Section 1: Importance

In the National Football League (NFL), there are currently 5 wide receivers (WR) set to make over $32 million annually heading into the 2025 NFL season, making WRs the highest paid non-quarterback position in the league (Kerr & Podell, 2025). As salaries hit all-time highs, teams are constantly seeking ways to extract value in player acquisition and contract structuring. Yet year-to-year production is volatile, and many signings fail to deliver return on investment. Only 11 of the 42 teams who made the playoffs since 2021 finished top 10 in both money and salary cap percentage allocated to the WR position, and those 11 teams combined for just 4 playoff wins, with none advancing past the divisional round (Greenawalt, 2024).

As WR roles continue to evolve with the increase in specialized usage against defensive schemes, evaluating WRs with a one-size-fits-all approach no longer works. Slot specialists, deep threats, and do-it-all WR1s all offer different strategic value, and their production must be evaluated accordingly. With rising WR salaries and a tightened NFL salary cap, understanding receiver type, efficiency, and future trajectories is the backbone of this project. This analysis addresses that need by using an unsupervised data mining approach by clustering WRs into performance-based profiles, evaluating contract efficiency by cluster for each profile.

Top-10 AVG Salary by Position (2011 vs 2025)

@DanDGriffis | Data: Spotrac

POS	2011	2024	% Change
QB	$14.6	$53.3	365.1%
WR	$10.0	$30.1	301.0%
OG	$7.2	$18.7	259.7%
DT	$10.0	$24.7	247.0%
OT	$10.4	$24.1	231.7%
EDGE	$11.9	$26.2	220.2%
TE	$6.7	$14.1	210.5%
S	$8.2	$17.0	207.3%
CB	$10.1	$20.6	204.0%
C	$5.5	$10.9	198.2%
LB	$8.1	$13.0	160.5%
RB	$8.1	$11.4	140.7%

Created with Datawrapper

Figure 1. The change in salaries from the year 2011 to 2025. Wide receivers have had the largest increase outside of quarterbacks (Griffis, 2025).

Section 2: Statistical Methodology

To better understand wide receiver value in the NFL, this project is divided into two phases: clustering player type, and evaluating contract efficiency within those groups. The full analysis used publicly available data from websites, FantasyPros and Pro Football Reference, for WR performance statistics during NFL seasons 2021-2024 and current year contract data from Over the Cap. This analysis filtered the data to include WRs who played a minimum 8 games (half the NFL season) to provide stable usage patterns. The performance metrics used were targets, total receiving yards, yards per reception (Y/R), yards after catch per reception (YAC/R), yards before contact per reception (YBC/R), red zone targets (RZ TGT), touchdowns, and drop rate. Player contracts were assessed using annual salary amounts.

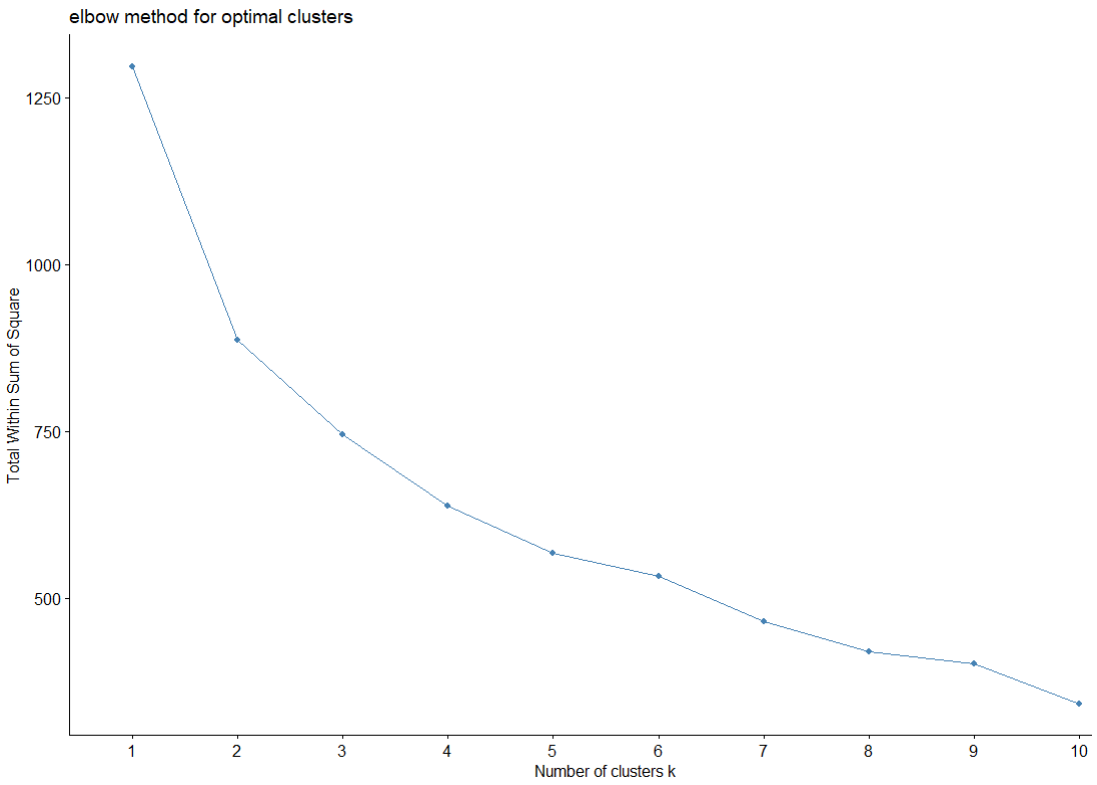
To identify WR profiles, this analysis used an unsupervised clustering approach on 2024 WR performance metrics, all variables were standardized prior to clustering. To determine the optimal number of clusters, both the elbow method and silhouette method were applied using k-means clustering to assess overall structure in the data. After testing both k-means and partitioning around medoids (PAM) clustering methods, PAM was selected due to its strength with outliers and using actual player profiles as cluster

medoids. This resulted in four clearly defined WR profiles: “Do-it-all WRs,” “Field-Stretchers,” “Slot/Gadget WRs,” and “Boom-or-Bust Depth WRs” (see Appendix B).

After clustering, contract efficiency was evaluated by calculating a “value-score”, a metric that measures production relative to salary. Upon experimenting with multiple formulas and performing a correlation matrix along with a multivariate linear regression, a composite z-score was used which consisted of receiving yards, red zone targets, and average annual salary. Drop rate was then introduced as a penalizing factor, which reshuffled rankings by rewarding reliability (scaled: (yards + red zone targets - drop rate) / (Annual Salary/$1 million). This adjustment helped differentiate high volume but inefficient WRs from those who deliver consistent value per dollar, leading to determine the most undervalued WRs heading into the 2025 NFL season (see Appendix B.5).

Section 3: Results and Interpretation

The first stage of this analysis focused on identifying distinct wide receiver types/profiles across the NFL based on performance. Key metrics were then selected from publicly available data that captured volume, explosiveness, efficiency, and scoring potential: YDS, Y/R, YAC/R, YBC/R, RZ TGT, TD, Drop rate. All numeric values were standardized to ensure equal weighting across different scales.



To determine the appropriate number of clusters, both the Elbow method (to assess total within-cluster sum of squares) and the Silhouette method (to evaluate cluster separation). The elbow method showed a bend at k = 4 (Figure 2), and the silhouette score was reasonably strong at both k = 4 and k = 5 (see Appendix B.1). Initially K-means clustering was considered, but PAM was ultimately chosen for its ability to evaluate outliers and to anchor clusters around actual WR profiles than theoretical means, given the variability of the wide receiver types. A 2D cluster projection was used to visually inspect the cluster structure (see Appendix B.3 & B. 4). The results of PAM at k = 4 (4 clusters) was selected in comparison to k = 5 (5 clusters) because it provided a more interpretable solution with the results of four clearly differentiated wide receiver clusters.

