

Transportability Engineering and the Acquisition Process

"Within DoD, transportability is the keystone of strategic mobility and rapid deployment."

"Transportability considerations for major weapon systems should begin during concept exploration, and transportability requirements are to be met by milestone III of the acquisition process."

"Major weapon and support systems will have less value to DoD if they cannot be efficiently transported when needed."

"Adequate safeguards do not exist in the acquisition process to ensure that transportability requirements are met before a system proceeds into low rate initial production or major modification."

"Crucial transportation needs may not be met in a time when deployability needs in DoD are increasing. Under DoD's streamlined acquisition process, transportability requirements, a critical element in the acquisition process, were not effectively met for the three systems audited, which have an estimated acquisition cost of \$2.2 billion. The program managers for the audited systems were not adequately considering the transportability of the systems during the acquisition process."

DoD Inspector General Report, "Transportability of Major Weapon and Support Systems" (Report No. 94-024), 27 December 1993

The quotes above come from a DoD IG report from 1993 on Transportability. The audit was requested by the Office of the Assistant Secretary of Defense for Production and Logistics. The findings in this report helped set up the regulations for the future of Engineering for Transportability Program. However, even before this report, in February 1991, DoDI 5000.2 *Defense Acquisition Management Policies and Procedures* was updated and included the following statement:

Activities accomplished by Milestone III, Production Approval – Transportability approval should be given by appropriate transportability agent.

The reason for having a transportability approval before Low Rate Initial Production (LRIP) or Milestone III/C is that changing the production design of a system/vehicle to meet its transportability requirements once production has already started is an expensive practice. The systems/vehicles already produced also have to be retrofitted with the changes. Again, an unnecessary expense if the regulations put in place to prevent such problems are followed.

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Many programs feel that the transportability regulations do not apply to their programs for various reasons. However, the types of programs the Engineering for Transportability Program applies to can be found in three different regulations.

Developing efficiently functioning and economically transportable equipment and combat resources is an integral part of the DoD acquisition process. All DoD Components will consider transportability and deployability in the:

- *Acquisition of all types of developmental systems, reprocurements of fielded systems, modified materiel, commercial off-the-shelf items, or non-developmental items.*
- *Acquisition of all systems defined as transportability problem items.*

Department of Defense Instruction (DoDI) 4540.07, Operation of the DoD Engineering for Transportability and Deployability Program, section 3.1.a & b, 22 September 2017

“All new systems, major modifications, upgrades to current systems, nondevelopmental items (NDIs), commercial items, and re-procurements designated as transportability problem items must obtain approval from the Director, Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA) (the DOD Secretariat for the Engineering for Transportability Program) in accordance with DODI 4540.07 and AR 70–47. Transportability approval from SDDCTEA is required before a Milestone C.”

Army Regulation (AR) 70-1, Army Acquisition Policy, section 15-8.h, 10 August 2018

“All new systems, major modifications, upgrades to current systems, nondevelopmental items, commercial items, and reprocurements designated as TPIs must obtain transportability approval from the Military Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA) per DODI 4540.07 and AR 70–1.”

Army Regulation (AR) 70-47, Engineering for Transportability Program, section 1-1, 11 January 2019

Unfortunately, many people do not understand Transportability Engineering (or they have misconceptions) and the role it plays in the DoD acquisition process. This paper attempts to provide a basic understanding of the transportability approval process and the role of the Military Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA) in the Acquisition Process. Before we get into the process, here are some basic definitions of terms taken from *AR 70-47, Engineering for Transportability Program, 11 January 2019*.

Transportability – *The inherent capability of an item or system to be effectively and efficiently moved by the required transportation assets and modes.*

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Transportability Approval – *A document from SDDCTEA, the Army transportability agent, that an item of materiel, in its shipping configurations, is transportable by the required mode(s) of transportation and meets its transportability requirements of the requirements/capabilities document.*

The transportability approval is required prior to Milestone C according to four different regulations (DoDI 4540.07, AR 70-1, AR 70-47, and AR 700-142). The reason for this is it can be VERY expensive for programs to make changes to the design of their system to pass transportability tests once production of the system begins. Details on the regulations will be provided later in this document.

