

Security Awareness for Public Bus Transportation: Case Studies of Attacks Against the Israeli Public Bus System



MTI Report 11-07



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REPORT 11-07

**SECURITY AWARENESS FOR PUBLIC BUS
TRANSPORTATION:
CASE STUDIES OF ATTACKS AGAINST
THE ISRAELI PUBLIC BUS SYSTEM**

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TABLE OF CONTENTS

Executive Summary	1
Introduction	3
Case 1 – The Kibbutzim Junction	7
Case 2 – Mehola Junction	13
Case 3 – Ma’ale Adumim	17
Case 4 – Bar-Ilan University Intersection	23
Case 5 – IDF Base No. 80	29
Case 6 – Haifa, Line 16 BUS	33
Case 7 – Jerusalem, Line 19 BUS	39
Case 8 – Jerusalem Clal Center, Line 14 Bus	43
Case 9 – Dual Bus Attacks in Beersheba	49
Case 10 – Beersheba, Central Bus Station	55
Case 11 – Tel Aviv, Central Bus Station	63
Case 12 – Tel Aviv, Line 51 Bus	69
Case 13 – Jerusalem, Line 36 Bus	75
Case 14 – Megiddo Junction, Line 830 Bus	79
Case 15 – Karkur Junction, Line 841 Bus	83
Case 16 – Pre-Operation Collection of Information in Jerusalem	89
A Comparative Analysis of the Effectiveness and Lethality of Different IED Types and Methods of Attack	95

Endnotes	99
About the Authors	101

LIST OF FIGURES

1. Number of Bus Attacks in Israel Since 1970	4
2. Number of Fatalities from Bus Attacks in Israel Since 1970	4
3. Bus Route and Sequence of the Case 1 Attack	8
4. Components of the Explosive Device	9
5. A Bag Similar to the One That Contained the IED	9
6. A Toggle Switch Similar to The One Identified by the Driver	10
7. The Remains of the Original Bag, Including the Initiation Switch	11
8. Bus Route and Sequence of the Case 2 Attack	14
9. Typical IEDs Based on TATP Contained in Water Pipes	15
10. An Explosive-Belt Initiation Switch Seized by the Israeli Defense Forces (IDF) in a Clandestine Laboratoy in Nablus	15
11. Bus Route and Sequence of the Case 3 Attack	18
12. Components of the IED	19
13. Conditions on the Bus Route of the Case 3 Attack	20
14. Bus Route and Sequence of the Case 4 Attack	24
15. Components of the IED Used in the Attack	25
16. Location of the Bus at the Time of the Attack	26
17. Location of the Detonation	27
18. Bus Route and Sequence of the Case 5 Attack	30
19. Bus Route and Sequence of the Case 6 Attack	33
20. The Suicide Bomber, Maher Muhi al-Din Kamal Hebesha	34
21. Components of an IED Similar to the One Used in the Attack	34
22. The Bus After the Attack	35
23. Front View of the Bus Showing the Blast Effect at the Bomber's Location	36
24. Bus Route and Sequence of the Case 7 Attack	40
25. The Suicide Bomber, Ali Munir Yussuf Jaarah	40
26. Components of an IED of the Type Used in the Attack	41

27. Location of the Suicide Bomber at the Time of Detonation	42
28. Blast Effect on the Bus	42
29. Street Typical of the One Where the Suicide Bomber Boarded the Bus	44
30. The Suicide Bomber, Abd al-Mu'ti Muhammad Salih Muhammad Shabaana Tamimi	44
31. Training Slide Showing Jewish Ultra-Orthodox Dress Code	45
32. Illustration of "Out of Code" Dress	46
33. The Demolished Bus	47
34. Ultra-Orthodox Hatzalah Motorcyclists	48
35. Bus Routes and Sequences of the Case 9 Attacks	50
36. The Suicide Bombers: Ahmed Abu al-Afu Abd al-Fatah Qawasmeh (left) and Nassim Muhammad Ali Abd al-Ghani Jabari (right)	51
37. The Arrest of Eimad Qawasmeh	51
38. The First Bus to Explode (Number 7)	52
39. The Second Bus to Explode (Number 12)	53
40. Beersheba Central Bus Station	56
41. The Suicide Bomber, Abd al-Rahman Qaisiya	56
42. Sequence of the Case 10 Attack	57
43. The Scene of the Attack	58
44. Bomber's Route After Being Identified	59
45. The Scene After the Attack	60
46. General View of the Tel Aviv Central Bus Station	64
47. Pedestrian Entrances Where the Terrorist Tried to Enter the Station	64
48. The Suicide Bomber, Iman Razawi	65
49. Route of Bus Line 19 Showing Location of the Case 12 Attack	69
50. The Suicide Bomber, Abdala Abu Jaber	70
51. A Cellular Phone Modified to Activate an IED	71
52. The Bus After the Explosion and the Passengers' Evacuation	72
53. The Explosive Device	76

54. The Suicide Bomber, Hamzah ‘Aref Hassan Samudi	80
55. A Renault Kangoo Panel Van	80
56. The Bus Route, Showing the Location of the Case 14 Attack	81
57. The Demolished Bus	82
58. The Bus Route, Showing the Location of the Case 15 Attack	84
59. The Nissan Guiding Vehicle	85
60. KIA SUV Remains After the Explosion	86
61. The Scene After the Explosion	87
62. Zaher Yusuf Diab Ali	89
63. An Articulated Bus Operated on Line 4A in Jerusalem	91
64. The Route of the Bus Showing the Location of the Case 16 Attack	91

EXECUTIVE SUMMARY

Public surface transportation has been and remains a primary target for terrorists throughout the world. The MTI Database on Terrorist and Serious Criminal Attacks Against Public Surface Transportation records 3,159 attacks against public surface transportation between January 1, 1970, and January 23, 2012, in which 7,997 people were killed and 30,046 were injured. Of these attacks, 47.4 percent were against buses, bus stations, and bus stops; they accounted for 55 percent of the fatalities and 41 percent of the injuries resulting from terrorist attacks during this period.

Public bus transportation is particularly important in developing countries, and also in Israel—perhaps uniquely among developed countries. This report examines 16 of the many attacks planned or carried out against the public bus system in Israel (including the West Bank and Gaza) during the period of intense rioting and civil unrest known as the Second Intifada, which lasted from September 2000 until it finally ended in the latter part of 2006.

The 16 cases described here were selected not because they are statistically representative, but because they provide a variety of interesting observations. They include both lethal and nonlethal attacks, attacks in which security measures were effective or were not followed or were ineffective, attacks in which the attackers' tactics and/or devices were lethal or failed or reduced the lethality of the attack, and one planned attack that was eventually carried out against a non-bus target.

All the attacks took place between 2000 and 2005. Fourteen of them were attempts to bomb a bus; in two cases, bus stations were the targets.

Suicide delivery was the dominant method of attack: In 11 cases, devices were worn by or carried by the attacker; in two cases, a vehicle-borne improvised explosive device (VBIED) was detonated by a suicide driver alongside a bus. In three cases, bombs were concealed in bags or other items left behind.

The two most lethal and successful attacks, one of which was a suicide VBIED attack, each killed 17 people. Among the other successful attacks, one killed 16 people, one killed 15, and one—the other suicide VBIED attack—killed 14. Six of the 15 actual attacks were considered unsuccessful, and five were considered partially successful. One case involved only preattack surveillance, with no attack.

In eight of the attacks that were considered failures or only partial successes, security measures and awareness played a role in stopping the attack or mitigating its consequences. In nine of those same cases, poor attacker techniques and bomb-making were also factors.

Of course, all of the cases raise questions. We do not attempt to answer these questions; rather, we pose them for further discussion. The most important question, particularly for security officials and transportation operators in the United States, is, How applicable

are these cases to the current environment in the United States? Another question is, How does Israel's experience compare with that of India, Pakistan, or Sri Lanka?

The United States, like many other developed countries, has not experienced successful terrorist attacks against public bus transportation. It may be that terrorists in the United States are not as capable or determined as those in other countries, their plots may have been interrupted by police and intelligence officials, they may not have chosen bus targets for lethal attacks, or they may not have focused extensively on public surface transportation. Israel faces, and has faced, a host of determined, constantly improving terrorist foes who have benefited from a relatively fast tempo of operations and a restive populace apparently willing to provide bombers and material support. At the same time, the Israeli traveling public is generally considered to be more in tune with security risks and more likely to be observant and to become involved than the traveling public in other countries, since the consequences of successful attacks are immediate and well known in a closely knit, small country.

While one might conclude that Western nations are not likely to experience the kinds of intense terrorist campaigns against public surface transportation experienced in Israel or in developing countries such as India, Pakistan, or Sri Lanka, these targets remain attractive and must be considered in security planning.

It is hoped that the cases presented here and the accompanying analysis will increase understanding of what can happen and of what can deter, prevent, and/or mitigate the occurrence of terrorist attacks against public bus systems.

INTRODUCTION

Public surface transportation has been and remains a primary target for terrorists throughout the world. The MTI Database on Terrorist and Serious Criminal Attacks against Public Surface Transportation records 3,159 attacks against public surface transportation between January 1, 1970, and January 23, 2012, in which 7,997 people were killed and 30,046 were injured. Of these attacks, 47.4 percent were against buses, bus stations, and bus stops; they accounted for 55 percent of the fatalities and 41 percent of the injuries resulting from terrorist attacks during this period.

Public bus transportation is particularly important in developing countries, and also in Israel—perhaps uniquely among developed countries. When combined, bus attacks in Israel and the West Bank and Gaza¹ constitute the largest share of attacks since 1970. (The only other developed country in the top ten where bus attacks have taken place is the Russian Federation.) Since 1970, 251 attacks have been made against buses in Israel (181) and in the West Bank and Gaza (70); they constitute 16.8 percent of all attacks against bus targets in the world during these years. The attacks in Israel and the West Bank and Gaza killed 588 people (an average of 2.3 per attack) and injured 2,706 (an average of 10.8 per attack). Attacks in Israel alone had a higher lethality rate (an average of 3.0 people per attack), only slightly below that of India (an average of 3.1, in 208 attacks).

It is not surprising that Israeli public buses and their stations and stops were hit hard and often during the period between 2000 and 2006 that has become known as the Second Intifada. In this time of intense rioting and civil unrest in the West Bank and Gaza, terrorist attacks are generally estimated to have killed 5,500 Palestinians and more than 1,100 Israeli military and civilian personnel. (The vast majority of Israeli deaths—1,084—resulted from 257,702 attacks that occurred between September 29, 2000, and the end of 2005.) The causes of the uprising have not been internationally agreed upon, but there is general agreement that the Second Intifada began just before or after the September 28, 2000, visit of Prime Minister Ariel Sharon to the Temple Mount in Jerusalem, an Islamic holy site, and finally ended in the latter part of 2006.

During this time, many terrorist attacks were made against Israeli government and military facilities, as well as public places such as cafes, markets, restaurants, and hotels. An intensive campaign was also directed against the Israeli bus system, including buses, bus stations, and bus stops. Israeli bus targets had been hit before, but never with such frequency and lethality: There were 80 attacks in Israel and 56 in the West Bank and Gaza, together constituting 21.7 percent of all attacks against buses in the world during these years, 23 percent of all the fatalities resulting from those attacks, and 39 percent of all the injuries. The attacks in Israel and the West Bank and Gaza killed 348 people (an average of 2.6 per attack) and injured 1,689 (an average of 12.4 per attack). Fatalities per attack in Israel alone (3.9) were the highest during these years *of any country* with 20 attacks or more.

Attacks carried out during the Second Intifada constitute 54 percent of all the bus attacks in Israel in the 40 years since 1970, 59 percent of the fatalities, and 62 percent of the injuries. Figure 1 shows the number of bus attacks in Israel since 1970 and the number of those

that killed at least one person. Figure 2 shows the total fatalities caused by all bus attacks and the fatalities caused by attacks that resulted in at least 10 deaths. The increased tempo and lethality of bus attacks during the Second Intifada are clearly shown—attacks and fatalities spiked dramatically during those years, peaking around 2003.

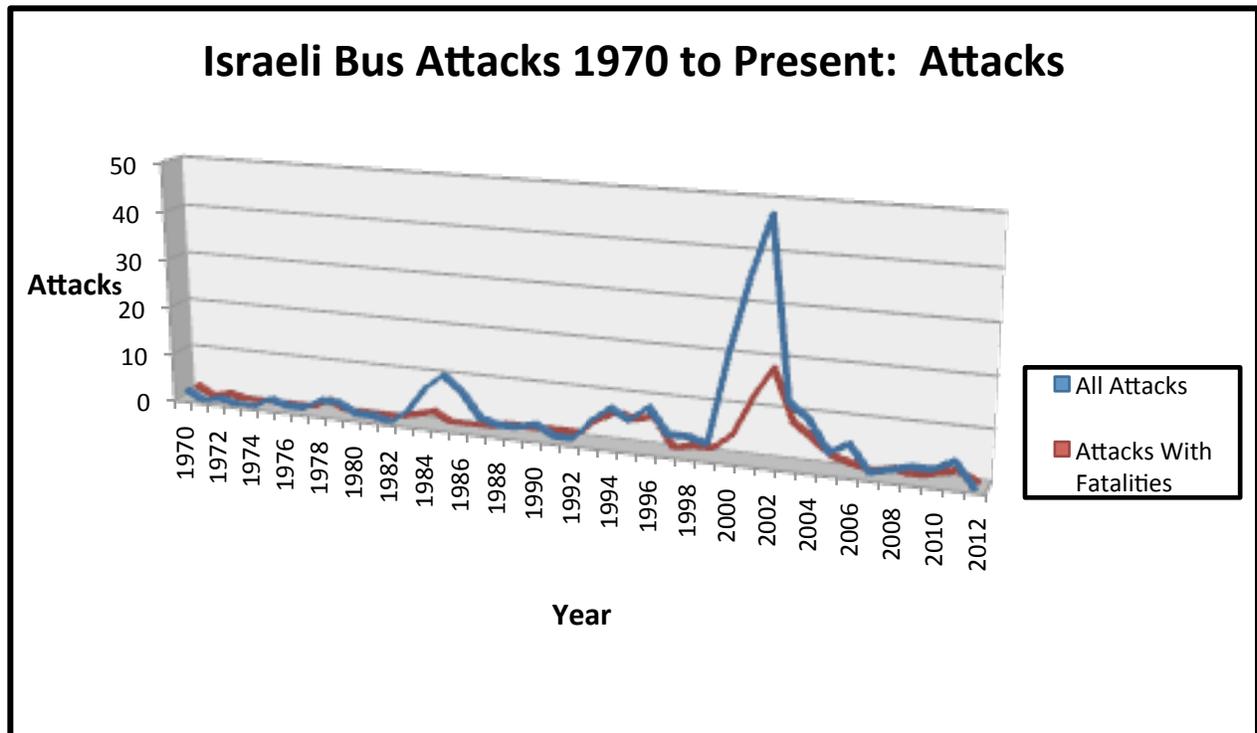


Figure 1: Number of Bus Attacks in Israel Since 1970

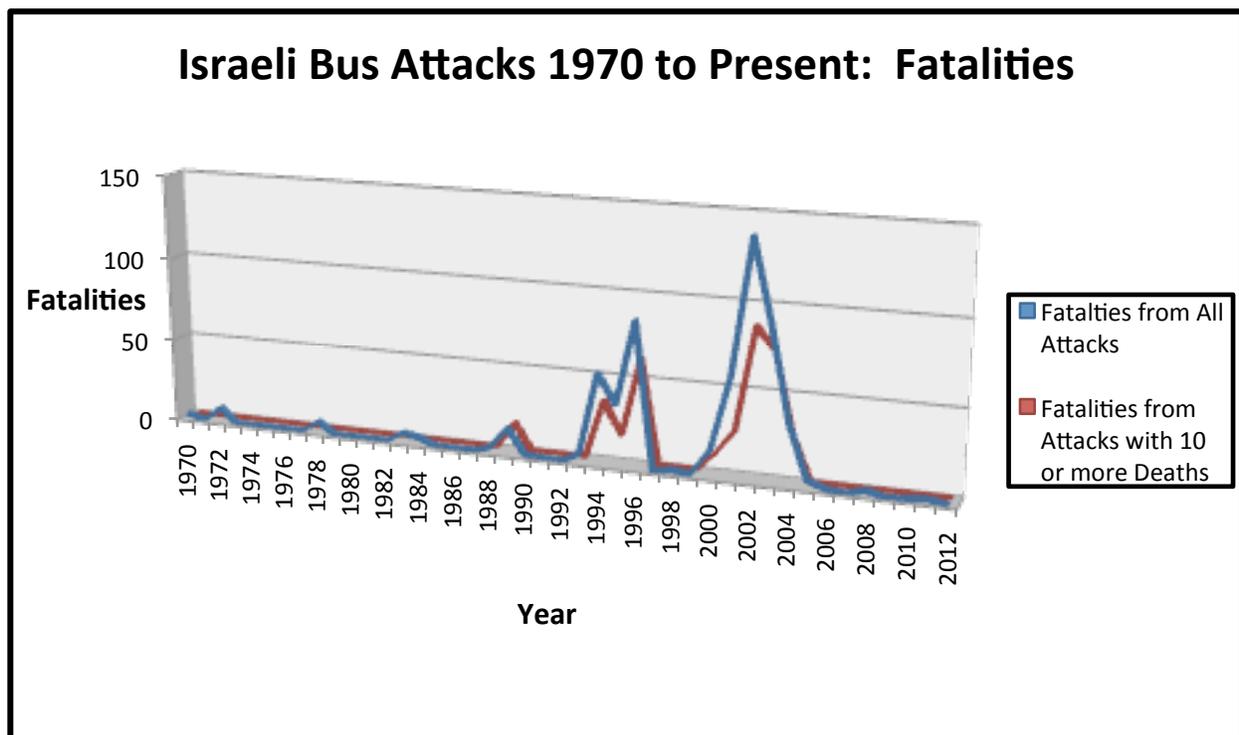


Figure 2. Number of Fatalities from Bus Attacks in Israel Since 1970

The terrorist campaign against Israeli bus targets during the Second Intifada may be the most intensive and lethal campaign ever waged in any country, with the *possible* exception of Sri Lanka. It did not happen in isolation but was part of a wider, complex terrorist campaign with many phases, actors, and targets. However, the attention paid to the attacks—particularly those carried out by suicide bombers—was intense. The images of buses ripped apart and strewn bodies were haunting, particularly in the West. They have caused transportation operators and security officials to reconsider their security measures.

In an effort to understand better which of these attacks were most lethal and which defensive measures worked most effectively, MTI collaborated with Shalom Dolev, a security consultant to the Israeli Ministry of Transport, who helped design the security measures that were adopted in Israel during the Second Intifada, to develop case studies of Israeli bus attacks and related terrorist operations. The work began in March 2011 and was completed in December 2011.

The 16 case studies presented in this report were selected not because they are statistically representative but because they provide a variety of interesting observations. They include both lethal and nonlethal attacks, attacks in which security measures were effective or were not followed or were ineffective, attacks in which attackers' tactics and/or devices were lethal or failed or reduced the lethality of the attack, and one planned attack that was eventually carried out against a non-bus target.

For each case, a general description provides a capsule summary of the attack. This is followed by a description of the target and its operating environment within the Israeli bus system. The bombers and their backgrounds are described, along with details of the devices used and how they were constructed and a time-sequenced analysis of how each attack was carried out. Finally, observations on terrorist tactics and security measures that were or were not effective are offered.

Following the case studies, the attacks and devices used in them are analyzed, and preliminary conclusions are drawn on which delivery method and which devices proved most lethal.

Of course, the cases raise many questions. We do not attempt to answer these questions; rather, we pose them for further discussion. The most important question, particularly for security officials and transportation operators in the United States, is, How applicable are these cases to the current environment in the United States? Another question is, How does Israel's experience compare with that of India, Pakistan, or Sri Lanka?

The United States, like many other developed countries, has not experienced successful terrorist attacks against public bus transportation. It may be that terrorists in the United States are not as capable or determined as those in other countries, their plots may have been interrupted by police and intelligence officials, they may not have chosen bus targets for lethal attacks, or they may not have focused extensively on public surface transportation. Israel faces, and has faced, a host of determined, constantly improving terrorist foes who have benefited from a relatively fast tempo of operations and a restive

populace apparently willing to provide bombers and material support. At the same time, the Israeli traveling public is generally considered to be more in tune with security risks and more likely to be observant and to become involved than the traveling public in other countries, since the consequences of successful attacks are immediate and well known in a closely knit, small country.

