Key Questions

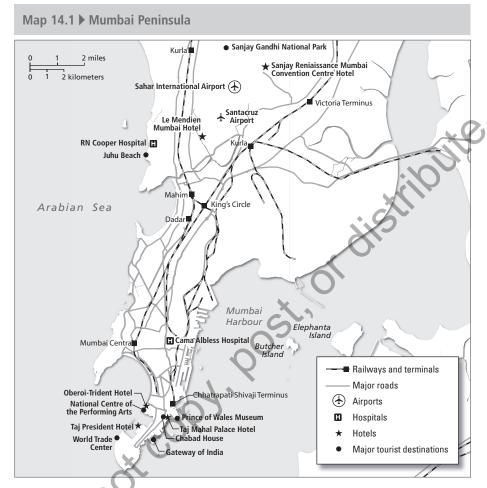
- ▶ What are the most likely terrorist targets in Mumbai?
- What type of attack would the terrorists most likely mount?
- ▶ How would they gain access to the city?
- ▶ What can be done to deter future terrorist attacks?

14 Defending Mumbai from Terrorist Attack

CASE NARRATIVE

The teeming sprawl of modern Mumbai's more than 18 million residents had humble beginnings. Poised on a peninsula jutting into the Arabian Sea (see Map 14.1), the city formerly known as Bombay began its life as a small fishing village populated by native Koli people. Portuguese sailors later claimed the Koli's seven swampy islands but did not see much value in them. In 1661, the Portuguese government gifted the islands to Britain as part of the dowry for Charles II's marriage to Catherine of Braganza. The city's gradual transformation into a bustling hub of world commerce began when the East India Company recognized the potential of the location's natural harbor and leased the islands from the British Crown. The subsequent colonization of India by Britain and the development of the textile industry in the mid-nine-teenth century solidified the city's importance to Asia and the rest of the world.

By 2008, Mumbai had become the epicenter of India's booming economy. The city hosts India's stock exchange and boasts a population density four times greater than that of New York City.³ A recent Global Cities Index rated Mumbai as the world's fourth most populous city, with the twenty-fifth highest gross domestic product.⁴ Mumbai's modern docking facilities, rail connections, and international airport make it India's gateway to the world's globalized economy.⁵ The city is also home to the popular Bollywood film industry, which churns out movies whose financial success is eclipsed only by that of their American counterparts. A virtual kaleidoscope of colors and cultures, Mumbai is both a playground for the fantastically wealthy and a congested shantytown for the urban poor. Local residents boast that it is a city that never sleeps, with streets that are never empty.⁶



Source: Pherson Associates, LLC, 2011.

It was not Mumbai's spectacular growth and increasing globalization that was foremost on the minds of Indian security officials in the fall of 2008, however. In mid-October, the United States had quietly told the Indian government that intelligence collected in Pakistan warned of an "oncoming attack that will be launched by terrorists against hotels and business centers in Mumbai (formerly Bombay)." The source of the warning made it credible, but it lacked specificity about the attackers and their methods, weapons, and targets. Absent such details, it would be difficult to assign priorities in defending the vast city. It fell to Indian intelligence and law enforcement officials to identify the most likely whens, wheres, and hows of an attack.

A History of Violence

Mumbai already had long experience as a target of terrorism. Between 1993 and 2008, terrorists conducted numerous bomb attacks in and around the city (see Table 14.1). Several of the incidents involved simultaneous attacks on multiple targets. In all, 544 died and 1,774 sustained injuries in the attacks. The assailants' weapons of choice included bombs—often hidden or thrown from motor scooters—and grenades. During this period there were no reports of suicide bombings.

The most notable of these attacks occurred in 1993, when Islamic terrorists exploded devices at thirteen locations throughout Mumbai, causing extensive

Table 14.1 ▶ Bomb Blasts in Mumbai, 1993–2008*				
Date	Place	Killed	Injured	
12 March 1993	Thirteen attacks throughout city	257	700	
23 January 1998	Kanjurmarg Station	unknown	unknown	
24 January 1998	Goregaon and Malad railway tracks	0	2	
27 February 1998	Three bombings at Virar, Santa Cruz, and Kandivali railway stations	9	22	
2 December 2002	Bus in Ghatokpar at railway station	3	34	
6 December 2002	Air-conditioning vent in McDonald's, central railway station	0	25	
27 January 2003	Bicycle near Vile Parle railway station	1	25	
13 March 2003	Train car at Mulund Station	10	70	
14 April 2003	Parcel at V. N. Jewelers in Bandra	1	0	
28 July 2003	Bus in Ghatkopar near a telephone exchange	4	32	
25 August 2003	Two taxis at Gateway of India and Zaveri Bazaar	50	150	
11 July 2006	Seven trains around the city	209	714	
	Total Casualties	544	1,774	

