Emerging Issues for Conflict and Security

2015 Report

About Vision Foresight Strategy LLC

Vision Foresight Strategy LLC (VFS) is a foresight and strategic analysis firm headquartered in Honolulu, Hawai'i.

We work with senior organizational leadership to reframe their understanding of the forces shaping their environment and help prepare their teams for navigating and shaping those emerging changes.

Founded by academically-trained, professional futurists, we are a global network of experts that love the challenge of seeing and thinking strategically in a world of complex and dynamic change.

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Reframing the Future

Introduction

As policy makers and pundits alike are coming to admit, the futures of conflict and security in the world are not simple to divine. The future, we are reminded on a daily basis, did not end with the fall of the Soviet Union, and the dynamics of power, international political change, and military competition have returned to the fore of academic and policy debates. Whether it is the debate over the "return" of great power politics, the narratives about the "decline" of the West – and the US in particular – or the apprehension that the world is entering truly uncharted and frightening waters of perpetual all-scale conflict and insecurity, we are shifting more of our attention to the multiplying possibilities for conflict and security in the decades ahead.

This report introduces an inventory of *emerging issues* related to the futures of conflict and security. It is intended to provide input for researchers engaged in foresight projects and offers "building blocks" for larger foresight efforts, such as scenario forecasts. Beyond providing original content, this report highlights the concept of emerging issues and its centrality to rigorous foresight work. Other planners and policy makers will also find the report useful as a source of logical yet provocative thinking about many of the issues that may come to play significant roles in shaping the future.

Emerging Issues of Conflict & Security
The following are some examples of the emerging issues found in this report.
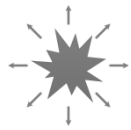
Background War
A state of continual "background noise" war as a regular, normal feature of human affairs.

Child Augmentation and Competitive Social Spiral
A "keeping up with the Jones's" dynamic focused on augmenting children in order to perform at ever-higher levels in academics and sports.

Distributed Autonomous Organizations
"Organizations" without human management run by software distributed across multiple computers.

Flash Conflict
Similar to flash mobs and flash crashes, the sudden, fleeting, and sometimes unpredictable coordination of multiple actors.

Smart Feral Cities
Urban areas ungoverned by states (areas of "limited statehood") but suffused with "smart city" technology and providing non-state actors with dramatic new possibilities for either governance or control.

To produce the *Emerging Issues for Conflict & Security* report VFS built upon its existing horizon scanning efforts and surveyed its global network of foresight, defense, and security professionals to help identify some of the many issues that might shape the futures of global conflict and security. The scanning framework that was used for this report – and which is useful for scanning in general – is depicted in Figure 1 on the following page.

The inventory of issues presented within this report is not intended to be exhaustive, but rather illustrative of the range of potentially important issues facing the world within the broad arena of conflict and security.
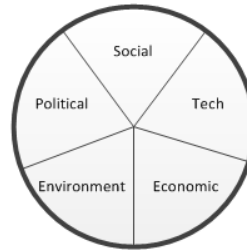
Multiple Scales

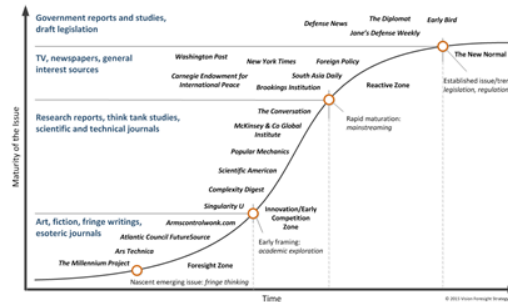Scan for signs of emerging issues across multiple scales of the issue under exploration.
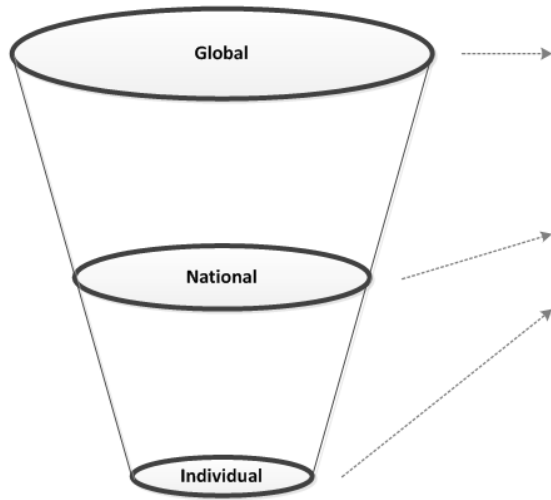
STEEP

Apply a framework such as STEEP during the scan at every scale to ensure a broad sweep.

Verge GPF

Explore the implications of each emerging issue through a framework such as Verge.

Global

National

Individual

Social

Political

Tech

Environment

Economic

Scan using multiple types of sources.

Define — How we define the world around us.

Relate — How we organize ourselves and relate to the wider world.

Connect — The tools and practices through which we connect to each other.

Create — The ways in which we create goods, services, and value.

Consume — The ways in which we acquire and use goods, services, and value.

Destroy — How we destroy value and the reasons we do so.

Government reports and studies, draft legislation

Defense News   The Diplomat   Early Bird
Jane's Defense Weekly

The New Normal

Established issue/trend: legislation, regulation

TV, newspapers, general interest sources

Washington Post   New York Times   Foreign Policy
Carnegie Endowment for   South Asia Daily
International Peace   Brookings Institution

Reactive Zone

Research reports, think tank studies, scientific and technical journals

The Conversation
McKinsey & Co Global Institute

Rapid maturation: mainstreaming

Popular Mechanics

Scientific American

Complexity Digest

Singularity U

Innovation/Early Competition Zone

Art, fiction, fringe writings, esoteric journals

Armscontrolwonk.com

Atlantic Council FutureSource

Early framing: academic exploration

Ars Technica

The Millennium Project   Foresight Zone

Nascent emerging issue: fringe thinking

Maturity of the Issue

Time

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Figure 1: Framework for Scanning

Trends

A trend is a historical change over time. A trend therefore describes history, not the future. In contrast, emerging issues are descriptions about things that *could* become meaningful in the future, but haven't yet reached their own maturity. Both trends and emerging issues are core building blocks of virtually all futures research. Even here, in a report specifically about emerging issues, trends were important inputs that informed our understanding of what has been changing and thus what might continue to change as we move forward into the future. We have therefore included a list of trends that informed the outlook and thought of VFS and its network of professionals.

As with everything in this report, the list of trends included here is not meant to be exhaustive within the broad domain of conflict and security; such an effort would be massive, to say the least. Rather, it represents a sweep of the historical changes of which we are aware and which play into many of our explorations of the futures of conflict and security. Any such list of trends should tend to be more familiar to readers and less surprising than the accompanying list of emerging issues.