While one might conclude that Western nations are not likely to experience the kinds of intense terrorist campaigns against public transportation experienced in Israel or in developing countries such as India, Pakistan, or Sri Lanka, these targets remain attractive and must be considered in security planning.

It is hoped that the case studies presented here and the accompanying analysis will increase understanding of what can happen and what can deter, prevent, and/or mitigate the occurrence of terrorist attacks against public bus systems.

CASE 1 – THE KIBBUTZIM JUNCTION

GENERAL DESCRIPTION

Date: August 2, 2001

Event: A suicide bomber boarding a bus near Beit She'an to carry out a suicide bombing attack aroused the suspicion of the bus driver, who tackled and restrained him.

Casualties: None.

Organization responsible: The Palestinian Islamic Jihad (PIJ).

Suicide bomber: Muhammad Sa'id Abdallah Abu Khadr.

THE OPERATIONAL ENVIRONMENT

Line 963 of EGGED, the major intercity bus operator in Israel, is a long route that passes through a variety of geographical and population areas. The line starts at the central bus station of Jerusalem and heads east to the Jordan Valley through the Joda desert; at the northern edge of the Dead Sea, the route turns north through the Jordan Valley up to the Sea of Galilee; it then continues along the western shore of the sea and through the H'achola Valley to Kiryat Shmona, the most northern city of Israel. It takes almost 4 hours to make the 240-kilometer drive, most of which is through low-population rural areas. The first 100 kilometers or so of the route is near the northern part of the territories controlled by the Palestinian Authority at the West Bank (Figure 3). On August 2, 2001, the bus was carrying 45 passengers, most of them young people traveling to the "Tzemach Rock & Love Festival" at the Sea of Galilee. The bus stop at which the terrorist tried to board the bus is in a farm area at the northern edge of the Jordan Valley.

THE SUICIDE BOMBER

The suicide bomber was a 16-year-old high school student from a small village near the city of Nablus. He was recruited from within the PIJ network in the town of Tubas.

THE EXPLOSIVE DEVICE

The explosive device carried by the suicide bomber comprised three mortar shells, a propane canister (with a detonator inserted into one of the fuse houses), a battery pack, and an electrical toggle switch (Figure 4). The device was carried in a black soft-sided shoulder bag (Figure 5).



Figure 3: Bus Route and Sequence of the Case 1 Attack



Mortar shells and propane canister after police disarmed the device



TNT remains after device was disarmed by police



Original battery pack



Additional fragmentation: steel balls and cut construction iron

Figure 4: Components of the Explosive Device



Figure 5: A Bag Similar to the One That Contained the IED

THE ATTACK

Members of the PIJ brought the bomber to a bus stop at the Kibbutzim Junction, 3 kilometers south of the town of Beit-Shean. When the bus arrived at the bus stop, the terrorist was the only passenger there. Although the area was not considered to be high-risk, the driver, 52-year-old Menashe Norial, followed the security-awareness training procedures and stopped the bus before the bus stop to have time to examine the waiting passenger's appearance and behavior. According to Norial, at that stage, the possibility that the passenger might be a terrorist did not enter his mind. He did note that the passenger was observing the bus before boarding but assumed that he was trying to verify whether a seat was available in the crowded bus.

The terrorist hesitated for several seconds, then walked to the front door of the bus. At that point, the driver, Norial, realized that the man was holding a mid-size shoulder bag in both hands, carrying it as if it was a baby.

Norial did not think the terrorist, who was wearing a black T shirt and a black baseball hat, was of Arab origin; he thought he was a local youth traveling to the festival. At that stage, neither the appearance nor the behavior of the passenger made Norial suspicious. He opened the door, and in accordance with security-awareness procedures, asked the passenger several questions about his destination. The passenger didn't respond and started to board the bus.

Norial thought that he was a "weird" person, maybe on drugs, like some of the youth traveling to the festival. He asked again for the passenger's destination and asked what was in the bag, but the young man did not respond and took another step onto the bus. At that point, Norial became suspicious and decided to take action. He pulled the handbrake, turned, and stood up against the passenger, ready to tackle him. Now extremely suspicious, he again shouted his questions, repeating them several times in Hebrew and Arabic. Norial explained later that he wanted to verify that the passenger understood his questions and warnings before he took physical action, to avoid being accused of attacking an innocent passenger.

The terrorist did not respond to the driver's demands and placed the bag very gently on the floor of the bus. Norial then saw that an electrical switch was attached to the bag with adhesive tape (see Figure 6).



Figure 6: A Toggle Switch Similar to The One Identified by the Driver

By then, certain that the passenger was a suicide bomber and that the bag contained an explosive device, Norial pushed the young man down the stairs and out of the bus, holding the bomber's hand to keep him from operating the switch. At the last step, Norial pushed the would-be bomber away from the bag and threw him down on the ground. A soldier passing by in his car saw the situation and helped the driver restrain the terrorist. The driver then returned to the bus and drove it away from the bag. Police arrived at the scene, arrested the terrorist, and disarmed the explosive device (Figure 7).

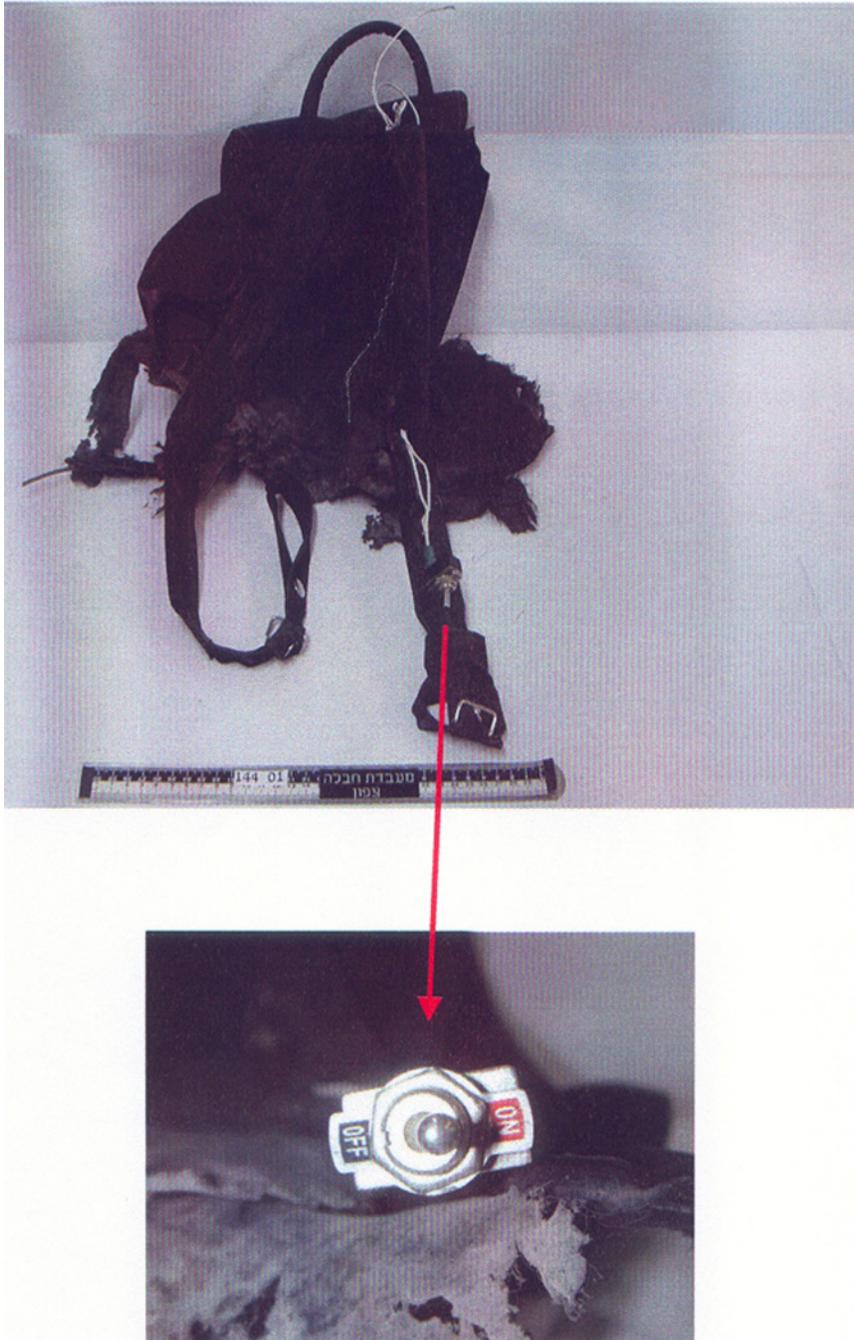


Figure 7: The Remains of the Original Bag, Including the Initiation Switch

ANALYSIS AND CONCLUSIONS

1. The practice of stopping the bus some distance before the bus stop to enable the driver to examine waiting passengers before they board is generally effective, although in this case, it did not result in the identification of suspicious indications.
2. Questioning of the passenger before and upon boarding was the most effective practice in this case, as the passenger's failure to respond raised the driver's suspicions. However, the unusual way the terrorist carried the bag should have raised them at an earlier stage.
3. Training the driver to insist on having a satisfactory response from a passenger he decides to question was effective here; a driver trained only to provide respectful service might have found it difficult to persist in this way.
4. Terrorists may take advantage of special public events such as crowded festivals or open performances, which provide lucrative targets where a bomber of suitable age and/or wearing appropriate clothing might not be detected.
5. The security awareness, dedication, determination, and bravery of the driver saved the lives of the bus passengers in this case.

CASE 2 – MEHOLA JUNCTION

GENERAL DESCRIPTION

Date: February 19, 2002.

Event: A suicide bomber attempted to board a bus near Mehola (an Israeli village in the northern Jordan Valley) to carry out an attack but was pushed away by the driver. The bomber blew himself up in an open field near the bus stop after the bus drove away.

Casualties: None.

Organization responsible: Fatah/Al-Aqsa Martyrs' Brigades.

Suicide bomber: Omar 'Abd al-Fatah Hafez Yassin.

THE OPERATIONAL ENVIRONMENT

Line 961 of EGGED, the major intercity bus operator in Israel, originates at Jerusalem's central station, and its final destination is the central station of Tiberias (a city on the western shore of the Sea of Galilee). The route is long, passing through a variety of geographical and demographic (population) areas. It heads east from the central station to the Jordan Valley, through the Joda desert. At the northern edge of the Dead Sea, the line turns north to the Jordan Valley up to the Sea of Galilee and proceeds along the western shore of the sea to Tiberias. The 150-kilometer drive, most of which is through sparsely populated or rural areas, takes about 2 hours. The first 100 kilometers or so of the route is near the northern part of the territories controlled by the Palestinian Authority at the West Bank (Figure 8).

On February 19, 2002, the bus was carrying about 30 passengers, many of them residents of the villages along the Jordan Valley. The bus stop at which the terrorist tried to board the bus is near Mehola, a village with a population of about 350 at the northern end of the Jordan Valley.

THE SUICIDE BOMBER

The bomber was a 20-year-old man from a village near the city of Nablus.

THE EXPLOSIVE DEVICE

The improvised explosive device (IED) used by the suicide bomber was a vest or belt strapped under his upper clothing. It was built with tri-acetone tri-peroxide (TATP), a homemade explosive, placed in metallic cylinders (common 2-inch steel water pipe) (Figure 9). The initiators were light bulbs connected to a battery pack controlled by an electrical switch located, most likely, in the terrorist's coat pocket (Figure 10).



Figure 8: Bus Route and Sequence of the Case 2 Attack

THE ATTACK

The bomber arrived at the bus stop at about 6:00 pm, probably on foot after walking several kilometers from the spot where he was dropped off by a car coming from the Nablus area.



Figure 9: Typical IEDs Based on TATP Contained in Water Pipes



Figure 10: An Explosive-Belt Initiation Switch Seized by the Israeli Defense Forces (IDF) in a Clandestine Laboratory in Nablus

Following the security-awareness procedure, the bus driver stopped some distance before the bus stop. At the stop, two passengers who were residents of Mehola village disembarked and asked the driver to open the luggage compartment on the right-hand side of the bus. In contrast to the normal procedure of using the rear door, the passengers disembarked through the front door, which was closer to the luggage compartment. While

they were unloading the luggage, a young man waiting at the bus stop walked toward the open front door of the bus.

Driver Shalom Deri said that when he saw the young man's Arab appearance and his oversized and inflated coat, he was immediately almost certain that the man was a suicide bomber. Devi called out to the young man to stop and asked the other passengers for help. When he realized that the bomber was putting his hand into his coat pocket, Devi kicked him off the bus, closed the front door, and drove the bus about 100 meters forward.

Some passengers who jumped off the bus through the rear door during the driver's struggle chased the suicide bomber about 40 meters into a nearby field, where he blew himself up.

ANALYSIS AND CONCLUSIONS

1. The practice of stopping the bus some distance before the bus stop to enable the driver to examine the passengers before they board was effective in this case, resulting in the identification of the passenger as a possible suicide bomber as soon as he arrived at the door of the bus. The suspicious indicator "a passenger wearing clothes that are loose fitting or larger than the person's body dictates" led to the identification.
2. The driver's training on the design and wearing of suicide bomb belts and bomb vests, including the location of the initiation switch in an upper pocket, was also effective, as was the tactical training on techniques to prevent a highly suspicious person from boarding the bus and on quickly driving the bus away from the danger.
3. The security awareness, dedication, determination, and bravery of the driver definitely saved the lives of the bus passengers.

CASE 3 – MA’ALE ADUMIM

GENERAL DESCRIPTION

Date: February 6, 2002.

Event: A suicide bomber who tried to board a bus was restrained, taken off the bus, and arrested by border police officers at a police checkpoint near the town of Ma’ale Adumim.

Casualties: None.

Organization responsible: Hamas.

Suicide bomber: Nidhal Jowad Ta’er Surkaji.

THE OPERATIONAL ENVIRONMENT

Line 176 of EGGED, the major intercity bus operator in Israel, originates at Jerusalem’s central station, and its final destination is Ma’ale Adumim, a town of approximately 36,000 residents 7 kilometers east of Jerusalem, on the Jerusalem-Jericho road. The line is a short intercity route, bringing passengers from various neighborhoods in Jerusalem to the neighborhoods of Ma’ale Adumim. Almost all of the bus stops are in Jerusalem or Ma’ale Adumim.

On February 6, 2002, the bus was carrying about 50 passengers, most of them residents of Ma’ale Adumim. The terrorist boarded the bus at French Hill Junction, near the north-central Jerusalem neighborhood of French Hill. The junction serves as a gateway between Jerusalem and Ma’ale Adumim and the Dead Sea. It is in a territory captured by Israel during the Six-Day War in 1967, at the boundary between Arab neighborhoods and neighborhoods inhabited by Jews. In addition, the junction is the major passage between the territories controlled by the Palestinian Authority north of Jerusalem and those controlled by it south of Jerusalem (Figure 11). This very busy intersection is therefore the most accessible corner in Jerusalem for terrorists from the West Bank territories controlled by the Palestinian Authority who are looking for a crowd of Israelis as a target.

THE SUICIDE BOMBER

The suicide bomber, a 23-year-old man from Nablus, was recruited by Hamas operative Eman Shachshir, whom he met during a pilgrimage to Mecca. During the postattack investigation, the bomber explained that he agreed to become a suicide terrorist (*shahid*, or martyr) after one of his relatives was killed in an IDF raid on a clandestine explosives workshop in Nablus.

The terrorist was prepared for his mission early in the morning on the day of the attack. He got a haircut, shaved, and put on new, stylish clothing purchased in a department store in Jerusalem to make himself look like an ordinary Israeli. He was then taken to the safe

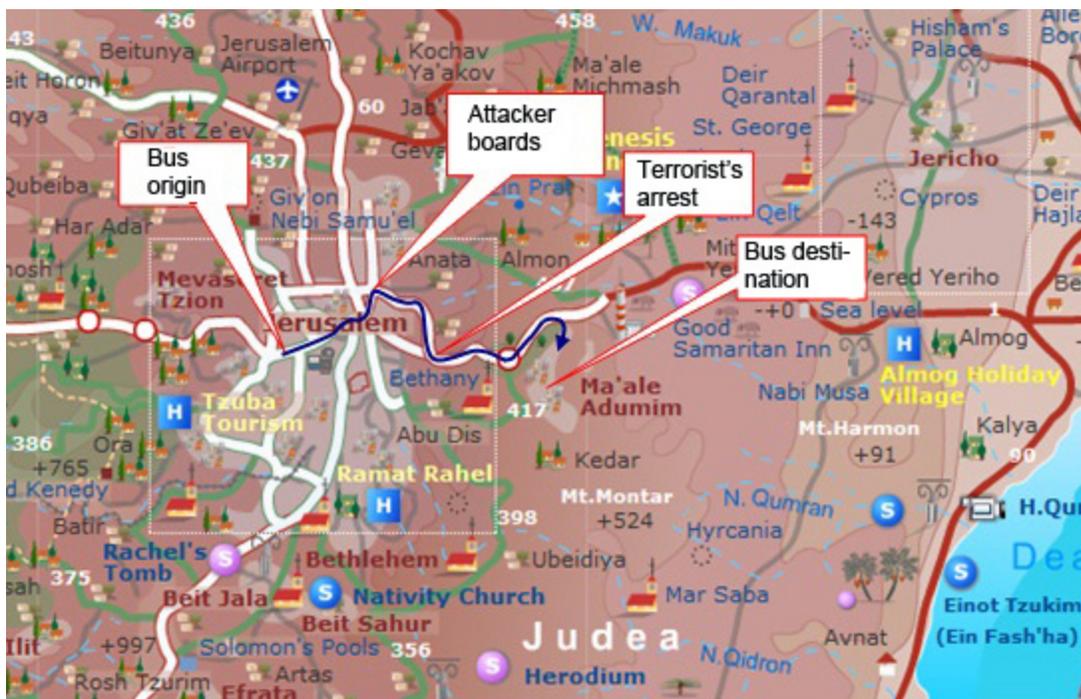


Figure 11: Bus Route and Sequence of the Case 3 Attack

house of his handler, where an explosives belt was strapped around his body, under his coat, and the initiation switch was placed in the coat pocket.

THE EXPLOSIVE DEVICE

The IED carried by the bomber contained TATP packed in nylon wrappers. The initiators were light bulbs connected to a battery pack through an electrical switch located in his coat pocket (Figure 12).

THE ATTACK

The suicide bomber was dispatched from Nablus to Jerusalem early on the morning of the attack. He was dropped at the Palestinian village of Anatot, on the eastern boundary of Jerusalem, within walking distance of the French Hill Junction. From Anatot, he walked to the bus stop. Although he was instructed to take a bus to the center of Jerusalem and wait until it became heavily loaded before detonating the IED, he mistakenly boarded an intercity bus at its last stop in Jerusalem that was headed in the opposite direction, to Maale Adummim. He chose that bus stop because he was familiar with the area and believed he could better assimilate and commingle with the many Palestinians waiting there. Although he was prepared and instructed to act as an Israeli, at “the moment of truth,” he lacked the confidence to do so.

The bus arrived at the bus stop at about 2:45 pm and stopped some distance before the bus stop. Five passengers who had been waiting there boarded the bus, and just before the driver closed the door, the terrorist arrived and boarded the bus. The bus driver did not have time to examine the terrorist before he boarded, as he was busy collecting fares



The explosive belt



The explosives



The initiation switch

Figure 12: Components of the IED

from the first three passengers. In Israel, the bus driver usually collects payment from the passengers upon boarding and starts to drive as soon as the last passenger is in and he can close the door. Consequently, at that stage, his attention is divided between driving and collecting fares, so very little attention, if any at all, is paid to examining a last-minute passenger.

Nevertheless, in his later questioning, the driver recalled noticing while the terrorist paid and waited for his change that he wore a closed long coat and kept his right hand in the pocket. The driver added that he could remember this because a boarding passenger usually uses one hand to hold a support and the other hand to pay and receive change. Even though the driver could later remember the passenger's unusual behavior, at the time, he did not suspect that he was a terrorist.

