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CRUMBLING INFRASTRUCTURE CRIPPLING THE ARMY

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CRUMBLING INFRASTRUCTURE CRIPPLING THE ARMY

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Adm(IE) through Comd CF RP Ops Gp

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- A. Report of the Auditor General of Canada to the House of Commons, Chapter 5 Real Property – National Defence, Fall 2012
- B. Strong, Secure, Engaged: Canada’s Defence Policy
- C. 1970-1 (CO RPOU(West)) RPOU(WEST) Orders, 23 April 2016
- D. Remarks by Commissioner Paul R. Belanger on Elliot Lake Mall Commission of Inquiry
- E. Delivering the Defence Estate: Ministry of Defence, Fall 2016
- F. National Security Orders and Directives, 2015
- G. Army Operating Plan 2017/2018

AIM

1. Infrastructure is a fundamental component of many organizations as it provides the physical structures that support operations.¹ As outlined in Reference A, the Department of National Defence (DND) has been cutting funding to infrastructure maintenance since the 1990s as a money saving measure. These cuts have caused the portfolio to deteriorate to the point where it now carries an increased risk of failure.² Over the next 10 years, the risk of infrastructure operational failure is predicted to be the Army’s single greatest challenge to their ability to apply land power. The aim of this paper is to highlight the requirement to correct infrastructure maintenance liabilities incurred over the last couple of decades and propose how this should occur.

¹ International Facilities Management Association, *Leadership and Strategy*. (London: IFMA, 2014), 2.

² Office of the Auditor General, “Report of the Auditor General of Canada to the House of Commons, Chapter 5 Real Property.” National Defence, Fall 2012, 1.

INTRODUCTION

2. Serviceable infrastructure is essential to the Army's ability to undertake missions in Canada and abroad.³ Without it, the Army's ability to function is at risk because infrastructure allows the Army to train soldiers, store equipment and maintain a wide variety of vehicles.⁴ If the portfolio continues to deteriorate at the current rate, some parts may wholly or partially be shutdown. This would reduce the Army's ability to generate operational forces as per the new defense policy at Reference B.

3. This paper will focus on the maintenance liabilities of infrastructure lifecycle management. First, a brief overview will be provided on how the infrastructure portfolio deteriorated. Second, the current situation of the portfolio and current maintenance challenges will be discussed under the new management model, Assistant Deputy Minister (Infrastructure & Environment) (Adm(IE)). Finally, the cumulative impacts of neglected maintenance and the risk this poses to the future of the Army will be discussed. The paper will conclude with recommendations for improvement. Although general DND infrastructure terms and portfolio data will be used, the scope of this paper will focus on infrastructure impacts to the Army.

³ Office of the Auditor General, "Report of the Auditor General of Canada to the House of Commons, Chapter 5 Real Property." National Defence, Fall 2012, 1.

⁴ Government of Canada, *Strong, Secure, Engaged: Canada's Defence Policy* (Ottawa: DND Canada, 2017), 81.

DISCUSSION

DND's Infrastructure Portfolio Background

4. DND currently maintains an extensive infrastructure portfolio at an estimated value of \$26 Billion.⁵ In 2010, DND reported that budget cuts since the 1990s resulted in a significant amount of infrastructure being overdue for refurbishment or repair. In addition to funding challenges, the DND portfolio is getting old. As of 2012, almost half of the portfolio was over 50 years old.⁶ Older infrastructure is typically less suited to serve current needs and if not properly maintained, it carries increased risks of operational failure.⁷ The cumulative risks to DND operations as a result of insufficient maintenance funding and aging infrastructure are outlined in Reference A.

5. Of particular note from Reference A, DND has not “been able to meet expenditure targets for maintenance, repair and recapitalization of infrastructure,” and in many instances it has been less than half of acceptable industry standards.⁸ An annual industry standard maintenance budget allocation is 1.4% of the property replacement cost; many times DND has spent less than half of this.⁹ While this is not alarming in the short term, there is no indication that DND has ever expended an industry standard maintenance budget since the budget cuts of the early 1990s.¹⁰ The cumulative debt created by underspending year over year increases the risk of infrastructure operational failure.

⁵ *Ibid.*, 76.

⁶ Office of the Auditor General, “Report of the Auditor General of Canada to the House of Commons, Chapter 5 Real Property.” National Defence, Fall 2012, 2.

⁷ *Ibid.*

⁸ *Ibid.*, 17.

⁹ *Ibid.*

¹⁰ *Ibid.*, 1.

