# 4

# The key to a megacity: Information

A recent addition to aggregating mobile, social, and location is Ushahidi, a platform that unifies data gathered from multiple sources (SMS, email, web) and distributes it onto a visual map or timeline. This technology was used to track the 'Snowmaggedon' storm in Washington D.C. last winter as well as tracking the progress of voting in India and the movement of swine flu across a map area. Most notably, this technology is being used for post-crisis information in Haiti. It is an open-source platform, which allows developers to see behind the technology and build additional features upon it. The site is rich in documentation to allow users to customize it for specific tasks.[1]

—American Red Cross, *The case for integrating crisis response with social media*

Rescue personnel will need to have information beyond what a two-dimensional grid coordinate can provide. Otherwise time will be lost in trying to determine where in a multi-story building individuals in need are located.[2]

—Russell W. Glenn et al., *Achieving Convergence during Humanitarian Assistance and Disaster Relief Operations*

1 American Red Cross, *The case for integrating crisis response with social media*, Paper, Washington, DC: American Red Cross, August 2010.

2 Russell W. Glenn, Colin Christopher, Caleb Dexter, David Norton and Robert Nussbaumer (eds), *Achieving Convergence during Humanitarian Assistance and Disaster Relief Operations in the World's Largest Urban Areas: Proceedings of the 'Current and Future Operations in Megacities' Conference, Tokyo, Japan, July 16–18, 2019*, Fort Eustis, VA: US Army Training and Doctrine Command, 1 October 2019, available from: community.apan.org/wg/tradoc-g2/mad-scientist/m/tokyo-megacities-conference-2019/294569.

Doctors and citizens came together, convincing reporters to warn that the 28 September Liberty Loan parade should be cancelled lest the highly contagious malady infect the thousands who would be packed in close company.[3] Editors refused to publish articles passing on the message. The parade went on as scheduled. At its peak proficiency, the disease would claim the lives of 759 people in a single day. Nearly all the city's eventual total of more than 12,000 dead fell in just six weeks. Few came forward when the city's Bureau of Child Hygiene begged for volunteers to take in the children of the perished or perishing. A medical student working in an emergency medical hospital saw not a single car as he drove the 20 kilometres home one night during the epidemic. He wrote of Philadelphia: 'The life of the city had almost stopped.' To the south-west, 51 per cent of San Antonians became sick, blood flowing from ears, noses, eyes and mouths—the last in a foamy mixture coughed up from deep within the lungs. Cities throughout the country ran short of coffins. Health officials started lying, desperate to contain the panic. The surgeon general assured Americans that all they had to do was follow precautionary guidelines to avoid becoming sick. The head of Los Angeles' public health department reinforced such dispatches. The public quickly came to recognise them as falsehoods. New York City's public health director blamed 'other bronchial diseases', not the real threat of Spanish flu. A British medical journal reassured readers that the influenza was gone when the disease paused to take a breath. Instead, as one author later put it: 'It was more like a great tsunami that initially pulls water away from the shore—only to return in a towering, overwhelming surge.' It was 1918. Trust was as much a victim as were the sick. People fled from their neighbours and neighbourhoods. Hundreds reportedly starved when the ill were left alone and none risked coming near. Almost exactly a century later US citizens would again be victimised by some political leaders' wilful ignorance or deliberate deception as Covid-19 stalked the streets.

It is not melodramatic to say that several of the world's megacities constantly flirt with disaster. That does not equate to pending devastation. We know Manila, Tokyo, Berlin, Paris and London survived World War II. New York City endured Hurricane Sandy and Covid-19. Mexico City, Tokyo (again), Los Angeles, Mumbai and what is now Istanbul exist

3 Material and quotations from the description of the 1918 influenza pandemic are adapted John M. Barry, 'How the horrific 1918 flu spread across America', *Smithsonian Magazine*, November 2017, available from: www.smithsonianmag.com/history/journal-plague-year-180965222/.

despite substantial and repeated earthquakes.[4] Manila was 80 per cent flooded in 2009 when Typhoon Ketsana (known as Tropical Storm Ondoy in the Philippines) dropped an average month's rain on the city in six hours. The region has experienced six severe earthquakes during the past century. Authorities admit the urban area is not sufficiently prepared for another despite parts of the megacity spanning two major fault lines.[5] Some of these urban areas are sure to suffer and survive again. Accurate information-sharing before, during and after disasters will underpin the best plans and responses.

## Help thy neighbour

> A woman rushed up to us in a state of frenzy in her night attire covered in grime and dust, blood streaming from her face and pleading with us to save her child trapped in the wreckage of her home. We tried to grope our way beneath the wreckage in a vain search for the child when we heard a groaning sound and a feeble voice saying, 'Oh please somebody help me.' [It] was that of an elderly woman, pinned down by the weight of the debris and ceiling, and after a struggle [we] managed to extricate her … What happened to the poor child for whom we began the search I never knew.[6]
>
> —Kenneth Holmes, quoted in Aaron William Moore, *Bombing the City*

> We looked around and saw a drab collection of small cement houses lining narrow, busy streets. When Matsuda-san described the neighborhood to us, however, it was clear he saw something different. He saw a community. He saw a few thousand people—the residents, the merchants, the students and teachers at our

4 Regarding Mumbai and earthquakes, see Mazhuvanchery Avarachen Sherly, Subhankar Karmakar, Devanathan Parthasarathy, Terence Chan and Christian Rau, 'Disaster vulnerability mapping for a densely populated coastal urban area: An application to Mumbai, India', *Annals of the Association of American Geographers* 105(6) (2015): 1198–220, at 1201, doi.org/10.1080/00045608.2015.1072792.

5 Sara Meerow, 'Double exposure, infrastructure planning, and urban climate resilience in coastal megacities: A case study of Manila', *Environment and Planning A: Economy and Space* 49(11) (2017): 2649–72, at 2651, doi.org/10.1177/0308518X17723630; and Roberts, 'Risk and resilience in Asian cities'. Roberts notes that though the disaster risk-management plans for Quezon and Makati cities within the Manila megacity lacked institutional capacity, technical capabilities and financing to make them effective, their existence and implementation in the aftermath of this storm made their response 'far more effective' than that for other parts of Manila lacking such plans.

6 Moore, *Bombing the City*, 147–48.

> local schools, the mailman, the two cops who watched over our neighborhood and the adjacent Subsection 2 from their little booth a few blocks down the street—who worked together to make a community. To him, Subsection 3 was a group of people.[7]
>
> —T.R. Reid, *Confucius Lives Next Door*

The survival rate for those rescued by neighbours or a passer-by from beneath debris after Kobe's January 1995 Great Hanshin Earthquake was 80 per cent. The rate for those recovered by emergency response personnel was 50 per cent. That is not a reflection on the competence of the professionals. Blocked roads, scarcity of earthmoving equipment and the fact that individuals found by professionals were likely buried under amounts of rubble immovable except by special equipment meant more of those recovered were killed outright, suffered greater injuries or could not be rescued in a timely fashion. But that does not in any way diminish the importance of *first* first responders: the community members without whom many more of their neighbours would have breathed their last.[8]

Citing lessons from New Orleans and Hurricane Katrina, one author concluded: '[P]robably the biggest change in recent years [is] the realization that disaster response is not just government response. It is a societal response. The federal government has a role, and so does everyone else.'[9] Others writing in 1995 concluded that:

> residents themselves are not only *capable* of contributing considerably to [citizen rescues], but in many cases *they are the primary actors by default*. For example, after the major earthquakes of the past decade (Armenia, Mexico City, etc.), 90 per cent of those rescued have been dug out by their neighbors and not by technical experts.[10]

We recall that most of those who made it to hospitals during the nerve agent attack on Tokyo's subways did not do so in emergency vehicles; more than one-third (34.9 per cent) walked. Another 37.6 per cent

7 Reid, *Confucius Lives Next Door*, 74.

8 Perry et al., *The Shakeout Earthquake Scenario*.

9 William Carwile, FEMA associate administrator for response and recovery, quoted in Dave Philipps, 'Seven hard lessons federal responders to Harvey learned from Katrina', *The New York Times*, 7 September 2017, available from: www.nytimes.com/2017/09/07/us/hurricane-harvey-katrina-federal-responders.html.

10 Ben Wisner and Henry R. Luce, 'Bridging "expert" and "local" knowledge for counter-disaster planning in urban South Africa', *GeoJournal* 37 (1995): 335–48, at 344, doi.org/10.1007/BF00814014. [Emphasis in original.]

arrived by taxi or thanks to good Samaritan private vehicle owners. Only 7 per cent arrived by ambulance, with firefighters and police lending transport support in lesser percentages (the numbers do not total 100 per cent, presumably because the means by which some patients reached the hospital remains unknown).

