Report: NFL Combine Analysis

Analyst: Maxx Olivo

Introduction:

The purpose of this report is to focus on the NFL Combine when it comes to Wide Receivers running their 40 yard dash to see if there is a correlation between a player running a high to low 40 yard dash time and the round they get drafted. This report will provide analysis into if there is a way we can predict when a player gets drafted based on their 40 yard dash time. I conducted the development, recommendation, and breakdown of the analysis for this report.

Background & Purpose:

Over the years, the NFL teams have placed a high emphasis on player speed, particularly how fast a prospect can run 40 yards in a straight line, as a key indicator of their draft potential. The general belief is that the faster a player runs, the greater impact they can make on the field.

In recent drafts, wide receivers who post faster 40-yard dash times often have a higher chance of being selected in the first two rounds, even when other performance metrics may not fully support such an early selection. Conversely, receivers who run slower 40 times during the combine or their pro day often see their draft stock fall, despite having data metrics that suggest they should be Day 1 or early Day 2 picks.

This leads to the recurring question: *Does a player's 40-yard dash time truly reflect their in-game speed?* This question becomes especially relevant when a player is considered a “reach” or seen as “sliding” on draft night, largely due to the weight placed on their 40 time.

My goal is to explore the correlation between a player's 40-yard dash time and the round in which they are selected, using a series of visualizations and data analysis. I also aim to provide draft predictions for this year's incoming wide receiver class, based on trends and data collected from previous NFL combines and drafts spanning 2010 to 2023.

Data Source:

The data used in this report spans from 2010 to 2023 and includes projections for 2025, sourced from two Kaggle datasets: "NFLCombine Stats2010_2013" and "NFL_Combine_2025." Each dataset included columns such as: Name, Position, Age, College, 40-Yard Dash, 3-Cone Shuttle, Height, Weight, Round, Pick, Drafted, 20-Yard Shuttle, Hand Size, Bench Press, Vertical Jump, Athleticism Score, and Wingspan.

The analysis for this report was conducted using Google Colab, with Python as the primary programming language. To support the analysis and visualizations, I imported several key libraries including pandas, seaborn, matplotlib, numpy, and google.

Firstly, I mounted my Google Drive within Google Colab by importing the google library to access the datasets. Using pandas, I created dataframes from the original .xlsx files through my google drive. Pandas was also essential for cleaning the data, specifically addressing missing values in the *Round* and *Pick* columns by replacing `NaN` values with `0`, ensuring complete numerical data for each player from the 2010–2023 dataset. I also dropped the *Drafted* column, as it was redundant due to the presence of *Round* and *Pick* fields. Additionally, I renamed multiple columns to ensure consistency and facilitate a seamless merge between the two datasets. For data visualization, I utilized seaborn to generate the charts included in this report.

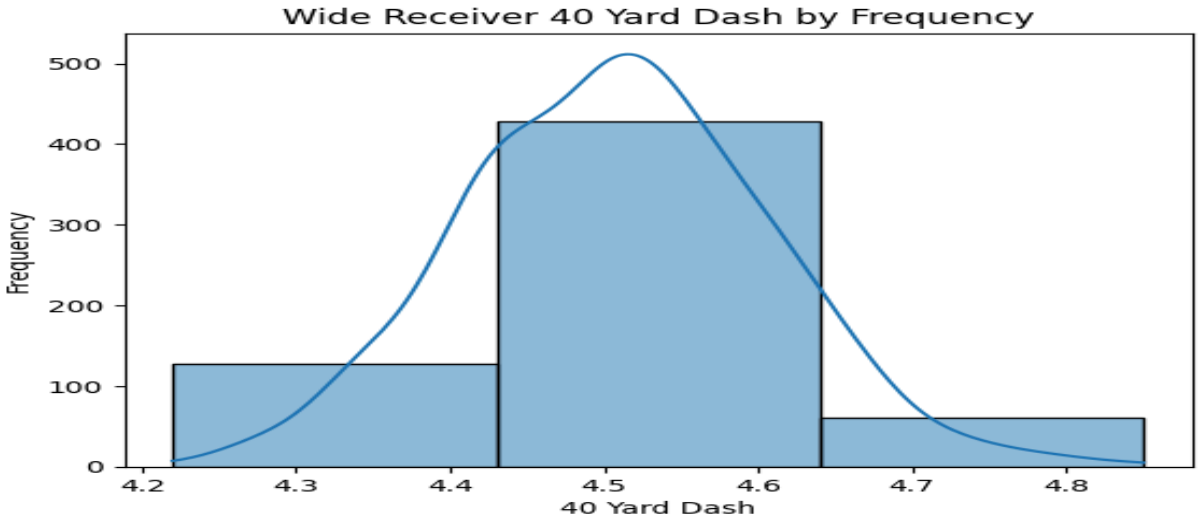
Analysis:

