have access to information that is not in the public domain. All the information is based on what I have gleaned from unclassified sources that have appeared in the public media over the years – listing them is impossible.
3. The accurate details of the exact location and layout of all the tunnels are known only by the Hamas and partially by Israeli intelligence services and the Israeli commanders who fought in Gaza last summer.
4. Hamas, in order not to reveal its secrets to the Israelis, has not released almost any information on the tunnels themselves except in the form of psychological warfare intended to terrorize Israeli civilians or eulogize its "victory" for the Palestinians: the messages being – the Israelis did not get all the tunnels and we are digging more and see how sophisticated our tunnel-digging operation is. These are carefully sanitized so as not to reveal information on locations or numbers.
5. The Israeli military have released only information that does not prejudice the survival of their information sources inside Gaza.
6. Here and there news reporters or academic researchers with access inside Gaza have managed to obtain bits of information from unofficial sources (Gaza inhabitants who have seen or heard things or been hired to dig tunnels), but these are to be regarded carefully as keyhole views of specific individuals and sometimes little more than rumors. Furthermore, the interviewees are all very much aware that what they say is going to be published so they are 'selling' a story and there is no way of finding out if the

speaker is truly giving his personal knowledge or is actually working for Hamas to impart disinformation.

Preamble

7. The war in Gaza in the summer of 2014 was not an isolated affair occurring out of the blue. Hamas and other terrorist organizations are constantly attacking Israel though usually the frequency of attacks is only about two to three times per month. Most attacks include the firing of rockets and mortar bombs towards Israeli villages near the border. **All together, in the 14 years since the first rocket attack from Gaza in 2001 till today (February 2015), approximately 23,000 rockets and mortar bombs have been fired into Israel killing approximately 45 Israeli civilians and wounding a couple of thousand.** Of these, almost 17,000 were fired **after** the Israeli withdrawal from Gaza in 2005. The frequency of fire has varied from a few per month to a few thousand in a single month. Thus, **just from late December 2012** (one month after the end of Operation 'Defensive Pillar') **to 12 June 2014 they fired 208 rockets and mortar bombs from Gaza into Israel** – at an average rate of roughly one attack per week (each attack included 1, 2 or 3 rockets or mortar bombs and occasionally more). Israeli responses were usually attempts to hit the launch team with aircraft. **From 13 June 2014 to 6 July 2014** the Hamas and the other terrorist organizations increased the tempo to attack every day – firing **another 232 rockets and mortar bombs**. They also gradually increased the number of rockets and mortar bombs fired each day from 2 to 3 per day to 19 to 44 per day. **Then, on 7 July 2014, they escalated dramatically. On that one day they fired 134 rockets and mortar bombs.** That night the Israeli government decided to respond with Operation 'Protective Edge'.
8. Though rockets and mortar bombs have been the prevalent form of attack (varying from approximately 80% to 90% of all attacks in different periods), they are not the only form: snipers sometimes fire at Israeli civilians living or working near the border and at Israeli soldiers patrolling the border, direction-focused bombs are emplaced near the border fence and exploded when Israelis pass by, anti-tank rockets or guided anti-tank missiles have been fired at civilian and military traffic inside Israel and occasionally single terrorists or teams try to infiltrate through the border into Israel. Since 2001 there have also been occasional attacks with explosive-filled tunnels or infiltrations of terrorist attack-teams through tunnels. The decision to enter Gaza on the ground was made only on 17 July 2014 after an infiltration attack by Hamas via a tunnel. The mission was to destroy the tunnels.
9. The past seven months, from the end of Operation 'Protective Edge' till today, have been the quietest since the 1990s (only three rockets fired, three sniping attacks and a few minor attempts to infiltrate through the border).

General History of Tunnel Warfare

10. The use of tunnels in warfare is not a new phenomenon – they have been used for many millennia for a variety of purposes, both defensive (to hide people and equipment from the enemy) and offensive (to surprise the enemy by 'popping up' in unexpected locations or to directly attack him with the tunnel itself by setting off explosions underneath him). Focusing on modern history the two most prominent examples are the use of offensive tunnels on the French front in the First World War and the use of defensive tunnels in the Vietnam War:
 - a. On the French front in the First World War hundreds of tunnels were dug by both sides under enemy trenches, filled with explosives and exploded. Though exact numbers are difficult to compute they are credited with killing or wounding **tens of thousands** of Allied and German soldiers.
 - b. In the Vietnam War, over a couple of decades, the Viet Cong dug extensive tunnel systems (in some cases tens of kilometers long) as safe havens from South Vietnamese and American troops. Though the primary function of these tunnels was to hide, they also had offensive functions: camouflaged combat positions protruded above the ground to enable shooting at South Vietnamese and American troops moving in the area above the tunnels and also hidden entrances enabled Viet-Cong troops to appear supposedly out of nowhere, attack and then disappear. The depth and invisibility of the tunnels made them virtually impervious to South Vietnamese and American attack except when entrances were found and specially trained ground troops entered them.
11. As noted above these are the two most prominent examples of the use of tunnels in modern warfare, not the only examples.

A Brief History of the Evolution of Using Tunnels in Gaza

12. The use of tunnels in Gaza is not new.
13. The first were dug as hiding places in the late 1960s. These were usually very short and shallow. However, in the first decade of the 21st century the number, depth and extent of the tunnels being dug for use as hiding-places increased greatly.
14. During the 1980s, after the Israeli withdrawal from Sinai following the Israel-Egypt Peace Treaty, Palestinians not affiliated with any particular organization began digging tunnels under the new border with Egypt for smuggling people and commodities back and forth. At first this was merely for illicit economic purposes (narcotics quickly became one of the most lucrative commodities smuggled) but gradually Terrorist Organizations began to use the tunnels to smuggle personnel and weapons across the border.
15. The digging of tunnels for offensive purposes began sometime in 2001. The first publicly recorded use of one was in 26 September 2001 when a bomb was exploded by the Palestinians underneath an Israeli army border post. This was the main use of tunnels for a number of years, but there were also a few attacks in which the tunnels were used to infiltrate attack-teams into Israeli areas – for example, on 26 February 2004 a two-man attack team infiltrated via a short tunnel into the Israeli side of the Erez civilian border crossing and killed a surprised Israeli guard before his comrades responded and killed them. It should be emphasized that the target of the attack was a civilian Israeli facility through which Palestinian civilians traveled into Israel for purposes of work, trade or receipt of medical care in Israeli hospitals or to visit family and friends in Judea and Samaria (the 'West Bank') and through which civilian merchandise entered or exited Gaza.
16. Though generally each tunnel in itself was effective in causing Israeli casualties, the tunnel attacks, both the exploding tunnels and the infiltration tunnels, were deemed inefficient by the Palestinians. Digging a tunnel takes a lot of effort and time and relative to the effort expended Israeli casualties in these attacks were usually few in number. This was certainly true when compared to other options to attack the Israelis, especially Israeli civilians which often achieved just as many casualties (sniping, stabbing attacks, mortar and rocket attacks), or in the case of suicide bombers – many more

Israeli casualties¹, for much less effort. Therefore, in total, not many of these tunnels were dug.

17. After the Israeli withdrawal from Gaza in summer 2005 the Israelis increasingly reinforced their border defense system and repeated attempts by terrorist teams based in Gaza to infiltrate or breach this system to get into Israel usually failed, so the digging of tunnels received new impetus.
18. The most famous Palestinian success in the use of tunnels to attack Israeli border security forces was the 25 June 2006 attack on Israeli positions protecting the border near the Israeli village of Kerem-Shalom. Under cover of a mortar bombardment of the Israeli positions, a team of Palestinian fighters exited from a tunnel dug underneath the border to a location just behind them. They then simultaneously attacked two separate positions – an infantry post and a tank observing the border. 2 Israeli soldiers were killed, 3 wounded and one, Gilad Shalit, kidnapped. 2 of the Palestinian attackers were also killed while the others managed to escape with Shalit back into Gaza. Shalit was held captive in Gaza for 5 years (without access to the Red Cross) and returned only after 1,027 terrorists were released from Israeli prisons. Some of whom subsequently renewed their terrorist activity.
19. Not all attempts to use tunnels offensively were successful – in some cases Israeli intelligence discovered the plan and the tunnel was attacked either from the air (a bomb was dropped on the ingress-site) or by an Israeli ground raid that captured the ingress-site, filled the tunnel with explosives and destroyed it. Thus for example, in January 2006, a tunnel intended to be used to place a very large bomb under the Karni civilian border-crossing between Gaza and Israel was discovered and destroyed; and in November 2008 another tunnel intended to be used for infiltrating a terrorist attack-team into Israel was also discovered and destroyed. Destroying the tunnels with ground raids were usually conducted only if the ingress-site was no more than a few hundred meters inside Gaza. Bombing it from the air was not very effective – usually only the entrance was destroyed so another entrance could be dug to bypass it and reconnect with the tunnel underneath which usually was not damaged.
20. Though more tunnels were being dug, it was still the subsidiary effort – Hamas preferred firing thousands of rockets and mortar-bombs across the border into Israeli towns and villages. This required much less effort and expense and was generally safer for the Hamas fighters since they could