The role of the person next-door is all the more vital when the official capacity to respond falls short. The citizenry of Mexico City stepped forward when their political and bureaucratic leaders did not after tremors shook the region in September 1985. Mexico City, like Tokyo, Los Angeles and many other megacities, is 'blessed' with a seeming perfect storm of vulnerabilities. Some are nature's doing. Others have their roots in either unfortunate ignorance or humankind's lack of care. Mexico City lies atop many fault lines, including those underlying some of its most densely populated communities. Humankind helped nature's violent side by building on what were until the beginning of the twentieth century several lakes. Many of the megacity's structures consequently sit atop soils saturated with water—soils that can turn into thick soup when violently shaken. These soils also amplify the effects of seismic waves up to 30 times more than do firmer soils found on the megacity's higher ground.[11]

Less obvious is the significance of neighbours and community members in the day-to-day welfare of megacity residents. Unexceptional in the seeming randomness of its growth, Lagos's edge communities often have roads lacking signage, pavement or an appreciation for straight lines. Houses are in various stages of building for weeks or months as residents cannot afford to buy building materials other than bit by bit when cash is at hand as they lack land titles and thus cannot secure loans. Some Lagos slum residents see little reason to invest their wealth in significant housing improvements when the inability to secure a title means they might be swept away without compensation. Redemption City is an exception. Established by a church group in the later years of the twentieth century, Redemption City's:

> streets form a grid. The roads are signed … Some have speed bumps—things that would be wholly redundant on a normal African road … There are few half-built houses, because the church checks that families have enough money to complete

11 Sergio Puente, 'Social Vulnerability to Disasters in Mexico City: An Assessment Method', in *Crucibles of Hazard: Mega-Cities and Disasters in Transition*, James K. Mitchell (ed.), New York, NY: United Nations University, 1999, 305.

> them and sets a strict time limit. All the homes are in gated communities, numbering 15 so far. Everything tends to work. Whereas Lagos hums with diesel generators, Redemption City has a steady electricity supply from a small gas-fired power station. It also has its own water supply.[12]

Other religious groups are following suit.

## When government falters

> The first earthquake, registering 8.1 on the Richter scale, hit Mexico City at 7:19 a.m. on Thursday, September 19, 1985. The second quake followed the next afternoon, registering 7.5 on the Richter scale … President Miguel de la Madrid admitted that the administration had failed to coordinate rescue efforts adequately. Instead, self-organized groups in affected communities took the initiative. Non-governmental organizations, such as the Red Cross, the Salvation Army, Catholic Relief Services, and numerous rescue teams from other countries such as France, West Germany, and Switzerland also provided assistance … Public institutional actors jockeyed for power, and struggles ensued between the Ministry of Interior, the Department of the Federal District, the military, and the president's office.[13]
>
> —Aseem Inam, *Planning for the Unplanned*

> In 2012, the North Carolina state legislature passed a law that bans the state from using scientific predictions about sea level rise to develop its coastal policies … During an episode of *The Colbert Report* shortly thereafter, comedian and host Stephen Colbert satirized the law quite appropriately: 'If your science gives you a result you don't like, pass a law saying the result is illegal. Problem solved.'[14]
>
> —David J. Helfand, *A Survival Guide to the Misinformation Age*

Tokyo's community governments are required to prepare disaster preparedness maps. Sometimes with one map per hazard type, other times with the data combined, these resources (at times in English as well as

12 The quotation and introductory material are from 'The anti-Lagos: Nigerian cities', *The Economist*, [London], 20 October 2018, 47.

13 Aseem Inam, *Planning for the Unplanned: Recovering from Crises in Megacities*, London: Routledge, 2005, 62–63.

14 David J. Helfand, *A Survival Guide to the Misinformation Age: Scientific Habits of Mind*, New York, NY: Columbia University Press, 2016, 206, doi.org/10.7312/helf16872.

Japanese given the capital's cosmopolitan nature) inform the user of those areas worst exposed to seismic activity, fire, flooding, landslides, tsunamis or other hazards. They also identify emergency centres and facilities offering refuge or other support in a catastrophe's aftermath. Government exercises require officials to practise responses, confirm communications systems work and otherwise validate readiness or identify shortfalls. As we have seen, in Mexico City … not so much. Occupants of private apartment buildings in the Latin American capital serve as safety marshals and participate in earthquake rehearsals, but as the quotation above makes clear, official preparations and interdepartmental cooperation can be ineffective. This is not a great situation for a megacity with seismic threats slumbering beneath its streets.

The 1985 earthquake killed 5,000 people, injured another 14,000 and left 2 million without homes. Water supplies ceased for many, as did telephone operations, power distribution and medical care. The collapse of telephone services—local, national and international—resulted from damage inflicted on a single downtown building. Tremors wreaked particular havoc on the city centre, meaning many government and commercial headquarters stopped functioning. Overcentralisation—of physical capabilities like those of telephone operations and human management—crippled where the dispersal of key capabilities could have provided redundancy.[15] Mexico City, the country's primate urban centre with more than four times the population of the second city of Guadalajara and home to many of the services on which the rest of Mexico relies, failed to ready itself for the inevitable visits of earthquakes.

Poor judgement in locating so many of the city's medical, governmental and higher-level educational institutions and other critical resources in the same area had egregious company in corrupt, uncaring and criminal authorities. The military distributed aid supplies—but to its own soldiers rather than earthquake victims. Various officials sold rescue material, pocketed aid money and delivered rescue equipment only after demanding bribes. Police rifled through abandoned structures and the clothing of the dead. Authorities directed that residents' neighbourhood organisations had no right to assist with recovery—saying this was a duty only their own

15 Diane E. Davis, 'Reverberations: Mexico City's 1985 Earthquake and the Transformation of the Capital', in *The Resilient City: How Modern Cities Recover from Disaster*, Lawrence J. Vale and Thomas I. Campanella (eds), New York, NY: Oxford University Press, 2005, 255–80, at 261–62, doi.org/10.1093/oso/9780195175844.003.0018.

people were to take on for fear that self-reliance outperforming officialdom might precipitate unrest. Citizens ignored the dictate.[16] The city's ruling Partido Revolucionario Institucional (PRI, Institutional Revolutionary Party) had good reason to be concerned; it lost city elections in 2000.[17]

Mexico City's is a particularly ugly story, but responses to the 1995 Great Hanshin Earthquake (Osaka–Kobe), the Tokyo sarin nerve agent attack the same year, the 2011 Fukushima Daiichi disaster (Tokyo) and Hurricane Sandy (New York) are among other examples where better-run and better-prepared urban governments struggled. Much of central Kobe burned.[18] New York City was hamstrung in part by its mayor failing to adequately ready his trusts for the hurricane's landfall yet helped in bouncing back not only by the state's national guard but also by its State Defense Forces, an organisation comprising mostly retired armed forces members, reservists and those from professions such as engineering, medicine and law, in addition to local police, fire and other organisations.[19] Plans and other preparations cannot guarantee a megacity's successful handling of and recovery from disaster, but they go a long way towards doing so even when initial decisions prove to be missteps.

## Mobilising for good or ill: Information and influence

> In *The Matrix*, every person has a choice. You can pick a red pill … that offers the truth. Or you can pick a blue pill, which allows you to 'believe whatever you want to believe.'[20]
>
> —P.W. Singer and Emerson T. Brooking, *Like War*

> We differentiate between two types of informative messages: direct, i.e., written by a person who is a direct eyewitness of what is taking place, or indirect, when the message repeats information

16 ibid., 273–74.
17 ibid., 270–71.
18 Hein, 'Resilient Tokyo', 228.
19 Steven Bucci, David Inserra, Jonathan Lesser, Matt Mayer, Jack Spencer, Brian Slattery and Katie Tubb, *After Hurricane Sandy: Time to Learn and Implement the Lessons in Preparedness, Response, and Resilience*, Homeland Security Report, Washington, DC: The Heritage Foundation, 24 October 2013, available from: www.heritage.org/homeland-security/report/after-hurricane-sandy-time-learn-and-implement-the-lessons-preparedness.
20 P.W. Singer and Emerson T. Brooking, *Like War: The Weaponization of Social Media*, Boston, MA: Houghton Mifflin, 2018, 273.

> reported by other sources. Once we detect informative tweets, we classify them into the following classes … Caution and Advice … Casualties and Damage … Donations … People missing, found, or seen … Information sources if a message points to information sources, photos, videos, or mentions a website, TV or radio stations providing extensive coverage.[21]
>
> —Muhammad Imran et al., 'Practical Extraction of Disaster-Relevant Information from Social Media'

Were it only as easy as providing a pill to influence the dispositions of a megacity population. As any police officer on the beat or soldier in battle knows, a gang member on their own turf or enemy fighting in their own city has the homefield advantage of being familiar with the lie of the land, the local population, social connections, local vulnerabilities, government officials' usefulness and much more. Having the support of a megacity's population can go a long way towards overcoming a visitor's disadvantage when outsiders seek to deliver succour in times of disaster. Police, firefighters, religious leaders and city government leaders are those who, like the person on the street, might be able to provide information regarding where the vulnerable (such as the elderly and disabled) live, what medicines or special care they need, which gangs control which neighbourhoods, who the local powerbrokers really are and other information vital to planning and responding effectively. Securing such information is no easy task in an era of social media and its unavoidable companions of misinformation and disinformation. If the pen really is mightier than the sword, a printing press is more powerful than an army. Social media is the equivalent of nuclear weapons.

