

## Risky Business Week 4

### You be the Judge

Last week after his third consecutive loss to open the 2021 campaign, and boasting a measly 6-13 career record, Giants' head coach Joe Judge was asked about his conservative actions on fourth down.

He replied, "Analytics is just a tool. You can look at a stat sheet all you want. I promise you if Excel was gonna win football games, Bill Gates would be killing it right now"

Well, he was correct in claiming that analytics is just a tool, but it is a very powerful tool that is creating a growing chasm between its' enlightened advocates and its naysayers. NFL coaches can choose to shun this revolution, but they do so at their own peril. Judge's comments invited some scrutiny, and it is easy to see why. After finishing 29th among 32 NFL head coaches in the EdjSports' rankings last season, he owned the fourth highest error rate going into week 4 with a total cost of -19.5% GWC. With this track record in mind, we decided to take a close look at his decisions in Sunday's contest against the Saints.

I must confess this article would have been easier to write if the Giants didn't manage to overcome a late 11 point deficit and win in overtime. However, as we often emphasize at EdjSports, good decision-making is not defined by short term results.

#### Four Key Errors:

Situation	Play Choice	Cost
Fourth and one, Saints 16 yard line, 0-0, 13:20 2 <sup>nd</sup> quarter	Field goal attempt	-3.7% GWC
Fourth and goal, 5 yard line, trailing 14-7, 8:36 3 <sup>rd</sup> quarter	Field goal attempt	-1.1% GWC
Fourth and two, NYG 30 yard line, 3:33 3 <sup>rd</sup> quarter, trailing 14-10	punt	-1.5% GWC

Fourth and eight, Saints 47 yard line, trailing 21-10, 9:31 4 <sup>th</sup> quarter	punt	-1.3% GWC
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If a total of -7.6% GWC doesn't seem like much, consider that at this rate per game the Giants would squander 1.29 expected games this season. Their total cost through four weeks now stands at -27.1% GWC.

Prior to the fourth and 1 at 13:20 of the first quarter, the Giants complicated matters by attempting a low percentage and conservative shot at the endzone. This is a tactic that seems to be biased by the perceived guarantee of three points on a fourth down field goal attempt. In reality, it often squanders two opportunities to convert the first down. To illustrate the fallacy of this strategy we can look at a hypothetical comparison of two-play parlays.

Strategy 1: Assume a 10% touchdown rate on the conservative third down pass with a fourth down field goal attempt if necessary.

Strategy 2: Short run on third down with assumption of 70% conversion rate and only one yard gain. Repeat on fourth down if necessary.

Using model generated corresponding GWCs we get:

Strategy 1:  $(.10 \times 51.6\% \text{ GWC}) + (.90 \times 37.7\% \text{ GWC}) = 39.1\% \text{ GWC}$

Strategy 2:  $(.70 \times 44.8\% \text{ GWC}) + (.30 \times .70 \times 44.8\% \text{ GWC}) + (.30 \times .30 \times 31.4\% \text{ GWC}) = 43.5\% \text{ GWC}$

In this simplified example, the Giants would require an 18.5% touchdown rate on third down (without risk of turnover) to compensate for the field goal attempt on fourth and one. Of course, they do better in all scenarios by going for it on fourth and one.

The fourth and goal decision at the 5-yard line is a difficult one. The residual value of having the Saints begin their subsequent drive backed up to the goal line when the fourth down attempt fails is the key factor.

Going for it on fourth and two from your own 30-yard line is counter intuitive for most coaches and Judge likely didn't even consider the option. It is the GWC leverage of the successful conversion with respect to score and clock that tips this in favor of a more aggressive action.

Finally, the decision to punt on fourth and 8 at mid field when trailing by 11 points is a more significant error than it might seem. The Giants only relinquished 1.3% GWC in absolute terms but it was the difference between 4.8% and 3.5%. In relative terms, the Giants gave up more than 25% of their available equity.

The Giants victory was surely a temporary reprieve for Joe Judge but it can also be a deceptive curse. By chalking up a rare win, he is not likely to reassess his short-sighted game management techniques any time soon. Poor decisions add up over time. Just check the “Stat Sheet” at the end of the season.

