BOEING®

THE ECONOMIC IMPACT OF THE GROUND-BASED MIDCOURSE DEFENSE PROGRAM IN THE STATE OF ARIZONA

Prepared for Boeing by the L. William Seidman Research Institute

Arizona's Leading Aerospace Partnership Supporting Our Warfighters in U.S. Missile Defense

ASU® W. P. CAREY SCHOOL of BUSINESS
ARIZONA STATE UNIVERSITY

INDISPENSABLE DEFENSE FOR THE NATION

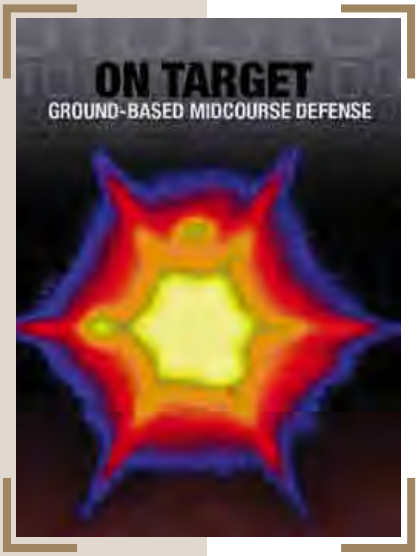
Since the inception of the Ground-based Midcourse Defense (GMD) program, the Boeing-led team has maintained responsibility for all development, test and integration activities. By developing and integrating best-of-industry solutions, Boeing successfully incorporated evolving U.S. Missile Defense Agency (MDA) requirements. Since 1998, the Boeing team has integrated both internal and external components into GMD, including sensors, weapons and command and control.

The GMD Mission

The Boeing-led industry team and the Missile Defense Agency are delivering America's only defense against the threat of long-range ballistic missiles. The GMD element of the overall U.S. Ballistic Missile Defense System consists of ground-based interceptors in Alaska and California, along with land-, sea- and space-based sensors and a sophisticated command-and-control system. It is designed to intercept and destroy long-range ballistic missiles during their midcourse phase of flight. Meeting the goals set forth by the President in 2002, the Boeing-led GMD team accelerated testing to deliver operational capability in just two-and-a-half years. Comparable in scale and complexity to the Apollo human spaceflight program, this effort provides the homeland with its only line of defense against a growing, long-range ballistic missile threat.

Demonstrated Capability

GMD detects and tracks missile launches early in the boost phase, discriminates the target from countermeasures during the midcourse flight, and, with pin-point precision, intercepts and destroys the target through force of collision. Since initially deployed in 2004, the Boeing team has ensured that GMD is maintained at an unprecedented level of readiness, while also continuing to develop the Ballistic Missile Defense System and supporting missile defense operations. GMD was operational during the 2006 North Korean missile launches. To date, GMD has had a total of seven successful intercept tests, including missile shootdowns with operationally configured interceptors in 2006 and 2007.



STRONG DIVIDENDS FOR ARIZONA'S ECONOMY

The impact of the Ground-based Midcourse Defense (GMD) operations on Arizona's economy is dramatic.

- In 2007 the GMD program had a total impact on the Arizona economy equal to **$193.2 million in gross state product, $137.2 million in employee earnings, and 1,936 jobs**.
- GMD partners employed 729 Arizonans in 2007. **The average compensation (wages and benefits) for these high-skill jobs is $128,260 per year, more than three times the average annual earnings of Arizona workers**. These high-tech jobs act as a catalyst for additional aerospace industry investment throughout the state.
- In addition to the 729 direct GMD jobs, the program created 1,207 more jobs through indirect and induced impacts from secondary spending. **For every 100 GMD jobs, an additional 166 jobs were created in the Arizona economy.**
- Consumer spending by GMD employees contributes $60.2 million to Arizona's gross state product, $28.8 million in earnings, and 860 Arizona jobs.
- The economic impacts connected with the recycling of state and local taxes in Arizona in 2007 include $16.1 million added to the state's gross state product, $11.8 million in additional employee earnings, and 279 jobs.
- In addition to non-payroll purchases and expenditures to **more than 100 vendors within Arizona**, the GMD Arizona-based operations had impacts on the entire nation, with purchases from suppliers across all other states that totaled $145.4 million in 2007.
- When considering all of its operations in Arizona – GMD and beyond – **The Boeing Company employs more than 4,900 workers in Arizona, with a payroll of $408 million. Boeing has a total impact on the Arizona economy of $2.6 billion in gross state product, 37,300 direct and indirect jobs, and $1.8 billion in Arizona household earnings.**
- Boeing and its Arizona partners support extensive charitable, community, and workforce development activities that create long term benefits for Arizona and its citizens.

