



Suicide Bombings Against Trains and Buses Are Lethal but Few in Number

by Brian Michael Jenkins, Director, Mineta Transportation Institute's
National Transportation Safety and Security Center
and Bruce R. Butterworth, Research Associate, Mineta Transportation Institute

This Transportation Security Perspective is the sixth in a continuing series produced by the National Transportation Safety and Security Center of the Mineta Transportation Institute. These examine major terrorist attacks and trends in terrorists targeting surface transportation. Previous perspectives include the terrorist bombings in Volgograd, Russia; the assault on passengers at the Kunming train station in China; the security breach at Mineta San Jose Airport; and the reported plot against the Metro in Los Angeles, among others.

To the casual observer, it would appear that suicide attacks on buses and trains are great and growing in number and severity. It also would seem that non-suicide attacks are probably more frequent but never as deadly. There is no doubt that body counts are piling up and that surface transportation is a frequent target. But what do the numbers really tell us?

People are always drawn to suicide attacks. Nothing gets attention more than a person sacrificing their life to kill the innocent. News photos and videos provide graphic testimony. Here are some examples.

- On January 5, 2003, a suicide bomber detonated a device at Tel Aviv's Central Bus Station, killing 26 and injuring over 100. This was one of series of deadly bus bombings that marked the Second Intifada – a Palestinian uprising against Israeli occupation.
- In December of that same year, a suicide bomber killed 46 and wounded more than 170 on a crowded commuter in Stavropol, Russia. Two months later, another suicide bomber killed 40 at a metro station in Moscow.
- On July 7, 2005, three suicide bombers detonated backpacks they were carrying in London's Underground. Unable to enter the crowded Tube station, a fourth attacker detonated his device on a London Transport bus. In all, 52 people were killed, not including the attackers, and more than 700 were injured.
- A second group of suicide bombers tried to replicate the attack two weeks later, but their devices failed to detonate. On March 29, 2010, two female suicide bombers detonated their devices during morning rush hour at two stations of the Moscow Metro, killing at least 40 people and wounding nearly 100.

While concentrated in a handful of countries or territories (Israel, the West Bank, Gaza, Pakistan, Russia, China, and Sri Lanka), authorities have uncovered and thwarted suicide bombing plots targeting transportation facilities in other countries, including at least two in the United States.

Suicide attacks are more lethal.

It has been well established that terrorists seeking high body counts are drawn to surface transportation targets—buses, bus depots, passenger trains, and stations, which offer easy access to crowds of people in confined spaces. In an effort to drive casualty totals even higher, terrorists

can resort to suicide bombings. Recent analysis by the Mineta Transportation Institute shows that these terrorists often succeed. Suicide attacks on surface transportation targets cause over four times more fatalities per attack than non-suicide attacks.

While suicide attacks account for only a small percentage of all attacks, they account for a disproportionate share of the total fatalities. Suicide bombings account for fewer than six percent of all terrorist attacks on buses, but they account for just over 16 percent of the fatalities. Suicide bombings account for 1.6 percent of the attacks on trains and train stations (including subways), but they account for nearly 11 percent of the deaths.

These statistics derive from continuing research performed by the authors on attacks against public surface transportation, using MTI's database of 4,068 attacks beginning with January 1, 1970 and recorded as of October 31, 2014. This includes 2,031 attacks against passenger buses and stations, 1,089 attacks against trains and stations, 583 attacks against rail tracks, 322 attacks against highway infrastructure such as bridges, and 36 attacks against passenger ferries.

Of a total 4,068 attacks, 2,945 were bombings, and 138 were suicide attacks. These suicide attacks accounted for 1,388 fatalities, or 14 percent of all fatalities and nearly 20 percent of those caused by bombings.

Suicide attacks on trains and train stations (18 of 1,089 total attacks, of which 858 were bombings) account for 384 fatalities, which translates to nearly 11 percent of the total fatalities in attacks on train targets and just over 14 percent of the total fatalities from bombings. All suicide attacks were bombings.

Suicide attacks on buses and bus stations (115 out of 2,031 total attacks, of which 1,217 were bombings) account for 1,003 fatalities or just over 16 percent of fatalities in all attacks and 25.5 percent of those resulting from bombings. As with bus targets, all suicide attacks were bombings.

Suicide attacks have become more lethal, while non-suicide attacks less so

Since 1970, the percentage of suicide attacks has been increasing. This conforms to a broader trend in terrorism toward the increasing use of suicide bombings. However, since 1992, that percentage decreases slightly.

This is due not to a decline in the total number of suicide attacks per year, but to the greater increase in the total number of non-suicide attacks. Although impossible to prove either way, it is possible that this is a function of data collection, which has improved in its ability to capture more low level events that were missed in the decades before the data collection began. (MTI began its data collection in 1997.)

The lethality of suicide attacks has been increasing steadily while non-suicide lethality has been decreasing. Our analysis shows a high rate of increase for attacks with either up to five or up to ten fatalities each.

Our analysis also shows that 83 percent of all suicide attacks are against bus targets, indeed a far higher percentage than for non-suicide attacks (30%). Much of this is due to bombings in Israel, the West Bank, and Gaza, many in the terrorist campaign that accompanied the Second Intifada. These attacks account for 50 percent of all suicide attacks on buses and bus stations and 44 percent of all suicide bus attack fatalities.

Train attacks offer higher body counts

However, the most lethal suicide attacks have been against passenger trains, followed by attacks on bus stations and bus stops, which are less than half as lethal. In part, this reflects terrorist strategy as well as the nature of the target. Terrorists can hope to achieve high body counts by carrying out suicide attacks, by carrying out attacks involving the detonation of multiple explosive devices, or by derailing speeding passenger trains. Derailing trains is a daunting task in which terrorists have only occasionally succeeded. However, we should point out that in developing countries like Cambodia and Angola, terrorists have achieved very high body counts by using a combination of bombs and assault weapons, which sometimes include derailments.