Although some positional overlap was expected most WRs grouped cleanly, supporting the idea that wide receiver roles in the NFL are not randomly distributed, but they fall into functional performance categories.

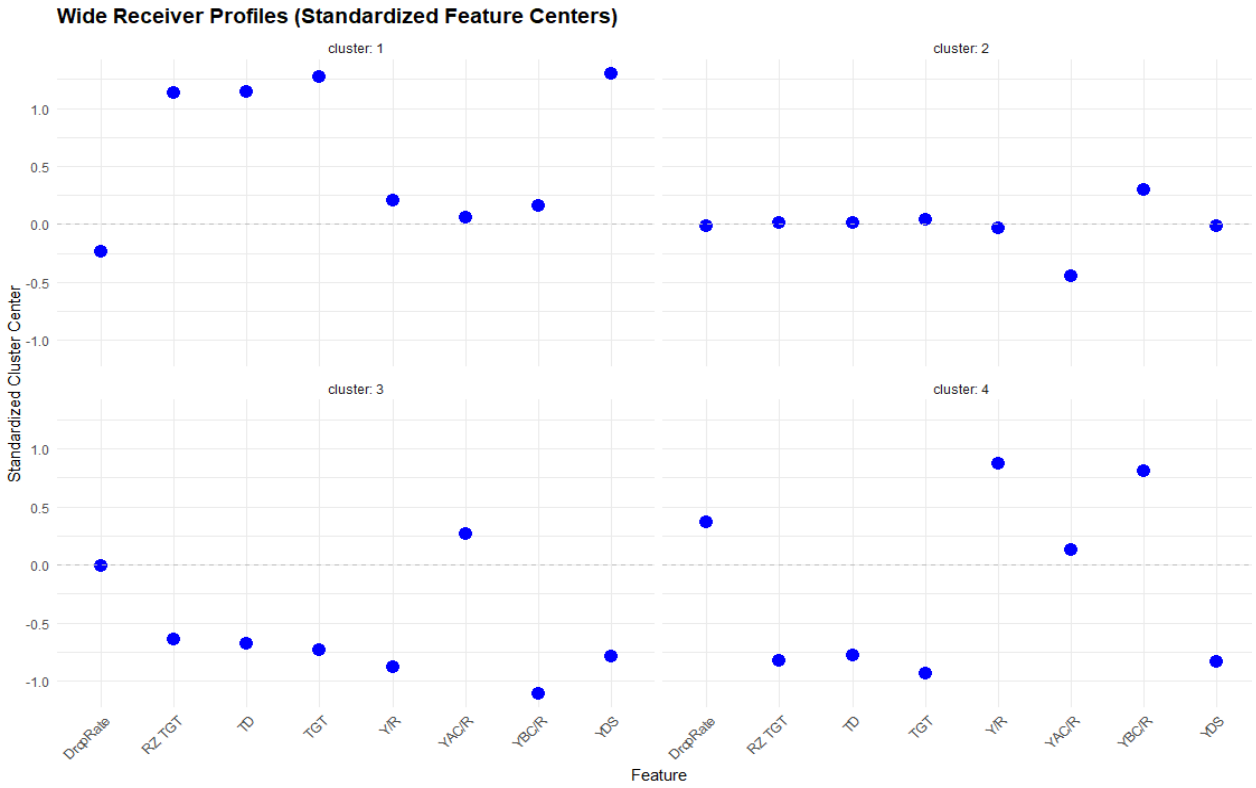


Figure 3. Dot plot of wide receiver profiles and their scaled average from PAM cluster analysis

A dot plat was used to visually inspect the scaled variable means from PAM cluster analysis to help interpret wide receiver description (Figure 3):

- **Do-it-all WRs (Cluster 1):** Players with strong volume, red zone usage, and consistent production across multiple metrics.
- **Field-Stretchers (Cluster 2):** Deep threats with high yards per reception and fewer overall targets.
- **Slot/Gadget WRs (Cluster 3):** Short-area receivers with high YAC/R and lower scoring totals.
- **Boom-or-Bust Depth WRs (Cluster 4):** Players who rely on touchdowns and deep shots but had inconsistent usage and drop rate concerns.

With clusters defined, contract data was used to explore whether teams were valuing players effectively by type. After merging the salary information, average annual salary per WR cluster was calculated. This revealed that Do-it-all WRs were being paid significantly more, almost 3x more than the next closest WR type (see Appendix B.9). This matched market expectations, but raised questions about whether teams were overpaying for volume without considering efficiency.

To build an efficiency metric, the relationship between player stats and salary was examined. A correlation analysis revealed that receiving yards (r = 0.6), targets (r = 0.56), and red zone targets (0.55) were among

the highest predictors of salary (see Appendix C.1). This relationship was then validated using a multivariate linear regression model, which confirmed that receiving yards (p = 0.001), targets (p = 0.041) and red zone targets (p = 0.043) were statistically significant predictors of WR salary. Targets were then dropped because it was highly correlated with yards (r = 0.96), and red zone targets (r = 0.86) (see Appendix C.2). Based on this evidence, a custom "Value Score" was created and initially defined as:

$$Value\ Score\ = \frac{\text{Receiving Yards} + \text{Red Zone Targets}}{\text{Annual Salary}}$$

However, upon reviewing, some higher ranking WRs had significant drop rates. This then led to recalculating the score with drop rate as a penalty, producing a better version that rewards reliable and efficient receivers. This adjustment reshaped the top 50 undervalued WRs table and helped highlight players who were more efficient in their role (see Appendix D).

$$Value\ Score\ = \frac{\text{Receiving Yards} + \text{Red Zone Targets} - \text{DropRate}}{\text{Annual Salary}}$$

Upon looking at these results, and with the knowledge of which wide receivers were rookies in 2024, there were nine "Do-it-all" profiled rookie WRs in the top 20. This information suggests that the 2024 draft class produced efficient and highly valued wide receivers based on their rookie season and grouping into cluster 1 "Do-it-all" profile (see Appendix D.3). Despite earning the highest average salaries, not all Do-it-all WRs ranked highly on value score, suggesting that teams are paying for volume, not efficiency. Several slot/gadget or Field-Stretcher WRs had strong efficiency at a fraction of the cost, particularly when drop rate was accounted for.

Section 4: Alternative Approaches

While k-means clustering was initially considered, PAM was selected due to its way of handling outliers, because of the many different WR performances in 2024, along with its ability to cluster around actual WR profiles which allowed for better interpretability in a diverse position such as WRs. Dimensionality reduction techniques such as PCA were also explored, but were excluded to preserve the original feature definitions because there were only 8 features originally.

Section 5: Conclusion

In the NFL, teams are pressured to spend wisely on wide receivers, a position that now seeks top tier salaries despite unpredictable production from year-to-year. This project explored that challenge by combining clustering, and contract analysis to offer a new framework for evaluating WR value. By identifying four distinct wide receiver profiles, this analysis showed that performance, and efficiency dramatically vary, which pins teams into making difficult decisions in valuing their wide receiver position.