The Impact of the GMD Program on Arizona's Economy in 2007

	Gross State Product	Earnings	Employment
Direct Effects from GMD Operations in Arizona	$112.2 million	$93.5 million	729 Arizonans
Indirect Effects of Purchases from Arizona Suppliers	$4.7 million	$3.1 million	68 Arizonans
Induced Effects from Consumer Spending of Direct Earnings	$60.2 million	$28.8 million	860 Arizonans
Multiplier Effects from Spending of State and Local Tax Revenues	$16.1 million	$11.8 million	279 Arizonans
Total Economic Impact	**$193.2 million**	**$137.2 million**	**1,936 Arizonans**

Source: L. William Seidman Research Institute, W. P. Carey School of Business, Arizona State University

PROTECTING AMERICA'S INTERESTS – AT HOME AND ABROAD

From America to Its Allies

From homeland defense to global security, missile defense is expanding in scope. Boeing, with its proven hit-to-kill technology, large scale integration expertise, and global business partners, is committed to aggressively developing advanced missile defense technologies and architectures. As a global company with a presence in 70 countries and over 22,000 suppliers in 100 countries, The Boeing Company is positioned to support the Missile Defense Agency's vision of deploying an expanded and reliable global missile defense system to protect friends and allies from ballistic threats.

The GMD Program

GMD incorporates decades of research, development, test and evaluation on proven hit-to-kill and other advanced technologies. In 2004, the GMD program fielded the first ground-based interceptors at Fort Greely, Alaska, and Vandenberg Air Force Base, Calif. Interceptors continue to be emplaced at both Fort Greely and Vandenberg. System capability increased to 24 interceptors in 2007, and the program is working toward a goal of 30 deployed interceptors by the end of 2008. The GMD system also includes two fire control nodes at Fort Greely and Colorado Springs, the Cobra Dane ground-based radar at Shemya, Alaska, and an upgraded early-warning radar at Beale Air Force Base, Calif. The new Sea-Based X-Band Radar is being integrated into GMD. GMD is a network-enabled system, linked by the world's largest fiber-optic ring, with 20,000 miles of cable integrating and enhancing program communications.

The team's countless operational, sustainment, and development accomplishments were recognized by the Missile Defense Agency in 2007 as exceptional.

Track Record: Experience When It Counts

The Boeing GMD team has demonstrated an outstanding record of success. The team's countless operational, sustainment, and development accomplishments were recognized by MDA in 2007 as exceptional. The most significant accomplishment was meeting the President's 2002 direction to prepare GMD for operations in 2004. The system was placed on alert status in 2004 and was operational during the 2006 North Korea missile launches. Other significant events included successful intercepts with operationally configured ground-based interceptors in 2006 and 2007 flight tests and accelerating the deployment of additional operational interceptors to Fort Greely, Alaska, and Vandenberg Air Force Base, Calif.

A ground-based interceptor is emplaced.

PARTNERING IN ARIZONA TO KEEP THE NATION SAFE

The Boeing Company

The Boeing Company is the prime contractor for the Ground-based Midcourse Defense (GMD) program. The Boeing-led industry team includes more than 400 partners in 36 states. In Arizona, Boeing partners with Orbital Sciences Corporation and Raytheon Missile Systems to build components for the GMD system. Since the inception of the GMD program, the Boeing-led team has maintained responsibility for all development, test and integration activities. For more information, visit **www.boeing.com**

Orbital Sciences Corporation

Orbital develops, tests and produces ground-based boost vehicles for the Ground-based Midcourse Defense program at its facilities in Chandler, Arizona. The rocket-propelled boost vehicles will carry advanced Exo-atmospheric kill vehicles (EKVs) that are designed to locate, track and destroy long-range enemy missiles in flight, protecting all 50 States and our Allies from future potential terrorist or rogue regime attacks. For more information, visit **www.orbital.com**

Raytheon

Missile Systems

Raytheon Missile Systems

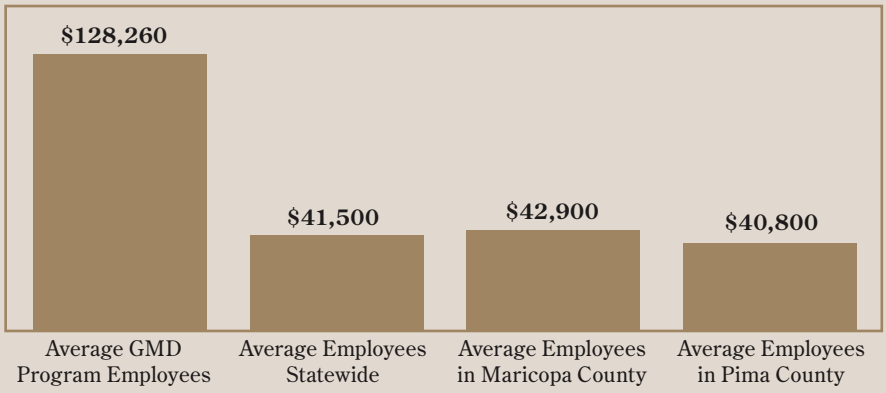
The payload for the GMD rockets is the Exo-atmoshperic kill vehicle, produced by Raytheon at facilities in Tucson, Arizona. The EKV is the intercept component of the ground-based interceptor, the weapon element of the Ground based Midcourse Defense System. The EKV consists of an infrared seeker in a flight package used to detect and discriminate the incoming warhead from other objects. The EKV also has its own propulsion, communications link, discrimination algorithms, guidance and control system and computers to support target selection and intercept. For more information, visit **www.raytheon.com**

