

Since that first fatal detonation of what is now known as an improvised explosive device, more than \$1,000 IED attacks have occurred in Iraq, including 25,000 so far this year, according to U.S. military sources. The war has indeed metastasized into something "completely different," a conflict in which the roadside bomb in its many variants -- including "suicide, vehicle-borne" -- has become the signature weapon in Iraq and Afghanistan, as iconic as the machine gun in World War I or the laserguided "smart bomb" in the Persian Gulf War of 1991.



have caused nearly two-thirds of the 3,100 American combat deaths in Iraq, and an even higher proportion of battle wounds. This year alone, through mid-July, they have also resulted in an estimated 11,000 Iraqi civilian casualties and more than 600 deaths among Iraqi security forces. To the extent that the United States is not winning militarily in Iraq. the roadside bomb, which as of Sept. 22 had killed or wounded 21,200 Americans, is both a proximate cause and a metaphor for the miscalculation and improvisation that have characterized the war.

The battle against this weapon has been a fitful struggle to regain the initiative -- a relentless cycle of measure, countermeasure and counter-countermeasure -- not only by discovering or neutralizing hidden bombs, the so-called fight at the roadside, but also by trying to identify and destroy the shadowy network of financiers, strategists, bombmakers and emplacers who have formed at least 160 insurgent cells in Iraq, according to a senior Defense Department official. But despite nearly \$10 billion spent in the past four years by the department's main IED-fighting agency, with an additional \$4.5 billion budgeted for fiscal 2008, the IED remains "the single most effective weapon against our deployed forces," as the Pentagon acknowledged this year.

As early as 2003, Army officers spoke of shifting the counter-IED effort "left of boom" by disrupting insurgent cells before bombs are built and planted. Yet U.S. efforts have focused overwhelmingly on "right of boom" -- by mitigating the effects of a bomb blast with heavier armor, sturdier vehicles and better trauma care -- or on the boom itself, by spending, for example, more than \$3 billion on 14 types of electronic jammers that sometimes also jammed the radios of friendly forces

For years the counter-IED effort was defensive, reactive and ultimately inadequate, driven initially by a presumption that IEDs were a passing nuisance in a short war, and then by an abiding faith that science would solve the problem.

"Americans want technical solutions. They want the silver bullet," said Rear Adm. Arch Macy, commander of the Naval Surface Warfare Center in Washington, which now oversees several counter-IED technologies. "The solution to IEDs is the whole range of national power --political-military affairs, strategy, operations, intelligence."

The costly and frustrating struggle against a weapon barely on the horizon of military planners before the war in Iraq provides a unique lens for examining what some Pentagon officials now call the Long War, and for understanding how the easy victory of 2003 became the morass of 2007.

This introduction and the four-part narrative that follows are drawn from more than 140 interviews with military and congressional officials, contractors, scientists, and defense analysts in Iraq, Afghanistan, Washington and elsewhere. Most agreed to speak candidly only on the condition of anonymity, because of the sensitivity of the subject, or because they are not authorized to comment. Ten senior officers or retired officers, each of them intimately. involved in the counter-IED fight, were asked to review the findings for accuracy and security considerations.

As U.S. casualties spiraled from dozens to hundreds to many thousands, the quest for IED countermeasures grew both desperate and ingenious. Honeybees and hunting dogs searched for explosives. Soldiers fashioned makeshift "hillbilly armor." Jammers proliferated, with names like Warlock, Chameleon, Acorn and Duke. Strategists concocted bomb-busting techniques, such as "IED Blitz" and "backtracking" and "persistent stare."

Yet bombs continued to detonate, and soldiers kept dying. The 100 or so daily IED "events". -- bombs that blow up, as well as those discovered before they detonate -- have doubled since the 50 per day typical in January 2006. The 3,229 IEDs recorded in March of this year put the monthly total in Iraq above 3,000 for the first time, a threshold also exceeded in May and June. "The numbers," one Army colonel said, "are astonishing."