6. Insufficient maintenance in the long term causes a predictable ‘failure pathway’. Balancing between a preventative maintenance and a breakdown maintenance program is generally the industry standard, except for no-fail infrastructure such as hospitals or fire halls.¹¹ As maintenance is deferred, increased breakdowns occur and eventually catastrophic failure can result (Figure 1). In efforts to further save costs, legislative inspections are sometimes skipped; this delays the identification of problems and hastens the slide down the ‘failure pathway’. Every year that budgets are underfunded, a maintenance debt is accumulated. This debt eventually requires repayment in order to reverse the ‘failure pathway’; simply starting to meet minimal industry standard expenditure targets only manages to maintain status quo at a deteriorated level. Although Figure 1 highlights an approximate cumulative debt of western situated DND infrastructure, extrapolated across the DND portfolio it demonstrates a large maintenance liability. As per Reference A, DND is not meeting legislative, regulatory, and policy requirements. This means that DND has large portions of infrastructure that have slid down the ‘failure pathway’ into the legislative non-compliance zone.¹²

¹¹ International Facilities Management Association, *Operations and Maintenance*. (London: IFMA, 2014), 86.

¹² Office of the Auditor General, “Report of the Auditor General of Canada to the House of Commons, Chapter 5 Real Property.” National Defence, Fall 2012, 15.

Infrastructure Maintenance Debt

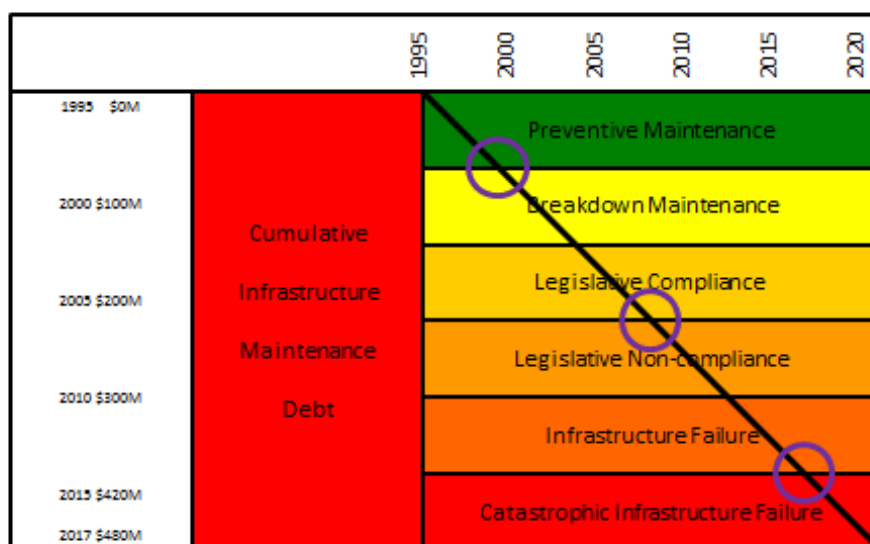


Figure 1

Source: RPOU(W) Orders

7. On 23 June 2012 at a mall in Elliot Lake Ontario, portions of the roof collapsed injuring 20 people and killing two.¹³ Due to improper infrastructure maintenance practices, some of the legislative compliance inspections of the Elliot Lake Mall were reported to be “so cursory and incomplete as to be essentially meaningless.”¹⁴ Incontrovertible evidence found the roof failed due to severe rusting of the connection between one column and one beam; an avoidable failure with proper maintenance practices.¹⁵ The subsequent inquiry concluded that the real cause of the Elliot Lake roof failure was in fact not material failure, but human error in infrastructure

¹³ Office of Commissioner, “The Elliot Lake Commission of Inquiry” In *Remarkd by Commissioner Paul R Belanger*, Ottawa: Province of Ontario, 2014, 51.

¹⁴ *Ibid.*, 5.

¹⁵ *Ibid.*

mismanagement.¹⁶ Although not DND infrastructure, the similar language between Reference A and the Elliot Lake Mall inquiry warns of the infrastructure mismanagement risks being assumed by DND not meeting legislative infrastructure maintenance requirements. On a smaller but equally deadly scale, Pte Steven Allen was killed on 06 November 2014 when an elevated observation post collapsed on him while training in Wainwright, Alberta.¹⁷ The elevated observation post again followed the ‘failure pathway’ through missed legislative compliances before becoming a catastrophic infrastructure failure. With large portions of DND’s infrastructure in the legislative non-compliant zone, and the continued neglect of industry standards, more failure is due to follow. The Army has a high reliance on infrastructure to train and maintain equipment, so if DND infrastructure fails, the Army will fail.

