

## US Expenditures on Ballistic Missile Defense Through Fiscal Year 2021

Frank N. von Hippel, 29 October 2021

Measured in 2020 dollars, the US has expended about \$280 billion on defense against long-range ballistic missiles as of the end of Fiscal Year 2021.

This estimate is based on reported expenditures by:

- The Department of Defense's (DOD's) Missile Defense Agency (MDA, Fiscal Years 2002-2021) and its predecessor organizations: the Strategic Defense Initiative Organization (FY1985-1994) and the Ballistic Missile Defense Organization (1994-2002),<sup>1</sup>
- Three major earlier DOD ballistic-missile defense programs involving nuclear-armed interceptors: Nike-Zeus (1962-65); Nike-X (1964-68); and Sentinel-Safeguard (1967-72),<sup>2</sup> and
- Additional DOD expenditures on ballistic missile defense (BMD) during FY1973-85.<sup>3</sup>

Historic dollar figures have been converted to 2020\$ using the U.S. Bureau of Economic Analysis GDP deflator.<sup>4</sup>

The year-by-year expenditures are shown in Figure 1. The expenditures shown prior to 1975 were mostly associated with programs launched by Presidents Johnson and Nixon in response to Soviet deployment of a BMD system to defend Moscow. The US deployment was shut down by Congress as not worth its cost after the 1972 US-Soviet Treaty on the Limitation of Anti-Ballistic Missile Systems (the ABM Treaty) and its 1974 protocol, which limited each country to 100 interceptors.

The increase in the mid 1980s followed President Reagan's 23 March 1983 announcement of his Strategic Defense Initiative.

The increase in the early 2000s followed President G.W. Bush's 13 December 2001 announcement that he had decided to take the US out of the ABM Treaty out of concern that additional countries were developing long-range ballistic missiles that, with chemical, biological or nuclear warheads, could be used as weapons of mass destruction.

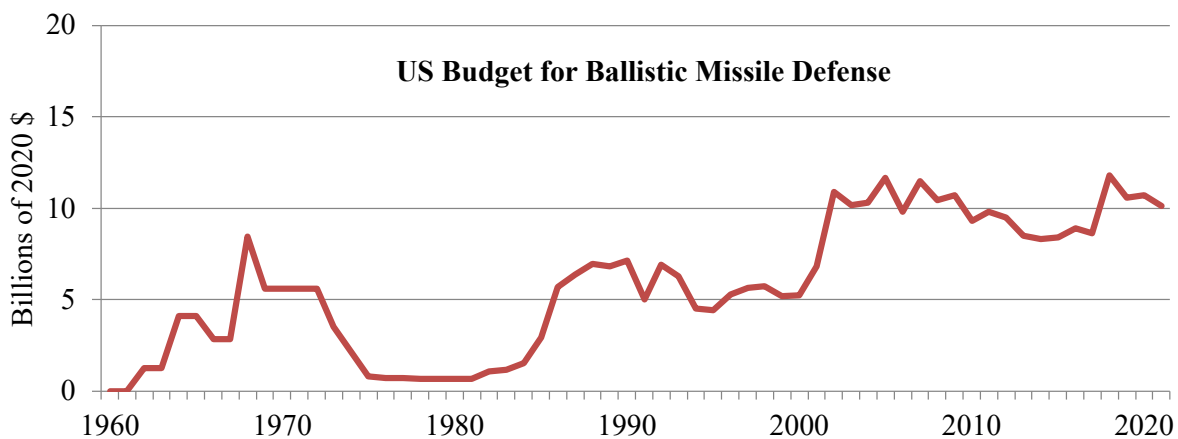


Figure 1. U.S. expenditures on ballistic missile defense, FY 1962-2021.

