



Report to the Chairman, Subcommittee  
on Military Construction, Veterans  
Affairs, and Related Agencies,  
Committee on Appropriations,  
U.S. Senate

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July 2017

# INTELLIGENCE COMMUNITY

Analysis of  
Alternatives Approach  
for a New Site  
Reflects Most  
Characteristics of a  
High-Quality Process

# GAO Highlights

Highlights of [GAO-17-643](#), a report to the Chairman, Subcommittee on Military Construction, Veterans Affairs, and Related Agencies, Committee on Appropriations, U.S. Senate

## Why GAO Did This Study

NGA, a defense agency and element of the Intelligence Community, provides geospatial intelligence to military and intelligence operations to support national security priorities. It currently operates out of two primary facilities—its headquarters in Springfield, Virginia, and its NGA West campus in St. Louis, Missouri. In 2012, NGA determined that a new location for its NGA West facilities was necessary to meet security standards and better support its national security mission. NGA estimates that the construction of the new campus will cost about \$945 million.

GAO was asked to evaluate the AOA process that NGA used to select the site for its new campus. This report (1) describes the process NGA used, including the key factors it considered and (2) evaluates the extent to which the AOA process met best practices for such analyses.

GAO visited the existing NGA West campus and the final four alternative sites that were considered, analyzed and assessed reports and information that document NGA's AOA process for selecting the site, and interviewed relevant officials about the process. GAO evaluated NGA's process against best practices identified by GAO as characteristics of a high-quality, reliable AOA process.

## What GAO Recommends

GAO is not making recommendations to NGA. In commenting on a draft of this report, NGA expressed concerns about GAO's assessment of NGA's estimates of cost risks and sensitivities. GAO continues to believe its assessment accurately reflects NGA's process.

View [GAO-17-643](#). For more information, contact Brian Lepore at (202) 512-4523 or [leporeb@gao.gov](mailto:leporeb@gao.gov).

July 2017

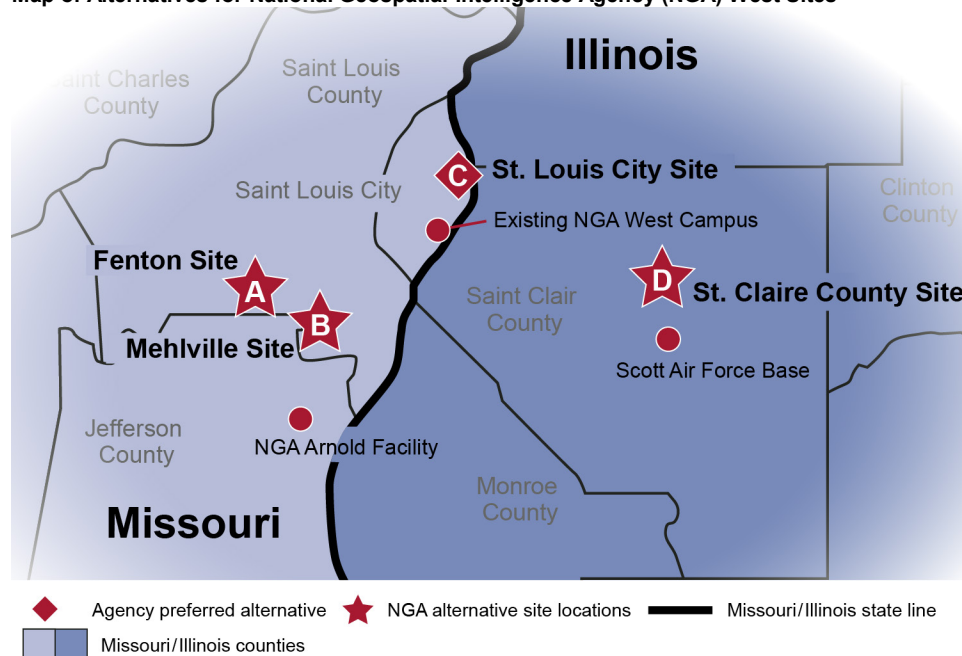
## INTELLIGENCE COMMUNITY

### Analysis of Alternatives Approach for a New Site Reflects Most Characteristics of a High-Quality Process

## What GAO Found

In 2012, the National Geospatial-Intelligence Agency (NGA) began an analysis of alternatives (AOA) process to evaluate potential sites for its new NGA Campus West (NGA West) using key evaluation factors related to mission, security, development and sustainability, schedule, cost, and environment. NGA's process included levels of analysis and considerations to select the agency-preferred alternative from an original list of 186 potential sites, subsequently narrowed to the final four alternative sites (see figure). The process culminated in the June 2016 selection of the agency-preferred alternative, the St. Louis City site.

Map of Alternatives for National Geospatial-Intelligence Agency (NGA) West Sites



Source: NGA and U.S. Army Corps of Engineers data. | GAO-17-643

NGA's process for selecting a site for the new NGA West campus substantially met three of the four characteristics of a high-quality, reliable AOA process. Specifically, NGA's process substantially met the characteristics that demonstrate a well-documented, comprehensive, and unbiased AOA process. It partially met the credibility characteristic, in part because it did not fully include information on the risks and sensitivities to cost estimates. NGA officials stated that there was no comprehensive DOD guidance to inform its AOA process, and although NGA's AOA process is complete, NGA plans to develop full cost estimates as part of construction, planning, and design. In September 2016, GAO recommended that DOD develop guidance for the use of AOA best practices for certain types of military construction decisions. While DOD did not concur and the recommendation remains open, GAO continues to believe such guidance would help ensure that future AOA processes are reliable and would result in decisions that best meet mission needs.

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## Abbreviations List

AOA	analysis of alternatives
DOE	Department of Energy
DOD	Department of Defense
NGA	National Geospatial-Intelligence Agency
NGA East	National Geospatial-Intelligence Agency Campus East
NGA West	National Geospatial-Intelligence Agency Campus West
PMO	Program Management Office
Corps of Engineers	U.S. Army Corps of Engineers

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July 28, 2017

The Honorable Jerry Moran  
Chairman  
Subcommittee on Military Construction,  
Veterans Affairs, and Related Agencies  
Committee on Appropriations  
United States Senate

Dear Mr. Chairman:

The National Geospatial-Intelligence Agency (NGA), a defense agency and member of the Intelligence Community, provides geospatial intelligence to the U.S. military, intelligence operations and analysis, and homeland defense in support of national security priorities, such as counterterrorism and counter-proliferation. NGA conducts the majority of its work in two locations—its Springfield, Virginia, headquarters, known as NGA Campus East (NGA East), and NGA Campus West (NGA West) facilities in St. Louis and Arnold, Missouri.<sup>1</sup> In 2012, NGA determined that it needed a new NGA West facility in order to better support its national security mission and address physical facility and security challenges of the current St. Louis campus, among other reasons. Preliminary estimates put the project's construction cost at roughly \$945 million, and it is designated a mega-project by the U.S. Army Corps of Engineers

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<sup>1</sup>According to officials, the data center in Arnold, Missouri, and the campus in St. Louis are collectively referred to as NGA West. Because only the St. Louis facilities are to be moved to a new site, this report's use of "NGA West" refers only to the St. Louis campus. NGA employees are also stationed at other locations with military, diplomatic, and other partners, both domestically and overseas.

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(Corps of Engineers).<sup>2</sup> According to NGA officials as of May 2017, construction of NGA West is expected to begin in summer 2019.

As part of the 2005 Base Realignment and Closure process, NGA closed some of its facilities in the Washington, D.C., metropolitan area and consolidated to a new headquarters facility on Fort Belvoir in Springfield, Virginia. NGA East was originally planned to cost \$1.1 billion but ultimately cost over \$2.5 billion after new requirements were added that were identified as essential to mission operability.<sup>3</sup>

You asked us to evaluate the analysis of alternatives (AOA) process that NGA used to select the site for its new NGA West. Our objectives were to (1) describe the overall site selection and AOA process NGA used, including the key factors it considered and (2) evaluate the extent to which NGA's AOA process met best practices for such analyses.

To describe the process and considerations that informed NGA's site selection for its new NGA West, we assessed documents and other information and interviewed officials from NGA and other DOD organizations, including the Corps of Engineers and the Office of the Undersecretary of Defense for Acquisition, Technology and Logistics. In addition, we visited the existing NGA West in St. Louis, Missouri in order to observe the condition of the current facilities, and we visited the four final alternative sites in Missouri and Illinois. We reviewed documentation

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<sup>2</sup>The Corps of Engineers developed this cost estimate (in 2014 dollars) as part of the environmental impact statement, which identifies economic, environmental, and other impacts of the project. This estimate was completed as part of the site selection process prior to the development of facility design and structural plans, and it was not provided as an official estimate of construction costs, according to NGA and Corps of Engineers officials. Corps of Engineers mega projects are those identified to be of large dollar value (in excess of \$200 million), long duration, high complexity, and flexible pricing, among other attributes. According to NGA and Corps of Engineers officials, full construction cost estimates for the project are currently under development. Additionally, any estimate for facility construction costs would likely be for unclassified construction costs only and would not include costs for relocation, technology, or intelligence-related costs identified in classified budget documents.

<sup>3</sup>In 2013 we reported that numerous Base Realignment and Closure military construction projects underestimated costs, in part due to reported issues with the Cost of Base Realignment Actions Model for comparing costs and savings for base closure and realignment recommendations. See GAO, *Military Bases: Opportunities Exist to Improve Future Base Realignment and Closure Rounds*, [GAO-13-149](#) (Washington, D.C.: Mar. 7, 2013). We made several recommendations to improve the cost estimating process, and while DOD has taken action in response to some recommendations, as of May 2017 none had yet been fully implemented.

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that described the condition of the current facilities, and we examined economic and qualitative analysis conducted in 2010–2012 that informed the decision to build a new NGA West on a new site.<sup>4</sup>

We further reviewed NGA plans, processes, and internal and public reports outlining the site selection and evaluation process to understand the requirements, criteria, and other factors NGA considered in selecting the site for the new NGA West, from 2012 through its final public decision in June 2016. These documents include two site location studies conducted during 2012 through 2014 that identified available sites and minimum requirements; internal briefing and process documents regarding each stage of the agency's process to select its preferred alternative, which outlined the evaluation criteria as well as how each alternative was scored and evaluated against those criteria; and preliminary master plans for each site. We reviewed NGA and Corps of Engineers cost and schedule assessments; environmental analyses for the project, including the publicly released draft and final environmental impact statements and NGA's record of decision;<sup>5</sup> documents and memoranda outlining inputs and decisions regarding the agency's preferred alternative; and relevant policy and guidance documents including the *2015 NGA Strategy*, and DOD instructions for economic analysis and acquisition of real property.<sup>6</sup>

To determine the extent to which NGA's AOA process for the selection of the site for its new NGA West aligns with best practices for such analyses, we reviewed all data and documentation developed by or for

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<sup>4</sup>Documents include seismic and condition assessments of the current facilities, security and threat analysis, economic analysis, and other qualitative analysis. Additionally, NGA refers to the project as "Next NGA West," or N2W, but for the purposes of this report we will refer to it as NGA West.