After boarding, the bomber sat in the rear of the bus, behind the rear door, although suicide bombers were usually instructed to detonate in the center of the bus to achieve maximum casualties. After a while, he moved to the front of the bus and sat in the right front seat, next to the driver. Although this cannot be verified, it is likely that he decided to move forward in order to kill the driver while the bus was moving at high speed, resulting in an accident in addition to the explosion. (At one point in the route, the road descends very sharply, and vehicles tend to develop high speed. Under such conditions the driver can



Figure 13: Conditions on the Bus Route of the Case 3 Attack

lose control and crash into the canyon (Figure 13). A bus accident in December 2008 under similar road and speed conditions caused 24 casualties and more than 30 injuries.)

At that point, the driver realized that the terrorist's coat was still closed. He questioned the young man about his destination, but the man didn't respond and his hand started moving in the coat pocket. Then the driver noticed electrical wires poking out of the coat. The bomber was wearing earphones, but the driver thought they had too many wires. The combination of the closed coat, the activity of the hand in the pocket, and the wires poking out caused the driver to become very suspicious, almost certain that the passenger was a suicide bomber.

The driver directed the passengers sitting next to the bomber to hold him and restrain his hands. He drove quickly to a nearby border police checkpoint, where he opened both doors and told the passengers to escape from the bus. The border police officers saw the bus come to a stop and saw passengers running away shouting that there was a suicide bomber in the bus. The police rushed into the bus and after a short fight, restrained, handcuffed, and arrested the bomber.

ANALYSIS AND CONCLUSIONS

1. The suspicious indicators “a passenger wearing clothes that are out of character with the environment or neighborhood, abnormal behavior, concealed objects in the hand, a clenched fist, etc.” proved effective in alerting the driver to the presence of the bomber.
2. The training of the driver on the design and wearing of suicide bomb belts and bomb vests, including the location of the initiation switch in an upper pocket, also proved effective.
3. The practice of stopping the bus at the first suitable location and evacuating the passengers while seeking law enforcement help in extremely suspicious situations was also effective.
4. The driver failed to identify suspicious factors when the terrorist boarded because he did not adhere to the established practice for “last-minute” passengers arriving from unexpected directions. His training called for him close the door in such a situation, examine the passenger, and allow him to board the bus only if he did not exhibit any suspicious indications.

CASE 4 – BAR-ILAN UNIVERSITY INTERSECTION

GENERAL DESCRIPTION

Date: October 10, 2002.

Event: The bus driver and a passenger tackled and temporarily restrained a suspected suicide bomber while he was boarding a bus near the Bar-Ilan University intersection to carry out an attack. After the bus and the area around it were evacuated, the driver and the passenger withdrew; the terrorist then recovered, ran toward the crowd, and blew himself up.

Casualties: 1 woman killed and approximately 48 people wounded.

Organization responsible: Hamas.

Suicide bomber: Rafik Muhammad 'Ali 'Abd al-Rahman Hamad.

THE OPERATIONAL ENVIRONMENT

Line 87 of DAN (known locally as “Gosh Dan”), the major bus operator in Tel Aviv area, is a short line connecting the Tel-Aviv suburb of Petach-Tikva with Shiba Hospital, the largest medical center in Israel. The route passes through two of the busiest urban and intercity roads in the heart of the largest and most populated urban area of Israel.

The line starts at the central bus station of Petach-Tikva and heads west, connecting the eastern Tel Aviv suburbs to Tel Aviv. It then turns south to Road 4, the busiest intercity road in Israel. The bus stop where the terrorist tried to board the bus serves not only the 18,000 students of the nearby Bar-Ilan University, but also residents of the nearby cities of Ramat-Gan, Bnei-Brak, and Giv'at-Shmu'el (Figure 14).

THE SUICIDE BOMBER

The suicide bomber was a resident of Qalqilya, a 31-year-old married man who had four children. He was forced to become a suicide bomber to counter suspicions of Hamas operatives that he was collaborating with Israeli authorities. He was equipped with the bomb vest and was dispatched from his home town of Qalqilya, a Palestinian town on the western boundary of the West Bank, 30 kilometers (18 miles) from the attack target.

THE EXPLOSIVE DEVICE

The IED carried by the suicide bomber was an explosive vest designed to be strapped under his shirt (Figure 15). It contained plastic high explosive, electrical detonators connected to a battery pack routed through a simple electrical switch, and 5-mm steel balls for fragmentation. It was contained in a vest consisting of several sack fabric pouches surrounding the body. The vest was kept tight against his body by a medical elastic

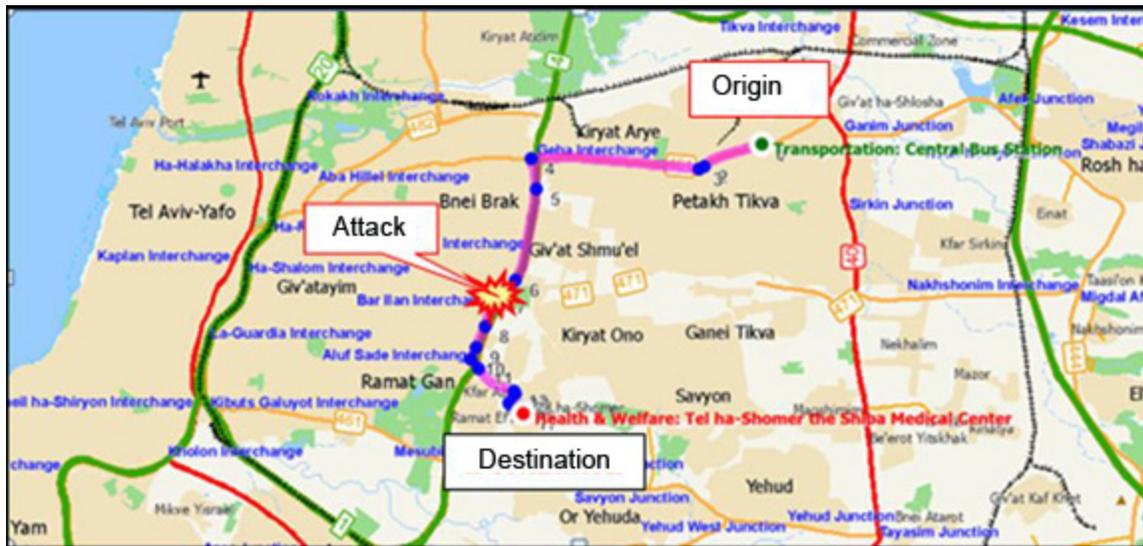


Figure 14: Bus Route and Sequence of the Case 4 Attack

bandage, probably because of its significant weight and size and also to minimize the chance that it would protrude from beneath the clothes. (The average temperature in the attack area in October is 29 C° (84 F°), so wearing a coat would be extremely unusual.)

THE ATTACK

How the suicide bomber arrived at the bus stop where he tried to board the bus is not known. However, it is certain that he did not wait at the bus stop with the other passengers who boarded the bus.

The bus stopped before reaching the bus stop, because there was another bus ahead of it (the same bus stop serves several lines). After the passengers waiting at the bus stop boarded the bus, the driver closed the front door. He then looked into the mirror at the rear door to verify that he could close it. As he was watching the last passenger disembark, he saw a man running to the bus, trying to board through the rear door. Adhering to the operational and security procedures, the driver immediately closed the rear door. Probably not expecting such a response, the terrorist could not stop in time and hit the closed door. He fell on his back, hitting his head on the ground.

The driver, having already started to drive the bus away from the stop, realized that the man had fallen and stopped the bus to find out whether he was injured and needed help. At that stage, the driver did not suspect that the man was a terrorist or that the situation was a clear security threat.

The driver and a passenger who said he was a physician rushed to the terrorist lying on the ground to examine him and to provide help if needed. Both the driver and the physician tried to speak with the man to determine whether he was hurt and how he was feeling. Although he looked conscious, the terrorist did not respond, so the driver and the physician thought that he was badly hurt and could not speak.



Remains of electric detonator (that did not explode) in plastic explosive wrapped in aluminum foil



Remains of electrical initiation switch (shown below a similar switch)



Remains of the battery pack



Fragmentation based on steel balls



Remains of carrying vest made of sack fabric



Remains of elastic bandage used to tighten vest to the body

Figure 15: Components of the IED Used in the Attack

The physician asked the driver to help him open the man's shirt so that he could examine him. As he opened the shirt, the driver observed electrical wires and then the bomb vest. Both the driver and the physician immediately recognized the bomb vest and realized that the man was a suicide bomber. The physician told the driver to hold and restrain one of the

terrorist's hands while he held and restrained the other to prevent him from reaching the initiation switch. The driver then shouted to the passengers that the man was a suicide bomber and told them to immediately evacuate the area.

After the area was evacuated and the suicide bomber started to recover, he began to struggle to be released. The driver said that the bomber was "as strong as a horse," and he was concerned that they would not be able to continue to restrain him. The physician and driver signaled each other to release the bomber's hands and run to a safe distance. They both shouted to the crowd to keep away.

The bomber soon stood up and started to run toward the crowd. Shortly afterwards, he detonated the IED, and the very powerful explosion killed one woman and injured 48 people. Fortunately, most of the injuries were not serious. Figures 16 and 17 show the location of the bus and the detonation.

ANALYSIS AND CONCLUSIONS

1. The driver's training on common designs of suicide bomb belts and vests and how they are worn proved effective in this case.
2. The tactical training on techniques of preventing people from boarding the bus through the rear door was not relevant in this case, as it did not enable the driver to examine the boarding passengers. However, the unusual way the terrorist tried to board the bus should have made the driver suspicious.

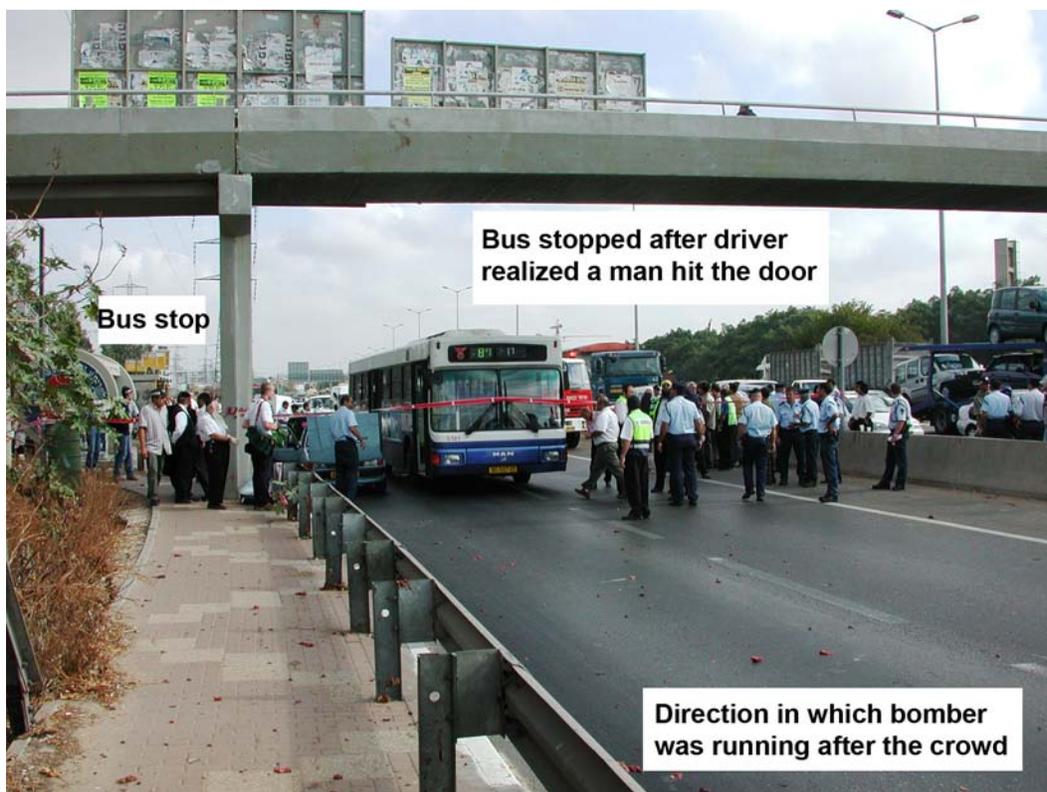


Figure 16: Location of the Bus at the Time of the Attack



Figure 17: Location of the Detonation

3. The practice of evacuating the passengers while seeking law enforcement help in extremely suspicious situations was effective in this case.
4. The security awareness, dedication, determination, and bravery of the driver clearly saved the lives of most of the bus passengers.

CASE 5 – IDF BASE NO. 80

GENERAL DESCRIPTION

Date: November 29, 2001.

Event: A suicide bomber boarded an intercity line bus at a bus stop next to the town of Umm al-Fahm and blew himself up in the center of the bus as it was passing IDF base No. 80.

Casualties: 3 persons killed and 8 wounded.

Organization responsible: The Palestinian Islamic Jihad (PIJ).

Suicide bomber: Samer 'Amer Ahmed As'ad.

THE OPERATIONAL ENVIRONMENT

Line 823 of EGGED, the major intercity bus operator in Israel, originates in the city of Nazareth, and its final destination is Tel Aviv's central station. The route is about 120 kilometers long and the journey typically takes 3 hours and 45 minutes. The line passes through a variety of geographical and population areas. It starts in downtown Nazareth near the Church of the Annunciation and St. Gabriel's Church and heads toward Tel Aviv. A significant portion of the route passes through towns and villages populated predominantly by Arab citizens of Israel.

The terrorist boarded at a bus stop at the Umm al-Fahm intersection in the heart of an area known as Wadi Ara or Nahal Iron. The intersection is only 3 kilometers from the West Bank area controlled by the Palestinian Authority. The suicide bomber blew himself up in an agricultural area populated primarily by Jewish farmers, near IDF base No. 80, which is used for basic training of new recruits, mainly women soldiers.

On November 29, 2001, the bus was carrying about 30 passengers, many of them residents of the towns and villages along the bus route (Figure 18).

THE SUICIDE BOMBER

The suicide bomber was a 20-year-old man from a village near the city of Jenin. He was recruited on the basis of his religious beliefs, which were used in indoctrination rituals. He was single and had a partial high school education. He was driven by car to the bus stop at which he boarded the bus.

The bomber was told by his handlers that the bus reached its maximum passenger load upon arrival at Tel Aviv. The PIJ had collected this information prior to the attack. The bomber was instructed to explode the bomb there to achieve maximal casualties and publicity.

ANALYSIS AND CONCLUSIONS

1. The suspicious indicator “a passenger wearing clothes that are out of character with the environment or neighborhood” should have alerted the driver when he first saw the bomber at the bus stop; the procedure would have been effective if followed.
2. The payment with a bill that was disproportional to the fare and the fact the passenger did not wait for his change should also have alerted the driver.
3. Although the terrorist was instructed to detonate the IED upon arrival at Tel Aviv, he did so several minutes after boarding, when the bus was fairly empty. The most probable explanation is that he misinterpreted the driver’s call for the change and was concerned that if he returned, the driver would become suspicious. It should be noted that a suicide bomber acts under incredible pressure, and any interaction with authority figures may have a great mental impact and can disrupt the bomber’s plans.

CASE 6 – HAIFA, LINE 16 BUS

GENERAL DESCRIPTION

Date: December 2, 2001.

Event: A suicide bomber blew himself up inside a bus on Yad Labanim Street in the city of Haifa.

Casualties: 15 persons killed and 35 wounded.

Organization responsible: Hamas.

Suicide bomber: Maher Muhi al-Din Kamal Hebeshah.

THE OPERATIONAL ENVIRONMENT

Line 16 of EGGED, the major bus operator in the Haifa area (at the time), is a busy urban line connecting neighborhoods on Mount Carmel with downtown Haifa. The bus route passes through some of the busiest roads in Haifa (Figure 19). The bus stop where the terrorist boarded the bus is in a neighborhood populated by a mixture of Jewish and Arab Israeli citizens. At the time of the explosion, the bus was fully loaded with sitting and standing passengers.

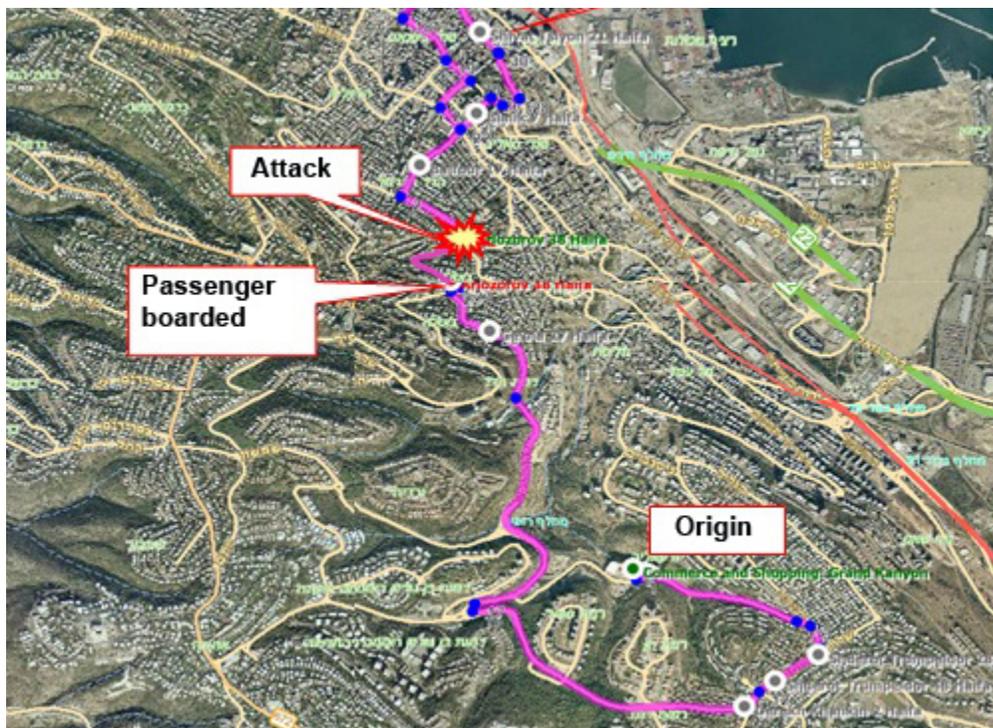


Figure 19: Bus Route and Sequence of the Case 6 Attack

THE SUICIDE BOMBER

Maher Muhi al-Din Kamal Hebesha, a single, 20-year-old man, was a resident of Nablus. He was recruited by a senior Hamas operative during his activity in a charity society in Nablus that served as a cover for the Hamas network in the West Bank. On the morning of the attack, the bomber got a haircut, shaved his beard, and had his picture taken (Figure 20).



Figure 20: The Suicide Bomber, Maher Muhi al-Din Kamal Hebesha

THE EXPLOSIVE DEVICE

The suicide bomber carried an IED in an explosive vest or belt structure strapped under his coat. The IED consisted of about 10 kilograms of TATP in plastic cylinders and improvised initiators made of flash bulbs connected to a battery pack through a simple electrical switch. Screws and nails were used as fragmentation materials (Figure 21). The vest was made of cotton fabric of an unknown source.



Bomb vest manufactured by the same clandestine workshop that provided the explosive vest for the attack



Nails used for fragmentation

Figure 21: Components of an IED Similar to the One Used in the Attack

THE ATTACK

The bus arrived at the bus station where the suicide bomber boarded around noon. The station serves other bus lines and was crowded with boarding and disembarking passengers and pedestrians. How the suicide bomber arrived at the station is not known. None of the passengers who were waiting at the station could remember the suicide bomber while waiting for the bus. Whether the bomber did not wait at the bus station or whether he just did not draw any attention cannot be determined.

When the bus stopped at the station, many passengers disembarked and several passengers boarded. The driver did not suspect that the attacker was a suicide bomber before he boarded, and the first significant eye contact was established only when the bomber paid the driver the fare. At that stage, the bus was already on the move, and the driver was concentrating on driving the bus through the heavy traffic.

The bomber moved toward the back of the bus without waiting for his change. The driver then became suspicious and called out to him to collect his change, with the intention of using this opportunity for security questioning.

The suicide bomber, standing with his back to the driver, did not realize that the driver was calling him, or he intentionally ignored the call. Nearby passengers drew the bomber's attention to the driver, and when he realized that the driver was calling him repeatedly, he detonated the bomb (Figures 22 and 23).



