

# NO LONGER AN URBAN MYTH

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## ‘WE’RE ON THE CASE’

### FOREWORD

The British Army’s Army Warfighting Experiment exploring modern urban warfare began this week. The Russian assaults on Ukrainian cities intensified this week. As we see the fight in Ukraine unfolding it is notable that, despite the fact that much of the fighting has occurred outside urban centres, both the Russian leadership and the world’s media seem to have decided that the vital ground in this fight is the possession of urban areas, and, in particular, those national or regional centres that hold political or iconic significance. Whether we like it or not, we have been reminded that warfare has a habit of finding its way into the urban environment. For too long has this unbelievably (and increasingly) complex environment been put on the ‘too difficult’ pile. In June 2018, on the CGS’s Staff Ride in Berlin, the then CFA gave clear direction that the elements of the Army under his command were, forthwith, to turn their concentrated attention to training and experimentation in the urban environment. Nearly four years later, and as that then CFA is poised to take over as the next CGS, the momentum in that respect is, at last, beginning to build up. This excellent article from Col Jim McDonough tells us exactly what we can expect to see in the Urban AWE as it unfolds. – Maj Gen (Retd) Dr A R D Sharpe CBE, Director CHACR

**T**ECHNOLOGICAL innovation has shaped success in combat since the first caveman lashed a shard of stone to a bit of sturdy stick. In the more recent history of warfare, Great Britain has habitually remained ahead of the pack by successfully combining new technologies with novel tactics to form battle-winning capabilities: using the longbow at Agincourt; employing the Shrapnel shell during the Peninsular War; introducing the Maxim gun in Africa; the tank appearing on the Western Front; and rolling out the Bailey bridge during the Second World War. Britain has a proven track record of marrying technology to tactics with greater aptitude than its adversaries.

The challenge for the British Army today is to remain capable of victory,

now and in the future. Capability relevancy is a relatively new challenge for the British Army, which is at its smallest since the 1700s;<sup>1</sup> it is smaller than plausible rival, Iran, and lesser resourced than most dangerous rival, Russia. Fortuitously, Britain has defeated larger and often better resourced adversaries throughout its history. Russia’s attack on Ukraine heightens the imperative for Britain to remain capable of competing meaningfully both ‘above and below the threshold’ and for the Army to stay ahead of the technology power curve. For the first time in the 21st Century an autocratic regime has initiated a large scale conventional attack against a smaller and democratic nation. Vladimir Putin’s unprovoked invasion of a European neighbour, and the Russian military’s hyper-focus on Ukraine’s municipal centres confirm that urban warfighting

<sup>1</sup>Bunkall, Alistair– “Army to shrink to its smallest size since the 1700s while £23bn is invested in technology, under new defence plans,” *Sky News*. 22 March 2021, [www.news.sky.com/story/army-to-shrink-to-its-smallest-size-since-the-1700s-while-16323bn-is-invested-in-technology-under-new-defence-plans-12253694](http://www.news.sky.com/story/army-to-shrink-to-its-smallest-size-since-the-1700s-while-16323bn-is-invested-in-technology-under-new-defence-plans-12253694).

is unavoidable. It is undeniably a form of warfare actively sought by our opponents. The United Kingdom and its North-Atlantic allies must be alive to this, and take substantial measures to develop our future urban warfare capabilities. This necessitates that the Army partner with those entities leading the technology revolution, namely industry, academia, and individual inventors, as well as allies. Enter the Army Warfighting Experiment as the British Army's flagship experimentation brand.

The Army Warfighting Experiment (AWE) has been British Army Headquarters' banner experiment since 2018, and the brand is well known to British and allied innovators. Since its inception, AWE has enhanced the Army's occasions to experiment with new technologies, specifically those technologies with low to medium Technology Readiness Levels (TRL).<sup>2</sup> Through AWE the headquarters staff familiarises the Director of Army Futures<sup>3</sup> with dawning innovation through evidentiary feedback from AWE's set-piece experiments, which provide him the understanding of how new technologies might deliver capability advantages to the Army when combined with revised tactics. This knowledge enables our senior leaders' transformative decision-making, enabling them to assess the best technologies for gaining supremacy over our adversaries. AWE is therefore the flagship vehicle by which the Army partners with the innovation community and explores the realm of the possible, helping Director of Army Futures and other of Britain's senior leaders to determine how we will win in the future.