¹ For example, in the period 2000 to 2006 suicide bomber attacks amounted to just 2% of the approximately 26,000 terrorist attacks on Israeli civilians and security personnel, but caused 48% of the fatalities! Virtually all the suicide bomber attacks were aimed at Israeli civilians.

usually set-up the launcher in a hidden location (often inside residential neighborhoods in Gaza, but also outside them), reveal themselves for a couple of minutes to launch and then run away before the Israeli military found the launch site. However, after the Israeli Defense Forces began to operate the 'Iron Dome' anti-rocket system, and especially after the system proved its capabilities in November 2012, Hamas felt that it no longer had any useful weapon to terrorize Israeli civilians. So though work on tunnels had begun earlier, this was the decision point in which Hamas decided to emphasize the tunnels as its new main strategic weapon. Till that date all the offensive tunnels used or discovered had been dug to only a very shallow distance into Israel – aimed at attacking Israeli border security forces located on the border itself or attacking the civilian border crossing points through which commodities were officially imported or exported into and from Gaza through Israel and through which Gazan civilians entered or exited Gaza through Israel (for medical treatment in Israeli hospitals, trade in Israel or in the West Bank etc.). They now decided to invest a huge effort in digging dozens of tunnels under the Israeli border defense system to the Israeli villages located within a few kilometers of the border.

Types of Tunnels in Gaza 2014

21. This brings us to situation in the summer of 2014 and the issue of the various types and uses of tunnels in Gaza prior to the war.
22. First it should be noted that though your questions focused on the "types of tunnels", the difference is not so much in the **TYPES** in the technical sense as in the **USES** being made of different tunnels. The technical differences are a result of choosing the appropriate techniques to make each tunnel as optimal as is possible for its particular use. The best distinction into groups by use would be:
 - a. **Tunnels which cross the border of Gaza into Israel.** These are explicitly offensive tunnels designed to infiltrate terrorist attack-teams or bombs under the Israeli border security system to Israeli villages near the border.
 - b. **Tunnels which do not cross any border.** This group is subdivided into a variety of different tactical uses – command posts, storage facilities, tactical movement or combat positions and even mortar and rocket-launcher positions.
 - c. **Tunnels which cross the border of Gaza into Egypt.** These are smuggling tunnels mostly for economic purposes but also a conduit for smuggling weapons and personnel into Gaza or out of Gaza. Some of the attacks perpetrated on Egyptian troops and civilians in Sinai have been traced to Salafist-Jihadi terrorists (such as members of the 'Ansar Beyt al-Muqadas' organization which recently declared its allegiance to the ISIS) receiving safe-haven, logistical support and training in Gaza – they enter and exit Gaza through these tunnels.

Tunnels Crossing the Border into Israel

23. **Though the fewest in number, these tunnels are the main threat to Israelis and so were the focus of the Israeli ground operation.** It should be emphasized that though they were the focus of the ground operation they were not the only objective – many of the residential areas the Israeli ground troops entered were being used to fire rockets and mortar bombs at Israeli civilians both from the ground and from roof-tops – the daily rate of fire into Israel dropped by approximately 50% once the ground operation began. Also not all Hamas command posts, weapons storage depots etc. are underground – most are actually located above ground in residential and public buildings (hospitals, clinics, mosques, schools, UNRWA facilities, etc.). The Israeli ground troops were searching for these too.
24. **Tunnels dug under the Gaza border with Israel were purely military tunnels intended to be used to attack the Israeli villages near the border – there are approximately 20 such villages located up to about 4 kilometers from the border – while bypassing Israeli border security** (the border fence, observation posts and army patrols). **Another optional use would be to infiltrate a terrorist team into an area from which it could have walked or driven further into Israel** (in one tunnel the Israeli forces found a couple of motorcycles, Israeli army uniforms and other paraphernalia that would have allowed long range infiltration once outside the tunnel on the Israeli side of the border). Thus, for example, one tunnel used by Hamas on 21 July exited in a wooded area not immediately adjacent to any village. In a surprise situation, in which the area is usually not manned with as many troops as were brought up during the war, an infiltration team could have then have traveled unnoticed in to central Israel to conduct an attack in one of the major towns or cities.
25. **The attacks would be either by infiltrating armed terrorist teams into the villages or by placing explosives underneath homes or public gathering places inside those Israeli villages.** In some tunnels the Israeli soldiers found equipment (plastic zip-cuffs, blindfolds, sedation medications) suggesting that in addition to outright killing of Israelis, Hamas planned to kidnap some back into Gaza to be used as hostages.
26. In May 2014 the Israel Security Agency published an alert that the Hamas was preparing to conduct a massive terrorist attack probably sometime in the summer or autumn of 2014. Hamas fighters captured and interrogated during the Israeli ground forces operation in Gaza in late July – early August 2014 revealed that the final plan was to simultaneously attack a number of Israeli

villages, each one with 10 to 15 terrorists. **Had this plan been successfully realized it would have resulted in hundreds of Israel civilian casualties.**

27. It should be emphasized that when the war began Hamas had not yet finished its tunnel-building project – many of the tunnels were still uncompleted and it is not clear if they were planning to start digging more tunnels, so it is not clear when the planned attack would have taken place.

28. In total, since January 2013 till today, the Israel Defense Forces reported **finding 36 cross-border tunnels:**

a. A few tunnels were discovered and partially destroyed by the Israelis **before** the summer 2014 war. **From January 2013 till May 2014** the Israeli military discovered and partially destroyed **3 tunnels** that had already crossed the border. They were only partially destroyed (the section already in Israel and maybe a couple of hundred meters inside Gaza) because destroying them completely would have required a full-scale operation entering Gaza all the way to the entrance of each tunnel. In one tunnel, after destroying the connection between it and Gaza, a section on the Israeli side of the border was kept open to be studied and shown to foreign visitors.

b. **At the beginning of July 2014** the Israeli military apparently acquired the rough location of **a fourth tunnel** near the Israeli village of Kerem Shalom and were digging deep trenches on the Israeli side of the border in order to find it. Either because the Israelis were getting close or because this was part of their original intention, Hamas filled the end of that tunnel with explosives and exploded them on 8th July. At the moment it was exploded tunnel's end was under the outskirts of Kerem-Shalom– either they made a mistake in underground navigation or the tunnel had not yet reached its intended end. Fortunately many of the residents had left the village when rocket and mortar fire from Gaza escalated in the first week of July (including one of my cousins and her baby daughter, her husband stayed to tend the village's collective chicken coops), taking refuge with relatives or friends in central Israel – the explosion occurred near an empty house and no one was hurt. **Had it exploded under the communal dining room during a festive dinner on one of our holidays the result would have been catastrophic...**

c. **32 tunnels** were discovered and destroyed **during the ground combat phase of the war in late July – early August 2014.**

29. When the Israeli ground operation began an unnamed senior Israeli officer was quoted in the Israeli media as stating that the IDF suspected the existence

of approximately 40 tunnels (these do not include the tunnels discovered **before** the war). As noted above when they withdrew from Gaza the IDF reported having destroyed 32 tunnels. No explanation was given on the discrepancy in numbers. Possible explanations for the discrepancy are:

- a. the quoted number was wrong and eight of the suspected locations were found to be not tunnels at all;
- b. or, eight of the tunnels turned out to not be cross-border tunnels;
- c. or, some of the tunnels had more than one branch and the pre-war intelligence reports mistook branches of the same tunnel as separate tunnels; or any mix of the above.

30. Of all 36 tunnels discovered from January 2013 to August 2014 (i.e., before and during the war in summer 2014):

- a. 22 had already been dug across the border. Not all the tunnels that crossed the border had already reached their final destinations – the furthest extent of some was still under the open fields rather than under the Israeli villages they seemed to be aiming for. Digging utensils found in the tunnels show that they were still working on them.
- b. 14 were still being dug and had not yet crossed the border.