The first part of my analysis will focus on the 2010 and 2023 dataset where I will be exploring the 40 yard dash time and the rounds the receiver is selected in

order to set up the backend of the analysis with the current NFL draft class receivers.

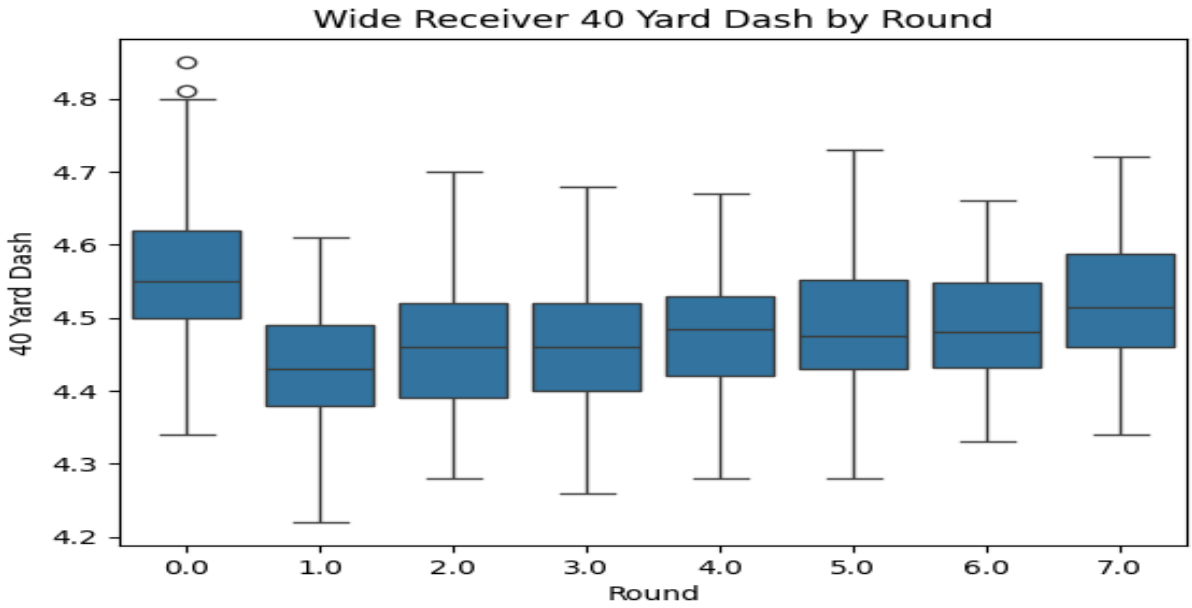
I broke down the dataset for receivers by three different speed categories with a player who ran a 4.20 to 4.49 as “FastWR”, a player who ran 4.50 to 4.69 as “MediumWR”, and 4.70 to higher as “SlowWR”. The results of players in each category were broken down by FastWR, MediumWR, and SlowWR which were 91, 250, and 17 respectively. I worked on finding the maximum, minimum, and median 40 yard dash time which consisted of 4.85, 4.22, and 4.51 respectively, this providing our range for what can be expected of a player in order to group them together as well as providing a thirteen year baseline of 40 yard dash times.

The first visualization developed is a histogram which separates the categories into three different bars in order to see the frequency of how much a player runs within the depicted 40 yard dash time.



The 40 yard dash times follow a normal distribution, with data showing that receivers are three times more likely to run within the 4.45 to 4.65 second range compared to the 4.20 to 4.44 second range. Additionally, they are five times more likely to run between 4.45 and 4.65 seconds than between 4.66 and 4.80 seconds. The histogram provides a strong baseline for what a typical 40 yard dash distribution looks like for receivers at a single NFL Combine.

