IED Resistant Vehicles for Marines in Iraq

Recently, an internal Pentagon report identified a lack of understanding among mid-level Marine commanders about the impact of IEDs (Improvised Explosive Devices) on Marines in Iraq as the key reason for delays in purchasing IED resistant vehicles at $1 million each (see article below).

Your assignment is to develop visualizations to help those mid-level commanders understand the impact of IEDs on Marines serving in Iraq. Does it make sense to buy the expensive vehicles? What is the impact of delaying this decision? Are there alternative solutions?

Vehicle delay blamed for Marines' deaths

By RICHARD LARDNER, Associated Press Writer Sat Feb 16, 7:28 AM ET

WASHINGTON - Hundreds of U.S. Marines have been killed or injured by roadside bombs in Iraq because Marine Corps bureaucrats refused an urgent request in 2005 from battlefield commanders for blast-resistant vehicles, an internal military study concludes.

The study, written by a civilian Marine Corps official and obtained by The Associated Press, accuses the service of "gross mismanagement" that delayed deliveries of the mine-resistant, ambush-protected trucks for more than two years.

Cost was a driving factor in the decision to turn down the request for the so-called MRAPs, according to the study. Stateside authorities saw the hulking vehicles, which can cost as much as a $1 million each, as a financial threat to programs aimed at developing lighter vehicles that were years from being fielded.

After Defense Secretary Robert Gates declared the MRAP (pronounced M-rap) the Pentagon's No. 1 acquisition priority in May 2007, the trucks began to be shipped to Iraq in large quantities.

The vehicles weigh as much as 40 tons and have been effective at protecting American forces from improvised explosive devices (IEDs), the weapon of choice for Iraqi insurgents. Only four U.S. troops have been killed by such bombs while riding in MRAPs; three of those deaths occurred in older versions of the vehicles.

The study's author, Franz J. Gayl, catalogs what he says were flawed decisions and missteps by midlevel managers in Marine Corps offices that occurred well before Gates replaced Donald Rumsfeld in December 2006.

Among the findings in the Jan. 22 study:

- Budget and procurement managers failed to recognize the damage being done by IEDs in late 2004 and early 2005 and were convinced the best solution was adding more armor to the less-sturdy Humvees the Marines were using. Humvees, even those with extra layers of steel, proved incapable of blunting the increasingly powerful explosives planted by insurgents.

- An urgent February 2005 request for MRAPs got lost in bureaucracy. It was signed by then-Brig. Gen. Dennis Hejlik, who asked for 1,169 of the vehicles. The Marines could not continue to take "serious and grave casualties" caused by IEDs when a solution was commercially available, wrote Hejlik, who was a commander in western Iraq from June 2004 to February 2005.

Gayl cites documents showing Hejlik's request was shuttled to a civilian logistics official at the Marine Corps Combat Development Command in suburban Washington who had little experience with military vehicles. As a result, there was more concern over how the MRAP would upset the Marine Corps' supply and maintenance chains than there was in getting the troops a truck that would keep them alive, the study contends.

- The Marine Corps' acquisition staff didn't give top leaders correct information. Gen. James Conway, the Marine Corps commandant, was not told of the gravity of Hejlik's MRAP request and the real reasons it was shelved, Gayl writes. That resulted in Conway giving "inaccurate and incomplete" information to Congress about why buying MRAPs was not hotly pursued.
• The Combat Development Command, which decides what gear to buy, treated the MRAP as an expensive obstacle to long-range plans for equipment that was more mobile and fit into the Marines Corps' vision as a rapid reaction force. Those projects included a Humvee replacement called the Joint Light Tactical Vehicle and a new vehicle for reconnaissance and surveillance missions.

The MRAPs didn't meet this fast-moving standard and so the Combat Development Command didn't want to buy them, according to Gayl. The study calls this approach a "Cold War orientation" that suffocates the ability to react to emergency situations.

• The Combat Development Command has managers — some of whom are retired Marines — who lack adequate technical credentials. They have outdated views of what works on the battlefield and how the defense industry operates, Gayl says. Yet they are in position to ignore or overrule calls from deployed commanders.

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Associated Press researcher Monika Mathur contributed to this report from New York.

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Redesign of Minard’s French Invasion of Russia

Minard’s graph showing the consequences of Napoleon’s 1812 invasion has become a well know example of effective information design. It was created long after the failed invasion and disastrous retreat.

