# Grading NFL Defenders in Coverage Using Player Tracking Data

## A Target-Agnostic Evaluation Method for Cornerbacks & Wide Receivers

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# Goals

Quantify CB & WR performance on ALL routes

Find undervalued players

Optimize CB-WR matchups

# Data

Game Data

Player Data (play position tag)

Player Tracking Data (x, y, speed, direction, orientation, event tag)

Play Data (down, distance, personnel, **EPA**)

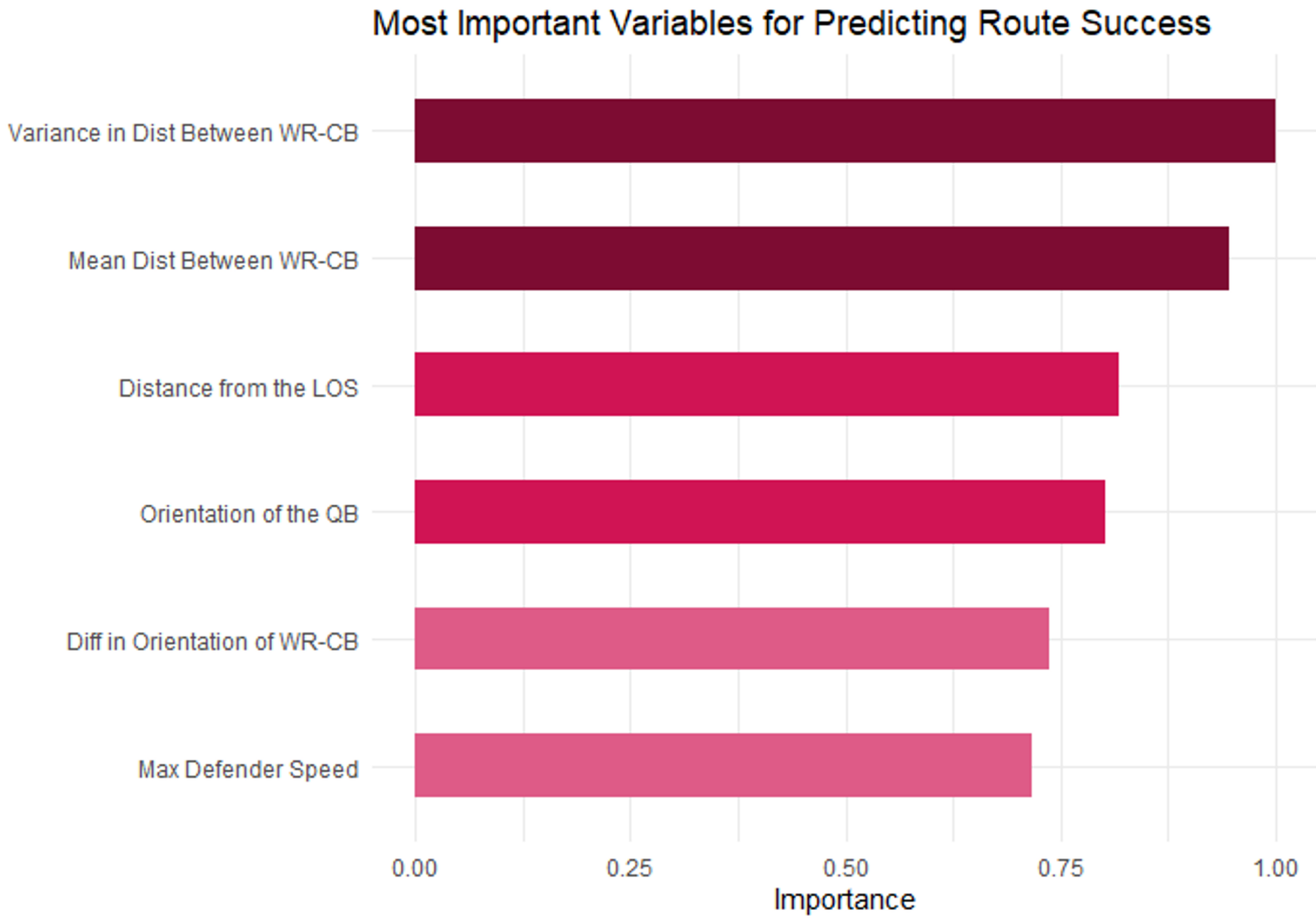
# Methodology

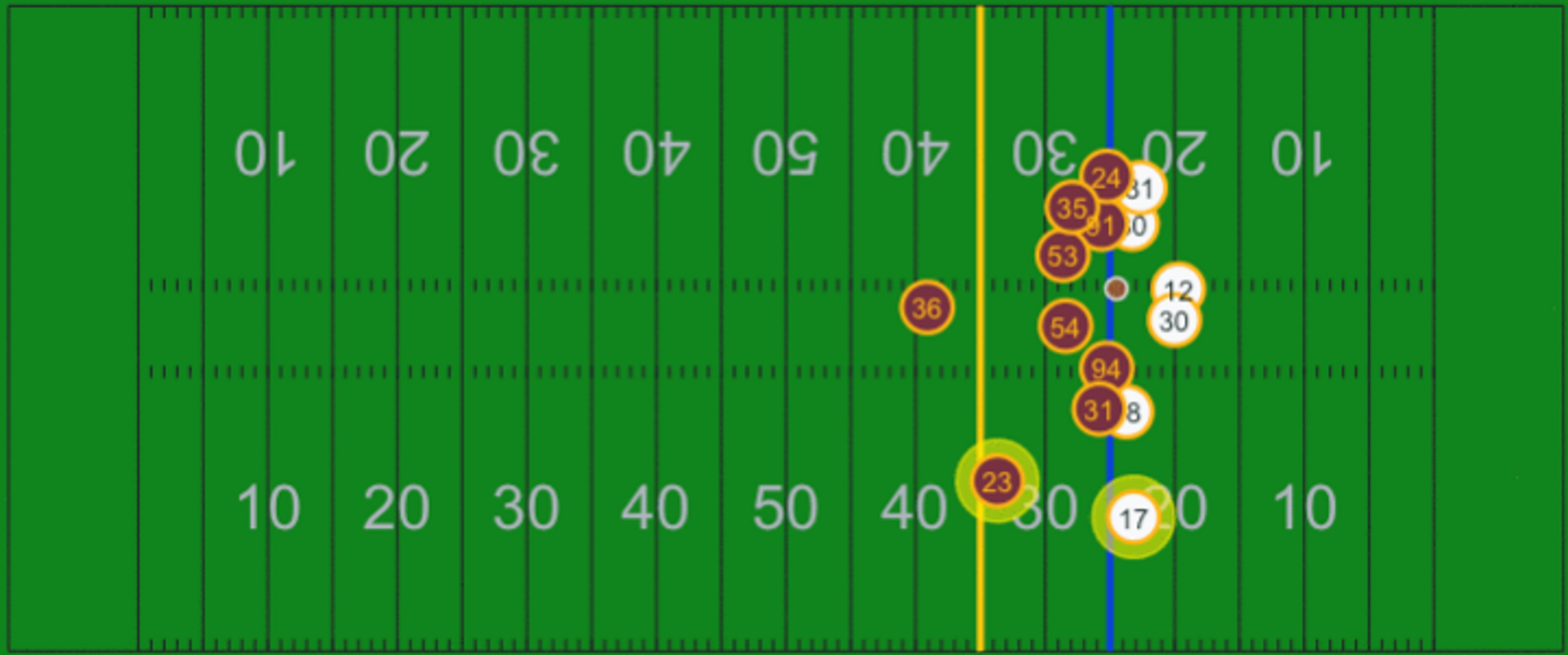
1. Predict Model Route Success (XGBoost)