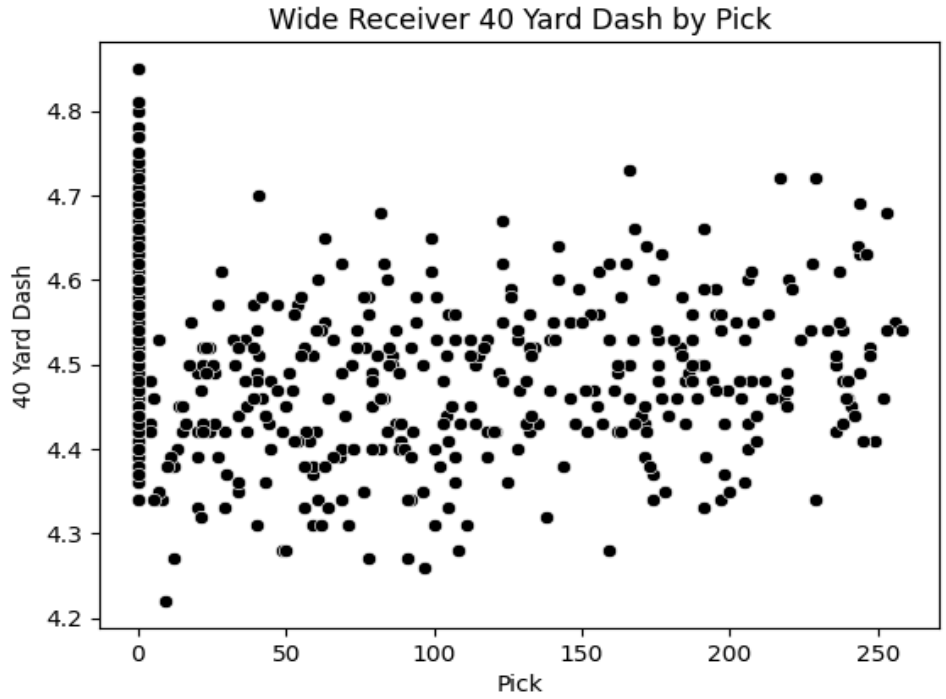
The second visualization is a box plot distribution featuring eight separate box plots, representing each draft round from the first to the seventh. An additional “zeroth” round is included to represent undrafted players. This allows for a comparison between drafted and undrafted wide receivers to determine if there is a noticeable correlation between draft status and 40-yard dash time.



The box plot provides a clear view of the maximum, minimum, and median 40 yard dash times across each draft round. One standout observation is the box plot for undrafted players, which includes two outliers that depict two players who recorded times above 4.80 seconds. Additionally, all quartiles for undrafted players are higher than those of any drafted round, including their maximum, minimum, and median values.

In contrast, the first round box plot shows the lowest 40 yard dash times across all categories: maximum, third quartile (Q3), median, first quartile (Q1), and minimum. As the draft rounds progress, there is a slight upward trend in Q3, Q1, and minimum times. This trend suggests a modest but meaningful correlation that even small differences in 40 yard dash times, down to the milliseconds, can influence whether a player is selected in an earlier round or goes undrafted.

The third visualization in this dataset is a scatter plot, which helps identify whether there is a clear positive or negative correlation between a player's 40 yard dash time and their overall draft pick position.



The scatterplot shows a significant concentration of points at zero, representing undrafted players. These undrafted players have 40 yard dash times ranging from 4.35 to 4.85 seconds. Overall, the scatter plot does not reveal a strong correlation between 40 yard dash times and draft position. While the slowest drafted players ran up to 4.7 seconds and were selected around the 150th pick, the fastest drafted players which resulted in those who ran under 4.40 seconds were selected within the top 10.

