Redzone Play Calling Efficiency

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Overview

- We set out to find the most efficient way to score a touchdown within 20 yards of the endzone.
- Which plays are most effective within 20 yards (Run / Pass type)
- Which teams had the best Redzone Percentage and what were their play call tendencies?

Methodology

Play-by-play (nfl_data_py 2021 to 2023) to observe trends in the play calling in the redzone.

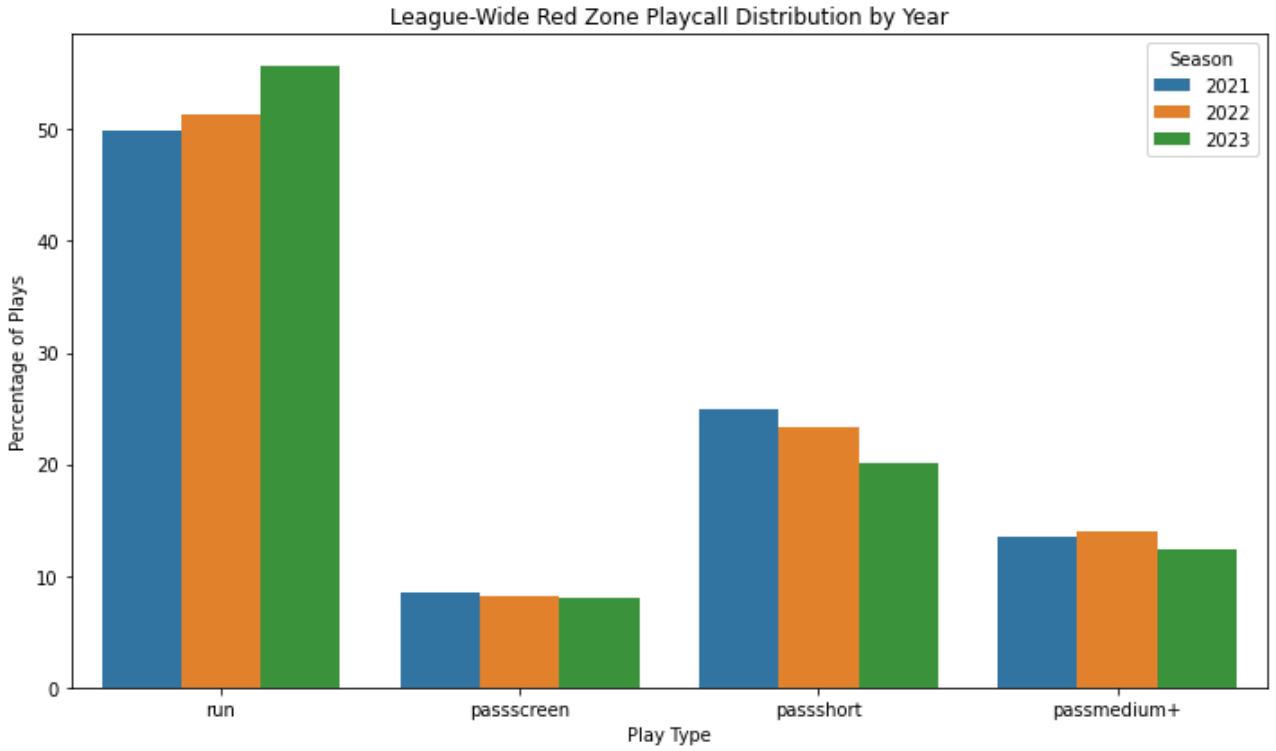
Data filtered to neutral game scripts and standard play types for accuracy

- Score Differential ≤ |16|
- No spikes, kneels, field goals, two point conversion attempts

Objective

- **Measure Efficiency:** Evaluate how effective the league's top offenses are at converting red zone opportunities into touchdowns.
- **Analyze Play Calling:** Identify which play call distributions correlate most strongly with high red zone touchdown rates.
- **Assess Play Type Impact:** Determine which types of plays (run, screen, short/intermediate passes) are most efficient in red zone situations.
- **Route Effectiveness:** Explore which receiver routes yield the most success when teams choose to pass in the red zone.

