

## Risky Business

### Wild Card Weekend

#### A Deeper Look at the Cowboys and Niners

The Cowboys ended what was once a promising season in spectacular fashion on Sunday afternoon. A late rally came up short after Dak Prescott made a daring sprint to the Niners' 24-yard line on the last play of the game. With 14 seconds remaining and no timeouts, the Cowboys had hoped to give themselves a better final shot at the end zone but were unable to spike the ball before the clock expired. Amid the chaos, the official couldn't properly place the ball on the correct line of scrimmage as he tried to squeeze through the Cowboys' offensive lineman. There was a crescendo of frustration among the Dallas faithful as they felt robbed of one more crack at the endzone. It is difficult to say how much GWC was lost in not being able to stop the clock as the Cowboys would have had one last pass attempt into the endzone from the 24-yard line. Our simulations indicate it may have been as much as 15%. All this late game drama obscured the fact that the Niners made a deliberate decision on fourth down just moments earlier which was even more costly in terms of expected GWC loss than the Cowboys poor execution on the final play.

With 2:51 remaining in the game, the Niners were facing a fourth-and-1 on the Cowboys' 49-yard line while holding on to a 23-17 lead. They lined up as if they were going to run a play, but it was only a weak attempt to draw the Cowboys offsides. After assessing the five-yard penalty the Niners were slightly more justified with their punt on fourth-and-6. A custom simulation reveals that punting on fourth-and-1 is a massive -17% GWC blunder. Amazingly, even after the penalty it is still a -6% GWC error for the Niners to punt the ball away on fourth-and-6. If we simplify the fourth-and-1 attempt as a one-yard gain on a success and a turnover at the line of scrimmage when it fails, the Niners risk approximately 6% GWC to gain 19% GWC. Therefore their required conversion rate is only  $6/(6 + 19)$  or 24%. We can debate what the actual conversion rate may be (NFL average is approximately 70%) but it should be clear that with any reasonable range of assumptions, this decision is a no-brainer.

A full table of suboptimal decisions from this game is represented below. There were several other "high-confidence" errors by both teams although none quite as egregious as the aforementioned. The high confidence label addresses something raised by many readers this season. While the underlying DVOA assumptions that inform our custom simulations are very good, we recognize there is a reasonable level of uncertainty. For this reason, a decision is re-run with very strong counter-case parameters. With regard to the Niners' fourth-and-one, even if we set the offense well below the worst rushing team in the NFL and set the defense well above the top rushing defense, we cannot come close to flipping the model's recommendation to attempt the first down. For example, swapping the Niners rushing offense with the Giants (worst rated offensive rush DVOA) and swapping the Cowboys rushing defense with the Niners (top rated defensive rush DVOA), the error only drops from -17% GWC to -11% GWC.

The Dallas Cowboys coaching staff will undoubtedly endure some criticism this week as the San Francisco 49ers prepare for their matchup with the Packers. While it is always difficult to argue with a win, our analysis reveals the Niners coaching staff should be subjected to at least as much scrutiny as the Cowboys.

49ers key fourth down errors:

Game Situation							Actual Play			Edj Play	
QTR	CLOCK	DOWN	DIST	POSITION	SCORE	TIMEOUTS	PLAY	GWC	LOSS	PLAY	GWC
2	09:44	4	1	DAL 22	10-0	2-3	✗ Field Goal High	77.5%	-3.5%	Rush	81.0%
3	07:44	4	1	SF 34	16-7	3-3	✗ Punt High	77.9%	-4.6%	Rush	82.5%
4	02:51	4	1	DAL 49	23-17	3-3	✗ Punt High	72.5%	-17.0%	Rush	89.5%

Cowboys key fourth down errors:

Game Situation							Actual Play			Edj Play	
QTR	CLOCK	DOWN	DIST	POSITION	SCORE	TIMEOUTS	PLAY	GWC	LOSS	PLAY	GWC
3	10:35	4	7	DAL 45	7-16	3-3	✗ Punt High	19.6%	-2.4%	Pass	22.0%
3	04:38	4	2	DAL 33	7-23	3-3	✗ Punt High	4.4%	-1.5%	Pass	5.8%
4	11:58	4	7	SF 33	7-23	3-3	✗ Field Goal	3.4%	-0.4%	Pass	3.8%