Transportability Engineering – *The process of identifying and measuring limiting constraints, characteristics, and environments of transportation systems; the integration of these data into design criteria to use operational and planned transportation capability effectively; and the development of technical transportability guidance.*

DoDI 4540.07, paragraph 2.5.c(1) states that the Commander, Military Surface Deployment and Distribution Command (SDDC) serves as the Army Transportability Agent and the DoD Transportability Agent for all systems and equipment (S/E) matters requiring multi-component coordination.

DoDI 4540.07, section 2.5.d states that the Director, SDDCTEA serves as the Land Mode Transportability Agent for the DoD and the single point of contact for the Department of the Army for conduct of transportability engineering and deployability analyses and for provision of transportability and deployability guidance and assistance. SDDCTEA also serves as the DoD Secretariat for the Engineering for Transportability and Deployability Program.

What Types of Materiel Requires Transportability Approval?

Per paragraph 1-5.a of AR 70-47, “Applies to all Army materiel (major end items, components, and spare parts) to include: research, development, test, and evaluation (RDT&E) systems; product improvements (including materiel modifications and upgrades); commercial items and military-adapted commercial items; foreign source items; nondevelopmental items; rapidly fielded equipment; procurements; and systems/equipment/munitions (SEM).”

Is the Materiel a Non-Problem Item?

If the materiel is considered a non-problem item (NPI) (SDDCTEA will make that determination per the definition of a transportability problem item (TPI) from *DoDI 4540.07* and *AR 70-47*), then per paragraph 1-5.f of *AR 70-47*, an NPI statement and email will be provided from SDDCTEA.

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For Transportability Problem Items (TPIs), a simple step-by-step process of transportability in the Army acquisition process and the organizations involved, begins with the end user or Capability Developer (CAPDEV) providing a requirement for a capability that they desire. A flowchart of the process can be found in Figure 1. This flowchart is based upon the requirements set forth in AR 70-47. The requirement is recorded into a formal capability document such as a Capability Development Document (CDD) or Capabilities Production Document (CPD). SDDCTEA is required to review the capability document to ensure that transportability requirements are adequately covered.

SDDCTEA Reviews Capability Documents

SDDCTEA reviews capability documents to ensure transportability considerations are adequately stated per *AR 70-47*: paragraph 1-12.a.(1), paragraph 1-13.q.(5), and section 2.3.

Once the capability document has been finalized and approved, the Materiel Developer (MATDEV) or Program Manager (PM), takes the program and seeks a materiel solution for the stated need. Part of that search for the materiel solution can be to convene a Source Selection Evaluation Board (SSEB) to select a piece of equipment to continue through the acquisition process.

SDDCTEA is Required to Participate in the SSEB

Per *AR 70-47*, paragraph 1-13.q.(8), SDDCTEA is required to supply an Army transportability agent representative to support the MATDEV with SSEBs. In paragraph 1-15.j, the MATDEV is required to request support from SDDCTEA for SSEBs.

The MATDEV (or contractor) would then need to submit to SDDCTEA a transportability report for the selected materiel per *AR 70-47*, section 2-4. The report is a detailed listing of all the physical characteristics for the piece of equipment and provides all the information necessary to perform a comprehensive transportability engineering analysis. A format for the transportability report can be found in Appendix B of *AR 70-47* or *Data Item Description (DI-PACK) 80880D*.

MATDEV Submits Transportability Report to SDDCTEA

Per *AR 70-47* section 2-4, a transportability report on the materiel that follows the format in Appendix B of *AR 70-47*, must be submitted to SDDCTEA.