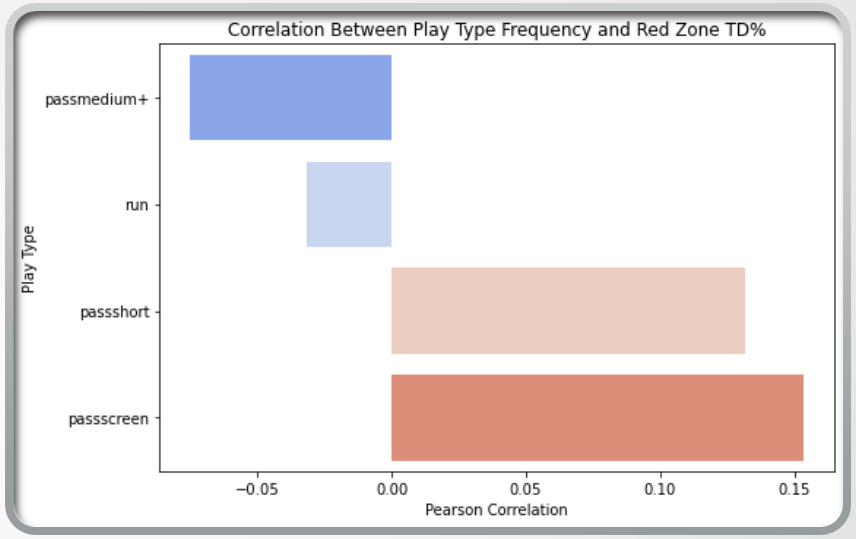
Offensive Play Calling

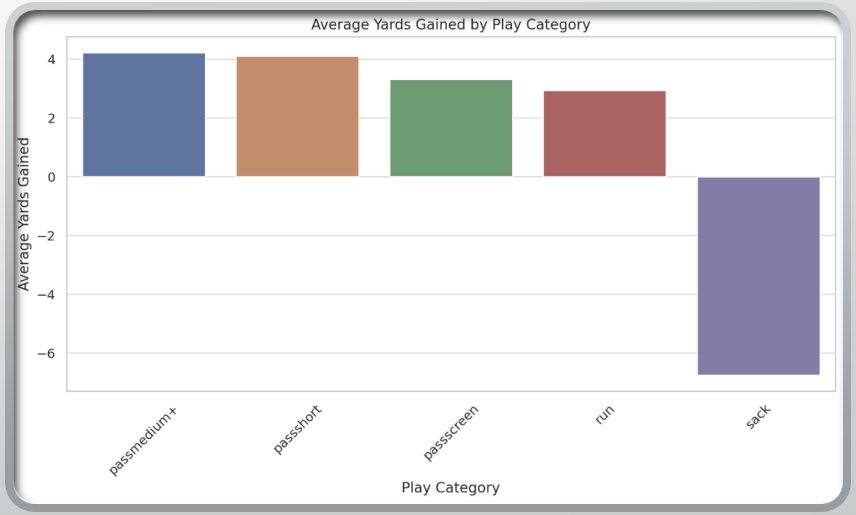


- **Run-Heavy Tendencies:** Teams favor the run in red zone situations more than any other play type — an unsurprising but consistent trend across seasons.
- **Downfield Over Screens:** When passing, offenses are more likely to target intermediate or deep routes rather than rely on screen plays.
- **Shifting Identity:** There's a noticeable league-wide shift toward increased rushing frequency — potentially signaling a modern resurgence of the running back's value in tight space.

Offensive Production

- **Pass plays**—regardless of depth—yield **higher average yardage** than runs.
- **Run plays and screens** show **comparable, limited gains**.
- **Sacks are significantly more detrimental** in the red zone—average losses are more than double the gains of a successful play.
- Highlights the **high-risk, high-reward** nature of **passing** near the goal line.



