



Army

Coming to terms with the modern way of war:

Precision missiles and the land
component of Australia's joint force

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Serving our Nation

The changes that these weapons are causing in the art of war are likely to be significant. While the future can never be accurately foreseen, one change that is becoming clear is the potential of long-range land-based strike weapons to tip the balance between the offence and the defence in war in favour of the defender. Long-range precision missiles, combined with advanced sensors, give the defender the potential to create killing zones with enormous depth encompassing the air, sea and land.

Tactics that currently allow an attacker to manoeuvre in the face of fire and close with an enemy may become too expensive and uncertain to attempt. A lodgement on a shore protected by an enemy armed with precision missiles may become all but impossible without incurring great losses of people and machines. And, as the thresholds of cost and access to missiles and advanced sensors reduce, these systems may proliferate and become commonplace, perhaps possessed by lesser powers and even non-state actors. It is wise, therefore, for Australia to deny an adversary any advantages these weapons may offer while creating opportunities for itself.

This paper is intended to spark a discussion about the future of Australia's land forces in light of advances in land-based precision technologies. It will explore a number of questions, ideas and possibilities with a view to encouraging others to participate in the discussion. Army welcomes feedback, criticism and support from all; not just military professionals but also members of the academic, defence industry and think tank communities. After all, the potential changes in the character of war that these technologies may cause are not issues of theoretical or practical importance for the Army alone. Rather they are of importance for the future security of Australia and its interests.

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A potential shift in the balance of warfare

Advances in long-range precision weapons, combined with modern sensors, may favour the defender in warfare because they give them the potential to create theatre-sized 'no-man's-lands' where attacking forces are exposed to precision weapons and can only operate at the risk of high casualties. The effectiveness of precision weapons at striking targets at long-ranges has been repeatedly demonstrated in recent wars. It is no longer remarkable that a missile or shell fired from a considerable distance or a bomb released from a great height can hit a target with only a minuscule margin of error. On today's battlefield, if it can be sensed it can probably be killed from afar, often with a single round. Consequently, modern precision weapons offer a defender the opportunity to create killing zones measured in hundreds, maybe even thousands, of kilometres.

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These developments have much in common with changes in warfare in the second half of the 19th century. Then, the introduction of a number of weapons allowed a defender to create a lethal fire-beaten zone in front of their positions with a depth that would eventually reach several kilometres. These weapons included breech-loading rifles and artillery, quick firing guns, machine guns and smokeless powder. In combination, these weapons shifted battlefield advantage decisively in favour of the defender. To close with their opponent, attacking troops on the Western Front in the First World War, for example, had to hazard a lethal and broad killing zone. Warfare became static and indecisive resulting in stalemate and the slaughter of tens of thousands of soldiers until tactical and technological solutions were developed slowly and at great cost.

The immense ranges of today's precision missiles give land forces the capability to hit targets out to sea or even over the sea. Some Indo-Pacific countries already deploy long-range land-based missiles, potentially creating defensive killing zones of immense scale. Just as on the Western Front, what began as a problem primarily of tactics may now also be one of operations and strategy. Even if combatants were to run out of missiles before they run out of targets, the cost in lives and destroyed platforms may be overwhelming. Warfare risks, therefore, becoming static and indecisive again, increasing the likelihood of long and exhaustive wars of attrition.

The extent of changes in warfare

To date, only a few countries have demonstrated precision capability in war. Typically, precision has been the remit of the United States and its coalition partners, or a few other countries such as Israel. Other countries – and even non-state actors – do have precision capability in varying degrees, some quite significant, but little or no experience in its employment in war. In recent wars, therefore, the application of precision weapons has been a largely one-sided affair.

This condition is unlikely to last. These weapons are proliferating and a future may not be too far off in which war is waged between two adversaries who both field a robust precision capability. For Israel this potential has already become a reality; for example, one of its corvettes was hit by an anti-ship cruise missile in its 2006 war with Hezbollah. China's rise has also been marked by its investment in precision technologies as it fields weapons aimed at denying access to its maritime approaches. Other countries are making similar investments, although not on the same scale. This means that the shift of the balance in war to the defender is likely to be widespread because the cost of these technologies will likely decline rapidly, bringing them within the budgetary reach of small states and ambitious non-state actors.¹

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Some states have benefitted from the provision of advanced anti-access systems by wealthier and more advanced allies. During the 1973 Arab-Israeli war both Egypt and Syria, for example, boasted highly effective Russian air defence systems that were virtually impenetrable to Israeli jets. There is likely to be, therefore, opportunities for impoverished and even unstable states to create, with outside assistance, a broad anti-access barrier that may make the cost of an adversary closing with their territory prohibitively costly in lives and major equipment.