For too long, analysts settled for the simple categories of bad guys, good guys and neutrals when considering a population (bad guys = gangs, organised crime syndicates and other evildoers; good guys = police, other government types and those locals or outsiders lending government types a hand; neutrals = everybody else). Leaders and planners used this breakdown whether readying for a crisis or fighting a war. My colleague Jamison Jo Medby offered a seemingly minor but very helpful revision to

21 Muhammad Imran, Shady Elbassuoni, Carlos Castillo, Fernando Diaz and Patrick Meier, 'Practical Extraction of Disaster-Relevant Information from Social Media', in *WWW '13 Companion: Proceedings of the 22nd International World Wide Web Conference*, New York, NY: Association for Computing Machinery, 2013, 1021–24, doi.org/10.1145/2487788.2488109.

this model with her 'continuum of relative interests'.[22] Imagine a flat line running from left to right across this page (or look at Figure 4.1. Your call). At the line's far left are the bad guys. Tag them as 'adversary'. Moving along to the right we find 'obstacle', individuals and groups that favour and willingly lend some degree of support to the adversaries. Smack in the middle of the line are those not wanting to favour either extreme ('neutral'). Continuing our trek along the line, we leave those neutrals and arrive at 'accomplice', which designates that part of the population willing to lend our side a hand in some way but stopping short of going whole-hog with that support. At the far right is us, the good guys, whom we label 'ally', and those willing to back us. A little contemplation reveals just how much richness the simple addition of 'obstacle' and 'accomplice' adds to the depth of our understanding of urban populations. First, considering noncombatants as uniformly neutral—once the default—is, to put it mildly, a gross oversimplification. The preferences, prejudices and predispositions of a megacity's noncombatant population and their many associations, communities and other relationships touch just about every point along that horizontal line. Some individuals and groups will be diehard supporters of the adversary (or, more accurately, *adversaries*, for neither the bad guys nor the good guys are any more homogeneous than the rest of the human mass that is a megacity population. Put differently, there are likely way more than just one group at the left and right extremes of the line as well as between the two). A disproportionate number of noncombatants are likely to remain near the 'neutral' centre, hoping to carry on with their lives and not be forced to make a choice between the competing parties. We might call this great mass the 'just leave me alone and let me make a living' segment.

**Figure 4.1 The continuum of relative interests**
Source: Image adapted from Medby and Glenn, *Street Smart*, 99.

Of course, Medby's continuum does not imply a population has only five rather than three categories into which everyone or every organisation fits. A little more thought makes it clear that there is an infinite number of dispositions along that line. A bit more mind work and we realise that even this important observation is only a first step towards better

22 Jamison Jo Medby and Russell W. Glenn, *Street Smart: Intelligence Preparation of the Battlefield*, Santa Monica, CA: RAND Corporation, 2002, 94–102.

understanding just how complex is a megacity's population. A group's members are not uniform in their biases. An organisation's leaders might claim their members favour one side or the other while individuals or clusters of people in the assemblage feel otherwise. Nor is a group's or an individual's leaning fixed over time. An adversary's or ally's change of policy or a bit of money pushed in the right direction might convince a religious leader to come off the neutrality fence and preach favouring one opponent over another. Insulting or roughing up an elderly couple at a traffic checkpoint could result in their son or daughter no longer supporting the army or police whose members acted foolishly—or any security force that associates itself with those mistreaters (as US soldiers found in Iraq and Afghanistan when dealing with corrupt or inept local security personnel). Adversary representatives will try to convince neutrals and individuals leaning towards the allies to see a new light, maybe with that bit of cash, some other form of assistance or a bullet in the mailbox that makes clear the risk of not rethinking who gets their support (this was a technique used by militias in Baghdad who wanted to purge a community of those with the 'wrong' religious bent). On the flipside, parties occupying the 'ally' end of the continuum will try to motivate organisations and individuals to shift to the right and be more partial in their efforts. Resources brought to bear in this tug of war include psychological operations messages, community projects and promises of other improvements in the potential favour-shifters' lives. Less ethical parties use threats (that bullet in the mailbox) or the application of violence to convince—something that is well known to many storeowners forced to pay protection money even when there is no threat other than that from the coercing thugs. And, while on the issue of lowlife ethics, the continuum of relative interests applies to children as well as adults. Though they might or might not be conscious of the motivations behind adults who direct their behaviour, the very young have long been tools wielded by adversary elders who recognise Westerners' tendency to consider youths a lesser threat and hesitate to use force even when a threat from that quarter is obvious. It is a dangerous predisposition when youngsters are tasked to collect information, act as couriers, carry supplies, engage with a rifle or bear a bomb.

There are only so many resources available for garnering favour. Choosing to spread those limited resources across an entire urban population makes no more sense than it would for a political candidate to spend significant funds trying to get an opponent's fully committed backers to change their votes. Far better to concentrate on the possibly mouldable. Easier said than done. First, determining just who or which organisations belong

where along the continuum demands much in the way of information, and not only in terms of the whos and wheres of these population segments. It is also essential to know how to best reach out to them and what types of messaging and other forms of influence hold most promise of succeeding. Second, figuring out a group's key influencers provides even more bang for the too few available bucks. Marketers hiring actors or sports figures are capitalising on this approach. Confronted with trying to stop the many religious and ethnic groups in 2005 in Mosul, Iraq, from competing instead of cooperating during rebuilding, US Army Colonel (later General) Robert B. Brown asked for assistance from a Kurdish leader who had been imprisoned by Saddam Hussein for 20 years. The leader's legitimacy thanks to those years of suffering acted as a neutral force to bring the competing parties to the table.[23] A further nuance inherent on the continuum of relative interests: those seeking to shape opinions or support must commit resources to keeping those already supporting them from falling prey to efforts by others to lure them away. Parties on the neutral, accomplice and ally portions of the continuum can become frustrated as they watch benefits go to parties less supportive of your objectives than they have been. 'Well,' they might conclude, 'obviously we need to show we can't be taken for granted.' Gaining and keeping support, or at least denying it to adversaries, will be a never-ending task—one that will reward those better able to 'walk around the table' and view a megacity's social situation from all relevant perspectives.

That table is a big one. The most influential perspective might be distant from the city. To draw on a telling nonurban example, the efforts by France, the United Kingdom and Israel in 1956 to stop Egypt's attempt to control the Suez Canal failed in great part because none in that trio recognised the importance of obtaining US acceptance for the incursion into Egypt. Pressure from the United States turned out to be decisive in the three nations eventually withdrawing their forces. Remembering megacities' interconnectedness, the parties interested in goings-on will include many distant from the city itself. The greatest influencers and the parties they bring onside will inevitably include surprises, as the Israel Defense Forces (IDF) found during another operation, this time nearly six decades after Suez. While the IDF maintained a 24/7 presence on six platforms (Twitter and Facebook, for example) in six different languages during its 2014 Operation Protective Edge, it was 16-year-old Palestinian Farah Baker who stole both local and international social media attention.

23 Glenn, *Achieving Convergence*.

Virtually an unknown outside Gaza before the conflict, her tweets such as 'I can't stop crying. I might die tonight' saw her worldwide followers skyrocket reportedly to more than 200,000 before the end of the 50-day contest. Israel was forced to fend off condemnation from Europe, the United States and other audiences it had hoped to move rightward along the continuum of relative interests (or lock in place if already occupying positions favourable to Israel). Baker's influence demonstrated how difficult it can be for a state actor to compete in the social media arena. While it is impossible to know just how much messaging such as Baker's influenced calls from the United States or European and Arab nations for Israel to cease military operations, that she added to the diplomatic calculus is a given.[24]

Social media and other forms of communication have proven valuable beyond this ability to persuade. Firefighters in Los Angeles in 2007 benefited from Twitter updates sent by those near the city's Griffith Park conflagration. The inputs allowed managers to guide emergency responders using real-time information.[25] When water supplies were interrupted during fighting in Aleppo, Syria, in 2015, NGOs worked with local authorities to restore access to old wells. However, there remained the challenge of informing the population of the wells' locations. Maps were handed out person-to-person in some areas, but creation of a GPS-enabled map that was shared via social media proved a better alternative for many. That was particularly true in those parts of Aleppo that had suffered so badly that identifying specific buildings, streets or other features was virtually impossible.[26]

Just as there seems to be a yang of opportunity for every yin of challenge during a megacity crisis, the opposite is also true. That is nowhere more the case than with social media. That Farah Baker was really a 16-year-old woman in no way means that future Farahs won't be fabrications by those trying to bend disasters to their own benefit. Faking identities to sway opinion has a history preceding by centuries mobile phones and Facebook accounts. The *New England Courant* was one of the United States' first newspapers. Its pages notably featured entertaining letters by 'Mrs Silence Dogood', better known as Benjamin Franklin. In 2017,

24 Glenn, *Short war in a perpetual conflict*, 78–79.

25 American Red Cross, *The case for integrating crisis response with social media*.

26 International Committee of the Red Cross (ICRC), 'Syria: ICRC works to avoid massive water crisis in Aleppo', *News*, Geneva: ICRC, 10 November 2015, available from: www.icrc.org/en/document/syria-icrc-water-crisis-aleppo.