References

- Kerr, & Podell. (2025, March 24). *10 highest-paid non-quarterbacks in NFL: Bengals' ja'marr chase no. 1, Texans' Danielle Hunter Third on list*.
    - Source: https://www.cbssports.com/nfl/news/10-highest-paid-non-quarterbacks-in-nfl-bengals-jamarr-chase-no-1-texans-danielle-hunter-third-on-list/
- Griffis. (2025, March 6). *New salary cap: The evolution of pay in the NFL by position*.
    - Source: https://sports.yahoo.com/article/salary-cap-evolution-pay-nfl-211159279.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAMV5SC-Hxukew3Xxp0u_am0BRpLBG5pxmcecpRUfWL9dgpfQ7igQCs3iG7y_JepGW0sgrIbPxx2Ik-CLJdsLHHGxi5Q2Yl17F-LvitJ3CEL-ieNqh-D2x9QttFgtL-sN_1T91tutL4aJ85I9jPmYyaCWklhMiMtydSEAeWBbXYKj
- Greenawalt, T. (2024, September 6). *Are the NFL's highest-paid wide receivers a bad investment?* Opta Analyst.
    - Source: https://theanalyst.com/2024/09/are-the-highest-paid-wide-receivers-worth-it
- Harmon, M. (2023, June 22). *Introduction to reception perception: Reception perception*. Reception Perception | Matt Harmon's Reception Perception | Evaluating wide receivers and quantifying route running with unique charting data since 2014.
    - Source:https://receptionperception.com/introduction-to-reception-perception-and-its-new-home/
- https://www.fantasypros.com/nfl/stats/wr.php
- https://www.pro-football-reference.com/years/2024/receiving.htm
- https://overthecap.com/position/wide-receiver/2025

Appendix A

Exploratory Analysis

Highest-paid non-quarterbacks in average annual salary

PLAYER	TEAM	POSITION	AVERAGE ANNUAL SALARY
Ja'Marr Chase	Cincinnati Bengals	WR	$40,250,000
Myles Garrett	Cleveland Browns	DE	$40,000,000
Danielle Hunter	Houston Texans	DE	$35,600,000
Maxx Crosby	Las Vegas Raiders	DE	$35,500,000
Justin Jefferson	Minnesota Vikings	WR	$35,000,000
CeeDee Lamb	Dallas Cowboys	WR	$34,000,000
Nick Bosa	San Francisco 49ers	DE	$34,000,000
DK Metcalf	Pittsburgh Steelers	WR	$33,000,000
A.J. Brown	Philadelphia Eagles	WR	$32,000,000
Chris Jones	Kansas City Chiefs	DT	$31,750,000

Appendix A.1 This table shows the highest paid non-quarterbacks in the NFL. 5 of the top 10 are wide receivers (Kerr & Podell 2025). Heading into the 2025/2026 season

Top-10 AVG Salary by Position (2011 vs 2025)

@DanDGriffis | Data: Spotrac

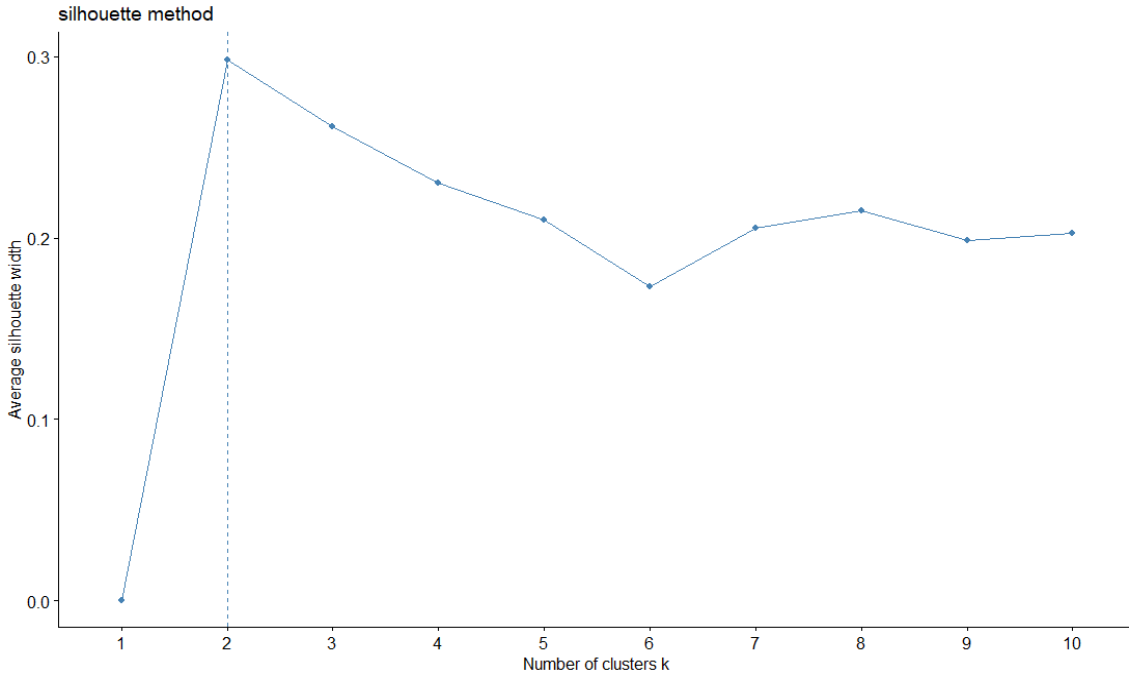
POS	2011	2024	% Change
QB	$14.6	$53.3	365.1%
WR	$10.0	$30.1	301.0%
OG	$7.2	$18.7	259.7%
DT	$10.0	$24.7	247.0%
OT	$10.4	$24.1	231.7%
EDGE	$11.9	$26.2	220.2%
TE	$6.7	$14.1	210.5%
S	$8.2	$17.0	207.3%
CB	$10.1	$20.6	204.0%
C	$5.5	$10.9	198.2%
LB	$8.1	$13.0	160.5%
RB	$8.1	$11.4	140.7%

Created with Datawrapper

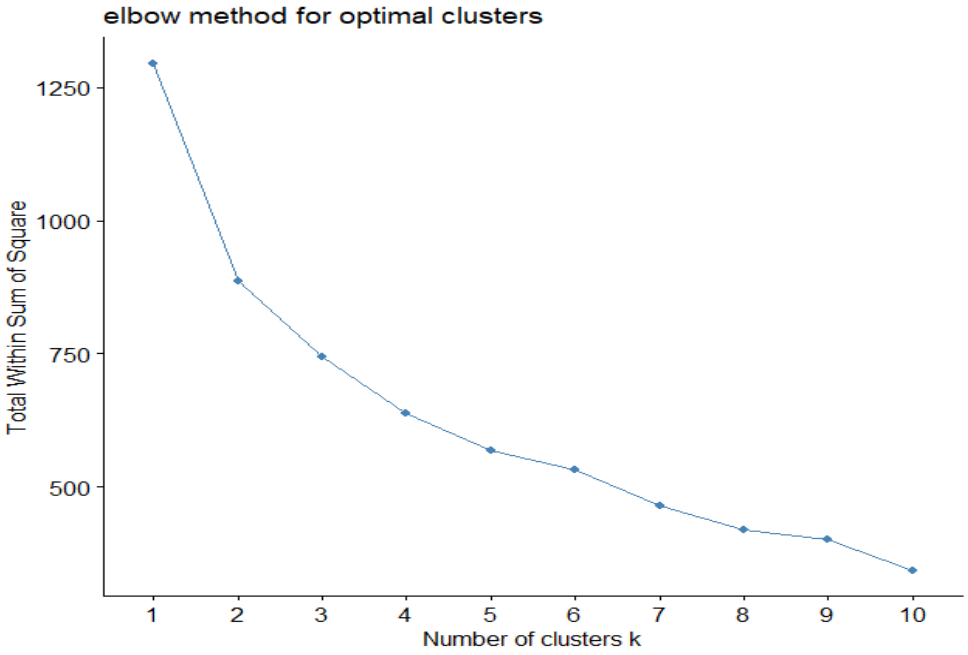
Appendix A.2 This table highlights the increase in WR salary from 2011-2024 seasons (Griffis, 2025).