¹ Cost and complexity of systems are likely to be proportional to range and payload. This means that longer-range systems will be more limited in numbers and more precious than shorter-range systems.

The probable effect on tactics and force structures

Changes in warfare resulting from developments in precision weapons are likely to effect tactics and force structures because precision weapons combined with advanced sensors will allow combatants to strike targets at great ranges with impressive accuracy. In fact, the effect of this combination on tactics is already being felt. From the former Yugoslavia to Gaza, Chechnya, Afghanistan and even the present war with ISIS, adversaries are seeking the cover of difficult terrain: hiding in features such as cities, mountains, caves, tunnels and jungles to avoid the firepower of their more powerful opponent. Moreover, hiding amongst targets that cannot be attacked such as civilians or critical infrastructure increases the potential political cost on an adversary. When a force fails to take such precautions the results can be devastating. In the Ukraine, for example, troops caught in the open have suffered greatly. Russian sensors easily found Ukrainian troops in exposed positions and coordinated rocket and artillery fire followed soon after. This seems to suggest that large battles in open country may become prohibitively expensive and increasingly rare.

Some land forces, such as ISIS, have recognised the danger and adjusted their tactics to minimise the risk to their operations. ISIS forces now tend to move across open ground in small groups that are barely detectable and represent a small reward for the expenditure of expensive advanced munitions. This method contrasts with the large convoys of vehicles in which its troops once boldly and openly raced across Iraq and Syria. ISIS troops only form into larger groups when in the relative safety of close urban terrain, where they are more able to avoid detection and are more willing to accept combat. Land warfare (if not warfare broadly) seems to resemble the island-hopping campaign in the Western Pacific of the Second World War. Close terrain is akin to the islands from which the Japanese established their fortresses. Open terrain is like the oceans between except that now the 'oceans' are far more dangerous places to be and where troops are most vulnerable. It is no surprise, therefore, that the fighting to recapture territory from ISIS in Iraq is characterised by a series of battles for cities and towns.

The Australia Army and adapting to precision missiles

The Australian Army is not ready for the potential change in the character of war that the widespread proliferation of precision missiles may cause.

Australia's land forces do not currently possess these weapons and, as a result, the Army's tactics,

force structures and intellectual understanding of how to fight are not adapted to war involving long-range precision capabilities. Thanks to a significant and sustained investment over many years, Australia will soon boast a 'fifth-generation' air force.

While there is no similar 'generational' construct for land forces, if there was, Australia's army by comparison is probably 'fourth-generation' at best in relative terms. The initiatives announced in the recent Defence White Paper will go a long way to addressing this imbalance, but not entirely.

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In the next decade, a new long-range surface-to-surface capability like the High Mobility Artillery Rocket System (HIMARS) and a land-based anti-ship missile system, combined with a mobile surface-to-air missile capability and an armed medium-altitude unmanned aircraft will allow Australia's land forces to project power from the land into the air and across the sea. These weapons are likely to give Australia's land forces the capacity to establish anti-access and area denial envelopes of considerable size. When protected by other elements of the land force's combined arms team, they are also likely to be hard to attack. The result should be a more robust joint anti-access and area denial envelope than one provided solely from the sea or from the sea and air.

However, creating an anti-access envelope is only half the problem.

The more difficult challenge is manoeuvring in the face of an adversary's anti-access envelope. If the advantage in warfare has tipped decisively in favour of the defender, as is likely, given the global scope of Australia's *Strategic Defence Interests*, it may be important for the ADF that the balance in warfare be returned to a more neutral setting between the attacker and the defender. Without manoeuvre warfare risks becoming static, costly and

indecisive. Disappointingly, there are no easy solutions to this problem. Many of the world's armed forces are applying their minds to solving it with no clear indication of a solution as yet.