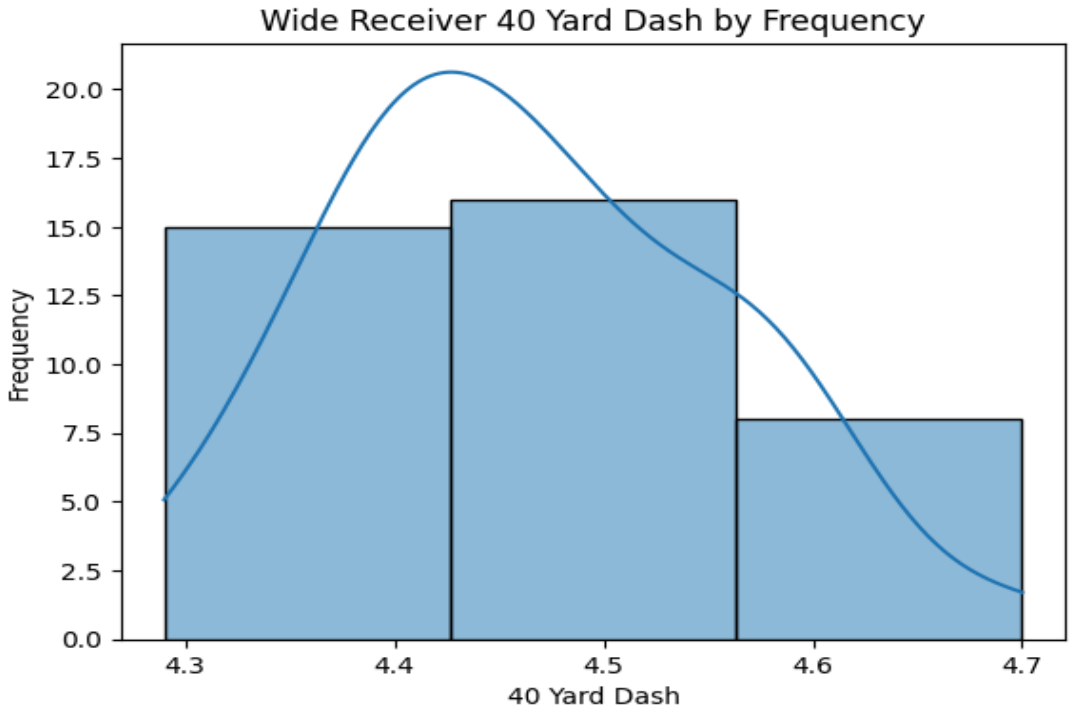
Ultimately, the scatterplot suggests that there is no direct correlation between a player's 40 yard dash time and whether or not they get drafted. Dash time alone is not a reliable predictor of draft outcome.

The second part of my analysis focuses on the 2025 NFL Combine wide receivers. While their 40 yard dash times are available, their draft positions are

not, as the NFL Draft has not yet taken place. Instead, I will be using their athleticism scores for this portion of the analysis.

This breakdown of the dataset includes twelve wide receivers who ran a 40 yard dash between 4.20 and 4.49 seconds, eleven receivers who ran between 4.50 and 4.69 seconds, and one receiver who recorded a time of 4.70 seconds or higher. This analysis only accounts for wide receivers who participated in the 40 yard dash at the NFL Combine, excluding Pro Day results. The maximum, minimum, and median 40 yard dash times recorded at this combine were 4.70, 4.29, and 4.46 seconds, respectively.

The first visualization is a histogram displaying a normal distribution, similar to the one used in the initial analysis. It shows the frequency of players running within specific 40 yard dash time ranges.