HELPING TO GROW A SECURE 21ST CENTURY ECONOMY IN ARIZONA

Supporting High-Paying, High-Technology Jobs

The Ground-based Midcourse Defense program is a vital part of the kind of high-technology economy that will keep Arizona, its businesses, and its citizens competitive in the 21st century. It's the kind of high-technology economy for which Arizonans have long fought. It's the kind of high-technology economy that offers Arizonans secure, high-paying jobs that allow them to support and grow their families and their communities. In fact, the 729 Arizonans who are directly employed in GMD program operations in Arizona earned an average of $128,260 in 2007. That's more than three times the average annual earnings of Arizona workers.

Arizona Workers' Average Annual Incomes in 2007



Source: L. William Seidman Research Institute, W. P. Carey School of Business, Arizona State University

Supporting State and Local Governments

The GMD program also supports vital state and local public programs through direct and indirect tax effects. In 2007, the program generated, both directly and indirectly, a total of $12.7 million in Arizona state and local tax revenues.

The Impact of GMD Operations on Arizona State and Local Tax Revenue in 2007

	Income Tax	Sales Tax	Property Tax	All Taxes
Taxes Paid Directly by GMD Contractors	$390,000	$108,000	$421,000	$919,000
Taxes Paid by GMD Employees	$2.6 million	$1.9 million	$3.1 million	$7.6 million
Taxes Associated with Multiplier Effects	$855,000	$2.0 million	$1.3 million	$4.2 million
Total of All Tax Effects	**$3.9 million**	**$4.0 million**	**$4.8 million**	**$12.7 million**

Source: L. William Seidman Research Institute, W. P. Carey School of Business, Arizona State University

INDEPENDENT RESEARCH AND CONSULTING IN ARIZONA AND BEYOND

This brochure, as well as the full report, *Economic Impact of the Boeing-led Ground-based Midcourse Defense Program: Arizona Operations 2007,* was produced by faculty and staff at the L. William Seidman Research Institute in the W. P. Carey School of Business at Arizona State University.

About the L. William Seidman Research Institute

The Seidman Institute serves as a link between the local, national and international business communities and the W. P. Carey School of Business. It collects, analyzes and disseminates information about local economies, benchmarks industry practices and identifies emerging business research issues affecting productivity and competitiveness.

Housed within the Institute, **Knowledge@ W. P. Carey** is a bi-weekly online resource that offers the latest business insights, information and research form a variety of sources. These include analysis of current business trends, interviews with industry leaders and W. P. Carey faculty, articles based on the most recent business research, book reviews, conference and seminar reports, as well as links to other web sites. To learn more please visit **http://knowledge.wpcarey.asu.edu**

About the W. P. Carey School of Business

The W. P. Carey School of Business at Arizona State University is one of the top-ranked and largest business schools in the United States. The school is internationally regarded for its research productivity and its distinguished faculty members, including a Nobel Prize winner. Students come from 75 countries and include more than 60 National Merit Scholars. The W. P. Carey School is located on ASU's Tempe campus, adjacent to Phoenix, Arizona, the fifth-largest city in the U.S. Classes and program services also are offered at satellite locations throughout greater Phoenix. The school is ranked 22nd nationally for the W. P. Carey MBA, 25th for its undergraduate programs, and has four academic disciplines ranked in the top 25 (U.S. News and World Report).

About Arizona State University

Arizona State University is a creating a new model for American higher education, an unprecedented combination of academic excellence, entrepreneurial energy and broad access. This New American University is a single, unified institution comprising four differentiated campuses positively impacting the economic, social, cultural and environmental health of the communities it serves.

Its research is inspired by real world application, blurring the boundaries that traditionally separate academic disciplines. ASU serves more than 64,000 students in metropolitan Phoenix. The university champions intellectual and cultural diversity, and welcomes students from all fifty states and more than 100 nations across the globe.

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(U.S. News and World Report)

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To learn more about this critical defense program, visit **www.boeing.com/defense-space/space/gmd/index.html**

Please contact your local congressman to advocate full funding for the Ground-based Midcourse Defense Program, which is the nation's only defense against long-range ballistic missile attack and a growth engine for the Arizona economy. To find out how you can help or if you have questions, please contact:

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