Appendix B

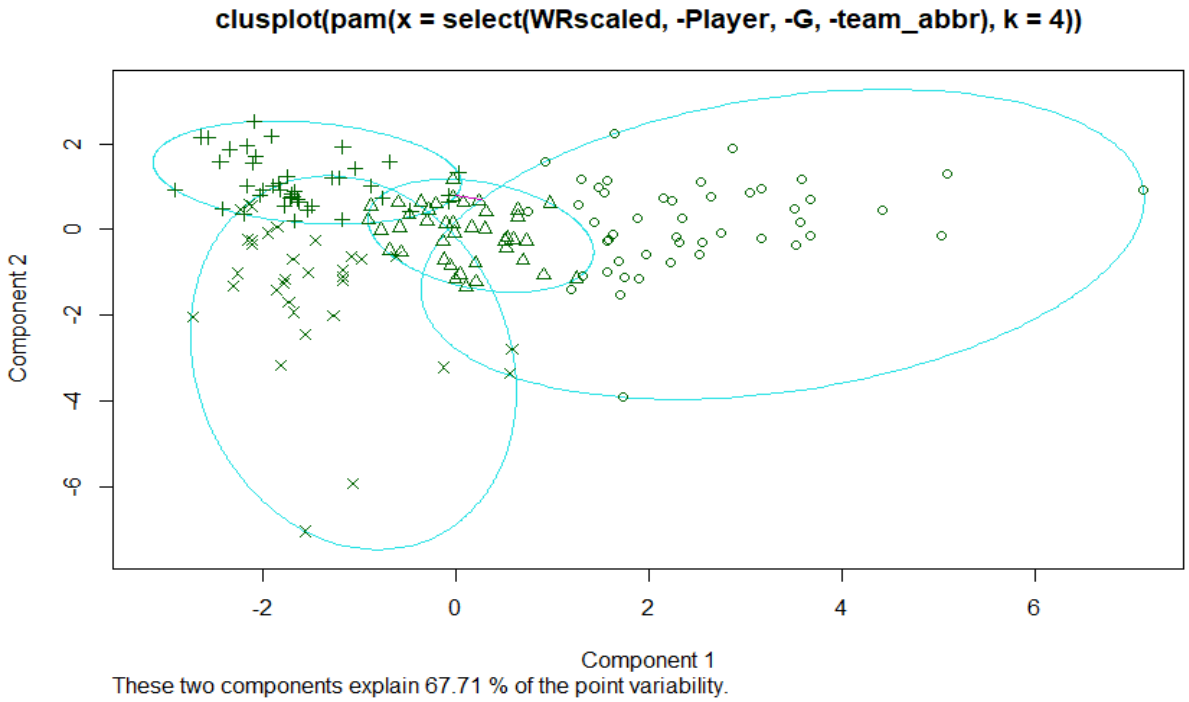
Cluster Analysis



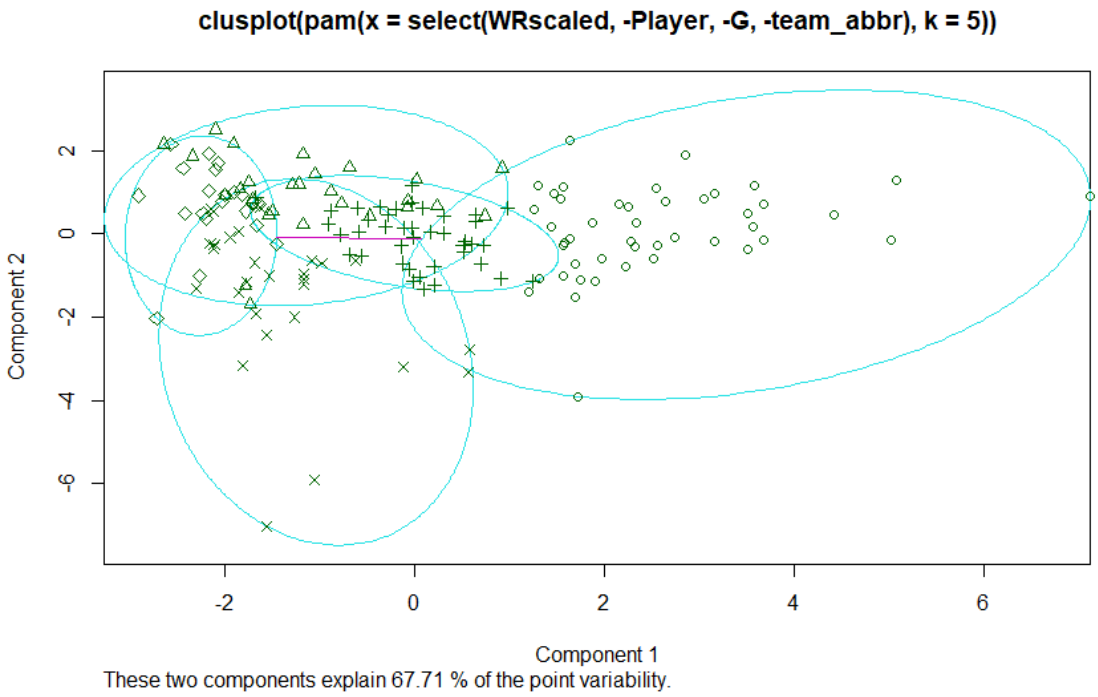
Appendix B.1 The k-means silhouette method prioritizes tight, well separated clusters. K-means provided an interpretable benchmark to assess overall structure in the data. This suggests there is a strong divide between two main wide receiver types.



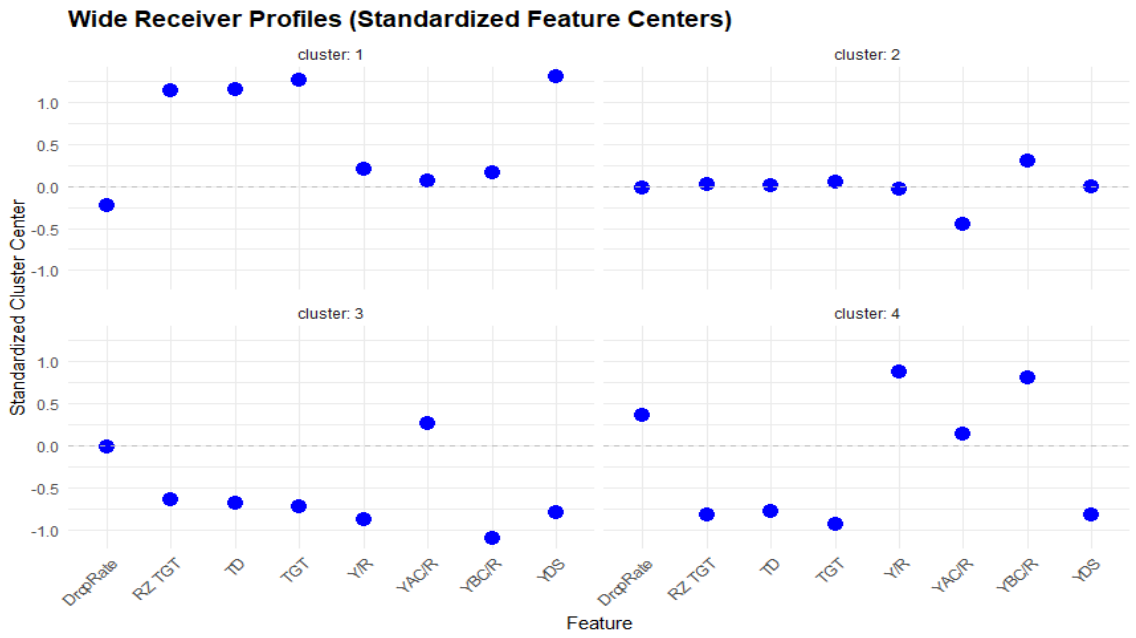
Appendix B.2 The k-means elbow method appears around k=4. K-means provided an interpretable benchmark to assess overall structure in the data. This method looks at diminishing returns in cluster variation.