Figure 22: The Bus After the Attack



Figure 23: Front View of the Bus Showing the Blast Effect at the Bomber's Location

Fifteen passengers were killed instantly, and another 30 were injured, many of them gravely, including the driver. The bus caught fire as a result of the explosion and kept moving down a descending road without the driver in control. It crossed a traffic separation island and moved into the opposite lane, stopping only after hitting a building fence shortly before a busy road junction.

ANALYSIS AND CONCLUSIONS

1. The suspicious indicator “a passenger wearing clothes that are out of character with the environment or neighborhood” should have alerted the driver at his first examination of the passenger at the bus stop.
2. However, the driver's ability to examine a passenger's appearance and behavior before he boards at crowded bus stations or stops that are congested with passengers and passersby is very limited and therefore not effective.
3. At highly crowded bus stations or stops, a terrorist can more easily assimilate in the crowd without drawing the attention of the driver or other passengers. When the threat level is high, authorities should consider deploying security guards or law enforcement officers to patrol such areas at rush hours.

4. The terrorist detonated the bomb shortly after boarding the bus, responding to the bus driver's call to collect his change. It can be assumed that the terrorist was instructed to detonate the explosive device later, after the bus had collected more passengers and was approaching the city center. It can also be inferred that although the terrorist could withstand the pressure of getting to the target with a bomb vest and boarding the bus without expressing visibly abnormal behavior, he could not deal with the pressure of a direct interaction with the driver.
5. The suicide bomber's not stopping to receive his change should have raised the driver's suspicions. Though recognition at this stage could have been too late to avoid the attack, it could have had a significant mitigation effect.

CASE 7 – JERUSALEM, LINE 19 BUS

GENERAL DESCRIPTION

Date: January 29, 2004.

Event: A suicide bomber detonated a large explosive device on a Line 19 bus in the center of Jerusalem.

Casualties: 11 persons killed and 44 wounded.

Organization responsible: Fatah's Al-Aqsa Martyrs Brigades.

Suicide bomber: Ali Munir Yussuf Jaarah.

THE OPERATIONAL ENVIRONMENT

Line 19 of EGGED, the major public bus operator in Jerusalem, is a busy line connecting two major medical centers in Jerusalem, the first at the northeast edge of Jerusalem on Mt. Scopus and the second at the southwest edge of the city. In addition to the medical centers, there are university campuses at both locations. The route of Line 19 crosses Jerusalem almost from end to end. The buses usually reach their maximum load capacity upon arrival at the center of the city.

Line 19 originates at Mount Scopus, collecting passengers from the medical center and from the university; it passes through the neighborhoods in the north of Jerusalem that are populated predominantly by Arab citizens of Israel, then enters the city center. It passes through the western neighborhoods and ends at Hadassah University Medical Center in Kiryat-Yovel (Figure 24).

The terrorist boarded a bus stop at Gaza Street in the center of Jerusalem, a short distance from the Prime Minister's formal residence.

THE SUICIDE BOMBER

The suicide bomber, Ali Munir Yussuf Jaarah, was a mentally depressed 25-year-old resident of Bethlehem (Figure 25). He was a dispatcher in the police department of the Bethlehem Governorate of the Palestinian National Authority and therefore had free access to Jerusalem. His recruiters, senior operatives from the Al-Aqsa Martyrs Brigades, also had free access, as one was a legal counsel and the other was a communications system operator at the Governorate.

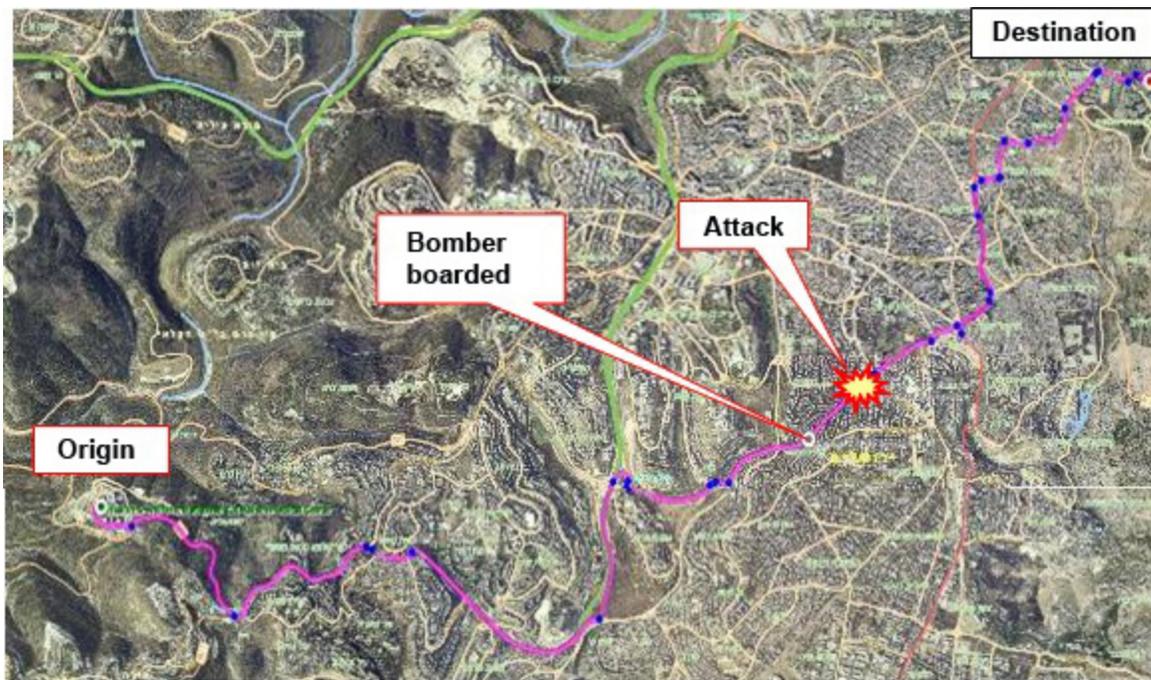


Figure 24: Bus Route and Sequence of the Case 7 Attack



Figure 25: The Suicide Bomber, Ali Munir Yussuf Jaarah

The recruiters drove the suicide bomber by car to the bus stop at which he boarded the bus. He was instructed to detonate the IED he carried when the bus became heavily loaded with passengers.

THE EXPLOSIVE DEVICE

The IED consisted of about 6 kilograms of TATP contained in plastic beverage bottles. The initiators were probably flashlight bulbs connected to a D battery pack, with an electrical switch located probably in an external compartment of the bag. Pieces of cut construction iron 6 mm in diameter and 25 mm long were included as fragmentation. The IED was contained in a school backpack (Figure 26).

THE ATTACK

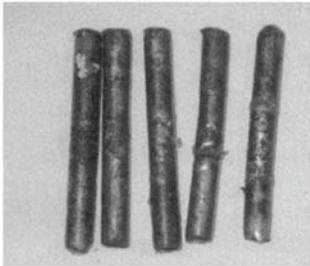
The suicide bomber boarded the bus at about 8:40 am. After boarding, the bomber moved toward the back of the bus and stood in the center, near the rear door. After the bus left



Structure of IED concealed in a school backpack



A similar bag



Pieces of cut construction iron used as fragmentation



Electrical switch

Figure 26: Components of an IED of the Type Used in the Attack

the second stop, he detonated the bomb while standing (Figures 27 and 28). The driver, Shalom Zaken, who was seriously injured by the explosion, later could not remember the suicide bomber (even when he was presented with his photograph), nor could he remember any suspicious passenger or event.

ANALYSIS AND CONCLUSIONS

1. The suspicious indicator “a passenger wearing clothes that are out of character with the environment or neighborhood” should have alerted the driver when he first saw the bomber at the bus stop. A 25-year-old man carrying a school backpack meets the definition of the suspicious indicator “carrying a suitcase, shoulder bag, or backpack which seems out of place with environment.”

- No information about the suicide bomber's behavior is available, as none of the passengers seated or standing next to him survived the explosion.

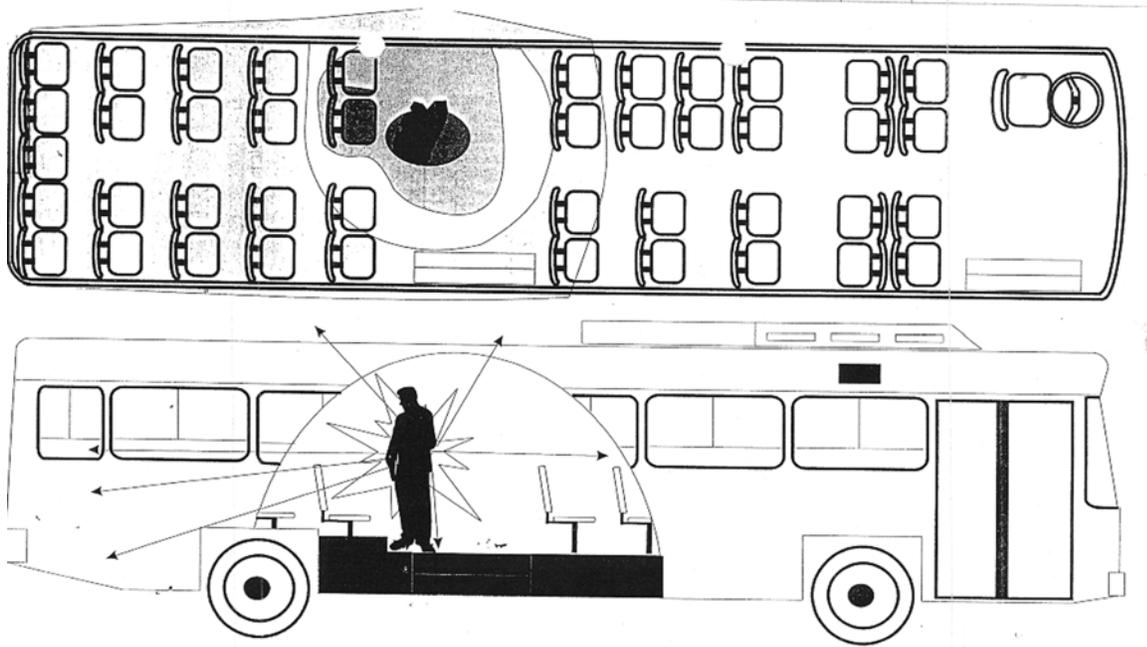


Figure 27: Location of the Suicide Bomber at the Time of Detonation



Figure 28: Blast Effect on the Bus

CASE 8 – JERUSALEM CLAL CENTER, LINE 14 BUS

GENERAL DESCRIPTION

Date: June 11, 2003.

Event: A suicide bomber disguised as an ultra-Orthodox Jew detonated a bomb on a Number 14 bus near the Clal Center in Jerusalem.

Casualties: 17 persons killed and 104 wounded.

Organization responsible: Hamas.

Suicide bomber: Abd al-Mu'ti Muhammad Salih Muhammad Shabaana Tamimi.

THE OPERATIONAL ENVIRONMENT

Line 14 of EGGED, the major public bus operator in Jerusalem, is a busy line connecting the southeastern bus terminal of Talpiot in Jerusalem with Beit HaKerem, an upscale neighborhood in the southwest part of the city. The route passes through the city center, including Jaffa Street and the central bus station.

The terrorist boarded the bus at the Davidka Square bus stop, in the center of downtown Jerusalem. The bus stop is located next to several of the major neighborhoods in Jerusalem populated by ultra-Orthodox Jews (Figure 29). The bus stops and buses in this area are typically very crowded, particularly in the afternoon rush hours when people return from the center of the city to the suburbs.

THE SUICIDE BOMBER

The suicide bomber, Abd al-Mu'ti Muhammad Salih Muhammad Shabaana Tamimi, was an 18-year-old high school student from Hebron (Figure 30). He arrived from Hebron at Abu Dis, a village due east of the Jerusalem municipal border, and was picked up by Samer Atarash, a Hamas operative, who took him to his house in A-Ram, a Palestinian neighborhood on the northern outskirts of East Jerusalem. At his home, Atarash provided the bomber with an explosive vest and trained him on its operation. The bomber slept overnight at Atarash's home, where he got a haircut and a bath. Early in the morning, he received new clothing of the type typically worn by ultra-Orthodox Jews, including black pants, a white shirt, a skullcap, and the ritual tasseled upper undergarment worn by Jewish males as part of the Jewish dress code. However, he kept his sneakers, which ultra-Orthodox Jews never wear.



Figure 29: Street Typical of the One Where the Suicide Bomber Boarded the Bus



Figure 30: The Suicide Bomber, Abd al-Mu'ti Muhammad Salih Muhammad Shabaana Tamimi

THE EXPLOSIVE DEVICE

The IED was an explosive vest strapped under the suicide bomber's shirt. It contained TATP in metallic cylinders (common 2-inch steel water pipe). The initiators were light bulbs connected to a battery pack controlled by an electrical switch. When the bomb vest was placed under the bomber's shirt, it protruded from beneath the shirt. Consequently, it was moved to a school backpack.

THE ATTACK

Because of two terrorist attacks in May 2003,² special security awareness training was prepared and delivered to bus drivers and security officers of the bus protection guard force. The training described the terrorists' new modus operandi and past incidents and provided details and photographs of the specific patterns and details of Jewish ultra-Orthodox dress codes (Figures 31 and 32).

Round black hat

Black skullcap

Beard and “ear-locks” (never shaved)

Long coat without belt

Long black socks

Black shoes



Fur hat worn only on Saturdays and holidays

Long pants always worn with velvet hat



Short jacket always worn with Borsalino hat and long regular pants

Figure 31: Training Slide Showing Jewish Ultra-Orthodox Dress Code



Figure 32: Illustration of “Out of Code” Dress

On June 11, 2003, Samer Atarash drove the suicide bomber in his car to the Mahane Yehuda open market, which is a short walking distance from the station at which the bomber was directed to board the bus. He was not instructed to board a specific line but instead was told to choose a bus stop that looked crowded.

At around 5:30 pm, the bomber, dressed as an ultra-Orthodox Jew, boarded bus No. 14A at the market. The bus stop was very crowded, and about 15 passengers boarded the bus. Due to traffic congestion, the driver could not stop the bus ahead of the bus stop to be able to examine the waiting passengers.

Although the suicide bomber was wearing *colored* sneakers—which ultra-Orthodox Jews never wear—this was not observed by the driver or by the other passengers. It is not known whether the bomber waited for the bus at the bus stop or somewhere nearby, as most of the passengers who boarded the bus at the same stop did not survive.

As the bus drove down Jaffa Road near the Clal Center, the terrorist detonated his bomb, destroying the bus and killing 17 passengers (Figure 33). More than 100 people were wounded, including dozens of passersby. Hamas claimed responsibility for the attack.



Figure 33: The Demolished Bus

ANALYSIS AND CONCLUSIONS

1. Because of the short period of time between the earlier attacks by terrorists disguised as ultra-Orthodox Jews and this attack, not all the bus drivers were able to be personally and fully briefed. However, the issuance of an alert to all bus drivers and the publicity the attacks received in the media should have made the driver aware of this mode of attack, even though he had not been briefed.
2. The suspicious indicator “a passenger wearing clothes that are out of character with the environment or neighborhood” might have alerted the driver had he been able to stop the bus before the bus stop, i.e., he could have noticed the unusual colored sneakers. But that security procedure is not always practical, especially in congested urban areas.
3. No information is available about the suicide bomber’s behavior, since none of the passengers seated or standing next to him survived.
4. Following the attack, a wide campaign was launched to increase public awareness. The ultra-Orthodox community took the initiative to instruct its residents to look around and identify those who “do not belong.” Motorcyclists of the ultra-Orthodox volunteer first aid organizations such as Hatzalah (Figure 34) were instructed to patrol the main roads of Jerusalem to identify terrorists disguised as ultra-Orthodox Jews.



Figure 34: Ultra-Orthodox Hatzalah Motorcyclists

5. This was the last attack in which terrorists disguised themselves as ultra-Orthodox Jews. In the short term, this can be explained by the exposure and arrest of the Hamas cell and infrastructure in Jerusalem. But in the longer term, it can be explained only by the aggressive awareness campaign that included thorough briefings of bus drivers, the bus security guard force, the involvement of the Jewish ultra-Orthodox community, and wide media publicity. This case shows the effectiveness of expanding security awareness beyond law enforcement, security, and professional circles to communities and to the general public.

CASE 9 – DUAL BUS ATTACKS IN BEERSHEBA

GENERAL DESCRIPTION

Date: August 31, 2004.

Event: Near-simultaneous suicide bombings on two buses in the city of Beersheba.

Casualties: 16 persons killed and more than 100 wounded.

Organization responsible: Hamas.

Suicide bombers: Nassim Muhammad Ali Abd al-Ghani Jabari and Ahmed Abu al-Afu Abd al-Fatah Qawasmeh.

THE OPERATIONAL ENVIRONMENT

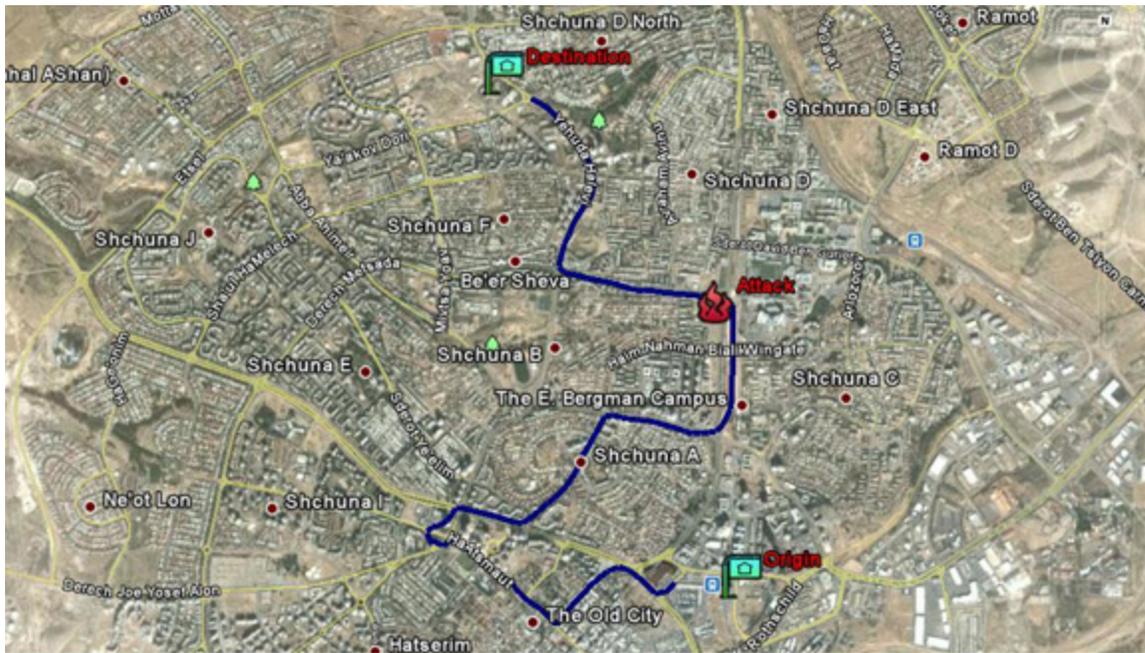
The attacks took place on two of the busiest bus lines in Beersheba, Lines 12 and 7. Both lines originate from the central bus station and cross the city center from south to north (Figure 35). Both lines serve passengers traveling to the major city institutes, including the municipality building, the University of the Negev, and the Soroka Medical Center. Both explosions took place next to the city hall, on Reger Avenue, the major street crossing the city center.