Jenn Abrams drew on *BBC News* and other legitimate sources to push a political agenda on Twitter that included support for Donald Trump—before those managing their platforms identified Jenn as the creation of Russia's Internet Research Agency.[27] Those naively retweeting such disinformation magnified its influence. Civilians used their mobile phones to send the location of Libyan leader Muammar Gaddafi's military force to the North Atlantic Treaty Organization (NATO) during operations in May 2011—assistance at once helpful but vulnerable to misuse by senders wanting to settle old scores or embarrass NATO by directing bombs on to innocent civilians.[28] Nor is potentially valuable information provided to emergency responders or soldiers by well-intentioned social media users always correct. The old saw that 'the first report is always wrong' too often proves true, meaning that those firefighters, paramedics, NGO members or military members could be unintentionally or intentionally misrouted to ill effect.

Parsing true from false requires careful sifting and no little guesswork. The grasp of artificial intelligence (AI) on history, physics and weather will someday be better than humans', meaning that determining the likely path of an urban fire or a message's truthfulness should be less challenging. Crowdsourcing will still be important, but AI will help to determine whether reports are accurate or mistaken. Hopefully, we'll never get to the point of the movie *Minority Report* in which three psychics with dubious quality of life predict future crimes (and what's up with the authorities not listening to the female in the trio?), although clever algorithms fed with years of updated statistics already show Los Angeles and other police the likeliest locations of future crimes. Combined with additional information (for example, that a member of Gang A shot a Gang B member and retribution is likely), AI-assisted use of such data should help law enforcement prevent undesirable events via what military types call 'left of bang' initiatives. The term means stopping detonation of an IED before the good guys' vehicle reaches the point of attack by capturing the bombmaker, interrupting delivery of the materials needed to make the bomb or in some other way disrupting the enemy's system before the attack's execution.

27 Singer and Brooking, *Like War*, 113–14.

28 David Kilcullen, *The Australian Army in the urban, networked littoral*, Australian Army Research Paper No. 2, Canberra: Australian Army Research Centre, 2014, 16, available from: researchcentre.army.gov.au/sites/default/files/kilcullen_b5_web_11august_0.pdf.

## Essential ingredients: Accurate information, shrewd analysis

> Snipers are great to have, but good intel [is even more important].[29]
>
> —Lieutenant Colonel Michael J. Paulovich, US Marine Corps

> Nothing helps a fighting force more than correct information.[30]
>
> —Ernesto 'Che' Guevara

> Among the 2,753 people killed at the World Trade Center site on 9/11, 343 were FDNY [Fire Department of the City of New York] fatalities … Radio communication became difficult as they ascended higher inside the buildings, whose steel frames and steel-reinforced concrete interfered with the signals. 'When attempting to reach a particular unit, chiefs in the lobby often heard nothing in response,' the 9/11 commission report noted.[31]
>
> —Patrick J. Kiger, 'How 9/11 became the deadliest day in history for US firefighters'

Men, women and children awoke from a peaceful night's rest and began their day with no thought that it might be their last.[32] Or so it was for the first of the many to suffer the disease. Seemingly perfectly healthy at dawn, within hours, a victim's eyes and cheeks sank into their faces. Pinching the skin left flesh malformed. Diarrhoea came suddenly—so severe that the body could lose one-fifth of its weight in a single day. Within 12 hours, the disease could kill what a half-day before was a carefree child, a loving mother or the father on whose wages a family depended.

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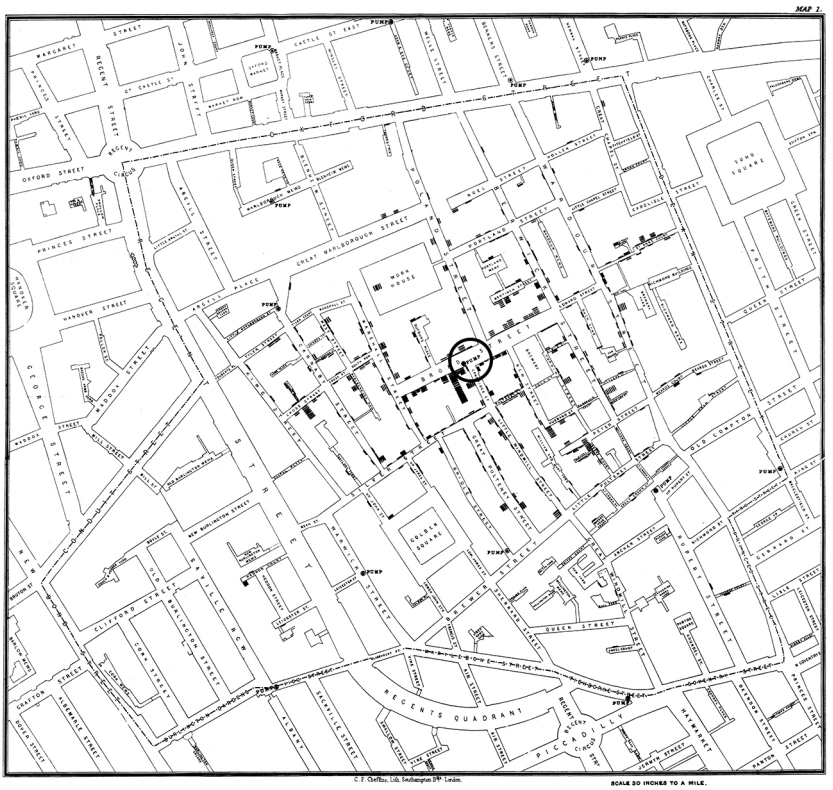
29 Michael J. Paulovich (Lieutenant-Colonel, US Marine Corps), Email to Russell W. Glenn, Subject: Force recon and STA [surveillance and target acquisition] teams, 13 November 2001, as quoted in Russell W. Glenn, *Honing the Keys to the City: Refining the United States Marine Corps Reconnaissance Force for Urban Ground Combat Operations*, Santa Monica, CA: RAND Corporation, 2003, 68.

30 Glenn, *Honing the Keys to the City*, 76.

31 Patrick J. Kiger, 'How 9/11 became the deadliest day in history for US firefighters', *History Channel*, 20 May 2019, available from: www.history.com/news/9-11-world-trade-center-firefighters.

32 The description of the 1854 cholera epidemic in London is adapted from Russell W. Glenn, *Managing complexity during military urban operations: Visualizing the elephant*, Documented Briefing No. DB-430-A, Santa Monica, CA: RAND Corporation, 2004, available from: www.rand.org/pubs/documented_briefings/DB430.readonline.html; and Medby and Glenn, *Street Smart*, 1–3. These in turn drew on material from the UCLA John Snow website—in particular, Ralph R. Frerichs, John Snow Site, [Online], Los Angeles, CA: UCLA Department of Epidemiology, n.d.[b], available from: www.ph.ucla.edu/epi/snow.html. Sandra Hempel's *The Medical Detective: John Snow and the Mystery of Cholera* (London: Granta, 2006) provides an informative and enjoyable read regarding the 1854 outbreak and health conditions in London at the time.




**Map 4.1 John Snow's 1854 map of deaths near London's Broad Street pump (circled)**

Source: Wikimedia, 'Snow Cholera Map 1' [from Snow, John, *On the Mode of Communication of Cholera*, C.F. Cheffins, London, 1854], available from: upload.wikimedia.org/wikipedia/commons/2/27/Snow-cholera-map-1.jpg.

It was 1854. Asiatic cholera ravaged London. Living to see the evening was no longer taken for granted. Many believed the disease was borne by miasma—gases from swamps or decayed organic matter. Others, Dr John Snow included, thought an infectious microbe was to blame. Snow lived in Soho, an area particularly hard hit by the outbreak. He wrote:

> [W]ithin two hundred and fifty yards [230 metres] of the spot where Cambridge Street joins Broad Street, there were upwards of five hundred fatal attacks of cholera in ten days … The mortality in this limited area probably equals any that was ever caused in this country, even by the plague, and it was more sudden, as the greater

> number of cases terminated in a few hours. The mortality would undoubtedly have been much greater had it not been for the flight of the population.[33]

Snow realised that most of the Soho cases were people living or working within a part of the neighbourhood whose residents used the Broad Street water pump. Of the 89 people who died in the first week of the local outbreak, 79 lived near or regularly acquired water from this source. Snow determined that at least eight of the remaining 10 had consumed water from it shortly before they died. Cholera rates were lower in a nearby workhouse that had its own pump and in a local brewery where a considerable number of employees chose to imbibe other liquid refreshment. Snow revealed his findings to the St James's parish Board of Guardians, the organisation responsible for the area's welfare. The board directed the removal of the Broad Street pump handle the following day, rendering it inoperable. Map 4.1 is Snow's own depiction of his analysis. Each dash represents a single cholera death; there are several when an address suffered more than one. The clustering around the Broad Street pump is obvious. It is not possible to definitively credit Dr Snow's efforts with the subsequent reduction of deaths in Soho. The number of fatalities began to fall even before the removal of the handle. Three-quarters of the area's residents had by that time fled the area. The evidence nonetheless supports a conclusion that Snow had determined the source of the problem and his information played a role in mitigating the disaster's effects—and those of disasters to come.