Appendix B.3 The PAM cluster analysis with k = 4, 2D cluster shows distinct groupings with minimal overlap. Overall, this 2D image shows that the variables are successfully identifying different wide receiver types.



Appendix B.4 This 2D image of PAM cluster analysis shows the results of k = 5 (or when there is 5 different cluster/wr types). This shows reasonable separation but overlapping does exist, specifically near the center. These results confirmed the cluster analysis to continue with k = 4.

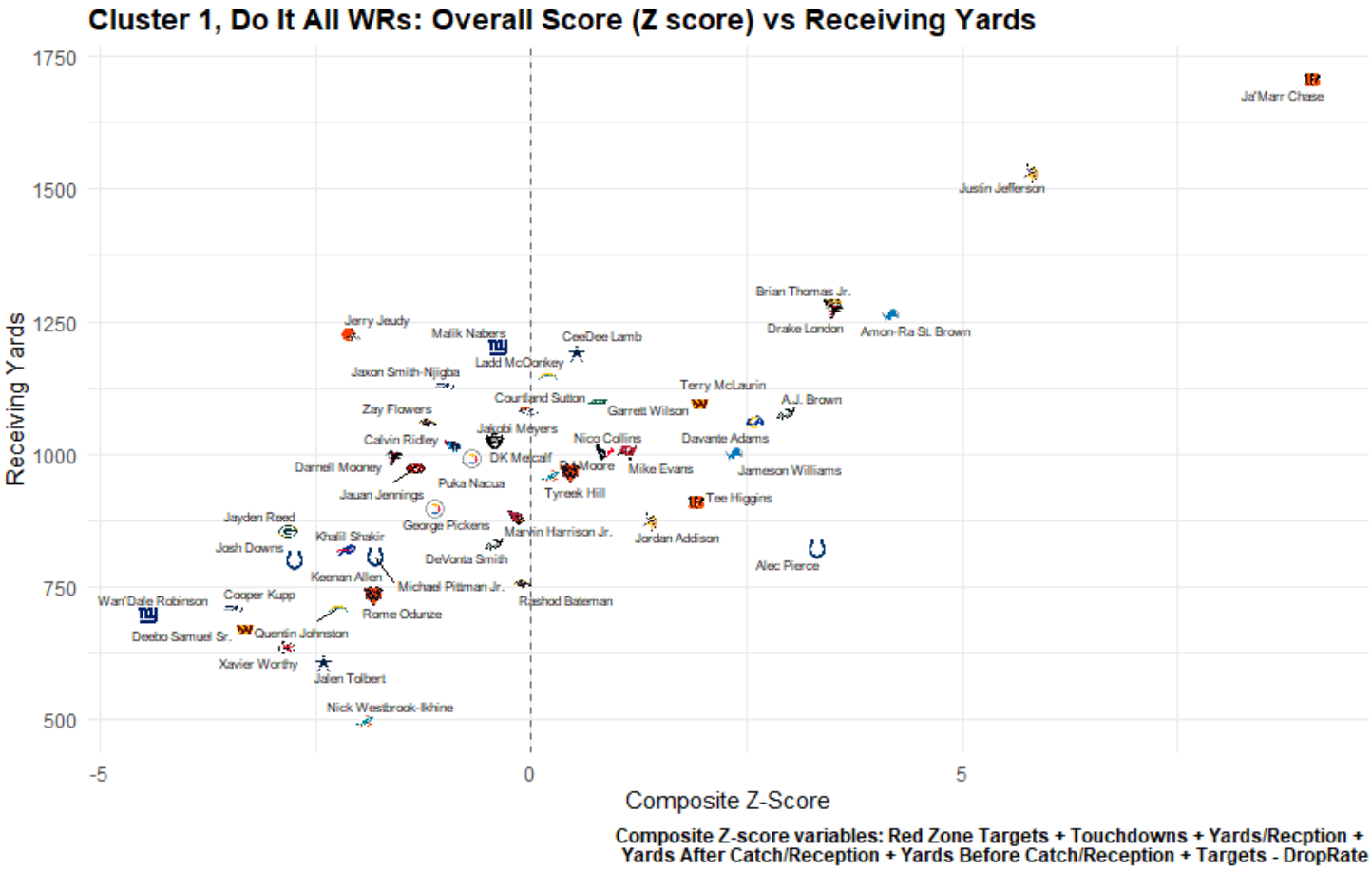


Appendix B.5 Wide receiver cluster profiles based on standardized feature analysis. This figure illustrates the standardized mean values for key performance metrics across the four WR clusters identified using PAM. Each subplot represents the cluster center (average standardized performance) across the selected features:

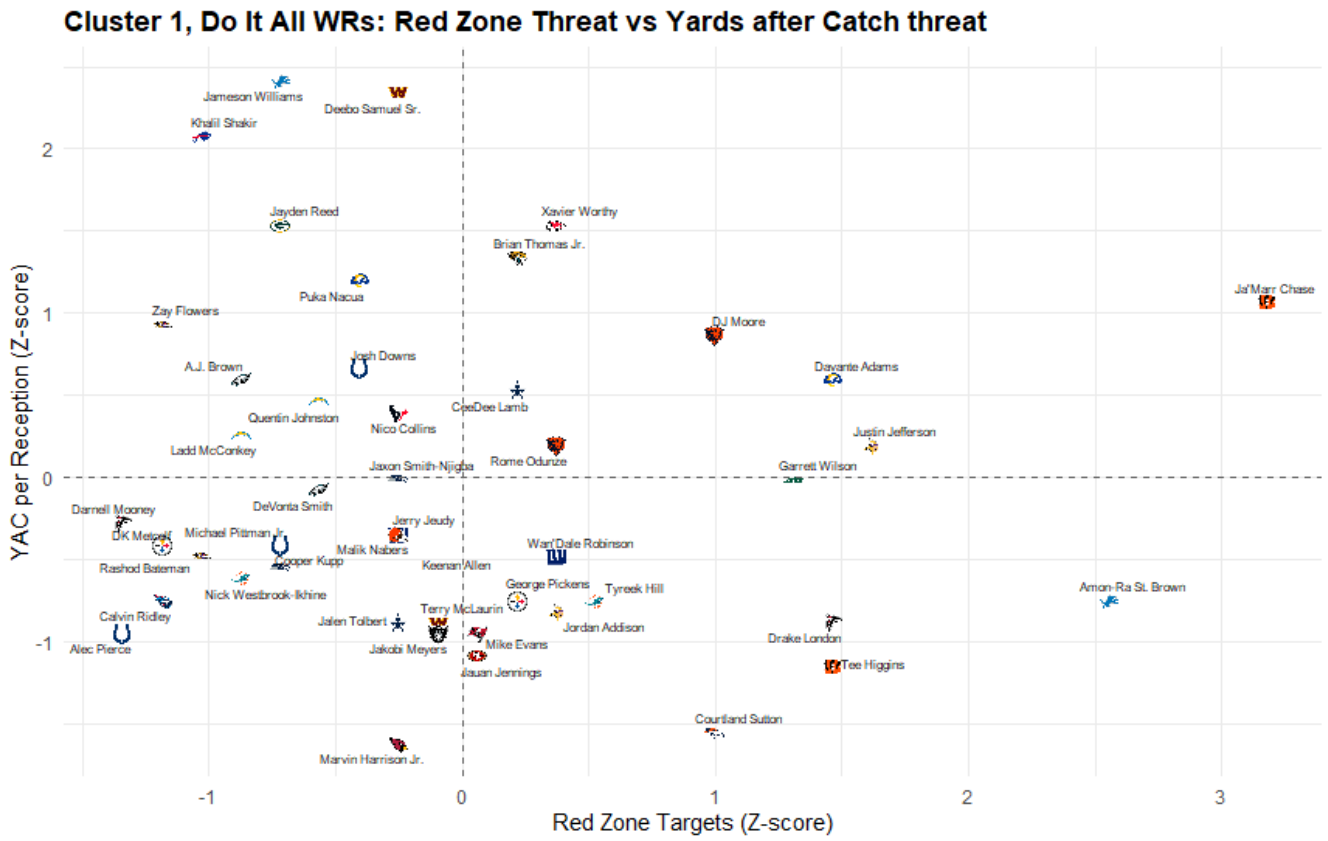
- Drop Rate
- Red Zone Targets (RZ TGT)
- Touchdowns (TD)
- Total Targets (TGT)
- Yards per Reception (Y/R)
- Yards After Catch per Reception (YAC/R)
- Yards Before Catch per Reception (YBC/R)
- Total Receiving Yards (YDS)