THE SUICIDE BOMBERS

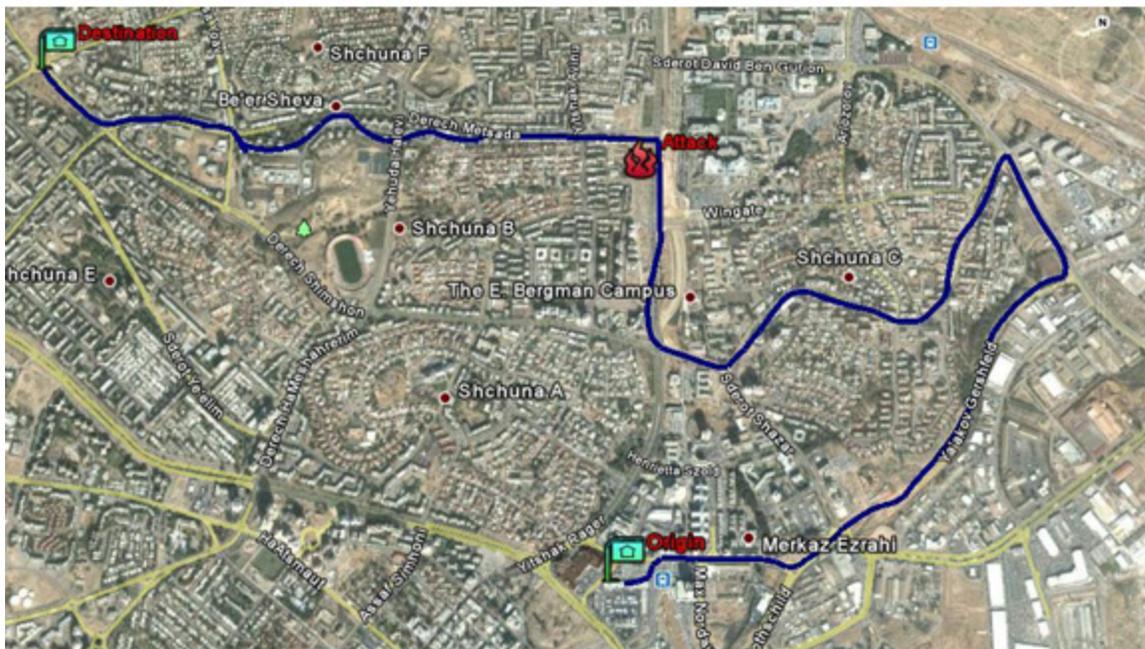
The bombers were both residents of Hebron, 22-year-old Nassim Muhammad Ali Abd al-Ghani Ja'bari and 29-year-old Ahmed Abu al-Afu Abd al-Fatah Qawasmeh (Figure 36). They had been personally recruited by Mus'ab Hashlamun, the head of Hamas in northern Hebron.

The operation was planned and controlled by Eimad Qawasmeh, the head of Hamas in Hebron and the uncle of one of the two bombers. Eimad Qawasmeh was responsible for many lethal terrorist attacks against Israeli citizens. He was eventually located by the Israeli Security Agency at a safe house in the heart of Hebron's Casbah on October 12, 2004. He surrendered to IDF Special Forces that engaged the house and arrested him (Figure 37). He was later sentenced to 16 life sentences.

His nephew, one of the suicide bombers, went to work in Beersheba several times with his brother to become acquainted with the area and to choose the best location for the attack. The preparation of explosive belts was completed two days before the attack. The belts had been concealed inside plaster picture frames to avoid being uncovered during the bombers' ride to Beersheba in a vehicle transporting illegal Palestinian workers into Israel.



Line 12



Line 7

Figure 35: Bus Routes and Sequences of the Case 9 Attacks



Figure 36: The Suicide Bombers: Ahmed Abu al-Afu Abd al-Fatah Qawasmeh (left) and Nassim Muhammad Ali Abd al-Ghani Jabari (right)



Figure 37: The Arrest of Eimad Qawasmeh

THE EXPLOSIVE DEVICE

The IEDs were explosive vests strapped under the bombers' shirts. They each contained about 5 kilograms of urea nitrate and nitroglycerin placed in metallic cylinders (common 2-inch steel water pipe). The initiators were light bulbs connected to battery packs controlled by electrical switches. In addition to the explosives, metallic "confetti" made of nails, screws, and iron pieces packed in nylon bags surrounded the pipes.

THE ATTACK

The two suicide bombers were dropped off at an open area south of the central bus station where illegal Palestinian workers wait for employers. Where the suicide bombers **actually** boarded the buses is not known. Both drivers reported that they did not notice any unusual or suspicious passengers.

It should be noted that these were the first attacks in Beersheba and in the southern region of Israel. The Hamas terror cell of Hebron previously focused on targets in Jerusalem and the Judea area in Joda (the official Israeli term for the territory known outside Israel as the southern part of the West Bank). A security fence built at the time around Jerusalem and tight security measures at the entrances to the Israeli settlements in the Hebron area had forced terrorists to redirect attacks to areas south of the West Bank.

The bombers detonated their IEDs within about 1 minute of each other, approximately 100 meters apart, each on a bus going in the same direction, from south to north, on Reger Avenue.

The bomber on the Number 7 bus detonated his device at about 2:50 pm (Figure 38).

Jacob Cohen, the driver of the Number 12 bus, heard the explosion and saw fire coming from the Number 7 bus, which was ahead of him. He immediately understood that he was witnessing a suicide attack and decided to evacuate his bus. He told a reporter from the Israeli newspaper *Marriv*, “I was waiting for the green light at a junction, and I heard an explosion. I understood that it was the second bus that just passed me and that it might be a suicide attack. I immediately stopped, opened the doors, and shouted to the passengers to evacuate the bus. Ten to 15 passengers disembarked, when I suddenly heard more explosions behind me. I felt like my back was burning. I turned back and saw horror, with bodies everywhere in the bus.”



Figure 38: The First Bus to Explode (Number 7)

The terrorist, standing in the center of the second bus, had detonated his device, killing six passengers and wounding dozens (Figure 39).

According to the formal police assessment, the evacuation of the second bus saved more than 10 lives.

It can be assumed that the terrorists were instructed to detonate the second device only after passersby and first responders had arrived and accumulated in the area of the first explosion. The intuitive decision of the driver to evacuate the bus probably surprised the second terrorist and prompted him to detonate his device earlier than originally planned.



Figure 39: The Second Bus to Explode (Number 12)

ANALYSIS AND CONCLUSIONS

1. The intuitive decision of the driver to evacuate passengers on the Number 12 bus was definitely effective in reducing the number of casualties.
2. In a series of attacks from 2002 to 2004, terrorist organizations tried to repeat the success they had had with one of the first suicide attacks within the Israeli territory on January 22, 1995 (many similar attacks had been made against the Israeli army in Lebanon). That attack, known as the Beit Lid massacre, was a double suicide bombing by Palestinian Islamic Jihad at the Beit-Lid Junction in the center of Israel. It was one of its bloodiest attacks, killing 21 and wounding 69. Also, on July 17, 2002, two suicide bombers blew themselves up in the Neveh Sha'anani pedestrian mall in Tel Aviv. Then, on January 5, 2003, two suicide bombers blew themselves up in the old central bus

station in Tel Aviv (which no longer functions as a public transportation facility). On April 30, 2003, two suicide bombers (UK citizens) planned to blow up a popular bar on Tel Aviv's beach; one succeeded, and the other escaped, ran into the sea, and drowned. Finally, on March 14, 2004, two suicide bombers blew themselves up in the Ashdod Port.

3. In all of these attacks, the two suicide bombers detonated almost at the same time, so the attacks did not achieve the number of casualties they would have if the second bomber had waited until passersby and first responders arrived to provide help. The modus operandi of the dual suicide attacks is particularly attractive in Israel, where people typically rush to help. It is likely that the second terrorists could not withstand the pressure of waiting after seeing or hearing the first explosion.
4. Evacuating the bus should become a recommended practice where a nearby explosion is heard or seen that might be a terrorist attack.

CASE 10 – BEERSHEBA, CENTRAL BUS STATION

GENERAL DESCRIPTION

Date: August 28, 2005.

Event: A suicide bomber blew himself up outside Beersheba's central bus station.

Casualties: 40 persons wounded.

Organization responsible: Hamas.

Suicide bomber: Abd al-Rahman Qaisiya.

THE OPERATIONAL ENVIRONMENT

Beersheba's central bus station is an old complex consisting of several separated buildings containing a mixture of commercial and transportation facilities. Two single-floor L-shaped buildings constitute the major operational and commercial portion of the station. The platforms for the intercity lines are located in the internal space of the station; the domestic-lines bus stops are located outside the station.

There are three main pedestrian gates to the station and two vehicle entrances for the buses. All the gates and entrances are controlled by security guards (Figure 40).

To protect people outside the station, two security guards patrol, one along the northern building and the other along the eastern building, where the local bus stops are located.

THE SUICIDE BOMBER

The suicide bomber, Abd al-Rahman Qaisiya, came from Al-Dhahiriya, a small town south of Hebron. He became a target for recruiting because he worked for a few years for a construction contractor in Beersheba and was therefore familiar with the target area, and also because of his "Israeli look" (Figure 41).

THE ATTACK

On the morning of the attack, the bomber took a bath, received a haircut, and did his hair with gel. He dressed in new, fashionable clothing—a colored jacket, jeans, and a dress shirt. He carried a blue rucksack containing an IED on his back and a nylon bag in his left hand.

Early in the morning, he arrived at Beersheba in a vehicle transporting illegal Palestinian workers into Israel. He was dropped at an open parking area about 70 meters south of the central bus station (point A in Figure 42).

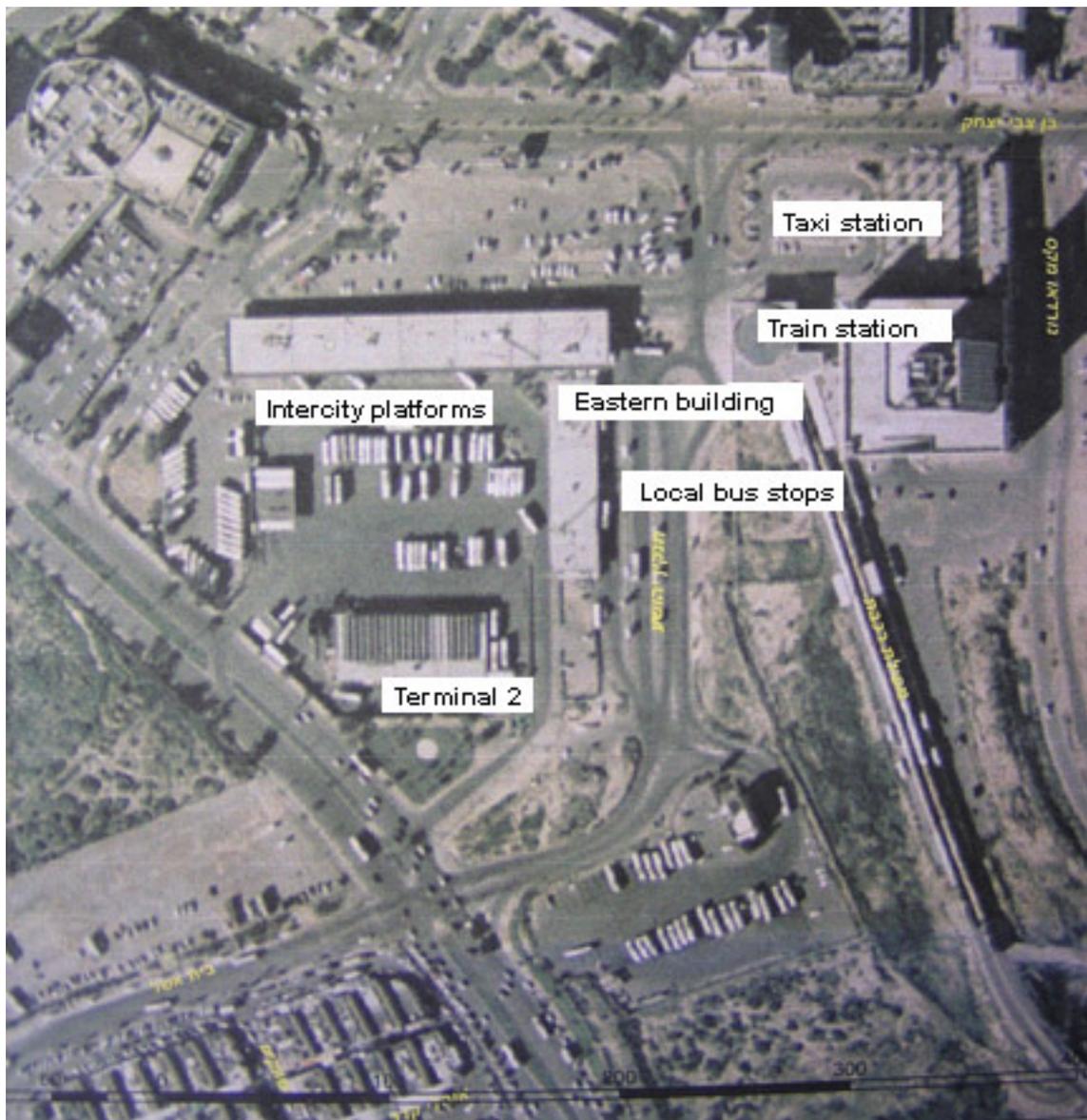


Figure 40: Beersheba Central Bus Station



Figure 41: The Suicide Bomber, Abd al-Rahman Qaisiya

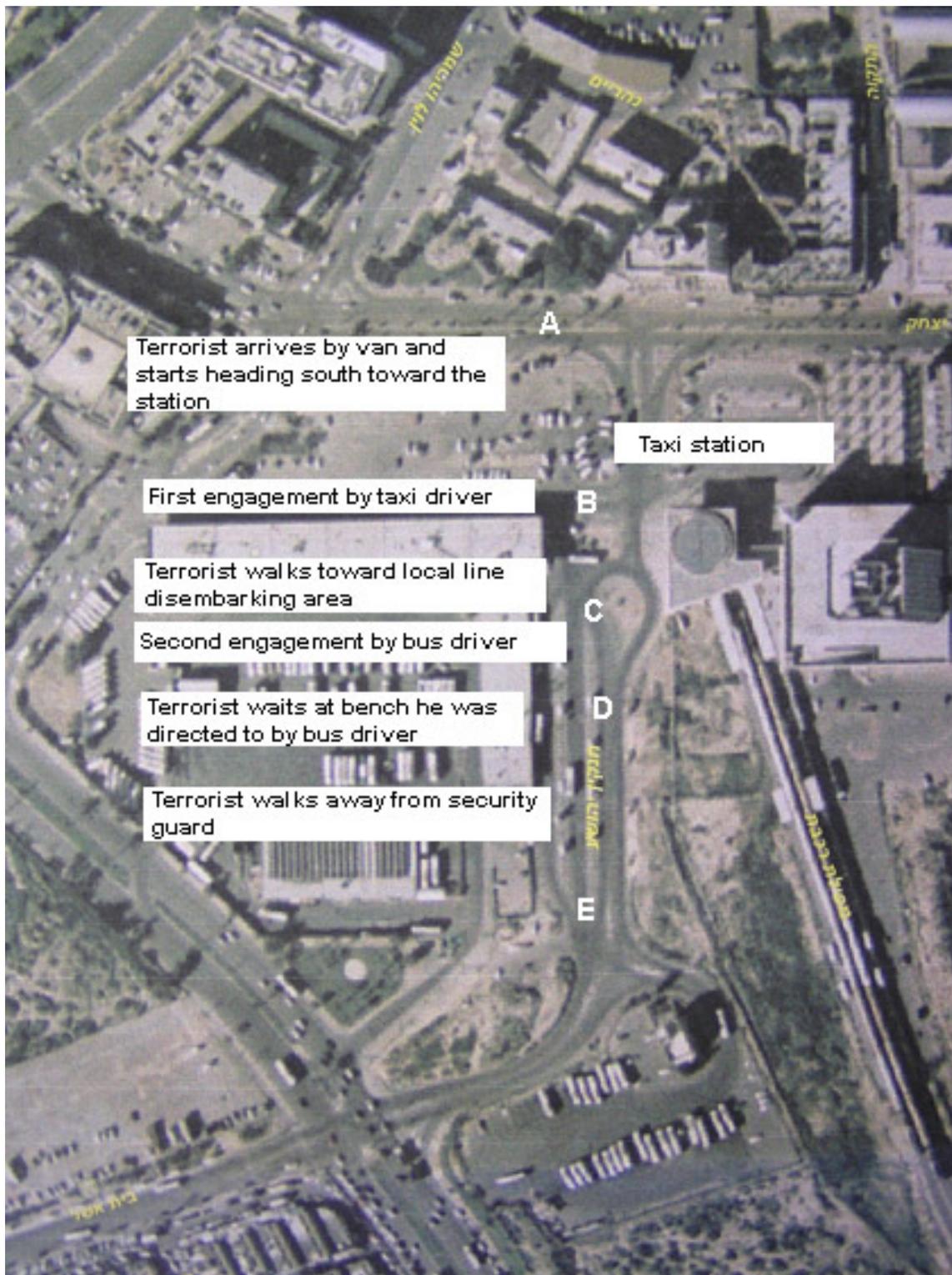


Figure 42: Sequence of the Case 10 Attack

At about 8:20 am, a taxi driver observed the bomber arriving at the station area and heading south toward the local disembarking area (point B). The taxi driver asked the suicide bomber whether he was looking for a ride to Eilat. The bomber nodded negatively and rushed forward.

Upon arriving at the disembarking area (point C), a bus driver, Nisim Horesh, who had just finished offloading his passengers, observed the suicide bomber approaching the area from the north. The suicide bomber caught his attention because of several suspicious indicators: His clothing was unusual; sophisticated sport clothing would be worn by youth in Beersheba for a Saturday evening party but not for a morning bus trip to work or school. He was also breathing heavily, looked to be under pressure, and appeared anxious.

Although the bus driver was not actively picking up or unloading passengers, when security procedures would require him to examine passengers waiting at a bus stop before they boarded his bus, he still exercised a high level of security awareness and decided to question the suicide bomber. He called to him and asked him for his destination. The suicide bomber responded, "To the hospital." The driver recognized an Arabic accent and the high level of tension in the bomber's voice. Increasingly suspicious, he told the terrorist to wait on a bench next to the Number 12 line bus stop (point D in Figure 40), an area that was relatively unoccupied, and immediately called the police, using his cellular phone. As he was calling, he saw a security guard passing by his bus. He called out to the security guard and told him about his suspicions, pointing to the terrorist sitting on the bench (Figure 43).

The security guard started to walk toward the bomber and reported on his radio that he was approaching a potential suspect for a security check. He realized that the suspect was alternately standing up and sitting down.



Figure 43: The Scene of the Attack

When the terrorist realized that the security guard was approaching him, he started to walk away, southward, toward the bus entrance to the station (Figure 44).

The security guard became concerned that the suspect might enter the main station, so he radioed the security guard positioned at Terminal 2 (south of the bus entry road) and told him to move north and block the suspect.

The second guard took a shortcut via a service gate to the parking area between the main terminal and terminal 2, and as he walked out the gate he realized the suspect was walking toward him.

At that point the first security guard decided to physically engage the suspect and restrain him, so if he actually was a suicide bomber, he would not be able to operate his explosive device.

The first security guard radioed the second security guard and told him to engage the suspect on his left side and restrain his left hand, while he restrained his right hand.

The security guards acted almost simultaneously, but while the first security guard reached the terrorist and grabbed his right hand, the second guard had just arrived when the bomb exploded (Figure 45). Both security guards were severely wounded, but they survived. Another 38 people were slightly wounded, most of them suffering from anxiety.



Figure 44: Bomber's Route After Being Identified



Figure 45: The Scene After the Attack

ANALYSIS AND CONCLUSIONS

1. The suspicious indicator “a passenger wearing clothes that are out of character with the environment or neighborhood” alerted the driver at a glance when the terrorist passed by his bus.
2. The driver’s level of security awareness must have been very high, since he noted the suspicious indicator even though the terrorist was only passing by his bus.
3. The driver’s high level of security awareness was evidenced again when he decided to further examine the terrorist.
4. The next suspicious indicator, “appearing nervous, tense or agitated,” also proved effective.
5. The verbal interaction of the taxi driver and then of the bus driver increased the bomber’s tension and anxiety and caused him to lose confidence.
6. The security awareness training of the driver, combined with his personal dedication and determination, was the major factor mitigating the casualty toll of the attack. Explosive devices similar to the one used in this attack have achieved an average of 5 to 10 deaths and 20 to 50 wounded passengers.

7. The security guards showed determination, bravery, and professional tactical skill in diverting the suicide bomber to an open, vacant area. Nevertheless, the final engagement tactic was not in line with their training. They could have deployed a standoff suspect detention procedure, using their weapons to threaten the suspect. This could have avoided the severe wounds they suffered.