Representative Trends

- Power transition among states
- Power diffusion away from states
- Continuing technological innovation and diffusion
- Increasing digitization
- Growing global ubiquity of internet access
- Growing global ubiquity of computing power
- Rising human connectivity
- Increasing urbanization
- Decreasing global wealth disparity
- Increasing national wealth disparities
- Aging population in advanced economies
- Growing population in developing economies
- Youth bulges in developing economies
- Improving capabilities in automation
- Diffusion of automation throughout the economy
- Improving capabilities in digital fabrication
- Rising Chinese Assertiveness in Foreign Policy
- Military modernization programs across Asia/Rising military expenditures
- Rising Chinese military expenditures
- Constrained/falling US defense expenditures
- Evolving capabilities of unmanned platforms
- Increasing rate of cyber attacks

Emerging Issues

An "emerging issue" can be a new technology under development, a potential future public policy issue, or a new concept or idea that might be fringe thinking now but which *could* mature and develop into an everyday issue or practice. In the present, they are usually encountered as "weak signals," blog posts about some "crazy" new philosophy, or an article about an experimental project run by graduate students. They are *not* mainstream realities at this point in time. As an example, the use of drones in warfare is not an emerging issue (it is, in fact, The New Normal; see Figure 1); yet the possibility of a persistent and global ecosystem of unmanned aerial platforms of all shapes and sizes *is* an emerging issue.

We classify emerging issues according to the amount and strength of the signals we are receiving about them. Maturing Developments refer to those possibilities for which there is a growing set of signals of change: research projects, commercial investment, increasing mention in articles and blogs, etc... Strengthening Signals are a little weaker, with fewer signals or anecdotes indicating an issue's emergence but a clear sense that there "might be something there." Lastly, Intuitive Possibilities often have few or just a single data point, but their possibility is both logical and compelling.

In futures research we use all three categories of emerging issues and we generally try to ensure that a foresight project benefits from a spread of issues across the s-curve. In theory, there are at any time far more Intuitive Possibilities out there than any other category, yet in practice it is often easier for individuals to sense and accept Maturing Developments, which typically have many more signals announcing their development and are by definition much closer to the mainstream.

Disruptive Combinations

One of the practices used to identify emerging issues is the VFS approach of *disruptive combinations*, which is used to identify potential nonlinear disruptions.   "Disruptive combos" are typically generated by identifying a set of individual emerging technologies, e.g. synthetic biology and automation, and then randomly combining those to explore the "mash-ups" that would result. A disruptive combos approach is useful for exploring all three categories of emerging issues, but it is particularly useful for exploring Intuitive Possibilities. A number of the issues in this report were identified through a disruptive combos approach that was used to produce the Global Security Forecast 2014[1] intense demonstration project.
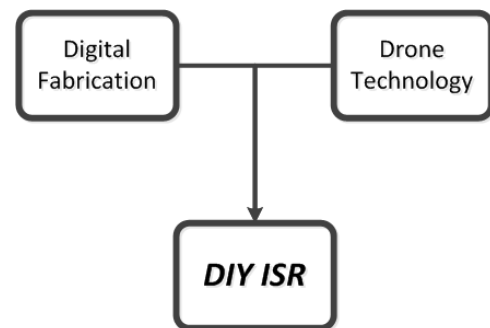
Example: by combining the emerging advances in digital fabrication technologies with the evolving technologies of drones and unmanned platforms, we can easily anticipate the growth of "DIY" intelligence, surveillance, and reconnaissance systems. Incidentally, this disruptive combo is being supported by phenomena such as the growing "drones for humanitarian assistance" movement.

S-Curve Plot

Figure 3 on the following page plots a selection of the emerging issues from this report along the s-curve.

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[1] *Global Security Forecast 2014*, www.visionforesightstrategy.com

Maturity of the Issue (y-axis)

Time (x-axis)

The New Normal
Reactive Zone
Innovation/Early Competition Zone
Foresight Zone

Lack of Preparedness for Pandemics

Ubiquity of Offensive Insurgent Tactics

Xi Jinping's Consolidation of Power

Enforced Transparency

Creating New Land and New Concepts of Sovereignty

Presumption of Inherent Digital Insecurity

Infectious Disease as a National Security Threat

UAVs Capable of Hyper-Targeted, Site-Specific Attacks

Security Risks of Ubiquitous Domestic Drone Use

DIY Intelligence, Surveillance, Reconnaissance (ISR)