31. Of the 22 already dug across the border:

- a. 17 were destroyed before being used (3 before the war and 14 during the war).
- b. 5 were used by Hamas before the Israel Defense Forces managed to destroy them: 1 was exploded under the outskirts of the Israeli village of Kerem Shalom (8 July), 4 were used to infiltrate attack-teams to the outskirts of 5 Israeli villages – Sufa (17 July); Beerli (19 July); Nir-Am and Erez together through the same tunnel (21 July); Nahal Oz (28 July).

32. The exact location of all the entrances and objectives is not clear. From the scraps of information available for some of the tunnels the following areas of seem to have been the entry-points and objectives – note that not all the tunnels noted here had already crossed the border and that the information is conflicting and so not necessarily 100% accurate:

- a. 1 tunnel from Beyt-Lahaya in Gaza towards Netiv Ha-Assara in Israel.
- b. 1 tunnel from Beyt-Hanoun in Gaza towards Nir-Am in Israel.
- c. 1 tunnel from Al-Wafa hospital on the outskirts of Shujayia towards Kfar Aza in Israel.

- d. 2 tunnel from Shujayia in Gaza towards Sa'ad in Israel.
- e. 3 tunnels from Shujayia in Gaza towards Nahal-Oz in Israel.
- f. 1 tunnel from Juhor a-Dik in Gaza towards Beerli in Israel.
- g. 3 tunnels from north of Jarara in Gaza towards Kissufim in Israel.
- h. 3 tunnels from Abasan al-Zrir and Abasan al-Kabir in Gaza towards Eyn HaShlosha and Nirim in Israel.
- i. 1 tunnel from Khuza'a in Gaza towards Nir-Oz in Israel.
- j. 1 tunnel from al-Buyoki in Gaza towards Sufa in Israel.
- k. 1 tunnel from eastern Raffa in Gaza towards Kerem-Shalom in Israel.

33. The typical cross-border tunnel was dug at a depth of 15 to 25 meters underground. It was approximately 1.5 meters wide and nearly 2 meters high – a few were wider to enable moving heavier equipment through them (as noted above, in one tunnel the Israeli forces found motor-cycles the Hamas intended to use on exiting the tunnel inside Israel). The sides and roof were lined with concrete. It had electricity for lighting and other uses and telephone wires. In some there were rooms for storing equipment or allowing personnel to stay under ground for extended periods. Some tunnels had more than one branch. In addition to the entrance (usually approximately a meter or slightly more across) there were ventilation shafts dug every few hundred meters.

34. The entrances to cross-border tunnels were generally dug from underneath buildings in the Gazan residential neighborhoods closest to the border. Some of these buildings were apartment houses or private family houses and some were public facilities. For example, at least one cross-border tunnel was dug from the grounds of the Al-Wafa hospital on the outskirts of the Gazan neighborhood of Shujayia towards the Israeli village of Kfar Aza approximately 3 kilometers away. Another was dug from the basement of a mosque in Khuza'a (it was still in the process of being dug but deducing from where it approached the border it was probably aimed at the Israeli village of Nir Oz about 2.5 kilometers away).

35. It should be noted that virtually all, if not all, the entrances were surrounded by explosive devices – some to be triggered by booby-traps and some to be triggered by Hamas observers watching from adjacent buildings. Some of these bombs were emplaced when the war began, but **some were built into the walls of the buildings so that Palestinian civilians were passing by them**

everyday! Also, around the entrance to each tunnel were defensive positions to fight Israeli ground troops trying to reach it. These defensive positions included tunnels that did not cross the border but were intended to enable Hamas fighters to move around without being seen by the Israelis or to conduct surprise attacks on Israeli soldiers in or adjacent to the building (more on these tunnels further down). Thus, for example, in the mosque mentioned above in Khuza'a there was also an entrance to such a tunnel.

Detecting the tunnels is a very very difficult task.

36. To date **there is no trustworthy detection technology for tunnels of this size at this depth.** All attempts to use radars etc. have proven insufficiently reliable or total failures. The only partially reliable technology that does exist is the use of sensitive microphones inserted into the ground to listen for sounds of digging. However, to hear the digging the microphones have to be fairly close to the location of the tunnel so you have to know in advance where to put them and this requires other sources of intelligence. Also, the sound of digging can be muffled by working slowly with specifically designed manual tools and other sounds in the vicinity can interfere too. Furthermore, once the tunnel is complete the microphones have nothing to hear.
37. Given the lack of technology the only way of detecting the tunnels is to acquire intelligence from other sources – either listening in to Hamas communications in case they talk about the locations; or stealing documents on the plans of the tunnels from Hamas headquarters; or infiltrating a spy into the digging operations. Hamas is fully aware of these intelligence capabilities and took especial care to maintain the secrecy of the tunnel projects. For example: discussions on the project were not allowed on telephone communications, the diggers were taken to the sites in completely closed vehicles so they could not see where they were and kept underground for a few days at a stretch, building materials taken to the sites and earth removed from the sites were camouflaged, the entrances were all inside buildings and ventilation shafts were camouflaged, etc.
38. Even if the location of an entrance point is revealed that does not mean you know where the tunnel crosses the border. The tunnels were not dug in straight lines. Every couple of hundred meters they changed direction.
39. Therefore, even when the Israelis managed to acquire information that a tunnel had crossed the border they rarely got information accurate enough to find it precisely. This can be seen first of all by the fact that prior to the ground offensive they found only 3 tunnels of the 22 that had already been

dug into Israel, and secondly by way they found these 3 tunnels and were looking for a fourth tunnel in the period **before** the war. In each case, after receiving intelligence that there might be a tunnel in a particular vicinity they brought mechanical diggers and began to dig deep trenches across a section of the border. The digging typically took several days before they found the tunnel itself. In the case of the Kerem Shalom tunnel the Hamas had time to see the work, to bring up a large amount of explosives and to explode the end of the tunnel before the Israelis found it. In another case, a tunnel found in autumn 2013, Hamas also had time to emplace a large explosive charge combining explosives and barrels of petrol in the tunnel underneath the Israeli diggers and rig it to explode when the Israeli digging machine reached the tunnel. 5 Israeli soldiers were wounded – one of them was severely burnt. There was also a lot of false information that caused the Israelis to dig fruitlessly for days in locations where there were no tunnels.

40. Also to avoid detection by the Israelis, **the exit points of cross-border tunnels inside Israel were not dug in advance**. In all the attacks conducted inside Israel during the war the exit points were dug only in the last hours before the tunnel was to be used for an attack-team. In tunnels intended for the placement of bombs underneath civilian or military targets no exit is needed.
41. Locating a tunnel via intelligence-collection is usually a slow painstaking process – it takes a long time. If there is a need to rapidly find many tunnels in a short space of time, the only solution is to send a great many troops to comb all possible areas in which there might be tunnel entrances. Hence the sudden Israeli decision to enter Gaza with large forces on 17 July was in response to the first attempt by Hamas to actually use a tunnel for infiltration. In the early hours of 17 July a team of 13 armed men dug their way out of a tunnel near the Israeli village of Sufa. From the Israeli media reports it seems that Israeli troops in the area were completely surprised and the terrorist team was sighted before it could attack the village only by pure chance. It was then fired upon, some of its members were hit and the others escaped back into the tunnel. That same day the Israeli government ordered the Israel Defense Forces to enter Gaza to locate all the other cross-border tunnels and destroy them.
42. The Israeli army also immediately reinforced its protection forces around and in the villages. Despite waiting specifically for attacks from tunnels, because the exact egress point could never be known in advance, these protection forces were surprised three times by Hamas fighters digging out from the ground, and though they managed to prevent access to the villages, the Israeli

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The Tunnels in Gaza
February 2015

forces suffered relatively heavy casualties – 11 killed and at least as many wounded.

Tunnels Inside Gaza

43. The tunnels dug **inside** Gaza are the most varied in use (and therefore also in location, shape and style of building). The different uses are:
- a. Underground mortar and rocket-launcher positions.
 - b. Command centers
 - c. Safe-havens for Hamas forces to avoid Israeli fire and to rest.
 - d. Hidden fighting positions from which small-arms fire can be directed onto Israeli troops in their vicinity.
 - e. Storage tunnels for weapons and equipment.
 - f. Tactical maneuver tunnels for moving troops or equipment between different locations inside Gaza while hidden from Israeli observation.
 - g. The last type of tunnels is useful also to conduct surprise attacks on Israeli troops from unexpected directions and especially to attempt to kidnap Israeli soldiers.
44. **There is absolutely no information available from which one can deduce how many tunnels all together there are in Gaza – but there were at least several hundred such tunnels of all the above categories and probably more than a thousand – most of them belonging to the last three categories!** Of the approximately 5,000 targets attacked by the Israeli air force, approximately 200 were reported to be storage tunnels. Again it must be reiterated – most of Hamas' combat power is located above ground, hidden in buildings in residential areas, often in multi-storey apartment buildings in which a few apartments, scattered randomly on all floors, are set aside for Hamas use (command posts, weapons stores, etc.)
45. The exact extent to which these various tunnels are connected into a comprehensive underground system is not clear – only Hamas knows the exact location and trace of each tunnel and for obvious reasons it is keeping this secret. Israeli intelligence services may have acquired some of the information – but they are not releasing the information so as not to compromise their sources. What is clear from reading and listening to accounts of the fighting in summer 2014 is that some of the tunnels are independent and some are interconnected into local systems. Also clear is that even if it knew the location of some of the tunnels, Israeli intelligence did not have accurate maps of all the tunnels.