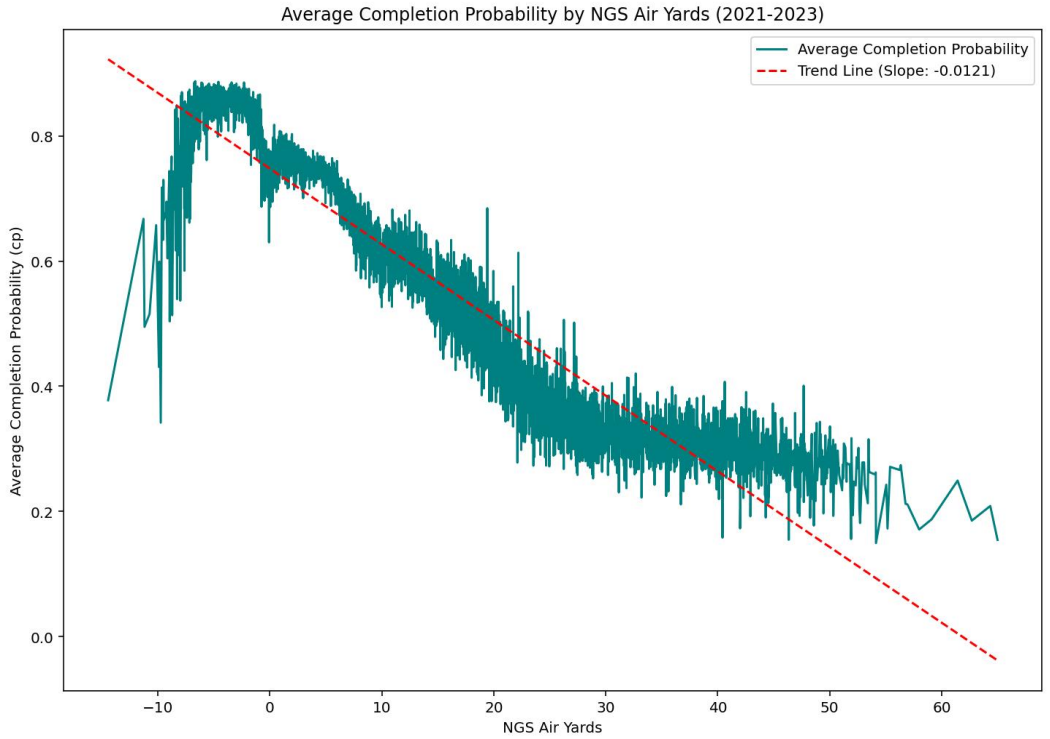


Completion Probability – Air Yards

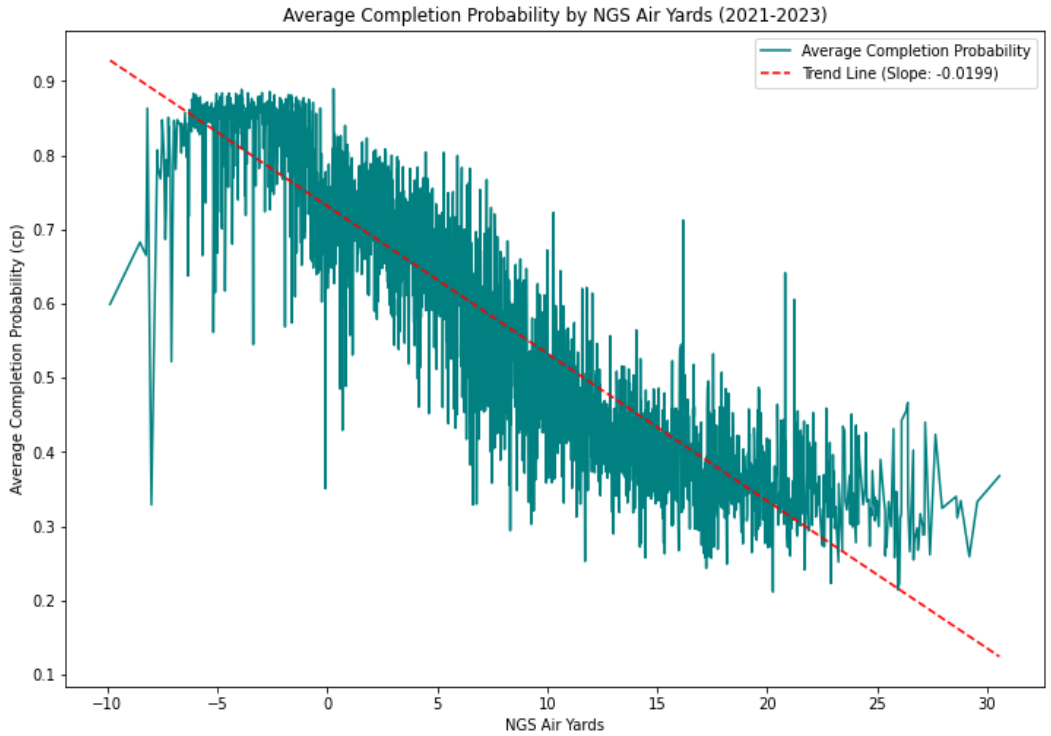
Red Zone vs. Full Field

- Red zone throws face a sharper efficiency cliff as air yards increase.
- With less field to stretch the defense vertically, longer throws become far more difficult.
- Defenders can compress space, leading to tighter coverage and reduced completion rates.