Diminishing Agency of the Westphalian State

Risks of Ubiquitous Smart Homes and Smart Cities

Dual Use Implications of Autonomous Vehicles

Global Individual Security Market

Synthetic Biology

Youth Bulges and High Unemployment as a Global Security Issue

Nations and Companies Looking to Mine the Moon

Mistrust and Conflict with AI

Distributed Autonomous Organizations

Large-Scale Ag Failures in S and SE Asia

Augmented Conflict Actors

Crowdsourced Distributed Conflict

Digital Human (Upload) Rights and Suffrage

Flash Conflict

Cryptocitizens

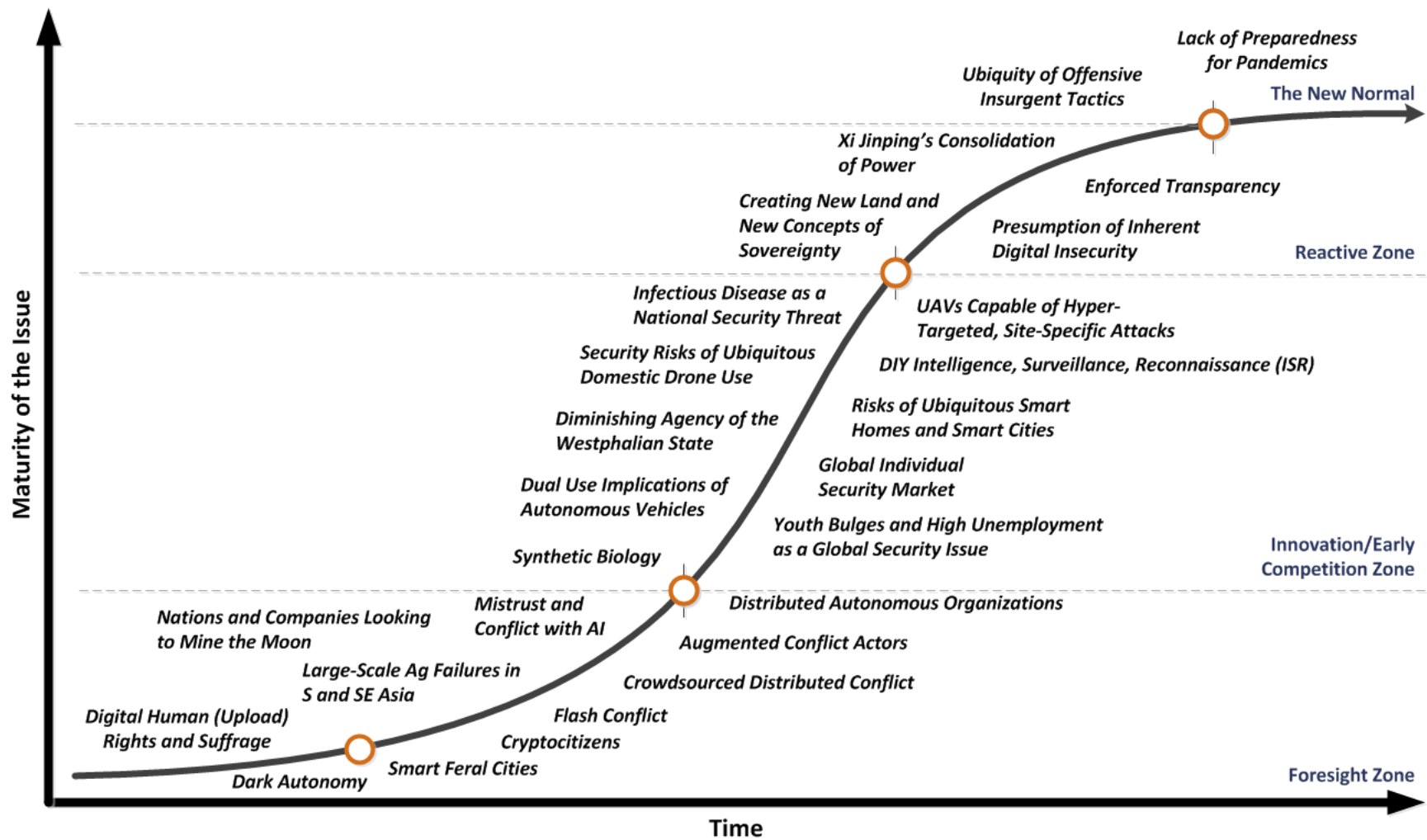Dark Autonomy

Smart Feral Cities

Figure 3: Selection of Emerging Issues Plotted on the S-Curve

The following three tables present the emerging issues identified in this year's report. Again, this is not meant to be an exhaustive list of emerging issues; rather it is meant to provide an initial inventory of emerging issues, which can be used as input and provocation for additional foresight work.

The emerging issues are sorted into the categories of Maturing Developments, Strengthening Signals, and Intuitive Possibilities. Each category is further sorted according to scale; at what level the issues are most applicable or important. As shown in Figure 1, the three scales used here are Global, National, and Individual.

Maturing Developments: things with a growing set of signals

GLOBAL	
Hyper-Networked Global Cities and Pandemics	The growing potential for virulent disease to spread rapidly via airport hubs. Quarantine of an entire city by 2025. Airports could evolve into zones of sophisticated biological sensing and response.
Privatization of Military Power	Growing concentration of military power in the hands of corporate actors (contractors). Altered decision making calculus for political leaders and increased dependency of the state on third parties.
Machine Autonomy and the Kill Chain	Rising concerns about the effects of "remote war" are helping to fuel the growing debate about the impending use of automation in warfare and what should be the "proper" place of machines in war between states.
Diminishing Agency of the Westphalian State	An increasing loss in agency of the traditional Westphalian state as the legitimate adjudicator in the use of force in pursuit of group goals.
Loosening of the Institutions and Norms of the "Liberal Hegemonic Order"	The diminishing influence of the liberal, rules-based order founded on American-favored principles, administered through post-WWII institutions like the UN and the IMF, and enforced by American military power.
Global Private Regulation	Globalization and the rise of large corporations, exemplified by Wal-Mart, with globe-straddling markets and operations is enabling private regulation of economic activities on a global scale.
Fragmentation of the Eurozone	The possibility of the reversal of the post-WWII trend of European political and economic integration and a return to a more historical typical fragmented map of Europe.
Background War	State of continual "background noise" war as a regular, normal feature of human affairs.
Perpetual Preparation for War	A continual state of "war preparations" by advanced states through aggressive use of cyber activities for both intelligence purposes but also as an offensive weapon that is just below the threshold for retaliatory strikes.

Legislation for Outer Space Property Rights	Domestic and especially international attempts to evolve definitions and regulation of future property rights claims and disputes over celestial bodies and territories within the solar system.
Domestic & International Procedures for Planetary (Asteroid) Defense	Domestic and international response plans and capabilities for defending the Earth against asteroid impacts.
Xi Jinping's Consolidation of Power	Xi Jinping's continued consolidation of power in China and his taking a harder-line stance in international affairs, based in part on greater confidence in his domestic political base.

NATIONAL	
Infectious Disease as a National Security Threat	Infectious diseases (e.g. Ebola) causing a greater ripple effect across society, posing greater threat to national security and requiring more stringent responses by national governments, militaries, etc… (either as a tangible requirement or a requirement fabricated by society).
Domestic Dissatisfaction and Unrest from Rising Inequality	Potential for a critical mass of citizens to actively agitate for change due to prolonged and widening economic hardship amidst increasingly prevalent wealth gaps in society.
Security Risks of Ubiquitous Domestic Drone Use	Aerial & Ground drones as delivery vehicles and concerns for safety (terrorism, hacking) and air / ground traffic safety.
Contest Between "Right to Drive" Activists and Insurance Companies (Robotic Autos)	The expected counter-trend to pervasive automation in society and the contest between the stakeholder groups most passionate about the institutionalization of automation over human agency.
Challenge of Megacity Urbanization for Power and Stability	The increasing urbanization of humanity and the rise of megacities, with their attendant implications for eroding state power and increasing local instability.
Persistent, Ubiquitous Drones	The evolution of unmanned systems of all types and their diffusion throughout society and the economy to become a normal and pervasive part of daily life.
Enforced Transparency	A form of hacktivism involving the acquisition and public dissemination of private or classified material specifically to reveal organizational secrets of questionable ethics or legality.
Presumption of Inherent Digital Insecurity	Individuals and institutions coming to *assume* that their ubiquitous (and increasingly necessary) digital lives are never fully secure.

INDIVIDUAL	
Virtual/Augmented/Mixed Reality as a Consumer Good	The maturation of both virtual and augmented reality and their emergence as a mainstream application and retail service.
Ad Hoc/P2P/Mesh Networking	Individuals able to easily establish and dismantle private and local networks, without the need for public or corporate grids or the internet, through pervasive peer-to-peer networking technologies.

Renewable Energy-Enabling Storage Technologies and Microgrids	Maturation and diffusion of energy storage innovations and functional energy microgrids, leading to a rapid proliferation of many types and scales of renewable energy generation.
Dual-Use Implications of Autonomous Vehicles	The increasing use of autonomous vehicles by states and individuals and their dual-use implications (both military and commercial).
DIY ISR	Commercially-available and retail unmanned platforms, drones, satellite services; DIY drones; ubiquitous mobile devices and internet access; rapid diffusion of digital fabrication with global design networks and markets.
Hacktivism	The use of cyber activities in the service of social causes and advocacy; generally nonviolent.
End of the Presumption of Personal Privacy	Individuals and institutions come to assume that personal privacy in a fully digital age is at best fleeting and compartmentalized, at worst simply an illusion.