Cluster 1 is characterized by high usage and touchdown production with a below average drop rate. Suggesting a reliable and go to WR. Cluster 2 includes receivers with broadly average performance across features. Cluster 3 identifies low-targeted, low-efficiency players, likely depth receivers. Cluster 4 stands out for its high yards per reception and yards after catch, reflecting a profile focused on explosive field-stretching plays but high volatility with the highest drop rate. The results highlight the diverse specialization of wide receivers beyond raw yardage.

- **Do-it-all WRs (Cluster 1):** Players with strong volume, red zone usage, and consistent production across multiple metrics.
- **Field-Stretchers (Cluster 2):** Deep threats with high yards per reception and fewer overall targets.
- **Slot/Gadget WRs (Cluster 3):** Short-area receivers with high YAC/R and lower scoring totals.
- **Boom-or-Bust Depth WRs (Cluster 4):** Players who rely on touchdowns and deep shots but had inconsistent usage and drop rate concerns.



Appendix B.6 Exploratory analysis with Cluster 1 wide receivers. This scatterplot illustrates the relationship between Composite Z-score and Receiving yards. WR located in the top right quadrant of the plot (Ja'Marr Chase, Justin Jefferson) demonstrate both high overall efficiency and high production. This makes sense as these two WR are considered the best in the NFL. WR towards the bottom left show lower efficiency and lower production.



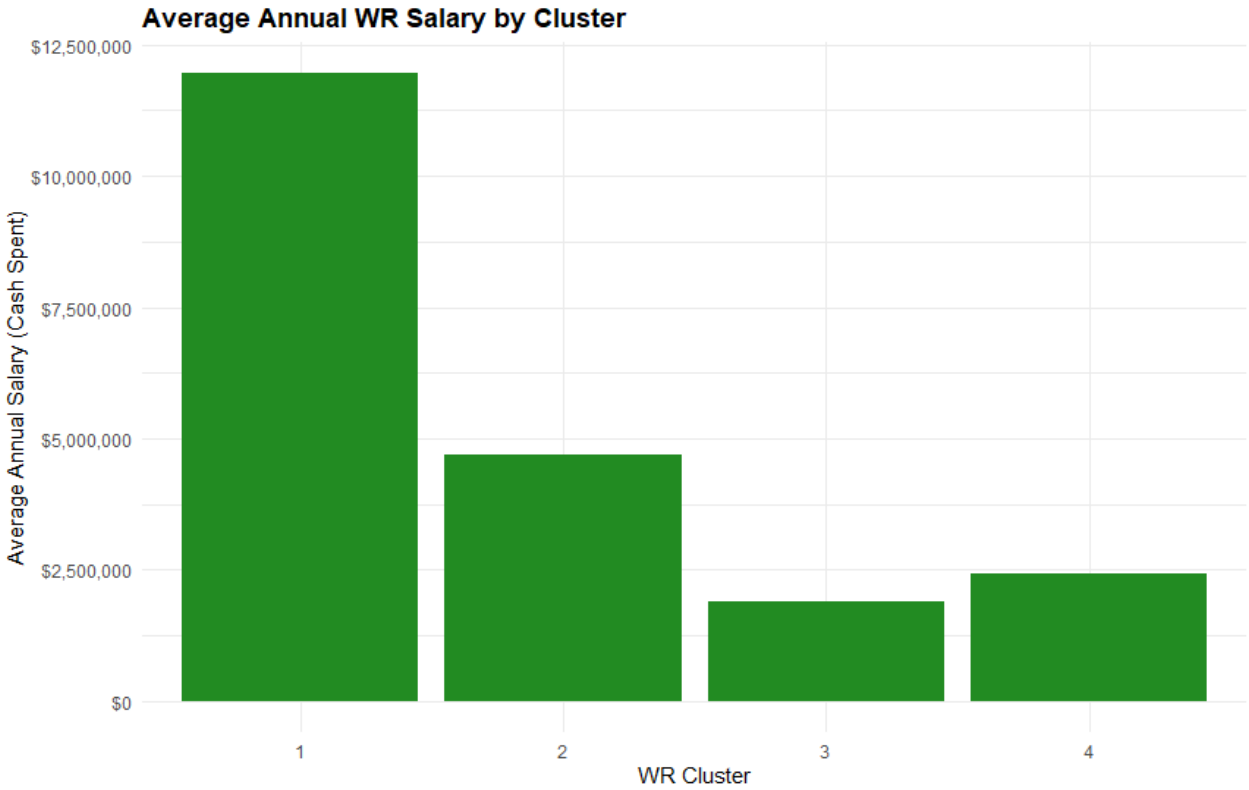
Appendix B.7 Further exploratory analysis separating out cluster 1 wide receivers by illustrating the relationship between red zone threats and yards after catch. Red zone targets and YAC/R were standardized (Z-score).

- Receivers positioned in the top right quadrant exhibit strengths as both high red zone threats and dynamic YAC playmakers.
- Receivers in bottom right quadrant act as strong red zone threats but generate less YAC/R
- Receivers in the top left quadrant demonstrate strong YAC abilities but are less frequently targeted in the red zone
- The bottom left quadrant represents players with lower scores in both red zone usage and YAC/R

This visualization highlights key differences within cluster 1 receivers beyond overall production totals, reinforcing the diversity of roles even among similarly classified WRs.

Appendix B.8: The table created in R that shows each 2024 wide receiver and their respective cluster from this analysis is in the repository link for this project. (tables/ClusterAnalysis.pdf)

ClusterAnalysis.pdf



Appendix B.9 This bar chart displays the average annual salary per wide receiver for each cluster.

- Cluster 1 (Do-it-all WRs) has by far the highest average annual salary, exceeding $12 million, reflecting the premium teams place on versatile, high volume wide receivers
- Cluster 2 shows a moderate average salary (roughly over $4.5million), representing receivers who contribute but may not dominate in all aspects.
- Cluster 3 and 4 exhibit lower average annual salaries ($2 - $2.5million), consistent with profiles of WRs who serve more specialized or limited offensive roles.

