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**MINNESOTA TIMBERWOLVES:
DATA-DRIVEN ACQUISITION STRATEGY**



SCOUTING REPORT



Tyrese Haliburton
Point & Shooting Guard



Austin Reaves
Shooting Guard



Anthony Lamb
Small Forward



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OBJECTIVE OF PROJECT



Optimize Roster Composition

Utilize data-driven analysis to **identify** key player acquisitions and lineup strategies that **enhance** team performance and efficiency.



Maximize Financial Efficiency

Develop a **sustainable** salary cap strategy that **balances** player investments with long-term financial flexibility.

Improve Competitive Edge

Leverage advanced analytics to enhance decision-making, **optimize** player rotations, and ensure a strategic advantage over competitors.



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THE GAME PLAN



- 1 Tip-Off:** Setting the Court with Data
- 2 Building the Playbook:** Modeling & Team Selection
- 3 Calling the Shots:** Player Selection Process
- 4 Net Gains:** Improvement Prediction & Financial Impacts



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TIP-OFF

Setting the Court with Data





DATA PROVIDED

Dataset Overview

542 NBA players from the 2022-2023 season

Metrics Included

Points, rebounds, assists, efficiency ratings, and salary comparisons

Purpose

Utilized in the player selection process to analyze performance and value

Selection Factors

Considered statistical performance, positional needs, and financial impact



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ADDITIONAL DATA

Dataset Overview

Collected 10 years (2013-2023) of NBA team and opponent metrics

Metrics Included

Scoring, defensive efficiency, turnovers, rebounds, and shooting percentages

Purpose

Used for modeling & team selection to identify trends and competitive advantages

Selection Factors

Analyzed historical trends to optimize team composition and strategy



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DATA DICTIONARY



Metrics

G: Games

MP: Minutes Played

eFG%: Effective Field Goal Percentage

FT%: Free Throw Percentage

ORB: Offensive Rebounds

TOV: Turnovers

PF: Personal Fouls

WL%: Win-Loss Percentage

FG: Field Goals Made

FGA: Field Goals Attempted

3P: 3-Pointers Attempted

eFG% Calculation

$$eFG\% = \frac{FG + (0.5 * 3P)}{FGA}$$

Positions

C: Center

PF: Power Forward

SF: Small Forward

PG: Point Guard

SG: Shooting Guard

POS: Position



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ASSUMPTIONS



Linear Relationship

Performance metrics are assumed to have a **direct** and **proportional** impact on a team's **Win-Loss Percentage (WL %)**, meaning statistical improvements in key areas consistently lead to better outcomes.

Data Reliability & Omitted Variable

Players with **minimal** data may have inconsistent or skewed performance metrics, so they are excluded. A 1,000+ minute threshold ensures a sufficient sample size for reliable analysis. Additionally, **omitted variable bias** is assumed to be minimal, meaning that **excluding** certain players or data points does not significantly impact overall predictions.



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ASSUMPTIONS



Consistency & Transferability

A player's past performance is a **reliable predictor** of future success. Additionally, a player's skill level and impact are assumed to remain stable despite team changes, implying that external factors (coaching, teammates, systems) do not significantly alter individual performance.

Compensation & Talent

High-paid players are presumed to be top performers. **Excluding** them prevents **biased** comparisons with lower-paid players, allowing for **better insight** into emerging talent and undervalued contributors.



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BUILDING THE PLAYBOOK

Modeling & Team
Selection





MODEL BASED ON WL %



WL % Choice

We chose **WL %** as our **dependent variable** because teams with higher WL % consistently have a greater likelihood of making and advancing through the playoffs, as shown by the **increasing WL %** across all rounds.

Playoff Advancement 10-Year Average

Higher WL % correlates with success across all playoff rounds, indicating its **predictive value** for championship contention.

	Round 1	Round 2	Round 3	Round 4
Eastern	59.03%	63.55%	64.42%	63.40%
Western	62.72%	67.90%	70.56%	74.14%
Overall	60.88%	65.72%	67.49%	68.77%

*team WL% to make each round

*MIN is a member of the Western Conference



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LINEAR REGRESSION



$$WL\% = \beta_0 + \sum_{i=1}^n \beta_i \times X_i$$

Linear Regression Model

- Ordinary Least Squares Stepwise Regression was used to **automate** model selection, identifying **significant variables** ($p < 0.05$) from 2018-2023 season averages for both teams and opponents, ensuring a **comprehensive** game representation.
- Each of the **model predictors** (shown on the next slide) **predict** the win-loss percentage for any specific team.
- Leave One Out Cross Validation is used to determine the **best** fitted model. The lowest sum of errors gives the best fitted model.