Strengthening Signals: fewer signals, but a clear sense of potential

GLOBAL	
Youth Bulges and High Unemployment as a Global Security Issue	Demographic transitions constrained by high unemployment levels in young adults across globe will lead to more geopolitical instability. A lack of jobs in emerging economies becomes a global security issue.
Ubiquity of Offensive Insurgent Tactics	The global diffusion and increased utilization of insurgent tactics used on the offensive, as evidenced by activities in Mali, Ukraine, Islamic State, etc.
Bioengineering	Advances in the ability to genetically engineer microbes, plants, and animals to exhibit desired traits, ranging from functioning as biological factories to resisting drought to improved physical and cognitive capabilities.
Synthetic Biology	The rising capabilities – and thus, importance of – this interdisciplinary field that works on designing and constructing new biological parts and systems.
Digital Fabrication	The maturation of an ecosystem of digital technologies (such as 3D printing) that enable individuals and groups to have unprecedented capabilities for the rapid and low cost design and fabrication of physical objects.
Creating New Land and New Concepts of Sovereignty	Sufficient capability at dredging, building large entities out of whole cloth, etc. that the 200+ years of maritime sovereignty is incomplete, and new concepts of sovereignty will need to be created for all the "terra nullius"

More Climate Change Refugees and Nations Losing their States	The rise of sea levels, the shifting of regional climates, and the increasing in extreme weather events leading to the loss of land mass (e.g. Kiribati) and driving more and more political communities into becoming climate change refugees.
More Prevalent Resource-Driven Instabilities and Conflict	Population growth, global urbanization, global littoralization, and increasing economic development (demands) will drive more resource deficiencies, resource-driven instabilities, and conflict over access to resources.
Nations & Companies Looking to Mine the Moon	The possibility for spacefaring countries like the US and China, along with commercial ventures and state-chartered missions to compete over exploration and mining of the Moon.
Race to build Space-Based Solar Power Satellites	The competition among states and companies to develop functional and cost-effective systems for collecting solar power in orbit and transmitting the energy to Earth.
Cyber as Increasingly a Cross-Domain Method of Warfare	The mainstreaming of cyber activities as it becomes a standard tool for conflict actors and for actors in non-violent contests and competitions.
Advances in Bioweapons	Improvements in scientists' ability to develop new pathogens, alter existing pathogens, and to weaponize deadly viruses and bacteria to use against enemy populations and livestock.
Lack of Preparedness for Pandemics	Growing mismatch between the potential frequency and severity of pandemics and the domestic response capabilities and the international coordination of responses.
Quantum Computing	Computational systems built around quantum phenomena and using qubits rather than traditional transistors and bits as in mainstream computers. Such systems are expected to perform calculations dramatically faster than traditional computers.
Quantum Cryptography	Using quantum-mechanical phenomena to carryout traditional cryptographic tasks.
Distributed Autonomous Organizations	A DAO is "…a decentralized network of narrow-AI autonomous agents which perform an output-maximizing production function… It can be thought of as a corporation run without any human involvement under the control of an incorruptible set of business rules. These rules are typically implemented as publicly auditable open-source software distributed across the computers of their stakeholders."[2]

New cryptography-based decentralized applications will enable more resilient organizational communication and decision-making systems (for 'good' guys and 'bad' guys) |

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[2] Wikipedia. "Distributed autonomous organization." Accessed on July 30, 2015

New Political "Peer Competitors" to the Nation-State Form	Governance challenges and new tools for organizing and for processing information will enable continued political experimentation as communities and non-state actors try to address the governance challenges they confront.
Privatization/Commercialization of Governance	Private companies (e.g. Google) with significant technical capabilities and resources will increasingly help build and operate initiatives and systems to help solve or manage collective challenges.
NATIONAL	
Permanent Labor Dislocation from Structural Shifts in the Economy	The permanent restructuring of domestic economies' labor needs as automation and improvements in industrial efficiency continue to improve output while reducing the need for high-value-added human labor.
UAVs Capable of Hyper-Targeted Site-Specific Operations	The potential for UAVs to gain the capability for launching site specific attacks (e.g. recent landing of micro drone on Japan's prime minister housing).
Contests Between "New Outer Space" Entrepreneurs and "Old Space" Institutions	Fight between "new space" (entrepreneurial, Space Development Focused, Business Focused) vs "old space" (Government, Exploration) for NASA budget and launch concepts and propellant depots
Risks of Ubiquitous Smart Homes and Smart Cities	The pervasive security risks that emerge as increasing numbers of homes and transportation are connected and controlled by digital systems and as cities are increasingly suffused with digital data and control systems.
End of the Capabilities Gap Between States and Non-State Actors	With the advance and spread of technologies like digital fabrication and cyber, and with rising connectivity and the ability to easily self-organize, the faster adaptive cycles of non-state actors will help propel them to innovation parity – if not supremacy.
Large-Scale Construction Constrained by Global Resource Limitations	Large-scale, new construction (as witnessed in places like Singapore and China) will increasingly be impossible due to lack of raw resources, primarily the sand needed to make concrete
INDIVIDUAL	
Augmented Conflict Actors	Soldiers, combatants, and other actors augmented with cognitive and physical enhancements ranging from pharmaceutical treatments to specialized adaptive learning systems to exoskeletal assist systems.
DIY Bio	Do-It-Yourself biologists and citizen scientists engaged in biological research, "biohacking," and synthetic biology outside of traditional research lab venues.
Resurgence of Personal Vendettas and Family Feuds	The evolution of using social media and tightly interwoven digital lives for escalating cycles of cyber bullying, shaming, destroying reputations through personal data and social media, and ultimately straight forward individual level cyber-attacks.

Child Augmentation and Competitive Social Spiral	A "keeping up with the Jones's" dynamic focused on augmenting children in order to perform at ever-higher levels in academics and sports. Spiraling use of adaptive cognitive tools (machine learning), hyper-fine-tuning of diet and lifestyle based on genetic profile, and application of pharmaceutical enhancements.