### **Addendum:**

There has been quite a bit of discussion around Belichick’s decision to have Folk attempt a field goal with 59 seconds remaining on a wet field in Foxboro. A custom EdjSports’ simulation came down in favor of going for the first down attempt by +11.5% GWC. But because of the unique circumstances it is helpful to look at some assumptions. There are a number of key considerations:

- Folks’ success rate from 55 yards
- Brady’s ability to orchestrate a game winning drive with about 54 seconds and 2 timeouts
- The Patriots ability to convert a fourth and three at the Bucs’ 37 yard line
- How much Folk’s field goal success rate improves if the Patriots can convert the fourth and three.

It should also be noted the Patriots will very likely be able to attempt a game winning field goal with no time remaining on the clock if they convert the fourth and three. Similarly, the Bucs should be able to use all remaining time if Brady can successfully get into field goal range.

The formula that must hold true to justify the Patriots going for it on fourth and three is as follows:

$$((\text{Success rate 4th and 3}) \times (\text{improved FG success rate})) > ((\text{55-yard FG success rate}) \times (1 - \text{Brady Game Winning Drive success rate}))$$

Dividing both sides by FG success rate we get:

$$((\text{Success rate 4th and 3}) \times (1 + \text{relative FG improvement})) > (1 - \text{Brady Game Winning Drive success rate})$$

The weather is certainly a dampening factor on all assumptions (FG success, fourth down conversion, and Brady GWD). In a similar situation in week 1 against Dallas, Betting markets, EdjSports and other analysts had Brady’s chances of a successful drive with 1:24 and no time outs around 56%. While the two timeouts for Tampa create some equivalence we should certainly discount for the rain. Since Folk will most likely be required to kick the field goal under all circumstances, it is the relative improvement of success rate based on field position that matters. The fourth and three attempt is probably the least affected by the weather.

To get some perspective. A 50% conversion rate and a 1.4X improvement on the field goal success rate makes Brady's required Game Winning Drive rate just 30% in order to justify the Patriots going for it on fourth and three. We can't be sure of the exact assumptions of course, but this benchmark seems to suggest Belichick erred in this situation.

## Risky Business Week 5

### Bringing them to their Knees

With just 1:47 remaining in the game the Chargers found themselves trailing the Browns by one point with a third-and-2 at the 11 yard line. Just when Austin Ekeler appeared to have a clear path to the endzone he slid to his knees three yards short of the goal line. It is not easy to get an NFL running back to show such restraint when they have been programmed to reach the endzone throughout their careers. However, Ekeler did the prudent thing. The Browns had just burned their final timeout prior to the snap and the Charger could now ensure themselves of kicking a game winning field goal with no time remaining on the clock. So far so good, now the Chargers needed to safely take a couple of knees and run the clock down to a couple of seconds while the Browns defense stood helpless. Surprisingly, Ekeler ran into the center of the Browns' defensive line on the subsequent play with apparently no intent on crossing the goal line. The Browns defenders would have no part of this clever strategy and provided a personal concierge service for Ekeler as they literally carried him forward for a touchdown.

Why the Chargers didn't simply take a knee behind the line of scrimmage is inexplicable. They were assured of kicking the equivalent of an extra-point for the win with very little risk. The Chargers' pre-snap GWC was 97.5% with the conservative approach. After the Ekeler was forced into the end zone, the Chargers' GWC dropped 13%. Prior to the two point conversion attempt the Chargers were at 84.5% GWC. With the failed conversion, the a custom simulation showed the Chargers' GWC to slip even further to 79.2% GWC. Independent betting market data rated a Baker Mayfield game winning drive even higher with an implied GWC for the Chargers at 73%.

Although it surely was not intent of Austin Ekeler to score a touchdown, this was an avoidable blunder. In fact, it was one of the most egregious and costly errors of the 2021 NFL season to date. Unfortunately for the Browns, they were unable to capitalize on this very poor decision.