Your assignment is to redesign the visualization as forecast instead of a history. You are on Napoleon’s staff. He has just announced that the French army will attempt to take Moscow during the winter. What information do unit commanders need to know en route to the objective? What information will help them contingency plan in case the assault fails?
Napoleon’s March to Moscow  The War of 1812

This chart of Charles Joseph Minard (1781-1850), the French engineer, shows the terrible fate of Napoleon’s army in Russia. Described by R. J. Sayre in Sewing to the gun of the historian by its brutal toll, this combination of data map and time-series, drawn in 1869, portrays the devastating losses suffered in Napoleon’s Russian campaign of 1812. Beginning at the left on the Polish-Russian frontier near the Niemen River, the black band shows the size of the army (420,000 men) as it invaded Russia in June 1812. The width of the band indicates the size of the army at each place on the map. In September, the army reached Moscow, which was by then sacked and desolated, with 60,000 men. The path of Napoleon’s retreat from Moscow is depicted by the darker, broken band, which is linked to a temperature scale and dates at the bottom of the chart. It was a bitterly cold winter, and many froze on the march out of Russia. As the graphic shows, the crossing of the Berezina River was a disaster, and the army finally struggled back into Poland with only 10,000 men remaining. Also shown are the movements of auxiliary troops, as they sought to protect the rear and the flank of the advancing army. Minard’s graphic tells a rich, colored story with its multimodal data, far more enlightening than any single number bouncing along over time.

Six variables are plotted: the size of the army, its location on a two-dimensional surface, direction of the army’s movement, and temperature on various days during the retreat from Moscow. It may well be the best statistical graphic ever drawn.

U-M Research Activity Daily Brief

As Federal research dollars have become more scarce in recent years, academic research leadership have had to pay closer attention to the funding climate and their institutions position in an increasingly competitive landscape.

Your assignment is to design a web-based daily brief for the VP of Research and Research Administrative Deans. Is the information only internal? Is it only quantitative? What is the length of the decision making cycle?

Jan. 17, 2008

U-M research spending tops $800 million for first time

ANN ARBOR, Mich.—Research expenditures by the University of Michigan surpassed $800 million in fiscal year 2007, a 3.3 percent increase over the previous year and an all-time high, Vice President for Research Stephen Forrest told the Board of Regents Thursday at its monthly meeting.

The federal government provided 72.4 percent of the $823 million total. Investments by the University, industry, foundations and the state accounted for most of the rest.

While Forrest said he considers last year's 3.3 percent increase satisfactory, continued growth of the U-M's world-class research enterprise will require "a new funding model." Because federal research funding is likely to remain nearly stagnant for the foreseeable future, the University must begin to rely more heavily on partnerships with businesses and industry, he said.

By strengthening ties with the private sector, the University can secure its future as a research powerhouse while helping to revive Michigan's struggling economy. It is time "to give back to a state that has so generously supported us for nearly 200 years," Forrest said during his annual research report to the regents.

"We cannot delude ourselves into imagining that we will remain competitive in such a depressed regional economy," he said. "The University of Michigan, which is one of the most effective knowledge- and skill-generating machines in the world, can and must play a central role in the inevitable transformation from a manufacturing- to a knowledge-based economy."

The U-M consistently ranks among the nation's top four research universities, based on R&D expenditure statistics compiled by the National Science Foundation. But it ranks 19th on NSF's most recent list of industry-financed R&D at U.S. universities.

Those industry numbers must change, and some indicators suggest the shift has already begun, Forrest said.

U-M funding from industry was up 14.9 percent last year—from $33.6 million to $38.6 million—though it's too soon to say whether the increase reflects a year-to-year fluctuation or a trend. At the same time, disclosures of new technologies to the U-M Office of Technology Transfer rose 14 percent, and royalty revenues increased 18 percent.

Several recent U-M policy changes and Forrest-led initiatives aim to build on those achievements. They include:

- Last month's opening of the campus-based Business Engagement Center, which provides a single, visible point of entry for businesses and industry seeking U-M expertise.
- The launch of the Michigan Innovation and Entrepreneurship Initiative, which establishes a partnership between Michigan's state universities and philanthropic foundations.
- A policy shift that allows U-M inventors to share equity and royalties from companies holding licenses to their inventions, even if the inventor has a direct connection to the company.
- A reduction in the indirect cost rate for industrial contracts, so it matches the rate used for government contracts.
• A commitment to use the U-M administration’s entire share of licensing revenues to support collaborations with the private sector.