8. It is important to note, however, that the reactions to several cases during 2003 and 2004 in which security guards deployed the standoff suspect detention procedure were found by the police in retrospect to be unjustified. This could have deterred the security guards from using the procedure in this case. In Israel, every time a security guard pulls a weapon on a citizen (even without actually shooting), a formal police investigation is launched. In such situations, when it becomes clear afterward that the suspect was not a terrorist, the security guard is often accused of using excessive power, even if he had good reason to suspect the person.

CASE 11 – TEL AVIV, CENTRAL BUS STATION

GENERAL DESCRIPTION

Date: August 3, 2001.

Event: Security guards thwarted an attempt by a female terrorist to leave an explosive device in a crowded area within the Tel Aviv central bus station or on a bus departing from the station and to detonate it after a time delay.

Casualties: None.

Organization responsible: Fatah.

Suicide bomber: Iman Razawi.

THE OPERATIONAL ENVIRONMENT

The Tel Aviv central bus station, known as the new central bus station, is the main bus station of Tel Aviv. The station serves all public bus operators with routes within the Tel Aviv metropolitan area and its suburbs, intercity bus routes, and routes serving most locations in Israel. The station has 230,000 square meters of space and a total area of 44 dunams (44,000 square meters). It is officially the world's largest bus station (although only three of its seven floors are used for transportation), and it contains a shopping mall with more than 1,000 shops and restaurants, along with the bus terminal (Figure 46). The station is located near Tel Aviv HaHagana Railway Station, but there is no direct link between the two stations.

Each day, more than 150,000 people and 5,000 buses pass through the bus station complex. During peak hours, it contains more than 15,000 people. The busiest days are Friday and Sunday, when people use public transportation to leave for and return from the weekend (most public buses in Israel do not operate between Friday afternoon and sunset on Saturday).

The building is known for its problematic structure. Some of the floors cannot be reached easily, and general navigation through the station is difficult. The entire building has become a synonym for bad design.

The complex has six driveway entrances and six pedestrian entrances (Figure 47). All entrances are controlled by security guards; the driveway entrances are equipped with anti-ram gates, and the pedestrian entrances are equipped with turnstiles and metal detectors.



Figure 46: General View of the Tel Aviv Central Bus Station



Figure 47: Pedestrian Entrances Where the Terrorist Tried to Enter the Station

THE SUICIDE BOMBER

The suicide bomber, Iman Razawi (Figure 48), was a 27-year-old resident of Nablus, married and the mother of two children. She was recruited by her husband and her brother-in-law, a senior Fatah activist, after her husband was suspected of collaborating with Israeli security forces. She was convinced by them that the attack would rehabilitate her husband and improve the economic status of her family.

The attack was planned and managed by her brother-in-law, who provided her with the explosive device, instructions, and directions to the target.



Figure 48: The Suicide Bomber, Iman Razawi

THE EXPLOSIVE DEVICE

The IED carried by Razawi consisted of about 5 kilograms of TATP contained in five 1-kilogram nylon bags. Improvised initiators were inserted into the explosive and connected to a battery pack by an electrical timer. The explosive device was concealed in a box of laundry powder carried in a big, dark nylon bag. The box was filled with screws and nails intended to serve as fragmentation materials. The box was carefully opened to insert the explosive device and was then closed and glued to look as if it had not been opened.

THE ATTACK

Late on the morning of August 3, 2001, Iman Razawi, accompanied by her husband and her brother-in-law, left Nablus on a bus transporting workers to Jerusalem. At the northern checkpoint into Jerusalem, her husband's entry was rejected, so he returned to Nablus. Razawi and her brother-in-law were allowed to enter, and they continued toward Tel Aviv on a regular shuttle taxi.

At about 1 pm, the two terrorists arrived at the new central bus station. Razawi's brother-in-law directed her to the busiest pedestrian entrance, at the corner of Levinski and Tsemakh David streets.

When Razawi saw the stringent security search at the entrance to the station, she panicked, dropped the bag next to the entrance, and fled back to her brother-in-law. A security guard positioned next to the entrance observed her dropping the bag, which he immediately suspected of containing an explosive device. He called another security guard and a police officer into action and started to evacuate the crowd away from the bag.

When Razawi told her brother-in-law that she had dropped the bag next to the entrance, he shouted to her that she should return, pick up the bag, and carry it into the station through the security check.

When she ran back and picked up the bag, the two security guards and the police officer realized that she was a possible bomber and turned to confront her. In response, she threw the bag away, turned and ran into the street leading to the old central station (a poor neighborhood mostly populated with foreign workers) where she last saw her brother-in-law. While crossing the busy street she was hit by a passing car, shortly after which her pursuers overtook her. After a short struggle, she was restrained and arrested.

The explosive device was rendered safe by the police bomb disposal unit.

Immediately after her arrest and preliminary on-the-spot interrogation, security forces

and police were deployed in force to search the area for more explosive devices and to find the person who was accompanying and directing her. The central station building was evacuated, and no other explosive devices were found. Razawi's brother-in-law succeeded in escaping back to the Nablus area, where he and her husband were later arrested by the Israeli security forces.

ANALYSIS AND CONCLUSIONS

1. The ability to conceal an explosive device in an innocent-looking item presents a challenge for the security personnel at checkpoints. It would have been difficult to detect the explosive device in the carefully closed laundry-powder box, even by a direct visual examination. The terrorists carefully opened the box and glued it back together after the insertion of the explosive device. The major suspicious indicator was the excessive weight of the box.
2. Even when a terrorist is under extreme pressure, it might be difficult, if not impossible, for a security guard to notice suspicious behavior. In this case, the guard who first observed Razawi walking toward the station entrance reported that her appearance and behavior before dropping the bag did not attract his attention or cause him to be suspicious. He explained that she was wearing clothes commonly worn by young women and apparently behaved normally. She did not draw his attention until she dropped the bag and walked away. The lesson learned is that even when a terrorist is under extreme pressure, such pressure is not necessarily observable, even by well-trained security personnel.
3. Nevertheless, a person dropping an item in a crowded area and walking away should be considered a highly probable indication of a serious security threat.
4. The positioning of a covert, non-uniformed security guard next to a security checkpoint to observe people's behavior and abnormal activities proved to be effective.
5. Only visible and highly stringent security searches provide detection capability and deterrence. The security check at the entrance to Jerusalem failed to detect the explosive device or to deter the terrorists. The check focused on the verification of people's identity and their permits to enter, while the search of their belongings consisted only of a rapid glance inside their bags. Such a search could not detect an explosive device or deter a terrorist. By contrast, the search at the central bus station included the full opening of every bag and visual and manual examination of most of the bags' contents. This search was very effective—the prospect of being searched deterred the terrorist.
6. The awareness and alertness of the security guard who observed the terrorist saved many lives. His immediate interpretation was that it was highly probable that the woman dropping the bag was a terrorist, and the action he took kept a potential attack from succeeding. Had the device, with its 5 kg of explosive and shrapnel material,

exploded near the crowd queuing to enter the checkpoint, it could have killed 10 or 15 people and injured as many as 100.

7. The security guard's decision to immediately evacuate the public and simultaneously call a nearby security guard and police officer for help was effective, as the crowd was too large to be evacuated by a single person.
8. During the preliminary evacuation, the security guard remained alert, looking for possible additional suspicious activity. This alertness enabled him to identify the terrorist returning to the scene and thus foiled her second attempt to bring the explosive device to the target.
9. The cooperation between the local police force and the station guard unit had been planned, briefed, and exercised for more than a year before the attack and proved to be very effective.

CASE 12 – TEL AVIV, LINE 51 BUS

GENERAL DESCRIPTION

Date: December 28, 2000.

Event: A terrorist boarded a Line 51 bus carrying a bag containing a remote-controlled explosive device. He placed the bag under a seat and disembarked. The device was detonated by a “dispatcher” whom he was instructed to call after he left the bus.

Casualties: 14 wounded.

Organization responsible: Fatah.

Bomber: Abdala Abu Jaber.

THE OPERATIONAL ENVIRONMENT

Line 51 of DAN, the major public bus operator in the Tel Aviv metropolitan area, connects Tel Aviv and its eastern suburb towns Ramat-Gan, Beni-Bark, and Petach-Tikva.

Line 51 serves a large variety of populations. Its final destination—the Petach-Tikva central bus station—is a gateway for the towns and villages of the eastern edge of the coastal plain and the western slopes of Samarian Highlands (Figure 49). The line passes through major commercial, transportation, and medical centers in the central region of Israel.

The bus stop where the terrorist boarded is next to the old central bus station and is the first stop after the line originates at the new central bus station. It can be assumed that the terrorist decided not to board the bus at the new central bus station because a security search is conducted at all of its entrances.

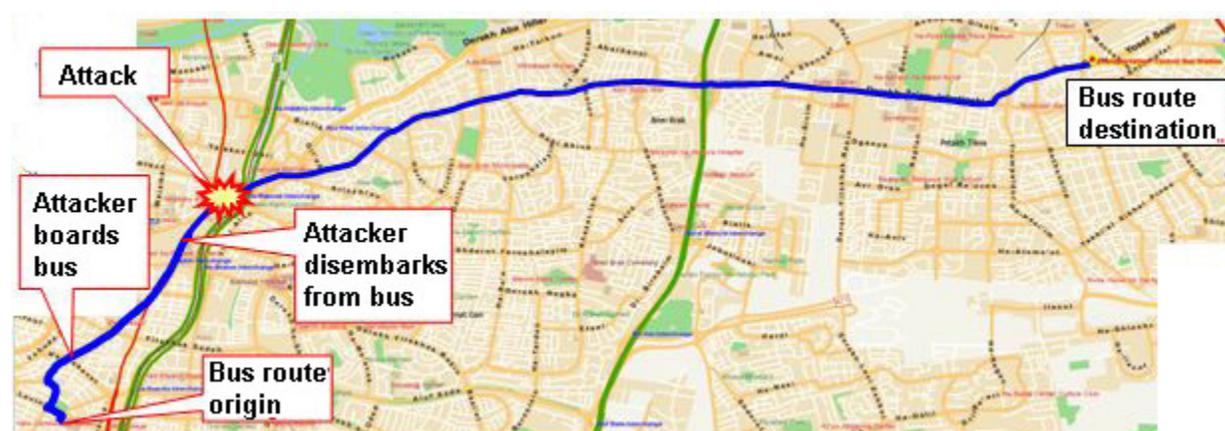


Figure 49: Route of Bus Line 19 Showing Location of the Case 12 Attack

THE SUICIDE BOMBER

Abdala Abu Jaber, 27 years old, was a Jordanian citizen who entered Israel as a tourist two years before the attack (Figure 50). After his visa expired, he was illegally employed by Akimar, a security company in Israel. His first assignment with Akimar was to guard a construction site in Kiriya-Gat, a town in the south of Israel. He was then promoted to guarding a restaurant in Rishon LeZion, the fourth largest city in Israel, located 5 miles from Tel Aviv. Apparently, the security company did not verify his identity and did not apply for a police permit to employ him, as security companies are required to by law in Israel. Following the postattack investigation, the Justice Minister canceled Akimar's certificate for providing security services.

On December 24, 2000, Jaber went to visit relatives in a refugee camp near Nablus. During his stay there, he was recruited by two Tanzin Fatah operatives, Maher Ahmad Jobara and Abboud Mobarak.

He was given a duffle bag containing an explosive and was instructed to place the bag in a crowded bus and then disembark. He was given the mobile-phone number of a "dispatcher" and a code word to use when the device was ready for detonation.



Figure 50: The Suicide Bomber, Abdala Abu Jaber

THE EXPLOSIVE DEVICE

The IED consisted of three metal cylinders (common 2-inch steel water pipe) filled with TATP and closed at both ends by metallic caps. Improvised initiators were inserted into the explosive and connected to a cellular phone. The phone had been modified by replacing the ringer with two wires connected to the improvised initiators (Figure 51). Upon receiving an incoming call, the phone supplied electrical current to the initiators to activate the IED.

As a precautionary measure, the phone battery was not attached to the phone; the terrorist was instructed to insert the battery shortly before disembarking.

The explosive device was concealed within clothing in a cheap yellow duffle bag.



Figure 51: A Cellular Phone Modified to Activate an IED

THE ATTACK

On the morning of December 28, 2000, Jaber was taken to the Askar refugee camp next to Nablus, where he received the explosive device and instructions for its use.

Jaber took a shuttle taxi to Tel Aviv. The shuttle taxis from the West Bank location are used mainly by Palestinians seeking work in Israel.

Jaber asked the shuttle taxi to drop him next to the old central bus station, which had been more or less abandoned after the new central bus station started service in the early 1990s. The neighborhood of the old central bus station is occupied by junkies and illegal foreign workers—an ideal area in which a terrorist can assimilate.

Jaber boarded the bus at a stop near the old central bus station. The driver reported that the terrorist did not seem suspicious. He took a seat at the rear of the bus and stuck the bag under the seats in front of him.

Before he disembarked, he inserted the battery into the cell phone and switched the phone on. Immediately after disembarking, he called his dispatcher and reported the agreed code word. Shortly afterward, the dispatcher called the cell phone connected to the IED and detonated the bomb (Figure 52).



Figure 52: The Bus After the Explosion and the Passengers' Evacuation

Fortunately, only one of the three pipe bombs detonated. However, the explosion wounded 14 passengers. The passenger sitting on the seat under which the bag was placed was seriously injured.

ANALYSIS AND CONCLUSIONS

1. It is easy for terrorists familiar with a target area to effectively assimilate and avoid drawing attention. Also, it is easier to remain calm in a familiar area, and a terrorist may be less likely to display nervous or unusual behavior.
2. The ability to hide an explosive device in a bag filled with ordinary contents presents a challenge for the limited inspection that can be done (if any can be done at all) of a passenger boarding a bus. Nonetheless, if the visual inspection had been accompanied by a weight assessment (i.e., if the inspector had held the bag during the inspection), the excessive weight of the three pipe bombs could have indicated the presence of a potential IED.
3. General public security awareness can be very effective in countering the modus operandi of “left behind” IEDs. Although the short time between the abandonment of the bag and the activation of the bomb would have required a very high state of alert on the part of passengers and the public, it is possible to achieve such a level of security awareness.

-
4. Only visible and very stringent security searches provide detection capability and deterrence. A search limited to a rapid glance inside a bag could not detect an explosive device or deter a terrorist.
 5. Three factors significantly mitigated the lethality of the attack:
 - The deterrent effect of the stringent security checks at the entrances to the new central bus station diverted the terrorist to a street bus stop where he could not choose the most crowded bus, as he would have in the central bus station.
 - The terrorist’s “left behind” modus operandi required him to choose the rear seat, where he could arm the IED (by attaching the battery to the cell phone) without drawing attention. This was not the most lethal place to put the bomb. Placing the bag beneath a seat at the rear of the bus also resulted in the seat absorbing much of the blast. Finally, only a few passengers were close to the explosion.
 - Connecting the electrical initiators to the power source in a serial sequence rather than in a parallel sequence individually—an example of poor bomb-making—resulted in two of the three pipe bombs failing to explode.

CASE 13 – JERUSALEM, LINE 36 BUS

GENERAL DESCRIPTION

Date: July 27, 2001.

Event: An explosive device was discovered by a bus driver on his bus on Line 36 in Jerusalem.

Casualties: None.

Organization responsible: Popular Front for the Liberation of Palestine (PFLP).

Bomber: Samar Mutab.

THE OPERATIONAL ENVIRONMENT

Line 36 of EGGED, the major public bus operator in Jerusalem, passed from north to south through the center of the city (the line is no longer operational).

THE SUICIDE BOMBER

The bomber was Samar Mutab, a 24-year-old resident of A-Ram, a village northeast of Jerusalem, just outside the city's municipal border.

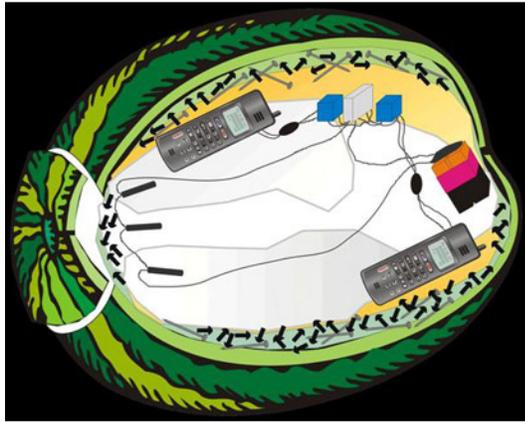
THE EXPLOSIVE DEVICE

The IED consisted of 5 to 7 kilograms of white powder, a homemade explosive, a battery pack connected to three improvised initiators through modified cellular phones, and nails for fragmentation material (Figure 53).

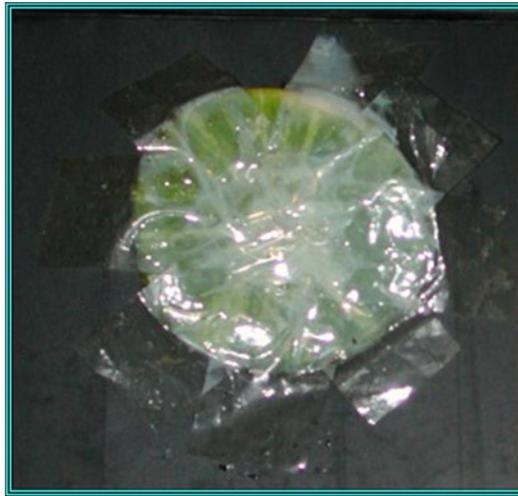
The device was concealed inside a watermelon. One of the watermelon's ends was carefully cut off, the soft flesh was taken out, and the IED components were inserted. The end of the watermelon was put back into place and enforced by toothpicks. The watermelon was wrapped with transparent nylon and put into a shopping bag with some other items.

THE ATTACK

On the morning of July 27, 2001, Bilal Uda, a 23-year-old operative of the PFLP and a resident of Jerusalem, traveled to Ramallah—a Palestinian city in the central West Bank 10 kilometers (6 miles) north of Jerusalem, which serves as the administrative capital of the Palestinian National Authority. There he met with Shadi Shurafa, the senior PFLP operative who planned the attack. Shurafa provided Uda with the IED concealed in the watermelon and a mobile phone having in its "one-touch" dialing memory the phone numbers of the two modified phones used to activate the IED.



Schematic cross-section of IED concealed in the watermelon



Watermelon in its nylon wrapper



A modified cellular phone



Remains of the IED after it was rendered safe

Figure 53: The Explosive Device

Uda was directed to deliver the IED and the mobile phone to another PFLP terrorist, Samar Mutab, who would execute the attack. Mutab was not familiar with either Uda or Shurafa. Not knowing them avoided the possibility that he would expose them if he were arrested.

Uda drove his car to a gas station in Sheikh Jarach, in the northeast portion of Jerusalem, where he met with Mutab. He gave Mutab the concealed IED and the mobile phone and briefed him on its operation. Then Uda drove him to the central bus station of Jerusalem, where he boarded the bus.

After a several stations, Mutab disembarked, leaving the shopping bag with the IED under his seat. Shortly after disembarking, he made several calls to the numbers of the two phones that had been modified to detonate the bomb, but the bomb failed to detonate.

After the bus reached its final station, the driver made a routine security search of the bus (mandatory in Israel before leaving the first station of the line and after reaching the final

station) and saw the bag stuck under a seat. He was suspicious because of its unusual location and called in the police.

The police bomb squad destroyed the device successfully, with no injuries or damage.

All three terrorists involved were arrested by the Israeli Security Agency several weeks later. They were tried and imprisoned for long periods.

ANALYSIS AND CONCLUSIONS

1. The ability to conceal an explosive device in an ordinary item presents a challenge for the limited inspection that can be done (if any can be done at all) of a passenger boarding a bus. Nonetheless, if the visual inspection had been accompanied by a weight assessment (i.e., if the inspector had held the bag during the inspection), the excessive weight of the bomb could have indicated the presence of a potential IED.
2. General public security awareness can be very effective in countering the modus operandi of “left behind” IEDs. An abandoned shopping bag stuck under a seat should immediately raise suspicion. Although there was little time between the abandonment of the bag on the bus and the activation of the bomb, and this would have required a high level of alert on the part of the traveling public, it is possible to achieve such a level.
3. Only visible and very stringent security searches provide detection capability and deterrence. A search limited to a rapid glance inside a bag could not have detected the device in the watermelon, nor would it have deterred the terrorist.
4. Poorly designed electrical wiring kept the bomb from exploding. The same terrorist cell tried to detonate another bomb in the center of Jerusalem, but that attempt failed for the same reason.

