

4th Down:
When is it Optimal to go for it? (NFL)
2 Real scenarios to consider

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Defining Optimality

when the choice to attempt a conversion, kick a field goal, or punt maximizes a team's expected win probability.





Empirical Evidence: 4th down recommendation (ESPN)

Model:

- X-axis: Yards to go, length of the field
- Y-axis: Yards to go for the down
- Recommendation for Fg, Attempt, or punt on 4th down
- A neutral game state — not extreme field position, time, or score circumstances.

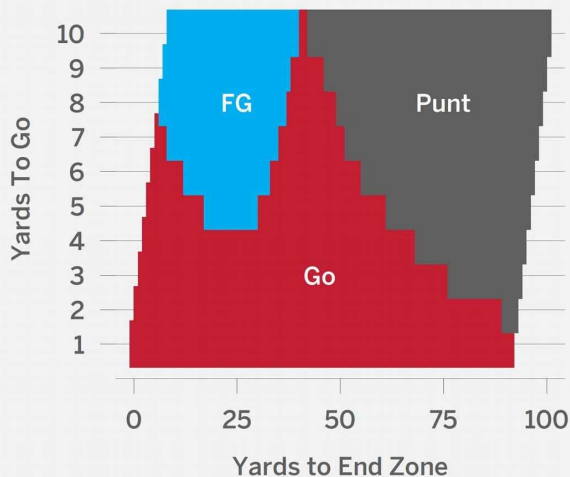
How ESPN's Fourth-Down Model Was Built:

- Uses win probability (WP) for each choice, *go*, *kick*, or *punt*.
- Calculates WP(success) and WP(fail), weighted by the expected 4th-down conversion rate.
- Adjusts for offensive and defensive strength (context-specific).
- Compares to WP of a punt or field goal attempt and recommends whichever gives higher overall WP.

Walder, S. (2023, January 14). *NFL game management cheat sheet: Guide to fourth downs and 2-point conversions*. ESPN.

4th Down Recommendation

Typical situations



Source: ESPN Analytics



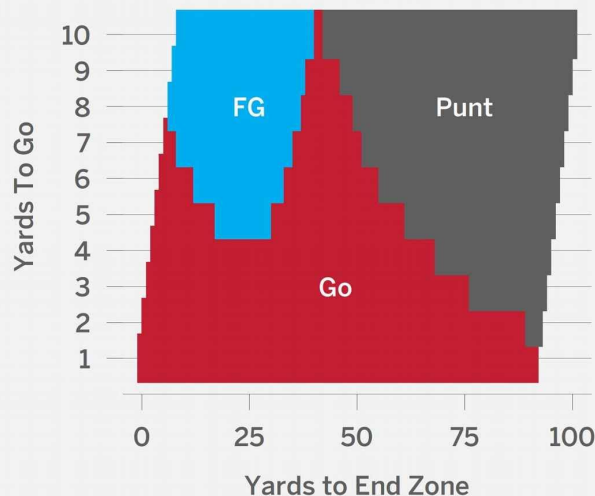
Empirical Evidence: 4th down recommendation

Assumptions:

- **Aggressive modern baseline:** Model assumes today's offenses are more efficient
- **League-average context:** Built using recent play-by-play data under typical weather, field, and scoring conditions.
- **Neutral game state:** Assumes no extreme time or score pressures
- **Stable probabilities:** Uses historical averages for conversion, field goal, and punt outcomes.
- **No psychological effects:** Ignores momentum or emotion, decisions based purely on expected win probability.

4th Down Recommendation

Typical situations



Source: ESPN Analytics



Empirical Evidence: 4th down recommendation

Findings:

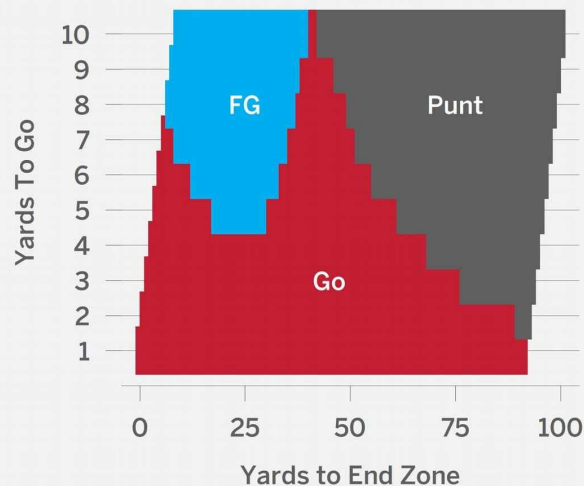
1. The **model favors going for it** (red area) on most 4th-down plays with fewer than 5 yards to go, regardless of field position.
2. **Field goals** (blue area) are generally optimal only **inside the opponent's 35-yard line** and when the distance to go is longer (around 6–10 yards).
3. **Punting** (gray area) is mainly recommended **on your own side of the field** when you're far from the end zone or **facing longer yardage situations**.