It does not take a lot of imagination to see how data could be used similarly to detect a disease outbreak or identify a biological, radiological or chemical agent terrorist attack on a megacity. Several cities in the United States already have programs where doctors, clinics and pharmacists feed databases with disease, symptom, prescription and other material so that it can be analysed to detect unusual trends and, hopefully, provide early warning, thereby providing authorities with the information they need to quickly address rising problems (we'll talk more about one of these, ESSENCE II, later). It's helpful to know a neighbourhood has more flu victims than a week ago and that the number a week ago was more than the one before. But are the numbers anything unusual for the time of

33 John Snow, 'Instances of the Communications of Cholera through the Medium of Polluted Water in the Neighborhood of Broad Street, Golden Square', in *On the Mode of Communication of Cholera*, London: John Churchill, 1855, available from: www.ph.ucla.edu/epi/snow/snowbook_a2.html.

year? Based on years past, should we be particularly worried or is what we see the normal pace of spread? Are the time of year and number of cases on track for a 'normal' flu season or an exceptional one? Is the fatality rate exceptional? Answering questions like these makes the information much more valuable. (In security terms, once data undergo analysis and processing, they become intelligence. Knowing there were 45 cases of flu last week is information. Putting that datapoint in context and addressing relevant questions such as those above provide intelligence.) Once analysed, information becomes the basis for educated decisions instead of guesswork. One of the reasons Covid-19 was so difficult for New York City to deal with during the spring of 2020 was the lack of a disease history (context) on which to base responses. Early cases triggered a near-frantic search for information. How long was the incubation period? Did everyone show the same symptoms? Could someone have the virus and not show any—or only some—symptoms? If so, could these lesser cases still spread the disease to others? Recommendations to limit testing once test kits became widely available were especially damaging (as was Chinese authorities' refusal to provide information on the disease's communicability). Not only did victims not receive appropriate care as soon as they might have; the resulting delay in gathering data meant there was insufficient information to create intelligence on which to base decisions impacting the lives, employment and survival of thousands.

The lack of insight when such information is not at hand is evident in another historical droplet—this time, from Israel's 1973 attack on Egypt's Suez City. Drawing on interviews with Colonel Nachum Zaken and Colonel Yaakov Hisdai, two of the IDF's battalion commanders making the attack:

> [Colonel Zaken] had only a 1:50,000-scale map of the city [on which 1 inch covers what is 50,000 inches on the ground; 0.8 miles or 1.3 kilometres] … The adversary was known to have forces in the city, but they were thought to be scattered, lacking in cohesion, challenged in leadership, and suffering the same collapse of morale as had much of the already defeated army. 'But,' Colonel Zaken recalled, 'there was a mistake.' The Egyptian leader had arrayed many of his defenders along the avenue that Zaken's force would use to conduct its attack. Concrete walls 80 centimeters high lined both the sides of the road … Tankers and their trailing infantry would find that it took several efforts and five to ten minutes to breach the walls and bypass immobile vehicles, the men forcing the breach suffering incoming enemy fire for the duration of the

frantic efforts. A lack of appropriate maps, overhead imagery, and ground reconnaissance denied the attackers information regarding the foe's dispositions, conditions along the attack route, and other intelligence that would have had a fundamental influence on the planning and execution of the mission.

The armored battalion moved out between 0830 and 0900 [8.30 and 9 am], October 23, 1973, with roughly 40 vehicles … The tankers' mission was to seize the main street of Suez as far as the port after which the two trailing infantry battalions would clear the remainder of the built-up area … The lead elements of the armor battalion reached their destination by early afternoon. The battalion headquarters set up in the city square some four kilometers into the built-up area. Remaining armored vehicles and trailing infantry units were spread out on both sides of the road for nearly the entirety of that distance … Egyptian units [attacked]; complete destruction threatened the three Israeli battalions. There were no surviving medics and no medical supplies beyond those in vehicle aid boxes (which many soldiers did not know how to use effectively). Few men were unwounded. Some tanks had completely exhausted their ammunition. Many knocked out earlier were virtually full, but cross loading was impossible with the continuing incoming fire. Surviving tanks with rounds remaining defended each other by engaging targets on the side of the road opposite themselves, thus taking advantage of the relative standoff distance to achieve greater effect from the elevation of their gun tubes. As most buildings were from four to eight stories high, tanks immediately next to a structure could not raise their main gun barrels sufficiently to engage targets on the upper floors and roofs. There was still little understanding of the enemy's strength or capabilities. The Egyptian soldiers employed hand grenades, rocket-propelled grenades (RPGs), and machine guns to continued telling effect … By 1800 [6 pm] the battalion commander's only means of collecting coherent situation reports was to send a runner north and west along the main streets to assess the situation. The unit eventually moved out of Suez to the southwest. The survivors of the two supporting infantry battalions exfiltrated on foot, leaving their vehicles behind and returning to Israeli lines north of Suez under the cover of darkness. Attacking Suez City without conducting a preliminary reconnaissance had 'proved to be a very grave error'.[34]

34 Glenn, *Honing the Keys to the City*, 2–5. Much of this material came from the author's interviews with Nachum Zaken (Brigadier General, IDF, ret.) and Yaakov Hisdai (Colonel, IDF, ret.), Latrun, Israel, 10 April 2000.

The above provides two convincing examples—one involving an epidemic in London, the other a combat situation—of why it is critical to have accurate information when dealing with an urban disaster. Understanding relevant parties' locations along the continuum of relative interests means an outsider is less likely to be at the mercy of local players who might seek to misguide them. So informed, aid providers also have some idea regarding who might seek to disrupt their operations. These could include groups as varied as state militaries, militias of various sorts (some perhaps acting as surrogates for the military), private armies, gangs, other criminals, local political factions more interested in power grabs than aiding a suffering population, insurgents or those seeking to promote personal or business interests. Such knowledge can also point to who has access to valuable skills, equipment or goods and is able to assist in navigating local social byways even more convoluted than the megacity's twisted streets and alleys. The two examples also tell us that understanding the physical world is crucial.

Accurate information tells NGO leaders whether those distributing aid require security before entering a community. Solid intelligence tells a military commander whether his or her soldiers should enter rooms only after a polite knock, following a flashbang grenade meant to preserve noncombatant lives, or only once they have led with a lethal fragmentation grenade or called for a tank main gun round given the expectation that no noncombatants shelter within. Information means not hiring a local gang to protect food stores its members are as likely to plunder as protect. Knowing the layout of a building means not heaving a grenade through a door only to find it rebounds off what is a closet wall. Intelligence means knowing whether the locals trust the police or prefer protection provided by the community's drug kingpin. Understanding a building, inside and out, means having knowledge of the possible larger role of the structure as a cultural (church, mosque or temple), diplomatic (embassy, consulate), communications, power, water or other utility hub, or other vital node in local or even worldwide systems—something not always evident in its external appearance. Old information should cause a leader to call for confirmation or update. Coalition forces relearned that lesson only after two perfectly aimed 900-kilogram bombs punched through the reinforced concrete roof of the Al Firdos command bunker in Baghdad on 13 February 1991. The facility had become a refuge for noncombatants. Some 400

died. Another 200 were severely wounded. Most of the casualties were women and children. Little matter that they were the families of senior armed forces, intelligence or other government leaders.[35]

Were a megacity's multitude of three-dimensional challenges not enough—four, if we add the social dimension—our previous discussions make it clear that considering only the urban area itself is insufficient. Megacities rely on water, fuel, food and much else that comes from outside their boundaries. Identifying where these necessities come from and how disaster will influence their availability means plans can be made for meeting shortfalls. No single organisation will be able to collect, analyse and distribute all the required data any more than one group can meet the total of a megacity's resource shortfalls. Recovery from whatever punishments a disaster inflicts will demand the cooperation of authorities both within and remote from the urban limits.

How to go about collecting this vital information? Methods range from those ancient to others beyond the currently possible. Reminiscent of scouts climbing trees to gaze ahead of their marching army, British Army forces in Northern Ireland's urban areas built towers to observe any goings on that registered the 'absence of the normal or presence of the abnormal'. Highrise buildings have always offered the same advantages; snipers and reconnaissance soldiers have long favoured church steeples, water towers or other perches that dominate surrounding terrain. The overhead perspectives of UAVs make them popular information collectors today. In the short term, such bird's-eye observations can provide the location of residents' suffering, where police need help in managing a demonstration or early detection of an approaching enemy. Long-term observation allows watchers to determine patterns of routine community behaviour ('the normal') and detect variations from those patterns ('the presence of the abnormal'). Police and soldiers gain the same by regularly patrolling the streets of an urban area.

City authorities and experienced aid providers have long recognised that good relations with residents magnify their vision and hearing hundreds or thousands of times over. That means they do not have to see everything themselves to gain knowledge. They do not have to hear first hand to know of a population's grievances or an enemy's movements. A helpful population offers insights impossible to otherwise possess. Drawing

35 'The battle for hearts and minds', *The Washington Post*, Fog of War Vignette No. 8, 1998, available from: www.washingtonpost.com/wp-srv/inatl/longterm/fogofwar/vignettes/v8.htm?noredirect=on.

on local knowledge means an outsider knows who those valuable key influencers are, what tensions exist between community groups and many other factors significant to achieving desired ends.