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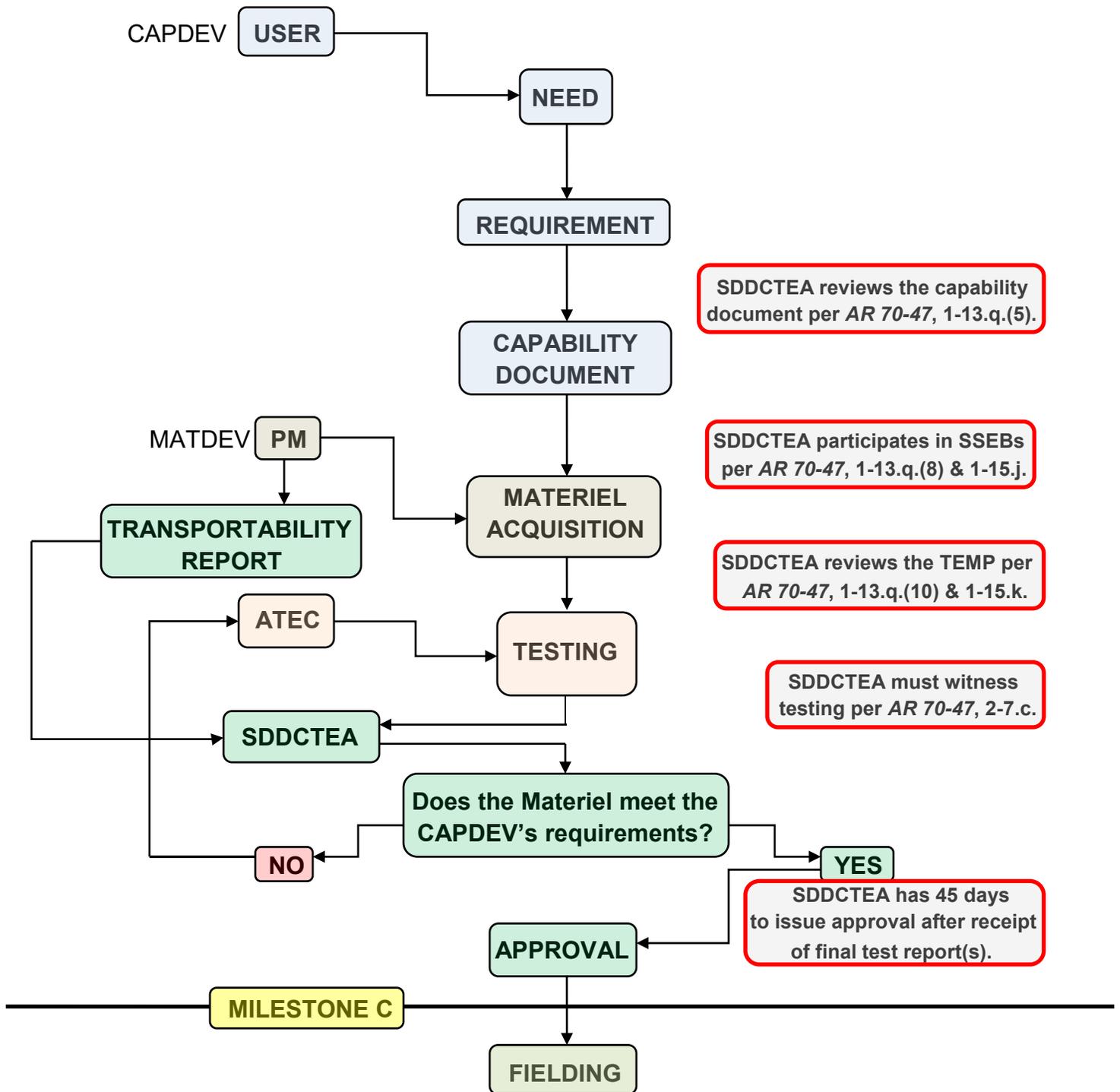


Figure 1. Transportability in Acquisition Flowchart According to AR 70-47

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The materiel selected by the MATDEV then needs to be tested to verify it meets the capabilities/requirements desired by the CAPDEV. This testing typically takes place in the “Engineering and Manufacturing Development” phase of the acquisition process. All required testing is stated in the test and evaluation master plan (TEMP). Required transportability testing typically would include *Military Standard (MIL-STD) 209*, Lifting and Tiedown Provision tests and a *MIL-STD-810* rail impact test. Required testing all depends on the particular transportability requirements of the materiel.