CASE 14 – MEGIDDO JUNCTION, LINE 830 BUS

GENERAL DESCRIPTION

Date: June 5, 2002.

Event: A suicide bomber driving a vehicle-borne IED (VBIED) blew himself up next to a Line 830 interurban bus at the Megiddo Junction.

Casualties: 17 persons killed and approximately 42 wounded.

Organization responsible: The Palestinian Islamic Jihad (PIJ).

Bomber: Hamzah 'Aref Hassan Samudi.

THE OPERATIONAL ENVIRONMENT

Line 830 of EGGED, the major intercity public bus operator in Israel, originates at the Tel Aviv central station and has as its final destination the city of Tiberius. The line is a major route to the northeast of Israel. It covers about 150 kilometers, and the journey typically takes 2 hours and 45 minutes.

The line passes through a variety of different geographies and population areas. A significant portion of it goes through towns and villages populated predominantly by Arab citizens of Israel.

The VBIED hit the bus at the exit of the area known as Wadi Ara, or Nahal Iron, an area within Israel that is mostly populated by Arab citizens. The exit is only 3 kilometers from the West Bank area controlled by the Palestinian Authority.

The attack took place about 500 meters south of the Megiddo Junction, where a prison for terrorists is located. The junction is a few miles away from the main road to the northernmost city of the West Bank, Jenin, where the suicide terrorist lived.

The bus was fully loaded with passengers, many of them residents of the towns and villages along the bus route.

THE SUICIDE BOMBER

The suicide bomber, Hamzah 'Aref Hassan Samudi (Figure 54), was an 18-year-old resident of Jenin, recruited by Anis Jaradat, a bomb expert who was a senior PIJ operative in the Jenin area.



Figure 54: The Suicide Bomber, Hamzah 'Aref Hassan Samudi

THE EXPLOSIVE DEVICE

The IED used in the attack consisted of two drums of homemade explosive, each weighing 55 kilograms (121 pounds). The bomb was activated by a modified cellular phone. Jaradat prepared and loaded the device onto the car, a stolen Renault Kangoo he purchased for 8000 NIS (Figure 55). The Kangoo had been stolen four months earlier, and its original license plates had been replaced with license plates of a Subaru sedan that was stolen shortly before the attack.

THE ATTACK

Early on the morning of the attack, Jaradat, driving another car, guided Samudi from Jenin to the Umm el-Fahem Junction, which had been chosen as the launch point for the



Figure 55: A Renault Kangoo Panel Van

attack (Figure 56). A guiding vehicle driving ahead of a car bomb on its way to the target is common practice for the PIJ. This ensures that the suicide bomber does not lose his way (most of the suicide bombers are not familiar with the locations of their targets), and it verifies that there are no military or police checkpoints on the route.

At about 7:15 am, the VBIED driver started driving from the Umm el-Fahem Junction northward. After a few kilometers, he saw an opportunity to pass a bus. As he moved to pass the bus, the guiding terrorist detonated the IED. The explosion generated a large fireball and overturned the bus.

The bus was completely burned (Figure 57). Seventeen passengers were killed, and more than 40 were wounded. Most of the casualties had been seated at the rear of the bus.

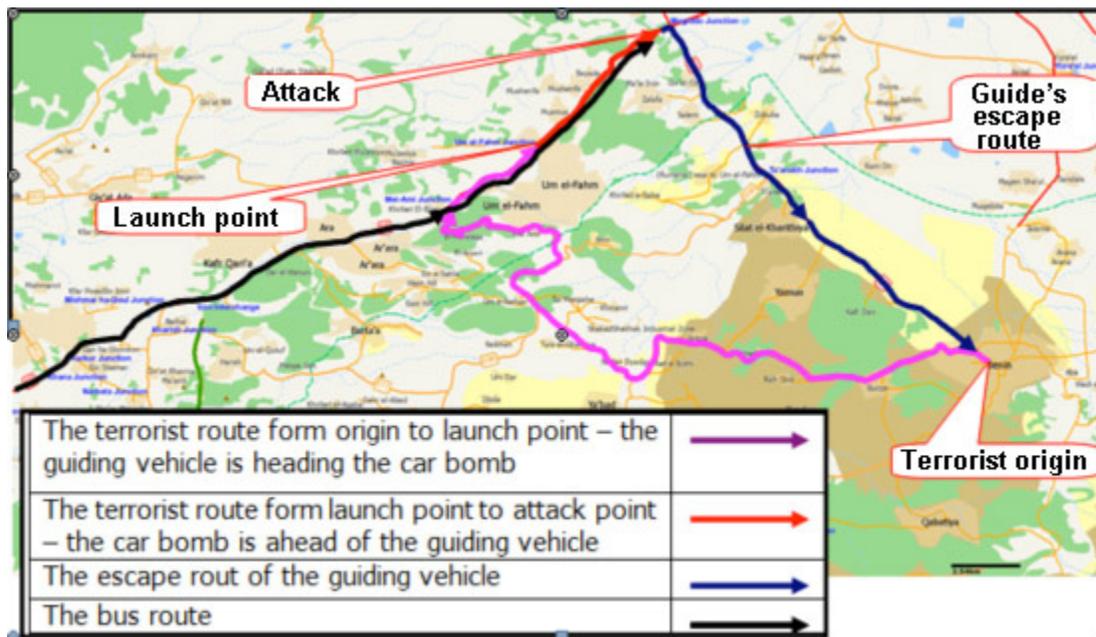


Figure 56: The Bus Route, Showing the Location of the Case 14 Attack

ANALYSIS AND CONCLUSIONS

1. The ability of a bus driver to avoid a car bomb attack is extremely limited.
2. The large amount of explosives a car bomb can carry provides very high potential lethality. In an attack against a bus, that lethality may be increased by the fire created by more than 100 gallons of diesel fuel.

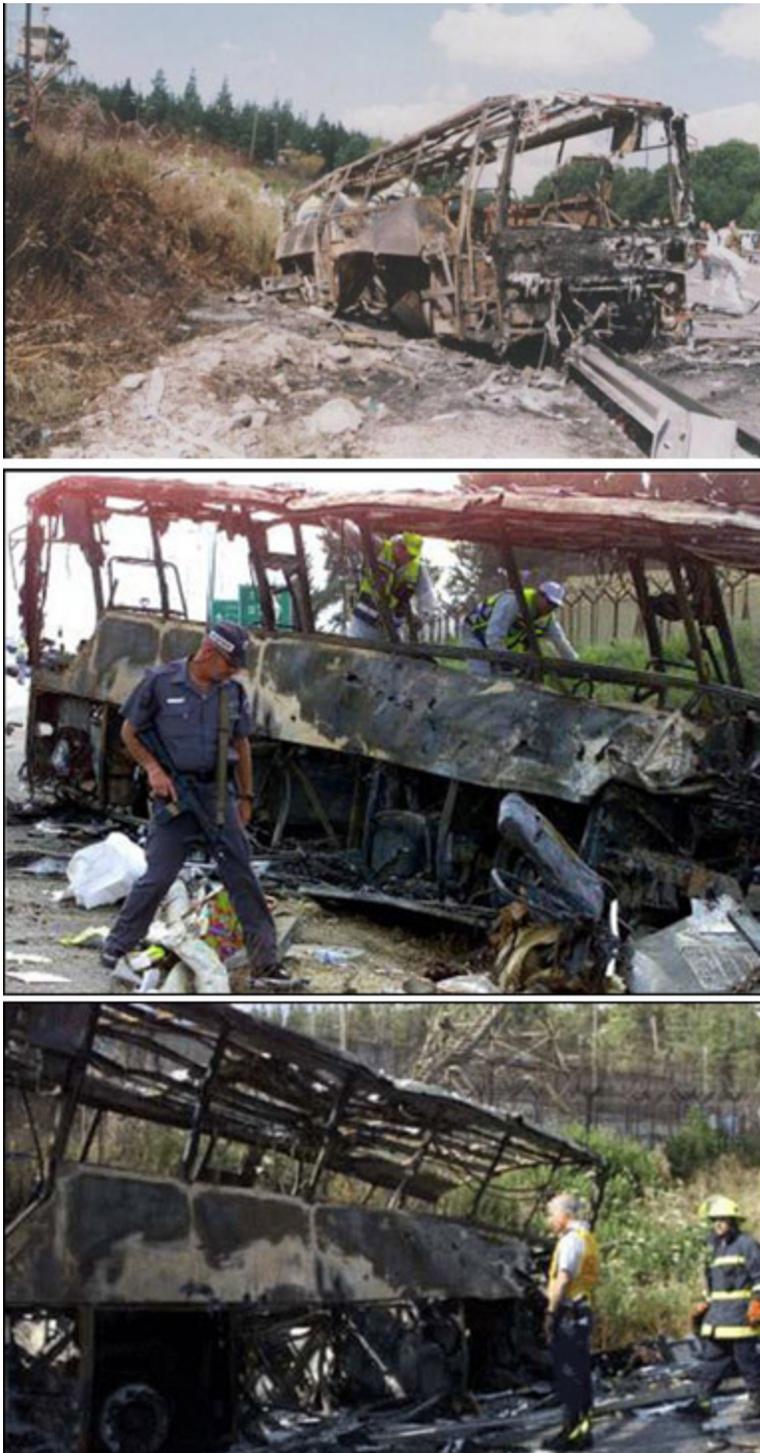


Figure 57: The Demolished Bus

CASE 15 – KARKUR JUNCTION, LINE 841 BUS

GENERAL DESCRIPTION

Date: October 21, 2002.

Event: Two suicide bombers exploded a VBIED next to a Line 841 interurban bus at the Karkur Junction.

Casualties: 14 persons killed and approximately 50 wounded.

Organization responsible: The Palestinian Islamic Jihad (PIJ).

Bombers: Muhammad Fawzi Sa'adi/Hamada Hasanain and Ashraf Salah Ahmad al-Asmar.

THE OPERATIONAL ENVIRONMENT

Line 841 of EGGED, the major intercity public bus operator in Israel, originates at the Tel Aviv central station and has as its final destination Kiryat Shmona, Israel's northernmost city. Line 841 is the major bus line to the northeast of Israel. Its route covers about 200 kilometers, and the journey typically takes 5 hours.

The line passes through a variety of different geographical areas and population centers, including many cities and towns, as well as rural areas (Figure 58). The portion of the line where the attack took place is populated predominantly by Arab citizens of Israel.

The VBIED hit the bus at the exit of an area known as Wadi Ara, or Nahal Iron, an area within Israel that is mostly populated by Arab citizens, 3 kilometers from the West Bank area controlled by the Palestinian Authority.

The attack took place near Karkur Junction, which is at the southern edge of the Iron Valley. For the terrorists arriving from the northern edge of the Iron Valley, it was a "point of no return" beyond which their return to the West Bank might be blocked by police roadblocks and checkpoints that are usually deployed after a terrorist attack.

The bus was fully loaded with passengers, most of them residents of the towns and villages along the bus route.

THE SUICIDE BOMBERS

The suicide bombers, Muhammad Hasanain and Ashraf Asmar, were residents of the Jenin area. Hasanain was 19 years old, and Asmar was 18. Both were recruited by Sayid Tubasi, the operations officer of the PIJ in the Jenin area. Tubasi planned and initiated the attack, together with Iyad Sawalha, the head of the PIJ in the Jenin area at the time. Anis Muhammad Jaradat, a bomb expert, prepared the explosive and assembled the explosive

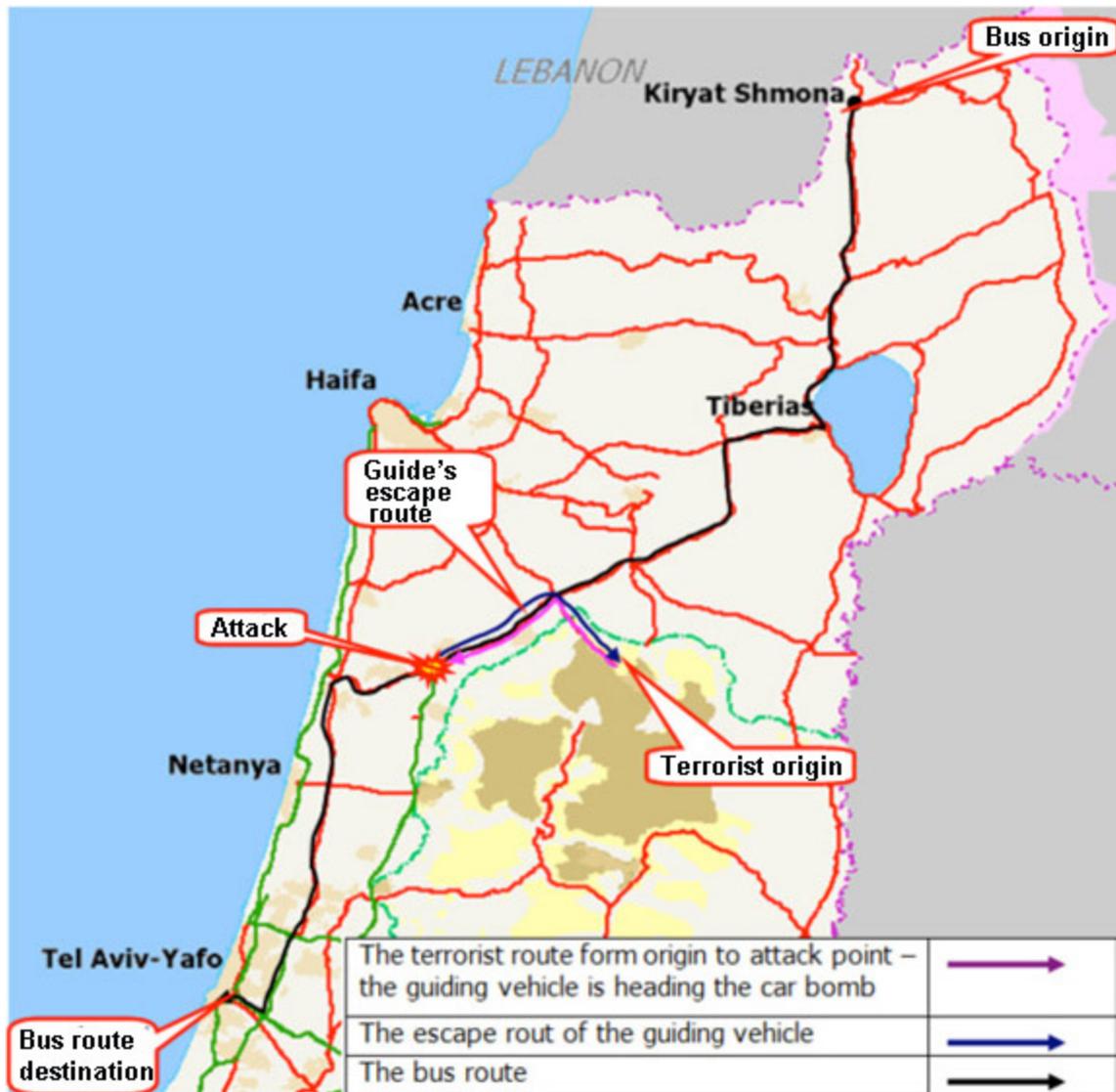


Figure 58: The Bus Route, Showing the Location of the Case 15 Attack

device, loaded it onto a stolen Kia SUV in a garage in Jenin, guided the suicide drivers to the target, and activated the device.

THE EXPLOSIVE DEVICE

The IED consisted of a single drum of homemade explosive weighing 70 kilograms (154 pounds). The bomb was activated by a modified cellular phone.

THE ATTACK

The day before the attack, Tubasi picked up the suicide terrorists and took them to Sawalha's safe houses in Jenin. Sawalha gave them money and instructed them to get haircuts and buy new clothing.

On the day of the attack, at about noon, Tubasi drove the suicide bombers to a location near the Jenin city municipality, where they were given a Kia SUV with dark windows that was loaded with the explosive device.

Jaradat, driving a Nissan SUV (Figure 59), guided the suicide bombers who drove the VBIED from Jenin to Megiddo Junction southward to find a bus to attack.

A guiding vehicle driving ahead of a VBIED on its way to a target is common terrorist practice. It ensures that the suicide bomber does not lose his way (most of the suicide bombers are not familiar with the locations of their targets), and it verifies that there are no military or police checkpoints on the route.

Because of the heavy afternoon traffic, the bombers had trouble identifying a suitable bus that they could pass to get into the required attack position. Finally, at the southern edge of the planned area of attack, they located the Line 841 bus, which was stopped at the Karkur Junction station. At 16:30 they got the opportunity to pass the bus and detonate the bomb (Figure 60). The detonation of the large amount of homemade explosive created a huge blast and fireball that completely burned the bus (Figure 61). Several vehicles passing by were also damaged and caught fire, injuring their passengers.

Fourteen of the passengers on the bus were killed, and more than 50 were wounded. Most of the casualties were seated at the rear of the bus.



Figure 59: The Nissan Guiding Vehicle



Figure 60: KIA SUV Remains After the Explosion

ANALYSIS AND CONCLUSIONS

1. The ability of a bus driver to avoid a car bomb attack is extremely limited.
2. The large amount of explosives a VBIED can carry provides very high potential lethality. In an attack against a bus, that lethality can be greatly increased by the burning of more than 100 gallons of diesel fuel.



The burning bus at the bus stop shortly after the explosion



The bus immediately after the fire was extinguished by the firemen. The police bomb squad is searching the area for potential additional terrorists.



The remains of a passing car.



The remains of the bus



Figure 61: The Scene After the Explosion

CASE 16 – PRE-OPERATION COLLECTION OF INFORMATION IN JERUSALEM

GENERAL DESCRIPTION

Date: July 14–15, 2004.

Event: An operative was recruited to locate targets in Jerusalem for a multiple suicide bombing. A bus target was considered, but an up-scale, “trendy” coffee shop was chosen instead. The bombing attack failed. The case is presented to illustrate the methods of pre-operation terrorist surveillance in Israel.

Casualties: None.

Organization responsible: Hamas.

Conductor of surveillance: Zaher Ali.

SUMMARY OF THE CASE

In a joint operation, the Israeli Security Agency and the Northern District of the Israeli Police arrested Zaher Ali (Figure 62), an Arab citizen of Israel, on July 14, 2004. Ali was a resident of Kaukab, a small village in the north of Israel. He was working toward a Master’s degree at the Hebrew University in Jerusalem. His arrest came after terrorist activities of Naal Glad were exposed as part of the Hamas Hebron Network. Glad was an Arab citizen of Israel and a resident of At-Tur (an Arab neighborhood in East Jerusalem which was annexed by Israel after the 1967 War).

Ali arrived in Jerusalem in 1996 to complete a Bachelor’s degree in education technology at the ORT College of the Hebrew University at Givat Ram, Jerusalem. He then continued his studies at the School of Education at the Mt. Scopus Campus. (Some of the potential targets he proposed for suicide bombing attacks were within the university campuses.) At the time of his involvement in terrorist activity, he was also teaching mathematics in Beit Safafa, an Arab neighborhood in south Jerusalem.



Figure 62: Zaher Yusuf Diab Ali

While at the Hebrew University, he joined several informal Islamic study groups that are affiliates of Hamas. These groups were led by charismatic extremists who explicitly promoted jihadist ideology through speeches, books, and videos.

In one of the Islamic education groups, Ali was recruited by Naal Glad to facilitate suicide attacks in Jerusalem. He had Israeli citizenship, which gave him free access to any location in Israel, and having studied in the Hebrew University, he was familiar with the city, its access routes, and potential targets.

Ali agreed to participate in collecting pre-operation information for suicide attacks. Glad assured him that the terror organization had suicide bombers available and that Ali's major assignment would be to locate suitable targets.

After Ali agreed to this assignment, he and Glad made several excursions into Jerusalem, during which he proposed the following potential targets for suicide attacks:

1. A coffee shop near the Hebrew University on Mount Scopus.
2. Bus Line 4A at Bar Ilan Street, a major road in Jerusalem connecting the northeast part of the city (including the university where Ali was studying) to the southern neighborhoods through the city center. Ali frequently used this bus line to go from the school where he was teaching to the university.
3. A busy bus stop on Bar Ilan Street.
4. A wedding venue in Beit Safafa (the neighborhood in southeastern Jerusalem where Ali was teaching).

