



Creating smarter military bases

Urban planning and defence base infrastructure

Canada's defence base infrastructure is largely a byproduct of decisions made during the Second World War and the Cold War. While there have been modest investments in the decades since, a new defence infrastructure and environmental strategy is necessary. It should be informed by an urban design model that incorporates the attributes of a smart military base to guide its long-term portfolio recapitalization and modernization.

Background: Military installations are the backbone of the Canadian Armed Forces (CAF) and Department of National Defence (DND). Insufficient investment over time has and will increasingly put the portfolio as well as CAF force projection (planning the response capacity for aircraft fighters, military ships, etc.) at risk. The 2019/2020

departmental plan identifies two key risks associated with sustainable bases, information technology systems, and core infrastructure: "There is a risk that DND/CAF cannot develop, manage, maintain, renew, and build modern, operational and sustainable bases and infrastructure which will affect program/service delivery, training, and could have legal liability consequences. There is also a risk that technology tools will impede DND/CAF ability to effectively operate/do business."^{*}

Key insight: We propose that modern defence infrastructure management requires a smart-base strategy grounded in a military base urban-planning (BUP) model. This in turn should be informed by industry best practices, and include the use of emerging and disruptive technologies. A BUP model would enable the identification of multi-year and stimulus investment opportunities, improved portfolio condition insights, effective management of a standardized best-practice model, improved multi-base investment in operational effectiveness and security capabilities, and identification of opportunities to partner with industry in areas of clean energy and waste management that support the climate change objectives of the Government of Canada.



What is a smart base?

A military base that integrates the technological and process innovations that improve the performance, efficiency, and convenience of the managed assets and services of a military installation.

^{*}Government of Canada, *Department of National Defence and the Canadian Armed Forces 2019-20 Departmental Plan*, 2019
<https://www.canada.ca/en/department-national-defence/corporate/reports-publications/departmental-plans/departmental-plan-2019-20-index.html>

Main advantages

1 Base condition index: The DND has successfully used the Facility Condition Index to understand and guide individual asset investment choices. However, the development and use of higher-level indexes, such as a base condition index, would inform understanding and strategic-level investment choices at the base portfolio level, and enable the identification of multi-base investments.*

2 Base urban-planning (BUP) model: While the context and needs of each military base are different, many bases share the same challenges and opportunities. These cannot be effectively addressed in a siloed approach to infrastructure and environment. The development and management of a military BUP model—and addenda that account for base differences (e.g., size and type of range)—would identify portfolio-wide issues and requirements. It would also set programmatic conditions to address issues and opportunities at scale, improving the efficiency of the programs and facilitating more substantive cooperation and partnership with industry.

When managed according to a well-designed BUP model, common base requirements—power, water, sewage, access control, environmental compliance, 5G WiFi service, facility condition monitoring, supply, transportation, and health services, among others—would simplify planning, effectively frame investment decision-making, identify savings opportunities, and improve effectiveness and resiliency (e.g., energy self-sufficiency with excess power sold to provinces; monitoring of remote asset condition to inform maintenance prioritization). In addition, more distinctive base or station capability elements should be managed by common asset type standards (e.g., live fire range, runways) or when necessary by bespoke management protocols (e.g., underwater sound range). While DND has implemented smart building technology in a few select structures, a standardized BUP model would aid in structuring, codifying, and normalizing standards for industry, National Research Council, and provincial/territorial construction, as well as the consideration of smart technology opportunities.

3 Financial framework, management, and industrial development: A BUP model would inform the development of a standardized base and wing financial framework that would more effectively capture and understand the investment requirements and stimulus investment opportunities within each base. When aggregated at various levels, including at capability and portfolio level, it would improve understanding of the investments required, investment opportunities at scale, and consequences of underinvestment, thereby enabling greater management effectiveness and efficiency. Finally, a BUP model would provide insight to small and medium-sized industry elements that would be well positioned to support base and wing requirements.



*Examples of a possible base condition index framework could be force protection, mission readiness, soldier readiness, and family readiness, or a multiple bottom-line framework such as efficiency, effectiveness, environment, and social outcomes.

4 Environmental and climate

change objectives: Defence is the largest federal producer of greenhouse gases, particularly from its extensive infrastructure and vehicle holdings. A standardized BUP model would, for reasons noted above, enable the identification and implementation of multi-base solutions (e.g., solar and wind power generation, vehicle management, waste management). For example, a BUP model would set the conditions for decarbonization investment metrics to be developed (e.g., tons saved/ investment cost) across the portfolio and by asset type, providing a useful lens to evaluate and prioritize investments. Given the size of the DND's land holdings, there is significant potential for solar and wind generation.

If Defence were to develop targeted partnerships with industry, it could directly contribute to the federal government's climate objectives of 100% clean electricity by 2022 (2025 at the latest) by producing or purchasing renewable electricity. Moreover, organic solar and wind power generation supports resilient base operations and enables valuable contributions to provincial and small-community energy needs.

The potential

Extended periods of insufficient investment in base infrastructure are increasingly challenging the operational effectiveness of the military installations of Canada's National Defence, putting at risk operational readiness. To change this trajectory, infrastructure management requires a smart-base strategy that's

grounded in BUP modelling, informed by industry best practices, and that employs disruptive technologies.

This novel approach would serve to elevate understanding, management, and proactive investment at the portfolio level in the \$26-billion National Defence holdings. It would also enable greater contribution to the federal government's climate change and environmental objectives, thereby having a positive impact on communities small and large across the country.

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Read the source article:

Matt Leonard, "Making the case for smarter military bases", March 3, 2017

<https://gcn.com/Articles/2017/03/03/smart-military-bases.aspx?m=1>

Erv Lessel, Bill Beyer, and Ted Johnson, *Byting the Bullet: Now is the time for smart military bases*, Deloitte Center for Government Insights

<https://www2.deloitte.com/content/dam/Deloitte/us/Documents/public-sector/us-fed-byting-the-bullet.pdf>

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