<sup>5</sup>U.S. Army Corps of Engineers, *Draft Environmental Impact Statement for the Next NGA West Campus in the Greater St. Louis Metropolitan Area* (Kansas City, MO: October 2015) and *Final Environmental Impact Statement for the Next NGA West Campus in the Greater St. Louis Metropolitan Area* (Kansas City, MO: April 1, 2016); NGA, *Record of Decision Next NGA West Campus in the Greater St. Louis Metropolitan Area* (June 2, 2016).

<sup>6</sup>NGA, *2015 NGA Strategy* (available at <https://www.nga.mil/About/NGAStrategy/Pages/default.aspx>); DOD Instruction 4165.71, *Real Property Acquisition* (Jan. 6, 2005); and DOD Instruction 7041.3, *Economic Analysis for Decision-Making* (Nov. 7, 1995) and its subsequent reissue DOD Instruction 7041.03, *Economic Analysis for Decision-Making* (Sept. 9, 2015) (hereinafter cited as DOD Instruction 7041.03 (Sep. 9, 2015)).

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DOD, including NGA and the Corps of Engineers, as part of NGA's site selection and evaluation process (which we refer to as its "AOA process").<sup>7</sup> We discussed these data and this documentation with officials from NGA and the Corps of Engineers, and with other DOD officials. We refer to this collection of data and documentation to support NGA's AOA process as NGA's "AOA body of work." After collecting available data, documentation, and other information, we evaluated NGA's AOA body of work against our 22 AOA best practices.<sup>8</sup>

To evaluate NGA's AOA process against these best practices, we took the following steps: (1) two GAO analysts independently examined the AOA information received from NGA, providing a score for each of the 22 best practices; (2) a third GAO analyst adjudicated any differences between the two analysts' initial scoring; (3) a GAO specialist on AOA best practices, independent of the audit team, reviewed the team's adjudicated AOA documentation and scores, cross-checking the scores

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<sup>7</sup>As part of our previous work assessing AOA processes for intelligence facilities, we evaluated NGA's process that led to the determination to build a new government-owned facility. Accordingly, this report does not re-evaluate NGA's decision to build a new facility, instead focusing on the subsequent site selection process to determine the agency's preferred alternative for the new NGA West site. However, to the extent those prior documents are referenced or reproduced in materials used in the site selection process, or used as an input to the site selection analysis, we considered the information as part of our analysis.

<sup>8</sup>These best practices were published in GAO, *Amphibious Combat Vehicle: Some Acquisition Activities Demonstrate Best Practices; Attainment of Amphibious Capability to Be Determined*, [GAO-16-22](#) (Washington, D.C.: Oct. 28, 2015), and more recently in *Joint Intelligence Analysis Complex: DOD Partially Used Best Practices for Analyzing Alternatives and Should Do So Fully for Future Military Construction Decisions*, [GAO-16-853](#) (Washington, D.C.: Sept. 30, 2016) and the previously published classified version of [GAO-16-853](#). An earlier version of the best practices was published in GAO, *DOE and NNSA Project Management: Analysis of Alternatives Could Be Improved by Incorporating Best Practices*, [GAO-15-37](#) (Washington, D.C.: Dec. 11, 2014). Explanation and application of the AOA best practices, including the definitions of each of the best practices and the applicability of the best practices to DOD military construction and acquisition policies and procedures, can be found in [GAO-16-853](#).



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and all of the analyses for consistency.<sup>9</sup> The resulting scores for individual best practices were used to identify the averaged, overall score for the four summary characteristics of a high-quality, reliable AOA process—that it should be well-documented, comprehensive, unbiased, and credible.<sup>10</sup> Next, we shared our draft analysis with NGA, asking the agency to provide technical comments and any additional documentation or other information that might affect our assessment. We then incorporated these additional comments to ensure that our analysis included all available information. Finally, we applied the same methodology and scoring process explained above to revise our initial analysis based on NGA’s technical comments and any other additional evidence we received, as appropriate.

While applying our AOA process best practices to NGA’s AOA body of work, we assessed the reasonableness of the information we collected. Examining NGA’s process for site selection against our AOA best practices allowed us to assess the strengths and limitations of the agency’s process. Our best practices were not used to determine whether NGA had made the correct decision on the location for its new campus or whether the department would have arrived at a different conclusion had it more fully conformed to the best practices. Rather, we used our best practices to assess the degree to which NGA can provide reasonable assurance that its process met each of the four characteristics of a high-quality, reliable AOA process. Based on discussions with NGA and the Corps of Engineers, we also determined that the NGA data we used to understand NGA’s site selection process were sufficiently reliable for our purposes of describing and understanding NGA’s process and rationale for choosing the St. Louis City site as the new location.

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<sup>9</sup>The process for scoring the alignment with best practices consists of qualitative and quantitative categories. The qualitative categories are as follows—Fully Met: NGA provided complete evidence that satisfies the elements of the best practice; Substantially Met: NGA provided evidence that satisfies a large portion of the elements of the best practice; Partially Met: NGA provided evidence that satisfies about half of the elements of the best practice; Minimally Met: NGA provided evidence that satisfies a small portion of the elements of the best practice; and Not Met: NGA provided no evidence that satisfies any of the elements of the best practice. The corresponding quantitative categories are as follows: Not Met = 1, Minimally Met = 2, Partially Met = 3, Substantially Met = 4, and Fully Met = 5.

<sup>10</sup>The average score for each characteristic corresponds to one of five qualitative categories as follows: Not Met = 1.0 to 1.4, Minimally Met = 1.5 to 2.4, Partially Met = 2.5 to 3.4, Substantially Met = 3.5 to 4.4, and Fully Met = 4.5 to 5.0.

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We conducted this performance audit from September 2016 to July 2017 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Background

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### Decision to Build a New NGA West

The existing NGA West campus consists of 15 facilities on 27 acres. Some of the buildings' original construction dates back to the early 1800s, and 22 acres of the site are on the National Register of Historic Places, according to NGA documents. In 2009 through 2010, NGA contracted with an independent firm to assess the condition of the existing NGA West. This assessment gave the facilities an overall condition rating of "poor," generally because of the insufficiency of the anti-terrorism and force protection measures, the average age of the structures, numerous code and accessibility shortfalls, and lack of seismic protection.<sup>11</sup>

Near the end of the completion of the NGA East headquarters consolidation in 2011, NGA focused its attention on the need to improve the operational capacity, security requirements, and modernization of its NGA West facilities. From approximately 2009 through 2012, NGA conducted a series of evaluations to inform its efforts to modernize NGA West.<sup>12</sup> These analyses included a condition assessment of the existing facilities; an economic analysis of alternatives to evaluate the options of building a new facility ("build new"), fully renovating the existing facilities ("modernize"), or remaining in the current facilities with minimum essential repairs ("status quo"); and a qualitative analysis of non-cost considerations for the build new, modernize, and status quo options identified in the economic analysis.

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<sup>11</sup>Frontenac Engineering and Ross & Baruzzini, Inc., *Facilities Condition Assessment: Second Street Complex—St. Louis, MO* (May 13, 2010). A study in 1996 also found that the seismic protection of many of the NGA West buildings was not adequate per contemporaneous building codes.

<sup>12</sup>As mentioned above, we previously evaluated NGA's process that led to the determination to build a new government-owned facility for NGA West.

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In 2012 NGA determined that a new NGA West would best meet the agency's mission and resource needs. After examining the options of renovating its current facility, leasing, or building a new government-owned facility, NGA determined that building a new, government-owned facility was the preferred option. NGA officials stated that they are in the process of soliciting design-build proposals and that the final design-build contract is planned for award near the end of fiscal year 2018. Construction is expected to begin approximately in the summer of 2019.

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## Best Practices for an Analysis of Alternatives Process

We identified 22 best practices for an AOA process in October 2015, based on government and private-sector guidance and input from subject-matter experts.<sup>13</sup> Many federal and industry guides have described approaches to analyses of alternatives; however, there was no single set of practices for the AOA process that was broadly recognized by both government and private-sector entities. We developed these best practices by (1) compiling and reviewing commonly mentioned AOA policies and guidance used by different government and private-sector entities and (2) incorporating experts' comments on a draft set of practices to develop a final set of practices. The 22 best practices are grouped into four characteristics that describe a high-quality, reliable AOA process and can be used to evaluate whether an AOA process meets the characteristics of well-documented, comprehensive, unbiased, and credible. These practices can be applied to AOA processes for a broad range of capability areas, projects, and programs, including military construction projects and decision-making processes, in which an alternative must be selected from a set of possible options.

In September 2016, we recommended that DOD develop guidance that requires the use of AOA best practices, including those practices we identified, when conducting AOA processes for certain types of military construction decisions. DOD did not concur with this recommendation and disagreed that these best practices apply to military construction decision-making processes.<sup>14</sup> We continue to believe that this recommendation is valid and that the principles demonstrated by the best practices—and the practices themselves—draw from related DOD and other practices.

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<sup>13</sup>These 22 best practices and their definitions were originally published in [GAO-16-22](#) and are based on previously published best practices.

<sup>14</sup>[GAO-16-853](#). As of June 2017, this recommendation has not been implemented.

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Our best practices also parallel those found in DOD and Air Force guidance on military construction and analysis for decision making.<sup>15</sup> For example, according to an Air Force instruction governing the planning and programming of military construction projects, one of the required planning actions is to evaluate alternative solutions.<sup>16</sup> According to a DOD directive pertaining to military construction, DOD must monitor the execution of its military construction program to ensure—among other things—that the program is accomplished in the most cost-effective way.<sup>17</sup> This guidance for cost effectiveness aligns with our AOA best practice Develop Life-cycle Cost Estimates, which focuses on providing decision makers with the information they need to assess the cost-effectiveness of alternatives. Further, DOD Instruction 7041.03, on economic analysis for decision making, contains numerous cost estimating principles and procedures that align with those called for in our AOA best practices.<sup>18</sup> As we reported in 2016, these policy documents and instructions align with the general intent of our best practices, and there are many similarities between our best practices and the department’s guidance.

Additionally, in our previous work reviewing AOA process for other national security facilities, agencies generally concurred with our recommendations to consider including our best practices in future guidance. For example, in 2014 we assessed three National Nuclear Security Administration construction projects and found each project’s AOA partially met our best practices for conducting an AOA process. The

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<sup>15</sup>Examples of sources used to develop the 22 best practices include Office of Aerospace Studies, U.S. Air Force Materiel Command, *Analysis of Alternatives (AOA) Handbook: A Practical Guide to Analyses of Alternatives* (June 2013); Defense Acquisition University, *The Defense Acquisition Guidebook* (accessed Feb. 13, 2017 at <https://www.dau.mil/tools/dag>); DOD Instruction 5000.02, *Operation of the Defense Acquisition System* (Jan. 7, 2015); and U.S. Army, *Army Cost Benefit Analysis Guide*, 3rd Ed (Apr. 24, 2013). For more information on the development of our AOA best practices, including the congruence of these best practices with DOD and military policies, see [GAO-16-853](#).