^{*}No attacks were recorded in 2007 and 2008.

casualties. The targets ranged from hotels to the airport to bazaars. The modus operandi was a staged vehicle with RDX bombs (see Box 14.1, on RDX bombs), although the assailants also threw grenades at some of the targets. The attack was orchestrated by Dawood Ibrahim, a well-known organized crime leader, in response to ongoing violence between Hindus and Muslims in prior months and, more specifically, as retaliation for the destruction of a sixteenth-century mosque in late 1992. Hinduism is the dominant religion in India; only 12 percent of the population is Muslim. Perceived inequities have been a major factor sparking intercommunal violence in the country.

Box 14.1 RDX BOMBS

RDX, commonly known as cyclonite, was widely used during World War II, often in explosive mixtures with TNT.ⁱ During World War II, the British termed cyclonite "Research Department Explosive" (R.D.X.) for security reasons and used it as a more powerful form of TNT for attacking German U-boats.ⁱⁱ It was one of the first plastic explosives and has been used in many terrorist plots.ⁱⁱⁱ Outside of military applications, RDX is used in controlled demolition to raze structures. Ahmed Ressam, the al-Qaeda "Millenium Bomber," used a small quantity of RDX as one of the components in the explosives that he prepared to bomb Los Angeles International Airport on New Year's Eve, 1999–2000; the combined explosives could have produced a blast forty times greater than that of a devastating car bomb.^{iv}

i. Tenney L. Davis, *The Chemistry of Powder and Explosives*, Vol. II (New York: John Wiley & Sons, 1943).

ii. MacDonald and Mack Partnership, *Historic Properties Report: Newport Army Ammunition Plant; Newport Indiana*, AD-A175 818, prepared for National Park Service (Minneapolis, MN: McDonald and Mack Partnership, 1984), 18, http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA175818.

iii. John Sweetman, *The Dambusters Raid* (London: Cassell Military Paperbacks, 2002), 144.

iv. *US v. Ressam*, US Court of Appeals for the Ninth Circuit (February 2, 2010), http://www.nefafoundation.org/miscellaneous/US_v_Ressam_9thcircuit appeals0210.pdf; *US v. Ressam*, US District Court, Western District of Washington at Seattle, December 1999, http://nefafoundation.org/miscellaneous/FeaturedDocs/U.S._v_Ressam_Complaint.pdf.

Five years later, a series of bombings occurred at train stations across the city and in the suburbs. Over a two-month period, assailants conducted successful attacks at six different train stations in three separate incidents. The terrorists targeted railway stations, platforms, and tracks. During the trial of the accused men, the prosecutor argued the attack was conducted at the behest of the Pakistani Inter-Services Intelligence (ISI). Some of the blasts occurred the night before parliamentary elections.

From December 2002 through August 2003, seven violent incidents occurred. Although all the attacks involved bombings, these incidents had the most variation in attack method. In the first attack on 2 December, a bomb was placed on a bus at the Ghatkopar train station. Four days later, a bomb exploded in an air-conditioning vent inside a McDonald's fast-food restaurant at the central railway station. Roughly a month and a half later, on 27 January, a bomb attached to a bicycle exploded at the Vile Parle train station. About two weeks later, on 13 March, a bomb exploded inside a train car at the Mulund train station. The most unusual attack occurred a month later, on 14 April, when a parcel exploded inside a jeweler's store. No attacks were recorded in May or June, but on 28 July a bus at Ghatkopar train station was destroyed by a bomb. The final and deadliest attack in this series occurred on



Wreckage from 25 August 2003 terrorist bombing attacks at Zaveri Bazaar in Mumbai.