On one of the excursions, Ali guided Glad along the Line 4A route and proposed it as the target. Because of high passenger volume, the operator was driving articulated buses (Figure 63) which can carry more than 100 passengers when fully loaded. The buses were usually loaded with many passengers, and the origin of the line route was close to several neighborhoods inhabited mainly by Arabs (Figure 64), which would enable the terrorists to assimilate at the bus stop.

However, after analyzing the potential targets, Ali and Glad decided to target a coffee shop in front of Liberty Bell Park. The plan was to use three suicide bombers. Two were supposed to burst into the target with bags containing IEDs, and the third was to wait for the first responders to arrive and then detonate his IED. This plan was judged to be too complicated for the bus lines and stations Ali and Glad had collected information on.

Most of the reasons for not attacking the bus line were practical, related to the difficulty of coordinating simultaneous attacks on moving buses with inconsistent schedules. In addition, bus security guard force activity forced the terrorists to consider the unexpected arrival of a security guard, which could hamper the coordination between the three suicide bombers. Security guards were deployed on the major public bus routes in foot patrols, vehicle patrols, motor-scooter patrols, and rides on buses. That combination provided deployment flexibility and also the deterrent of unpredictability.



Figure 63: An Articulated Bus Operated on Line 4A in Jerusalem

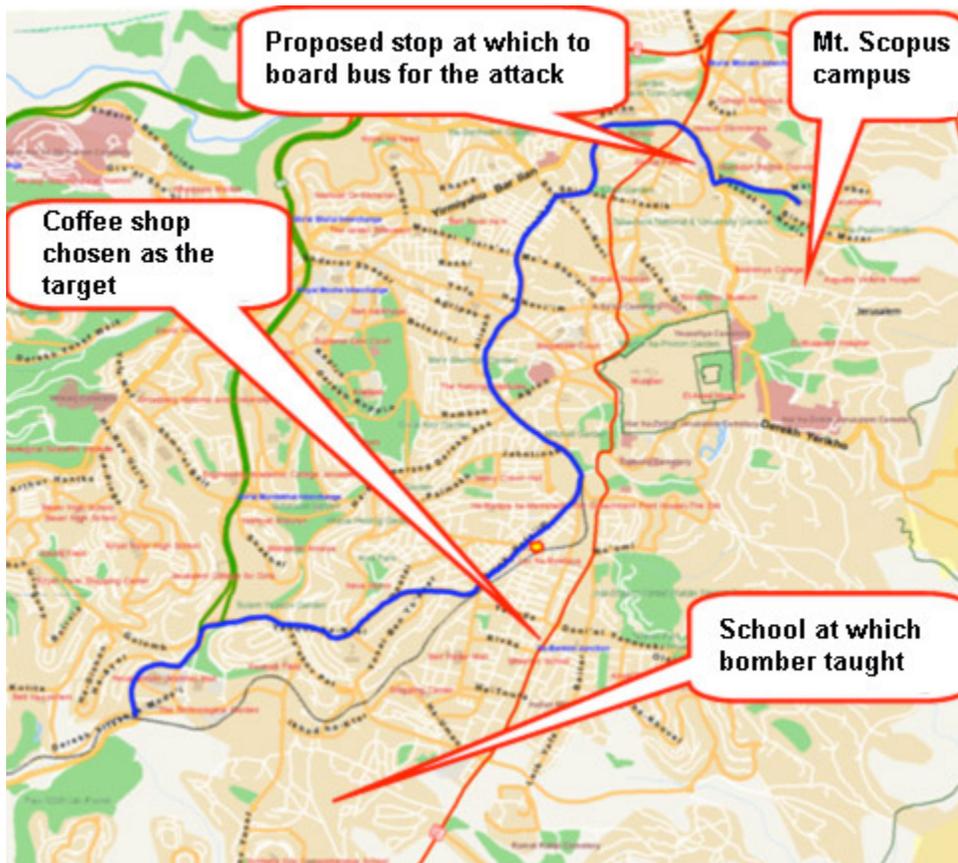


Figure 64: The Route of the Bus Showing the Location of the Case 16 Attack

Hamas also considered a trendy coffee shop a higher-value target than a bus, because the people sitting there were of a higher class than those riding public buses. Consequently, an attack on a coffee shop could have a higher media impact than an attack on a public bus.

On July 11, 2004, the attack against the coffee shop was launched, but only one suicide bomber was actually deployed. The terrorist was equipped with a gun and a bomb belt. He planned to shoot the security guard at the entrance to the coffee shop and then enter the coffee shop and detonate the bomb belt.

After the suicide bomber was dropped off by the vehicle that drove him to the target, he had regrets or panicked, threw the gun and the bomb into a nearby garden, and walked away. A passerby saw him throwing things into the garden and called the police. A police patrol found him wandering around and arrested him.

ANALYSIS AND CONCLUSIONS

1. Although most attacks against public buses in Israel involve some degree of pre-operation surveillance, this case is one of the few we know about in which the surveillance was relatively systematic.
2. In most cases, target selection and planning are based on the personal knowledge of the planner and of the terrorist assigned to execute the attack. In fact, terrorists usually choose a target or target area that the dispatcher terrorists or the executing terrorists are familiar with. Even in this case, the terrorist leading the pre-operation surveillance preferred to survey places and bus lines he was familiar with. Protective security measures cannot detect this kind of hostile surveillance. Using people who already have access to targets and areas where targets may exist is not unique to the terror organization operating in Israel—it is a common terrorist tactic elsewhere as well.
3. Pre-operation surveillance is based on personal, firsthand impressions more than on such measures as photographing, taking notes, or sketching. The practice is used for crowded public targets, since it is not only highly effective, but also undetectable.
4. The most effective countersurveillance tactics against this kind of pre-operation surveillance are those that create a deterrent effect strong enough to stop a hostile operation dead in its tracks and cause the operatives to focus their efforts elsewhere. One of the most effective of these tactics is the avoidance of routine, repeatable, and therefore predictable patterns of operation. Although this principle is well known, it is very difficult to implement for large-scale security operations. Control, organizational, and administrative constraints, coupled with the human tendency to repeat established patterns of behavior, usually lead over time to repetitious, patterned security practices.
5. A special model of operation was developed for the public bus security guard force in Israel. The guards who patrol the stops on the bus routes use several different transportation means—walking, driving covert and marked vehicles and motor

scooters, and riding on the buses themselves—and move in different directions. The different speeds of the transportation means, along with city traffic conditions, make it impossible to develop a routine pattern of operations.

6. An important objective of pre-operation surveillance is to establish patterns and timing for planned attacks. The terrorists in this case found out that they could not predict when and from which direction the next security patrol might come. This was an important factor in their decision to target the coffee shop rather than the bus. Although the coffee shop was also protected by a security guard, he was permanently positioned at the entrance. This enabled the terrorists to develop a simple plan: equip the suicide bomber with a pistol so that he could shoot the security guard and force his way into the coffee shop.

A COMPARATIVE ANALYSIS OF THE EFFECTIVENESS AND LETHALITY OF DIFFERENT IED TYPES AND METHODS OF ATTACK

Throughout the five-year campaign of intensive attacks in Israel between September 29, 2000, and the end of 2005, Palestinian terrorist organizations carried out 257,702 attacks, killing 1,084 Israelis and injuring more than 6,000. Although only 0.06 percent (147) of the 257,702 attacks were suicide bombings, those attacks were particularly lethal, accounting for 49 percent of the fatalities (527) and 56 percent of the injuries (3,350).

Attacks against public bus targets were the most lethal suicide bombings. Urban buses in Jerusalem and Haifa were the bus targets with the greatest number of casualties—23, 19, 17, and 15 people were killed in those attacks. Suicide attacks against buses are particularly lethal because a bus is technically an optimal target for an IED attack in Israel, providing a small, confined environment. The air pressure wave when an explosive charge is detonated in a small, enclosed space has high amplitude (3.0 to 5.2 atmospheres per meter) and relatively long duration (2 to 3 meters per second). Homemade explosives may have even longer-duration pressure waves than military high explosives and therefore greater lethality.

It should be noted that this analysis concerns only the set of attacks in Israel during this time; it does not include attacks in other countries against passenger or subway trains, which can be more lethal environments for IEDs because of their relatively stronger construction, which retains, rather than vents, the air-pressure wave, particularly in a tunnel such as a subway tunnel. Israel as yet has no subway system, and there have been no successful attacks in Israel in passenger train cars.

The victims of violent explosions nearly always sustain other damage, such as penetrating wounds from flying debris (secondary blast injuries) and blunt trauma from displacement of the body and its forceful impact with rigid and stationary objects (tertiary blast injuries). Finally, the flash of a homemade explosion or the open fire of bus fuel causes burns, and victims also suffer from smoke and dust inhalation. The severity of these injuries is directly related to (1) the magnitude of the explosion (the quantity of explosive actually exploded); (2) fragmentation (metallic materials, such as steel ball bearings, used in the IED); and (3) the site of its occurrence, i.e., the location and position of the suicide bomber at the time of detonation.

Two major factors affected the relative lethality of terrorist attacks in Israel during this period: (1) the methods of attack (*modus operandi*) and (2) bomb-making skills.

THE MODUS OPERANDI EFFECT

The “Leave Behind” Method

The *modus operandi* of leaving the explosive device behind limits the terrorist’s ability to optimally locate and position the explosive device. The device must be hidden to avoid

early detection by passengers or others, which usually mitigates the explosion effects. The attack against Line 51 in Tel-Aviv on December 28, 2000 (Case 12) illustrates this limitation: The terrorist had to choose the rear seat, where he could arm the IED (attach the battery to the cell phone) without drawing attention. Placing the bag underneath a seat at the rear of the bus resulted in the seat absorbing the blast. Also, only a few passengers were close to the explosion.

Suicide Bombings

The failure of suicide bombers to place the explosive device in the optimal location to maximize lethality was illustrated in attacks such as the February 19, 2002, attack at Mehola junction (Case 2), the October 10, 2002, attack at the Bar Ilan University intersection (Case 4), and the November 29, 2001, attack near Israeli Defense Force (IDF) Base 40 in the town of Umm al-Fahm (Case 5). Nevertheless, a suicide bomber has the ability to optimize lethality. The bomber in the January 29, 2004, attack against a bus in the center of Jerusalem (Case 7) placed himself so that 11 people were killed and 44 were injured in the attack (see Figure 27). The attack against Line 14 in Jerusalem on June 11, 2003 (Case 8) killed 17 and wounded approximately 104 (Figure 33), and the attack against Line 16 in Haifa on December 2, 2001 (Case 6) killed 15 and wounded 35 (Figures 21, 22, and 23).

BOMB-MAKING SKILLS

Poor Skills

The influence of poor bomb-making skills on lethality is illustrated by four examples:

1. The bomb hidden in a watermelon used in the attack on Line 36 in Jerusalem on July 27, 2001 (Case 13) failed to explode because of poorly designed electrical wiring.
2. The IED used in the attack at the Kibbutzim Junction on August 2, 2001 (Case 1) probably failed to explode because it was poorly constructed. After the police rendered the bomb safe, the initiation toggle switch was found in the "on" position, indicating that the terrorist succeeded in switching it on, but the device did not explode.
3. The driver of the Line 176 bus that was attacked on February 6, 2002 (Case 3) at Ma'ale Adumim reported that he tried to question the terrorist about his destination. It is reasonable to assume from the sequence of events that followed that the bomber tried to activate the bomb but failed.
4. In the attack against Line 51 in Tel-Aviv on December 28, 2000 (Case 12), only one of three pipe bombs exploded.

Superior Skills

The VBIED attacks against Line 830 at Megiddo junction on June 5, 2002 (Case 14) and against Line 841 at Karkur junction (Case 15), which resulted in 17 and 14 deaths, respectively, illustrate the lethal effect of superior bomb-making skills coupled with an effective operational plan. In the attack at Karkur junction, a single terrorist prepared hundreds of kilograms of homemade explosives, successfully modified cellular phones to activate the explosives, wired the devices, and gave the suicide driver of the VBIED instructions on where to detonate his vehicle to maximize fatalities. In addition to the 14 people who were killed, 50 were wounded.

ENDNOTES

1. The MTI database counts attacks in Israel separately from attacks in the West Bank and the Gaza Strip.
2. On May 17, a suicide bomber disguised as an ultra-Orthodox Jew blew himself up near a group of Israelis at Gross Square in the Jewish quarter of Hebron; two Israeli citizens were killed. On May 18, another suicide bomber disguised as an ultra-Orthodox Jew blew himself up on a Number 6 bus in Jerusalem near the French Hill intersection.

ABOUT THE AUTHORS

BRUCE ROBERT BUTTERWORTH

Bruce Butterworth has had a distinguished government career, working at congressional, senior policy, and operational levels. Between 1975 and 1980, as a professional staff member for the House Government Operations Committee, he ran investigations and hearings on many transportation-safety issues, particularly in aviation. He spent 11 years in the Department of Transportation, eight of them in the Office of the Secretary. He managed negotiations on air and maritime services in the General Agreement on Tariffs and Trade (GATT) (now the World Trade Organization [WTO]), chaired U.S. delegations to United Nations Committees, dealt with transport and aviation issues related to border inspections, and was part of the response to the bombing of Pan Am 103.

Mr. Butterworth held two executive posts in aviation security and in both worked closely with Congress as the informal but primary liaison. He was Director of Policy and Planning (1991–1995), establishing strategic, long-term, and contingency plans and federal rules. As Director of Operations (1995–2000), he was responsible for federal air marshals, hijacking response, and 900 field agents; he worked hard to improve security and the performance of security measures at U.S. airports and by U.S. airlines worldwide. He ran the FAA's aviation command center, successfully managing the resolution of hijackings and security emergencies. He launched a successful program of dangerous-goods regulation and cargo security after the 1995 ValuJet crash, oversaw the conversion of the air marshal program to a full-time program with high standards, was a key player in the response to the ValuJet and TWA 800 accidents, and was a frequent media spokesperson. He worked closely with the Congress, the National Security Council staff, the intelligence community, law enforcement agencies, and authorities of other nations.

He was an Associate Director at the U.S. Holocaust Memorial Museum (2000–January 2003), responsible for security and building operations. He designed and implemented a “best practice” procedure to deal with mail that could contain anthrax, and he developed and conducted new, comprehensive emergency planning procedures and exercises. Between January 2003 and September 2007, he was one of two deputy directors in a 1,300 person engineering directorate at NASA's Goddard Space Flight Center, managing workforce planning, budgeting, and human capital management for complex robotics space missions, substantially reducing overhead and improving workplace safety there. He also worked with the Department of Homeland Security (DHS) on information sharing.

Mr. Butterworth is a research associate with the Mineta Transportation Institute. In this capacity, he has co-authored several reports with Brian Michael Jenkins, including one on security risks created by highway-borne hazardous materials for the State of California. In February 2009 he published with Mr. Jenkins an opinion piece on information sharing, and on March 23, 2010, he published an article on intelligence and aviation security in the *Washington Post*.

In 2011, his leading role in creating MTI's unique database of attacks on public surface

transportation and in creating and delivering nearly all the briefings to the Transportation Safety Administration's (TSA's) front-line bomb appraisal officers was recognized in a DHS High Impact award.

Mr. Butterworth received a Master of Science degree from the London School of Economics in 1974 and a Bachelor of Arts degree from the University of the Pacific in 1972 (Magna cum Laude). He was a California State Scholar and a Rotary Foundation Fellow. He has received numerous special achievement and performance awards.

SHALOM DOLEV

Shalom Dolev is an expert in security operations, methodologies, and security strategy development, with special emphasis on countering terrorism. He has more than 25 years of experience in the field and has worked for several governmental agencies, serving as a security consultant on issues including aviation, seaports, maritime activities, mass-transit transportation, border crossings, and high-risk institutions.

Mr. Dolev has held senior executive posts in the Israeli government, including security officer, team leader, shift duty manager, and security technologies manager for a security division at Ben Gurion International Airport. He also served as the head of the Counter-Sabotage Branch at the Israeli Security Agency (ISA), where he was responsible for intelligence analysis and research on weapons, explosives, IED techniques, and modus operandi of international terror organizations; development of concepts, measures, techniques, and procedures for counter-sabotage; search operations; physical security for the Israeli civil aviation system (airports and airlines) worldwide, the national VIP protection unit, the Ministry of Foreign Affairs (for Israeli diplomatic installations overseas), the Israeli maritime system, postal security, and selected high-risk governmental installations; evaluation, testing, and deployment of equipment and technologies for search operations; screening and detection of weapons and explosives; training of the all-Israeli security community on counter-sabotage operations, security inspections, and screening; and leadership of the Israeli intelligence, security, and law enforcement community in counter-sabotage operations and technologies.

As a senior consultant, Mr. Dolev acquired unique expertise in countering terrorist attacks and development of operational deployment models and training methodologies, along with expertise in the deployment of security technologies in complex security operations. He has played a key role in many major national security operations in Israel, including the development of the operational deployment concept and practice of the public bus system guard force, the development of a unique land-border-crossings concept and its practical implementation, and the migration of Israel's aviation security from a human-based system to a technology-based system. He initiated the development of the first explosives detection devices and has participated in numerous research and development programs on innovative explosive detection technologies and their implementation in major security programs. He has a degree in electronics engineering from Tel Aviv University and is a graduate of Tel Aviv University Law School. He retired recently after 25 years of reserve military service and seven years of full service in the Israeli Defence Forces combat-engineering special forces.

BRIAN MICHAEL JENKINS

Brian Michael Jenkins received a Bachelor of Arts degree in fine arts and a Masters degree in history, both from UCLA. He also studied at the University of Guanajuato, Mexico, and in the Department of Humanities at the University of San Carlos, Guatemala, where he was a Fulbright Fellow and received a second fellowship from the Organization of American States.

Commissioned in the infantry at the age of 19, Mr. Jenkins became a paratrooper and ultimately a captain in the Green Berets. He is a decorated combat veteran, having served in the Seventh Special Forces Group in the Dominican Republic during the American intervention and later as a member of the Fifth Special Forces Group in Vietnam (1966–1967). He returned to Vietnam on a special assignment in 1968 to serve as a member of the Long Range Planning Task Group; he remained with the Group until the end of 1969, receiving the Department of the Army's highest award for his service. Mr. Jenkins returned to Vietnam on an additional special assignment in 1971.

In 1983, Mr. Jenkins served as an advisor to the Long Commission, convened to examine the circumstances and response to the bombing of the U.S. Marine Barracks in Lebanon. In 1984, he assisted the Inman Panel in examining the security of American diplomatic facilities abroad. In 1985–1986, he served as a member of the Committee of the Embassy of the Future, which established new guidelines for the construction of U.S. diplomatic posts. In 1989, Mr. Jenkins served as an advisor to the national commission established to review terrorist threats following the bombing of Pan Am 103. In 1993, he served as a member of the team contracted by the New Jersey–New York Port Authority to review threats and develop new security measures for the World Trade Center following the bombing in February of that year.

In 1996, President Clinton appointed Mr. Jenkins to the White House Commission on Aviation Safety and Security. From 1999 to 2000, he served as an advisor to the National Commission on Terrorism, and since 2000, he has been a member of the U.S. Comptroller General's Advisory Board. Mr. Jenkins is also the Director of the National Transportation Security Center at the Mineta Transportation Institute and since 1997 has directed the Institute's continuing research on protecting surface transportation against terrorist attacks. Mr. Jenkins is a Special Advisor to the International Chamber of Commerce (ICC) and a member of the advisory board of the ICC's investigative arm, the Commercial Crime Services. Over the years, he has served as a consultant to or carried out assignments for a number of government agencies, including the Department of Homeland Security (DHS). As part of its international project to create a global strategy to combat terrorism, the Club of Madrid in 2004 appointed Mr. Jenkins to lead an international working group on the role of intelligence.

Mr. Jenkins is the author of *International Terrorism: A New Mode of Conflict*; the editor and co-author of *Terrorism and Personal Protection*; the co-editor and co-author of *Aviation Terrorism and Security*; and a co-author of *The Fall of South Vietnam*. His latest books are *Unconquerable Nation: Knowing Our Enemy, Strengthening Ourselves* and *Will Terrorists Go Nuclear?* He is also the author of numerous articles, book chapters, and published research reports on conflict and crime.

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