



Report to Congress

2023

This report discusses the National Highway Traffic Safety Administration's test dummy development and provides insight into related contracts for fiscal years 2018-2022.

TEST DUMMIES

Test Dummies - FY2023 Report to House and Senate Committees on Appropriations

Introduction

NHTSA's use of crash test dummies dates to the 1970s, when the first dummy was codified into NHTSA's regulation for Anthropomorphic Test Devices (ATD)¹, 49 CFR Part 572. Since that time, as the Federal motor vehicle safety standards (FMVSS) and New Car Assessment Program (NCAP) have evolved, NHTSA has codified other dummies that vary in size, age, and measurement capability, including those that represent midsize adult males, small adult females, infants, toddlers, and older children. In addition, NHTSA has continually conducted research into advancements in crash safety, including the development of advanced dummies that may better capture the details of the interaction of vehicle occupants with modern restraint systems, such as force-limited three-point seat belts and air bags.

NHTSA takes great efforts to ensure that dummies have a human-like response, or are "biofidelic," in a crash. To this end, crash test dummy development is a complex and lengthy process requiring a cooperative approach between NHTSA and dummy manufacturers, involving numerous design iterations aimed at refining accuracy and precision to best reflect actual human kinematics and resulting injury measures in a crash. An assessment of a dummy's biofidelity includes, but is not limited to, anthropometry, mass properties, joint properties (e.g., range of motion), and response to crash forces. Biofidelity must be weighed against other requirements, including durability, repeatability, and reproducibility of the dummy motion and injury prediction. Biofidelity and durability are often competing priorities. Developing a dummy that not only has a human-like response but also remains intact through multiple crashes is a considerable challenge and necessitates the previously mentioned iterative design process with the ATD manufacturers.

Procurement for Crash Safety Testing

This report is responsive to the request in the House Report 117-40 accompanying the Consolidated Appropriations Act, 2023 (Pub. L. 117-328), enacted on December 29, 2022, which directs NHTSA to submit a report to the House and Senate Committees on Appropriations "detailing all contracts related to crash safety testing awarded in the previous five fiscal years, including an explanation of the types of bids received and not awarded."

NHTSA uses a variety of purchasing mechanisms to support our crash safety test efforts. Research stage crash safety testing is often conducted at NHTSA's Vehicle Research and Test Center (VRTC) facility. The VRTC facility is located onsite at the Transportation Research

¹ The technical term for a crash test dummy is 'Anthropomorphic Test Device.'

Center (TRC). NHTSA has a contract with TRC for use of their test facilities and support personnel. This Indefinite Delivery Indefinite Quantity (IDIQ) contract provides professional, technical and support services including personnel, facilities, equipment, and materials to assist the Vehicle Research and Test Center with research and testing activities. These services are provided through Task Orders issued under this contract. Among the services procured through this contract is for TRC to provide testing in support of crash test dummy research and development.

Where necessary, additional crash safety tests are conducted through multi-award Indefinite Delivery Indefinite Quantity (IDIQ) contracts. Commercial test facilities submit capability bids for 5-year testing contracts. NHTSA reviews proposals consistent with Federal procurement law by establishing an evaluation committee and maintains strict confidentiality of all proposal information. Multiple contracts for the base IDIQ are awarded based on the best value for the government among the technically qualified bids. After award of a contract, NHTSA, following fair opportunity, will issue a task order for individual testing where the successful contractors may submit a task order proposal that is subject to another evaluation committee process. These task order proposals are also confidential. NHTSA will evaluate each individual crash testing task order proposal and make an award based on the best value for the government among the technically qualified bids. Competitive IDIQ task awards are also used for the development of prototype ATD systems.

Procurement for Crash Test Dummies

NHTSA's crash test dummies (ATDs) and supporting hardware are purchased in a slightly different manner. Crash safety testing with ATDs uses a lot of consumables and breakage can occur during the course of their use. When authorized, simplified acquisition procedures are used for most purchases to replace parts or make repairs. Significant ATD and ATD part purchases are conducted using 5-year fixed price IDIQ contracts. In 2019, the previous base IDIQ contract for ATD purchases expired. NHTSA published a request for proposals for a new multiple award indefinite delivery indefinite quantity contract. The purpose of the contract was to provide an efficient means for the acquisition of commercial supplies and services relating to ATDs. Prospective offerors were instructed to provide technical and cost/business proposals when responding to the solicitation. Each offeror was required to submit itemized catalogs of the ATDs, parts, accessories, and/or services with costs associated for each item that they offer. Nine offerors responded to the solicitation and eight of the nine proposals were deemed to be technically acceptable. In 2020, following agency evaluation of proposals, eight vendors were each awarded a five-year IDIQ contract. No single vendor offers all the items that the agency requires. There is also some overlap in the items offered by the various vendors. When NHTSA requires any parts or full ATDs, NHTSA will provide fair opportunity by issuing a Request for Quotation (RFQ) to those vendors who were awarded contracts for the requested parts or dummies. In response to NHTSA's RFQ, vendors are encouraged to provide NHTSA with competitive prices. When making the award decision, NHTSA will use the evaluation criteria in the RFQ and apply applicable federal regulations to ensure the best value for the government. In

the instance that only one vendor supplies the parts or dummies that NHTSA is requesting, NHTSA seeks competitive prices and follows applicable federal regulations to ensure the buy is in the best interest of the government. After this evaluation is complete, firm fixed price (FFP) delivery orders for supplies and services are issued.

The following eight companies were awarded a contract to provide ATDs, ATD components, instrumentation, or services for the THOR 50th, THOR 5th, WorldSID 50th, and/or WorldSID 5th ATDs:

Boxboro Systems LLC
 Diversified Technical Systems Inc
 Encocam LTD
 EuroAmerica LLC
 Humanetics Innovative Solutions Inc
 JASTI USA INC
 Kistler Instrument Corporation
 SACO Research LLC

Recent Contracts for ATD Purchases

The text of the House and Senate Committees on Appropriations report focuses on development and procurement for advanced ATDs. The following table provides a summary of procurement totals, by company, involving the THOR 50th, THOR 5th, WorldSID 50th and WorldSID 5th ATDs for FY2018 through FY2022.

Name	Total Awards
Boxboro Systems LLC	\$211,000
Diversified Technical Systems Inc	\$32,000
Encocam LTD	\$843,800
EuroAmerica LLC	\$1,281,390
Humanetics Innovative Solutions Inc	\$7,905,000
JASTI USA INC	\$130,000
Kistler Instrument Corporation	\$844,000
SACO Research LLC	\$224,000