Like money in a bank accruing interest, information creates more information as knowledge breeds additional questions and contacts. Quality information, like a good investment, leads to not only more but also more valuable material. The greater the number of individuals at the 'accomplice' or 'ally' end of the continuum of relative interests, the greater is the flow of information and the better able is a recipient to confirm it as valid. Having mechanisms in place to filter incoming information prevents squandering of resources and loss of legitimacy in the eyes of locals. British Army Lieutenant Ross Kennedy was clever in this regard during his tour as a platoon leader in Iraq in 2003. He hired a local Iraqi to act as his interpreter but had his regular Kuwaiti interpreter—who was wearing a British Army uniform and whose role was unknown to the local hire—stand by during a meeting with a community reconstruction committee:

> I asked the town engineer what I could do for them. What did they most need money for? The engineer [replied], and the interpreter, who was a schoolteacher, [translated] 'We need books' … My Kuwaiti interpreter said 'That's not what he said. He said he wants a water-pumping station.' They all had their own agenda … It was frustrating.[36]

Getting word to members of the public regarding what information outsiders need is all the harder in the immediate aftermath of a disaster or during combat operations. Power could be out for days, weeks or longer. Mobile phone towers might be damaged or overwhelmed. Phone lines, radio and television stations, newspaper printing offices and other normally available means of communicating may be offline even if power is still available. Innovation will help close the gaps. Posting flyers, broadcasting via loudspeaker, having messages affixed to vehicles, passing messages to local residents at aid distribution points or while patrolling or—as worked recently in the Philippines and Iraq—creating a comic book popular with targeted age groups light fuses that burst into widespread sharing of messages via word of mouth. These means of getting in touch inform audiences both regarding megacity government or NGO information needs and of how to pass that information to these

36 Ross Kennedy (1st Lieutenant, British Army), Interview with Russell W. Glenn and Todd Helmus, Upavon, UK, 8 December 2003.

resource providers. Soldiers in Iraq painted their information line phone numbers on coalition vehicles and soccer balls given to neighbourhood children. While potentially effective, any such means need to be viewed in terms of the potential risks. Insurgents in Iraq were known to have beaten or killed those whose houses contained items affiliated with the coalition.

Technology might offer additional solutions. Commercial companies providing mobile phone service can step in when disaster knocks out or overwhelms standard capabilities. Depending on the system and type of vehicle transporting it, New York City has vendors who provide a veritable communications zoo via Cells on Wheels (COWs), Cells on Light Trucks (COLTs) or Generators on a Trailer (GOATs). The Jangala briefcase-sized cellular system in Lagos can serve up to 1,000 users. That will be a drop in the bucket during a megacity outage, but such capabilities could address emergency services' needs or niche mobile phone voids. Stretching mobile phone capacity by blocking ads, capping video pixilation and encouraging users to avoid streaming or other high-bandwidth use also helps.[37] (Some urban authorities shut off mobile phone access entirely in parts or throughout their jurisdictions. Those in Karachi, Pakistan, for example, reportedly do so on some religious holidays to deny potential bombers use of mobile phones to detonate explosive devices).[38]

These resources have become particularly important in recent years given the proliferation of mobile phones as virtual necessities. The most effective way of touching chosen audiences can be via targeted mobile messaging, thereby solving the challenge of not only getting word out to specific recipients but also doing so with a system they can use to provide information in return. Disaster planners ideally arrange for backup ways of communicating; Japanese soldiers used bicycles to transport floppy disks in the aftermath of the 2018 great Hokkaido earthquake. Early Tokyo residents received warning of approaching fires thanks to fire towers. Aside from:

> castle towers and a few pagodas, the only noticeable feature of the Edo skyline was for many years the fire tower in each district which contained a bell that was rung with an increasing number of strikes to the minute in ratio of nearness to the fire.[39]

37 'Internet providers to the dispossessed', *WIRED Business Special*, [UK edn], November–December 2018, 28–29.

38 Shackle, *Karachi Vice*, 156.

39 A.L. Sadler, *Japanese Architecture: A Short History*, Tokyo: Tuttle Publishing, 2009, 104.

Information is also key to constraining runaway good intentions. Ignorance can mean wasting resources when outsiders introduce technologies beyond an urban area's capacity to sustain them. Recovery efforts in Iraq and Afghanistan provide some notorious examples. They include installing sophisticated medical equipment without confirming whether sufficiently qualified operators lived nearby (Iraq), providing porcelain sinks that broke when users hoisted themselves on to them while performing pre-prayer ablutions (Afghanistan), installing gas ovens when far cheaper and more readily available wood was the normal fuel (Afghanistan again) and introducing airconditioning that immediately caused windows to sheen with condensation in lieu of cheaper to buy, cheaper to run and easier to maintain ceiling fans (Afghanistan a third time). Introducing such uninformed technological 'progress' proved wasteful, harmed benefactors' reputations for good judgement and burdened government officials with popular expectations that they couldn't meet once the rich outsiders departed.

This does not mean those providing relief should pass up opportunities to improve residents' quality of life. Whether replacing slums with improved housing or strengthening damaged buildings during post-earthquake repairs, improvements can be the wiser choice when well informed. Determining how much is enough can be particularly difficult given pre-existing needs. Routine rates of infant mortality in 2012 Manila's slums were tragically high due to malnutrition and disease.[40] The challenge in such circumstances is one of determining how far to go without going too far. Decisions are best made in partnership with the local leaders who will have to maintain any new programs when they are once again on their own.

Savvy megacity governments better their chances of effective response if they collect vital information before an event, thereby avoiding a game of catchup. We have noted more than once that much of the information needed during disaster response will prove valuable regardless of what form the calamity takes. Maintaining the addresses of homebound residents sets the stage for timely delivery of food, medicines and other aid regardless of whether it was a tsunami, tropical storm, earthquake or act of terror that made the assistance necessary. Knowledge of key dates such as those for delivery of social security cheques means officials can make

40 Ferris, 'Urban disasters, conflict and violence'.

informed decisions when setting evacuation dates. Receipt of cheques before departure is especially important given it may take several months for subsequent payments to reach displaced recipients.

The kinds of information needed include the obvious and the 'who would have thought'. Well-designed exercises inform new and test existing plans in terms of what information officials need. Helicopter pilots will want to know which air routes put buildings between them and neighbourhoods likely to be the source of potshots. Humanitarian assistance providers need to know how they can access water, food, power and shelter for both their own people and those rendered homeless. The combat soldier knowing what materials dominate in local dwelling construction can choose weapons less likely to injure or kill the innocent. A unit might opt for shotguns, stun grenades or other weapons with less penetrating power when homes are primarily made of wood or corrugated metal. The same soldier might know chosen materials have value in surviving earthquakes and thus are more appropriate when rebuilding post disaster than 'better' technologies imported from elsewhere. Detailed understanding of what lies ahead means knowing which buildings are off-limits and when that 'off' becomes 'on'. In some cases, the restriction will be a matter of social mores: asking permission to enter all or part of a religious structure, perhaps, or limiting entry due to gender norms or quarantine dictates. How a building is being used often determines its standing. The British Army's *Urban Operations* field manual informs its soldiers:

> Like civilian personnel, civilian buildings and towns normally have a protected status—for example, they are not legitimate targets. Buildings and towns lose their protected status if the appropriate authorities determine that the enemy is using them for military purposes.[41]

Sometimes what is not present reveals what is. The absence of mobile phone or other electronic signals in a neighbourhood might suggest the presence of an off-limits intelligence installation—a rock around which the stream of cyber traffic flows. Hyper mobile phone activity, on the other hand, indicates a train, subway or bus station, shopping market or other hub of human activity where the risk of spreading biological or chemical contamination would be extraordinarily high.

41 Glenn, *Honing the Keys to the City*, 1.

Subterranean features pose special challenges and opportunities. For soldiers, they are a way to move between points without the enemy detecting or firing on them. The other side of that coin is that the enemy might use such passages to move their attackers into areas previously cleared of a threat, as Israeli soldiers found during fighting in 2014 in Gaza:

> On 20 July, an Israeli APC [armoured personnel carrier] driving with other forces into Shujayia suffered a mechanical malfunction and stopped on the side of the road between two small buildings. As the Israeli soldiers waited for a repair team to come, they were sighted by a Hamas spotter hiding in some buildings down the road. A Hamas team used a tunnel to enter one of the buildings adjacent to the Israeli APC. They then surprised the Israeli soldiers by firing RPG rockets and small-arms fire at the APC and the soldiers around it. Seven Israeli soldiers were killed.[42]

Hamas's use of tunnels and other subterranean features represents an adaptation to Israel's improved detection of aboveground activities. The results were the infiltrations and attacks on IDF soldiers described above and assaults targeting Israeli civilians near the Gaza border. Tunnels—some large enough to support motorbike movement—also provided storage facilities difficult to detect and hard to destroy even when they were discovered. Knowing that finding entrances to the subterranean passageways would be an Israeli priority, Palestinian factions sometimes used children and other civilians to lure soldiers into ambushes with promises of revealing those locations.[43]

Knowing the location and character of underground passageways also offers opportunities for those with more humanitarian objectives. An ability to move beneath the surface provides a safer way to evacuate wounded when combat rages above. Subway stations, subterranean levels of parking garages, below-ground floors in shopping malls and similarly large and accessible spaces are potential hospitals, storage facilities or places where aid providers and those they are helping can shelter when being aboveground proves too risky. All these benefits may have to be forgone if the threat of the use of heavier-than-air chemical weapons exists or sewer gas poses a danger. Fortunately, neither was a significant threat in 1993 in Sarajevo. A tunnel beneath the city's airport took on vital importance when it became the protected link between two Bosnian communities.