Limitations:

1. **Simplified assumptions:** Doesn't capture factors like momentum, weather shifts, crowd impact, or player fatigue that can influence real-game decisions.
2. **Average-based estimates:** Relies on league-average data, which may not reflect a specific team's strengths (elite offense, weak kicker, etc.).
3. **Static context:** Evaluates each play in isolation; strategy and injury excluded.

4th Down Recommendation

Typical situations



Source: ESPN Analytics

Situation #1

Midfield, 4th-and-short, 2 yards or less: Maintain possession or protect field position within one score and late-game?

Overview: The average consensus generally speaking holding psychological influences constant and assuming no extreme game pressures, is to go for it because the potential WP is higher around 60-70%

Assumptions: Teams are relatively similar in terms of strength, psychological factors have no influence, and weather is not extreme.

Hypothesis: When a team is leading late-game (under 4 minutes), the optimal 4th-down decision is to go for it rather than punt or attempt a field goal, because going for it produces a higher win probability.

Defining Terms:

- **Late game** = 4th quarter, 4 minutes and under
- **Score** = One-score game, with a scoring margin of 8 points or fewer
- **Midfield** = Between own 40-yard line and the opponent's 40-yard line

Ex: Chiefs vs. Ravens, 2021 Week 2.
While up 1 late in the fourth quarter, Ravens elect to go for it & successfully convert, winning the game.





Findings

1. Punting is extremely safe when protecting a one-score lead

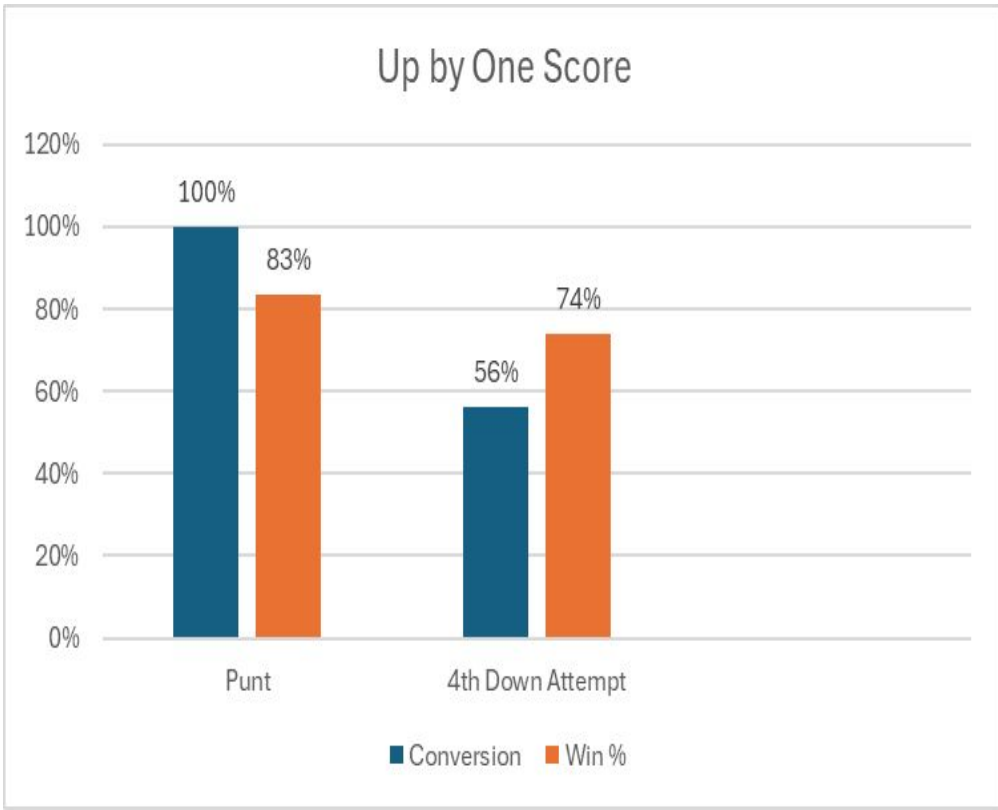
Interpretation: When leading, punting reliably flips field position and strongly supports closing out the game.

2. Going for it is much riskier and less successful in this situation

Interpretation: Even when teams successfully go for it roughly half the time, the win rate is still **lower than punting**. A failed 4th-down attempt while holding a lead is costly and likely explains the drop.

3. Teams ahead by one score benefit more from field position security than from aggression

The data shows that **protecting the lead** (punting) produces better outcomes than trying to extend it via a risky 4th-down attempt.