Army Headquarters can nevertheless improve upon its delivery of AWE. The Futures Directorate, which the Army



Tomorrow's tech: An X2 unmanned ground vehicle alongside a Challenger 2 during Army Warfighting Experiment 2020 in Wiltshire. Picture: Sgt Tom Evans, © Crown copyright

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formed in late 2021 to reach the future faster, has taken a critical look at how the Headquarters has previously delivered AWE over the last several years.<sup>4</sup> We have concluded that while AWE has always delivered us valuable evidence about dawning technologies, the Army as a whole has still to fully understand and exploit the evidence AWE has gained. Futures has also determined that we could better serve the innovation community were we to employ AWE in such a way as to allow the Army's partnership with the innovators to ripen and were we to afford more time for the most promising technologies to mature. So, Futures has identified two key areas for changing how we deliver AWE. First, we must place the evidence from AWE, that is the lessons we learn from our experimentation, at the heart of the Army's capability management cycle, ensuring that this evidence is formally presented, recognised, and digested by senior leaders both inside the Army and Defence.

Second, through AWE we must afford the innovation community more enduring opportunities for their unique innovations to develop in the hands of Army units and soldiers.

**A NEW MODEL**

As a result of our assessment of AWEs past, Futures is committed to incorporating three new practices. First, we will deliver AWE via themed serials. Second, we will formally present the evidence from AWE to the Army's leadership at various governance boards and, most importantly, we will anchor AWE directly to the Ministry of Defence's quinquennial cycle of Integrated Reviews (IRs). Third, Futures has designed – in cooperation with Defence Equipment and Support (DE&S) – a new commercial framework that will benefit industry participation in AWE.

In delivery, Futures will run each AWE serial over a period of roughly four years. We will conclude each serial in sufficient time for us to render a

comprehensive body of evidence to the Army's leadership ahead of discussions with the Ministry of Defence and the publication of its IR. By bounding AWE to the IR cycle, Futures sets an objective date by when a serial must conclude, and also ensures that sufficient and compelling evidence is available to Army leaders for presentation to Defence as difficult decisions are made about which prototype technologies should be funded as programmes of record. This is vitally important for the Army, as the diversity of land force capability requirements is vast in comparison with the needs of the Royal Navy and Royal Air Force, commands which generally have fewer systems in their inventories and programmes that are more easily understood by the civilian leadership. Thus, fastening AWE to the IR cycle benefits the Army by ensuring our evidence directly informs our internal change-decisions, and better assists the Army's senior leadership when it advocates for scarce transformation resources from the Ministry of Defence.

The serialised approach to AWE will also benefit the innovation community. While the Army's previous 'one-and-done' themes disallowed sufficient time for industry, academia and private innovators to mature their inventions in collaboration with the Army, a single theme year-on-year over multiple years will stabilise this critical relationship, affording all of us more time to work together at maturing technologies with the greatest potential for meeting the Army's future requirements. In short, the serialised approach to AWE affords the innovation community the time and space to mature its partnership with the Army, ensuring that their ideas are fit for military purpose, marketable at home and abroad, and able to underwrite the British Army's future capability decisions.

<sup>2</sup>In this sense, the Army is experimenting with technologies that are maturing and not yet altogether practical for military use.

<sup>3</sup>The first and present Director of Army Futures is Major General James Maurice Hannan Bowdler, OBE.

<sup>4</sup>This included AWE 2018 (Autonomous Warrior), AWE 2019 (Manned, Unmanned Teaming), AWE 2020 (Agile Command, Control, and Communication), and AWE 2021 (Future Training).

Finally, and to the direct benefit of the innovation community, Futures Directorate has created with the Futures Capability Group (FCG) at DE&S, a new and unique commercial framework for AWE. We have written this framework as a nil-value contract to ensure industry will have more flexibility when participating in AWE over the course of each themed-serial. This contract will allow industry to enter in and out of AWE as the situation merits, while also permitting the Army the ability to exploit best-of-best technology whenever accelerated the exploitation of new technology is necessary. In essence, the new commercial framework allows AWE to serve as protected space for industry partners to experiment freely, while also offering the Army a gateway for rapidly converting new technology into military capability.