Another reason Australia's land forces may not be ready for a war involving long-range precision missiles is because the ADF does not yet have a truly integrated joint sensor-shooter network. Such a network is needed if a land-based weapon system is to engage targets identified and tracked by an air or naval platform and vice versa. The ADF is working hard to address this shortfall. The Air Force's Plan Jericho in particular will be important in developing such an integrated system.



Expeditionary warfare

Australia's land forces have always fought overseas as a part of an expedition. Expeditionary warfare is simply the deployment of a state's armed forces to fight away from established bases, usually across the sea. It places extra demands on land forces that operations across contiguous land borders or within borders do not.

Australia has no contiguous land border with any other country and, as an island continent, the sea has always been a major factor in the defining of its military strategy. This will remain true regardless of the character of any future adversary or of a future war or non-warlike operation. Australia cannot change its geography. Whether

Australia undertakes independent military operations in the immediate region or operations in support of a global coalition farther afield, they must be, by definition, expeditionary.

The critical demand in any expeditionary operation is its greater support and sustainment requirements. Simply put, expeditionary warfare will make a tremendous call on the Army's logistic capacity and to have any chance of success expeditionary operations requires a higher ratio of 'tail' to 'teeth' than is the norm for non-expeditionary operations. The expeditionary force must establish much of its own infrastructure for communications and sustainment; this infrastructure must extend from the theatre of operations back to the national support base in Australia. Deployed land forces are therefore dependent on air and sea power not just for deployment, but also for sustainment.

Air forces are not exempt from the logistic demands of expeditionary operations. If Australian aircraft are to operate from overseas bases they may need to rely on land forces' sustainment, communications and administrative capabilities to some extent. In addition, expeditionary warfare

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requires sophisticated joint command and control constructs to enable the necessary close coordination of land, sea and air forces, further adding to the tail's metaphorical weight.

There are ways to reduce the challenging logistic requirements of expeditionary operations. For example, sea-basing and remote command and control can provide some degree of relief for land-based logistics. However, the savings will be relatively minor and the support, communications and command functions will remain daunting. Consequently, Australia's future land force planners must include the needs of theatre sustainment, communications, command, control and other enabling and support functions in their preparations if expeditionary operations are to remain possible. This is particularly true for Australian-led or Australian independent operations in the near region.

Precision weapons will add another layer of complexity to the provision of logistic support to expeditionary operations. Logistic elements will need the same ability to hide as is required for the combat arms. They will need to move with speed, be able to disperse and coalesce when the combat arms require concentrated support. Logistic forces must also be able to transition between heavy and light in order to manoeuvre and support the close fight. This may require a rethink of how the ADF provides for its support and may require changes to the organisation and equipment for expeditionary logistics, including the status of the logistician in the Army's hierarchy. This is a very controversial idea because it implies potentially shifting the balance of Australia's land forces from its present focus on the combat arms to that of its enabling and support elements. This transition is already apparent with special operations.



Precision missiles and their significance for Australia

The Government recognises that Australia's security and prosperity are directly affected by events outside the region and are not just linked to geography or confronting threats in Australia's maritime approaches. This recognition is reflected in *Australia's Strategic Defence Interests*, which include: (1) a 'secure, resilient Australia' achieved through the ability to deter, deny or defeat any attempt by a hostile country or non-state actor to attack, threaten or coerce it; (2) a secure near region encompassing maritime South-East Asia and the South Pacific achieved by supporting the governments of Papua New Guinea, Timor-Leste and Pacific island countries to build and strengthen their security, and; (3) a stable Indo-Pacific region and rules-based global order, achieved by providing meaningful contributions to global responses to threats to that order when Australia's interests are engaged.

Long-range precision missiles, unmanned aircraft and advance sensors will enhance the ability of the ADF to meet the Australian Government's direction. Admittedly, the incorporation of technological advances is but



one part of the art of war. Training, professional military education and inculcating an effective way of war are of equal importance. But a nation that does not exploit new and emerging technologies, that does not continuously modernise and which does not seek novel opportunities for advantage over potential adversaries will be found wanting when its military is needed.

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The acquisition of these new weapons by Australia is not a knee-jerk response to the glittering allure of new technologies. While they offer a more effective way for Australia to defend itself and to secure its interests, they also offer a better way of waging war. Precision missiles will enhance Australian deterrence, improve the ADF's ability to keep potential threats far from our shores and when used, potentially reduce the devastation and loss of war. All are important ambitions.