46. The locations of the tunnels in general and of the entrance and exit points of tunnels in particular, of the non-cross-border tunnels inside Gaza are much more varied than those of the cross-border tunnels:
- a. Some are located underneath open fields with the entrances and exits camouflaged under huts supposedly built by farmers for resting or storing their tools.
 - b. Others are located underneath the residential areas. **Most of the entrances and exits are from the ground floors or basements of residential homes or of public buildings** – including Mosques (for example the above-mentioned Khuza'a Mosque), hospitals (The chief headquarters of the Hamas is believed to be under the Al-Shifa hospital²), medical clinics, schools and other public service buildings. Some entrances, exits and ventilation holes are located outside buildings and camouflaged to appear to be 'innocent' civilian locations, covered by vegetation etc. or even disguised to resemble merey pot-holes in the street.
47. It should be noted that many tunnels had multiple entrances so that even if the Israelis found and destroyed one entrance the Hamas could often still use that tunnel or even redig the destroyed entrance.
48. Here too it should be noted that most of the entrances were surrounded by explosive devices – some to be triggered by booby-traps and some to be triggered by Hamas observers watching from adjacent buildings. Also, Hamas placed great emphasis on camouflaging the openings of the tunnels. Therefore, finding a tunnel entrance was a slow dangerous process to avoid enemy fire, avoid booby-traps and recognize the camouflage. An Israeli unit could be inside a building on the same floor as the tunnel entrance, searching for it and still be surprised by a Hamas team 'popping out' of the floor or wall. An Israeli unit could be in the street and suddenly be attacked from behind by a Hamas team 'popping up' out of the ground or shooting at it from a building the Israelis had previously searched and thought they had cleared. In one incident in Shujayia, the entrance to a tunnel was discovered only 6 days after it had been used to attack an Israeli unit and therefore the building it was in had been searched a number of times.
49. In addition to shooting at the Israelis or exploding bombs near them, a number of attempts were made to kidnap Israeli soldiers – the kidnap team would wait in the camouflaged tunnel entrance and try to pounce on an

² Indications for this are the inordinate number of armed guards and closed areas in the lower areas of the hospital and guarded remarks by locals to foreign journalists.

unwary Israeli soldier to drag him into the tunnel. They failed to capture any live Israeli soldiers, but in one case they managed to drag a dead Israeli officer off in this way (at first the Israelis thought the officer had been captured alive).

50. Again – it should be emphasized that **the tunnels were only one tactic and one problem the Israeli troops had to deal with simultaneously**. It was rare that an Israeli unit be fired upon from only one direction and most of the shooting was done from buildings, whether residential or public.
51. Hamas scattered thousands of explosives throughout the area – connected to doors, windows, various objects or apparently abandoned weapons, so that moving them sets off a bomb. They also tried to use various subterfuges to get to the Israeli soldiers: in one incident an old man called out to an Israeli force and requested medical assistance – when the soldiers approached him he hurled a grenade towards them; in at least three cases elderly men wearing suicide bomb vests tried to approach the Israeli soldiers with supposedly innocent requests; in another incident a donkey laden with explosives was sent walking to an Israeli force; civilians (**including children**) were sent to entice Israeli soldiers to enter booby-trapped rooms by supposedly coming to volunteer information that the Israelis would find a tunnel or a store of weapons or whatever in the room. A Hamas spokesman appearing on television declared that they intend to mobilize children to attack the Israeli forces with hand-grenades.
52. In addition to the booby-traps, Hamas also scattered remote-controlled bombs inside residential and public buildings and in the streets and set them off when Israeli troops passed by them. A favorite technique was to rig the entire ground floor of a house with bombs and petrol barrels and set them off with a remote control to demolish the entire floor with the Israelis in it or trapped on the floors above as the building caught fire. In one case nearly one ton of explosives were placed in a medical clinic and exploded on the Israeli soldiers who entered the building to search it for a tunnel (see photographs in appendix N). Of the soldiers in and around the building – 3 were killed and 12 wounded.
53. Hamas and other smaller Palestinian terrorist groups ('Palestinian Islamic Jihad', 'The Resistance Committees') also fired a couple of thousand mortar bombs at Israeli troops operating inside the residential areas of Gaza. Note that whereas the number of rockets and mortar bombs fired towards Israeli territory from 8 July 2014 till the ceasefire in August is given as approximately 4,500; according to public statements by Hamas and other Palestinian groups they fired a total approximately 6,870 rockets and mortar bombs during the

war. Assuming they are not lying then apparently almost 2,400 of these were fired at Israeli troops **inside** Gaza, virtually all of them inside residential areas.

54. This combination of attacks meant that the Israelis had to move around very carefully to reduce casualties. Despite this, they suffered approximately 45 killed and approximately 650 wounded inside Gaza.

Tunnels From Gaza into Egypt

55. Tunnels dug under the Gaza border with Egypt had (and those few that remain still have) a mixed civilian and military use.

56. The first tunnels in this group were dug in the 1980s after the Israel-Egypt Peace Treaty cut Gaza off from Sinai – requiring permits to cross the border. This was especially problematic for the population of the town of Raffa which was cut in half by the border. To maintain contact families on both sides began digging shallow passages a few dozen meters long at most between houses on either side of the official border. Gradually criminal enterprises found this useful to smuggle narcotics from Egypt into Gaza and from Gaza into Israel (travel between Gaza and Israel was at the time only partially regulated).

57. During the 1987 – 1993 Intifada the tunnels became useful for infiltrating weapons into Gaza. However, smuggling a wide variety of civilian commodities from Egypt into Gaza was also lucrative because they were cheaper than buying the same items in Israel.

58. In 2005 Israel unilaterally withdrew from Gaza, evacuated all the Israeli settlements in Gaza and subsequently fortified its border with Gaza. In January 2006 Hamas was voted the largest party in the Palestinian Parliament and became the official government. In 2007 following a short civil war the Palestinian Authority split into two entities: the West Bank controlled by Fatah and Gaza controlled by Hamas. European monitors located at the Egypt-Gaza border-crossings since 2005 to ensure that no weapons were being imported were threatened and forced to flee. After this Israel and Egypt both closed their borders with Gaza and both imposed trade restrictions (especially on dual-use materials and items) focused on preventing Hamas from strengthening its military capabilities. The use of the tunnels between Gaza and Egypt to import and export civilian commodities (including narcotics), civilians traveling out of Gaza for a variety of reasons or entering Gaza, continued and even became more lucrative, however, there was also a shift to the import of more advanced military equipment, weapons and materials from Iran, and after the toppling of the Ghaddafi regime in Libya also from there. The more advanced equipment included, among other items, longer ranged rockets enabling Hamas to bombard central Israel, guided anti-tank missiles and man-portable guided anti-aircraft missiles. On 7 April 2011 one of these anti-tank missiles was fired from the roof of a house in Shujayia across the border into a school-bus exiting the Israeli village of Saad killing one Israeli teenager and wounding the driver (fortunately most of the children on the bus had just disembarked inside the village).