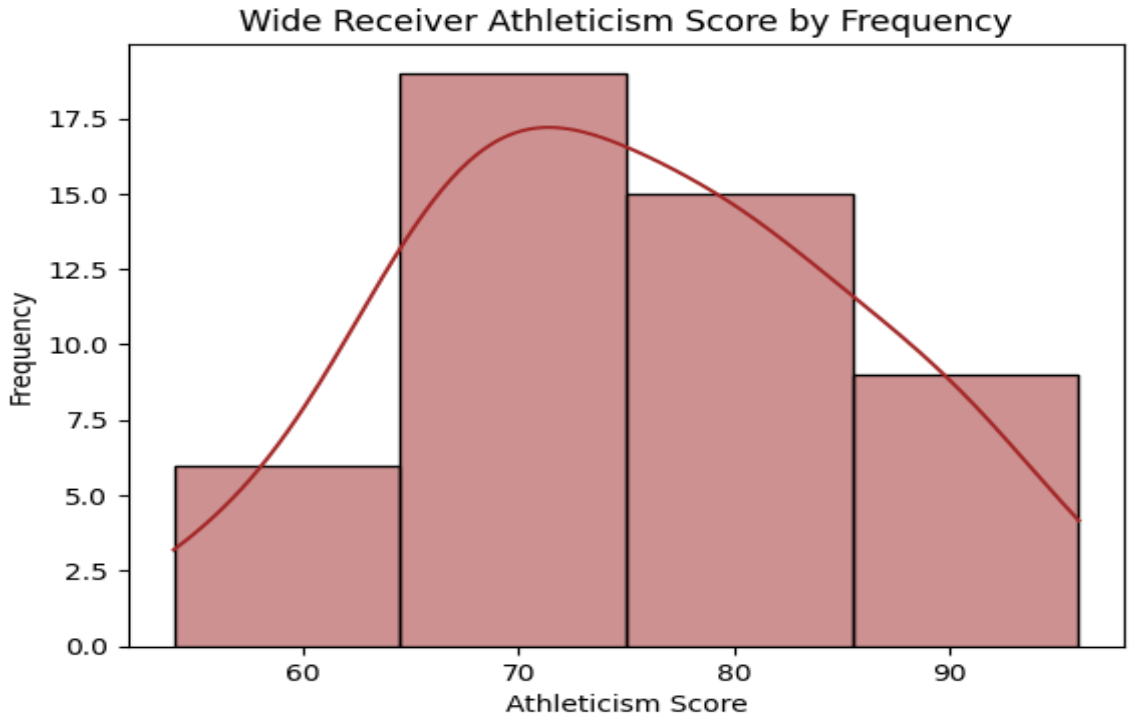


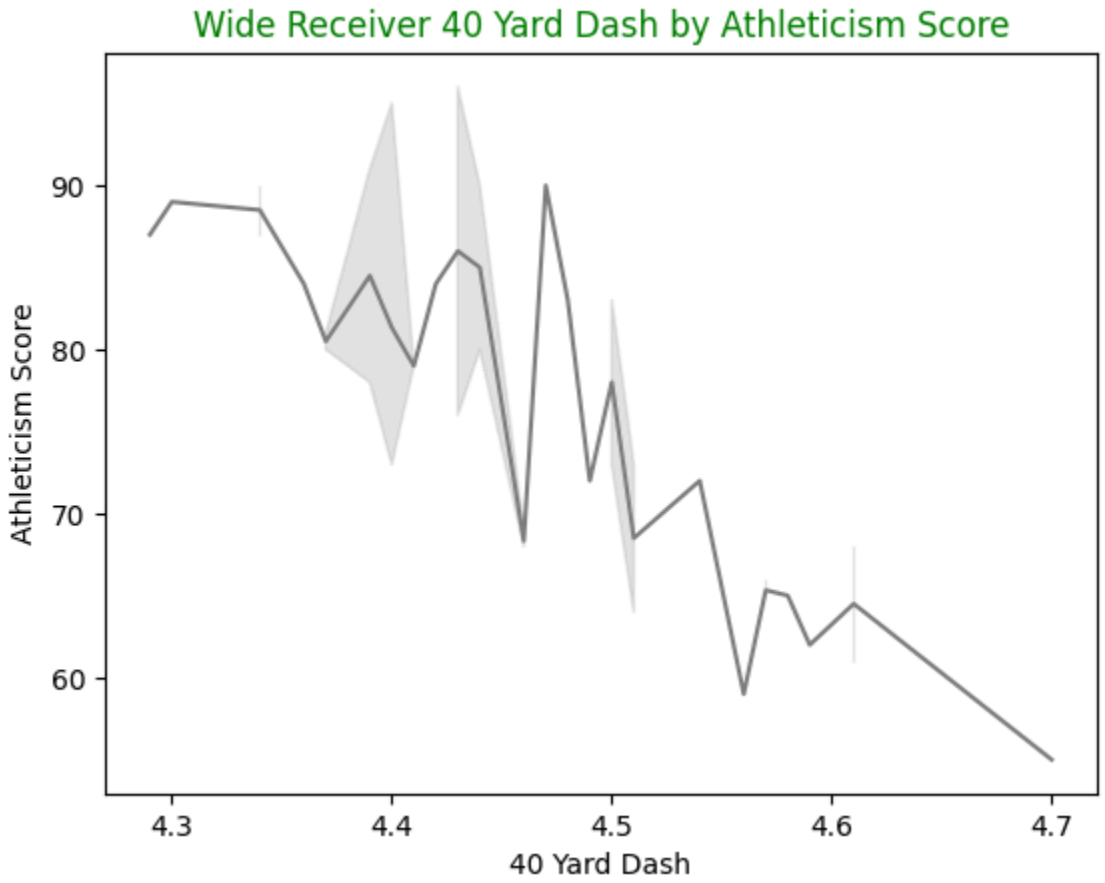
The histogram shows a strong concentration of players with 40 yard dash times between 4.29 to 4.42 and 4.43 to 4.56 seconds, with only a one-player difference between the two ranges. Compared to the previously presented historical data, there is less variance outside of the 4.57 to 4.70 range. This suggests that more players are focusing on improving their 40 yard dash

performance and have become faster over time, as the current sample shows a tighter clustering of times below 4.56 seconds compared to recent years where there was more disparity.