Intuitive Possibilities: few data points, but logical and compelling possibilities

GLOBAL	
Large-Scale Agricultural Failures in South and SE Asia	Large-scale agricultural failures due to increasing drought and soil erosion, particularly in Southeast Asia and the sub-continent
Space Property Rights on the South and North Poles of the Moon	The future possibility of conflict over property rights on the Moon. Easily connected to the emerging possibility of state and commercial mining and development of the Moon.
Environmental Protection of the Moon	With the rise in development and exploitation of the Moon's resources, there is very likely to be a concomitant emergence of a counter-development movement that seeks to preserve the Moon.
Conflicting Great Power Ideas Over How to Deflect an Asteroid	Prominent states like the US and China differing over how to attempt to defend the human race from the collective problem of an asteroid strike. Competing ideas may conflict over resources, organization, and spheres of authority.
Global Individual Security Market	The potential for a worldwide market for individual-level and personalized security systems built on digital platforms such as mobile devices and smart environments and incorporating surveillance, data analytics, and automated response through human services and the built environment.
Putin as a Leader Increasingly Vulnerable to Domestic Politics	The possibility of Russia's economic and social stability not improving, causing its authoritarian leadership to use foreign policy as a way to distract and/or deal with domestic issues.
Diversifying Innovation in Conflict Resources	Beyond the linear extrapolation of "3D printing guns," digital fabrication technologies and the global innovation networks that emerge in relation to them will enable non-state actors of all types to experiment, share, and produce unforeseen new capabilities for conflict.
Mistrust and Conflict Between Humanity and AI	Advances in raw computing power and algorithms mean we will soon see machine "intelligence" that will discern patterns we do not – and much more quickly. Will such systems see humans as a threat? Humans are likely to be fearful of such systems, implying that AI *should* see humans as a threat.
Crowdsourced Distributed Conflict	Capabilities like microtasking, distributed computing, and online collaboration platforms used to temporarily "staff" conflict.

Dark Nations	The aggregation of **cryptocitizens**, formed around every conceivable interest, identity, and social movement. More than simply ad hoc social networks, these represent coherent and enduring identities.
Dark Autonomy	Decentralized, autonomous, and (cryptographically) anonymous organizations and entities become regular actors on the economic stage. Built on code, operated by algorithms and without the need for human management.
Ecology-of-Things	Emergent and unpredictable patterns of behaviors among networked autonomous things. "Control" dissipates as discrete systems mesh with (and disappear into) the broader digital built environment.
Nano Leaps	Low cost abundant energy unlocked via materials science. Disruption of traditional supply chains and even geopolitics as the global energy equation is rewritten.

NATIONAL	
Digital Human (Upload) Rights and Suffrage	The future issue of civil rights for individuals who have been uploaded/converted to a digital form.
Contests Between the State and Corporations for Control of Civic Infrastructure	The potential for states to come into increasing conflict (both overt and covert) with the private companies that design, sell, build, and run the globe-spanning digital infrastructure upon which the world's social, economic, and political affairs are increasingly dependent.
Smart Feral Cities	Urban areas ungoverned by states (areas of "limited statehood") but suffused with "smart city" technology and providing non-state actors with dramatic new possibilities for either governance or control.
Flash Conflict	Similar to flash mobs and flash crashes, the sudden, fleeting, and sometimes unpredictable coordination of multiple distributed actors in conflict-related activities. The event dissolves as quickly as it forms.
Nation-Sourcing	The 21st century *levee en masse*: a country turning every household into a digital fab factory or cyber defense node; an entire nation capable of surging "drones and code."
Unhackable Code	The masking of synthetic genomes through cryptographic technologies.
Digital Foreman	The machine-managed evolution and production of synthetic genomes for biobased production and economies.
Quantum Teleportation	Systems that draw upon quantum-mechanical phenomena to transmit information (such as the precise state of an atom) from one place (object) to another via quantum entanglement.

INDIVIDUAL	
Digital Human-Like Chat-Bot "Companions"/Staff Accused of Ruining Marriages	*Her* as the home-wrecker. The possibility of digital assistance and artificial intelligence becoming so life-like that people develop socially-significant emotional attachments and dysfunctions.

Military Service as a Route to Youth and Longevity	Joining the military as a route to youth rather than education and social mobility due to the military's access to advanced treatments for physical longevity and performance enhancement.
DIY Personal Security	The evolving capabilities and increasing ease of digital fabrication, computer programming, and the Internet of Things will enable the "average Joe" to cobble together increasingly sophisticated security systems of stationary and mobile surveillance (micro and nano drones) and automated response (drones).
Cryptocitizens	Individuals submerging parts or all of their lives below the visible digital surface of daily life, using cryptographic technologies to mask their behaviors and assets.
Micro Drone Delivery of Nano-Bio Packages	The use of increasingly small and sophisticated drones to deliver payloads of molecules and microbes to both animate and inanimate targets.
Bot-Driven Champions Against Cyber-Bullying	Partly in response to the rise of social media-enabled bullying, shaming, and digital retribution, autonomous bot "champion" will emerge as popular systems for "second strike", first with parents of young children, and then increasingly the population at large.

Why "Emerging Issues?"

Emerging issues are a fundamental component of most futures research, offering an important alternative set of inputs to foresight work than do historical trends. An emerging issue is any new technology under development, any potential future public policy issue, or any new concept or idea that might be fringe thinking now but which *could* mature and one day become accepted as normal thinking or policy. Emerging issues are usually encountered in the present as "weak signals," and they are often interpreted by incumbent institutions and mainstream thinking as fringe ideas or unlikely possibilities.

Emerging issues are identified through emerging issues analysis (EIA), which is a practice endemic to the field of *futures studies*. EIA uses the standard s-curve of issues/technology development as its backbone framework for understanding and plotting the emergence and maturation of future issues (see Figure 4). Using this development curve as a guide, futures researchers help to frame many of the potentially disruptive future issues that are not immediately apparent by extrapolating current trends or by running quantitative models of well-defined systems.
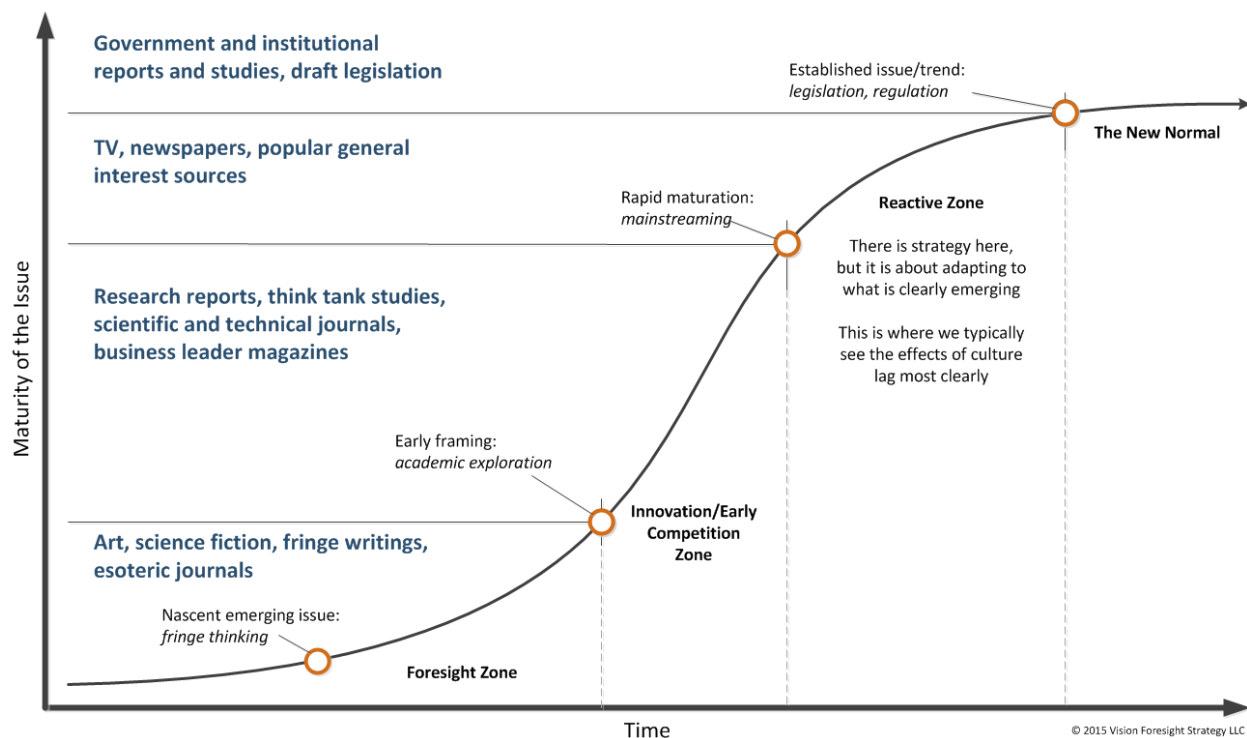