42 Glenn, *Short war in a perpetual conflict*, 29, 71.
43 ibid., 103.

An average of 20 tonnes of supplies and other materiel and 4,000 people moved through it daily, avoiding Serbian snipers seeking to multiply the number of red-painted 'Sarajevo roses' that marred the capital's streets, marking where someone had fallen to rifle or mortar fire.[44]

While navigating underground complexes can be difficult, moving at surface level is no guarantee of improved understanding of one's location. On the other hand, being aware of local signage can aid navigation even if the local language is a mystery. Eighteenth-century London and Paris featured:

> signs shaped to look like massive animals or objects began as a means of advertising that was intelligible to the illiterate and the literate alike … These boards had an additional function: to help outsiders and residents establish where they were … In the absence of street numbers, packages and visitors to eighteenth-century London and Paris were addressed or directed to a house 'at the sign of X,' or 'by the sign of the Y.'[45]

Relying on other than traditional signage might be the only way to navigate when damage is so extensive that streets and neighbourhoods are unrecognisable even to those who live or work there. This is all well and good if global positioning systems are operating. Innovation will otherwise be the way to proceed. US Marine Corps snipers in 1992–93 in Mogadishu, Somalia, designated locations in terms of where they were in relation to 'Dead Cow Road'—a byway featuring what must have been a reference of decaying value. Features such as those subways, underground shopping malls and subterranean parking garages mentioned above will—the extent of damage allowing—generally be evident thanks to a megacity's signage or their signature characteristics. Consider the 'M' signs denoting Washington, DC, Metro (subway) entrances or the red circles filled with white and overlaid with a blue horizontal bar for London's Underground. The same may not be true with house addresses in residential neighbourhoods, particularly in the case of slums where house numbers might be non-existent. The cosmopolitan character of urban areas—and megacities in particular—means signs might be in English, or at least English script, even when that is not the local language. This is helpful, but the English may not be of a form recognisable even to native speakers of that language. It would

44 Williams and Selle, *Military Contingencies in Megacities and Sub-Megacities*, 44.
45 Conlin, *Tales of Two Cities*, 79–80.

take a minute's thought to figure out that 'Satay-Wan' on a Tokyo shop represented a valiant effort to translate '31'—the number of flavours of the Baskin-Robbins ice-cream offered within.[46] Megacities can also have an unspoken language that only those in the know comprehend. London's Underground stations might be easy to identify, but once a rescue team leaves a station for its tunnels, they would confront a maze where 'tangles of wrist-thick electric cables are blackened by dust from the trains' brake shoes, and where the only place indicators are mysterious codes in chalk, spray paint, and ancient enamelled plates'.[47] New York City similarly has its own technical codes below, above and at ground level. Its special tongue reveals to the knowledgeable what lies beneath the manhole cover, utility plate or on the adjacent wall's spaghetti knot of wires. Having someone who can translate this lingua franca reveals where access to electricity, mobile phone systems, water lines and other infrastructure lies hidden. The difference between knowing and not knowing could mean saving an aid organisation or other outsider the need to rely on portable generators or imported water while at the same time those in the know could deny access to undesirable or noncompliant parties. This might include cutting off resources to an uncooperative neighbourhood to coerce more favourable behaviour, encouraging civilians to leave for any one of many reasons or preventing contamination or disease from spreading. Some of an urban area's signs, symbols and codes are so commonplace that their meaning ought to be made known to every member of a coalition. Being aware that a blue background with white arrow and the lettering 'Senso Unico' on a sign in Rome means one-way street and not the direction to the US Embassy can be the difference between mistakenly wandering into danger or getting aid to the needy in time.

## Getting smarter faster

> The IRA [Irish Republican Army] were getting better because, don't forget, they had their own intelligence—but the British Army was getting better quicker.[48]
>
> —Charles Allen, *The Savage Wars of Peace*

46 Reid, *Confucius Lives Next Door*, 33–34.
47 Schilthuizen, *Darwin Comes to Town*, 3.
48 Charles Allen, *The Savage Wars of Peace*, as quoted in Russell W. Glenn, Steven L. Hartman and Scott Gerwehr, *Urban Combat Service Support Operations: The Shoulders of Atlas*, Santa Monica, CA: RAND Corporation, 2003, 75, available from: www.rand.org/content/dam/rand/pubs/monograph_reports/2005/MR1717.pdf.

> Training and intelligence need to identify what's [notable] in the infrastructure. What are the important parts of the power plant? Given two plants, which should I take out?[49]
>
> —Master Chief Robert B. Fitzgerald, US Navy, 1st Force Reconnaissance Company, 1st Reconnaissance Battalion, 1st Marine Division

We earlier noted that homefield advantage applies no less to urban undertakings than it does to sport. The British Army in Northern Ireland was at something of a disadvantage; most of its soldiers were visitors to the six provinces. Lieutenant Kennedy's experience in south-western Iraq tells us that acquiring the information needed to overcome challenges during 'away games' can be daunting.

Soliciting multiple views from a population regarding who should represent their interests (and, conversely, who is suspect) and carefully screening all associations to avoid undermining one's legitimacy via ill-chosen associations are both steps in the right direction. One could do worse than perform an occasional sleight of hand such as employing multiple translators as did our mature-before-his-time Lieutenant Kennedy.

Commonsense precautions when soliciting information also make sense from a security perspective. A relief provider asking a city engineer what load a bridge can handle, for example, might expose supply trucks to ambush and robbery. Why would an organisation ask for such information if it was not preparing to use the crossing? Asking for information on several spans increases the odds of getting the convoy through unmolested. Confirming information via the internet or interviewing multiple neighbourhood individuals when needing to speak to only one reduces risk of compromising plans or exposing an information source to retribution.

The Irish USAID representative's clever use of UAVs to inspect worksite progress reminds us that the ways of remotely collecting information are ever increasing. Tracking population movements by monitoring mobile phone usage can help aid providers more effectively position their resources. Failing to confirm data reliability exposes users to outdated information or data designed less for accuracy than to impress investors

49 Robert B. Fitzgerald (Master Chief USN, 1st Force Reconnaissance Company, 1st Reconnaissance Battalion, 1st Marine Division), Interview with Russell W. Glenn, Camp Pendleton, CA, 12 July 2001, as quoted in Glenn, *Honing the Keys to the City*, 80.

or voters.[50] The problem can be worse still in megacities given their rate of growth and authorities' related inability to keep pace with data collection.[51] Maintaining accurate statistics in even developed-world megacities is far from easy. Urban-dwellers tend to be more mobile than rural types. Introduce a devastating storm, tsunami or brush with war and the difficult becomes yet harder. Those with special needs among the recently arrived, in transit or working in the informal sector are especially at risk given they often live close to survival's edge.[52] Even the best disaster planning and accountability endeavours will unavoidably leave large numbers of those in need unaccounted for.[53] Flexible plans and sufficient resources to deal with the unknown but expected will go a long way towards addressing gaps.

Even less good news: keeping up with changes in the physical environment and having a reasonable handle on who lives where could be the easy part. Groups seeking to undermine an effective response deliberately hinder the operations of aid providers. Identifying the various culprits and their motivations will require aggressive intelligence collection and analysis. Israel found this to be true when it chose to divide intelligence responsibilities for Iran, Syria and Hezbollah among separate organisations in the years leading up to the 2006 Second Lebanon War. The nature and extent of ties between Hezbollah and Iran remained opaque until well into the conflict, much to the detriment of Israeli operations.[54] The situation will be considerably more complex given megacities' many formal and informal authorities, each with priorities as likely to differ as agree with those of an outsider. That the locations of these government organisations may be scattered across the megacity further complicates information exchange and coordination. Consider the City of Los Angeles and the many other urban governments mentioned above that together make up the megacity of that name. Add to those the federal military installations at Port Hueneme and Los Angeles Air Force Base, FBI, Border Patrol and customs officials, private universities, major commercial properties, and the list goes on and on. The most 'interesting' cases throw multiple

50 Charles Kelly, 'Assessing disaster needs in megacities: Perspectives from developing countries', *GeoJournal* 37 (November 1995): 381–85, at 384, doi.org/10.1007/BF00814020.

51 ibid., 384.

52 D.K. Chester, M. Degg, A.M Duncan and J.E. Guest, 'The increasing exposure of cities to the effects of volcanic eruptions: A global survey', *Environmental Hazards* 2(3) (2001): 89–103, at 100, doi.org/10.3763/ehaz.2000.0214.

53 ibid., 100.

54 Russell W. Glenn, *All Glory is Fleeting: Insights from the Second Lebanon War*, Santa Monica, CA: RAND Corporation, February 2008, 66.

national governments into the mix, as with Singapore spanning the eponymous city-state and parts of Indonesia and Malaysia. Just trying to identify the relevant players is task enough, much less attempting to fathom the relationships between them—relationships possibly evolving in the aftermath of a catastrophe. Information management becomes not science but the art of the possible—a possibility best measured in terms of 'good enough' rather than perfect.