Appendix C

Correlation Analysis for Creating Value Score

	Cash Spent ▾	YDS	TD	TGT	RZ TGT	YAC/R	Y/R	YBC/R
Cash Spent ▾	1.000000000	0.600444732	0.52045431	0.56125416	0.55484873	-0.007574398	0.07219186	0.07859792
YDS	0.600444732	1.000000000	0.82422398	0.96223701	0.83275765	0.008986739	0.17501882	0.17104921
TD	0.520454311	0.824223977	1.00000000	0.77739537	0.81897692	-0.011284340	0.15929047	0.16954787
TGT	0.561254160	0.962237009	0.77739537	1.00000000	0.86474746	-0.049123100	0.04396459	0.07860163
RZ TGT	0.554848727	0.832757653	0.81897692	0.86474746	1.00000000	-0.035892584	0.03251122	0.05766748
YAC/R	-0.007574398	0.008986739	-0.01128434	-0.04912310	-0.03589258	1.000000000	0.39851002	-0.32293439
Y/R	0.072191857	0.175018819	0.15929047	0.04396459	0.03251122	0.398510024	1.00000000	0.73924564
YBC/R	0.078597924	0.171049211	0.16954787	0.07860163	0.05766748	-0.322934392	0.73924564	1.00000000

```
Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  2064308    2380598   0.867  0.38734
YDS            22362       6725   3.325  0.00113 **
TD           -191399     349215  -0.548  0.58450
`RZ TGT`      391834     191976   2.041  0.04311 *
TGT          -122278      59303  -2.062  0.04105 *
`YAC/R`      3221716   11844587   0.272  0.78602
`Y/R`       -3408326   11821861  -0.288  0.77354
`YBC/R`      3237914   11807959   0.274  0.78432
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Appendix C.1 The correlation matrix (top) and a multivariate linear regression model (bottom) of the variables within analysis to determine which metrics correlate to athlete salary. Both tables show strong association with volume-based production specifically total yards and red zone targets play a primary role in wide receiver salaries within this dataset.

Appendix D

Wide Receiver Evaluation

Appendix D.1 A table created in R (below) shows the ranking of the most undervalued wide receivers in each cluster. Evaluated by incorporating the correlation results and generating a scaled composite z-score called "value score":

$$Value\ Score\ = \frac{\text{Receiving Yards} + \text{Red Zone Targets}}{\text{Annual Salary}}$$

The table shows the top 10 undervalued wide receiver in each cluster from this analysis. The full table can be found in this projects repository. (table/Top25Cluster.pdf)

Top25cluster.pdf

Top 25 Most Cost-Efficient (Undervalued) WRs per Cluster

Ranked by Value Score ((Yards + RZ TGTs) / Annual Salary)

Player	Team	Annual Salary	WRtype	Cluster	Rank in Cluster
Brian Thomas Jr.	JAX	$1,461,363.00	Do it all WR	1	1
Puka Nacua	LAR	$1,030,000.00	Do it all WR	1	2
Ladd McConkey	LAC	$1,249,327.00	Do it all WR	1	3
Xavier Worthy	KC	$1,421,830.00	Do it all WR	1	4
Malik Nabers	NYG	$2,122,625.00	Do it all WR	1	5
Drake London	ATL	$3,641,520.00	Do it all WR	1	6
Jordan Addison	MIN	$1,998,340.00	Do it all WR	1	7
Jaxon Smith-Njigba	SEA	$2,060,664.00	Do it all WR	1	8
Josh Downs	IND	$1,251,860.00	Do it all WR	1	9
Garrett Wilson	NYJ	$3,507,819.00	Do it all WR	1	10

Top 25 Most Cost-Efficient (Undervalued) WRs per Cluster

Ranked by Value Score ((Yards + RZ TGTs) / Annual Salary)

Player	Team	Annual Salary	WRtype	Cluster	Rank in Cluster
Dontayvion Wicks	GB	$1,030,000.00	Field-Stretcher	2	1
Xavier Legette	CAR	$1,356,690.00	Field-Stretcher	2	2
Tank Dell	HOU	$1,267,192.00	Field-Stretcher	2	3
Andrei Iosivas	CIN	$1,030,000.00	Field-Stretcher	2	4
Allen Lazard	NYJ	$2,500,000.00	Field-Stretcher	2	5
DeAndre Hopkins	BAL	$5,000,000.00	Field-Stretcher	2	6
Romeo Doubs	GB	$3,406,000.00	Field-Stretcher	2	7
Demarcus Robinson	SF	$4,000,000.00	Field-Stretcher	2	8
David Moore	CAR	$1,422,500.00	Field-Stretcher	2	9
Jaylen Waddle	MIA	$16,150,000.00	Field-Stretcher	2	10

Top 25 Most Cost-Efficient (Undervalued) WRs per Cluster

Ranked by Value Score ((Yards + RZ TGTs) / Annual Salary)

Player	Team	Annual Salary	WRtype	Cluster	Rank in Cluster
Olamide Zaccheaus	CHI	$1,500,000.00	Slot/Gadget WR	3	1
KaVontae Turpin	DAL	$5,500,000.00	Slot/Gadget WR	3	2
DeMario Douglas	NE	$1,030,000.00	Slot/Gadget WR	3	3
Dyami Brown	JAX	$10,000,000.00	Slot/Gadget WR	3	4
Curtis Samuel	BUF	$7,400,000.00	Slot/Gadget WR	3	5
Tyler Johnson	NYJ	$1,337,500.00	Slot/Gadget WR	3	6
Greg Dortch	ARI	$3,263,000.00	Slot/Gadget WR	3	7
Marvin Mims Jr.	DEN	$1,301,694.00	Slot/Gadget WR	3	8
Kalif Raymond	DET	$4,000,000.00	Slot/Gadget WR	3	9
Jahan Dotson	PHI	$2,757,048.00	Slot/Gadget WR	3	10

Top 25 Most Cost-Efficient (Undervalued) WRs per Cluster

Ranked by Value Score ((Yards + RZ TGTs) / Annual Salary)

Player	Team	Annual Salary	WRtype	Cluster	Rank in Cluster
Christian Watson	GB	$1,965,141.00	Boom-or-Bust Depth WR	4	1
Keon Coleman	BUF	$1,252,921.00	Boom-or-Bust Depth WR	4	2
Christian Kirk	HOU	$16,500,000.00	Boom-or-Bust Depth WR	4	3
Kendrick Bourne	NE	$6,500,000.00	Boom-or-Bust Depth WR	4	4
Marquez Valdes-Scantling	SEA	$4,000,000.00	Boom-or-Bust Depth WR	4	5
Mike Williams	LAC	$3,000,000.00	Boom-or-Bust Depth WR	4	6
Justin Watson	HOU	$2,500,000.00	Boom-or-Bust Depth WR	4	7
Josh Reynolds	NYJ	$2,750,000.00	Boom-or-Bust Depth WR	4	8
Ashton Dulin	IND	$3,450,000.00	Boom-or-Bust Depth WR	4	9
KhaDarel Hodge	ATL	$2,760,000.00	Boom-or-Bust Depth WR	4	10