59. At some point Hamas began levying a customs tax on the civilian imports through the tunnels and this became a major source of its revenues. All the published numbers are problematic as far as reliability is concerned but the figures usually quoted are from a low of 40% to a high of perhaps 75% of Hamas' annual revenues came from this tax. Only Hamas (and perhaps the Israeli intelligence services) know the true figures and they varied over time – especially as Hamas lost other sources of revenue due to political disagreements with Fatah in the Palestinian National Authority (Fatah stopped paying salaries to Authority workers in Gaza) and with Iran (because Hamas supported the rebels in Syria) and Qatar its principle foreign benefactors.
60. Throughout, the tunnels continued to be used to import weapons (mostly from Iran, but also from various other sources such as pillaged Libyan army storage depots), send Hamas members abroad for training, coordination meetings with allies abroad or a variety of logistical purposes. In addition Hamas allowed entry in to Gaza, via the tunnels, for members of various allied terrorist organizations such as the 'Ansar Jihad al-Beyt al-Muqadas' in Egypt (an extreme Salafi Moslem terrorist group currently allied to ISIS), supplying them safe-haven, training and storage facilities in return for assistance in smuggling weapons through Egypt.
61. Over the years the Israelis turned a blind eye to the activities in these tunnels except when they had explicit information on the transfer of a weapons shipment through a specific tunnel. During the war in the summer the Israelis completely ignored these tunnels. Egypt on the other hand, angered by Hamas' assistance to the Salafist Jihadi terrorists attacking Egyptian civilians and soldiers, began searching for and shutting down the exits to the tunnels **on its side of the border**. Over the past year and a half, with complete and free access (this is Egyptian territory) the Egyptian forces located and destroyed more than 1,800 tunnels. This was done by house to house searches in the Egyptian town of Raffa where all the tunnels have active entrances – many of them very large and impossible to hide once the right building is entered. The search was conducted without need for combat as the house owners are mostly Egyptian civilians working for profit and have no motivation to fight. Some months ago the Egyptian authorities decided that the only solution is to evict the population and raze all the houses within 500 meters of the border with Gaza and then dig a deep ditch and fill it with sea-water. There have been more recent reports that before digging the ditch they intend to widen the depopulated zone to about 1,000 meters.

The Tunnel Diggers

62. **The tunnels dug under the Gaza border with Egypt are mostly if not wholly private enterprises.** Each tunnel is dug, owned and operated as a business venture. To dig and operate a tunnel requires a permit from the Hamas government. Usually the owners are specific families who dig the tunnels themselves or hire people to do so. According to a foreign academic who visited Gaza and studied the issue of the tunnels being dug between Gaza and Egypt, the workers are of all ages including children. **By 2012** (when the academic was in Gaza) **at least 160 children died in digging accidents.** Adults killed in digging accidents are probably at least as many if not more. There is no information on casualties to diggers over the period after the academic returned from Gaza. The investment is returned by the fees they collect from people using the tunnels – and most of the tunnel-owning families have become wealthy.
63. I wrote "mostly if not wholly private enterprises" because, given the enormous number of these tunnels (over the past year and a half the Egyptians claim to have shut down approximately 1,800 tunnels and there are still more active), it is impossible to tell from existing information if there are not a few run directly by Hamas – enabling them to be used for more secretive missions.
64. **All the other tunnels – those crossing the border into Israel and those for military use inside Gaza – are dug directly by Hamas.** The workers actually digging the Hamas owned tunnels are almost all temporary hirelings who have no knowledge of where they are digging. They are told to be at a certain spot, picked up in closed vehicles and taken to the dig-site where they are sent in immediately without being allowed to view the surroundings. They usually spend a few days and nights working in the tunnels – they eat and sleep in the tunnels during those days and nights – and are then taken out as they came in, without seeing the surroundings. They are paid a salary based on how many days they worked and sent home.

Tunnels in Shujayia and Khuza'a

65. The Israel Defense Forces have not released a complete list of tunnels discovered by them. They have referred only to cross-border tunnels and even of these they have not released a complete list to the public.

Shujayia

66. The only map of tunnels released to the media by the IDF Spokesperson shows 6 cross-border tunnels originating in Shujayia, one of them from Al-Wafa hospital: three of them lead towards the Israeli village of Nahal Oz, two towards to the Israeli village of Sa'ad (though they apparently had not yet reached it) and one towards the Israeli village of Kfar Aza. For a copy of the map see below in the Appendix.

Khuza'a

67. At least one cross-border tunnel dug from the basement of a mosque in Khuza'a aimed towards the Israeli village of Nir Oz.

68. Again it is important to note that though this was their central mission, the IDF ground troops operating inside Gaza were not looking only for tunnels – Hamas and the other Palestinian terrorist organizations active in Gaza also use residential and public buildings to store weapons, place command posts and fire rockets and mortar bombs. Most rockets are fired from above ground or from shallow pits dug into the ground and camouflaged (pits such as these were found in school yards and other similar locations by Israeli troops – some before they were fired and some only after). In some cases rockets were launched from the roofs of buildings. The entry of the Israeli ground troops into Gaza in general caused an immediate reduction in the rate of rocket and mortar bomb fire to approximately half what it was before they entered. For example, in the two weeks prior to the entry of Israeli ground forces into Shujayia about 140 rockets and dozens of mortar bombs were fired from there into Israel, whereas while the Israeli ground troops were in Shujayia almost none were fired from that neighborhood.

How does the IDF destroy the tunnels?

69. The manner of destruction depends on the type of tunnel and the result required. I will begin with the easy part – the non-cross border tunnels.

Non-Cross-Border Tunnels

70. As I described above, ground fighting inside Gaza resembled a deadly version of the game of 'hide and go seek' – Hamas fighters hid in the buildings and set off bombs hidden inside adjacent buildings or in the streets (thousands of bombs of various sizes and shapes were emplaced in residential and public buildings including Mosques and medical clinics – some were placed only when the fighting began, others were embedded permanently in the walls or floors of buildings) when Israeli troops passed near them as well as firing small-arms, RPG rockets and mortar bombs towards the Israeli troops.
71. As noted before – non-cross-border tunnels interested the **Israeli ground forces only insofar as they were being used to attack them while they searched for the cross-border tunnels**. Tunnels that were considered non-cross-border merely had their entrances blown in with explosives to prevent them being used to infiltrate Hamas attack-teams behind the advancing Israelis. This sometimes proved insufficient because of the way the tunnels were built, so that the damage caused was superficial and Hamas fighters reopened them.
72. During the summer 2014 war the **Israeli air force** attacked a long list of targets that included many tunnels inside Gaza. It was not used to attack cross-border tunnels. Air attacks are usually not effective in destroying entire tunnels – the depth of the tunnels means that only special bombs will reach them and their small size means that to hit them requires extremely accurate intelligence as to their exact location (this is not a finding unique to Gaza – the Americans were confounded by it in Vietnam). Therefore, unable to know the exact trace of the tunnel underground, the **Israeli air force** attacks tunnels by dropping bombs on the entrances. However, the damage caused is only partial and temporary – collapsing only that entrance and perhaps a very short section of tunnel next to it. The exact extent of the damage depends on the depth of the tunnel – the deeper it is, the longer the entrance-shaft and the less the damage to the tunnel beneath. Other entrances would rarely be damaged and the damaged entrance can be replaced by digging a new one within a couple of weeks. Therefore, aircraft are usually used only to attack tunnels that ground forces cannot reach, or when a partial and temporary destruction of a tunnel is deemed sufficient. Exceptional cases are tunnels

used to store explosive or flammable materials. In a number of cases in Gaza, bombs dropped by the Israeli air force on the entrances of storage-tunnels filled with explosive and flammable materials set-off a chain-reaction of sympathetic explosions that destroyed the entire tunnel and its contents.

Cross-border Tunnels

73. Prior to the summer 2014 war Israeli troops could only deal with the portion of the tunnel inside Israel and perhaps a few dozen meters across the border inside Gaza. They dug an entrance into the tunnel, climbed into it and filled it with explosives and blew it up. To ensure no collateral damage was caused inside Israel or inside Gaza the explosion was designed to destroy only the section of the tunnel near the border. In any case, even using a few tons of explosives it was impossible to cave-in the tunnel for more than a few dozen meters by placing them all at one point and Israeli troops were not allowed to enter Gaza more than a couple of hundred meters beyond the border. So the Palestinians could easily dig a shaft from the location nearest the border that was not damaged and then dig a new branch around the destroyed section.
74. **During the summer 2014 war, the required result was total and permanent destruction of the cross-border tunnels.** To do this the Israeli soldiers had to:
- a. Fight their way to the suspected locations of tunnel entrances, search those locations to find the tunnel entrance.
 - b. Then they had to fight off Hamas counter-attacks while clearing the explosive booby-traps around and in the tunnel entrances or dig a new parallel entrance to avoid the booby-traps altogether.
 - c. Then they searched each tunnel to map it in order to find all the branches and entrances – again having to deal in some cases with booby-traps and sometimes 'bumping' into Hamas fighters waiting inside the tunnels – in order to figure out where it was going. In some cases what initially looked like a cross-border tunnel turned out to be only a tactical tunnel inside Gaza.
 - d. After clearing and mapping each tunnel, Israeli soldiers had to manually carry several tons of explosives into it with a minimum of mechanical help like a winch for inserting it down the typically 20 to 25 meter long entrance shaft. The exact tonnage depended on the length of the tunnel, but averaged 9 to 11 tons per tunnel.
 - e. Then the explosives were scattered along the entire length of all the branches of the tunnel and connected to a common detonator. The

amount of explosives used was computed to be the minimum necessary to ensure destruction of the tunnel with minimal damage above ground. Since the tunnels were reinforced with concrete too small a charge would have not caused sufficient damage to destroy the tunnel.

