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Improvised Explosive Devices

In Southern Afghanistan and Western Pakistan, 2002-2009

Alec D. Barker, April 2010

Introduction

This study examines the specific attributes of violence observed in the Afghan provinces of Kandahar, Helmand, and Nimroz, and much of the Pakistani province of Balochistan between January 1, 2002, and June 30, 2009, in an effort to understand how the Taliban have sought to reclaim power in Afghanistan following their hasty evacuation of Kandahar in late 2001.[1] In particular, we canvass the phenomenon of the homemade bomb, known in American military-technical parlance as the improvised explosive device, or IED. Though this effort is primarily concerned with instances of violence committed by the Taliban or their affiliates, it investigates any attack in which the perpetrator may be unknown but for which Taliban responsibility is plausible.[2]

Whereas prior analyses may have considered IEDs in the abstract, or assessed the impact of a particular IED type (such as suicide devices), this project examines all IED trends in detail sufficient to describe methods of construction and operation, lethality, frequency distribution, and geospatial disposition over time. To accomplish these ends, the study uses, merges, and analyzes four distinct data sets: two open-source terrorism databases, one government geospatial information database, and one private intelligence database accessed by special arrangement with the author. This effort also employs geospatial statistical techniques including kernel density estimation, resulting in a set of 42 maps illustrating IED trends.[3] The maps are presented in Appendix 1. Detailed descriptions of the data, including its limitations, and methodology employed are presented in Appendices 2 and 3, respectively.

From 2004 to 2009, at least two distinct bombing campaigns, one perpetrated by the Taliban in Afghanistan and parts of Balochistan and another by Baloch separatists in Pakistan, have consistently grown in momentum.

We found a general and continual increase in the prevalence and effectiveness (measured in terms of dead and wounded) of IED events across southern Afghanistan and western Pakistan from 2004 to 2009. At least two distinct bombing campaigns, one perpetrated by the Taliban in Afghanistan and parts of Balochistan and another by Baloch separatists in Pakistan, have consistently grown in momentum. Though these campaigns overlap in Balochistan's capital, Quetta, each may be distinguished from the other by tactic, technique, and care to avoid loss of life: The Taliban prefer command-initiated attacks against

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military and government personnel in which collateral casualties are tolerated, while the Baloch separatists adhere to a pattern of time-initiated attacks against infrastructure in which casualties are avoided.

Kandahar province had been the location most prone to IED violence until early 2009, when it was overtaken by Helmand province in this regard, indicating a shift in the operational emphasis of the Taliban toward the U.S. and British forces operating there. Though northern Nimroz province has experienced fewer events, the area between towns of Zaranj and Delaram has seen a spate of highly effective suicide attacks against government entities, this despite the absence of troops from the International Security Assistance Force. Other patterns include attacks against Indian interests in Nimroz province and anti-Shiite attacks in Balochistan.

This study both acknowledges and scrutinizes the so-called "Iraq effect," which posits a central role for veterans of the Iraq insurgency in the evolution of Taliban IED tactics, techniques, and procedures (TTPs) in Afghanistan. Without debunking the Iraq effect, we find additional causes and contributing factors – such as the influence of Kashmiri fighters – as well as instances in Afghanistan and Pakistan that predated or conflicted with those in Iraq. While acknowledging local reasons for bombings and bomb innovation, we also suggest a phenomenon of generalized and global TTP acceleration in which generations of terrorists and insurgents take progressively shorter periods of time to accomplish advances in IED TTPs, supported by information-sharing and training among fighters and improvements in available components.

One might ask why it is necessary to study what is fundamentally a weapon or, better, why focus on a technology of warfare rather than the reasons, personalities, politics, and decisions behind the war. What, after all, is the substantive difference between an IED and a line of Napoleonic cavalry in the context of an analysis aimed at shedding light on the strategic nature of a war or improving policy? We suggest that an exclusive focus on strategic and operational factors, devoid of the study of weapons, tactics, and fighters, provides only a disjointed, partial, and low-resolution understanding of any conflict.

Further, the insurgents who have used IEDs in last few decades have successfully introduced a model for strategic competition that is unusual because it permits non-state actors with minimal resources to effectively challenge powerful states. Though IEDs are not a new development in warfare, their effect before the late 1970s – and the development of the suicide car bomb by the forerunners of Hezbollah – was more or less tactical. More recently, however, the clever, sustained, and adaptive use of IEDs, exploiting consumer and information technologies to maximize versatility and propaganda effect, has cheaply and effectively imposed enormous costs that present burdensome implications for American strategy, policy, and programs. Since 2003, the U.S. Department of Defense has spent at least $17.5 billion on technology and training, built a massive new military bureaucracy, and established unconventional processes for introducing new programs, all in response to the problems presented by insurgent and terrorist usage of IEDs.[4] Above all else, the United States has accepted engagement in two costly counterinsurgency campaigns characterized by the imperative to suppress IEDs. Non-state actors that use IEDs now believe they can cause the general exhaustion of resources as well as overall collapse in the states and governments they oppose.[5]

The IED phenomenon has driven a larger debate about the proper focus for American military strategy.

The IED phenomenon has driven a larger debate about the proper focus for American military strategy.[6] The debate pits traditional viewpoints, which espouse dominance in conventional conflicts with competitor states, against realizations – driven by the experience of IEDs in Iraq and Afghanistan – that conflicts with non-state actors involving

counterinsurgency, stability, security, and special operations will be increasingly more likely. For now, the debate has resulted in the decision to cultivate a balance in the national ability to cope simultaneously with all of these threats, forcing a reassessment of the inescapable tradeoffs in capability.[7]

While it may seem useful enough for purposes of making strategy and policy to understand that violence is increasing or decreasing in severity or frequency here or there, there is particular utility in understanding the specific nature of the violence applied. Knowing what weapons are used, how they are composed, and what tactics, techniques, and procedures a fighter uses can help illuminate, among other things, who is perpetrating the violence, who is supporting the perpetrators, where they derive material support, and what they hope to achieve. These facts, when established, can provide valuable guidance to policymakers; when they are left assumed or extrapolated, policy may run awry of the evidence.

Findings

The study found 1,803 unique events (See Table 1). These include instances where IEDs or components were discovered and/or disarmed before detonation as well as successful attacks.[8] Fewer than 40 events occurred in southern Afghanistan in the first three years following the 2001 fall of the Taliban, with about 80 percent of these occurring in Kandahar province, historically a Taliban stronghold. There were 174 events on the Pakistani side of the Durand Line in the years 2002-05, accounting for a majority -- 62 percent -- of all events observed during that period. See Maps 1-8 for estimations of all events.

In 2006, events in the three provinces of southern Afghanistan increased by 249 percent with respect to the previous year, while events in Balochistan province increased only 40 percent. By 2007, events in Pakistan fell – for the first time in at least five years – by a third, while in Afghanistan events increased by just under a third, from 169 to 221. IED activity in Helmand and Kandahar provinces increased rapidly in 2008, and set a doubling pace across southern Afghanistan in the first six months of 2009. Overall, events on both sides of the border have increased by at least 40 percent every year except 2007, when observations held steady at just above 340 before jumping to 480 the next year.

Table 1. All Events by Province, 2002-2009

***2009 records include observations between 1/1/2009 and 6/30/2009.**

	Balochistan, PK	Helmand, AF	Kandahar, AF	Nimroz, AF	Total
2002	2	0	2	0	4
2003	11	1	16	0	28
2004	33	4	14	0	51
2005	128	19	47	2	196
2006	180	39	124	6	349
2007	120	76	138	7	341
2008	165	115	180	20	480
2009*	62	114	168	10	354
Total	701	368	689	45	1803

Table 2 displays the number of events and total allied, government, and/or civilian victims per year (wounded and dead) by province and administrative district. For purposes of this study, casualty figures do not include Taliban insurgents or other extremists killed or injured while perpetrating attacks.