These tactics are in essence the logical extension of the infiltration tactics² of the First World War that appeared on the Western Front in 1917–18 in response to the stalemate of the trenches. From that beginning, such tactics have been refined over a century because of continuous improvements in the lethality, range and precision of weapons. The likely implication of this evolution is that traditional notions of heavy and light ground forces may become out-dated. Perhaps land forces now need to have the qualities of both so that they can survive and move at speed across open terrain like heavy armour formations, but can also penetrate into buildings, tunnels, forests and caves like light infantry formations. Land forces may need to be able to change quickly from a heavy protected force to a light force and back again, which may be a significant factor in dealing with the immense ‘no man’s lands’ of contemporary and future warfare.

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² Infiltration tactics are characterised by small dispersed groups of soldiers exploiting terrain to mask movement, avoid enemy strong points, get inside an enemy position and attack it from the rear or from within.



Precision missiles and war from the land across the sea

The appearance of long-range precision missiles, combined with advanced sensors, suggests that land-based weapons will have the ability to contest the control of the sea in ways that only ships could have done in the past. This is because distance is a less significant factor in warfare than it once was. There is a truism, 'a ship's a fool to fight a fort'. With anti-access weapons, the fort is no longer a cannon-armed static redoubt guarding the nearby entry to a harbour or the passage of a narrow strait. Instead, it is likely to be masses of missile batteries and, potentially, swarms of unmanned small boats, submersible vessels, and remotely piloted aircraft that reach beyond the horizon and far out over the sea. The significance of this development is likely to be just as great for land forces as it is for navies, especially as armies become increasingly able to project power in the maritime space.

In fact, command of the sea may no longer be a function of being the dominant naval power. Instead, the prerequisite for command of the sea may be command of the land. If navies are to manoeuvre in waters over-watched by anti-access weapons, they may only be able to do so if friendly forces control both their own land and the land of their adversary. Some might argue that this situation has been true since aircraft became viable anti-ship systems. The campaign in the Western Pacific in the Second World War was largely about advancing one's bases for land-based air to reduce the enemy's room for manoeuvre. Having the ability to exert dominance over the land on both sides of a body of water may become a prerequisite for being able to operate on the water between.

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It would seem, therefore, that the traditional theoretical division of warfare between land, sea and air may be unhelpful in thinking about contemporary warfare, at least warfare involving long-range precision missiles. In the past, oceans were cloaks for manoeuvre. Ships could disappear out of sight of land and then re-appear somewhere else a long way away. Longer-ranged

sensors have gradually been reducing this cloak. Theoretical divisions in the art of war are also usually unhelpful simply because warfare is an activity that is more effectively considered as a joint endeavour.

The supreme consideration in war must be how to make an enemy do what you want them to do or to stop doing what you do not want them to do, ideally willingly or for a long time. The joint effect that land, naval and air forces exert upon **people** is therefore the essential means. Since people live upon the land, the binding connection between land, naval and air forces must be their joint capacity to affect events on land.





Penetrating an anti-access envelope

Penetrating an adversary's anti-access envelope will be difficult, but it is necessary if war is to retain its ability to achieve decision. After all, states and even non-state actors go to war to achieve a political outcome that could not be reached by other means. Penetrating an anti-access envelope will not be easy and will require considerable effort and investment in new capabilities, but it can be done. The experience of the First World War suggests that those same ideas that overcame the defensive anti-access envelope then (the no-man's land of the Western Front) can be reconceptualised in ways that will restore the equilibrium between the defence and the offense now. The land force will play a key role in achieving this rebalance.

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The way forward for the land force is unclear, but certain options are becoming apparent. For example, the land force will need to learn to work with other assets including decoys, electronic warfare and cyber in order to cross the enemy's anti-access envelope. How this will be achieved still needs to be determined but the potential is there. It might also be possible to infiltrate small parties of soldiers into and through the area covered by the enemy's precision weapons. These troops, once across, would coalesce into larger bodies to attack and reduce the envelope, thereby making it easier and safer for the main force to follow. However, the easiest way to negate the defender's strength may be to have troops already inside the anti-access window before a conflict commences. This would require access to another country's territory and is firstly a question of diplomatic arrangement with a partner state. By prepositioning forces forward the strength of an adversary's anti-access envelope may be considerably reduced, allowing access by the ADF's land, sea and air forces. Its potential is worth exploring.