Appendix D.2 After inspecting the results of the value score (in appendix D.1) to show a more accurate representation of wide receivers, the incorporation of drop rate to the "value score" equation as a penalty for wide receivers who struggled to catch the ball and represent lower efficiency was added. After incorporating this to the value score the table results were re-arranged and further analysis utilized the updated score to show wide receiver value. The updated "value score" is now:

$$Value\ Score\ = \frac{\text{Receiving Yards} + \text{Red Zone Targets} - \text{Drop Rate}}{\text{Annual Salary}}$$

The table below shows the top 10 undervalued wide receivers in each cluster. The full top 25 undervalued wide receivers per cluster can be found in this projects repository. (table/Top25WithDropRate.pdf)

Top25WithDropRate.pdf

Top 25 Most Cost-Efficient (Undervalued) WRs per Cluster

Ranked by Value Score ((Yards + RZ TGTs - Drop Rate) / Annual Salary)

Player	Team	Annual Salary	WRtype	Cluster	Rank in Cluster
Puka Nacua	LAR	$1,030,000.00	Do it all WR	1	1
Brian Thomas Jr.	JAX	$1,461,363.00	Do it all WR	1	2
Ladd McConkey	LAC	$1,249,327.00	Do it all WR	1	3
Jordan Addison	MIN	$1,998,340.00	Do it all WR	1	4
Jaxon Smith-Njigba	SEA	$2,060,664.00	Do it all WR	1	5
Drake London	ATL	$3,641,520.00	Do it all WR	1	6
Josh Downs	IND	$1,251,860.00	Do it all WR	1	7
Malik Nabers	NYG	$2,122,625.00	Do it all WR	1	8
Wan'Dale Robinson	NYG	$1,821,159.00	Do it all WR	1	9
Garrett Wilson	NYJ	$3,507,819.00	Do it all WR	1	10

Top 25 Most Cost-Efficient (Undervalued) WRs per Cluster

Ranked by Value Score ((Yards + RZ TGTs - Drop Rate) / Annual Salary)

Player	Team	Annual Salary	WRtype	Cluster	Rank in Cluster
Jalen Coker	CAR	$960,000.00	Field-Stretcher	2	1
Ricky Pearsall	SF	$1,364,927.00	Field-Stretcher	2	2
Van Jefferson	TEN	$1,670,000.00	Field-Stretcher	2	3
Michael Wilson	ARI	$1,235,406.00	Field-Stretcher	2	4
Demarcus Robinson	SF	$4,000,000.00	Field-Stretcher	2	5
DeAndre Hopkins	BAL	$5,000,000.00	Field-Stretcher	2	6
Tre Tucker	LV	$1,232,190.00	Field-Stretcher	2	7
John Metchie III	HOU	$1,805,478.00	Field-Stretcher	2	8
Tim Patrick	DET	$2,500,000.00	Field-Stretcher	2	9
Parker Washington	JAX	$1,030,000.00	Field-Stretcher	2	10

Top 25 Most Cost-Efficient (Undervalued) WRs per Cluster

Ranked by Value Score ((Yards + RZ TGTs - Drop Rate) / Annual Salary)

Player	Team	Annual Salary	WRtype	Cluster	Rank in Cluster
Tyler Johnson	NYJ	$1,337,500.00	Slot/Gadget WR	3	1
KaVontae Turpin	DAL	$5,500,000.00	Slot/Gadget WR	3	2
Curtis Samuel	BUF	$7,400,000.00	Slot/Gadget WR	3	3
Olamide Zaccheaus	CHI	$1,500,000.00	Slot/Gadget WR	3	4
Dyami Brown	JAX	$10,000,000.00	Slot/Gadget WR	3	5
Greg Dortch	ARI	$3,263,000.00	Slot/Gadget WR	3	6
Kalif Raymond	DET	$4,000,000.00	Slot/Gadget WR	3	7
Jahan Dotson	PHI	$2,757,048.00	Slot/Gadget WR	3	8
Mecole Hardman Jr.	GB	$1,500,000.00	Slot/Gadget WR	3	9
Marvin Mims Jr.	DEN	$1,301,694.00	Slot/Gadget WR	3	10

Top 25 Most Cost-Efficient (Undervalued) WRs per Cluster

Ranked by Value Score ((Yards + RZ TGTs - Drop Rate) / Annual Salary)

Player	Team	Annual Salary	WRtype	Cluster	Rank in Cluster
Christian Watson	GB	$1,965,141.00	Boom-or-Bust Depth WR	4	1
Christian Kirk	HOU	$16,500,000.00	Boom-or-Bust Depth WR	4	2
Josh Reynolds	NYJ	$2,750,000.00	Boom-or-Bust Depth WR	4	3
Keon Coleman	BUF	$1,252,921.00	Boom-or-Bust Depth WR	4	4
Marquez Valdes-Scantling	SEA	$4,000,000.00	Boom-or-Bust Depth WR	4	5
Zay Jones	ARI	$2,400,000.00	Boom-or-Bust Depth WR	4	6
Kendrick Bourne	NE	$6,500,000.00	Boom-or-Bust Depth WR	4	7
Tim Jones	MIN	$1,870,000.00	Boom-or-Bust Depth WR	4	8
Mike Williams	LAC	$3,000,000.00	Boom-or-Bust Depth WR	4	9
Rakim Jarrett	TB	$1,030,000.00	Boom-or-Bust Depth WR	4	10

Appendix D.3 A table showing the top 20 undervalued wide receivers from this analysis can be found below. The full top 50 table is in the projects repository. (table/Top50Undervalued.pdf)

Top 50 Most Undervalued WRs in the NFL

Based on Value Score ((Yards + RZ TGT - Drop Rate) / Annual Salary)

	Player	Team	Annual Salary	WR Profile	cluster	Value Score	Undervalued Rank
	Puka Nacua	Los Angeles Rams	$1,030,000.00	Do it all WR	1	2.80	1
	Brian Thomas Jr.	Jacksonville Jaguars	$1,461,363.00	Do it all WR	1	2.33	2
	Ladd McConkey	Los Angeles Chargers	$1,249,327.00	Do it all WR	1	1.79	3
	Jordan Addison	Minnesota Vikings	$1,998,340.00	Do it all WR	1	1.54	4
	Jaxon Smith-Njigba	Seattle Seahawks	$2,060,664.00	Do it all WR	1	1.43	5
	Drake London	Atlanta Falcons	$3,641,520.00	Do it all WR	1	1.36	6
	Josh Downs	Indianapolis Colts	$1,251,860.00	Do it all WR	1	1.33	7
	Malik Nabers	New York Giants	$2,122,625.00	Do it all WR	1	1.28	8
	Wan'Dale Robinson	New York Giants	$1,821,159.00	Do it all WR	1	1.22	9
	Garrett Wilson	New York Jets	$3,507,819.00	Do it all WR	1	1.14	10
	Xavier Worthy	Kansas City Chiefs	$1,421,830.00	Do it all WR	1	1.03	11
	Jalen Coker	Carolina Panthers	$960,000.00	Field-Stretcher	2	0.99	12
	Rome Odunze	Chicago Bears	$1,827,932.00	Do it all WR	1	0.98	13
	Marvin Harrison Jr.	Arizona Cardinals	$2,402,943.00	Do it all WR	1	0.80	14
	Zay Flowers	Baltimore Ravens	$2,026,040.00	Do it all WR	1	0.73	15
	Jameson Williams	Detroit Lions	$3,086,154.00	Do it all WR	1	0.69	16
	George Pickens	Pittsburgh Steelers	$3,656,000.00	Do it all WR	1	0.55	17
	Ricky Pearsall	San Francisco 49ers	$1,364,927.00	Field-Stretcher	2	0.55	18
	Jalen Tolbert	Dallas Cowboys	$3,406,000.00	Do it all WR	1	0.42	19
	Amon-Ra St. Brown	Detroit Lions	$17,410,000.00	Do it all WR	1	0.36	20