Findings

1. **Field goals have a higher success rate than 4th-down attempts.**

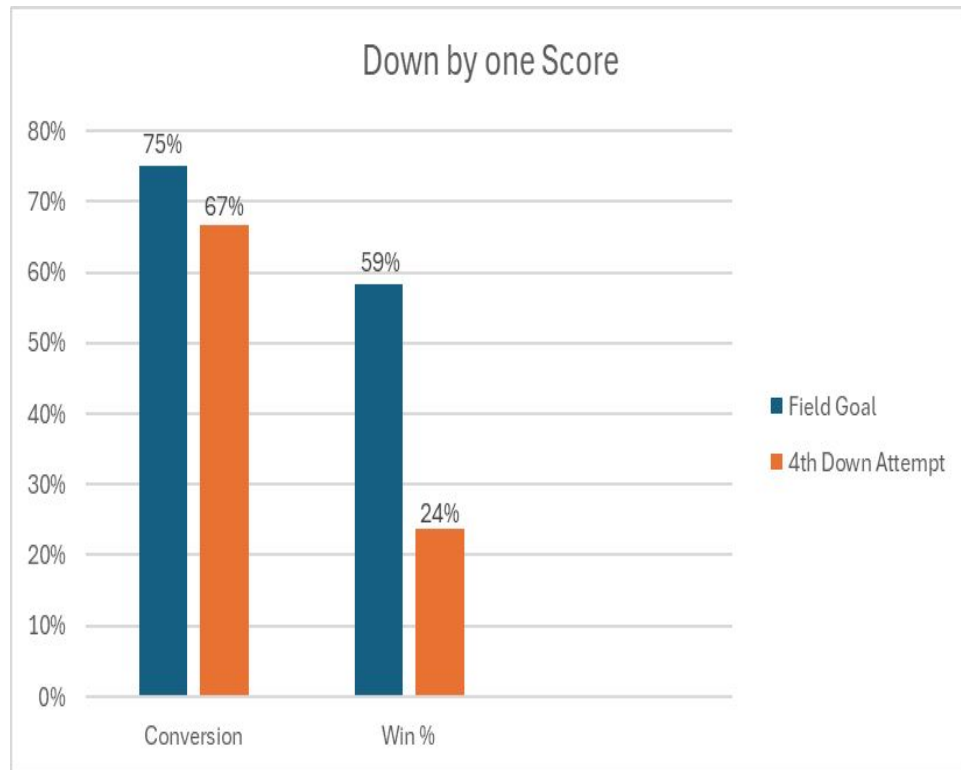
Interpretation: When trailing by one score, teams are slightly more successful at securing points through a field goal than they are at converting a 4th-down attempt.

2. **Teams that kicked a field goal won far more often than teams that went for it.**

Interpretation: 4th-down attempts convert at a decent rate, but they rarely translate into wins. Field goals, despite being more conservative, more than double the win probability here.

3. **Context likely explains the gap:**

Teams going for it are often in **more desperate situations**, score wise. Field goals tend to be taken when teams still have a viable path to win, which boosts their final outcome percentages.



Situation #2

4th down, up 3, in FG range in late-game: go up 6 or go for it?

Overview: Teams face a conflict whether to extend their lead to six points, risking losing if they give up a touchdown on the ensuing drive, or to attempt to end the game by converting a fourth down, leading to only a field goal being necessary to tie the game

Hypothesis: Generally, going for it on fourth down will lead to a greater probability of winning, especially on shorter conversion attempts. This could be as a result of the rate of fourth down conversion successes, as well as the potential psychological effect of motivating a team to need to score a touchdown.

Defining Terms:

- **Late game** = 4th quarter, 4 minutes and under

Ex: Giants vs Lions, 2025 Week 12.
The Giants were up three facing fourth and goal in the 4th – they went for it and failed → Lions ended up winning in overtime.





Findings

Finding:

Historically, there has been no difference in winning percentage between teams who go for a field goal versus those who go for a fourth down conversion when up 3 in late game situations in reasonable field goal range (in opposing territory). In 260 such situations since 1999, there is an 82% win percentage for teams who make either decision.

Interpretation:

There are a variety of factors that could contribute to this result. The most likely factor is the changing philosophy on fourth down decision making in the NFL over this time. Teams are more likely now to go for fourth downs in more advantageous scenarios, so assuming teams would utilize this information, it can be expected that the win percentage of teams that go for it would increase.

Application:

The most reasonable application would be to know that there is not a clearly-defined analytical decision which would impact win probability, as the percentages are nearly identical. Instead, teams should focus on traditional evaluations of their team's strengths and weaknesses to make this decision, and optimize their chances of success.



Potential Irregularities to Our Findings

- Strength of certain NFL teams that choose to go for it
 - Teams above .500 will have a higher success rate when playing against subpar ones
- Coach job security & bias toward conservative decisions
 - Offensive Coordinators on the hot seat could be more passive/aggressive depending on their risk tolerance under pressure (Sandholtz, 2024).
- Game context
 - Factors including being home/away, during primetime, or the overall weather can influence an offense's choices (Brill, 2024).



References

Willman, D. (n.d.). *NFLsavant.com: Advanced NFL statistics*. Retrieved November 27, 2025, from <https://nflsavant.com/about.php>

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Sandholtz, N., Wu, L., Puterman, M., & Chan, T. C. Y. (2024). *Learning risk preferences in Markov decision processes: An application to the fourth down decision in the National Football League*. arXiv preprint arXiv:2309.00756. <https://doi.org/10.48550/arXiv.2309.00756>. Retrieved December 1, 2025.