Infrastructure Management Model

8. In response to Reference A, a management framework was constructed within Adm(IE) in 2014. Since transformation, Adm(IE) has received funding and has diligently improved the management practices of infrastructure. But additional funding is only good if you can spend it. Including the current fiscal year, Adm(IE) has not been able to expend allocated maintenance funds, keeping a large portion of the portfolio in the non-compliance zone. Common problems are contractor availability, lengthy project approval processes, increased security protocols and financial expenditure restraints.¹⁸ Within the challenges above, Adm(IE) is unfortunately so focused on resource stewardship processes that maintenance work is being delayed. Arguably the infrastructure portfolio they received in 2014 was so broken they had no choice but to

¹⁶ *Ibid.*

¹⁷ Tyler Anderson, “Canadian Soldier Killed in Training,” *National Post*, 7 November, 2014.

¹⁸ Office of the Auditor General, “Report of the Auditor General of Canada to the House of Commons, Chapter 5 Real Property.” National Defence, Fall 2012, 2.

address stewardship processes first, but a careful balance between fixing the process and conducting actual maintenance needs to occur in order to improve the portfolio from non-compliance levels.

9. At Reference E, the United Kingdom (UK) provides insightful lessons on the risks of under-spending on infrastructure maintenance. Formed in 2011 to address the same infrastructure challenges as DND, Defense Infrastructure Organization (DIO) is the UK equivalent of Adm(IE). Interestingly, DIO's strategy and funding levels only permit a partial reversal of the declined state of UK infrastructure.¹⁹ DIO has not been able to expend enough funds to pay back the maintenance debt and improve their infrastructure from non-compliance levels. In efforts to ameliorate the situation, DIO is working with strategic level financing authorities to find additional financing options and improve expenditure procedures.²⁰ In addition, the UK is working with consultants from Deloitte, a UK company that was also consulted in the formation of Reference B.²¹ Unfortunately, lessons from DIO's inability to expend enough have not transferred over and have become a short coming of the infrastructure plan in Reference B. The inability of DIO to expend funds on their infrastructure is risking the operational effectiveness of UK forces, and now Adm(IE) is following the same path by not aggressively taking action to expend maintenance funds. This leaves the residual failure risks of Army infrastructure unaddressed. To compound the risk of failure, poor infrastructure and service accommodations for service families is affecting the recruitment and retention of the UK;

¹⁹ Office of the Auditor General, "Delivering the Defence Estate." Ministry of Defence, Fall 2016, 8.

²⁰ *Ibid.*, 11.

²¹ Government of Canada, *Strong, Secure, Engaged: Canada's Defence Policy* (Ottawa: DND Canada, 2017), 47.

this will likely impact Canada the same way and is contrary to aspirational growths of Reference B.²²

FUTURE CHALLENGES WITH *STRONG SECURE ENGAGED*

10. Reference B allocates \$4.9 Billion to infrastructure over the next 20 years in order to maintain the necessary portfolio.²³ However, when compared to the industry maintenance standards of Reference A, infrastructure is still underfunded. Using the industry 1.4% guideline, DND's \$26 Billion portfolio should receive \$364 Million annually. \$4.9 Billion spread evenly over 20 years is only \$245 Million annually. This is \$100M short per year, and doesn't yet account for the maintenance debt incurred over the last couple of decades. Exacerbating the underfunding issue, Reference B does not solve an even bigger issue of Adm(IE)'s inability to expend funds. Budgets only have value when used.

11. Leveraging lessons from Reference E, there is a significant risk that the poor condition of support infrastructure will affect the Army's future capabilities.²⁴ Training and force generation requirements of Reference G are already experiencing challenges. Gagetown training area roads are so deteriorated they cannot properly support tanks; this impacts the armored school's ability to force generate an armored capability. Until recently, bridges in the Canadian Maneuverer Training Centre in Wainwright, responsible for final deployment gateway training of Canadian soldiers, could not support Leopard II tanks in a battlegroup. The Leopard II tank fleet continues to cause maintenance and operational challenges due to their size and weight, likely

²² Office of the Auditor General, "Delivering the Defence Estate." Ministry of Defence, Fall 2016, 7.

²³ Government of Canada, *Strong, Secure, Engaged: Canada's Defence Policy* (Ottawa: DND Canada, 2017), 103.

²⁴ Office of the Auditor General, "Delivering the Defence Estate." Ministry of Defence, Fall 2016, 7.

foreshadowing future Army challenges fielding new armored vehicles. Unit maintenance bays are not big enough to store, or equipped to maintain the new vehicle fleets detailed in Reference B.²⁵ Current support infrastructure as a whole is also undersized. Training school infrastructure and unit lines are not large enough to house Army growth aspirations of Reference B.²⁶

12. New Army vehicles and equipment bring increased security measures due to the requirements of Reference F. An increased security protocol generates additional administration, and will reduce Adm(IE)'s ability to timely spend budgeted funds. In addition to the time required to process, cumbersome administration deters maintenance contractors from bidding on DND projects. This reduces the pool of available contractors to complete work, thus prolonging project timelines. A centrally controlled funding and project approval process by nature impacts maintenance productivity, and increased security challenges exacerbate the delays. Like financial stewardship, a careful balance of meeting security protocols and completing urgent maintenance is required in order to raise the portfolio from non-compliance zones.