The above notwithstanding, the problem of how to get the land forces to the launch point for their infiltration across the sea looms large.



The Army Reserve in an age of precision

By optimising its forces for operations in a precision strike environment the Australian Army risks losing the capacity to fight or hold terrain against an opponent organised for traditional ground combat. This is one of the challenges of military modernisation. Any modernisation initiative must get this balance right. The land force needs to adapt to an emerging threat but must remain capable against an existing threat while also being responsive to an unknown threat. A military force that is optimised for only one kind of war is at high risk of defeat if it does not get the war it prefers. The coalition's unreadiness for the Iraq insurgency in 2003 underscores this point.

Weighting land forces to be more capable of land-based precision strike, enabling and support, puts them at risk of not being able to fight or hold terrain against traditional ground combat troops. Expeditionary warfare's high demand for enabling and support capabilities, and the development of new precision strike capabilities must not therefore come at the expense of maintaining capable combat forces. Thus, even in an age of precision weapons and the potential for theatre-wide killing zones, soldiers must be prepared and able to fight, just as they have always been.



It may come as a surprise to some but the raising of enabling and support capabilities takes a relatively long time and consume considerable resources to grow and maintain. In fact, it is arguable that it is quicker and cheaper to train an infantry soldier than it is a signaller. Therefore, it may be best to concentrate the necessary enabling and support capabilities in the Regular Army. This idea represents a major shift in the existential philosophy of the Regular Army, but it must be considered.

The Regular Army probably only needs sufficient combat forces to allow the ADF's land forces to respond to short-notice needs, whereas the Army Reserve can provide the depth of ground combat or general-purpose forces for protracted operations. The Army Reserve is therefore critical for the future force generation of the nation's land forces. It will need to become a resilience and adaptive force, either reinforcing regular ground combat forces or providing a substantive part of the combat and general-purpose forces for subsequent force rotations.

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Notwithstanding these particular characteristics of the full-time and part-time land forces, the Army Reserve must still maintain some specialist capabilities with expertise that is more appropriately gained and maintained in the civilian sector, for example medical staff and cyber specialists.

Understanding divergent needs: Preparing land forces for Australian- led operations versus contributions to distant coalition operations

As outlined in *Australia's Strategic Defence Interests* the Australian Government has numerous and varied expectations of what it expects the ADF to provide. The land force must be able to act:

1. as a component in a joint multi-agency force in response to domestic or foreign threats to national sovereignty;
2. as a component to an Australian-led multinational coalition in the immediate region, in independent operations in the approaches to Australia or in support of Australia's security partners in the near region;
3. in a meaningful contribution to international coalitions led by Australia's allies in matters of global interest when Australia's interests have been threatened;
4. in a humanitarian assistance and disaster relief mission at home and abroad; and
5. by engaging with international security partners in peacetime.

The Government weights its *Strategic Defence Interests* equally for determining force structures. As missions, they are not the same, however. While the tactical requirements of Australian land forces for independent combat operations in the immediate region are not significantly different from those needed to contribute to global coalition operations there are significant differences at the operational and strategic levels. An independent or Australian-led mission in the immediate region would be markedly more difficult than a contribution to a global coalition. Additionally, and, critically, the consequences of Australian failure as a coalition partner in a distant operation are likely to be far less significant than failure in an Australian-led regional operation.

An independent or Australian-led operation would likely require greater numbers of Australian troops. It would necessitate intimate interoperability with the Royal Australia Navy, the Royal Australian Air Force, Australian Government agencies and regional partners. Australia would be responsible for 'theatre entry', 'theatre setting' and 'theatre sustainment', placing a high priority on operational-level enabling and support capabilities such as terminal operations, health facilities and casualty evacuation, intelligence functions, communications infrastructure, theatre-level logistics, major base infrastructure (incorporating an airfield and perhaps a seaport) and the provision of a joint task force headquarters.

Global coalition operations, on the other hand, are likely to have a narrower range of challenges for the ADF than an independent regional mission. For a global coalition operation the ADF would likely need to contribute only minor force elements that would fit within a structure organised by a larger and more capable ally. This was the case in the Middle East and Afghanistan over the last decade. Australia did not have to deploy the full range of support and sustainment elements, or even combat arms, as the United States had capacity that the ADF could rely upon. In other words, a larger partner did the 'heavy lifting' and in a future distant coalition operation the situation would likely be the same.