- f. Other Israeli soldiers were sent above ground to ensure that the area above the tunnel route was clear of people.
- g. After this the explosives were fired.

75. It should be emphasized that throughout this laborious and therefore long process (usually a few days per tunnel) the entire area around the tunnel entrance and between the tunnel entrance and Israeli territory had to be kept clear of Hamas fighters trying to attack the Israeli tunnel units either above ground or via tactical maneuver tunnels, sniping from a distance and bombarding them with mortars.
76. The continuous fighting in the vicinity of each tunnel often interfered with the transfer of explosives from stores in Israeli territory to the tunnel entrance. Taking the entire amount all at once was not possible in an armored vehicle for lack of room. Also, not any armored vehicle would do. Using an insufficiently armored vehicle was too dangerous – even partial damage caused by any anti-tank weapon would become catastrophic if it hit the explosives inside. In May 2004 an Israeli M113 APC carrying one ton of explosives to be used in destroying a tunnel in Raffa was hit by an anti-tank rocket – the M113 exploded killing all 5 men riding in the vehicle. On the first day of the battle in Shujayia another M113 APC carrying far less explosives was hit and exploded killing 7 Israeli soldiers. The number of heavily protected APCs was limited and they were needed for other battle tasks as well, so the task of loading the explosives by hand onto the APC, ferrying them to each site, unloading them by hand (sometimes under fire) and sending the APC back for another batch took a long time. Then each load had to be winched down the shaft in smaller batches that a single man could carry (the tunnels were only wide enough for one person) and in the tunnels they had to be carried manually over hundreds of meters (some tunnels were already a few of kilometers long) and placed exactly in the right locations and order.
77. The entire process requires special training so only specific units could conduct this and the number of such units is limited, so instead of an operation lasting a few days the ground operation lasted a couple of weeks.

Israeli Casualties Specifically From Tunnel-Related Attacks

Inside Israel

78. 11 Israeli soldiers killed inside Israel as a result of attacks via cross-border tunnels. The number of Israeli soldiers wounded in these attacks is not clear from the media reports, but is probably similar to the number killed
79. No Israeli civilians were hurt by tunnel attacks for a number of reasons:
- a. All the tunnels that had reached the ground underneath Israeli villages were discovered and destroyed before they were used.
 - b. Most of the tunnels had not yet been completed. The first one used as an underground bomb actually hit an empty house on the outskirts of an Israeli village. It should be noted, that we now know that some of the tunnels that had already crossed the border into Israel had not yet reached their final targets and were therefore still works in progress – as shown by digging tools found in them. Furthermore, underground navigation is more difficult than navigating above ground, especially since they were deliberately not being dug in a straight line in order to make finding them more difficult, so some tunnels probably missed their intended targets.
 - c. Apparently the war had caught Hamas not completely ready to use the tunnels and some attack-teams were caught before they could be activated. In at least two tunnels Hamas fighters were found waiting for orders – they had been waiting in the tunnels for days without sufficient food or new orders, they were exhausted and hungry and surrendered without a fight. Furthermore the pressure caused by the Israeli ground offensive caused a "use it or lose it" situation in which tunnels were used without proper planning – those used were chosen because they were available rather than preferred.
 - d. Once the threat became clear the Israeli army flooded the areas in and around the villages with troops. Each of the four Hamas attack teams that entered Israel via the tunnels exited in locations that were adjacent rather than under Israeli villages. So none of the four attack-teams that crossed the border managed to reach any of the villages. All the engagements occurred adjacent to but not inside the villages.
 - e. Many Israeli civilians living in those villages evacuated their homes and moved to refuge elsewhere in Israel – so, as noted above, the exploding tunnel in Kerem-Shalom hit an empty house.

80. Though no civilians were hurt physically by attacks via tunnels, the fact that this was a matter of luck (the war began before Hamas was ready to use the tunnels) quickly became clear to the local Israeli population as information on the tunnel system gradually emerged during and after the war. This caused a severe psychological trauma to many, who began to live in fear that the ground would suddenly open up and kill them in a massive explosion or Hamas terrorists would climb out into their homes. Many people who had not left their homes for fear of the rockets and mortar bombs now fled to central Israel. This fear lingers on because Hamas claims that the Israelis did not find all their tunnels.
81. A side effect is that people living in northern Israel, along the Lebanese border, are now anxiously reporting to the army any strange sound they hear which they fear might be an indication of a similar digging operation being conducted there by Hizbullah.

Inside Gaza

82. **Approximately 45 Israeli soldiers were killed and approximately 650 were wounded fighting inside Gaza.** From the published reports **it is almost impossible to ascertain how many of them were hurt specifically by Hamas fighters using tunnels, how many were hurt by Hamas fighters or booby-traps defending tunnel entrances and how many in the general fighting all around.** However, since the central mission of the Israeli soldiers was to find and destroy the cross-border tunnels, in essence all the casualties inside Gaza were because of the tunnels – had there been no cross-border tunnels it is very unlikely that the Israeli government would have ordered a ground operation.
83. Hamas tactics were to use the internal tunnels to move from one location to the next without being seen by Israeli troops, in order to surprise them from unexpected directions. They would enter a building via a tunnel in its ground floor or basement, fire from that building at Israeli soldiers in the vicinity, return to the tunnel to evade the Israeli response and walk underground to another building to repeat the process there. Because of this, attacks against Israeli troops could come from any direction at any moment. The only way to prevent it was to find every tunnel exit in every building and destroy that exit with a bomb.
84. There are two incidents in which it is certain that Hamas fighters used tunnels to surprise Israeli soldiers and the details of which were published by

the Israel Defense Forces because of the relatively numerous casualties suffered by the Israeli troops:

- a. On 20 July, an Israeli APC driving with the other forces into Shujayia suffered a mechanical malfunction and stopped on the side of the road between two small buildings. As the Israeli soldiers waited for a repair team to come they were sighted by a Hamas spotter hiding in some building down the road. A Hamas team used a tunnel to enter one of the buildings adjacent to the Israeli APC. They then surprised the Israeli soldiers by firing RPG rockets and small-arms fire at the APC and the soldiers around it. 7 Israeli soldiers were killed. The Hamas team attempted to kidnap one of the soldiers then rushed back into the tunnel to escape a counter-attack by other Israeli soldiers. The tunnel itself was well-hidden under the house and was discovered only on 26 July by an Israeli patrol. The entrance shaft was then destroyed with explosives.
 - b. On 1 August, three Israeli soldiers were killed and a few more wounded an hour and a half after the beginning of one of the ceasefires agreed upon. When the ceasefire began a group of Israeli soldiers were inside a building suspected of having a tunnel. They searched for it but before they found it, a suicide-bomber came up out of the tunnel and detonated his explosives-vest among the soldiers. 3 of the Israeli soldiers were killed by the blast and a number wounded. Immediately after the explosion a Hamas assault-team came out of the tunnel attacked the dazed Israeli soldiers as they were recovering from the blast, snatched the body of an Israeli officer and then retreated back into the tunnel. Unsure if the abducted soldier was alive or dead, the Israeli forces immediately closed off the entire area and began searching house-to-house looking for other entrances into the tunnel. One group of soldiers entered the tunnel and chased the Hamas team underground, but the latter, having a head start and knowing the tunnels better, escaped. However they apparently left behind parts of blood-soaked equipment (or perhaps body parts – the exact details have not been released) that enabled the Israelis to conclude the officer was dead.
85. From scraps of descriptions of the fighting in general one can assume that **these two incidents are typical of how Hamas operated**, except that in these specific cases they were exceptionally successful, whereas in most cases the number of Israeli soldiers killed or wounded were fewer and Hamas fighters suffered casualties too.

86. One point that should be emphasized is that the total number of Israeli casualties inside Gaza (nearly 700 dead and wounded) was higher than necessary from a purely military perspective – it was the direct result of Israel trying to reduce Palestinian civilian casualties by advertising 24 to 72 hours in advance where it intended to send its troops. In Shujayia, for example, leaflets were dropped over a period of three days asking the population to move out. This gave Hamas crucial intelligence and enabled it to prepare a large ambush for the Israeli forces – planting hundreds more bombs in the neighborhood buildings and reinforcing its combat forces in the neighborhood – according to some reports up to 800 to 850 Hamas fighters deployed in this area alone. Added to this was the Israeli decision to limit the force of the covering fire given to its troops – rather than destroy in advance with long-range fire every single building with a line of sight to the area they intended to enter, they limited their preparatory fires to a bare minimum. This ensured that Hamas fighters usually got the 'first shot' and caused more Israeli casualties before the Israelis responded. Heavy fire was allowed only in cases where Israeli units were trapped and there was no other way to extricate them.