#### DELIVERING THE AWE URBAN SERIES, 2022-2024

Futures has selected the theme of *urban* for its first AWE serial. This theme will identify for the Army the technologies it must acquire to thrive within urban topography when pitted against great power competitors. Among the military services, it is the Army that must fight where people live – and they live in the urban. By 2050 nearly 70% of the global populace will live in an urban landscape,<sup>4</sup> and as people are central to allied democracies, it follows that the British Army must operate in towns, cities and megacities more often than it will not. Antagonists frequently secure and stronghold urban centres to manipulate, control, hold hostage, and terrorise friendly populations. In this way our enemies will challenge British and allied forces with unique and manifold dilemmas, dilemmas that range from the operational, to the moral, to the political.



Credit: Piotr Chrobot on unsplash.com

And the urban will challenge the British Army in ways not fully understood by commanders and soldiers more recently experienced with operating in places such as Afghanistan and Mali, against technologically inferior opponents. The British Army is far less familiar with fighting in Europe’s and Asia’s megacities against great power competitors, certainly less so than it was during the Second World War. Urban structures, superstructures, and infrastructure will impede all the Army’s tactical functions. Today’s topographical maps will neither sufficiently aid command headquarters’ planning analysis, nor allow the soldier on the ground to navigate multistorey buildings and subterranean passages. Manoeuvring units will find their visibility obscured not only horizontally but vertically. Masonry, electrical wires, and radio emissions will impede GPS navigation – a hallmark of western military navigation – making it useless for both soldiers trying to find their way, and command headquarters tracking their movement from afar. Combat formations will find

their fires rendered ineffective by various material compositions, and worse, discover that their munitions cause unintended consequences to friendly forces and the civilians that they seek to protect. Buildings will impair communication between units, as radios that are designed to communicate across tens of open kilometres fail to penetrate mere tens of meters. Etcetera, etcetera. The technology exists to overcome these impediments, and the Army must work with the innovation community to discover and develop it. The Army will do so through the AWE Urban Series, 2022-2024.

During the AWE Urban Series, Futures will home in upon five primary capabilities challenges. First, optimising ISTAR<sup>6</sup> platforms for use in urban terrain, particularly the ability of ISTAR to loiter and overcome the urban canyon effect. Second, adapting Battle Management Systems and Applications (BMS and BMA) to map and visualise the complex layers of an urban environment in support of timely and better decision-making across all levels of command.

Third, improving voice and data communications systems to enable sufficient interface between platforms when urban terrain impairs line-of-site. Fourth, increasing the Army’s operational advantages in built-up areas through the discovery of AI-enabled<sup>7</sup> autonomous systems which are able to accelerate a commander’s decision-making timelines; improve kinetic and non-kinetic effects; facilitate logistical activity; and reduce the soldier’s cognitive and physical burdens, and exposure to risk. Fifth and finally, ensuring that network architecture is resilient to enemy cyber disruption and contested EMS<sup>8</sup>, adaptable to civilian network architectures, and made more sufficient at enabling ever-increasing information flows. Overcoming these capability challenges requires a deliberate and structured effort from the Army. Therefore, Futures will deliver the AWE Urban Series through a sequential and cumulative set of events. These are:

- a) 7-25 March 2022. AWE Urban Understand will focus on establishing the network

<sup>4</sup>UN Department of Economic and Social Affairs. “2018 Revision of World Urbanization Prospects,” 16 May 2018, [www.un.org/development/desa/publications/2018-revision-of-world-urbanization-prospects.html](http://www.un.org/development/desa/publications/2018-revision-of-world-urbanization-prospects.html).

<sup>6</sup>ISTAR is a commonly used military acronym that stands for Intelligence, Surveillance, Target Acquisition, and Reconnaissance.