Figure 4: S-curve of Emerging Issues Analysis

Along the s-curve, the Foresight Zone represents the earliest period of an emerging issue's life cycle. Here the new idea or technology is so different from the "normal" way of thinking or doing that it cannot help but be considered a fringe or unlikely event. This zone typically has the greatest number of possible emerging issues, and also the craziest sounding ones. A little farther up, the Innovation Zone represents the stretch of the curve in which those emerging issues that have not "died" or fallen by the wayside are experiencing a period of rapid development and rising interest. Researchers, funders, and analysts are starting to take real notice of the issues that pass through this zone. The Reactive Zone is the final stretch of the curve in which an issue is reaching is mature form (be it a technological standard

or a policy framing). Here is where mainstream society is finally taking full notice of the issue and where institutions are learning to adapt to its existence. Finally, The New Normal represents all that has become mainstream and conventional. If an issue is mapped to this part of the curve then it is no longer an emerging issue.
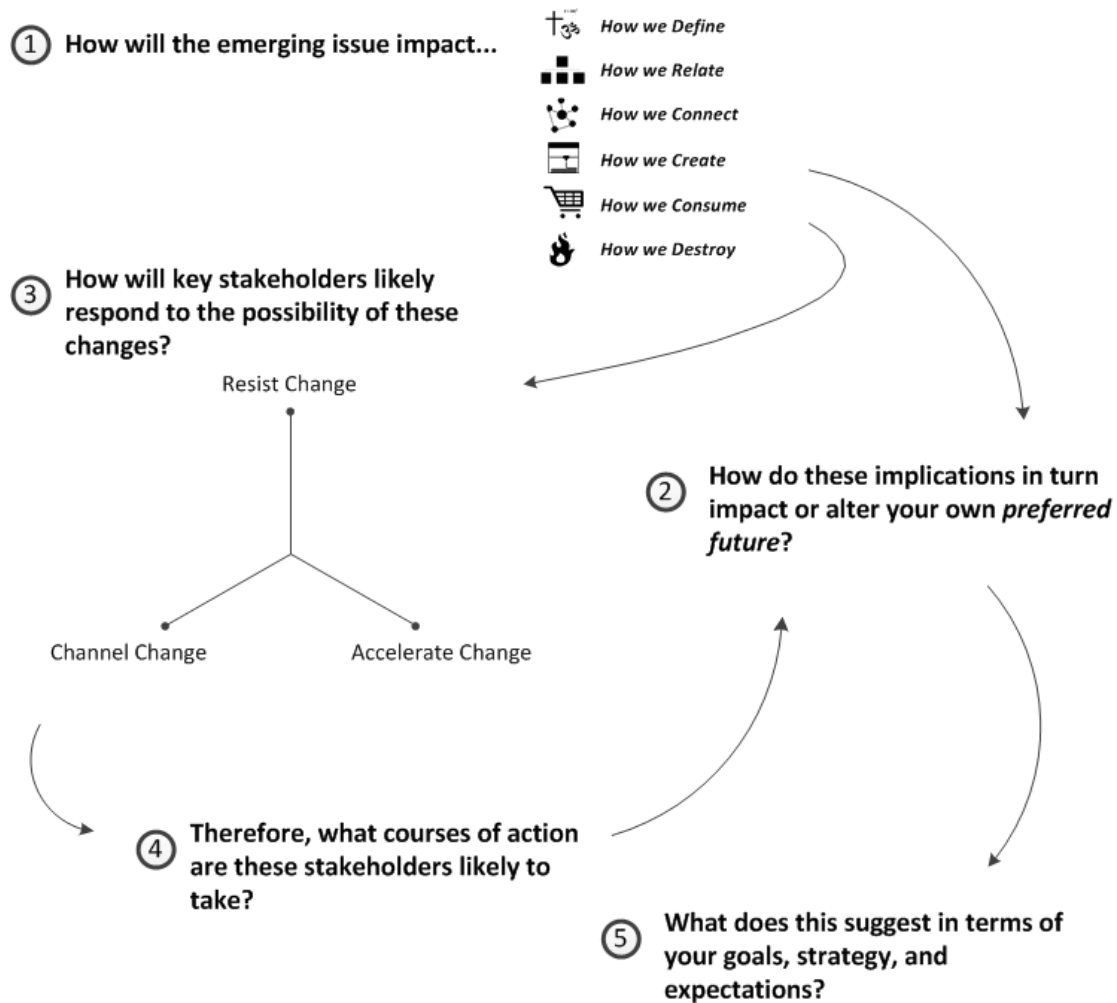
Emerging issues are critically important for foresight work, though they can sometimes be difficult for leaders (and the organizations they lead) to hear and contemplate. A good horizon scan and emerging issues analysis is not like a trend report; the latter identifies the historical changes that mainstream expertise and data collection already monitor, while the former specifically hunts for signals of new – often nonlinear – change. Such emergent, novel, and disruptive change necessarily challenges the assumptions and norms that established and successful organizations now take for granted.

Successful emerging issues analysis - or rather, the success of getting an organization to sincerely engage emerging issues – can often depend on finding the proper balance point between novelty and familiarity. Too far up the s-curve (too familiar) and the issues will be recognizable but far along the path to mainstream success and adoption, leaving the organization with little to do other than react like most other organizations. Too far down the s-curve (too novel) and the issues will be too far off in the future to be meaningful for the organization. And this balance between novelty and familiarity must be struck anew with each and every organization.

Implications and the Application of Emerging Issues

Emerging issues are one of the key building blocks of good futures research. To be valuable, however, they must either be **explored individually** for their implications for the future, or they need to be used as components for larger forecasts (scenarios) of **alternative futures**.
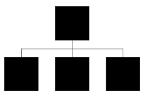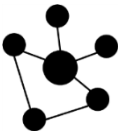
When considered as **individual issues**, the implications of emerging issues can be explored through analyses such as that shown in the illustration below.