<sup>16</sup>Air Force Instruction 32-1021, *Planning and Programming Military Construction (MILCON) Projects*, (Feb. 25, 2016).

<sup>17</sup>DOD Directive 4270.5, *Military Construction* (Feb. 12, 2005).

<sup>18</sup>DOD Instruction 7041.03 (Sept. 9, 2015).

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Department of Energy agreed with our recommendation and has begun implementation.<sup>19</sup>

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<sup>19</sup>In [GAO-15-37](#), we recommended that the Department of Energy (DOE) update its project management requirements to incorporate our best practices, and DOE agreed. As of June 2017, the recommendation had not been implemented, but DOE has updated a relevant departmental order to state that it will be consistent with our best practices and has committed to incorporating these best practices in forthcoming guidance expected to be complete in fiscal year 2017. For a list of reports related to this topic, see the Related GAO Products page at the end of this report.

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## NGA's Site Selection Process Began in 2012, and Potential Sites Were Evaluated Based on Mission, Security, Environment, Cost, and Schedule Considerations

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### Site Selection Process Began in 2012 and Concluded with the June 2016 Record of Decision

NGA launched its search for a new NGA West site in 2012 with a site location study conducted by an outside real estate firm, and it concluded the search with the issuance of a record of decision in June 2016. The site location study included a check for existing federal sites that could accommodate NGA West's workforce and mission.<sup>20</sup> This search resulted in a total of 186 sites being identified initially as possible options; the list was narrowed to 6 sites in the St. Louis metropolitan area for further

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<sup>20</sup>Jones Lang LaSalle, *National Geospatial-Intelligence Agency West Facilities Modernization Site Location Study Final Report* (June 17, 2013). NGA attempted to identify federal sites, including outside the St. Louis metropolitan area, but due to general lack of availability, and legal requirements regarding closure or realignment of certain installations in accordance with section 2687 of Title 10 of the United States Code, as well as the existing workforce that resides in the area, the site selection focused on the greater St. Louis area, according to officials.

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study.<sup>21</sup> During preliminary master planning, 4 of the 6 sites identified by the site location studies were determined to be suitable for further analysis to select the agency's preferred alternative.<sup>22</sup> Three of these sites are in the Missouri cities of Fenton, Mehlville, and St. Louis, and one is in St. Clair County, Illinois, near Scott Air Force Base. See figure 1 for the geographic distribution of the 4 sites.

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<sup>21</sup>After the 186 sites were identified, a filtering process against minimum criteria resulted in 31 for further study, and sufficient information was received for 22 to be evaluated against specific criteria, resulting in 6 final sites. The steps to narrow the 186 sites to 6 were as follows: (1) Establish site minimum requirements including minimum acreage and delineated areas; (2) Issue a short general request for information for the sites that appeared to meet the site minimums; (3) Issue a more detailed request for information on the narrowed list of 31 sites; and (4) Perform consensus evaluation on the 22 sites that responded to the detailed request for information based on the evaluation factors. A second site location study using the same methodology was conducted by the Corps of Engineers in 2014 in order to validate the original results, given the amount of time that had elapsed, and to ensure that input from the public was included. The second study evaluated 13 site locations—the original 6 from the first study and 7 additional sites—to determine which properties were viable and available for NGA West, ultimately validating the original 6 sites for further analysis.

<sup>22</sup>NGA determined that two sites were no longer viable for NGA West. One could not accommodate mission requirements without greatly exceeding the high-rise construction limit. A second became unsuitable for the project following the sale of a portion of the site.

Figure 1: Geographic Locations of the Four Final Site Alternatives for the New National Geospatial-Intelligence Agency (NGA) West



Source: NGA and U.S. Army Corps of Engineers data. | GAO-17-643



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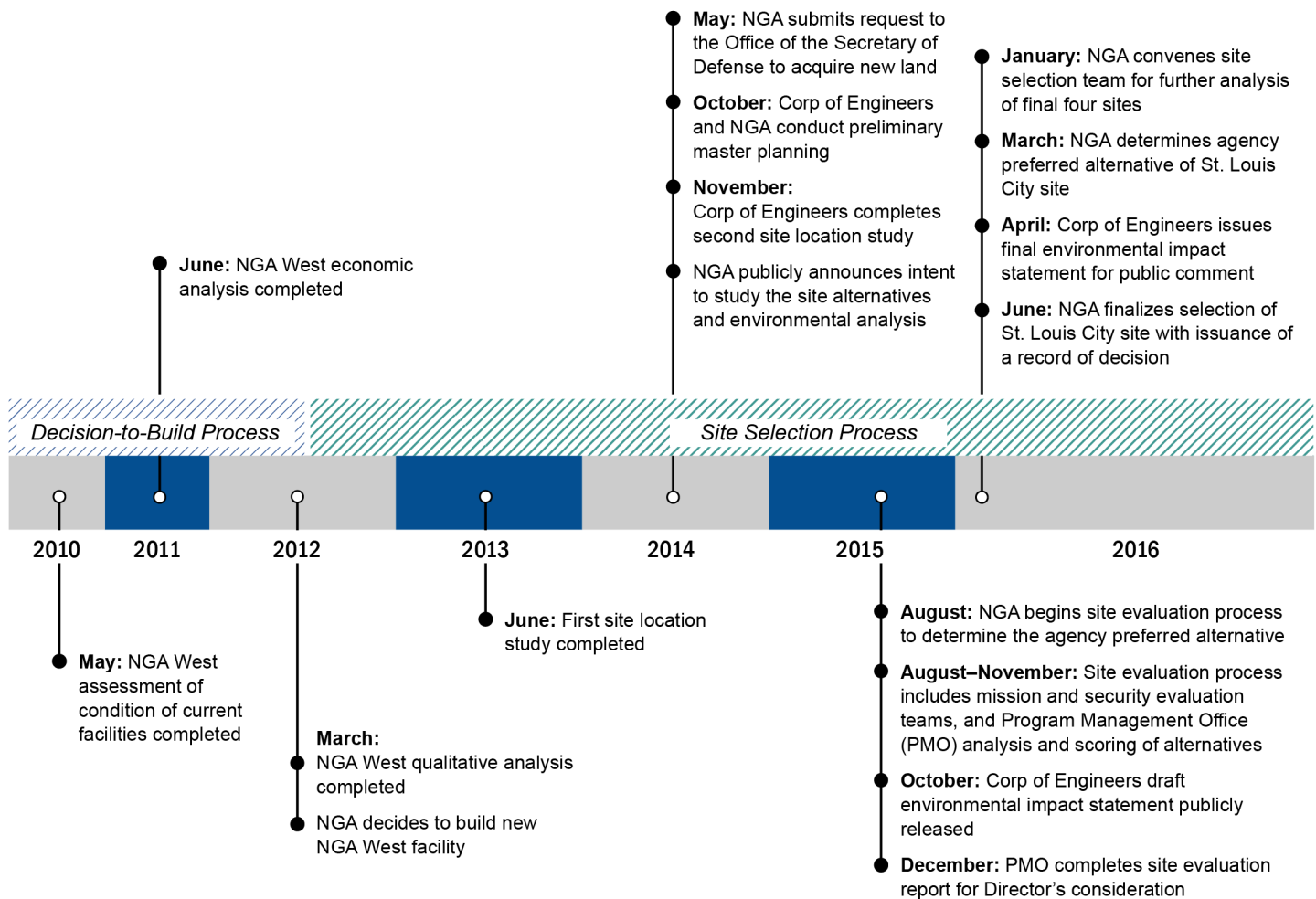
The subsequent site selection process included an environmental impact statement as required by the National Environmental Policy Act of 1969, analysis of NGA and the Corps of Engineers' compliance with related DOD policies and other federal laws and requirements, preliminary master planning conducted by the Corps of Engineers, and a site evaluation process initiated by the NGA West Program Management Office (PMO), which is responsible for managing the NGA West project.<sup>23</sup> To select the final site from the four alternatives, NGA initiated a site evaluation process in August 2015 that was led by the NGA West PMO. This process involved various teams of experts analyzing the sites and evaluating them against defined criteria to identify the advantages and disadvantages of each site.

Figure 2 provides an overview of the key elements and milestones of NGA's site selection process, beginning with its earlier decision to build and concluding with its 2016 selection of the new site and issuance of its record of decision.

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<sup>23</sup>Under the National Environmental Policy Act of 1969, Pub. L. No. 91-190 (1970), codified at 42 U.S.C. §§ 4321-4347, agencies evaluate the likely environmental effects of projects they are proposing using an environmental assessment or, if the projects likely would significantly affect the environment, a more detailed environmental impact statement. If, however, the agency determines that activities of a proposed project fall within a category of activities the agency has already determined has no significant environmental impact—called a categorical exclusion—then the agency generally need not prepare an environmental assessment or impact statement. The key elements and documents required when conducting an environmental impact statement include notice of intent in the Federal Register; draft and final environmental impact statements with opportunities for public comment; identification of the agency-preferred alternative (if there is one); and a record of decision. Additionally, according to officials from NGA and the Office of the Undersecretary of Defense for Acquisition, Technology and Logistics, NGA complied with DOD instructions on real property acquisition and economic analysis in its decision to build a new NGA West and select a new site.

**Figure 2: Key Events and Decisions for the National Geospatial-Intelligence Agency (NGA) West Site Selection Process**



Source: GAO analysis of NGA information. | GAO-17-643

According to NGA officials, there was no NGA or DOD policy or set of practices to comprehensively guide NGA's site selection and AOA process. As a result, NGA relied on various DOD policies and instructions, other federal guidance, and industry standards. It incorporated these practices into the site selection process to ensure that it complied with federal requirements and industry practice to develop its

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AOA process, according to NGA and Corps of Engineers officials.<sup>24</sup> Additionally, NGA officials stated that our AOA best practices would have been helpful in planning the site selection process for NGA West, but the process began in 2012, and our 22 best practices were not published until October 2015.

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Potential Sites Were Assessed Based on Key Factors, and NGA and the Corps of Engineers Conducted Additional Analysis in Order to Reach a Final Determination

Potential Sites Were Assessed Based on Mission, Security, Environment, Cost, and Schedule Factors

At the outset of the site evaluation process in August 2015, the PMO set forth broad sets of criteria to use in analyzing the four alternatives. These broad sets of criteria, referred to as “evaluation factors,” were mission, security, development and sustainability, schedule, cost, and environment. In addition, each site was assessed to ensure that it complied with key laws, regulations, and directives. The PMO divided the analysis of the evaluation factors among NGA and Corps of Engineers teams.