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25 August. Two taxis exploded at the Gateway of India and at the Zaveri Bazaar, killing 50 people and injuring 150.¹⁸

Most of the attacks were traced back to radical Islamic groups; most of these were based in Pakistan. Authorities believed the Student Islamic Movement of India (SIMI) was responsible for the 6 December 2002 and 25 August 2003 attacks; Laškar-ě-Taiba (LeT) was suspected in the 25 August 2003 attack as well.¹⁹

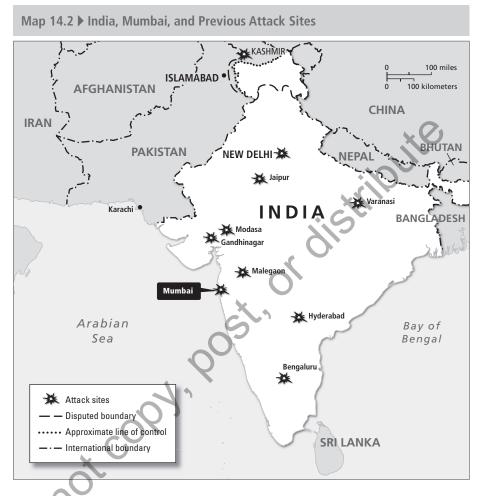
Almost three years passed until the next incident, which came to be called 7/11. On 11 July 2006, seven explosions occurred on seven trains along the western rail line in Mumbai between 1824 and 1835 hours. The explosions occurred at or near the Khar, Mahim, Matunga, Jogeshwari, Borivili, and Bhayandra-Mira Road train stations and between the Khar and Santa Cruz stations. Each bomb consisted of a pressure cooker filled with 2.5 kilograms of RDX and ammonium nitrate; the bombs were placed inside first-class train compartments. Indian officials claimed that SIMI and LeT conducted the attacks on behalf of the Pakistani ISI.

Recent Major Terrorist Attacks in India

Mumbai has not been the only target of attack for Muslim and separatist groups. From 2001 to 2008, twenty-one major incidents occurred elsewhere in India (see Map 14.2).²³ Some 550 people died in these attacks, most of which involved bombs.

Assailants used a vehicle-borne improvised explosive device (VBIED) to blow up the front gate of the Jammu and Kashmir state assembly complex on 1 October 2001. Two attackers entered the complex and opened fire until security forces shot and killed them.²⁴ Two months later, on 13 December 2001, five individuals attacked the National Parliament in New Delhi using AK-47s and grenades.²⁵ At least one of the attackers was wearing a suicide vest, but it exploded after he was shot, and it did not harm anyone.²⁶ The terrorist group Jaish-e-Mohammed (JEM) claimed responsibility for the October attack, and some of its members were convicted; authorities also suspected LeT of involvement.²⁷

On 24 September 2002, terrorists launched a similar attack on the Hindu temple complex in Gandhinagar. Two terrorists entered the complex and opened fire with AK-47s; they also threw hand grenades before being killed by Indian commandos.²⁸ Another attack using similar tactics occurred on 14 May 2002, when three attackers fired at a bus and then attacked the Kalu Chak army camp in Jammu.²⁹ LeT was suspected of conducting the attack, and press reports raised the specter of Pakistani support.³⁰



Source: Pherson Associates, LLC, 2011.

Sporadic bombings continued for several years.

- ▶ On 15 August 2004, a bomb exploded in Assam during the Independence Day parade.³¹ The attack was attributed to the United Liberation Front of Asom (ULFA),³² a terrorist group with the goal of "establishing a 'sovereign socialist Assam' through armed struggle."³³
- ▶ On 29 October 2005, three bombs exploded during the festival of lights in New Delhi³⁴ at two marketplaces and on a bus.³⁵ Police suspected that a group connected to LeT, called Inquilab, was responsible for the attack.³⁶

- ▶ Terrorists detonated bombs at the Sankat Mochan temple and a train and hall in the Cantonmen railway station in Varanasi on 7 March 2006. The tactics were similar to those used in the Gandhinagar attack, and as many as ten other bombs were found throughout the city.³⁷
- On 8 September 2006, two or three bicycle bombs exploded at a Muslim graveyard near a mosque just before prayers began on Shab-e-Barat. Although it is not clear who was responsible for the attack, one person arrested for the incident had ties to LeT. 39

In 2007, the frequency of attacks began to escalate. In the past, nearly all attacks on trains in India had occurred at or near a primary rail station. On 19 February 2007, however, two crude briefcase bombs were detonated on a train near the village of Dewana and set the train on fire. The train was heading to the Pakistani–Indian border when it caught fire. Officials found two unexploded briefcases in other cars on the train. The attack took place the day before scheduled India–Pakistan peace talks began.⁴⁰

Only three months later, on 18 May 2007, a bomb exploded during prayers at the Mecca Masjid in Hyderabad, a city populated mostly by Muslims. ⁴¹ In addition to the bomb that detonated, police found two unexploded bombs with cell phone triggers inside the mosque that had failed to explode. Following the blast, Muslim protestors at the site became unruly, and police fired into the crowd, killing some of the protestors. ⁴² Hyderabad was the site of violence again when two bombs exploded in the early evening of 25 August 2007. The terrorists targeted the Lumbini Amusement Park and the restaurant Gokul Chat Bhandar. ⁴³ Authorities discovered nineteen other bombs hidden throughout the city. ⁴⁴