<sup>7</sup>AI-enabled systems are those that have some inherent level on integrated Artificial Intelligence and also the possibility of machine learning

<sup>8</sup>EMS stands for Electromagnetic Spectrum.

requirements necessary to support future technologies throughout the duration of the Urban Series. During Urban Understand, select industry partners will provide an emulated tactical network to identify opportunities and constraints in support of autonomous platforms and battlefield management systems.

b) **7-25 November 2022.** AWE Urban Sustain and Protect will focus on intelligent logistics, novel medical extraction, and autonomous vehicle extraction. It will also focus on physical and non-physical barriers which will encompass counter UAS and counter CEMA<sup>9</sup> to ensure automated platforms are survivable on the modern battlefield.

c) **Autumn 2023.** AWE Urban Shape and Defend is ambitious by design and will capitalise on previous AWE outputs by layering in Deep-Recce-Strike capabilities through long range ISR and enhanced effect capabilities. It will forge coherence with the Army's new Experimentation and Trials Group (ETG)<sup>10</sup> to further drive transformation and integrate multidomain experimentation.

d) **Autumn 2024.** AWE Urban Integrate will culminate the Series and bring together the best-of-best technologies into a multi-domain experiment with Defence and the Front Line Commands. Urban Integrate will identify exploitable opportunities to help inform the next Integrated Review, as well as present choices for future Army equipment programmes.



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### THE BRITISH ARMY MUST GET THIS RIGHT

It is imperative that the Army get AWE right, and critical that we begin with the AWE Urban Series. Britain names Russia as its primary adversary and pacing threat<sup>11</sup>, as well it should. The Russian government's belligerence in opposition to global norms is well established and Russia's military competency increasingly observed and understood. Russia's military investment, while comparable to Britain's in straight pound-for-pound terms, has greater purchasing power. Its technological employments alongside more traditional capabilities much improved, even since 2014 when Russian forces first astonished Britain and its allies by eliminating several Ukrainian brigades near Zelenopillya.

China, meanwhile, has moved to accelerate its pace of military

modernisation through the implementation of a Military-Civil Fusion Development Strategy, and the exploration of new technologies with defence application.<sup>12</sup> China's success with its hypersonic weapons programme is now well-catalogued, yet it is also making progress in lower-cost technology such as suicide drone swarms that could overwhelm more traditional British Army systems.<sup>13</sup> More recent demonstrations of new technological capabilities in places such as Libya and Azerbaijan may seem less astonishing, yet only before consideration that relatively low-technology and low-budget solutions were used to devastating effect against more traditional high-end military capabilities. When Russia, China, and others might ever seek to use these capabilities against Britain and its allies is immaterial. Britain's choice is to keep pace

or someday face a defeat from which the nation cannot recover. Futures chooses to keep pace by transforming and developing the Army's urban capability sets through the AWE Urban Series.

Thus, the Army Warfighting Experiment is about filling a critical need. The world needs a stalwart Great Britain and Britain, to be relevant in the international arena, needs a capable Army. The challenge for the British Army is to remain not merely competitive in the modern world, but to be capable of military victory against the forces of our would-be antagonists now and in the future, and especially against those armies which are larger and better resourced than Britain's. Our enemies are not sleeping. Through their accelerated research and development programmes they are actively pursuing technologies that will further enhance their military power. The British Army can do no less and must do more than its probable competition. Disadvantaged by its small size and contracted budget, the Army has no choice but to find the technologies which will offset its drastic reduction in human capital and improve upon legacy capabilities. To do this at affordable cost, the Army must intensify its collaboration with industry, academia, allies, and private innovators. Their goodwill is as imperative to our future in a contested arena, as is our feedback vital to their future in a competitive market. The AWE Urban Series begins the intensification of this partnership.

<sup>9</sup>CEMA is the acronym for Cyber and Electromagnetic Activities.

<sup>10</sup>In 2021, the Army decided that a professionalised experimentation force was needed to help accelerate the Army's learning. The ETG officially stood up in January 2022, and will reach full functionality in 2024.

<sup>11</sup>Ministry of Defence. "Joint Concept Note 1/20, Multi Domain Integration," Nov 2020, page VII.

<sup>12</sup>Department of Defense. "Military and Security Developments Involving the People's Republic of China," no publication date, page 141.

<sup>13</sup>Mittal, Vikram. "U.S. Army Needs New Technology for Projected Role in the Pacific, 10 Dec 2021, [www.forbes.com/sites/vikrammittal/2021/12/10/us-army-needs-new-technology-for-projected-role-in-the-pacific/?sh=154a14bca49b](https://www.forbes.com/sites/vikrammittal/2021/12/10/us-army-needs-new-technology-for-projected-role-in-the-pacific/?sh=154a14bca49b).

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