There have been at least 6,201 allied, government, and/or civilian dead and wounded as a result of all IED events in the period studied. Of these, 4,804, or 77.5 percent, occurred in Afghanistan rather than Pakistan. Nearly half of all casualties occurred in Kandahar province, and 18 percent and 13 percent of all events in the region occurred in the two large city districts of Kandahar and Quetta, respectively. Lashkar Gah in Helmand province was particularly hard hit in 2006, averaging 15.3 casualties per attack that year. See Maps 9-16 for estimations of lethal IED events.

Table 2. Events† and Victims by District, 2002-2009

*2009 records include observations between 1/1/2009 and 6/30/2009

† Events include devices found and cleared

		2002		2003		2004		2005		2006		2007		2008		2009*		Total	
Province	District	Events	Victims	Events	Victims	Events	Victims	Events	Victims	Events	Victims	Events	Victims	Events	Victims	Events	Victims	Events	Victims
Balochistan, PK	Unknown	0	0	0	0	0	0	3	0	4	7	5	16	2	14	1	14	15	51
	Barkhan	0	0	0	0	0	0	4	0	6	15	0	0	2	0	0	0	12	15
	Bolan	0	0	0	0	1	0	19	6	13	7	4	0	3	5	0	0	40	18
	Chagai	0	0	0	0	1	2	13	5	15	11	1	0	9	14	1	0	40	32
	Dera Bugti	1	0	1	0	4	19	1	0	54	61	37	91	53	40	26	15	177	226
	Kalat	0	0	0	0	1	10	14	2	6	11	6	0	7	5	2	15	36	43
	Kharan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
	Kohlu	1	0	0	0	2	4	10	4	10	32	3	0	11	13	1	0	38	53
	Loralai	0	0	0	0	0	0	1	3	0	0	0	0	2	2	0	0	3	5
	Mastung	0	0	0	0	0	0	8	10	15	1	17	3	8	17	1	0	49	31
	Pishin	0	0	0	0	0	0	1	2	0	0	1	0	0	0	1	18	3	20
	Qila Abdullah	0	0	3	9	1	3	4	29	2	2	3	4	2	2	1	0	16	49
	Qilla Saifullah	0	0	0	0	0	0	0	0	0	0	1	11	0	0	0	0	1	11
	Quetta	0	0	7	118	23	214	43	5	44	197	34	105	64	169	27	19	242	827
	Sibi	0	0	0	0	0	0	7	11	10	0	8	2	1	0	0	0	26	13
	Ziarat	0	0	0	0	0	0	0	0	1	3	0	0	1	0	0	0	2	3
	Sub Total	2	0	11	127	33	252	128	77	180	347	120	232	165	281	62	81	701	1397
Helmand, AF	Unknown	0	0	0	0	1	0	5	13	5	17	8	13	18	31	7	28	44	102
	Dishu	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	1	3
	Garmsir	0	0	0	0	0	0	1	11	3	9	1	8	4	3	8	14	17	45
	Kajaki	0	0	0	0	0	0	1	0	1	3	1	2	7	14	7	1	17	20
	Lashkar Gah	0	0	0	0	1	1	4	6	10	153	12	55	15	73	24	120	66	408
	Musa Qaleh	0	0	0	0	0	0	0	0	0	0	2	0	8	65	11	13	21	78
	Nad Ali	0	0	1	15	0	0	0	0	2	9	8	47	10	31	18	40	39	142
	Nahr-i-saraj	0	0	0	0	2	0	4	18	14	29	31	230	29	156	23	216	103	649
	Nawa	0	0	0	0	0	0	0	0	1	2	0	0	1	2	1	0	3	4
	Now Zad	0	0	0	0	0	0	1	4	0	0	0	0	2	6	1	7	4	17
	Reg	0	0	0	0	0	0	1	4	0	0	0	0	0	0	1	0	2	4
	Sangin	0	0	0	0	0	0	1	2	2	6	13	35	21	26	13	12	50	81
	Washir	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
	Sub Total	0	0	1	15	4	1	19	61	39	228	76	390	115	407	114	451	368	1553
Kandahar, AF	Unknown	0	0	0	0	0	0	7	109	8	31	19	40	10	22	7	16	51	218
	Arghandab	0	0	0	0	0	0	1	15	2	1	9	35	16	165	13	30	41	246
	Arghestan	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0
	Daman	0	0	0	0	0	0	3	4	12	55	2	1	3	9	4	7	24	76
	Dand	0	0	0	0	0	0	0	0	0	0	0	0	3	0	10	0	13	0
	Ghorak	0	0	0	0	0	0	0	0	0	0	1	15	0	0	0	0	1	15
	Kalat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
	Kandahar	2	8	12	94	12	64	19	103	48	276	39	127	54	245	76	191	262	1108
	Khakriz	0	0	0	0	0	0	0	0	3	19	3	5	1	0	1	7	8	31
	Maruf	0	0	0	0	1	7	1	0	0	0	1	0	0	0	0	0	3	7
	Maywand	0	0	0	0	0	0	3	4	7	22	4	22	12	45	18	39	44	132
	Panjvay'i	0	0	1	3	0	0	2	2	18	70	29	81	38	106	18	38	106	300
	Reg	0	0	0	0	0	0	0	0	0	0	4	19	0	0	1	2	5	21
	Sangin	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	1	2
	Shah Wali Kot	0	0	0	0	0	0	3	14	11	39	5	13	4	27	8	21	31	114
	Shorawak	0	0	1	3	0	0	1	5	4	65	8	37	10	56	5	26	29	192
	Spin Boldak	0	0	2	22	1	3	7	15	9	58	13	97	29	287	6	27	67	509
	Sub Total	2	8	16	122	14	74	47	271	124	638	138	492	180	962	168	405	689	2972
Nimroz, AF	Unknown	0	0	0	0	0	0	1	0	1	1	1	8	3	6	0	0	6	15
	Delaram	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	3
	Kang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
	Khash Rud	0	0	0	0	0	0	0	0	3	17	1	11	9	50	4	6	17	84
	Zaranj	0	0	0	0	0	0	1	7	2	2	5	26	8	92	4	50	20	177
	Sub Total	0	0	0	0	0	0	2	7	6	20	7	45	20	148	10	59	45	279
	Total	4	8	28	264	51	327	196	416	349	1233	341	1159	480	1798	354	996	1803	6201

Among districts with at least 20 IED events through the whole period, Arghandab (Kandahar), Lashkar Gah (Helmand), Nahr-i-saraj (Helmand), Shorawak (Kandahar), Spin Boldak (Kandahar), and Zaranj (Nimroz) all experienced an average of six casualties or more per event; Zaranj had the highest figure, 8.9 casualties per event.

Nine of the 10 districts with the highest average casualties per event were in Afghanistan. The districts experiencing the highest occurrence of IED casualties are ranked in Table 3, while the districts with the highest average victims per event are ranked in Table 4.