On 11 October, a blast at a Sufi mosque in Ajmer killed three people. A few days later, on 14 October, a theater in Ludhiana was rocked with an explosion that killed seven people. Three simultaneous bombs on 23 November in judicial complexes in Lucknow, Varanasi, and Faizabad killed thirteen.⁴⁵

The number of terrorist attacks escalated even further beginning in May 2008. On 13 May, seven bombs exploded in Jaipur at several markets and Hindu temples. On 25 July 2008, eight bombs exploded in Bengaluru (formerly Bangalore). The next day, sixteen bombs exploded in Ahmedabad. Then, on 13 September, five bombs exploded in the markets of New Delhi. Suspicion for the Jaipur, Bengaluru, and New Delhi attacks fell on SIMI, LeT, and Harkat-ul-Jehad-al-Islami (HUJI), a Sunni terrorist group. 46 SIMI was also associated with the Ahmedabad attack. 47 A group called the Indian Mujahideen, however, claimed responsibility for the Jaipur, Ahmedabad, and New Delhi attacks. 48

Two weeks after the explosions in New Delhi, another bomb went off in the city on 24 September 2008. Two terrorists dropped the bomb in a bag from their motorcycle, and a ten-year-old boy was trying to return it to them when the bomb exploded.⁴⁹ Two days later, in the towns of Modasa and Malegaon, two bombs exploded nearly simultaneously after being dropped from motorcycles.⁵⁰ The attack in Modasa occurred in a Muslim-dominated market.⁵¹ In Malegaon, the blast occurred near a building previously used by SIMI before it was banned.⁵²

Three attacks occurred in the following month. The first occurred in Kanpur when a bomb on a bicycle exploded on 14 October. The next attack occurred a week later on 21 October in Imphal. The bomb had been placed on a motor scooter and may have been targeting a nearby police complex. Authorities suspected a separatist group called the People's Revolutionary Party of Kangleipak, based out of Myanmar (Burma), of conducting the bombing. The deadliest of the attacks that month occurred on 30 October in Assam. As with the attacks in Jaipur, Ahmedabad, and Bengaluru, and the first New Delhi attack in September 2008, multiple bombs—eighteen—using RDX exploded throughout the city nearly simultaneously. Authorities suspected HUJI and ULFA of carrying out the attacks.

Countering the Threat

Responsibility for defending Mumbai from terrorist attack is shared by several law enforcement and intelligence organizations at both the local and national levels. At the national level, in addition to military intelligence, two main civilian intelligence services as well as other ministries share an intelligence mandate. At the local level, the police respond to and share information based on national-level guidance regarding terrorist activities.

The Research and Analysis Wing (RAW) and the Intelligence Bureau are the two main civilian intelligence services. The RAW is the country's foreign intelligence unit and focuses primarily on issues outside India's borders, mostly in the neighboring countries of Pakistan and Bangladesh.⁵⁸ The Intelligence Bureau concentrates primarily on domestic security.⁵⁹ Both services are routinely engaged in collecting intelligence on and assessing the threat posed by militant Pakistani Islamist groups. Along with RAW, the Army's Signals Intelligence Directorate collects signals intelligence that has the potential to reveal terrorist planning and operations.⁶⁰

India's Ministry of Home Affairs has several armed units it can task to assist in internal security matters. The Border Security Force is a paramilitary service dedicated to monitoring the country's international frontiers.⁶¹ The Indian Home Guard is a paramilitary force capable of serving as an auxiliary to the Indian Police Service—a nationwide law enforcement unit. The National Security Guard, also known as the "Black Cats," is a highly trained counterterrorism force capable of preventing or responding to large-scale terror assaults.⁶²

In addition to these national resources, the Mumbai Police Department has had extensive experience trying to counter terrorist attacks. In 2004, the Mumbai Police Department created an elite Anti-Terrorism Squad to exchange information on terrorist threats and coordinate its activities with national intelligence agencies. Members of the squad receive special weapons and tactics training.⁶³

RECOMMENDED READINGS

20 Mot cop

Rabasa, Angel, et al. *The Lessons of Mumbai*. Santa Monica, CA: RAND Corporation, 2009. http://www.rand.org/pubs/occasional_papers/2009/RAND OP249.pdf.