2. Develop Player Ratings (ELO)

# Route Success Classification Model

- **Model:** XGBoost
- **Output:** % Route Success
- **Accuracy:** 70.4%






Quinton Dunbar

CB, Washington

23

CB Win

50-50

WR Win

17

Davante Adams

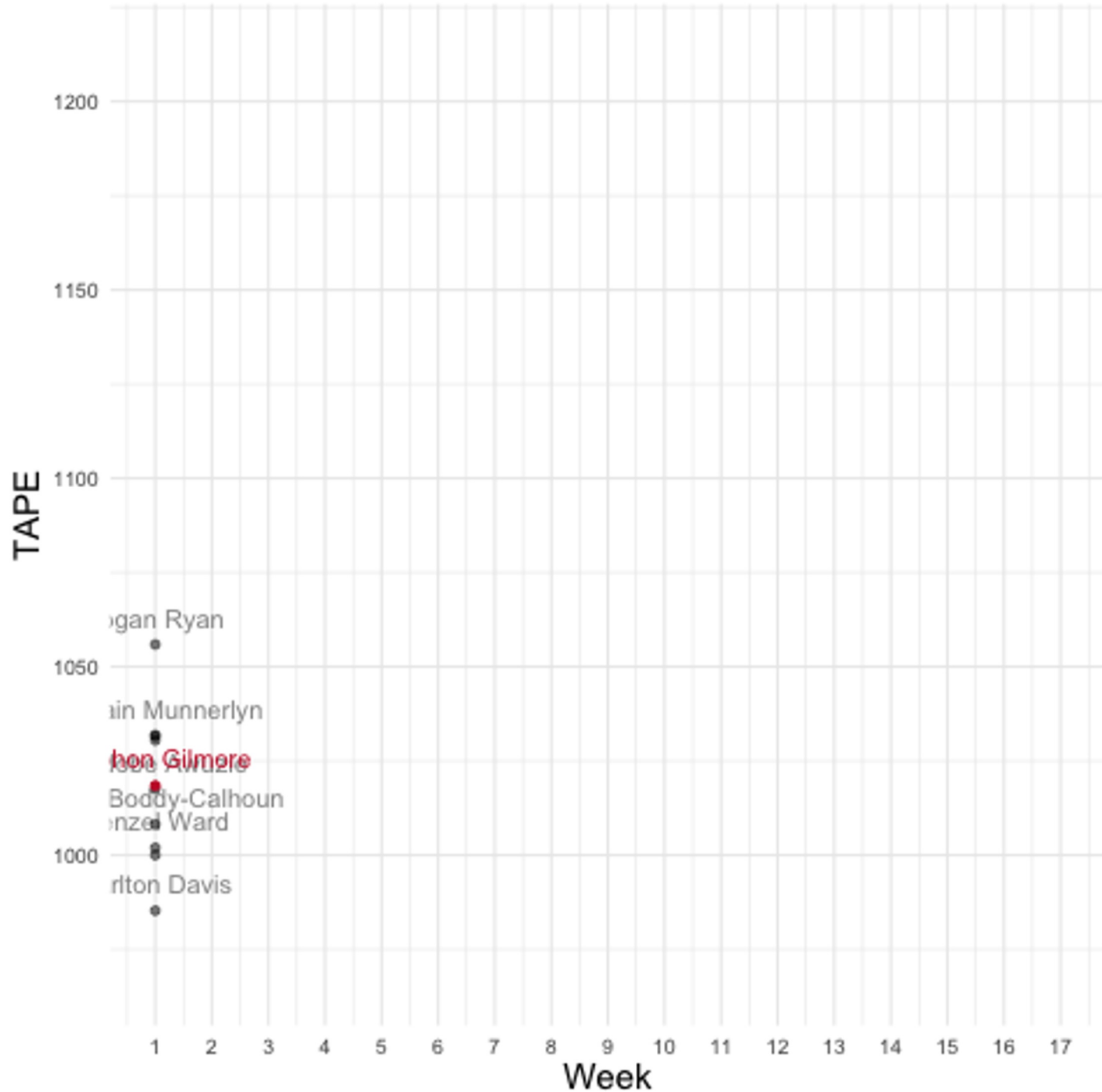
WR, Green Bay

## Final Defender Rankings

2018 NFL Season

| Defensive Player | TAPE[1] |
|---|---|
| Stephon Gilmore | 1232.06 |
| William Jackson | 1191.08 |
| Captain Munnerlyn | 1170.95 |
| Denzel Ward | 1158.11 |
| Chidobe Awuzie | 1141.88 |
| Jason McCourty | 1134.40 |
| Carlton Davis | 1131.76 |
| Briean Boddy-Calhoun | 1131.24 |
| Logan Ryan | 1130.89 |
| Jalen Ramsey | 1130.33 |