① How will the emerging issue impact...

- How we Define
- How we Relate
- How we Connect
- How we Create
- How we Consume
- How we Destroy

③ How will key stakeholders likely respond to the possibility of these changes?

Resist Change

Channel Change   Accelerate Change

② How do these implications in turn impact or alter your own *preferred future*?

④ Therefore, what courses of action are these stakeholders likely to take?

⑤ What does this suggest in terms of your goals, strategy, and expectations?

Explored in this fashion, we can consider the many changes and reactions that an emerging issue could cause, as well as explore the implications to our current (and future) goals and strategies.

The General Practice Framework

As shown in Figure 1 and as illustrated on the previous page, the implications of individual emerging issues can be explored using the "Verge" General Practice Framework, which is a 6-domain framework for futures research developed by Dr. Richard Lum and Michele Bowman. This framework is particularly useful for us because it drives us to look at things that are: a) only indirectly or tangentially related to actual violence and warfighting; and b) systemic or contextual components of conflict and security. In these ways the framework helps us look out beyond the traditional "surface" of conflict with its usual suspects of great power personalities, military technologies, and traditional definitions of state power.

	Generic Domain	Examples Specific to Conflict & Security
Define	The concepts, ideas, and paradigms we use to define ourselves and the world around us. This includes things like worldview, paradigms, and social values and attitudes.	Law, norms; shifts in issues like sovereignty, a rules-based order; recognition of the role of NSAs; shifting definitions of security and social justice; new notions of governance.
Relate	The social structures and relationships that organize people and create organizations. Here we look at things like family structures, business models, and governance structures.	Institutions for collective security; the emerging forms of non-state organization for security and conflict; social classes, structural inequities, and rising tensions.
Connect	Encompasses the technologies and practices used to connect people, places, and things. Connect looks for things like information technology, urban design, and language.	The digital networks on which conflict between humans increasing relies; the narratives and story-telling platforms that enable us to organize each other.
Create	Concerned with the technology and processes through which we produce goods and services. This is all about things like manufacturing, efficiency, and rule-making.	Changes in the ways we develop the innovations and produce the tools of war; the collaborations, and strategies we pursue to create order and security.
Consume	About the ways in which we acquire and use the goods and services we create. This domain is about issues like modes of exchange, consumer preferences, and marketing.	Military modernization programs; diffusion of conflict technology and its patterns of sales; the evolution of the military-industrial complex.
Destroy	About the ways in which we destroy value and the reasons for doing so. Here we are concerned with phenomena like violence and killing, waste, and attempts to undermine rules and norms.	Efforts to undermine the authority and power of the state; espionage and the leaking of classified information; hacking, cybercrime, and cyberbullying.

The general practice framework is not a perfectly orthogonal construct; rather it is used to ensure that our thinking covers a broad sweep of the issue we are examining and that our subsequent explorations of emerging issues is suitably rich in human-centered implications.

Emerging Issues and Forecasting Alternative Futures
Individual emerging issues can be usefully explored individually for their implications, but they can also be used collectively to generate scenarios of **alternative futures**. One method of generating scenarios with emerging issues is the TOCS-driven approach[3], which incorporates emerging issues specifically as building blocks in a framework that also includes models, trends, and intuition. A second approach is the "Manoa method"[4] in which several emerging issues are explored through futures wheels, and their respective implications later combined to form coherent scenarios.

Figure 6: Sample Futures Wheel

When used as building blocks for scenario forecasts, emerging issues play the important role of introducing into futures thinking the non-linear and disruptive impact of those events, developments, and emergent phenomena that are not captured in trend extrapolation or traditional quantitative modeling. They are thus immensely important elements in critical thinking about the future.

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[3] Lum, R. "A Theory-Driven Approach to Scenarios." *Compass*, Association of Professional Futurists, July 2015
[4] Curry, A, and Schultz, W. (2009) "Roads Less Travelled: Different Methods, Different Futures", Journal of Futures Studies, Vol. 13, No. 4, pp. 35 – 60

Conclusion

Internal relations scholars and government policy makers have long tended to connote the term "conflict" with state-centric hostilities and warfare, yet strife, tension, and fighting are found in virtually every sphere – and at every scale – of human life. Thus, futures research into conflict and human security are therefore bounded only by the researcher's scope of interest. Scanning for emerging issues relevant to the futures of conflict and security is therefore a potentially overwhelming task unless one keeps a narrow and focused scope. Nonetheless, the inventory of emerging issues in this report hopefully provides a kick start to any new work on the futures of conflict and security.

In addition to the emerging issues themselves, the methods presented in the latter part of the report are meant to provide you with some tools and process for incorporating the emerging issues featured in this report into your own foresight work. Emerging issues themselves cannot tell us much about the futures that might be; they must themselves by analyzed for their implications to our larger plans and priorities and/or incorporated as building blocks in more comprehensive forecasting work.

More information on the concepts framing this material as well as further information about how to identify and employ emerging issues in foresight can be found in the Additional Resources section.

Glossary

Emerging Issue: any new technology under development, potential future public policy issue, or new concept or idea that might be fringe thinking now but which *could* mature and develop into the mainstream; usually encountered as "weak signals" in the present.

Forecast: a statement about the future intended to be logical, though not necessarily accurate (see Prediction); to use formal theories and rules to anticipate change.

Foresight: insight into how and why the future may be different from the present.

Futures: the contemplation, exploration, description, and anticipation of potential change (for contrast, see History).

Futures Studies: an academic field concerned with understanding and anticipating change in society.

Futures Wheel: a common and easy-to-learn visual method for futures research in which the first, second, and third order impacts of an emerging issue or future scenario are explored.

History: a description of change (Karl Popper)

Horizon Scanning: Also known as environmental scanning, a process of skimming a wide variety and high volume of information sources in order to identify signals of emerging change.

Intuitive Possibility: emerging issues with few or just a single data point, but their possibility is both logical and compelling.

Maturing Development: the most mature category of emerging issue; those possibilities for which there is a growing set of signals of change: research projects, commercial investment, increasing mention in articles and blogs, etc...

Mission: an organization's purpose, often articulated as a statement describing how the organization is configured to achieve its vision and thereby serve the needs of its customers.

Plan: a sequence of actions selected to attain an objective

Precognition: "clairvoyance related to an event or state not yet experienced"; to know beforehand.

Prediction: a statement about the future that is intended to be accurate.

Prophecy: a statement about an event about which you can do nothing (Karl Popper).

Scenario: a description of an alternative, possible future.

Strategy: a concept or theory for how, in a given context and employing a given set of resources and competencies, you expect to achieve your goals.

Strengthening Signal: emerging issues with fewer signals or anecdotes indicating their emergence than Maturing Developments, but still having a clear sense that there might "be something there."

Trend: a measurable change over time; historical.

Vision: an articulation of the preferred future of an organization, measurably vivid, informed by foresight, purpose, and aspiration.