Rotella, Sebastian. "On the Trail of a Terrorist." *Washington Post*, November 14, 2010. http://www.washingtonpost.com/wp-dyn/content/article/2010/11/13/AR2010111304345.html.

Table 14.2 ▶ Case Snapshot: Defending Mumbai from Terrorist Attack				
Structured Analytic Technique Used	Heuer and Pherson Page Number	Analytic Family		
Structured Brainstorming	p. 102	Idea Generation		
Red Hat Analysis	p. 223	Assessment of Cause and Effect		
Classic Quadrant Crunching™	p. 122	Idea Generation		
Indicators	p. 149	Scenarios and Indicators		
Indicators Validator™	p. 157	Scenarios and Indicators		

DEFENDING MUMBAI FROM TERRORIST ATTACK

Structured Analytic Techniques in Action

It is mid-October 2008. You are an analyst working in the Mumbai Police Department, and you just received the US warning about the threat to Mumbai from the Intelligence Bureau in New Delhi. Analysis of the threat has to be done quickly in order to develop guidance to help authorities anticipate and detect the type of attack that is being planned. Although no analyst has a crystal ball, it is incumbent upon analysts to help law enforcement officials and policy makers anticipate how adversaries will behave, outline the range of possible futures that could develop, and recognize the signs that a particular future is beginning to take shape. The techniques in this case—Structured Brainstorming, Red Hat Analysis, Classic Quadrant CrunchingTM, Indicators, and the Indicators ValidatorTM—can help analysts tackle each part of this task.

Technique 1: Structured Brainstorming

Brainstorming is a group process that follows specific rules and procedures designed for generating new ideas and concepts. The stimulus for creativity comes from two or more analysts bouncing ideas off each other. A brainstorming session usually exposes an analyst to a greater range of ideas and perspectives than the analyst could generate alone, and this broadening of views typically results in a better analytic product. (See eight rules for successful brainstorming in Box 14.2.)

Box 14.2 EIGHT RULES FOR SUCCESSFUL BRAINSTORMING

- Be specific about the purpose and the topic of the brainstorming session.
- 2. Never criticize an idea, no matter how weird, unconventional, or improbable it might sound. Instead, try to figure out how the idea might be applied to the task at hand.
- 3. Allow only one conversation at a time and ensure that everyone has an opportunity to speak.
- 4. Allocate enough time to complete the brainstorming session.
- 5. Engage all participants in the discussion; sometimes this might require "silent brainstorming" techniques such as asking everyone to be quiet for five minutes and write down their key ideas on 3×5 cards and then discussing what everyone wrote down on their cards.
- 6. Try to include one or more "outsiders" in the group to avoid groupthink and stimulate divergent thinking. Recruit astute thinkers who do not share the same body of knowledge or perspective as other group members but have some familiarity with the topic.
- 7. Write it down! Track the discussion by using a whiteboard, an easel, or sticky notes.
- 8. Summarize key findings at the end of the session. Ask the participants to write down their key takeaways or the most important things they learned on 3×5 cards as they depart the session. Then, prepare a short summary and distribute the list to the participants (who may add items to the list) and to others interested in the topic (including those who could not attend).

Structured Brainstorming is a more systematic twelve-step process for conducting group brainstorming. It requires a facilitator, in part because participants are not allowed to talk during the brainstorming session. Structured Brainstorming is most often used to identify key drivers or all the forces and factors that may come into play in a given situation.

Task 1. Conduct a Structured Brainstorming exercise to identify all the various modes of transport the assailants might use to enter Mumbai.

- **STEP 1:** Gather a group of analysts with knowledge of the target and its operating culture and environment.
- **STEP 2:** Pass out sticky notes and marker-type pens to all participants. Inform the team that there is no talking during the sticky-notes portion of the brainstorming exercise.
- **STEP 3:** Present the team with the following question: What are all the various modes of transport the assailants might use to enter Mumbai?
- **STEP 4:** Ask them to pretend they are Muslim terrorists and simulate how they would expect the assailants to think about the problem. Emphasize the need to avoid mirror imaging. The question is not "What would you do if you were in their shoes?" but "How would the assailants think about this problem?"
- STEP 5: Ask the group to write down responses to the question with a few key words that will fit on a sticky note. After a response is written down, the participant gives it to the facilitator, who then reads it out loud. Marker-type pens are used so that people can easily see what is written on the sticky notes when they are posted on the wall.
- STEP 6: Post all the sticky notes on a wall in the order in which they are called out. Treat all ideas the same. Encourage participants to build on one another's ideas. Usually an initial spurt of ideas is followed by pauses as participants contemplate the question. After five or ten minutes there is often a long pause of a minute or so. This slowing down suggests that the group has "emptied the barrel of the obvious" and is now on the verge of coming up with some fresh insights and ideas. Do not talk during this pause, even if the silence is uncomfortable.
- **STEP 7:** After two or three long pauses, conclude this divergent-thinking phase of the brainstorming session.
- **STEP 8:** Ask all participants (or a small group) to go up to the wall and rearrange the sticky notes by affinity groups (groups that have some common characteristics). Some sticky notes may be moved several times; some may also be copied if an idea applies to more than one affinity group.
- **STEP 9:** When all sticky notes have been arranged, ask the group to select a word or phrase that best describes each grouping.