SDDCTEA is Required to Review the TEMP

Per *AR 70-47*, paragraphs 1-13.q.(10) and 1-15.k, SDDCTEA is required to review the transportability sections of the TEMP to ensure that transportability testing (such as *MIL-STD-209* and *MIL-STD-810* testing) is adequately covered.

As stated earlier, transportability testing usually involves *MIL-STD-209* lift and tiedown provision testing as most materiel must be tied down (secured) during transport. The lift and tiedown provisions must successfully pass their pull tests before moving on to other types of transportability testing, such as the *MIL-STD-810* rail impact test. Other specialized transportability testing would also take place based on the specific transportability requirements of the materiel. This other testing could include (but not limited to) test loadings, airdrops, or helicopter sling loading. Per *AR 70-47*, test procedures shall be coordinated with SDDCTEA at least 30 days before the test date. SDDCTEA shall be notified of the exact test time and location at least five days before the test. SDDCTEA or SDDCTEA’s appointed representative must witness all transportability testing.

SDDCTEA Must Witness All Transportability Testing

Transportability procedures shall be coordinated with SDDCTEA at least 30 days prior to the test. SDDCTEA must be notified of the exact time and location of transportability tests 5 days before the test. SDDCTEA (or their appointed representative) must witness all transportability testing per *AR 70-47*, paragraph 2-7.c.

Once all required transportability testing has been successfully completed, the final test reports received by SDDCTEA, and all required transportability certifications (shelter, air transport, helicopter sling load, and/or airdrop) from other transportability agents are received by SDDCTEA, SDDCTEA has 45 days to provide a transportability approval to the MATDEV per *AR 70-47*, paragraph 2-9.d. Transportability approval is also required prior to Milestone C per *DoDI 4540.07*, paragraphs 3.4.b and c; *AR 70-1*, paragraph 15-8.h; and *AR 700-142, Type Classification, Materiel Release, Fielding, and Transfer, 8 June 2018*, section 2-20.d.(8). SDDCTEA’s transportability approval is also used to support the Materiel Release process.

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SDDCTEA Transportability Approval in Support of Milestone C

Per paragraph 3.4.b of *DoDI 4540.07*, the MATDEV should request transportability approval for TPIs at least 90 days prior to Milestone C. SDDCTEA will provide transportability approval to TPIs before Milestone C if the item meets all of its transportability requirements (3.4.c). Per *AR 70-47*, paragraph 2-9.d, SDDCTEA has 45 days to provide a transportability approval to the MATDEV in support of Milestone C, once all transportability testing has been successfully completed, all transportability certifications and test reports have been received, and the materiel meets its transportability requirements. Please keep this in mind when planning for the Milestone C decision point. Other regulations where transportability approval is mentioned include, *AR 70-1* (section 15-8.h), *AR 71-9* (section 2-20), *AR 73-1* (section 2-20), *AR 700-127* (section 1-19), and *AR 700-142* (section 2-20.d.(8)).

Because requirements and capabilities are always being updated or revised, any revision in the materiel might require new transportability testing and/or an update to the transportability approval. In the final paragraph of each transportability approval, SDDCTEA includes a statement about the need to update the transportability approval if modifications take place or changes occur that increase the size and/or weight of the system. *AR 70-1* (15-8.h) and *70-47* (1-5.a) also state that any product improvements, developmental systems, non-developmental items, modifications, upgrades to current systems or reprocrements will require an updated transportability report and an upgraded transportability approval.

Transportability Approval Updates

Any product improvements, modifications, upgrades, or reprocrements may require new transportability testing and will require an updated transportability approval, especially when changes have occurred in the size and/or weight of the materiel.