The expenditures shown in Figure 1 cumulate through FY 2021 to about \$360 billion in 2020 dollars. Of that total, about \$40 billion each has been spent on two systems whose primary mission has been defense against shorter-range ballistic missiles:

- The Army's THAAD (Theater High Altitude Area Defense) system began development in Fiscal Year 1993 following Iraq's use of short-range Scud missiles during the 1991 war to eject Iraq from Kuwait.<sup>5</sup> As of the end of FY2009, THAAD's "sunk cost" was \$20 billion in FY2010\$.<sup>6</sup> Based on the budget numbers for THAAD during FY16-FY21,<sup>7</sup> an average of \$1.2 billion per year has been assumed for FY2010-15. On that basis, THAAD would cumulatively have cost about \$40 billion in 2020\$.
- The Navy's Aegis BMD program dates to 1995. It was originally developed to defend ships against short- and then intermediate-range missiles. The cumulative appropriations through FY2021 also total about \$40 billion in 2020\$.<sup>8</sup>

Subtracting the amounts spent on these programs, total US expenditures on defense against long-range ballistic missiles were about \$280 billion in 2020 dollars as of the end of 2021.

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<sup>1</sup> Missile Defense Agency (MDA), "Historical Funding for MDA FY85-17 Fiscal Year (FY in Billions)" [https://www.mda.mil/global/documents/pdf/FY17\\_histfunds.pdf](https://www.mda.mil/global/documents/pdf/FY17_histfunds.pdf); MDA expenditures for FY 2018-20 from Tom Karako and Wes Rumbaugh, "Inflection Point: Missile Defense and Defeat in the 2021 Budget," Center for Strategic and International Studies, 22 March 2020, Table 1, <https://www.csis.org/analysis/inflection-point-missile-defense-and-defeat-2021-budget>; and for FY 2021, US Department of Defense, *Defense Budget Overview, FY 2022 Budget Request*, [https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2022/FY2022\\_Budget\\_Request\\_Overview\\_Book.pdf](https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2022/FY2022_Budget_Request_Overview_Book.pdf), Figure 2.2, based on amount for "missile defense and defeat" after subtracting out \$2.1 billion for hypersonic weapons R&D based on Congressional Research Service, *Hypersonic Weapons: Background and Issues for Congress*, 19 October 2021, <https://sgp.fas.org/crs/weapons/R45811.pdf>, Table 1.

<sup>2</sup> Bruce G. Blair, Thomas S. Blanton, William Burr, Steven M. Kosiak, Arjun Makhijani, Robert S. Norris, Kevin O'Niell, John E. Pike, William Weida and *Atomic Audit: The Costs and Consequences of U.S. Nuclear Weapons Since 1940*, Stephen I. Schwartz, editor (Brookings, 1998) Figure 4-2 (p. 296).

<sup>3</sup> *Ballistic Missile Defense*, Ashton B. Carter and David N. Schwartz, eds (Brookings Institution Press, 1984) Table 9-1 (p. 344).

<sup>4</sup> US Bureau of Economic Analysis, "Gross Domestic Product Implicit Price Deflator," <https://fred.stlouisfed.org/series/GDPDEF>, accessed 23 October 2021.

<sup>5</sup> *Terminal High Altitude Area Defense*, [https://en.wikipedia.org/wiki/Terminal\\_High\\_Altitude\\_Area\\_Defense#Demonstration\\_and\\_validation](https://en.wikipedia.org/wiki/Terminal_High_Altitude_Area_Defense#Demonstration_and_validation), accessed 29 October 2021.

<sup>6</sup> *Making Sense of Ballistic Missile Defense* (National Academies Press, 2012) Figure S-2, p. 5, <https://www.nap.edu/catalog/13189/making-sense-of-ballistic-missile-defense-an-assessment-of-concepts>.

<sup>7</sup> "Inflection Point: Missile Defense and Defeat in the 2021 Budget," Figure 8.

<sup>8</sup> *Sea-based Ballistic Missile Defense* (Congressional Research Service, 21 May 2009) Table 1, <https://apps.dtic.mil/sti/citations/ADA501199>; and numbers for budget requests and projections for later fiscal years in *Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress* (28 September 2010, 15 June 2012, 17 October 2013, 25 October 2016, 1 September 2017, 31 March 2020, 20 October 2021) and budget outlays reported in *Inflection Point: Missile Defense and Defeat in the 2021 Budget*, *op. cit.* Figure 7.