Table 3. IED Casualties by District

Rank	District, Province, Country	Victims
1	Kandahar, Kandahar, AF	1108
2	Quetta, Balochistan, PK	827
3	Nahr-i-saraj, Helmand, AF	649
4	Spin Boldak, Kandahar, AF	509
5	Lashkar Gah, Helmand, AF	408
6	Panjvay'i, Kandahar, AF	300
7	Arghandab, Kandahar, AF	246
8	Dera Bugti, Balochistan, PK	226
9	Shorawak, Kandahar, AF	192
10	Zaranj, Nimroz, AF	177

Table 4. Average Casualties Per IED Event, by District

Rank	District, Province, Country	Average Victims per Event
1	Zaranj, Nimroz, AF	8.9
2	Spin Boldak, Kandahar, AF	7.6
3	Shorawak, Kandahar, AF	6.6
4	Nahr-i-saraj, Helmand, AF	6.3
5	Lashkar Gah, Helmand, AF	6.2
6	Arghandab, Kandahar, AF	6.0
7	Quetta, Balochistan, PK	4.2
8	Musa Qaleh, Kandahar, AF	3.7
9	Shah Wali Kot, Kandahar, AF	3.6
10	Nad Ali, Helmand, AF	3.6

Excluding 2002, 2004 was the year with the highest ratio of wounded survival to deaths; 75 percent of total victims, or 246 of 327, survived detonation with injuries. This rate of injured survival steadily declined over the next four-and-a-half years, to 59 percent in the first half of 2009. Generally speaking, IED events have gradually become more lethal across the studied area since the beginning of 2004. Over the whole period, 64 percent of those exposed to IED blasts were wounded rather than killed. See Table 5.

The most hazardous years in southern Afghanistan and western Pakistan in terms of IED casualties were 2008, with 1,798 dead and wounded, and 2006, with 1,233 total casualties. The years 2008 and 2007, however, were the most deadly. Nearly one-third of all fatal IED events in the period studied occurred in 2008, and fatalities in 2009 are on pace to exceed the 2008 count by more than 100.

In the districts studied in Pakistan's Balochistan province, IED risk peaked in 2006, with 25 percent of all victims and 21 percent of provincial fatalities experienced that year. Of all four provinces examined, Balochistan province universally

Table 5. Casualty Type Per Year, 2002-2009

	All Locations								
	Wounded			Dead			Total Victims		
	Total	Average per event	Cumulative %	Total	Average per event	Cumulative %	Total	Average per event	Cumulative %
2002	8	2	0.2	0	0	0	8	2	0.13
2003	150	6	3.79	114	4.56	5.08	264	10.56	4.26
2004	246	5.13	6.22	81	1.69	3.61	327	6.81	5.27
2005	288	1.51	7.28	128	0.67	5.7	416	2.18	6.71
2006	843	2.56	21.31	390	1.19	17.37	1233	3.75	19.88
2007	754	2.41	19.06	405	1.29	18.04	1159	3.7	18.69
2008	1081	2.53	27.33	717	1.68	31.94	1798	4.2	29
2009*	586	1.98	14.81	410	1.39	18.26	996	3.36	16.06
Total	3956	2.42	100	2245	1.37	100	6201	3.79	100

*2009 records include observations between 1/1/2009 and 6/30/2009

exhibits rates of wounded survival that exceed rates of death. Across the entire period 2002-09, averages in Balochistan were 0.5 deaths per event and 1.6 wounded per event.

Helmand province in Afghanistan accounts for one-quarter of all IED-related casualties observed. In the first half of 2009 alone, reports of allied, government, and/or civilian dead and wounded due to IEDs already exceeded the total for 2008, the year with the previous record of Helmand-area IED hazard and lethality. Most measures of IED lethality in Helmand have risen since 2004.

Kandahar leads all four provinces with 48 percent of total casualties. Casualty tallies in the province outpaced those in the two other Afghan provinces from 2002 to 2008, reaching their apex in 2008 before falling off in the first half of 2009, when Helmand experienced the most casualties. Average fatalities per event also dropped from a high of 2.76 in 2008 to a low of 1.34 in the first six months of 2009.

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Nimroz province has seen less than 5 percent of all casualties, but the relatively few events that have been reported have been very hazardous. Nimroz leads the entire area of study with per-event averages of 3.74 wounded, 2.74 dead, and 6.49 total casualties. There were only seven casualties in the province before 2006; since then, IEDs have killed or wounded 272. Provincial statistics regarding lethality effects per event are presented in Table 6 on the following page.

There were 285 suicide events in the study, including all person-borne, vehicle-borne, and aborted or foiled suicide attacks (see Table 7 on Page 8). Suicide events carried a much higher average of victims per event – 9.85 – than all IED events, which produced 3.79 victims on average. Yet this is overall much lower than the casualties typically caused by suicide bombings in other conflicts, which according to some estimates total about 43 per attack.[9]

Balochistan province experienced very high rates of casualties due to suicide events, averaging 26 per event, owing mostly to a handful of deadly events in 2003, 2004, and 2007. Though suicide attacks were not entirely foreign to the region before 2005, suicide events on the Afghan side of the border did not begin in earnest until June 2005 in Kandahar. A wave of 62 suicide events befell the province in 2006, producing 443 dead and wounded, and in 2008 suicide IED-related casualties there topped 500.

As of the first half of 2009, Helmand province led all others in suicide event casualties, with 234 in 15 events. In Nimroz province, suicide attacks accounted for 84 percent of all IED-related casualties in 2002-09. See Maps 17-23 for estimations of suicide events.

Open-source information proved of limited utility in determining the specific tactics, techniques, or procedures used by those employing IEDs (see Table 8 on Page 9). Of all records examined, 48 percent did not provide sufficient information to determine the method of initiation, for example. Tallies of a few IED types – especially victim-operated IEDs (VOIEDs, commonly known as booby traps) and command wire IEDs (CWIEDs) – appear artificially low, given official statements and anecdotal evidence. For example, the study found only 56 VOIED and 11 CWIED observations; however, the U.S. Joint IED Defeat Organization notes in its 2008 annual report that these IED types are very common and effective in Afghanistan.[10]

In many cases where command wire may be reasonably suspected, reporting was sufficient only to determine that devices were initiated by command method, lacking the specificity to assess whether wire – or indeed electricity – was the technique of initiation. Map 24 presents estimation of unknown IED events.

Table 6. Casualty Type by Province, Per Year, 2002-2009

*2009 records include observations between 1/1/2009 and 6/30/2009.

