

## New Fighter Aircraft life-cycle cost estimates

	(1)	(2)	(3)
<b>65 Aircraft</b>	<b>F-35 DND Estimate<sup>i</sup></b>	<b>F-35 PBO/DND Estimate</b>	<b>F-18 Super Hornet Estimate<sup>ii</sup></b>
	<i>\$92.3 million Per Unit<sup>iii</sup></i>	<i>\$148 million Per Unit<sup>iv</sup></i>	<i>\$60 million Per Unit<sup>v</sup></i>
(today's dollar)	\$ billions	\$ billions	\$ billion
Initial 65 Aircraft Acquisition (including Canadian modifications)	6.0	9.7	4.0
Additional infrastructure, weapons and other capital costs <sup>vi</sup>	3.0	<sup>vii</sup> 3.4	3.0
14 Replacement Aircraft <sup>viii</sup>	1.3	2.1	.8
Personnel, operating, and maintenance costs for 36 years	<sup>ix</sup> 29.5	<sup>x</sup> 25.3	<sup>xi</sup> 29.5
Upgrades	<sup>xii</sup> nil	<sup>xiii</sup> 3.9	<sup>xiv</sup> 3.9
<b>Total costs over 36 years<sup>xv</sup></b>	<b>\$39.8</b>	<b>\$44.4</b>	<b>\$41.2</b>
Fighter Aircraft Program Cost per year	\$1.11	\$1.23	\$1.14
<b>Lifetime cost per aircraft</b>	<b>\$.612</b>	<b>\$.683</b>	<b>\$.634</b>

### Notes

<sup>i</sup> This DND estimate is taken from June 2010 cost estimate as it appears on p. 27 of Auditor General's report. Added to the DND estimate is the cost for 14 replacement aircraft which the Auditor General estimates would be required to keep a fleet at 65 aircraft throughout their expected life (p. 29). The AG says that DND expects to use the aircraft at least 36 years (p. 28), so the life-cycle costs should reflect that. DND put out projections for only 20 years (presumably to the numbers as low as possible) – hence in this table the figures for 20 years are multiplied by 1.8 to extend the estimate to 36 years.

For the chapter on the F-35 of the April 2012 Auditor General's report go to:

[http://www.oag-bvg.gc.ca/internet/English/parl\\_oag\\_201204\\_02\\_e\\_36466.html](http://www.oag-bvg.gc.ca/internet/English/parl_oag_201204_02_e_36466.html)

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ii The F-18 Super Hornet is often referred to as a less expensive advanced fighter alternative to the F-35.

iii This per unit cost is taken directly from DND which says that the acquisition of 65 F-35 aircraft will be \$5.58 billion for the basic aircraft, plus \$420 million for Canadian modifications, which comes to \$92.3 million per aircraft. Auditor General's Report of March 2011, p. 27.

iv The Parliamentary Budget Officer estimated the cost per aircraft at \$148 million per unit (p. 28), which DND, in its response, compares with its own unit cost of \$6 billion for 65 aircraft, or \$92.3 million each. For the Parliamentary Budget Officer's March 10, 2011 Report, An Estimate of the Fiscal Impact of Canada's Proposed Acquisition of the F-35 Lightning II Joint Strike Fighter," go to:  
[http://www.parl.gc.ca/PBO-DPB/documents/F-35\\_Cost\\_Estimate\\_EN.pdf](http://www.parl.gc.ca/PBO-DPB/documents/F-35_Cost_Estimate_EN.pdf)

v For argument's sake, the initial basic acquisition price is given at \$60 million – a figure used by several commentators:

-Industry Daily: "Canada Preparing to Replace its CF-18 Hornets," at

<http://www.defenseindustrydaily.com/Canada-Preparing-to-Replace-its-CF-18-Hornets-05739/>.

-Sharkey's World Blog: <http://www.sharkeyworld.com/2011/07/f-18-super-hornet-better-option-for-rn.html>;

-Online Defense and Acquisition Journal: <http://www.dodbuzz.com/2012/03/20/more-cost-overruns-delays-and-uncertainty-for-f-35/>;

-Defense-Aerospace has prices ranging from \$53 million to \$95 million.

"Sticker Shock: Estimating the Real Cost of Modern Fighter Aircraft"

An occasional report by defense-aerospace.com

<http://www.defense-aerospace.com/dae/articles/communiques/FighterCostFinalJuly06.pdf>

vi DND estimates an additional \$3 billion for the initial logistics and set-up, project management, infrastructure, initial weapons, and a contingency fund. The assumption here is that these same costs would apply in the other two cases as well.

vii The PBO has a figure for \$1.7 billion for initial set up costs, which compares to \$1.3 billion by DND, but DND has an overall figure of \$3 billion of additional capital expenditures, which include other infrastructure, project management and initial weapons costs (hence to get an equivalent figure the difference between the \$1.7 and \$1.3 figures – \$.4 billion – is added to the DND \$3 billion figure for this category of costs.

DND, "Next Generation Fighter Capability: Comparison of Costing"

<http://www.forces.gc.ca/site/pri/2/pro-pro/ngfc-fs-ft/comparison-comparaison-eng.asp>

viii Auditor General's Report says that the usual rates of attrition suggest that, in order to maintain a full complement of 65 aircraft over 36 years, DND will likely have to purchase another 14 aircraft during that period (p. 25). Thus, in all three examples, the replacement cost for these 14 aircraft is taken to be the same as the original acquisition cost.

ix The DND Estimate for these personnel, operating, and maintenance costs is \$16.14 billion over 20 years (that is the June 2010 estimate; in March 2011 DND, now famously, offered an estimate of \$5.7 billion for this same category of costs, inexplicably omitting contingency, operating, and personnel costs), so to get to the full life-cycle cost for the 36 years which the Auditor General uses as the basic life-span of these aircraft, the June 2010 DND estimate is multiplied by 1.8.

x The PBO estimates operating and sustainment costs at \$14 billion over 30 years (p. 32), compared with DND's estimate of \$10.4 billion for the equivalent costs over 20 years (both converted to 36 years shows the PBO estimate as lower than the DND estimate).

xi Assumed to be the same as the DND estimate for the F-35.

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<sup>xii</sup> DND's response to the PBO Report says the upgrade process for the F-35 is to be regular and ongoing with costs apparently included in the maintenance or "contract sustainment costs. Instead of major upgrades at the 10-year and 20-year marks, as the PBO assumes, DND says software upgrades will take place every two years and hardware upgrades every four years and will be provided for all F-35s worldwide and will thus not incur costs beyond the maintenance costs.

<sup>xiii</sup> The PBO assumes two major upgrades at 10 and 20 years at \$30 million per aircraft for each upgrade (hence \$60 million x 65 aircraft). p.32

<sup>xiv</sup> The same upgrades tht the PBO projects for the F-35 are projected here for the Hornet as well.

<sup>xv</sup> In today's dollars.