The mission, security, and development and sustainability factors were assigned to two NGA evaluation teams of subject-matter experts—the “mission evaluation team” and “security, infrastructure and schedule

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<sup>24</sup>According to NGA officials, given existing DOD guidance that applies to NGA operations, military construction, and program oversight, and because NGA consists of three main facilities and does not regularly conduct large-scale construction projects, NGA does not have separate guidance for AOA for construction. NGA identified various federal and DOD guidance documents and regulations that generally applied to NGA’s site selection process, including General Services Administration, *Site Selection Guide*; DOD Instruction 4165.71 *Real Property Acquisition*, and DOD Instruction 7041.3 *Economic Analysis* (the latter was updated in September 2015 as DOD Instruction 7041.03). Additionally, although DOD did not concur with our 2016 recommendation to develop guidance requiring the use of our AOA best practices, NGA officials stated that such guidance would have been helpful to their site selection process.

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evaluation team” (referred to here as security evaluation team).<sup>25</sup> Each of these teams used its expertise to develop “sub-factors” to assess the advantages and disadvantages of each site. For example:

- The mission evaluation team developed 10 mission-related sub-factors based on the PMO guidance, NGA’s mission, and the strategic goals outlined in the *2015 NGA Strategy*.<sup>26</sup> The mission-related sub-factors focused largely on elements pertaining to NGA’s workforce and partnerships, such as the sites’ proximity to the existing workforce, their distance from NGA’s Arnold facility, and the likelihood that the sites would attract mission partners to create a “GEOINT Valley.”<sup>27</sup>
- The security evaluation team developed 13 sub-factors related to security and infrastructure based on PMO guidance, DOD and other federal security and energy requirements, threat analysis, and other subject-matter expertise. Examples of the sub-factors include a 500-foot setback, perimeter security elements, sustainable characteristics, and infrastructure resilience.

Separate evaluations of cost, schedule, and environmental considerations were conducted by the Corps of Engineers in its role as construction agent as part of the environmental impact analysis. In addition, NGA and the Corps of Engineers conducted an assessment of relevant laws and regulations.

The PMO integrated these analyses and provided an additional layer of review to each of the evaluation factors, in some cases adjusting them.

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<sup>25</sup>According to the PMO’s documentation of the process, the original scope of the security evaluation team was to also evaluate schedule and environmental considerations, but because the Corps of Engineers was evaluating these elements as part of the National Environmental Policy Act analysis and in its role as NGA’s construction agent for the project, the security evaluation team focused its analysis on the security and development and sustainability evaluations.

<sup>26</sup>The four strategic goals of “Our People, Our Partners, Our Profession, and Our Value” focus on various aspects of the NGA workforce, expanding partnerships and engagement, excelling at NGA’s craft, and NGA’s customers.

<sup>27</sup>In support of NGA’s strategic goal of “Our Partners,” NGA has identified a desire to create a regional GEOINT—or, geospatial intelligence—community of various government, industry, and academic partners in relation to NGA West, and this informed the criteria at all levels of analysis. Specifically, the mission evaluation team and PMO analysis expressed this desire to attract mission partners colloquially as creating a “GEOINT Valley,” and the site selection team and director used “Team GEOINT” to express this aim.

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For instance, the PMO reorganized the 10 mission-related sub-factors for its review. Specifically, while the mission evaluation team focused the sub-factors largely on NGA's strategic goals related to workforce and partnerships, the PMO's analysis reorganized those same mission-related sub-factors by how they supported all four of the 2015 strategic goals. The PMO listed under three "strategic effects"—"Create GEOINT Valley," "Enhance Operations," and "Attract and Sustain the Workforce"—all of the sub-factors related to that strategic effect. The PMO re-analyzed the sites by weighting those strategic effects and sub-factors that were linked to multiple strategic goals higher than those that were linked to fewer such goals. The PMO also adjusted some of the sub-factors used in the evaluation for security and for development and sustainability.

The PMO's additional analysis did not change the overall outcome of the evaluation of the sites; rather, it validated the mission evaluation team's conclusion and generally supported all but one of the overall findings of the other analyses.<sup>28</sup> At the conclusion of the PMO's analysis in December 2015, the PMO's conclusion was that no one site had emerged as a clear preferred alternative.

#### NGA Director Requested Additional Analysis in Order to Reach a Decision

Because the master planning and site evaluation process concluded that all four sites—Fenton, Mehlville, St. Louis City, and St. Clair—could meet the overall requirements and that no single site held substantial advantage over another, the NGA Director requested additional analysis with refined criteria to more clearly differentiate among the final four sites. Consequently, in January 2016 NGA initiated a new site selection team—consisting of NGA and Corps of Engineers personnel who had previously been involved in various stages of the process—to reassess the sites against refined criteria and perspectives in order to determine the agency-preferred alternative.<sup>29</sup>

The site selection team carried forward five of the six original evaluation criteria from the start of the site evaluation process, as well as compliance

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<sup>28</sup>Out of the seven broad evaluation factors, the only area in which the PMO did not agree with the previous teams' assessments was the security evaluation team's conclusion that the St. Clair site was slightly more advantageous regarding the development and sustainability criterion. In this instance the PMO's analysis concluded that all of the sites were equal.

<sup>29</sup>The PMO identified one site—Fenton—as not having sufficient advantages to be carried forward for further consideration, given its high cost, schedule risk, and security concerns, but the site selection team began its process with all four final sites.

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with federal law, policy, and other regulations, to develop its six “refined criteria.”<sup>30</sup> In reviewing these refined criteria, the site selection team determined that cost and schedule accounted for the greatest differences among the sites. The team therefore used the cost and schedule assessments completed as part of the PMO process to narrow the sites, concluding that because the Mehlville and Fenton sites were the most expensive and posed the greatest schedule risk they should be eliminated from final consideration.

The site selection team then focused its analysis on the final two sites—St. Clair and St. Louis City—to inform the Director’s selection. The team used the following six refined criteria to evaluate the sites: (1) cost, (2) schedule, (3) security, (4) mission efficiency and expansion, (5) applicability of and compliance with federal policies, executive orders, and federal initiatives; and (6) environmental considerations. The team proposed narrowing the relevant sub-criteria to those that provided the greatest differentiation among the sites, according to officials on the team. For example, the security criterion was narrowed to include 3 of the original 13 security and infrastructure evaluation sub-factors, and the adjusted “mission efficiency and expansion” criterion included one of the mission evaluation team’s 10 original mission sub-factors.

Subsequently, the NGA Director provided additional direction, including adding a review of potential support from Scott Air Force Base, based on the support NGA East receives from being located at Ft. Belvoir, as well as ensuring that the security-related sub-factors carried over from prior analyses were consistently defined. Additionally, the director added 2 sub-criteria to the mission-related criterion to ensure that the site evaluation continued in terms of NGA’s strategic goals of partnership and people:

1. “Team GEOINT,” which refers to NGA’s current and future partnerships with academic, public, and private sector partners, and which parallels the “GEOINT Valley” element evaluated by the mission evaluation team and PMO.

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<sup>30</sup>The PMO had previously concluded that there was no difference in the seventh area of criteria—development and sustainability—and the site selection team did not include this in its refined criteria.

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2. “Team NGA,” which refers to the potential effects of workforce recruitment and retention that were also analyzed in the mission evaluation team and PMO analyses.

According to NGA officials, while certain sub-factors or criteria were adjusted to provide further layers of analysis, the most important factors were always seen as mission and security. Additionally, NGA and Corps of Engineers officials said that adding these two sub-criteria expanded the analysis of the mission-related criteria to resemble the scope of the PMO’s analysis and incorporated the NGA Director’s mission and vision perspective.

Finally, the NGA Director determined the weighting of the final criteria to evaluate the last two sites, the site selection team provided input on which of the sites was more advantageous with respect to each criterion, and in March 2016 this information was used to inform the NGA Director’s selection of the agency-preferred alternative. The weighting and final decisions are shown in table 1.<sup>31</sup>

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**Table 1: National Geospatial-Intelligence Agency (NGA) Site Evaluation Results and Agency-Preferred Alternative**

<b>Criterion (Evaluation Factor)</b>	<b>Weight</b>	<b>More Advantageous Site</b>
Mission Efficiency and Flexibility	High	St. Louis City
Security	High	St. Clair
Environmental Impact	Medium	St. Louis City
Laws, Executive Orders, Regulations, Policies	Medium	St. Louis City
Schedule	Low	Slight advantage – St. Clair
Cost	Low	Slight advantage – St. Louis City
<i>Director’s Selection of Agency’s Preferred Alternative</i>	<i>St. Louis City</i>	

Source: GAO analysis of NGA information. | GAO-17-643

Note: “Weight” refers to the level of precedence each criterion was given in evaluation of the sites. Specifically, those criteria with “high” weights would bear more heavily on the final decision than those with a “medium” or “low” weight.

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<sup>31</sup> Simultaneous with the conclusion of the site selection team’s analysis, the St. Clair and St. Louis City sites each provided updated information that was included in the director’s cost and schedule analysis, but according to officials this did not substantially affect the overall findings.

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The NGA Director selected the St. Louis City site as the agency-preferred alternative. It was identified in the publication of the final environmental impact statement and finalized with the issuance of the record of decision in June 2016.

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**NGA's AOA Process  
for Selecting the New  
NGA West Site  
Substantially Met  
Three and Partially  
Met One  
Characteristic of a  
High-Quality, Reliable  
AOA Process but  
Lacked Important  
Cost Information**

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**Site Selection Process  
Substantially Met Three of  
the Four Characteristics  
for a High-Quality, Reliable  
AOA Process but Could  
Have Been Strengthened**

We compared NGA's AOA process for selecting a site for the new NGA West campus to our AOA best practices and determined that NGA's process substantially met three and partially met one characteristic of a high-quality, reliable AOA process. Although NGA's AOA process substantially met most of the characteristics, we did find areas where the process could have been strengthened if NGA had more fully incorporated the AOA best practices. See table 2 for a summary of our assessment and appendix I for additional details on our scoring of NGA's alignment with each of the 22 best practices.