- STEP 10: Look for sticky notes that do not fit neatly into any of the groups.

 Consider whether such an outlier is useless noise or the germ of an idea that deserves further attention.
- **STEP 11:** Assess what the group has accomplished. How many different ways have you identified that the assailants could transport a team to Mumbai?
- **STEP 12:** Present the results, describing the key themes or dimensions of the problem that were identified. Consider less conventional means of presenting the results by engaging in a hypothetical conversation in which terrorist leaders discuss the issue in the first person.

Analytic Value Added. Were we careful to avoid mirror imaging when we put ourselves "in the shoes" of Muslim terrorist planners? Did we explore all the possible forces and factors that could influence how the terrorists might gain access to Mumbai to launch their attack? Did we cluster the ideas into coherent affinity groups? How did we treat outliers or sticky notes that seemed to belong in a group all by themselves? Did the outliers spark any new lines of inquiry?

Technique 2: Red Hat Analysis

Analysts frequently endeavor to forecast the actions of an adversary or a competitor. In doing so, they need to avoid the common error of mirror imaging, the natural tendency to assume that others think and perceive the world in the same way as they do. Red Hat Analysis is a useful technique for trying to perceive threats and opportunities as others see them, but this technique alone is of limited value without significant understanding of the cultures of other countries, groups, or people involved. There is a great deal of truth to the maxim that "where you stand depends on where you sit." By imagining the situation as the target perceives it, an analyst can gain a different and usually more accurate perspective on a problem or issue.

Reframing the problem typically changes the analyst's perspective from that of an analyst observing and forecasting an adversary's behavior to that of someone who must make difficult decisions within that operational culture. This reframing process often introduces new and different stimuli that might not have been factored into a traditional analysis.

Task 2. Use Red Hat Analysis to prioritize the list of various modes of transport the terrorists might use to enter Mumbai.

- **STEP 1:** Gather a group of experts with in-depth knowledge of the target, operating environment, and the terrorist group's motives and style of thinking. If at all possible, try to include people who are well grounded in Mumbai's culture, speak the language, share the same ethnic background, or have lived extensively in the region.
- **STEP 2:** Ask group members to develop a list of criteria that they would most likely use when deciding which modes of transport they personally would choose to enter Mumbai. The reason for first asking the group *how* it would act is to establish a baseline for assessing whether the terrorists are likely to act differently.
- **STEP 3:** Use this list to prioritize the ideas that were generated for each affinity group in the structured brainstorming session, placing the most likely choice for that group at the top of the list and the least likely at the bottom.
- **STEP 4:** After prioritizing the ideas in each affinity group, generate a master list combining all of the lists. The most likely ideas overall should be at the top of the list and the least likely overall at the bottom.
- **STEP 5:** Once the group has articulated *how* it would have acted, ask it to explain *why* the group members think they would behave that way. Ask them to list what core values or core assumptions were motivating their behavior or actions. Again, this step establishes a baseline for assessing *why* the adversary is likely to react differently.
- Step 6: Once the group can explain in a convincing way why it chose to act the way it did, ask the group members to put themselves in the shoes of the terrorists and simulate how they would respond, repeating Steps 2 to 4. Emphasize the need to avoid mirror imaging. The question now is not "What would you do if you were in their shoes?" but "How would the terrorists approach this problem, given their background, past experience, and the current situation?"
- **Step 7:** At this point, after all the terrorists' ideas are gathered and prioritized, the group should ask, "Do the terrorists share our values or methods of operation?" If not, then how do those differences lead them to act in ways we might not have anticipated before engaging in this exercise?

- **Step 8:** Present the results, describing the alternatives that were considered and the rationale for selecting the modes of transit the terrorists are most likely to choose. Consider less conventional means of presenting the results of the analysis, such as the following:
 - Describing a hypothetical conversation in which the terrorists would discuss the issue in the first person.
 - Drafting a document (set of instructions, military orders, or directives) that the leader of the terrorist group would likely generate.