Full Field

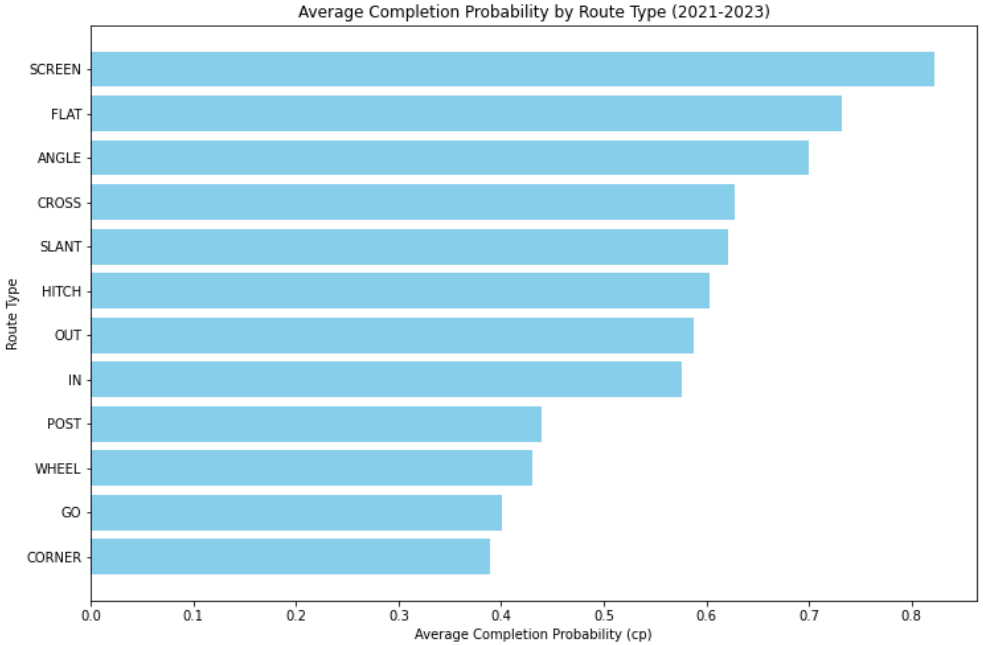


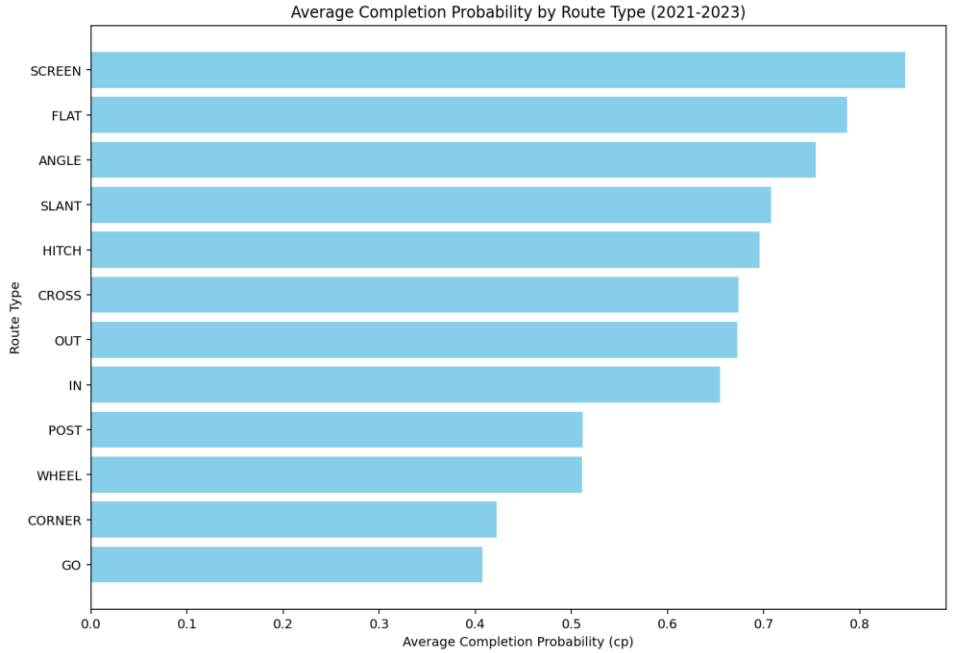
Redzone

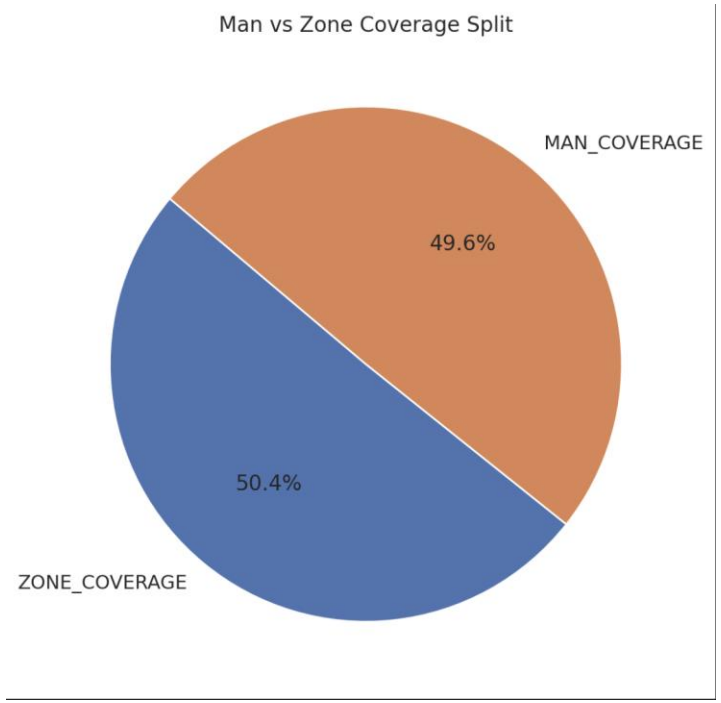


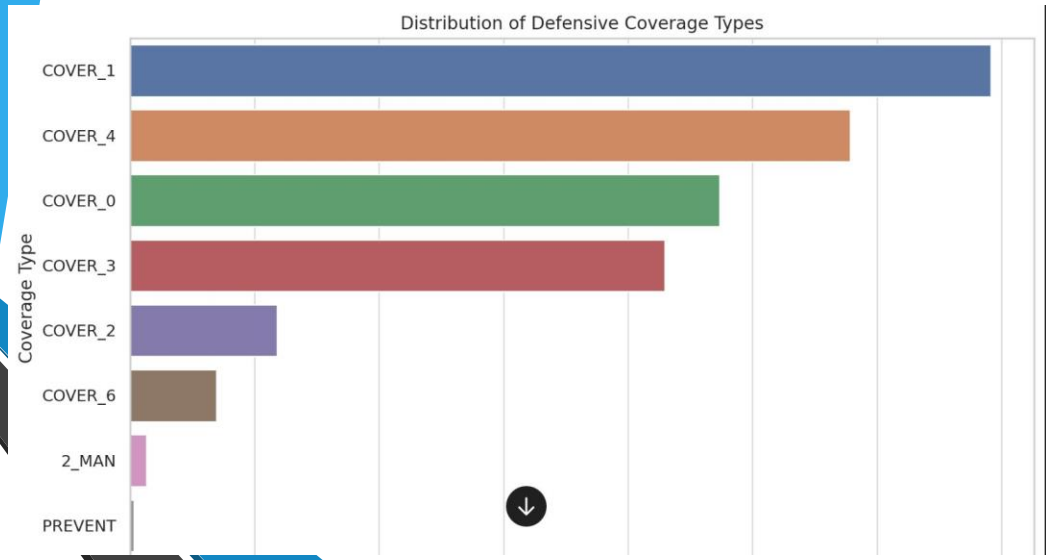
Completion Probability — Route Types

- **Lower success rates across all routes** in the red zone due to tighter coverage and compressed space.
- **Route effectiveness hierarchy remains consistent** — short routes like flats, slants, and outs continue to dominate.
- Reinforces the value of **quick, timing-based concepts** near the goal line.









Defensive Coverage

- **Man Coverage:** Defenses frequently rely on **Cover 1** or **Cover 0** — aggressive, press man-to-man looks designed to tighten throwing windows in the red zone.
- **Zone Coverage:** When opting for zone, **Cover 3** and **Cover 4** are the most commonly deployed, aiming to keep plays in front and clog passing lanes.

Limitations

Missing Data on Sacks: Route data is unavailable when a quarterback is sacked, preventing classification of the intended pass concept.

Target Bias: Only the targeted route is logged in the data, omitting the full route concept or progression design.

Broken Plays: Plays that break down (e.g., scrambles, miscommunications) cannot reliably reflect the original call.

RPOs and Option Runs: These are not explicitly labeled in the play-by-play data, limiting accuracy in classifying hybrid concepts.

Application/Future Expansion

- **Coaching Use Case**: Inform red zone playcalling decisions based on high-efficiency concepts and route success rates
- **Team Scouting Reports**: Identify opponent tendencies and inefficiencies in red zone play distribution
- **Predictive Modeling**: Build models to forecast touchdown probability based on play design, personnel, and defensive look
- **Expanded Data Depth**: Integrate QB reads, progression data, and pre-snap motion for a fuller picture of play intent

That's A Wrap — Thanks For Listening!