	Balochistan, PK											
	Wounded				Dead				Total Victims			
	Sum	Average	%	% of All Events	Sum	Average	%	% of All Events	Sum	Average	%	% of All Events
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	65	7.22	6	1.64	62	6.89	19.75	2.76	127	14.11	9.09	2.05
2004	195	6.29	18.01	4.93	57	1.84	18.15	2.54	252	8.13	18.04	4.06
2005	62	0.49	5.72	1.57	15	0.12	4.78	0.67	77	0.61	5.51	1.24
2006	281	1.63	25.95	7.1	66	0.38	21.02	2.94	347	2.02	24.84	5.6
2007	172	1.52	15.88	4.35	60	0.53	19.11	2.67	232	2.05	16.61	3.74
2008	241	1.56	22.25	6.09	40	0.26	12.74	1.78	281	1.82	20.11	4.53
2009*	67	1.12	6.19	1.69	14	0.23	4.46	0.62	81	1.35	5.8	1.31
Total	1083	1.62	100	27.38	314	0.47	100	13.99	1397	2.09	100	22.53
	Helmand, AF											
	Wounded				Dead				Total Victims			
	Sum	Average	%	% of All Events	Sum	Average	%	% of All Events	Sum	Average	%	% of All Events
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	15	15	2.31	0.67	15	15	0.97	0.24
2004	1	0.33	0.11	0.03	0	0	0	0	1	0.33	0.06	0.02
2005	34	2	3.77	0.86	27	1.59	4.15	1.2	61	3.59	3.93	0.98
2006	131	3.74	14.51	3.31	97	2.77	14.92	4.32	228	6.51	14.68	3.68
2007	264	3.88	29.24	6.67	126	1.85	19.38	5.61	390	5.74	25.11	6.29
2008	225	2.21	24.92	5.69	182	1.78	28	8.11	407	3.99	26.21	6.56
2009*	248	2.51	27.46	6.27	203	2.05	31.23	9.04	451	4.56	29.04	7.27
Total	903	2.78	100	22.83	650	2	100	28.95	1553	4.78	100	25.04
	Kandahar, AF											
	Wounded				Dead				Total Victims			
	Sum	Average	%	% of All Events	Sum	Average	%	% of All Events	Sum	Average	%	% of All Events
2002	8	4	0.44	0.2	0	0	0	0	8	4	0.27	0.13
2003	85	5.67	4.7	2.15	37	2.47	3.18	1.65	122	8.13	4.1	1.97
2004	50	3.57	2.76	1.26	24	1.71	2.06	1.07	74	5.29	2.49	1.19
2005	187	4.07	10.34	4.73	84	1.83	7.22	3.74	271	5.89	9.12	4.37
2006	419	3.58	23.16	10.59	219	1.87	18.83	9.76	638	5.45	21.47	10.29
2007	286	2.29	15.81	7.23	206	1.65	17.71	9.18	492	3.94	16.55	7.93
2008	539	3.52	29.8	13.62	423	2.76	36.37	18.84	962	6.29	32.37	15.51
2009*	235	1.85	12.99	5.94	170	1.34	14.62	7.57	405	3.19	13.63	6.53
Total	1809	3.02	100	45.73	1163	1.94	100	51.8	2972	4.96	100	47.93
	Nimroz, AF											
	Wounded				Dead				Total Victims			
	Sum	Average	%	% of All Events	Sum	Average	%	% of All Events	Sum	Average	%	% of All Events
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0
2005	5	2.5	3.11	0.13	2	1	1.69	0.09	7	3.5	2.51	0.11
2006	12	2.4	7.45	0.3	8	1.6	6.78	0.36	20	4	7.17	0.32
2007	32	4.57	19.88	0.81	13	1.86	11.02	0.58	45	6.43	16.13	0.73
2008	76	4	47.2	1.92	72	3.79	61.02	3.21	148	7.79	53.05	2.39
2009*	36	3.6	22.36	0.91	23	2.3	19.49	1.02	59	5.9	21.15	0.95
Total	161	3.74	100	4.07	118	2.74	100	5.26	279	6.49	100	4.5

Table 7. Suicide Events by Province, Per Year, 2003-2009

*2009 records include observations between 1/1/2009 and 6/30/2009

	Balochistan, PK			Helmand, AF			Kandahar, AF			Nimroz, AF			Total		
	Suicide Events	Victims	Average Victims	Suicide Events	Victims	Average Victims	Suicide Events	Victims	Average Victims	Suicide Events	Victims	Average Victims	Suicide Events	Victims	Average Victims
2003	1	106	106	0	0	0	0	0	0	0	0	0	1	106	106
2004	1	174	174	0	0	0	0	0	0	0	0	0	1	174	174
2005	1	0	0	1	4	4	13	111	8.54	0	0	0	15	115	7.67
2006	3	12	4	10	145	14.5	62	443	7.15	2	12	6	77	612	7.95
2007	2	73	36.5	30	214	7.13	37	195	5.27	3	34	11.33	72	516	7.17
2008	5	42	8.4	23	155	6.74	34	501	14.74	12	131	10.92	74	829	11.2
2009*	4	36	9	15	234	15.6	18	130	7.22	8	56	7	45	456	10.13
Total	17	443	26.06	79	752	9.52	164	1380	8.41	25	233	9.32	285	2808	9.85

Regardless, there are some important observations to draw from the limited results available. About 13 percent of all events were in some way discovered before a bomb was set off, with the number of averted explosions increasing dramatically in Kandahar province in the first six months of 2009. Overall, about 22 percent of the events in the first half of 2009 were foiled attacks. See Map 25.

About 13 percent of all events were in some way discovered before a bomb was set off, with the number of averted explosions increasing dramatically in Kandahar province in the first six months of 2009.

Unsurprisingly, the roadside bomb, or anti-vehicular IED, was by volume quite prominent among all IED types. Events in which the bomber's intent was to destroy a vehicle -- be it moving, parked, vacant, or occupied -- were counted as anti-vehicular IED events.

About 20 percent of all IEDs were counted among this type, and their number has increased every year since they first appeared in 2003. Map 26 shows a prevalence of roadside IEDs along the route from Qila Abdullah, Pakistan, through Spin Boldak, Afghanistan, and on to Kandahar.

Although anti-infrastructure devices initiated by time delay tallied above 12 percent of all observations, their geographic distribution was almost exclusively limited to Balochistan province. These events included attacks in which a bomb primarily damaged or sabotaged a piece of infrastructure such as a bridge, utility installation, railway, or public building. These devices averaged about 0.1 victims (dead and/or wounded) per event, which suggests that the bombers generally intended to avoid human casualties. Maps 27, 28, and 29 illustrate the preference for these types of devices on the Pakistani side of the border.

Radio controlled IEDs (RCIEDs) have been present and effective in the area of study since at least 2004 (see Map 30 for an estimation of events before 2007). Although according to this study their volume peaked in 2006 and in Kandahar province, they have been most effective on a casualties-per-attack basis in Helmand and Balochistan provinces in recent years (see Map 31 for an estimation of events 2007-09). RCIEDs have remained a fixture across the region, especially when Afghan civilians or security and government officials are targeted.

Suicide attacks generally occur in two styles: the car bomb and the suicide vest. No clear pattern of preference emerges with respect to either technique, though it appears that attacks using suicide vehicle-borne IEDs (SVBIEDs) declined from 2006 to 2009.

Table 8. IEDs by Selected Tactic, Technique, or Procedure, by Province, 2002-2009

	IEDs with Unknown Initiation‡								Total	
	Balochistan, PK		Helmand, AF		Kandahar, AF		Nimroz, AF			
	Events	Victims	Events	Victims	Events	Victims	Events	Victims	Events	Victims
2002	1	0	0	0	2	8	0	0	3	8
2003	7	118	1	15	4	25	0	0	12	158
2004	7	197	2	0	3	10	0	0	12	207
2005	13	43	7	24	18	150	0	0	38	217
2006	45	159	18	169	59	414	2	12	124	754
2007	66	161	53	270	94	347	3	34	216	812
2008	30	88	75	257	121	735	11	122	237	1202
2009*	15	44	77	320	128	272	10	59	230	695
Total	184	810	233	1055	429	1961	26	227	872	4053

	IEDs Found and Cleared								Total	
	Balochistan, PK		Helmand, AF		Kandahar, AF		Nimroz, AF			
	Events	Victims	Events	Victims	Events	Victims	Events	Victims	Events	Victims
2003	2	0	0	0	1	0	0	0	3	0
2004	2	0	1	0	1	0	0	0	4	0
2005	2	0	3	2†	2	0	0	0	7	2†
2006	9	0	5	0	14	0	2	0	30	0
2007	8	0	11	0	18	0	0	0	37	0
2008	19	0	14	0	36	0	1	0	70	0
2009*	2	0	19	0	57	0	1	0	79	0
Total	44	0	53	2†	129	0	4	0	230	2†

	Anti-Vehicular IEDs								Total	
	Balochistan, PK		Helmand, AF		Kandahar, AF		Nimroz, AF			
	Events	Victims	Events	Victims	Events	Victims	Events	Victims	Events	Victims
2003	2	12	0	0	1	3	0	0	3	15
2004	4	22	1	1	2	10	0	0	7	33
2005	5	19	6	15	10	40	0	0	21	74
2006	9	54	12	47	34	158	3	8	58	267
2007	10	38	22	67	54	200	3	11	89	316
2008	6	29	37	113	66	272	1	0	110	414
2009*	1	5	32	91	38	125	1	3	72	224
Total	37	179	110	334	205	808	8	22	360	1343