The second visualization is a line graph that illustrates the relationship between a player's 40 yard dash time and their athleticism score. Since the 2025 NFL Draft has not yet taken place and draft round or pick data is unavailable, athleticism score is being used as an alternative metric. This score is another key parameter that teams use when evaluating prospects.

The athleticism scores are categorized into four ranges: 99 to 90, 89 to 80, 79 to 70, and 69 and below. The number of players falling within each category is 6, 11, 16, and 13, respectively. The frequency of the players is placed below in the histogram chart which is normally distributed.

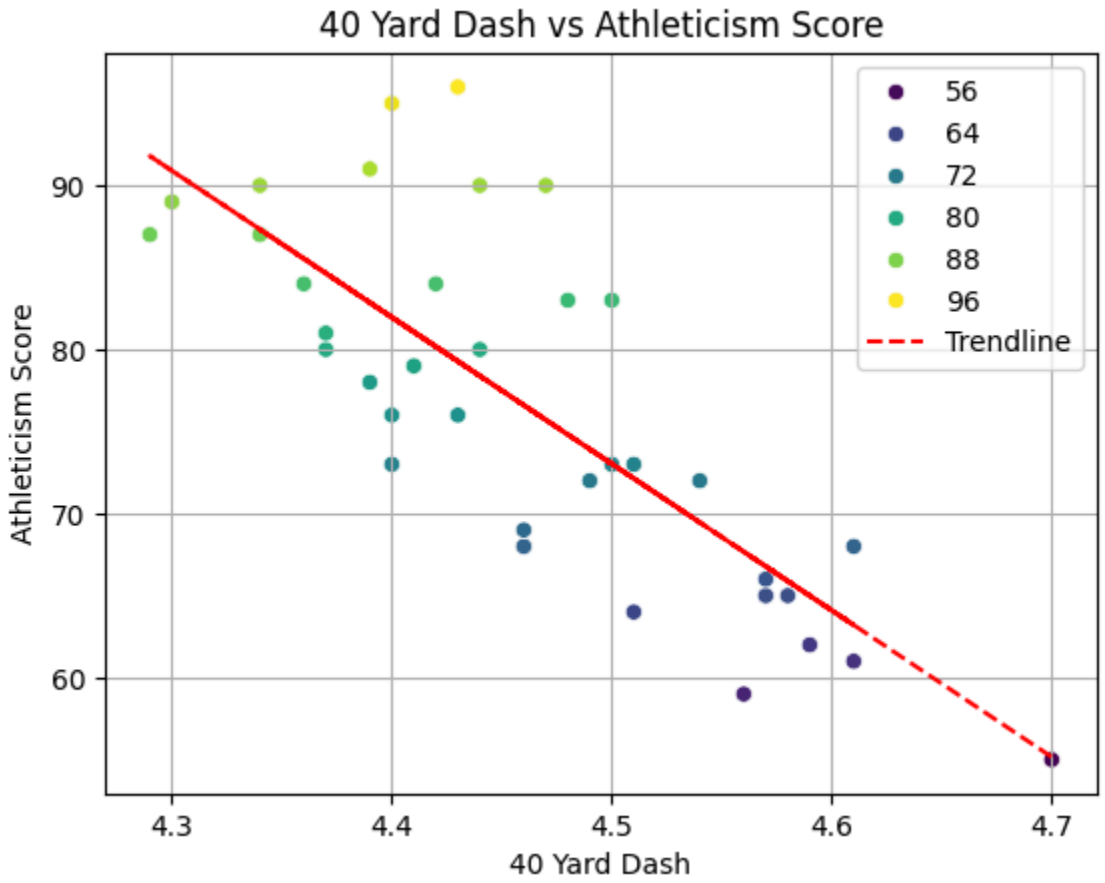




The line plot shows that, as a player's 40 yard dash time increases, their athleticism score tends to decrease. One notable exception appears between 4.46 and 4.47 seconds, where there is a sharp spike in athleticism score, indicating that a player scored exceptionally high despite running a 4.47 40 yard dash.