Analytic Value Added. Was your list of criteria comprehensive? Did some criteria deserve greater weight than others? Did you reflect this when you rated the various ideas?

Technique 3: Classic Quadrant CrunchingTM

Classic Quadrant CrunchingTM combines the methodology of a Key Assumptions Check⁶⁴ with Multiple Scenarios Generation⁶⁵ to generate an array of alternative scenarios or stories. This process is particularly helpful in the Mumbai case because little is known about the actual plans and intentions of the attackers. This technique helps the analyst identify and challenge key assumptions that may underpin the analysis while generating an array of credible alternative scenarios to help law enforcement focus on the most likely types of attacks to anticipate.

- *Task 3.* Use Classic Quadrant CrunchingTM to brainstorm all the possible ways terrorists might launch an attack on Mumbai. List the scenarios from most to least likely.
- **STEP 1:** State your lead hypothesis.
- **STEP 2:** Break the lead hypothesis down into its component parts based on the journalist's list of Who? What? How? When? Where? and Why?
- **STEP 3:** Identify which of these components are most critical to the analysis.
- **STEP 4:** For each of the critical components, identify two or four (an even number) contrary dimensions in a table (a sample template is provided in Table 14.3).

Table 14.3 ▶ Classic Quadrant Crunching™ Matrix Template				
Key Components of the Lead Hypothesis	Contrary or Alternative Dimensions			

- **STEP 5:** Array combinations of these contrary assumptions in sets of 2×2 matrices.
- **STEP 6:** Generate one or two credible scenarios for each quadrant.
- **STEP 7:** Array all the scenarios generated in a single list with the most credible scenario at the top of the list and the least credible at the bottom.

Analytic Value Added. Which scenario is the most deserving of attention? Should attention focus on just one scenario, or could several scenarios play out simultaneously? Are any key themes present when reviewing the most likely set of attention-deserving scenarios? Does this technique help one determine where to devote the most attention in trying to deter the attack or mitigate the potential damage of the attack?

Technique 4: Indicators

Indicators are observable or deduced phenomena that can be periodically reviewed to track events, anticipate an adversary's plan of attack, spot emerging trends, distinguish among competing hypotheses, and warn of unanticipated change. An indicators list is a preestablished set of actions, conditions, facts, or events whose simultaneous occurrence would argue strongly that a phenomenon is present or about to be present or that a hypothesis is correct. The identification and monitoring of indicators are fundamental tasks of intelligence analysis, because they are the principal means of avoiding surprise. In the law enforcement community, indicators are used to assess whether a target's activities or behavior are consistent with an established pattern or lead hypothesis. These are often described as backward-looking or descriptive indicators. In intelligence analysis, indicators are often described as forward-looking or predictive indicators.

Preparation of a detailed indicator list by a group of knowledgeable analysts is usually a good learning experience for all participants. It can be a useful medium for an exchange of knowledge between analysts from different organizations or those with different types of expertise—for example, counterterrorism or counterdrug analysis, infrastructure protection, and country expertise. The indicator list can become the basis for conducting an investigation or directing collection efforts and routing relevant information to all interested parties. Identification and monitoring of indicators or signposts that a scenario is emerging can provide early warning of the direction in which the future is heading, but these early signs are not obvious. The human mind tends to see what it expects to see and to overlook the unexpected. Indicators take on meaning only in the context of a specific scenario with which they have been identified. The prior identification of a scenario and associated indicators can create an awareness that prepares the mind to recognize and prevent a bad scenario from unfolding or help a good scenario to come about.

- *Task 4.* Create separate sets of indicators for the most attention-deserving scenarios, including those that were generated in Task 3, the Classic Quadrant CrunchingTM exercise.
- **STEP 1:** Create a list of the most attention-deserving scenarios to track for this case.
- **STEP 2:** Work alone, or preferably with a small group, to brainstorm a list of indicators for each scenario.
- **STEP 3:** Review and refine each set of indicators, discarding any that are duplicative and combining those that are similar.
- **STEP 4:** Examine each indicator to determine if it meets the following five criteria. Discard those that are found wanting.
 - Observable and collectible. There must be some reasonable expectation that, if present, the indicator will be observed and reported by a reliable source. If an indicator is to monitor change over time, it must be collectible over time.
 - 2. **Valid.** An indicator must be clearly relevant to the endstate the analyst is trying to predict or assess, and it must be inconsistent with all or at least some of the alternative explanations or outcomes. It must accurately measure the concept or phenomenon at issue.