	Time-Initiated, Anti-Infrastructure IEDs								Total	
	Balochistan, PK		Helmand, AF		Kandahar, AF		Nimroz, AF			
	Events	Victims	Events	Victims	Events	Victims	Events	Victims	Events	Victims
2003	1	0	0	0	0	0	0	0	1	0
2004	4	0	0	0	0	0	0	0	4	0
2005	43	2	0	0	0	0	0	0	43	2
2006	81	9	0	0	0	0	0	0	81	9
2007	15	10	0	0	0	0	0	0	15	10
2008	50	2	0	0	0	0	0	0	50	2
2009*	22	0	1	0	2	0	0	0	25	0
Total	216	23	1	0	2	0	0	0	219	23

‡Includes IEDs for which method of initiation could not be established using open sources

*2009 records include observations between 1/1/2009 and 6/30/2009

†Includes two demining personnel killed while attempting to render an IED safe

	Victim Operated IEDs								Total	
	Balochistan, PK		Helmand, AF		Kandahar, AF		Nimroz, AF			
	Events	Victims	Events	Victims	Events	Victims	Events	Victims	Events	Victims
2004	1	0	0	0	0	0	0	0	1	0
2005	1	5	0	0	1	15	0	0	2	20
2006	6	29	2	8	6	12	0	0	14	49
2007	0	0	1	5	5	9	0	0	6	14
2008	1	3	8	10	9	11	0	0	18	24
2009*	1	3	10	16	4	11	0	0	15	30
Total	10	40	21	39	25	58	0	0	56	137

	Remote Control IEDs								Total	
	Balochistan, PK		Helmand, AF		Kandahar, AF		Nimroz, AF			
	Events	Victims	Events	Victims	Events	Victims	Events	Victims	Events	Victims
2004	4	34	1	1	5	9	0	0	10	44
2005	1	0	7	24	12	59	1	7	21	90
2006	4	6	16	39	44	162	4	8	68	215
2007	3	14	8	46	14	38	1	0	26	98
2008	13	67	11	72	17	78	1	0	42	217
2009*	3	17	10	71	23	87	0	0	36	175
Total	28	138	53	253	115	433	7	15	203	839

	Suicide Person Borne IEDs								Total	
	Balochistan, PK		Helmand, AF		Kandahar, AF		Nimroz, AF			
	Events	Victims	Events	Victims	Events	Victims	Events	Victims	Events	Victims
2003	1	106	0	0	0	0	0	0	1	106
2004	1	174	0	0	0	0	0	0	1	174
2005	1	0	0	0	5	89	0	0	6	89
2006	1	3	6	137	6	48	1	0	14	188
2007	2	73	15	56	13	83	2	31	32	243
2008	2	0	14	109	11	206	6	101	33	416
2009*	1	18	8	86	7	41	6	53	22	198
Total	9	374	43	388	42	467	15	185	109	1414

	Suicide Vehicle-Borne IEDs								Total	
	Balochistan, PK		Helmand, AF		Kandahar, AF		Nimroz, AF			
	Events	Victims	Events	Victims	Events	Victims	Events	Victims	Events	Victims
2005	0	0	1	4	6	18	0	0	7	22
2006	1	9	4	8	49	381	1	12	55	410
2007	0	0	7	121	18	102	0	0	25	223
2008	1	25	3	27	15	191	4	21	23	264
2009*	1	15	5	148	8	86	2	3	16	252
Total	3	49	20	308	96	778	7	36	126	1171

	"Fedayeen" Attacks								Total	
	Balochistan, PK		Helmand, AF		Kandahar, AF		Nimroz, AF			
	Events	Victims	Events	Victims	Events	Victims	Events	Victims	Events	Victims
2004	1	174	0	0	0	0	0	0	1	174
2006	0	0	2	77	6	78	1	0	9	155
2007	2	73	2	88	4	20	1	20	9	201
2008	0	0	8	55	4	177	5	45	17	277
2009*	2	33	4	93	6	79	3	42	15	247
Total	5	280	16	313	20	354	10	107	51	1054

A pair of outlying suicide vest attacks in Balochistan in 2003 and 2004 skew the rate of effectiveness for all suicide attacks upward, and in both cases weapons in addition to the IEDs contributed to the casualty toll. Map 32 depicts all person-borne IEDs (PBIEDs), with notable concentrations in the Lashkar Gah-Gereshk and Kandahar City areas. Map 33 shows that the Kandahar-Spin Boldak corridor experienced a majority of SVBIED events, while the Khash Rud and Zaranj districts of Nimroz had a comparatively high number of SVBIED attacks. Although such attacks never reached the spectacular effectiveness of those in Iraq during the time when Abu Musab al-Zarqawi led the insurgent group known as al Qaeda in Iraq, an anomalous surge of SVBIED events in 2006 clearly reflected a concerted effort to drive up casualty numbers.[11] Generally, suicide events occurred in a wide arc stretching from Quetta through Spin Boldak, Kandahar, Lashkar Gah, and Khash Rud, terminating in Zaranj (see Map 34).

A remarkable development in suicide tactics is the so-called "fedayeen attack," in which an operative arms himself with multiple weapons, perhaps alongside several conspirators,

to assault a target continuously until the moment when suicide becomes unavoidable.[12] Fedayeen attacks, attributed to Kashmiri militants as early as the 1990s, are typically associated with the November 2008 terrorist attacks in Mumbai, India.[13] What seems common to all is the fearless intent and coordinated design to maximize destructive effects before suicide. Though fedayeen attacks in India and Kashmir historically did not necessarily incorporate suicide IEDs, it appears that in Afghanistan they often have done so.[14] In this case, we have examined as fedayeen attacks any suicide attack of increased complexity, including those involving multiple arms, multiple bombers, or coordinated strikes. The category also covers attacks designed to maximize destruction before suicide, including the deliberate intent to fight toward the assassination of individual leaders. Multiple coordinated attacks, it should be noted, are also a mark of groups associated with al Qaeda.[15]

A remarkable development in suicide tactics is the so-called "fedayeen attack" in which an operative assaults a target continuously until the moment when suicide becomes unavoidable.

Though there were only 51 such events in this study, fedayeen attacks had an anomalously high average of more than 21 victims per event. These attacks were particularly lethal in Balochistan province, where five attacks over five years claimed 280 victims, or a mean of 56 per attack. In Nimroz province, especially in the Khash Rud, Zaranj, and Kang districts, fedayeen attacks accounted for 22 percent of all events and 38 percent of all casualties. Lashkar Gah, Kandahar, and Quetta accounted for most of the fedayeen attacks observed in the study. See Map 35 for an estimation of fedayeen activity, and Map 36 for suicide assassination attacks.