[1] Target Agnostic Player Elo

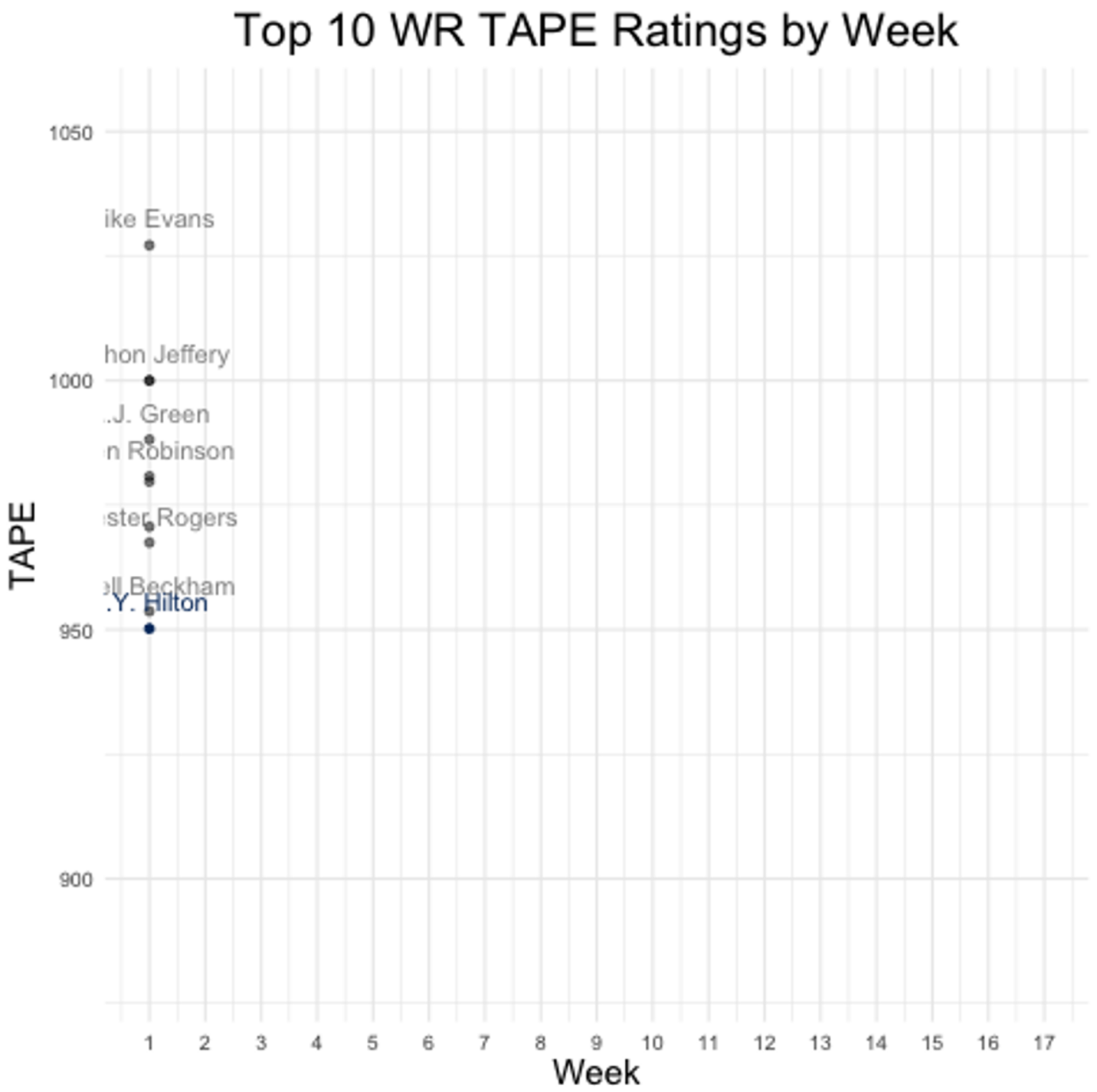


## Final Wide Receiver Rankings

2018 NFL Season

| | Offensive Player | TAPE[1] |
|---|---|---|
| | T.Y. Hilton | 1052.50 |
| | Odell Beckham | 1049.31 |
| PRO BOWL | Mike Evans | 1040.38 |
| | Brandin Cooks | 1040.33 |
| | A.J. Green | 1038.11 |
| PRO BOWL | Tyreek Hill | 1031.35 |
| | Alshon Jeffery | 1030.36 |
| | Chester Rogers | 1024.37 |
| | Allen Robinson | 1019.07 |
| PRO BOWL | Julio Jones | 1016.38 |