- Reliable. Data collection must be consistent when comparable methods are used. Those observing and collecting data must observe the same things. Reliability requires precise definition of the indicators.
- 4. **Stable.** An indicator must be useful over time to allow comparisons and to track events. Ideally, the indicator should be observable early in the evolution of a development so that analysts and decision makers have time to react accordingly.
- 5. Unique. An indicator should measure only one thing and, in combination with other indicators, should point only to the phenomenon being studied. Valuable indicators are those that not only are consistent with a specified scenario or hypothesis but also are inconsistent with all other alternative scenarios.

Analytic Value Added. Are the indicators mutually exclusive and comprehensive? Have a sufficient number of high-quality indicators been generated for each scenario to enable an effective analysis? Can the indicators be used to help detect a planned attack or deter a possible hostile course of action?

Technique 5: Indicators ValidatorTM

The Indicators ValidatorTM is a simple tool for assessing the diagnostic power of indicators. Once an analyst has developed a set of attention-deserving alternative scenarios or competing hypotheses, the next step is to generate indicators for each scenario or hypothesis that would appear if that particular scenario were beginning to emerge or that particular hypothesis were true. A critical question that is not often asked is whether a given indicator would appear only for the scenario or hypothesis to which it is assigned or also in one or more alternative scenarios or hypotheses. Indicators that could appear under several scenarios or hypotheses are not considered diagnostic; that is, they are not particularly useful in determining whether a specific scenario is beginning to emerge or a particular hypothesis is true. The ideal indicator is highly likely for the scenario to which it is assigned and highly unlikely for all others.

Task 5. Use the Indicators ValidatorTM to assess the diagnosticity of your indicators.

- STEP 1: Create a matrix similar to that used for Analysis of Competing Hypotheses. 66 This can be done manually or by using the Indicators Validator TM software. Contact Globalytica, LLC at THINK-Suite@globalytica.com or go to http://www.globalytica.com to obtain access to the Indicators Validator Software if it is not available on your system. List the alternative scenarios along the top of the matrix and the indicators that have been generated for each of the scenarios down the left side of the matrix.
- **STEP 2:** Moving across the indicator rows, assess whether the indicator for each scenario
 - Is highly likely to appear
 - Is likely to appear
 - Could appear
 - Is unlikely to appear
 - Is highly unlikely to appear

Indicators developed for their particular scenario, the home scenario, should be either highly likely or likely.

If the software is unavailable, you can do your own scoring. If the indicator is *highly likely* in the home scenario, then in the other scenarios,

- Highly likely is 0 points.
- Likely is 1 point.
- Could is 2 points.
- Unlikely is 4 points.
- Highly unlikely is 6 points.

If the indicator is *likely* in the home scenario, then in the other scenarios,

- ▶ Highly likely is 0 points.
- Likely is 0 points.
- Could is 1 point.
- Unlikely is 3 points.
- Highly unlikely is 5 points.
- **STEP 3:** Tally up the scores across each row and then rank order all the indicators.

- STEP 4: Re-sort the indicators, putting those with the highest total score at the top of the matrix and those with the lowest score at the bottom. The most discriminating indicator is highly likely to emerge under the home scenario and highly unlikely to emerge under all other scenarios. The least discriminating indicator is highly likely to appear in all scenarios. Most indicators will fall somewhere in between.
- **STEP 5:** The indicators with the most highly unlikely and unlikely ratings are the most discriminating and should be retained.
- **STEP 6:** Indicators with no highly unlikely or unlikely ratings should be discarded.
- STEP 7: Use your judgment as to whether you should retain or discard indicators that score fewer points. Generally, you should discard all indicators that have no highly unlikely or unlikely ratings. In some cases, an indicator may be worth keeping if it is useful when viewed in combination with several other indicators.
- **STEP 8:** Once nondiscriminating indicators have been eliminated, regroup the indicators under their home scenarios.
- **STEP 9:** If a large number of indicators for a particular scenario have been eliminated, develop additional—and more diagnostic—indicators for that scenario.
- **STEP 10:** Recheck the diagnostic value of any new indicators by applying the Indicators Validator TM to them as well.

Analytic Value Added. Does each scenario have a robust set of highly diagnostic indicators? Do these indicator lists provide useful leads for alerting local officials and businesspeople, such as hotel and restaurant owners, of plausible attack scenarios? Are the indicators focused enough to generate specific collection requirements or follow-on tasking by giving local officials and businesspeople a more concrete idea of what to look for?

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