**Table 2: Summary of GAO’s 22 Analysis of Alternatives (AOA) Best Practices Grouped into Four Characteristics, with GAO’s Scores for the National Geospatial-Intelligence Agency (NGA) AOA Process for the Site Selection of NGA West**

Characteristic	Best Practice	GAO Scoring of NGA AOA Process
<b>Well-documented:</b> The AOA process is thoroughly described in a single document, including all source data, clearly detailed methodologies, calculations and results, and selection criteria are explained.	12. Identify significant risks and mitigation strategies.	3 – Partially Met
	14. Tie benefits/effectiveness to mission need.	4 – Substantially Met
	18. Document AOA process in a single document.	3 – Partially Met
	19. Document assumptions and constraints.	4 – Substantially Met
<b>Overall Assessment<sup>a</sup> (Well-documented): Substantially Met</b>		<b>Average Score: 3.5</b>
<b>Comprehensive:</b> The AOA process ensures that the mission need is defined in a way to allow for a robust set of alternatives, that no alternatives are omitted, and that each alternative is examined thoroughly for the project’s entire life cycle.	1. Define mission need.	5 – Fully Met
	3. Develop AOA timeframe.	4 – Substantially Met
	8. Develop list of alternatives.	5 – Fully Met
	11. Assess alternatives’ viability.	4 – Substantially Met
	15. Develop life-cycle cost estimates.	3 – Partially Met
<b>Overall Assessment<sup>a</sup> (Comprehensive): Substantially Met</b>		<b>Average Score: 4.2</b>
<b>Unbiased:</b> The AOA process does not have a predisposition toward one alternative over another and is based on traceable and verified information.	2. Define functional requirements.	5 – Fully Met
	4. Establish AOA team.	5 – Fully Met
	6. Weight selection criteria.	3 – Partially Met
	7. Develop AOA process plan.	5 – Fully Met
	13. Determine and quantify benefits and effectiveness.	3 – Partially Met
	20. Ensure AOA process is impartial.	
	22. Compare alternatives	3 – Partially Met
		2 – Minimally Met

Characteristic	Best Practice	GAO Scoring of NGA AOA Process
<b>Overall Assessment<sup>a</sup> (Unbiased): Substantially Met</b>		<b>Average Score: 3.71</b>
<b>Credible:</b> The AOA process thoroughly discusses the limitations of the analyses resulting from the uncertainty that surrounds both the data and assumptions made for each alternative.	5. Define selection criteria.	4 – Substantially Met
	9. Describe alternatives.	5 – Fully Met
	10. Include baseline alternative.	3 – Partially Met
	16. Include a confidence interval or range for life-cycle cost estimates.	2 – Minimally Met
	17. Perform sensitivity analysis.	2 – Minimally Met
	21. Perform independent review.	3 – Partially Met
<b>Overall Assessment<sup>a</sup> (Credible): Partially Met</b>		<b>Average Score: 3.16</b>

Source: GAO analysis of NGA information. | GAO-17-643

<sup>a</sup>We determined the overall assessment rating by assigning each individual best practice rating a qualitative and a quantitative score: Not Met = 1, Minimally Met = 2, Partially Met = 3, Substantially Met = 4, and Fully Met = 5. Then we took the average of the individual assessment ratings to determine the overall rating for each of the four characteristics. The resulting average becomes the overall assessment as follows: Not Met = 1.0 to 1.4, Minimally Met = 1.5 to 2.4, Partially Met = 2.5 to 3.4, Substantially Met = 3.5 to 4.4, and Fully Met = 4.5 to 5.0.

Well-documented  
Characteristic: Substantially Met

NGA's AOA process for selecting a site for the new NGA West substantially met the well-documented characteristic of a high-quality, reliable AOA process, although we did find areas for improvement.

For example, NGA's AOA body of work demonstrated that the assumptions and constraints for each alternative for the site selection process were documented. NGA West's *Prospective Sites Master Plan* included a set of overall assumptions that guided the preliminary planning process and provided specific assumptions and constraints for each alternative. Specifically, the plan identified various assumptions and constraints for the four final sites, such as calculations of the site boundaries, the estimated number of parking spaces, the square footage of the buildings and estimates of the building's height, site utilities, and environmental constraints, among other things. In one instance, the plan documented the assumption that if the Mehlville site were to be used, all utilities would need to be removed from within the property line and existing buildings, parking lots, and roads would have to be demolished.

In another example, the Corps of Engineers conducted a schedule and negotiation risk assessment and recorded scores for each site and some mitigation strategies for specific issues. The assessment documented risks to meeting the site acquisition schedule with the St. Louis site because, among other reasons, the site needed environmental cleanup

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that was expected to take six months. The Fenton site had high negotiation risks, in part because the asking price of the site was significantly higher than the appraised value. However, NGA did not provide information on other risks, such as technical feasibility and resource risks, and did not rank the risks or provide over-arching mitigation strategies for each alternative. According to the best practice, not documenting the risks and related mitigation strategies for each alternative prevents decision makers from performing a meaningful trade-off analysis, which is necessary to select an alternative to be recommended.

**Comprehensive Characteristic:  
Substantially Met**

NGA's AOA process for selecting a site for the new NGA West substantially met the comprehensiveness characteristic of a high-quality AOA process, but although it had strengths, we identified some limitations.

NGA's AOA process considered a diverse range of alternatives to meet the mission need and conducted market surveillance and market research to develop as many alternative solutions as possible. According to our best practices, an AOA process that encompasses numerous and diverse alternatives ensures that the study provides a broad view of the issue and guards against biases to the AOA process. Specifically, NGA's AOA process included a site location study that provided a summary of the thorough analysis that NGA conducted to identify potential site locations for the new NGA West campus. The study relied on information from local real estate market databases and input from the local real estate community, multiple municipal officials and organizations, and the public to identify an original set of 186 possible sites and narrow that list to a final 6 for further analysis.

However, although the NGA body of work provides evidence that the Corps of Engineers developed initial cost estimates that compared each alternative using different cost categories, NGA's AOA process did not include life-cycle cost estimates for the final 4 sites.<sup>32</sup> NGA officials chose not to analyze total construction and other facility sustainment costs, because they assumed that since the sites were in the same geographic

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<sup>32</sup>A life-cycle cost estimate including all costs from the inception of the project through design, development, deployment, operation, maintenance, and disposal should be developed for each alternative.

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area, construction and operating costs would be similar.<sup>33</sup> However, the estimates did not include sufficient details regarding all of the costs examined—specifically, how the cost estimates were developed for information technology trunk line costs. NGA stated that this best practice had limited application to its AOA process because it had determined that variation in the life-cycle cost estimates based on the location of the four sites—all in the St. Louis metropolitan area—was negligible. NGA officials also stated that the lack of final project design details constrained their ability to develop full life-cycle cost estimates. However, without estimates for full life-cycle costs, decision makers may not have a complete picture of the costs for each alternative and may have difficulty comparing the alternatives, because comparisons may not be based on accurate and complete information. NGA and Corps of Engineers officials said that they are in the process of developing full life-cycle cost estimates for the construction and design of the new NGA West campus, for the agency-preferred alternative.

Unbiased Characteristic:  
Substantially Met

NGA's AOA process for selecting a site for the new NGA West substantially met the characteristic of an unbiased AOA process, although we did identify some limitations.

NGA's AOA body of work demonstrated that NGA had developed functional requirements based on the mission need without a predetermined solution and that the requirements were realistic, organized, and clear. For example, NGA's AOA body of work provided facilities requirements and specifically listed 11 site location and campus requirements that were tied to mission needs, including requiring a facility that will support future changes to mission requirements and allow for continuity of NGA operations. NGA's AOA body of work also identified physical requirements for the new NGA West campus, for example, that the new facility must have at least 800,000 gross square feet and a 500-foot security buffer, and it must allow for a possible expansion in the future.

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<sup>33</sup>According to Corps of Engineers officials, NGA did not ask them to conduct more long-term cost analysis or to develop life-cycle cost estimates. NGA officials stated that consideration of the estimated costs was restricted to those where variation was identified and could be reasonably defined. NGA officials focused on the costs they identified as being the most variable: land acquisition, site development, transportation improvements, and costs for an information technology trunk line.

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However, although the NGA AOA body of work demonstrated a thorough comparison of the alternatives throughout the site evaluation process, it did not provide evidence that net present value was used to compare or differentiate among the alternatives, nor did it provide a rationale for why net present value could not be used.<sup>34</sup> NGA officials acknowledged that they did not compare the alternatives using net present value. They stated that they had normalized some of the costs but that it was not necessary to normalize all costs, because the estimates were all done during the same time period. According to our best practice, if net present value is not used to compare the alternatives, then the AOA team should document the reason why and explain and describe the other methods applied. Additionally, comparing items that have been discounted or normalized with net present value allows for time series comparisons, since alternatives may have different life cycles or different costs and benefits.<sup>35</sup>

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**Site Selection Process  
Only Partially Met the  
Characteristic for a  
Credible AOA Because It  
Lacked Important  
Information on Cost Risks  
and Sensitivities**

NGA's AOA process for selecting the site for the new NGA West campus partially met the credible characteristic for an agency's AOA process. Although NGA's AOA process had strengths, it also had limitations, such as lacking important information related to cost risks and sensitivity analyses for both cost and benefits identified.

NGA's AOA body of work described the alternatives in sufficient detail to allow for robust analysis. Specifically, it provided descriptions of each of the alternatives at varying levels of detail. For example, the first site location study provided descriptions of the top 6 potential sites, including information on size, the sites' strengths and weaknesses, and any acquisition or development issues. The NGA AOA body of work also provided evidence that site master planning was conducted to provide additional details on the physical and environmental attributes of each site, as well as constraints and benefits. For example, the *NGA West Prospective Sites Master Plan* described the Mehlville site as having landscape features such as mature trees, waterways, areas of steep

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<sup>34</sup>Net present value is a financial calculation that accounts for the time value of money by determining the present value of future savings minus up-front investment costs over a specific period of time.

<sup>35</sup>DOD Instruction 7041.03 on economic analysis directs that, when comparing alternatives, the costs and benefits should be compared and ranked according to net present value, and the instruction provides a specific formula to calculate it.

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topography, options for public transportation, bike-friendly streets, and existing utility infrastructure.

However, NGA did not fully include key information on either the risk or the uncertainty related to cost estimates or the sensitivity to the costs and benefits identified as part of its AOA process. For example, the NGA body of work did not include a confidence interval or range for the cost estimates for each viable alternative in order to document the level of risk associated with the estimate. NGA's AOA body of work documented the estimated alternatives' initial costs and included contingency costs across all four alternatives. Corps of Engineers officials told us that they had developed a 30 percent design and 5 percent construction contingency cost factor across the four alternatives to account for cost risks in those areas. However, the NGA AOA body of work did not provide evidence of a confidence interval or range for the costs provided. NGA acknowledged that while its AOA body of work did not identify the risk associated with specific cost elements for each alternative, it did provide a "level of confidence," because the methodology behind the cost components in the estimate implied a high level of confidence. Although we agree that NGA did provide a contingency factor for the site development costs and provided cost estimates for all four viable alternatives, NGA did not develop a confidence interval or risk range for those estimates. NGA's cost estimates were used as a determining factor in the final decision among the four alternatives. However, without understanding the cost risk and the uncertainty of those costs as outlined in the best practice, a decision maker might be unable to make an informed decision.

Additionally, the NGA AOA body of work did not demonstrate that NGA had conducted a sensitivity analysis for the cost and benefit and effectiveness estimates for each alternative in order to examine how changes in key assumptions would affect the cost and benefit estimates. The NGA AOA body of work documented that some sensitivity analysis or level of risk was analyzed as part of the schedule analysis, and NGA officials stated that the project considered how different values and variables affect each other during the criteria and evaluation analysis. However, the NGA AOA body of work did not document the sensitivity of cost and benefit estimates to changes in key assumptions for each alternative, and a sensitivity analysis was not applied to the initial cost estimates or benefit assumptions that were used to make the final site selection.