• The creation of the Distinguished University Innovator Award to recognize faculty for their work with the business sector.

"While we face a very challenging landscape in FY08—from an uncertain base of government funding to a state economy that is in urgent need of restructuring—I believe that we are entering a period of unprecedented opportunity," Forrest said.

"Our university has the possibility to leverage this situation to become the undisputed leader in academic research connected to industry."

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Related Categories: Institutional.
The University and the State Economy

As the Michigan economy weakens, state government leaders have called on the state’s three large research universities to play a larger role in the state’s economic recovery.

Your assignment is to design visualizations that would help university, government, and business leaders understand how the University affects the local and state economy and help them strategize about how the University could help power a state-wide economic recovery. How can the University be a better engine of innovation? How does innovation translate to real economic growth? How can an economy based on knowledge and innovation be sustained?

Nov. 28, 2006

MSU, U-M, Wayne State create University Research Corridor

Michigan State University, the University of Michigan and Wayne State University announced Tuesday the creation of the University Research Corridor, an ongoing alliance to work jointly to transform, strengthen and diversify Michigan’s economy.

The University Research Corridor universities are a magnet for investment and jobs, and bring more than $1.3 billion in federal research grants into Michigan each year. By marshalling their resources, the presidents of the three universities are reaching out to businesses, policymakers, innovators, investors and the public to speed up technology transfer, make resources more accessible and help attract new jobs to the state.

Over the past five years, the universities—which together bring 95 percent of federal academic research dollars to Michigan—have announced an average of one invention every day. Collectively these discoveries have led to more than 500 license agreements for new technologies and systems.

The corridor partners work in collaboration on many projects, among themselves and with business communities on topics ranging from technology transfer and commercialization to entrepreneurship and urban policy. Michigan’s resulting “brain gain” is a prime example of research as a magnet for economic development.

The goal of the URC is to enhance state and national competitiveness in an era of globalization, and to communicate the role and activities of the universities to improve their ability to engage in meaningful partnerships.

"We have an absolute responsibility to the state to help transform an economy that is flagging," said U-M President Mary Sue Coleman. "Together we have achieved much. But we must set our sights higher and do even more to turn ideas into action."

Research Corridor universities spark regional economic development via invention, innovation, technology transfer and by attracting smart and talented people to our state. The presidents stressed their commitment to the state’s success and creating a Michigan that sustains a high quality of life.

"Our three universities continue to give Michigan a body of educated, responsible citizens who contribute to the state’s cultural, social and economic life in myriad ways from curing the sick to feeding the world," said Wayne State University President Irvin D. Reid.
Each year, the universities produce more than 26,000 graduates, including 3,800 new engineers, 1,300 PhDs, 1,400 MBAs, more than 1,000 new doctors and nurses and 54 percent of the science and engineering graduates. Together, they have more than 1 million living alumni, including more than 100 CEOs of major companies in metro Detroit.

The University Research Corridor partners will provide tools and university resources to improve their outreach and collaborative efforts. The presidents also announced the launch of a joint Web site, www.urcmich.org, to make their efforts and resources more easily accessible and understandable to the public, and to give stakeholders the means to more easily locate potential partners within the universities.

"Our research universities are creators of knowledge and generate the innovations, the new technologies, and the new businesses that not only provide jobs, but also improve life for all citizens of Michigan," said MSU President Lou Anna Simon.

Detroit News columnist Dan Howes has argued that "all the right tools are here" for an economic comeback, calling the three universities "the closest thing Michigan has to Silicon Valley—an intellectual powerhouse."

The three are working to develop the state's most promising growth sectors, including alternative energy, medicine, life sciences, nanotechnology, homeland security and transportation.

The University Research Corridor builds on the foundation of the 1999 Life Sciences Corridor initiative where the three collaborated to help develop a new industry from the ground up. The three constitutionally autonomous universities are each involved with projects across the state, with impact reaching around the globe.

Last year, the U.S. Base Realignment and Closure Commission (BRAC) decided to retain 4,100 jobs at the Detroit Arsenal in Warren, home of TACOM and to bring an additional 1,000 jobs here because of the area’s convergence of transportation experts from universities and private industry. Meanwhile, new Michigan employers like Toyota, Google and Hyundai said proximity to local research universities was one of the main reasons they moved here.

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