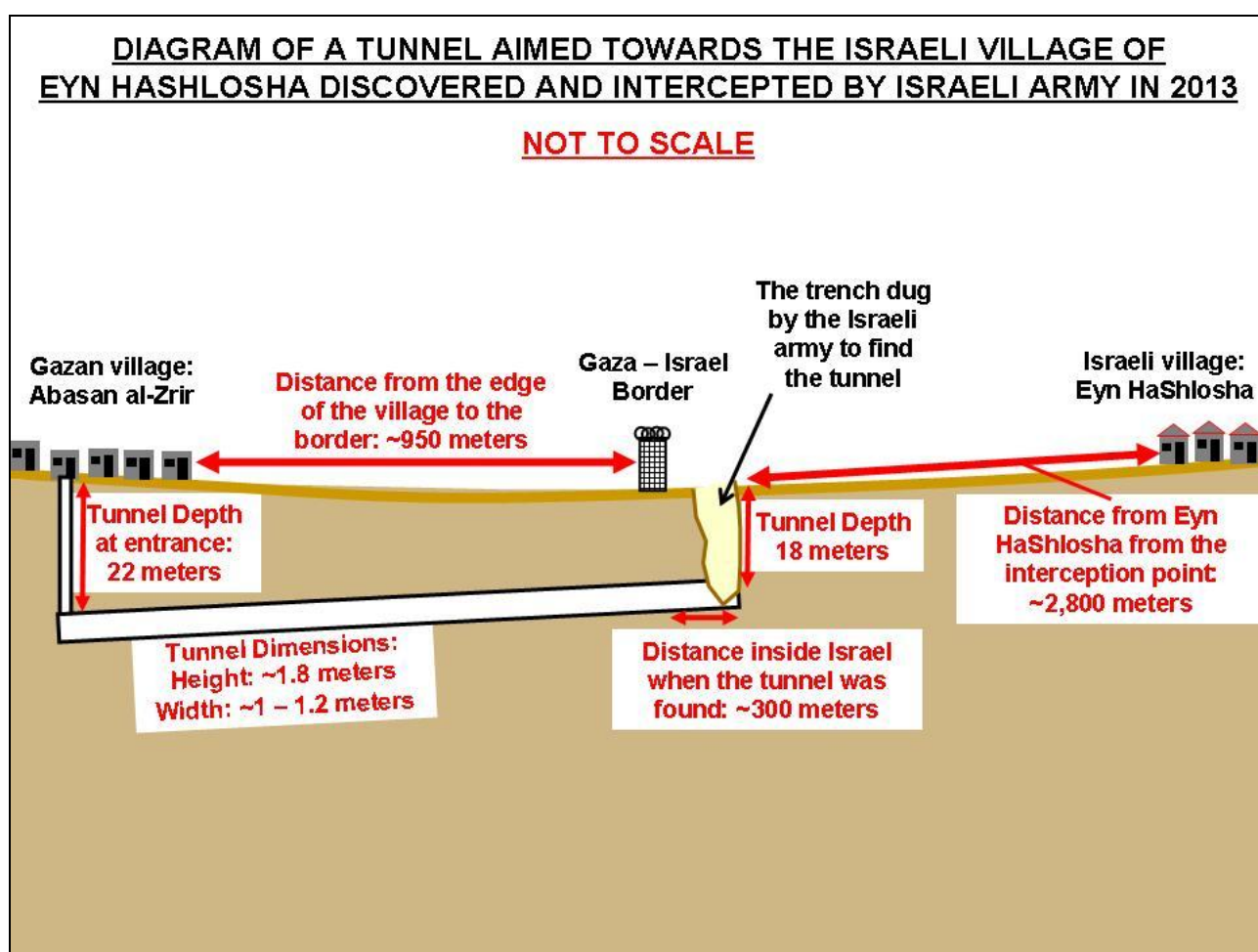
APPENDIX OF PHOTOGRAPHS

Appendix A

Schematic Illustration of a Cross-border Tunnel Discovered by the IDF in **2013**
(nearly a year before the summer 2014 war).

The tunnel entrance was inside the Gazan village of Abasan al-Zrir.
It was aimed to reach the Israeli village of Ein HaShlosha, but the diggers could have changed direction further on to the village of Nirim.

(The illustration is NOT to scale)



Appendix B

Exit hole of a Palestinian cross-border tunnel inside Israel.

13 Palestinian fighters dug their way out of this tunnel in the early hours of 17 July 2014 near the Israeli village of Sufa. They were spotted, fired at by Israeli forces and forced to withdraw, at least 5 of them were killed.



Appendix C

Typical entrance to a tunnel in the basement of a house in Gaza found by Israeli troops.

Note the white sacks that were originally used to distribute food or other commodities to Palestinian refugees by UNRWA (see inside the red circle). They were being used as camouflage to evade detection by Israeli intelligence services - bringing building materials to the tunnel and extricating the soil dug up from within the tunnel and in some cases covering tunnel entrances.



Appendix D

A typical air-vent and entrance to a tunnel inside Gaza.
Originally it was camouflaged.



Appendix E

An Israeli soldier inside an incomplete cross-border Hamas tunnel. Note the concrete sections holding the roof and walls, the tools at the bottom in the area still being excavated and the electricity wiring for operating power-tools. The metal lines on the ground are for rolling small trolleys to facilitate carrying equipment and soil.

Note also the extremely narrow width of the tunnel.



Appendix F

Israeli soldiers excavating a new entrance into a tunnel – thus avoiding the booby traps set around, on and in the original entrances. One soldier digs and another kneels, aiming his rifle into the tunnel over the digger's shoulder in case there are Hamas fighters inside waiting in ambush.

The initial digging was usually done with mechanical digging machines, but to reach the depth of the tunnels needed machines of a size that made them very vulnerable to hostile fire, so after reaching a certain depth the digging continued by hand – obviously requiring more time.



Appendix G

An explosive booby-trap inside an apartment
Marked in the red circle is the trigger mechanism.



Explosive device attached to a wall inside the living room of someone's home.



Appendix H

The Deliberate Use of Civilians By Hamas

During the battle in Shujayia, Israeli soldiers found a Hamas doctrinal manual that included a section on the use of civilians to impede the Israelis.

The IDF translated and published the relevant portions:





In a section entitled **Limiting the Use of Weapons** the manual explains that:
The soldiers and commanders (of the IDF) must limit their use of weapons and tactics that lead to the harm and unnecessary loss of people and [destruction of] civilian facilities. It is difficult for them to get the most use out of their firearms, especially of supporting fire [e.g. artillery].

Clearly Hamas knows the IDF will limit its use of weapons in order to [avoid harming civilians](#), including refraining from using larger firepower to support its forward troops.

The manual goes on to explain that the “*presence of civilians in pockets of resistance*” causes three major problems for advancing Israeli troops:

- (1) *Problems with opening fire.*
- (2) *Problems in controlling the civilian population during operations and afterward.*
- (3) *Assurance of supplying medical care to civilians who need it.*

Lastly, the manual discusses the benefits for Hamas when civilian homes are destroyed:

The destruction of civilian homes: This increases the hatred of the citizens towards the attackers [the IDF] and increases their gathering [support] around the city defenders (resistance forces [i.e. Hamas]).

It is clear that Hamas actually [desires the destruction of homes](#) and civilian infrastructure, knowing it will increase hatred for the IDF and support their fighters.

Appendix I

Photo of Leaflet Dropped by the IDF on village of Beyt Lahia

Warning the population to leave the area for their own safety till the fighting ends. Similar leaflets were dropped on areas about to be entered at least a day before Israeli troops entered, and in some cases two to three days before.



"To the residents of Beyt Lahia, The IDF intends to attack terrorists and terror infrastructures in the area east of Al-Atatra and Al-Salatin St., and in the area west and north of Ma'bscar Jabalyia. Israel is currently attacking, and will continue to attack, every area from which rockets are being launched at its territory. The civilians are requested to evacuate their residences immediately and move by 12:00 PM today, south of Jabalyia Al-Badr via Shar'a Al-Faluja. The IDF's campaign is to be short and temporary. Those who fail to comply with the instruction will endanger their lives and the lives of their families. Beware."

The map also shows a safe route for travel.

Appendix J

An information slide released by the Israel Defense Forces during the war.