On several matters of pervasive interest concerning IED tactics, techniques, and procedures, the data available was not statistically significant. Regarding the critical issue of explosives availability, the data proved inconclusive as to the source and type of explosive materials. Many observers and experts assert that the type of explosives used in IEDs indicate the resources available – or unavailable – to an insurgency.[16] The majority of events in which IEDs used military munitions were reported in 2006; however, the data did not indicate how many IEDs used homemade explosives. Further, no reporting suggested the extent to which military explosives were reclaimed from existing munitions or appropriated in original form from bulk stocks, or which homemade explosives were nitrate- or peroxide-based. These are all substantive issues in discussing the origin, training, and direction of bombers and bombmakers.[17]

Insurgents have long employed a constantly evolving assortment of TTPs to counteract military precautions, but recent reports have suggested that militants in the studied area have begun to employ "more primitive" methods in their attempts to bypass or circumvent "more modern" IED countermeasures.[18] In some cases, this means employing switches actuated by tension upon long pieces of string to avoid jamming of radio signals; in others, it means using commonly available, conductive, yet diamagnetic alloys to close pressure-activated circuits.[19] Reporting and independent research have confirmed the viability of so-called "low-metallic" methods to cheaply and readily close victim-operated circuits and introduce fragmentation while evading metal detectors.[20] Notwithstanding these developments, insurgents have long modified and/or used land mines constructed almost entirely of plastic, such as the Italian-made TC-6 anti-tank mine.[21]

Although the study shows that radio controlled IEDs have played a leading role in the story of IEDs along the western Durand Line, there is little information available regarding the type of RCIEDs employed. Anecdotal reporting shows that as early as 2002, RCIEDs initiated by custom-made switches known as "spider devices" – after their arachnoid

pattern of circuitry and wiring – were present in Afghanistan.[22] Spider devices matured and developed in the region between 2002 and 2005, progressing through at least five stages of modification and apparently originating in Pakistan.[23] Other devices have used modified doorbells, garage door openers, cell phones, and long-range telephones.[24] It was these specific types of RCIED technologies that could not be determined from open-source event reporting.

Victim-operated IEDs – especially pressure plate or PPIEDs – appeared far less commonly than had been expected. Both military and media sources have reported pressure plate devices with increasing frequency in 2007-09, yet these were sparsely observed.[25] It seems logical that successful detonations of pressure plate devices would be more commonly reported as devices of unknown initiation. Map 37 shows VOIEDs and Map 38 shows PPIEDs, as assessed.

Command wire IEDs also appeared infrequently despite anecdotal reporting that these are among the most deadly in Afghanistan.[26] In one report from December 2008, fighters in Kandahar province used command wire as long as a mile to target U.S. troops crossing a bridge.[27] It is most likely that many command wire devices are accounted for as devices with unknown initiation. Map 39 depicts CWIED events.

There was little evidence to help describe either the quantity or the quality of explosive charges, despite general commentary that in recent years most devices make use of homemade explosives.

There was little evidence to help describe either the quantity or the quality of explosive charges, despite general commentary that in recent years most devices make use of homemade explosives.[28] In all, there were 100 recorded observations of military munitions used in IEDs, with 64 of these written up in 2006 alone. Only 21 specific reports of homemade explosives were found. In 2009, "Everything is homemade," according to one U.S. Marine in Helmand province, where large quantities of ammonium nitrate appear to have been imported from Pakistan, ostensibly for legitimate use as fertilizer.[29] Understandably and for reasons described above, it is very difficult for reporters to firmly establish the explosive content of an IED after the explosion.

There is even less information to determine the degree to which detonators themselves may have been manufactured using highly sensitive homemade explosives such as mercury fulminate or triacetone triperoxide (also called TATP).[30] There were a mere 15 reports indicating the discovery of detonators and none of the detonators were definitively described. Because commercial and military detonators are specially manufactured, generally well-marked, and often controlled, their recovery and forensic examination may reveal information as to the supply chain, identity, and general resources of bombmakers.[31] On the other hand, expedient construction of detonators may be considered an indicator of many important factors, including external support not received (in the form of stable commercial or military detonators, for example), bombmaker proficiency, or chemical supplies available.

Several significant techniques, technologies, and bomb types were never observed. In spite of a great deal of press coverage, neither the notorious explosively formed projectile, or EFP, nor the related technology of shaped charges has proliferated across South Asia. EFPs are very destructive and deadly improvised charges that use shaped explosives and metal slugs to penetrate thick vehicular armor at a range of two to 10 meters or more. EFPs found in Iraq have been predominately manufactured in Iran.[32] Shaped charges are similar in concept, though they use a jet of explosive energy rather than metal projectiles to punch holes into armor at very close ranges.[33] Though EFPs have been found in Afghanistan on a few occasions, no authorities have confirmed their use in the studied area.[34]

Passive infrared (PIR) triggers – which use motion sensors to initiate bombs in a victim-operated fashion – were widely employed in Iraq during 2006-07 but not detected in this study.[35] PIR was a technology associated with the EFP in Iraq; however, this deadly combination has not surfaced in the Afghanistan-Pakistan area.[36] Another lethal tactic not seen in Afghanistan or Pakistan to date is the addition of toxic chemicals – such as chlorine – to large IEDs, resulting in death and illness by poisoning as well as explosive effects.[37] Finally, there were no inordinately large vehicle-borne IEDs like those that, on several occasions, have killed and wounded hundreds at a time in Iraq, and very few instances of multiple concurrent vehicle bombings.[38]

Assessment

IEDs have continually increased in frequency of observation and generally in effectiveness throughout the area and duration of this study. The cities of Kandahar and Quetta have been the central locations of IED activity for most of the period, though in 2009 the Helmand River Valley became the major locus of fighting, apparently as a result of the increased deployment there of NATO forces, notably U.S. and U.K. Marines.[39] Statistics from the Joint IED Defeat Organization show that ISAF troop casualties attributed to IEDs increased from 69 percent in 2008 to approximately 77 percent through the first half of 2009.[40]

But the presence of Western forces does not explain the increase in IED events and event lethality in Nimroz province, especially along the Khash Rud and Route 606/Highway 9 corridor from Delaram to Zaranj, en route to Iran.[41] Though some of these attacks have been claimed by the Taliban, Zaranj is populated by a majority of ethnic Balochs, not Pashtuns, and there are too many other parties with interests in this strategic border crossing to rule out many potential perpetrators.[42] As Western powers pursue an expansion of the Afghan war effort, it is important to consider the nature of areas into which they could plausibly expand. Northern Nimroz province already exhibits substantial hazards – suicide bombers, especially – despite the absence of ISAF troops. The recent escalation of NATO operations in Helmand and the subsequent increase in IED activity there demonstrate how expansion may lead to increased violence, underscoring the need for additional foresight and preparation.

At least two major patterns are clear: a concerted Taliban IED campaign across southern Afghanistan that includes at least Quetta in Pakistan, and a continuing Baloch separatist campaign within Pashtun areas of Balochistan.

At least two major patterns are clear: a concerted Taliban IED campaign across southern Afghanistan that includes at least Quetta in Pakistan, and a continuing Baloch separatist campaign within Pashtun areas of Balochistan. Quetta is notable for its pivotal position: It is the major point of confluence for both of these insurgencies. Quetta is where many observers claim Mullah Omar, the Taliban leader, has taken refuge for some time. It is also the location of the Afghan Taliban high command.[43] But Quetta must also be understood as the major point of overlap between at least two very different types of fighters: those who commit large indiscriminate attacks and those who conduct limited acts of sabotage. Maps 41 and 42 illustrate these two patterns (given by events with 10 or more casualties and events with no casualties where infrastructure was the target) as well as their convergence in Quetta.

Three additional minor patterns also emerge, but with less supporting data: very effective attacks against government interests in the Zaranj-Delaram area, attacks against Shiites in Balochistan, and attacks against Indian interests in Afghanistan.[44] Given the severity of attacks in Zaranj, as well as the district's ethnic composition, any allied or government effort to expand control there should carefully consider how to mitigate IED threats, especially suicide attacks. A sophisticated plan in northern Nimroz would

assess the multi-faceted human landscape as well as various political interests of regional powers (Iran, India), non-state actors (Taliban, Balochi separatists, anti-Shiite groups), and criminal elements (opportunists, smugglers, narcotraffickers).

Two of the three highest casualty-causing events were fedayeen assaults against Shiite worshippers in Quetta in 2003 and 2004, allegedly perpetrated by Lashkar-e-Jhangvi (LeJ).[45] Two other groups, Sipah-e-Sahaba Pakistan and Jundallah, share LeJ's anti-Shiite – and anti-Iranian – ideology.[46] These groups allegedly have ties to the Taliban, Balochi militants, and al Qaeda, and stand at odds with the Pakistani government. Any effort to suppress this source of violence must account for political and ideological objectives distinct from, but related to, those of the Taliban/Pashtun insurgency in Afghanistan.