This highlights an important point that running the fastest 40 yard dash does not necessarily result in the highest athleticism score. It reinforces a couple things with one being that athleticism score is a broader and valuable draft metric that teams will continue to consider when evaluating prospects. Secondly, that speed does not always equate to athleticism.

The third visualization is a scatterplot which will display whether there is a positive, negative, weak, or strong correlation between Athleticism Score and 40 Yard Dash.



The scatterplot was developed with the use of linear regression analysis which helped provide the trendline that shows a relatively negative correlation, indicating that players with higher athleticism scores tend to have lower 40 yard dash times, and vice versa. For example, the lowest athleticism score recorded was 56, which corresponds to the slowest 40 yard dash time among the receivers at the combine at 4.70 seconds. Overall, players who scored 72 or higher on the athleticism scale were more likely to post faster 40 yard dash times.

Results:

The 40-yard dash continues to deliver mixed results in evaluating prospects, but a noticeable trend emerged in 2025: players, on average, ran faster times compared to the 2010–2023 window. This improvement can likely be attributed to the ongoing emphasis on speed and the advancements in training technology,

particularly those that tailor speed development based on an athlete's body mass index.

While there's no strong correlation between a player's 40-yard dash time and the round in which they're drafted, or whether they're drafted at all, some subtle patterns did appear. Undrafted players tended to have both a higher minimum and maximum 40-yard dash time compared to those who were selected. Despite the unclear direct statistical link, NFL teams still view the 40-yard dash as a valuable piece in the evaluation process, especially for wide receivers. Speed remains a key differentiator at the position. For example, when two prospects share similar profiles in size, height, and play style, a difference of even milliseconds in their 40-yard dash times could tip the scales in favor of one over the other.

Incorporating the 2025 NFL Combine's 40-yard dash results alongside the Athleticism Score added another important layer of analysis. The Athleticism Score factors in not just speed but a combination of physical traits such as height, weight, and bench press, providing a more holistic view of a player's athletic profile. A trend emerged showing a negative correlation between 40-yard dash times and Athleticism Scores where generally, the faster(lower) the 40 time, the higher the score. However, a few outliers did deviate from this pattern.

Using these metrics, I created a table that sorted players by specific 40-yard dash times and Athleticism Scores. For the 2025 draft, I developed a filter to identify players who ran between 4.20 and 4.39 seconds and had an Athleticism Score of at least 85. This filter yielded six players, and from that group, I focused on two standout prospects: Matthew Golden from Texas, who ran a 4.29 with an Athleticism Score of 87, and Jaylin Noel from Iowa State, who ran a 4.39 with a score of 91.

Based on my analysis and considering team needs, I predict that Matthew Golden will be selected 12th overall by the Dallas Cowboys. His combination of speed and athleticism makes him a strong candidate to complement CeeDee Lamb, easing the

pressure on Lamb as the primary target. As for Jaylin Noel, I project he'll be drafted in the third round, 77th overall, by the New England Patriots. With quarterback Drake Maye heading into his second year and head coach Mike Vrabel focusing on the defense during the offseason, this pick could provide the offense with a much-needed explosive playmaker.

Lastly, by combining 40-yard dash times, Athleticism Scores, and historical NFL Combine and Draft data, we can start to build a clearer picture of a player's draft potential. Still, these two metrics alone aren't enough for teams to make final decisions. NFL organizations rely on a variety of evaluation methods including physical and mental testing, interviews, and college performance data to make informed selections.

Limitations:

During my research, I encountered several limitations that I had to consider in both the data and the overall analysis. For example, I did not include data from the 2024 NFL Combine and Draft. While it's just one year out of a thirteen-year span, its absence could still have influenced the trends in the 2010–2023 dataset, potentially providing insights more in line with the 2025 Combine. Another limitation was the decision to focus only on wide receivers who participated in the NFL Combine. This excluded players who either weren't invited or only participated in their university's Pro Day. These missing players might have significantly impacted the distribution of 40-yard dash times and, consequently, the potential draft round or pick. Despite these limitations, this analysis offered a compelling look into the NFL Combine's most iconic workout, the 40-yard dash and how it may influence how teams evaluate and draft wide receivers, especially when viewed through a narrow, focused lens.