NGA officials stated that this best practice has limited application to its AOA process, because the lack of variables between sites constrained

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their ability to develop full life-cycle cost estimates and complete a sensitivity analysis. NGA officials stated that their sensitivity analysis was limited to those considerations that were measurable and sensitive to change—predominantly schedule risk associated with land acquisition activities. Further, NGA officials explained that because all the site alternatives were located within the St. Louis metropolitan area, any variations in conditions would have equal effect. Although we agree that NGA did conduct a sensitivity analysis for schedule risks, NGA neither documented how the schedule sensitivity affected its cost or benefit estimates nor performed a sensitivity analysis for the various assumptions used to develop the cost or benefit for each alternative. According to the DOD instruction on economic analysis, a sensitivity analysis is a “what-if” exercise that should be performed to test the conclusions and assumptions of changes in cost and benefit variables and should always be performed when the results of the economic analysis do not clearly favor any one alternative.<sup>36</sup> According to our best practice, not conducting a sensitivity analysis to identify the uncertainties associated with different assumptions increases the chances that an AOA team will recommend an alternative without understanding the full effects of costs, which could lead to cost and schedule overruns.

Although NGA’s AOA process did not reflect all of the characteristics of a high-quality process, we are not making recommendations in this report, in part because NGA plans to conduct additional cost analysis and in part because we made an applicable recommendation to DOD in 2016. Specifically, although NGA’s AOA process is complete, NGA and Corps of Engineers officials said that they are developing full life-cycle cost estimates for the construction and design of the new NGA West campus and that these estimates will include many elements from our best practices. Further, we continue to believe that our September 2016 recommendation that DOD develop guidance requiring the use of AOA best practices for certain military construction decisions could help ensure that future AOA processes conducted by DOD agencies like NGA are reliable and that agencies identify a preferred alternative that best meets mission needs.<sup>37</sup> While DOD did not concur with our recommendation, as we reported in 2016, our best practices are based on longstanding, fundamental tenets of sound decision making and economic analysis. Additionally, our best practices align with many DOD and military policies,

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<sup>36</sup>DOD Instruction 7041.03 (Sep. 9, 2015).

<sup>37</sup>[GAO-16-853](#).

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directives, and other guidance pertaining to military construction. Further, during this review NGA officials stated that DOD did not have a set of best practices for conducting an AOA to help NGA make decisions regarding its military construction project, and that our AOA best practices would have been helpful had they been published prior to the start of NGA's site selection process in 2012. Accordingly, we continue to believe our prior recommendation is relevant and that unless DOD has guidance directing that certain military construction AOA processes be conducted in accordance with identified best practices, it may not be providing Congress with complete information to inform its oversight of DOD's future military construction decisions.

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## Agency Comments and Our Evaluation

We provided a draft of this report of this report to NGA for review and comment. NGA's comments are reprinted in their entirety in appendix II.

In comments on our report, NGA stated that it valued our assessment of its AOA process, which we judged to have substantially met the characteristics of a well-documented, comprehensive, and unbiased process, and would use our findings to continue to refine and improve its corporate decision making and processes.

NGA raised a concern about our assessment that its AOA process used to select the site for its new NGA West project partially met the best practices that demonstrate a credible process. NGA's specific concern was that we concluded that the AOA process did not fully include information on risks and sensitivities to cost estimates. In its letter, NGA stated that its analysis demonstrated that cost was a factor but not the most important factor. Moreover, NGA stated that cost elements and details ranged from well-defined costs, such as real estate costs, to estimates based on analogy such as an information technology trunk line. NGA additionally stated that, due to the conceptual nature of the design of the facility at that time, more detailed cost analysis was judged to provide no discrimination among alternatives and were thus purposely excluded from the initial cost estimates that were used in the AOA process. While NGA may have concluded that the project's cost was not the most important factor, the agency estimates that construction of the campus will cost about \$945 million and NGA used the cost estimate as a determining factor to select from the four final alternatives. Moreover, our assessment of the credibility characteristic is based only in part on NGA's initial cost estimates and did not penalize NGA for excluding additional cost estimates. Rather, we assessed that NGA's AOA body of work did not provide evidence of documenting the sensitivity of the cost-benefit or



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effectiveness estimates to changes in key assumptions for alternatives, nor was a sensitivity or risk analysis applied to the initial cost estimates used to make the final site selection.

NGA also stated in its letter that our AOA best practices are not applicable in all circumstances, and pointed out that DOD did not concur with a recommendation in a prior report<sup>38</sup> to develop AOA guidance requiring departmental components to use AOA practices, including the best practices we identified, for certain future military construction projects. Our prior report suggested that such guidance might only apply to certain military construction projects as determined by DOD. In addition, while DOD's existing relevant guidance does not require use of our AOA best practices, the guidance does not prohibit it either. Further, as discussed in our report, NGA officials told us the AOA best practices are helpful to such processes, and lacking such DOD guidance NGA had to draw on expertise, practices, and procedures from a variety of sources to conduct its AOA for the new NGA West site.

Finally, in its letter NGA proposed that two documents—the environmental impact statement and record of decision—fulfill the best practice to document the AOA process in a single document. Specifically, NGA stated that within the context of the environmental impact statement process, the record of decision is the authoritative capstone document of the process, and that together the two documents include discussions of the decision-making and factors considered by the director in selecting the agency-preferred alternative. These two documents were prepared to fulfill requirements of the National Environmental Policy Act of 1969 in order to determine the environmental impacts of the project, as discussed earlier in our report. While we recognize that the record of decision and the environmental impact statement are significant documents that include summaries of aspects of NGA's AOA process, as NGA indicated these are two documents within an expansive AOA body of work. Further, many of the elements of NGA's AOA process are diffused throughout these and several other reports and documents—that were specifically identified by NGA as the key documentation of its AOA process—rather than clearly delineated in a single document as prescribed by the best practice (see appendix I).

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<sup>38</sup>[GAO-16-853](#)

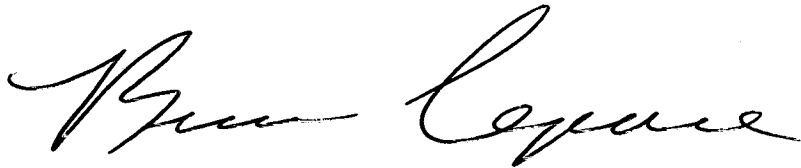
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As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of this report to the appropriate congressional committees; the Secretary of Defense; the Secretary of the Air Force; the Secretary of the Army; the Under Secretary of Defense for Acquisitions, Technology and Logistics; the Under Secretary of Defense for Intelligence; and the Director, National Geospatial-Intelligence Agency. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-4523 or [leporeb@gao.gov](mailto:leporeb@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Brian Lepore". The signature is fluid and cursive, with the first name "Brian" and last name "Lepore" clearly distinguishable.

Brian J. Lepore  
Director,  
Defense Capabilities and Management

# Appendix I: Analysis of Alternatives (AOA) 22 Best Practices with GAO’s Evaluation of National Geospatial-Intelligence Agency (NGA) AOA Process and Scores

In our earlier discussion of the extent to which NGA’s AOA process met best practices for such processes, we presented our analysis for specific best practices. These 22 best practices and their definitions were originally published and are listed in [GAO-16-22](#).<sup>1</sup> Table 3 summarizes our analysis of NGA’s AOA process for selecting the site for the new NGA West and our ratings of that process against all 22 best practices.

**Table 3: Evaluation of the National Geospatial-Intelligence Agency (NGA) Analysis of Alternatives (AOA) Process against GAO’s Best Practices**

Best Practices for an AOA Process	NGA’s AOA Process
1. Define mission need <b>Score 5 – Fully Met</b>	Defines mission need in various documents including the two site location studies, the Project Management Office (PMO) site evaluation report (PMO Report), and the NGA Director’s memo identifying the agency-preferred alternative. For example, both site location studies identify the mission need as “to enhance current missions, improve resiliency and solve the numerous challenges associated with its current 2nd street facilities, NGA is pursuing a new facility in the St. Louis metropolitan area.”
2. Define functional requirements <b>Score 5 – Fully Met</b>	Provides descriptions of functional (facilities and program) requirements that are realistic, organized, clear, and based on mission needs. For example, the first site location study identified several physical requirements for the new NGA West campus (e.g. 800,000 gross square feet, 500-foot security buffer, and 35 percent allowable growth). The first site location study also expanded the list to create site minimum requirements which established firm criteria to eliminate sites from further consideration. Additionally, the PMO Report provides functional requirements to fulfill NGA’s mission and identifies gaps between NGA’s current NGA West facilities and its mission-based functional requirements.
3. Develop AOA time frame <b>Score 4 – Substantially Met</b>	Provides evidence of a schedule that was developed prior to starting the site evaluation process to select the agency-preferred alternative for NGA West. Several documents within the body of work outline that time frame. Specifically, a briefing provided by the PMO on the site evaluation process provides significant milestone dates for the completion of the site evaluation process, including dates for the evaluation teams’ and PMO’s analyses, the National Environmental Policy Act analysis, and the agency-preferred alternative decision. Although the NGA body of work does provide a time line for the significant milestones associated with the site evaluation process, the time line established during the site evaluation process does not include other key processes such as the site location studies, the master planning efforts, or the site selection team evaluation.

<sup>1</sup>GAO, *Amphibious Combat Vehicle: Some Acquisition Activities Demonstrate Best Practices; Attainment of Amphibious Capability to Be Determined*, [GAO-16-22](#) (Washington, D.C.: Oct. 28, 2015).