The choice in most countries is usually between suicide bombers and multiple bombs in non-suicide attacks. Suicide bombers, as we see here, are lethal, but multiple bombs can rack up very high body counts as we have seen in the attack on the commuter trains in Madrid in 2004, which killed 191 people, and in Mumbai in 2007, which killed 207 people. Suicide bombers are a rare commodity, individually lethal but not easy to recruit in groups. Planting multiple bombs also requires a group, but volunteering for a suicide mission is not a pre-requisite.

In addition, a bus is the target of a single bomb, and only so many people can be killed on a single bus. Therefore, a train may be more suitable to an attack involving multiple bombs. Terrorists have used explosives-filled vehicles to make attacks more lethal by having suicide attackers ram them into crowded buses or into bus terminals or stops, or just by leaving them near those targets.

Jihadist and non-jihadist attacks have some differences

Both jihadist groups—those subscribing to al Qaeda’s or similar ideologies of a religious war against Western infidels in order to ultimately impose a new world order under Sharia law—and non-jihadist groups employ terrorist tactics. Suicide attacks by jihadist and non-jihadist groups are increasing at about the same rate. And the lethality of their attacks is increasing for both types of groups, although it is increasing more for jihadist attackers.

There is less of a difference between suicide attacks and non-suicide attacks by jihadists. All jihadist attacks aim for high body counts. There is a greater difference between non-jihadist suicide and non-jihadist non-suicide attacks, reflecting more diverse motivations and objectives.

Despite their overall higher lethality, only 56 percent of the jihadist devices detonated on target while 19 percent were rendered safe, according to MTI data. In contrast, 84 percent of the non-jihadist devices detonated on target and only five percent were rendered safe.

This may be at least in part explained by the fact that the Palestinian groups that carried out the many lethal suicide bus bombings during the Second Intifada are classified as non-jihadists. Their aims, including the destruction of Israel and the creation of a Palestinian state, are more secular than those who seek to create a caliphate that will eventually rule the world. These groups, however, were highly effective in delivering well-constructed devices. Their failures were not ones of engineering, but rather interceptions by Israeli authorities before they came close to their targets.

Of course, regardless of the group, suicide attacks still kill more than non-suicide attacks, although a few non-suicide tactics, such as placing an explosives-laden vehicle next to a bus stop or terminal, can be as lethal if not more so.

But the number is still relatively few

But let's return to perhaps the most striking number. Only 138 suicide attacks have occurred since 1970, far fewer than most people would think. Meanwhile, just fewer than 4,000 non-suicide attacks have taken place, occasionally with greater lethality. Though growing in number and lethality, suicide attackers in the world of buses and trains are still relatively few. They have not been the unstoppable, monstrous wave of attackers our worst nightmare would conjure up.

(Previous Transportation Security Perspectives include [*By the Numbers: Russia's Terrorists Increasingly Target Transportation; Mineta Transportation Institute Says Subways Are Still in Terrorists' Sights*](#); [*The Breach of Security at San Jose's Airport Raises Broader Issues*](#), and [*The Terrorist Attack in Kunming, China: Does It Indicate a Growing Threat Worldwide?*](#) All are available for free download and no registration.)

ABOUT BRIAN MICHAEL JENKINS

Brian Michael Jenkins is an international authority on terrorism and sophisticated crime. He directs the Mineta Transportation Institute's National Transportation Safety and Security Center, which focuses on research into protecting surface transportation against terrorist attacks. He is also a senior advisor to the president of RAND. From 1989-98, Mr. Jenkins was deputy chairman of Kroll Associates, an international investigative and consulting firm. Before that, he was chairman of RAND's Political Science Department, where he also directed research on political violence. He has authored several books, chapters, and articles on counterterrorism, including *International Terrorism: A New Mode of Conflict* and *Will Terrorists Go Nuclear?* Most recently, he published *When Armies Divide*, a discussion about nuclear arms in the hands of rebelling armies. He also has been principal investigator for many peer-reviewed security-focused research reports for MTI.

ABOUT BRUCE R. BUTTERWORTH

Mr. Butterworth has worked at congressional, senior policy, and operational levels, including with the House Government Operations Committee, Department of Transportation, and 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), chaired U.S. delegations to United Nations committees, and was part of the response to the bombing of Pan Am 103. He was an executive in airline security, and he launched a successful program of dangerous-goods regulation and cargo security after the 1995 ValuJet crash. He worked closely with Congress and other federal-level agencies and departments. Currently, he is a research associate at the Mineta Transportation Institute. Mr. Butterworth received an MS degree from the London School of Economics and a BA degree from the University of the Pacific (magna cum laude). He was a California State Scholar and a Rotary Foundation Fellow.

ABOUT THE MINETA TRANSPORTATION INSTITUTE (MTI):

MTI conducts research, education, and information transfer programs focusing on surface transportation policy and management issues, especially related to transit. MTI was established by Congress in 1991 as part of the Intermodal Surface Transportation Efficiency Act and won national re-designation competitions in 2002, 2006 and 2011. The Institute is funded by Congress through the US DOT Research and Innovative Technology Administration, by the California Legislature through Caltrans, and public and private grants. In 2006 the US Department of Homeland Security selected MTI as a National Transportation Security Center of Excellence. The internationally respected members of the MTI Board of Trustees represent all major surface transportation modes. MTI is the lead institute for the Mineta National Transit Research

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Contact: Donna Maurillo
MTI Communications Director
831-234-4009 (mobile)
donna.maurillo (at) sjsu.edu