The role of pre-disaster cooperative organisations such as the former Los Angeles Terrorism Early Warning Group (TEWG) and coordinating mechanisms like Los Angeles County's emergency operations centre offer effective foundations for arranging mutual support in times of crisis. Ideally, such organisations would share relevant (and mutually accessible) databases from which any could pull or provide information when preparing for and responding to crises. New York City and London set examples with their liaison exchanges and intelligence-sharing relationships with each other and additional urban areas.[55] Establishing relationships before a disaster will be the difference between getting a leg up on recovery or playing catchup. US Government reconnaissance operations in the immediate aftermath of 2003's Operation Iraqi Freedom focused more on petroleum concerns in Iraq's south-east than those related to electricity provision. Both fed Baghdad's power grid. Only too late did it become apparent that it was the electrical system that was more in need of rehabilitation. By then, the misdirection of personnel and equipment had set back recovery efforts. Lest we think the problem could only occur in distant lands, a White House study in the aftermath of Hurricane Katrina's ravaging of New Orleans concluded that the Federal Emergency Management Agency (FEMA) 'teams that were deployed to assess … damage to the region did not focus on critical infrastructure and did not have the expertise necessary to evaluate protection and restoration needs'.[56] Both these cases make it clear that collecting information is not enough. People with knowledge of an urban area and how it fits into the broader system of which it is a part should be known to authorities before a calamity, thereby speeding effective response once a need arises.

55 For more detail on the nature of these relationships, see Brian Nussbaum, 'Protecting global cities: New York, London and the internationalization of municipal policing for counter terrorism', *Global Crime* 8(3) (2007): 213–32, doi.org/10.1080/17440570701507745.

56 The White House, 'Chapter Five: Lessons Learned', in *The Federal Response to Hurricane Katrina: Lessons Learned*, Washington, DC: The White House, 2006, available from: georgewbush-whitehouse.archives.gov/reports/katrina-lessons-learned/chapter5.html.

## Today is different than yesterday. The same will be true tomorrow

> Sometimes the city is worse than the jungle. You can get lost in it with a million people within arm's length … A guy could roam the streets for a week without being recognized if he were careful not to do anything to attract attention.[57]
>
> —Private eye Mike Hammer, in Mickey Spillane, *My Gun is Quick*

> The Greeks sometimes imagined that we travel backwards into the future, watching the past recede but blind as to what lies ahead.[58]
>
> —Greg Woolf, *The Life and Death of Ancient Cities*

California's Electronic Surveillance System for the Early Notification of Community-Based Epidemics II (ESSENCE II) was a clever way of making data serve its human masters. ESSENCE II drew on military and civilian healthcare information to detect possible epidemic outbreaks (and, conceivably, a chemical or biological agent attack). This and similar systems rely on hospital emergency room, private medical practice and veterinarian reports along with data on pharmacy prescriptions, school and work absences, nurses' notes and over-the-counter purchases to potentially provide early warning of unusual medical trends.[59] We're not there yet. Early results show promise, but experienced medical personnel thus far tend to prove quicker at detecting such anomalies or routine events such as the arrival of the flu season. The situation might be different when the symptoms are less familiar, as was the case with the sarin nerve agent attack in 1995 in Tokyo. Early detection of problems with water and power distribution or transportation systems has long existed without the aid of a human in the loop. Knowing which such capabilities exist and how to access them would be a boon to any party responding to a megacity crisis. Being aware of which do not exist would mean knowing which experts need contacting to close the knowledge void. Overreliance on classified computer networks handicapped US Government representatives coming to the aid of Ebola-stricken West African countries in 2014. Information

57 In Spillane, *The Mike Hammer Collection*, 283.

58 Woolf, *The Life and Death of Ancient Cities*, xvi.

59 Joseph Lombardo, Howard Burkom, Eugene Elbert, Steven Magruder, Sheryl Happel Lewis, Wayne Loschen, James Sari, Carol Sniegoski, Richard Wojcik and Julie Pavlin, 'A systems overview of the Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE II)', *Journal of Urban Health: Bulletin of the New York Academy of Medicine* 80(Supp. 1) (2003): i32–i42, doi.org/10.1007/PL00022313.

stored on those networks, classified or otherwise, was not available even to members of the owner organisation, the US Department of Defense, when special equipment was not at hand. NGO, IGO and other partners whose aid would have made soldiers' jobs easier lacked security clearances and were likewise shut out.[60]

Most recruits joining ISIS and supporting its five-month battle in Marawi, Philippines, during 2017 reportedly came not from the city itself but from the surrounding countryside.[61] However, leaders, funding and propaganda from the Middle East were behind the recruitment and sustainment of the local hires. Just as those responding to crises in a megacity need to know how the city's *physical* infrastructure links to external resources, much of the *social* infrastructure will have ties that reach beyond urban boundaries—sometimes thousands of kilometres beyond.

Knowing what information is important will not be the preserve of leaders on high. The men and women daily patrolling the streets, rendering face-to-face aid or monitoring hours of CCTV and other sensor feeds will be the ones best able to sense the absence of the normal or presence of the abnormal. Is the never before seen car on a side street a vehicle-borne explosive weapon or a visitor to one of the residents? Does it sit low on its axles because it contains hundreds of kilos of explosives or due to exhausted shock absorbers? Why is the falafel cart that is normally on the corner not there today? Does the failure to show up mean the owner knows the enemy is up to no good or is it a local holiday and sales are better elsewhere? The daily hum of a megacity's normal routine consists of uncountable dynamic activities. A terrorist, criminal or other hostile group is difficult to detect if it operates as part of this ever-present vibration of activity, remaining below the threshold that would bring it to the attention of authorities. As we will see when looking at the 1995 nerve agent attack on the Tokyo subway in greater detail, all five men who punctured their chemical-filled balloons managed to escape detection. They remained 'concealed' by ensuring they seemed to be just part of the commuter flow on an otherwise typical Tokyo workday morning.

60 United States Army Center for Army Lessons Learned (CALL), 'Operation United Assistance: Report for follow-on forces', *Bulletin: Lessons and Best Practices*, No. 15-16, Fort Leavenworth, KS: US Army Center for Army Lessons Learned, September 2015, 7, available from: usacac.army.mil/sites/default/files/publications/15-16.pdf.

61 Kiriloi M. Ingram, 'Revisiting Marawi: Women and the struggle against the Islamic State in the Philippines', *Lawfare*, 4 August 2019, available from: www.lawfareblog.com/revisiting-marawi-women-and-struggle-against-islamic-state-philippines.

## Information: The new opiate of the masses

> Our brains have evolved to become highly adept at finding patterns but not at gathering comprehensive and scrupulously unbiased data.[62]
>
> —David J. Helfand, *A Survival Guide to the Misinformation Age*

> In wartime, truth is inseparable from rumor.[63]
>
> —James Verini, *They Will Have to Die Now*

An IBM study conducted not too many years ago reported that information provided via smartphones, social media sites and other sources every day provides the equivalent of five trillion books.[64] Much of that information is wrong. The reasons range from ignorance, misplaced faith in sources, simple mistakes and misguided good intentions to more malicious causes such as fraud, deliberate manipulation or reinforcement of authoritarian messaging. Disasters provide rich soil for anyone wanting to plant untruths. Think of how frequently you hear of society's weeds fraudulently soliciting donations after a calamity. The city's mayor held two press conferences the day after the 2013 Boston Marathon bombing. He had an equal number of goals. He first sought to keep his constituents informed. Second, he wanted to encourage public unity in the face of any attempts to breed hatred that might be directed at specific demographic groups once the ethnicity of the bombers was known.[65] Both are commendable objectives that have elsewhere proven difficult to accomplish in times of crisis.

Recognition of the need to take control of messaging is noteworthy. Russia, China and other competitors are demonstrating that they would rather outmanoeuvre the United States with propaganda, disinformation, misinformation or mal-information to undermine the foundations of its government than confront US forces in combat. There is no reason to believe anyone seeking to sow chaos or forward their agendas during and in the aftermath of an urban disaster will not use the same tools in increasingly sophisticated ways. Perhaps it is time to adapt those lessons from Boston by offering the option of service in a social media corps in

62 Helfand, *A Survival Guide to the Misinformation Age*, 192.
63 Verini, *They Will Have to Die Now*, 147.
64 Helfand, *A Survival Guide to the Misinformation Age*, 2.
65 Rodin, *The Resilience Dividend*, 211.

lieu of more traditional military specialties. Such an organisation would offer the benefits of messaging consistency during day-to-day interfaces with groups along the continuum of relative interests while providing a shield to counter criminal and other adversary misuse of information during a crisis. If historian Daniel Headrick is correct in considering the telegraph as the invisible weapon of empire, information is the battlefield on which millions wage a struggle for truth.[66]

66 Daniel Headrick, *The Invisible Weapon: Telecommunications and International Politics, 1851–1945* (New York, NY: Oxford University Press, 1991), as cited in Paul Farmer, *Fevers, Feuds, and Diamonds: Ebola and the Ravages of History*, New York, NY: Farrar, Straus & Giroux, 2020, 239.

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