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**AOA Process and Scores**

Best Practices for an AOA Process	NGA's AOA Process
4. Establish AOA team <b>Score 5 – Fully Met</b>	<p>Demonstrates evidence of an AOA team with members that are from diverse parts of the agency and includes a variety of subject matter experts. For example, the PMO Report lays out the overall composition of the personnel involved in the site evaluation process, including PMO staff and advisors who are subject matter experts and who provided guidance on topics such as legal matters, financial management, human development, contracting, and communications. The PMO's site evaluation process brief also identifies the specific makeup of the site evaluation team, which included the mission evaluation team, security, infrastructure, and schedule evaluation team, advisors, the National Environmental Policy Act documentation team, and the master planning team. Additionally, NGA established a site selection team to comprehensively review the summaries of all previous site evaluation efforts and reports and develop a path to selecting the agency's preferred alternative. The site selection team consisted of representatives from NGA, U.S. Army Corps of Engineers (Corps of Engineers), Air Force, and contractor support staff.</p>
5. Define selection criteria <b>Score 4 – Substantially Met</b>	<p>Identifies and defines selection criteria in numerous documents at various stages of the AOA process—such as physical requirements developed by contractors in 2013, evaluation factors developed by the PMO in 2015, evaluation sub-factors developed during the evaluation teams' analyses in 2015, strategic effect criteria evaluated by the PMO in 2015, and refining criteria developed by the site selection team in consultation with the NGA Director in 2016.</p> <p>In most instances, the criteria were defined before the analysis was done, for example, in the case of the physical requirements in the first site location study and the evaluation factors in the PMO Report. In one instance, mission criteria used by the site selection team to differentiate between the final two alternatives were adjusted so that they were defined slightly differently from the criteria that were used in previous analyses, giving the appearance that NGA's criteria had been adjusted after overall analysis began. However, NGA officials stated that they used consistent selection criteria in their AOA process and that their core criteria did not change during the phases of analyses but were clarified as the process matured.</p>
6. Weight selection criteria <b>Score 3 – Partially Met</b>	<p>Identifies when certain criteria were ranked or weighted at various stages of the process and generally demonstrated how this ranking affected the overall scores. For example, the mission evaluation team's workshop results in the PMO Report document how the team ranked its mission sub-factors by order of precedence. Specifically, the team considered each sub-factor's relative importance by assessing it according to a high, medium, or low order of precedence and then evaluated it from both the near- and far-term perspectives. In one instance, the team ranked its mission sub-factor "Low Crime" as a high order of precedence and "Proximity to Amenities" as a low order of precedence.</p> <p>However, the NGA body of work included instances in which criteria were ranked or weighted after the analysis began. For example, as documented in the NGA Director's memorandum identifying the agency-preferred alternative, the director adjusted the weight of a few criteria toward the end of the AOA process. Also, the evaluation teams, the PMO, and the NGA Director used different weights over the course of the evaluation process, and there is little justification provided in the body of work behind the ranking of the various criteria.</p> <p>While the iterative nature of NGA's AOA process allowed for a more thorough review, it also resulted in the criteria and weighting being adjusted as the process unfolded, possibly allowing for bias to enter the process.</p>

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<b>Best Practices for an AOA Process</b>	<b>NGA's AOA Process</b>
<p>7. Develop AOA process plan  <b>Score 5 – Fully Met</b></p>	<p>Includes documents that lay out specific plans and protocols for the site evaluation process and address key processes. For example, the PMO Report provides a description of the protocol established to complete the site evaluation process. Specifically, the PMO Report establishes roles and responsibilities for participants, sets key milestones and objectives, establishes evaluation teams and processes, and describes the format and content of the required reports. Further, the PMO Report includes a site selection methodologies brief that demonstrates that NGA researched and relied on methodologies established within the federal government for conducting site selections and based its site evaluation process on the U.S. General Service Administration's site selection process.</p>
<p>8. Develop list of alternatives  <b>Score 5 – Fully Met</b></p>	<p>Documents that NGA considered a diverse range of alternatives and conducted market research and surveillance in order to ensure a diverse list of alternatives. For example, the first site selection study provides a summary of the thorough analysis taken to identify potential site locations for NGA West. This study was conducted by real estate firm using "local market databases, mass and selective communications with the local real estate community, and interactions with municipal and economic development staff, including the U.S. General Services Administration." This process included narrowing the alternative site locations from 186 sites to 6 sites for further analysis. Next, the Corps of Engineers conducted a second site location study, identifying additional sites for analysis, which ultimately validated the original six sites for further study. During the preliminary master planning, four of the six sites identified by the site location studies were determined suitable for further analysis to select the agency's preferred alternative.</p>
<p>9. Describe alternatives  <b>Score 5 – Fully Met</b></p>	<p>Provides comprehensive descriptions of each of the alternatives at varying levels of detail:</p> <ol style="list-style-type: none"> <li>1. The first site location study provides descriptions of the top six potential sites, including information on the overall size, strengths and weakness, any acquisition or development issues, an overall grade, and a conclusion.</li> <li>2. The <i>Prospective Sites Master Plan</i> lists a detailed analysis of the final four potential sites and includes a discussion of the existing buildings' height, landscape and zoning assessments, and aerial, utility, and environmental constraints, among other things.</li> <li>3. The second site location study lists details on additional sites and includes information on the advantages and disadvantages.</li> </ol> <p>NGA officials stated the NGA body of work also provided an analysis of cost and non-cost data for each potential site alternative, and that the information presented reflected the best available assessment of defined benefits in relation to associated costs.</p>

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10. Include baseline alternative <b>Score 3 – Partially Met</b>	<p>Discusses that the status quo, which represents the existing capability's baseline where no action is taken, was evaluated prior to the site selection AOA during NGA's decision-to-build process in 2010–2012. However, NGA officials stated that once the decision to build a new NGA West campus was finalized, NGA did not reevaluate the baseline alternative, and the baseline was not documented as an alternative in part of the NGA body of work to compare to the final site alternatives in the site evaluation process.</p> <p>Additionally, as required by the National Environmental Policy Act of 1969 and implementing regulations, a "no action alternative" was included in the environmental impact statement analysis, which was considered as part of the PMO site evaluation process. This analysis compared and evaluated the alternative of taking no action to the other alternatives. However, the "no action alternative" serves as the baseline for the comparison of environmental and related impacts only.</p> <p>NGA officials stated that the need for carrying the "status quo" alternative further into their AOA process was not necessary given the previous decision to build a new site. However, our best practice states that if the baseline alternative is not used to compare the alternatives then there is no benchmark for comparison; which can allow for arbitrary alternative comparisons.</p>
11. Assess alternatives' viability <b>Score 4 – Substantially Met</b>	<p>Provides evidence of an assessment for each alternative's viability using predetermined factors, including a screening of the alternatives against minimum requirements and operational factors as well as assessing viability after the passage of time. Specifically, NGA assessed the alternatives' viability against qualitative technical and operational factors at different levels of the site selection process, including the two site location studies and preliminary master planning. For example, the first site location study narrowed down the full list of sites from 186 to 22 to guide NGA in its analysis of only those sites that were available and fully met requirements, including size and cost considerations. Additionally, notional master planning was conducted on the final 4 sites to ensure that all sites met more detailed specifications.</p> <p>The NGA body of work also provides documentation of the elimination of nonviable alternatives. For example, the second site location study observed that, through preliminary master planning, two of the final six sites had become nonviable (NorthPark and Weldon Spring) and been eliminated from further analysis. However, according to NGA and Corps of Engineers officials, the Mehlville site, one of the final four site alternatives, had existing tenants and buildings, but there was no plan for eviction and occupation by NGA if the site were to be chosen as the agency-preferred alternative. It is therefore unclear whether this site was truly viable.</p>
12. Identify significant risks and mitigation strategies <b>Score 3 – Partially Met</b>	<p>Provides documentation on the identification and evaluation of some risks and mitigation strategies for each alternative at varying stages of the process. For example, the PMO Report identifies schedule and negotiation risks that were analyzed for each potential site, along with scores for each, and it also includes some estimated mitigation requirements. Additionally, the first site location study includes a discussion of risks associated with cost, procurement, seismic, and geotechnical/environment factors as part of a criterion for the evaluation of viable alternatives,</p> <p>However, the body of work does not provide evidence that risks were ranked, that risks and strategies were documented for each alternative, or that the seven specific types of risks identified in this best practice were discussed. Not documenting the risks and the associated mitigation strategies for each alternative prevents decision makers from performing a meaningful trade-off analysis necessary to choose a recommended alternative.</p>

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<p>13. Determine and quantify benefits/effectiveness  <b>Score 3 – Partially Met</b></p>	<p>Includes discussion of the benefits and effectiveness of each alternative. For example, the PMO Report demonstrates that the evaluation teams used a standard process to evaluate each alternative and provides a score against various evaluation factors and sub-factors. Next, the PMO evaluated the evaluation teams' scores with different data or measures, including applying a strategic effect that placed precedence on sub-factors that had higher value and broader impact for NGA's strategic goals. The PMO then scored and weighted the alternatives using some of the scores from the evaluation teams with its own level of precedence.</p> <p>However, NGA did not quantify all benefits/effectiveness of each alternative over the alternative's full life cycle or provide an explanation of why it was not possible to quantify benefits. Additionally, the various scalability assessments used by the PMO and the evaluation teams led to varying results that are not clearly traceable. Examining effectiveness over the life cycle, and determining a standard process to quantify benefits are essential to ensuring that biases are not introduced and that decision makers have a complete picture.</p>
<p>14. Tie benefits/effectiveness to mission need  <b>Score 4 – Substantially Met</b></p>	<p>Provides evidence that the benefits of the alternatives were evaluated against NGA's mission needs. For example, the results of the mission evaluation team's workshop provided in the PMO Report demonstrate a filtering process to validate the evaluation criteria according to NGA's mission. The report also determined whether the mission-based criteria were "an enhancer or detractor" to NGA's strategic goals and identified the advantages of the mission-based criteria sub-factors. In another example, the site selection team's memorandum documenting its analysis demonstrates that its criteria are linked to NGA's mission and that the team evaluated the final two sites' adherence to criteria related to NGA's strategic goal. However, although NGA's AOA body of work provides evidence of evaluating NGA's current environment against its desired environment, this is not done consistently for all criteria throughout the analysis.</p>
<p>15. Develop life-cycle cost estimates  <b>Score 3 – Partially Met</b></p>	<p>Identifies and compares some land acquisition, site development, transportation improvements, and information technology costs for each alternative. Specifically, the NGA PMO Report includes Corps of Engineers cost estimates that provide evidence of (1) using a common work breakdown structure to compare the four alternatives, (2) documenting overarching/general ground rules and assumptions as well as specific ground rules and assumptions that were alternative specific, and (3) providing a comparison of the costs by alternative that showed the breakout of different cost categories for each site.</p> <p>NGA and the Corps of Engineers referred to these as "initial costs" and confirmed that they did not complete full life-cycle cost estimates for their potential site alternatives. NGA officials said they chose not to analyze longer term costs for each of the four alternatives, because they assumed similar cost rates, since the sites are in the same geographic area. Officials added that the lack of final design details constrained their ability to develop full life-cycle cost estimates. NGA officials stated that, as a result, they focused on the costs they identified as being the most variable, which were the land acquisition, site development, transportation improvements, and information technology trunk line costs. However, the information technology trunk line costs lacked details and sufficient information regarding how the figures had been developed and what data they were based on. Without full life-cycle costs, decision makers may not have a complete picture of the costs for each alternative and may have difficulty comparing the alternatives, because comparisons may not be based on accurate information.</p>