13. There are limited infrastructure funds available to Adm(IE) and the Army is at a disadvantage when competing against the Air Force and Navy. Infrastructure funds are required to maintain Army training areas, but this is a significantly smaller expense for the Air Force and Navy as they often train by flying and sailing on non-DND property. Lack of training area maintenance projects allows funds to focus more on Air Force and Navy specific infrastructure, reducing the likelihood of operational failure in comparison to the Army. Additionally, the Army is generally a higher risk deployment option for the Government of Canada with respect to

²⁵ Government of Canada, *Strong, Secure, Engaged: Canada's Defence Policy* (Ottawa: DND Canada, 2017), 109.

²⁶ *Ibid.*, 13.

casualties of Canadian soldiers. From experiences in Afghanistan, when the Army is deployed in a conventional role, it has a higher risk of casualties. On the contrary, missions like Op UNIFIED PROTECTOR and Op IMPACT are significantly less risk to Canadian soldiers as the Army is not employed in a conventional combat role. As the Air Force and Navy can fulfill alliance commitments without exposing Canadian soldiers directly to high threat areas, these types of missions are likely to be the political preference when working with allies in the future. With focused infrastructure spending without training area maintenance concerns and lower risk to deploy, the Air Force and Navy are well suited to get priority infrastructure funds at the expense of maintaining Army assets. With the operational failure already impacting force generation, the portfolio being under-equipped for future aspirations, and increased security protocols limiting maintenance options, infrastructure shortcomings will be the single greatest challenge facing the Army.

CONCLUSION

14. This paper has provided an overview of how existing infrastructure challenges manifested, provided some insight to current restraints limiting the ability to expend funds, and it has outlined a future challenge the Army will experience when competing with the Navy and Air Force for maintenance funds. The cumulative challenges of a deteriorated infrastructure portfolio, undersized and ill-equipped infrastructure, the likely preference of deploying the Army in non-conventional roles and the inability of Adm(IE) to spend infrastructure funds is a major risk to the Army's ability to deliver on future mandates. From this analysis, it is argued that the risk of infrastructure operational failure will be the single greatest challenge facing the Canadian Army in their ability to apply land power over the next 10 years.

RECOMMENDATIONS

15. The wrong risks are being assumed in the management of infrastructure supporting Army operations. The Army must encourage Adm(IE) to be as aggressive as possible to expend maintenance funds and to remove any self-imposed limitations. Currently, legislative infrastructure maintenance requirements are subservient to project approval, financial and security processes. In light of the deteriorated infrastructure portfolio and the accumulated maintenance debt, there are three distinct areas to consider assuming more risk until the infrastructure becomes legislatively compliant.

- a. Delegation of Authority. For maintenance and repair projects of existing infrastructure, Adm(IE) should provide legislative compliance priorities of effort and delegate as much project approval and funding expenditure authorities as possible to the Real Property Operation Units (RPOU). As they are closely linked with Army units, they are best positioned to prioritize maintenance efforts to maintain and improve Army infrastructure. Centralized control of project approvals through Adm(IE) is a desired end state, however too much infrastructure failure risk is being assumed while processes and procedures are followed for centralized management.
- b. Assume Financial Risks. The Army should encourage Adm(IE) to over-program allocated maintenance budgets. 140% over planning is usually required to expend an allocated maintenance budget due to contracting challenges and project management delays. Adm(IE) should be prepared to have some over

expenditures which should be viewed positively since this repays maintenance debt and reduces the risk of infrastructure failure to the Army.

- c. Better Security Management. There are already provisions in place to assume risk for emergency repairs at Reference F, the Army should request these be expanded to incorporate 'urgent' as well. This would allow qualified maintenance personnel to do work without proper security classifications. Allowing and better managing security risk would remove weeks of delays on basic maintenance work and remove months of delays on project work. Reduced security requirements would also remove cumbersome and timely administration, subsequently increasing the potential contractor pool available to conduct work. Better security management would facilitate more maintenance and reduce infrastructure failure risk to the Army.

16. For Adm(IE) to support the Army and infrastructure portfolio as a whole, these recommendations are a starting point to address infrastructure challenges. As Adm(IE) continues to mature in the management of DND's portfolio, the Army needs to remain acutely aware of how their infrastructure shortfalls will be rectified.

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