The differences in the scale of Australia's contribution to a regional Australian-led mission or participation in a distant coalition operation relate mainly to interoperability priorities and the greater or lesser demands on sustainment, support and enabling rather than the relative intensity of combat and the tactics employed. It would seem that designing a force for regional interventions, but with warfare involving precision missiles in mind, would at least address the needs of any potential contribution to a coalition farther afield, while also ensuring that the ADF is capable of dealing with the very difficult challenge of leading a campaign closer to home.

The characteristics of a future Australian land force

Given the factors bearing on future warfare and the Government's requirements of Defence, it seems that the principal characteristics required of Australia's land forces may be:

- flexible force structures that are able to adapt quickly to the wide variety of potential places and circumstances where the Government believes the pursuit of Australia's interests requires the use of land forces as part of a joint military force
- amphibious and air-transportable forces that are ready and light enough to project quickly over long distances and sustainable by air and sea
- able to survive and move at speed across open terrain, but also to hide and penetrate into buildings, tunnels, forests and caves where decision is likely to be achieved
- possessing precision strike capabilities to contribute to a joint anti-access envelope
- possessing capabilities to neutralise an enemy's anti-access envelope at a point and time of the joint force's choosing, thereby enabling entry and manoeuvre
- integrated into a joint sensor-shooter digital network and able to inform the network, draw support from the network and direct elements of the network as required



- possessing reliable and relatively simple equipment with common features and open digital architecture, demanding as little as possible in maintenance and sustainment support for a prolonged period
- able to function dispersed in relatively small groupings, infiltrating through difficult terrain and using it to advantage in order to avoid destruction (hard to find and hard to target) – a difficult challenge indeed
- able to exploit opportunities afforded by developments in space, cyber, communication and information technologies and disrupt an adversary's systems but not be so dependent on these capabilities that disruption or denial of our systems or a failure to disrupt an adversary's systems has a marked effect on the performance of the force
- possess an ability and a doctrine to act despite the absence of clarity or knowledge of the situation, demanding offensive mindedness and aggressive reconnaissance-in-force as principal force characteristics
- possessing a culture of life-long professional military education to ensure intellectual agility and breadth of knowledge that supports rapid responses to unexpected circumstances
- and able to deal with foes and contingencies in cooperation with allies and indigenous partners, and able to build the capacity of these partners also if required.





Follow-on work

Creating land forces for a contemporary battlefield involving precision missiles and advanced sensors is no trivial task. This paper merely marks the beginning of the journey. Importantly, there is, as yet, no robust concept of how the joint (and coalition) force might operate in this environment from which to anchor land force solutions. In cooperation with the Navy, Air Force and other joint and international partners, the Land Warfare Branch of Army Headquarters will assist in this joint intellectual endeavour by undertaking a series of research activities. The initial research includes, among other work:

- achieving the right balance of enabler/combat forces for joint and expeditionary warfare
- land forces and joint theatre sustainment
- land forces and cyber security in a theatre of operations
- land forces and electronic and cyber attack in a theatre of operations
- joint integrated land operations in the networked urban littoral
- land forces and the provision of joint anti-access and area denial envelopes
- land forces and joint penetration and reduction of anti-access and area denial envelopes
- land forces and the intellectual preparation of the future soldier.

Conclusion

Like all innovations, precision weapons offer both risks and rewards. Whether one achieves the benefits of the rewards of an innovation or one is deterred by its risks is a matter not of the technology but the agency of the human brain in coming to understand the opportunities offered and the willingness to overcome institutional reluctance and cultural impediment. The effects of developments in long-range precision weapons may be far-reaching. These developments promise – or perhaps require – a rethinking of the character of war, particularly the relationship between the traditional air, sea and land domains. It is prudent, therefore, for Australia's joint forces to think through all the implications of long-range precision weapons, which is more than just working out how to use them to improve targeting and the ability to kill. This is because the future does not just happen on its own, it must be created.

To this end, the Army encourages you to participate in the debate by contributing ideas to the following forums and journals:

Australian Army Journal

www.army.gov.au/Our-future/Publications/Australian-Army-Journal

Land Power Forum

www.army.gov.au/Our-future/Blog