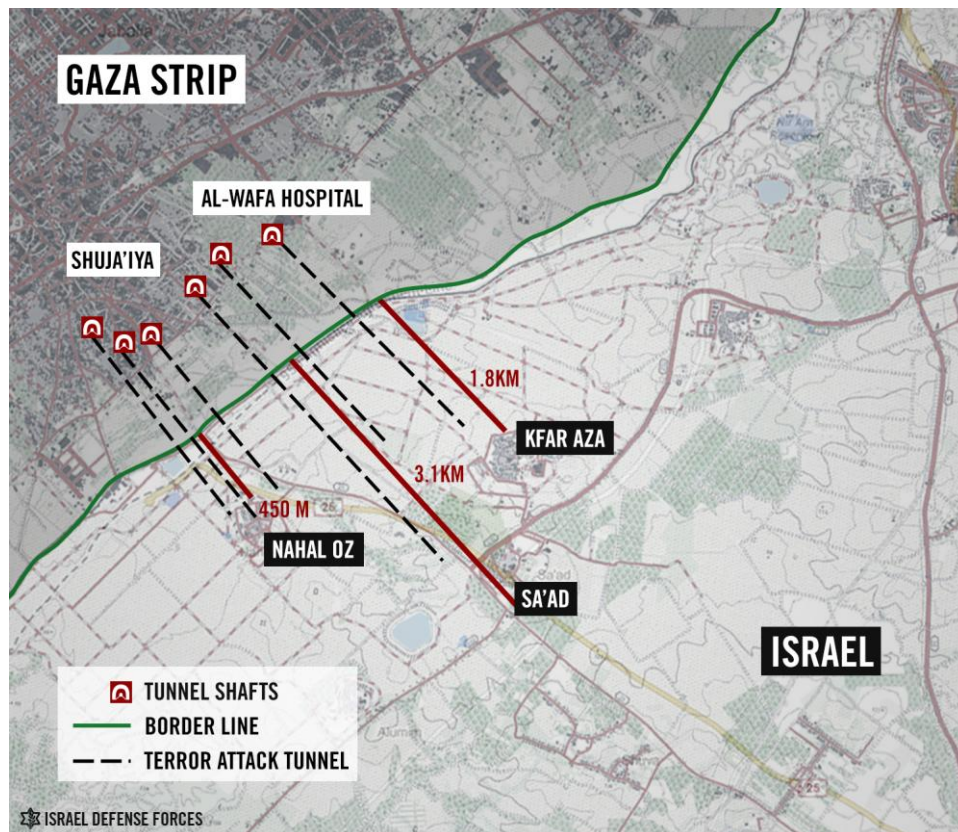


The actual price of a tunnel varies of course depending on the length, depth and quality of building (how much concrete and other materials are used to strengthen the walls, etc.)

The information slide does not mention the time taken to dig a tunnel – depending on length, depth and quality of building from 6 months to a couple of years each.

Appendix K

The Map below was published by the Israel Defense Forces. It shows the rough location of six tunnels originating in the neighborhood of Shujayia – one of them from the local Al-Wafa hospital.

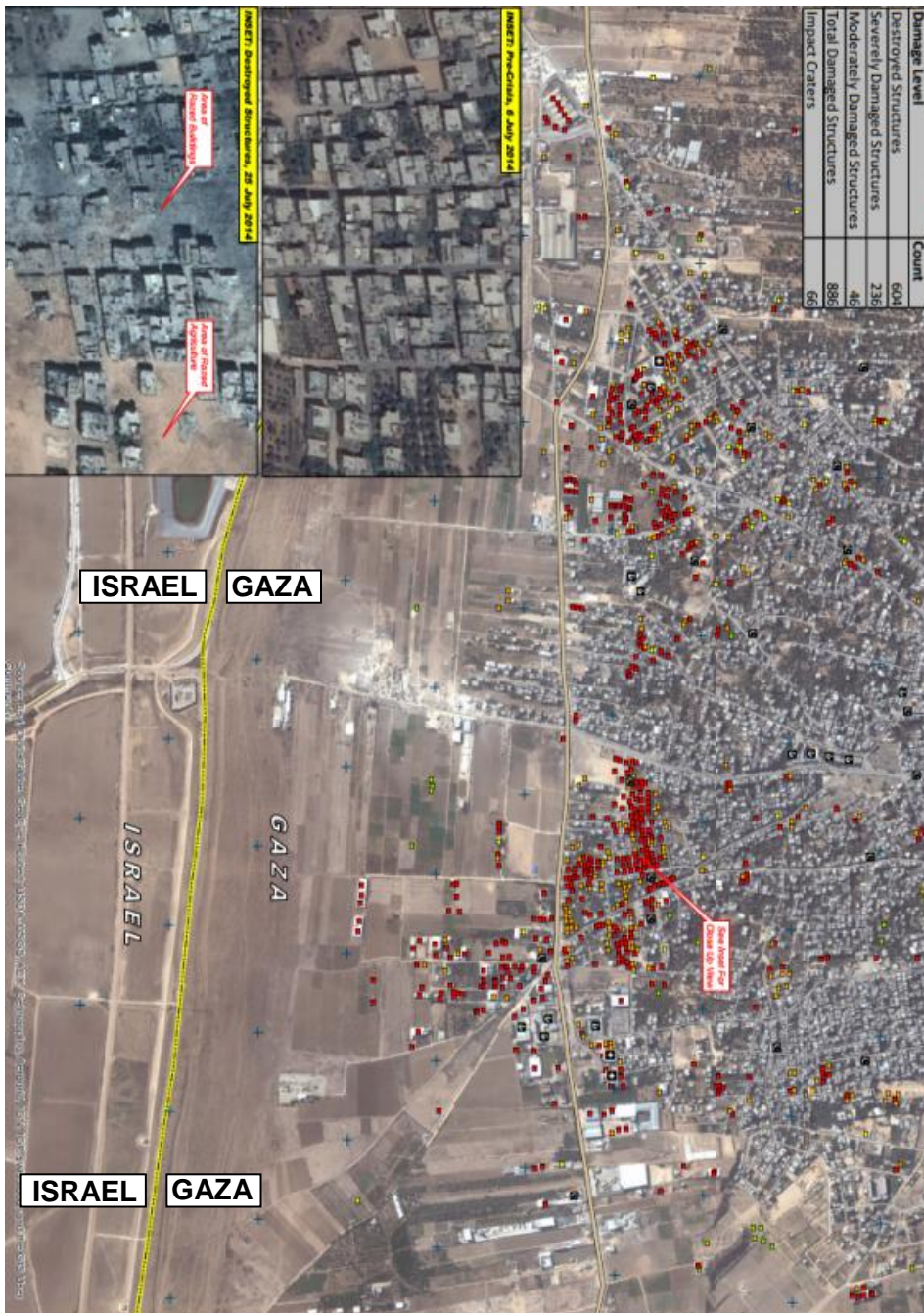


Comparing this map to the satellite photograph published by the UN of damaged areas inside Shujayia (see next page) shows that the damage to the neighborhood is concentrated around the tunnel entrance sites – which is where most of the fighting between Israeli troops and Hamas occurred, especially the ambushes Hamas prepared there following repeated Israeli notification to the population over the three days prior to entering, requesting it move away from the neighborhood to prevent it being caught in the crossfire.

Appendix L

Below is a satellite photograph published by the United Nations of Shujayia after the battle there.

- 604 houses, marked in red, were totally destroyed.
- 236 houses, marked in orange, were severely damaged.
- 46 houses, marked in yellow, were moderately damaged.
- The total number of destroyed or damaged houses: 886 - (less than 10% of the buildings in Shujayia).
- Inset photographs (top left corner) are a 'before' and 'after' comparison of a specific area in which fighting occurred.
- The yellow line is the border between Israel and Gaza.



As can be clearly seen, the damage is concentrated in specific areas – most of it at the eastern entrances to the built-up area where the IDF units entered the neighborhood to look for tunnels and were ambushed by Hamas forces. In addition to hundreds of camouflaged bombs exploded by Hamas fighters at Israeli troops inside houses and along the streets, Hamas also bombarded this area with mortars. So not all the damage was caused by Israeli fire.

Appendix M

Rocket launch sites in Shujayia
Aerial photographs published by the Israel Defense Forces



Appendix N

Photographs from different angles of a Medical Center in eastern Khan Yunis / western Abasan al-Zrir, in which 3 Israeli soldiers were killed and 12 wounded by a concentration of explosive-filled drums (nearly 1 ton all together) placed inside. The soldiers entered the clinic searching for a tunnel entrance and it was exploded on them by a Hamas observer using a remote-control located in another building.



Appendix O

Rockets launched from within residential areas in Gaza