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<p>16. Include a confidence interval or range for life-cycle cost estimates</p> <p><b>Score 2 – Minimally Met</b></p>	<p>Documents the estimated alternatives' initial costs, but these estimates do not provide evidence that a confidence interval or range for the estimates was developed for each alternative. In the initial site development estimates, the Corps of Engineers did include a contingency factor for each estimate to identify some risks. Specifically, Corps of Engineers officials said that they included the same contingency factor for all four alternatives for certain costs based on their own expertise. However, the officials could not provide further details regarding how the contingency factors were identified. There was no indication of contingency factors or other analyses for the other costs developed as part of the NGA AOA process.</p> <p>For decision makers to make an informed decision, cost estimates must reflect the degree of uncertainty or include a range of costs to convey a level of confidence for each alternative to achieve a most likely cost.</p>
<p>17. Perform sensitivity analysis</p> <p><b>Score 2 – Minimally Met</b></p>	<p>Does not provide evidence of documenting the sensitivity of the cost-benefit or effectiveness estimates for each alternative to risks and changes in key assumptions. NGA officials stated that the project had considered how different values and variables affect each other during the criteria and evaluation analysis. The NGA body of work also documents that some sensitivity analysis or level of risk was analyzed as part of the schedule and negotiation analysis, but similar sensitivity analysis was not applied to show how schedule sensitivity affected the initial cost estimate or how the cost or benefit assumptions that were used in selecting the final site were affected by changes to their cost drivers.</p> <p>NGA officials stated that this best practice has limited application to their AOA process, in part because their sensitivity analysis was limited to the considerations that were measurable and sensitive to change. While other risk analyses were conducted, such as environmental risk analysis, those analyses were not related to the cost or benefit estimates, which is the focus of this best practice. Failure to conduct a sensitivity analysis to identify the uncertainties associated with different cost and benefit assumptions increases the chance the AOA team will recommend an alternative without understanding the full effects of costs, which could lead to cost and schedule overruns.</p>
<p>18. Document AOA process in a single document</p> <p><b>Score 3 – Partially Met</b></p>	<p>Demonstrates that a series of reports was used to document the entire NGA site evaluation process. According to NGA officials, this is due to the analyses being conducted over 5 years and documented in various reports as a result of the many phases and complexities of the AOA process. NGA officials pointed to four reports that illustrate the bulk of the analyses of NGA's AOA process. These four reports document the steps taken to (1) initialize the AOA process, (2) identify, analyze, and select the alternatives including details on the criteria used, (3) provide assumption for each alternative, (4) identify risks drivers and mitigation techniques, and (5) determine costs and schedule risks for each alternative. Although these reports document NGA's entire AOA process, including the final decision by the NGA director, many of the elements of a clearly documented AOA process are diffused throughout the various documents rather than clearly delineated in a single document. As stated in our best practice, a clear report should be compiled in one document to allow for an independent reviewer to assess the AOA process.</p>



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19. Document assumptions and constraints <b>Score 4 – Substantially Met</b>	<p>Supports that assumptions and constraints were developed and documented. For example, the first site location study lists various site location assumptions for all alternative locations, such as “only sites that were explicitly available for acquisition were included in the evaluation process.” Additionally, the <i>Prospective Sites Master Plan</i> developed a set of overall assumptions to guide the preliminary planning process and identified specific assumptions and constraints for each alternative. Specifically, the plan identifies various assumptions and constraints for the four final sites, such as calculations of the site boundaries, square footage of buildings, and parking estimates. However, although the NGA body of work provides evidence that assumptions and constraints were provided for each alternative, justifications for the assumptions and constraints were not detailed within the analyses.</p>
20. Ensure AOA process is impartial <b>Score 3 – Partially Met</b>	<p>Illustrates the intention of impartiality, including (1) hiring an external firm in the first site location study to conduct a real estate market analysis based on minimum and initial requirements, (2) conducting a second site location study to ensure that no available options were overlooked by the omission of public advertisement, (3) including alternative designs in the <i>Prospective Sites Master Plan</i> to ensure that there was no predetermined design assumption per site, and (4) requesting subject matter experts to conduct an independent review of the site evaluation process.</p> <p>However, the NGA body of work demonstrates that different scoring processes and methodologies to rank potential sites existed, such as the different scoring with the PMO's analysis and the site selection team's evaluation. Such differences can add bias to the overall AOA process and its individual reports. The validity of the analysis is affected if biases are introduced to the inputs.</p>
21. Perform independent review <b>Score 3 – Partially Met</b>	<p>Documents external and internal reviews conducted by subject matter experts outside the team conducting the AOA. These reviews provide an independent critique of the site evaluation criteria and process. Specifically, the PMO Report identifies an external review of the site evaluation process by representatives from the Office of the Director of National Intelligence, Defense Intelligence Agency, and National Security Agency. Additionally, the PMO Report documents an independent internal review by NGA personnel independent of the AOA team.</p> <p>The two groups in the internal review were comprised of experts from selected NGA components—one group comprised of senior leaders from Security and Installations and the other of senior leaders from Human Development and Diversity Management and others. The report stated that the comments received from these groups were key to validating the site evaluation process.</p> <p>However, these reviews did not assess the AOA process as a whole, including the site location studies and the site selection team evaluation, and it is unclear whether or how NGA addressed the recommendations from the independent reviews. It is recommended that experts outside the AOA process review the process to ensure that it is free of organizational bias and is sufficiently thorough.</p>

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22. Compare Alternatives <b>Score 2 – Minimally Met</b>	Documents various analyses that compared the alternatives from different perspectives with varying criteria over time. Specifically, the alternatives were compared and scored in a way that allows a decision maker to compare the alternatives at varying levels of detail. However, although the NGA body of work demonstrates comparison of the analyses throughout the AOA process, it does not provide evidence that the AOA team used net present value to compare alternatives—a key element of this best practice. NGA officials acknowledged that they did not compare the alternatives using net present value and stated that they believed it was not necessary for their review. Our best practice notes that an agency must document why it cannot use net present value. NGA’s AOA body of work did not document why net present value could not be used, fully describe an alternate method that was used to differentiate between alternatives, or explain why that method had been applied. Furthermore, comparing alternatives that have not been discounted or normalized does not allow for time series comparisons, since alternatives may have different life cycles or different costs and benefits.

Source: GAO analysis of NGA Information | GAO-17-643

# Appendix II: Comments from the National Geospatial-Intelligence Agency



## NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

7500 GEOINT Drive  
Springfield, Virginia 22150

Mr. Brian Lepore  
Director, Defense Capabilities and Management  
U.S. Government Accountability Office  
441 G Street NW  
Washington, DC 20548

Dear Mr. Lepore,

This is the National Geospatial-Intelligence Agency (NGA) response to the GAO Draft Report, GAO-17-643, "INTELLIGENCE COMMUNITY: Analysis of Alternatives Approach for a New Site Reflects Most Characteristics of a High-Quality Process," dated June 22, 2017 (GAO Code 101149). We appreciate the professionalism of your staff and the collaborative manner in which this arduous assessment was conducted. We are pleased that you find our site evaluation and selection process to be well-documented, comprehensive and unbiased. We value its findings and will use them as an important reference in our continuing efforts to refine and improve corporate decision-making practices and processes.

We have specific concerns with one area of your report — credibility, primarily as it relates to assessment of risk and sensitivities on cost. Our work demonstrates that cost was a factor in our analysis, but it was not the most important factor. Due to the conceptual nature of our future facility, the elements and level of detail of cost data ranged from the well-defined (e.g., real estate) to that which was estimated based on analogy and/or professional judgement (e.g., IT trunk line). Detailed analysis of costs that were judged to provide no degree of discrimination among the alternatives were purposefully excluded from the analysis because their inclusion yielded no tangible effect. Essential costs that we considered relevant to the process were subject to thorough analysis.

Although the 22 best practices provide a template from which to frame or structure an analysis of alternatives process, they are not applicable in all circumstances. As your report indicates on page six, the Department of Defense (DOD) did not concur with your recommendation to develop guidance that requires the use of analysis of alternatives (AOA) best practices. In the absence of specific DOD guidance regarding the analysis of alternatives, we developed a sound and well-reasoned process which drew on expertise, practices and procedures from a variety of sources.

Additionally, regarding the compilation of our analysis of alternatives in a single document for ease of independent review, we submit that requirement was fulfilled through completion of the Environmental Impact Statement (EIS) and issuance of the Record of Decisions (ROD). The EIS process provided the overarching framework in which our site evaluation/selection process was completed. As your report documents, our analysis of alternatives is captured in an expansive body of work which was developed and compiled over many years and includes the Final EIS (FEIS) and the ROD. This is a particularly important point, considering that both Section 2.0 of the FEIS and the ROD include comprehensive discussions regarding the decision-making process and the factors considered by the director in selecting the agency's preferred alternative. We therefore contend that in circumstances where an analysis of alternatives is being completed

within the context of the EIS process, the ROD is the authoritative capstone document of the complete process, and no additional summary documentation is necessary.

Once again, thank you for the opportunity to provide comment on the report. Should you require further information, please contact Ms. Reishia Kelsey, NGA Congressional Affairs, who may be reached at 571-557-5300.

Sincerely,



Susan R. Pollmann  
Director, N2W Program Management Office  
National Geospatial-Intelligence Agency

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# Appendix III: GAO Contact and Staff Acknowledgments

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## GAO Contact

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## Staff Acknowledgments

In addition to the contact named above, Brian Mazanec, Assistant Director; Jim Ashley; Tracy Barnes; Chris Businsky; George Depaoli; Richard Johnson; Joanne Landesman; Jennifer Leotta; Jamilah Moon; Joseph Thompson; and Sally Williamson made key contributions to this report.

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# Related GAO Products

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*Amphibious Combat Vehicle Acquisition: Cost Estimate Meets Best Practices, but Concurrency between Testing and Production Increases Risk.* [GAO-17-402](#). Washington, D.C.: Apr. 18, 2017.

*Joint Intelligence Analysis Complex: DOD Needs to Fully Incorporate Best Practices into Future Cost Estimates.* [GAO-17-29](#). Washington, D.C.: Nov. 3, 2016.

*Joint Intelligence Analysis Complex: DOD Partially Used Best Practices for Analyzing Alternatives and Should Do So Fully for Future Military Construction Decisions.* [GAO-16-853](#). Washington, D.C.: Sept. 30, 2016.

*Patriot Modernization: Oversight Mechanism Needed to Track Progress and Provide Accountability.* [GAO-16-488](#). Washington, D.C.: Aug. 25, 2016.

*Amphibious Combat Vehicle: Some Acquisition Activities Demonstrate Best Practices; Attainment of Amphibious Capability to Be Determined.* [GAO-16-22](#). Washington, D.C.: Oct. 28, 2015.

*DOE and NNSA Project Management: Analysis of Alternatives Could Be Improved by Incorporating Best Practices.* [GAO-15-37](#). Washington, D.C.: Dec. 11, 2014.

*Military Bases: DOD Has Processes to Comply with Statutory Requirements for Closing or Realigning Installations.* [GAO-13-645](#). June 27, 2013.

*Military Bases: Opportunities Exist to Improve Future Base Realignment and Closure Rounds.* [GAO-13-149](#). Washington, D.C.: Mar. 7, 2013.

*Military Base Realignments and Closures: The National Geospatial-Intelligence Agency's Technology Center Construction Project.* [GAO-12-770R](#). Washington, D.C.: June 29, 2012.

*Military Base Realignments and Closures: DOD Is Taking Steps to Mitigate Challenges but It Is Not Fully Reporting Some Additional Costs.* [GAO-10-725R](#). Washington, D.C.: June 24, 2010.

*GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs.* [GAO-09-3SP](#). Washington, D.C., Mar. 2, 2009.

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