Perhaps the murkiest of all trends observed is that of attacks against Indian diplomatic and business interests in southern Afghanistan. For an international assistance project in Nimroz province, the Indian government sent engineers, administrators, and construction workers to rebuild Route 606/Highway 9, finishing the project and opening the road in January 2009.[47] Several attacks along the road targeted either Indian workers or the Afghans protecting them, and conformed to a wider pattern of large and small attacks against symbols of India in the region.[48] Without deep investigation it may be impossible to assess the intent of every attack, but of the many international, nonprofit, non-state, or political missions in Afghanistan, the Indians seem to have been specifically targeted.

A logical and critical question is how the types of IED targets -- be they Afghan, Pakistani, Western, local, multinational, corporate, or charitable -- have shifted or evolved over eight years of war.[49] Unfortunately, this study was unable to provide an answer due to inconsistency of data; however, anecdotal accounts provide some indicators. NATO casualties attributable to IEDs in the area studied have risen dramatically in the last year. Nearly 80 percent of ISAF deaths and injuries in Helmand province in the first half of 2009 were the result of IEDs.[50] Allied troops accounted for no injuries or deaths in Nimroz, meaning that Afghan civilians as well as security and governmental officials absorbed every casualty in that area during this study. Kandahar is a far more complex story; the province has consistently averaged above all other provinces in attacks observed as well as resulting casualties. Unfortunately, the quality of reporting made it impossible to differentiate reliably between Afghan security and ISAF troops injured or killed in the province over the past several years. It is clear, however, that Canadian forces have paid a heavy toll. In 81 events, 281 Canadians were killed or wounded in Kandahar province.

Some knowledgeable observers have expressed anxiety that the "university of terror" that was Iraq would provide advanced training to fighters who would carry the lessons forward to battlefields worldwide.

Some knowledgeable observers have expressed anxiety that the "university of terror" that was Iraq during the height of the post-Saddam Hussein violence would provide advanced training to fighters who would carry the lessons forward to battlefields worldwide.[51] Brian Glyn Williams, for example, has argued that al Qaeda and foreign fighters from Iraq caused an "Iraq effect" that transferred several Iraqi tactics and somehow legitimized suicide bombing among the Taliban and within portions of Pashtun culture.[52] While there is no doubt that the Iraq conflict has educated many about bombs and bombmaking and instructed the world as to their utility in asymmetric warfare, the emphasis placed on the effect of the Iraq war alone is overstated. The global ascension of improvised bombs is a phenomenon far more pervasive than observers of the Iraq conflict are perhaps prone to admit.

Let us examine first the ways in which the Iraq war has shaped combat in the area of study. Locally based fighters in Afghanistan and Pakistan clearly received assistance in the form of training and facilitation from foreign veterans of Iraq. Maulvi Mohammad Haqqani, a Taliban official who recruits fighters on both sides of the border, has recounted that around 2004, "Arab and Iraqi mujahedin began visiting us, transferring the latest IED technology and suicide-bomber tactics they had learned in the Iraqi resistance during combat with U.S. forces."[53] What the Taliban gained, it seemed, were "new weapons and techniques: bigger and better IEDs for roadside bombings, and suicide attacks."[54] Sustained suicide attacks clearly demarcate a new trend, beginning in 2005, at least inspired by the Iraq conflict. Maps 17-23 depict the spread of suicide attacks across the area over time, from Quetta in 2003 and 2004, across the border into Spin Boldak and Kandahar in 2005, on into Gereshk, Lashkar Gah, and Delaram in 2006, and eventually into Khash Rud and Zaranj in 2007. The timing of this proliferation undeniably corresponds to the surge in suicide bombings in Iraq in 2004-07.

However, IEDs have been a central part of the curriculum in training camps in the region for decades.[55] Classic techniques that were widespread in Iraq, such as command wire and pressure plate initiation, have also been staples of combat in Afghanistan and Pakistan for years, though this study was unable to conclusively determine the extent of this. Some who fought in Iraq have come to Afghanistan and Pakistan to assist the Taliban and other extremists, but so too have veterans of many other conflicts where IEDs have proliferated, such as Chechnya and Kashmir.[56] Regarding the introduction of suicide tactics in the region, it is incorrect to suggest that suicide attacks were entirely new and an exclusive result of the Iraq experience. The first major suicide attack in the area after 9/11 occurred in 2003 (and the second in 2004) in Quetta, well before the worst of the suicide events in Iraq. The far lower rate of casualties per suicide attack in Afghanistan and Pakistan may be attributable to lower population density and urbanization than in Iraq, but it is also an indicator that if the transfer of lessons learned in Iraq did occur, these lessons were less than effectively communicated. Regardless, the spread of suicide fedayeen attacks reflects the introduction of Kashmiri – not Iraqi – lessons of war, raising the question of facilitation by Pakistani or Kashmiri insurgent groups such as Lashkar-e-Taiba.[57]

It is incorrect to suggest that suicide attacks were entirely new and an exclusive result of the Iraq experience.

There are other plausible explanations for this surge in suicide events. For one, it corresponded to the expansion of ISAF, begun in 2003, which called for the transfer of authority for the southern region from U.S.-led coalition forces to NATO forces. This shift was announced in late 2005 and enacted gradually over the first half of 2006.[58] The Taliban possibly saw the introduction of the NATO contingent as an opportunity to whittle away the Western alliance by targeting Canadian forces in Kandahar. This surge also appears part of a planned Taliban return to Kandahar following several years of regrouping and preparation in Balochistan relatively unencumbered by Pakistani forces such as the Frontier Corps.[59] Finally, the Taliban probably sought a new and effective tactical response to the experience of defeat brought by relentless precision bombing in 2001, as well as a sense of desperation that the American forces could not be beaten in the same guerrilla fashion as the Soviets had been.

Whereas many of the more prominent suicide vehicle-borne IED attacks in Iraq involved the near-simultaneous use of multiple truck bombs, some of which carried hundreds or thousands of pounds of explosives and accelerants, against fixed targets in populated areas, Afghan SVBIEDs have frequently targeted military convoys on the move, using single vehicles and smaller explosive charges.[60] In fact, many Afghan SVBIEDs have used motorcycles or bicycles rather than vans or trucks.[61] If the intent in Iraq was to foment sectarian strife and

demonstrate the illegitimacy of the government through massive casualties in spectacular attacks against specific portions of the population, the intent in Afghanistan seems to be the steady attrition of security forces and government leadership, a strategy doubtlessly reinforced by the experience of Afghan victory over Soviet occupation.[62]

In an expansive study conducted for the United Nations Assistance Mission in Afghanistan, Christine Fair found no single explanation for the phenomenon of suicide bombings in Afghanistan, no definitive influence stemming from Iraq, and much to say about the general global proliferation of suicide events over the past 30 years.[63] She noted the important difference that in Iraq, the suicide attacker and attack were commonly memorialized in martyrdom videos, while the Afghanistan-Pakistan suicide campaign has not produced the same library of video testimonials.[64] Indeed, the best-known suicide "last will" video to come out of Afghanistan is that of Saad Ebu Furkan, a Bavarian-born German citizen of Turkish heritage affiliated with an Uzbek terror group, the Islamic Jihad Union.[65] His attack hardly substantiates the transfer of suicide doctrine from Arab veterans of the Iraq war to Pashtun fighters and the Taliban.

Explosively formed projectiles, though they have been found, have not been widely used. In Iraq these were the most lethal bombs observed.