[1] Elo Rating



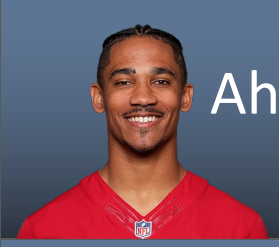
# Finding Undervalued Players

**Jaire Alexander**
PFF Grade: 90.4 (#1)

**Xavien Howard**
PFF Grade: 87.3 (#2)

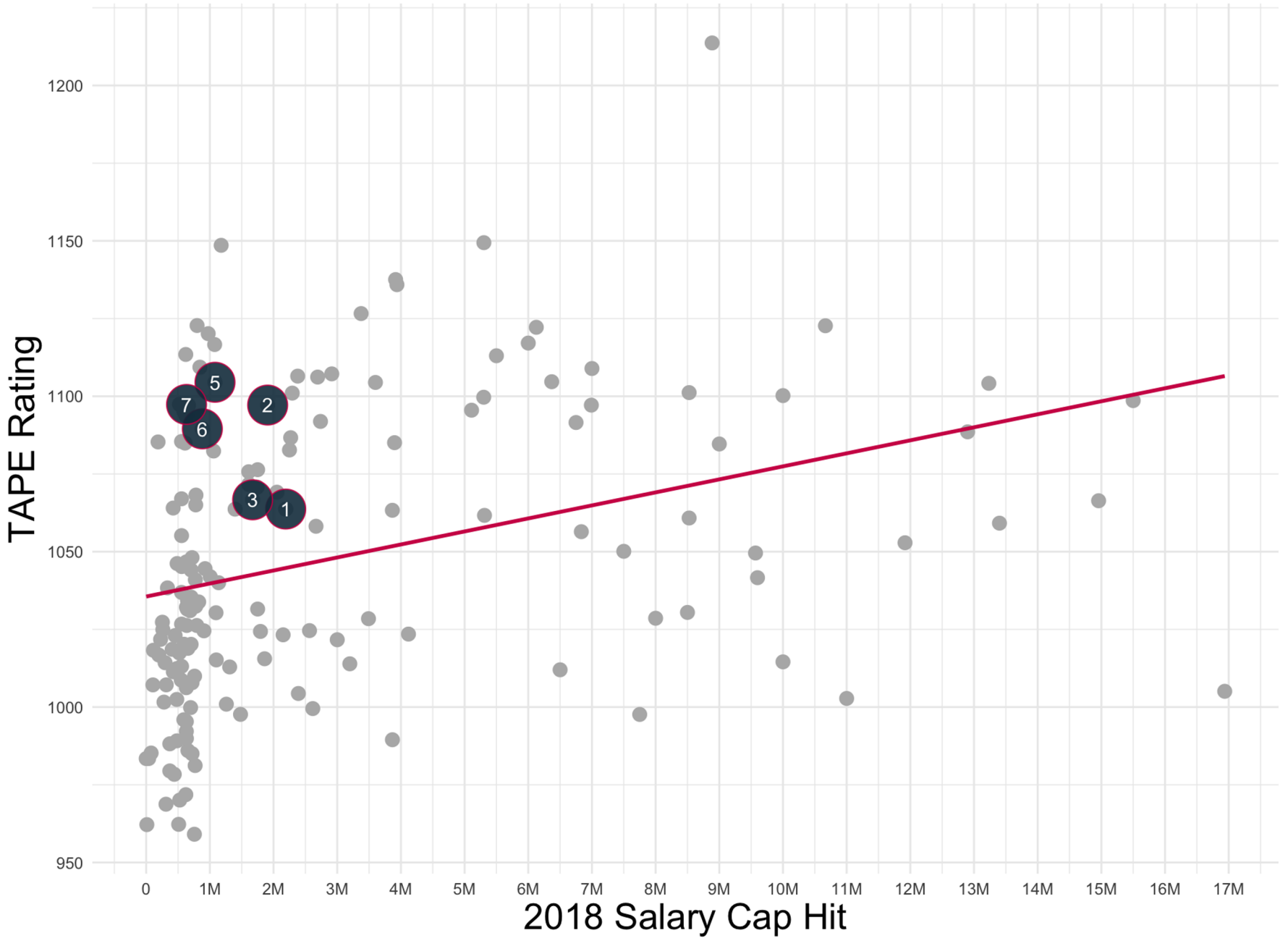
**Bryce Callahan**
PFF Grade: 84.1 (#3)

**Jonathan Jones**
PFF Grade: 80.7 (#5)



**Ahkello Witherspoon**
PFF Grade: 80.2 (#6)

**James Bradberry**
PFF Grade: 79.8 (#7)



# Optimizing Matchups

Stephon Gilmore
TAPE: 1213.69

Jonathan Jones
TAPE: 1097.37

Stephon Gilmore
TAPE: 1213.69

Jonathan Jones
TAPE: 1097.37

Davante Adams
TAPE: 945.17

&

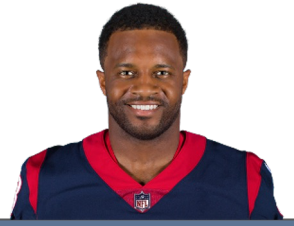
Randall Cobb
TAPE: 889.66

Gilmore: 82.43% Win

Jones: 76.78% Win

NE: 63.29% Win

OR



Randall Cobb
TAPE: 889.66

&

Davante Adams
TAPE: 945.17

Gilmore: 86.59% Win

Jones: 70.60% Win

NE: 61.13% Win

# Conclusion

Our metric provides effective player evaluation

Teams can use this for game planning

Spatiotemporal data is an important predictor of route outcomes