Many use different terms such as “statement,” “assessment,” or “certification” to refer to an “approval.” However, all four documents mean different things. The definition of a “transportability approval” was covered earlier.

Transportability Statement – *A document from SDDCTEA, to provide the status of the system’s transportability approval. The statement should clearly list what transportability mode testing has been successfully completed and the transport modes where there are still issues and how those issues can be resolved.*

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Transportability Assessment – A review from SDDCTEA that evaluates the system's early projected ability to meet deployment requirements. The evaluation is based on the system's projected dimensions, operational capabilities, and fielding requirements. It is usually produced prior to Milestone B.

Transportability Certification – A document produced by a transportability agent (ATTLA, CCDC Soldier Center, or the USMC for example) that provides a specific modal approval, such as air transport, helicopter sling load (HSL), low velocity air drop (LVAD), or landing craft air cushioned (LCAC)). These certifications are rolled into SDDCTEA's transportability approval.

Once a transportability approval has been issued by SDDCTEA, their role in the Engineering for Transportability Program is not over. SDDCTEA is responsible for managing data collection and maintaining the *Standard Characteristics (Dimensions, Weight, and Cube) for Transportability of Military Vehicles and Other Outsize/Overweight Equipment*, Army TB-55-46, per DoDI 4540.07 (2.5.d(9)) and AR 70-47 (1-13.q.(15)). The MATDEV is required to support this data collection per AR 70-47 (1-15.l).

SDDCTEA also publishes and distributes transportability guidance/procedures for moving military equipment by the various transport modes per AR 25-30, *Army Publishing Program* (3-14.g). These publications used to be called "pamphlets," but this name was changed to "modal instructions" to prevent confusion with other "pamphlets" published by the Department of the Army. These modal instructions are required per DoDI 4540.07 (2.5.d.(9)) and AR 70-47 (1-13.q.(15)). The modal instructions are sent out free of charge and can be ordered or electronically downloaded from the SDDCTEA web site, <http://www.sddc.army.mil/sites/TEA/Functions/Deployability/TransportabilityEngineering/Pages/default.aspx>. The current list of modal instructions (MI) available are as follows:

MI 19 Rail, Tiedown Instructions for Rail Movements

MI 20 Truck, Tiedown Handbook for Truck Movements

MI 21 Helicopter, Lifting and Tiedown Instructions for Helicopter Movements

MI 22 Sealift, Listing and Lashing Instructions for Sealift

MI 23 Containerization, Tiedown Instructions for Containerized Movements

MI 24 Airlift, Vehicle and Equipment Preparation Instructions for Fixed Wing Air Movements

Transportability Instruction 70-1, Transportability for Better Deployability

MI 4, Vessel Characteristics for Shiploading

MI 6, LMSR User's Manual

MI 7, Fast Sealift Ship User's Manual

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A DVD with all these documents and all related transportability regulations can also be ordered from the SDDCTEA web site.

For any transportability engineering questions, feel free to contact the Transportability Engineering Branch at SDDCTEA.

U.S. Army Military Surface Deployment and Distribution Command
Transportation Engineering Agency (ATTN: SDTE-DPE)
1 Soldier Way, Building 1900W
Scott AFB, IL 62225-5006

(618) 220-5263
DSN 770

usarmy.scott.sddc.mbx.tea-dpe@mail.mil

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Transportability References

DoDD 4510.11, DoD Transportation Engineering, (Change 1) 3 August 2017

DoDI 4540.07, Operation of the DoD Engineering for Transportability and Deployability Program, (Change 1) 22 September 2017

AR 25-30, Army Publishing Program, 13 June 2018

AR 70-1, Army Acquisition Policy, 10 August 2018

AR 70-47, Engineering for Transportability Program, 11 January 2019

AR 73-1, Test and Evaluation Policy, 8 June 2018

AR 700-127, Integrated Product Support, 22 October 2018

AR 700-142, Type Classification, Materiel Release, Fielding, and Transfer, 8 June 2018

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