There are some other important concepts and methods that have definitely not crossed over from Iraq. The absence of devices enhanced with toxic industrial chemicals like chlorine, which were briefly a peril in Iraq's western Al Anbar province, suggests a lesson untaught by Sunni fighters in Iraq to the Pashtun insurgents of southern Afghanistan and western Pakistan. Explosively formed projectiles, though they have been found, have not been widely used. In Iraq these were the most lethal bombs observed, even more so when paired with passive infrared triggers, a technology not yet seen in the area studied. Since EFPs and PIR were primarily associated in Iraq with Shiite militants and Iranian support, it would seem that neither influence is strongly felt.

Why have EFPs not become the menace they once were in Iraq? The negligible significance of EFPs in the Taliban insurgency is logical in light of the Iranian regime's long-standing apprehension of and opposition to a Taliban-ruled Afghanistan.[66] Tehran denounced the Taliban's rise to power in the 1990s and probably wants to see enough instability in Afghanistan so that no Afghan regime – especially one led by the Taliban or serving U.S. interests – is powerful enough to check Iranian interests in the region.[67] Moreover, Iran lacks in Afghanistan what it had in Iraq: ready-made Shiite proxy groups like the Jaish al Mahdi militia of Muqtada al-Sadr. The EFPs that have appeared in Afghanistan are possibly exceptional instances of spontaneous technology transfer rather than a concerted Iranian effort to equip the Taliban. Alternatively, Iranian authorities may have intentionally delivered EFPs to Afghanistan in an attempt to convey threats to, or gain leverage over, Western powers.

In Iraq, IED attacks were frequently recorded on video for prompt dissemination via the Internet, especially by the Sunni insurgent groups Islamic Army in Iraq and al Qaeda in Iraq.[68] In Afghanistan, however, Internet videos of bombings are far less prevalent, particularly those claimed by the Taliban rather than Arab or foreign insurgent groups in the country.[69] Taliban propagandists clearly prefer to distribute their ideological messages locally on paper and recorded media (especially VCDs and DVDs) or broadcast via radio, rather than disseminating videos of explosions globally online.[70] This is likely reinforced by the difficulties of achieving Internet access in many parts of the studied area as well as the Taliban's erstwhile forbiddance of Internet use.

Radio controlled IEDs also help measure the influence of the Iraq experience. Afghan spider devices predate the Iraq

war, and in some ways precipitated the development of the electronic radio frequency jammers (such as the Acorn) that eventually flooded the battlefield in Iraq.[71] Taliban fighters describe receiving RCIED training from Arab fighters in camps in South Waziristan, Pakistan, as early as 2003.[72] When jammers began to disrupt the RCIED threat, Iraqi fighters largely gave up on radio control.[73] The Taliban, however, continue to use RCIEDs in great numbers in Afghanistan, despite the presence of more Westerners and more jammers.[74] In fact, RCIED use in 2007-09 roughly equaled that during 2002-06 (See Maps 30 and 31).[75] If Iraq conflict veterans had truly imparted their wisdom upon local fighters, one might expect to see a decline in RCIED use in southern Afghanistan after 2006. A decline is not observed; instead, we see the publication and distribution of a Pashto-language field manual with a chapter dedicated to building and deploying RCIEDs.[76]

For some other developments and trends, links to the Iraq war are questionable.

For some other developments and trends, links to the Iraq war are questionable. The recent introduction of specific pressure plate IED switch components with low metal content is a frighteningly effective innovation of unclear origin.[77] Additionally, a particular type of vehicle-borne IED involving RCIEDs affixed to parked bicycles appeared at least 19 times in the study. This is a pattern common to the Iraq war, but was more prominent in recent conflicts in Thailand, the Philippines, and Nepal, as well as historical bombing campaigns like that in Vietnam in the 1960s.[78]

Conclusion

IEDs existed as a feature of conflict zones in Afghanistan and Pakistan long before September 11, 2001. The Soviet General Staff, for example, wrote about how in the Soviet-Afghan war of 1979-89, "the Mujahideen used a wide variety of homemade mines and explosive charges made from unexploded aerial bombs, mortar rounds, artillery rounds, and other explosives."[79]

Though it may be tempting for Westerners to seek analogies between the conflicts in Iraq and Afghanistan-Pakistan, this temptation must be resisted and differences must be examined in detail. Although suicide tactics may have been imported or inspired by foreign veterans of the Iraq conflict, they were implemented by Taliban leaders, shaped by different forces including veterans of other conflicts, and quickly evolved into a distinctly local version of an international trend.[80] The employment of IEDs in the studied area is, relatively speaking, more discriminate than in much of Iraq (certainly in Balochistan more so than in Helmand or Kandahar), causing fewer civilian deaths. The public political messages associated with IED activities are focused at the local level rather than international audiences.

What about this study carries global implications, then? When we compare the evolution of bomb-related violence in this study to other conflicts in recent history, we observe a general and worldwide phenomenon of TTP acceleration, in which terrorist and insurgent bombing campaigns have taken progressively shorter periods to achieve relatively high levels of technical and tactical sophistication. It took the Irish Republican Army about 30 years to progress from CWIEDs, to RCIEDs, to shaped charges, and the group had only begun to exchange information with other terrorist organizations toward the end of this period. Mark Maginess, a veteran bomb technician and director of training at the firm Hazard Management Solutions, remarked about the early years of the conflict in Northern Ireland, "The IRA had to rely on themselves. ...They had no one to teach them or learn from."[81] By contrast, it took about six years for militants to make the same improvements in Chechnya, three years for fighters in Gaza, and about 12 months for insurgents in Iraq.[82]

In Afghanistan-Pakistan, fighters began with RCIED technology in hand, and have quickly progressed to innovations such as diamagnetic, low-metal switch

components. This can be explained at least partially by the widening availability of bomb-related information, exchanged in many ways including person-to-person communications, printed manuals, and the Internet. It is also attributable in part to the general and legitimate proliferation of consumer electronics and other technologies that happen to be suitable for making bombs. The compression of this cycle of training, execution, and innovation means that militaries and governments must exert great effort, wisdom, and resources to keep pace with the bombers, while making important choices about how to prepare for the future security environment. Because of their lethality, propaganda applications, variable technologies, and seemingly innocuous components, IEDs are tactical weapons that impose costs with strategic implications.

IEDs are a global phenomenon, but the specific TTPs associated with them are also derived from tactical intent and local experience. Development of IED technologies, tactics, techniques, and procedures in Afghanistan-Pakistan has partly been an organic result of the interaction between allied/government actors and militant groups in combat. The evolution of technique on either side is shaped by tactical success or failure, and concerted efforts to respond to these experiences. For most fighters who actually handle the devices, IED TTP evolution is not a matter of seeking assistance from an international network of experts, but rather a simple and intuitive process of trial, error, research, remediation, assessment, and observation, assisted by other knowledgeable locals.

With additional research, we might improve our awareness of trends in target selection, victim identity, or the origin of components. We should expect only marginal advancement in many areas of interest, however, until authorities declassify and release quality data for purposes of scholarly research. Doing so would raise legitimate concerns about the publication of information that could assist militants or bolster their resolve, but without this data, public deliberations on important policy decisions will continue to rely on incomplete information.

[1] Events in these districts of Balochistan province were excluded: Gwadar, Jafarabad, Jhal Magsi, Kech, Kharan, Khuzdar, Lasbela, Nasirabad, and Panjgur. See Appendix 2.

[2] Incidentally, this means the inclusion of some events which ultimately may not be attributable to Taliban-affiliated extremists.

[3] The maps were created using vector data that is freely available to the public via the Global Administrative Areas database at www.gadm.org. Discrepancies in place names are a result of the place name metadata associated with these vector files.

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