Additional Resources

The following are additional resources for learning more about foresight and futures research.

Foresight Training
VFS offers foresight training for organizational leaders and staff. We offer 1-day, 2-day, and 4-day courses on Foundational Foresight Skills, Intermediate Foresight Methods, and Advanced Foresight Applications.

Please contact us at admin@visionforesightstrategy.com to discuss foresight training for your organization.

Emerging Issues Analysis
Dator, J. "Trend Analysis vs Emerging Issues Analysis", Hawaii Research Center for Futures Studies. (Undated document, originally downloaded 2003).

Lang, T (1995) "An Overview of Four Futures Methodologies (Delphi, Environmental Scanning, Issues Management and Emerging Issues Analysis)", *Manoa Journal of Fried and Half-Fried Ideas*, Hawaii Research Center for Futures Studies, pp. 1 – 43.

Molitor, G. (1977) "How to anticipate public policy changes", *S.A.M. Advanced Management Journal*, Society for Advancement of Management, New York.

Scenario Forecasting and Development
Curry, A, and Schultz, W. (2009) "Roads Less Travelled: Different Methods, Different Futures", *Journal of Futures Studies*, Vol. 13, No. 4, pp. 35 – 60.

Lum, R. (2015) "A Theory-Driven Approach to Scenarios." *Compass*, Association of Professional Futurists, July 2015.

Horizon Scanning Sources for Conflict & Security
The following page presents a sampling of scanning sources for identifying and monitoring emerging issues relevant to the futures of conflict and security.

Maturity of the Issue (vertical axis)

Time (horizontal axis)

Government reports and studies, draft legislation

TV, newspapers, general interest sources

Research reports, think tank studies, scientific and technical journals

Art, fiction, fringe writings, esoteric journals

Defense News

The Diplomat

Early Bird

Jane's Defense Weekly

The New Normal

Washington Post

New York Times

Foreign Policy

Established issue/trend: *legislation, regulation*

Carnegie Endowment for International Peace

South Asia Daily

Brookings Institution

Reactive Zone

The Conversation

McKinsey & Co Global Institute

Rapid maturation: *mainstreaming*

Popular Mechanics

Scientific American

Complexity Digest

Singularity U

Innovation/Early Competition Zone

Armscontrolwonk.com

Atlantic Council FutureSource

Early framing: *academic exploration*

Ars Technica

The Millennium Project

Foresight Zone

Nascent emerging issue: *fringe thinking*

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Appendix A: Quick View Table of Emerging Issues

Maturing Developments	Strengthening Signals	Intuitive Possibilities
The most mature category of emerging issue; those possibilities for which there is a growing set of signals of change: research projects, commercial investment, increasing mention in articles and blogs, etc...	Emerging issues with fewer signals or anecdotes indicating their emergence than Maturing Developments, but still having a clear sense that there might "be something there."	Emerging issues with few or just a single data point, but their possibility is both logical and compelling.
GLOBAL	**GLOBAL**	**GLOBAL**
Hyper-Networked Global Cities and Pandemics	*Youth Bulges and High Unemployment as a Global Security Issue*	*Large-Scale Agricultural Failures in South and SE Asia*
Privatization of Military Power	Ubiquity of Offensive Insurgent Tactics	*Space Property Rights on the South and North Poles of the Moon*
Machine Autonomy and the Kill Chain	Bioengineering	*Environmental Protection of the Moon*
Diminishing Agency of the Westphalian State	Synthetic Biology	*Conflicting Great Power Ideas Over How to Deflect an Asteroid*
Loosening of the Institutions and Norms of the "Liberal Hegemonic Order"	Digital Fabrication	*Global Individual Security Market*
Global Private Regulation	Creating New Land and New Concepts of Sovereignty	*Putin as a Leader Increasingly Vulnerable to Domestic Politics*
Fragmentation of the Eurozone	*More Climate Change Refugees and Nations Losing their States*	Diversifying Innovation in Conflict Resources
Background War	*More Prevalent Resource-Driven Instabilities and Conflict*	Mistrust and Conflict Between Humanity and AI
Perpetual Preparation for War	Nations & Companies Looking to Mine the Moon	*Crowdsourced Distributed Conflict*
Legislation for Outer Space Property Rights	Race to build Space-Based Solar Power Satellites	Dark Nations
Domestic & International Procedures for Planetary (Asteroid) Defense	*Cyber as Increasingly a Cross-Domain Method of Warfare*	Dark Autonomy
Xi Jinping's Consolidation of Power	Advances in Bioweapons	Ecology-of-Things
NATIONAL	Lack of Preparedness for Pandemics	Nano Leaps
Infectious Disease as a National Security Threat	Quantum Computing	**NATIONAL**
Domestic Dissatisfaction and Unrest from Rising Inequality	Quantum Cryptography	*Digital Human (Upload) Rights and Suffrage*

Maturing Developments	Strengthening Signals	Intuitive Possibilities
Security Risks of Ubiquitous Domestic Drone Use	*Distributed Autonomous Organizations*	*Contests Between the State and Corporations for Control of Civic Infrastructure*
Contest Between "Right to Drive" Activists and Insurance Companies (Robotic Autos)	*New Political "Peer Competitors" to the Nation-State Form*	*Smart Feral Cities*
Challenge of Megacity Urbanization for Power and Stability	*Privatization/Commercialization of Governance*	*Flash Conflict*
Persistent, Ubiquitous Drones	**NATIONAL**	*Nation-Sourcing*
Enforced Transparency	*Permanent Labor Dislocation from Structural Shifts in the Economy*	*Unhackable Code*
Presumption of Inherent Digital Insecurity	*UAVs Capable of Hyper-Targeted Site-Specific Operations*	*Digital Foreman*
INDIVIDUAL	*Contests Between "New Outer Space" Entrepreneurs and "Old Space" Institutions*	*Quantum Teleportation*
Virtual/Augmented/Mixed Reality as a Consumer Good	*Risks of Ubiquitous Smart Homes and Smart Cities*	**INDIVIDUAL**
Ad Hoc/P2P/Mesh Networking	*End of the Capabilities Gap Between States and Non-State Actors*	*Digital Human-Like Chat-Bot "Companions"/Staff Accused of Ruining Marriages*
Renewable Energy-Enabling Storage Technologies and Microgrids	*Large-Scale Construction Constrained by Global Resource Limitations*	*Military Service as a Route to Youth and Longevity*
Dual-Use Implications of Autonomous Vehicles	**INDIVIDUAL**	*DIY Personal Security*
DIY ISR	*Augmented Conflict Actors*	*Cryptocitizens*
Hacktivism	*DIY Bio*	*Micro Drone Delivery of Nano-Bio Packages*
End of the Presumption of Personal Privacy	*Resurgence of Personal Vendettas and Family Feuds*	*Bot-Driven Champions Against Cyber-Bullying*
	Child Augmentation and Competitive Social Spiral	