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SIGNIFICANT VARIABLES



Variables	Estimate	Variables	Estimate
Intercept	0.912	Explanatory Power (Adj. R-Sqr)	90.56%
Effective Field Goal %	4.744	Opponent Effective Field Goal %	-4.892
Free Throw %	0.642	Opponent Free Throw %	-1.054
Turnovers	-0.027	Opponent Turnovers	0.026
Offensive Rebounds	0.032	Opponent Offensive Rebounds	-0.024
Personal Fouls	-0.017	Opponent Personal Fouls	0.013

Utilizing both the team and the opponent metrics for each measure allows for a comprehensive understanding of the impact of both sides of the game.



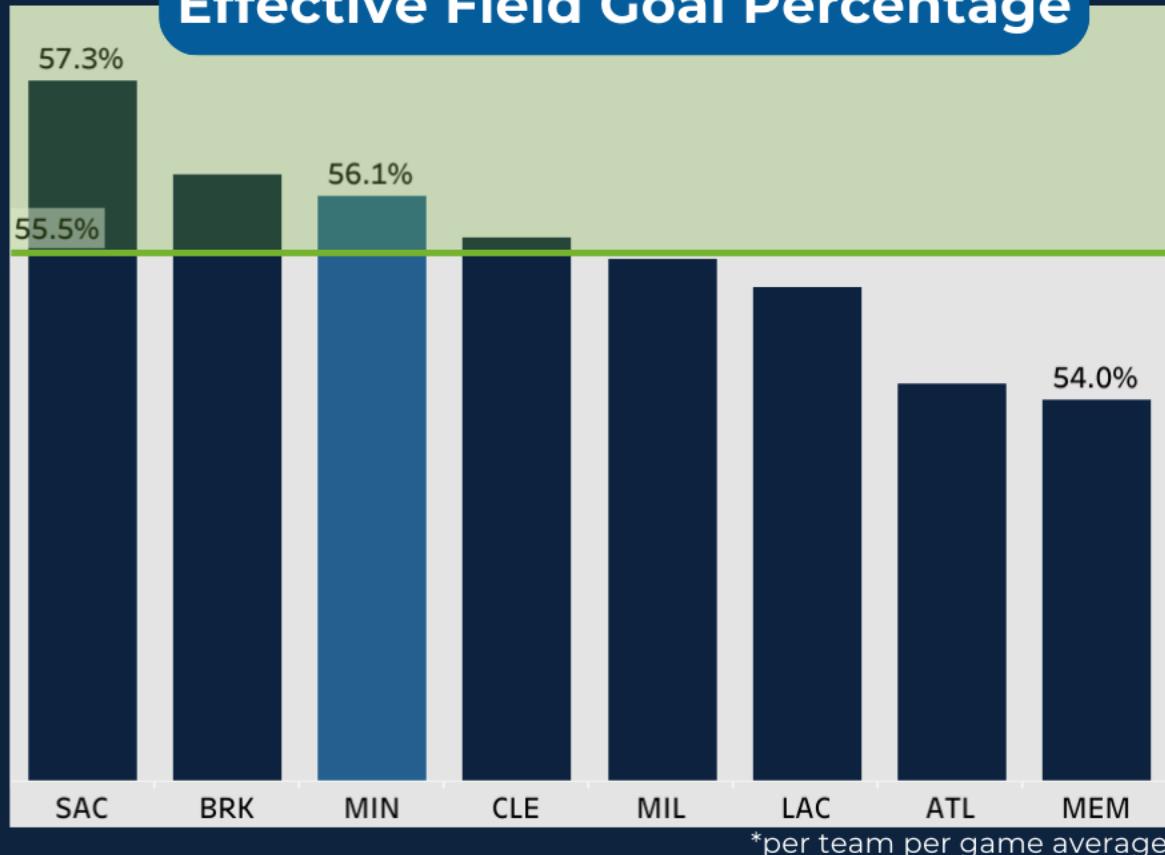
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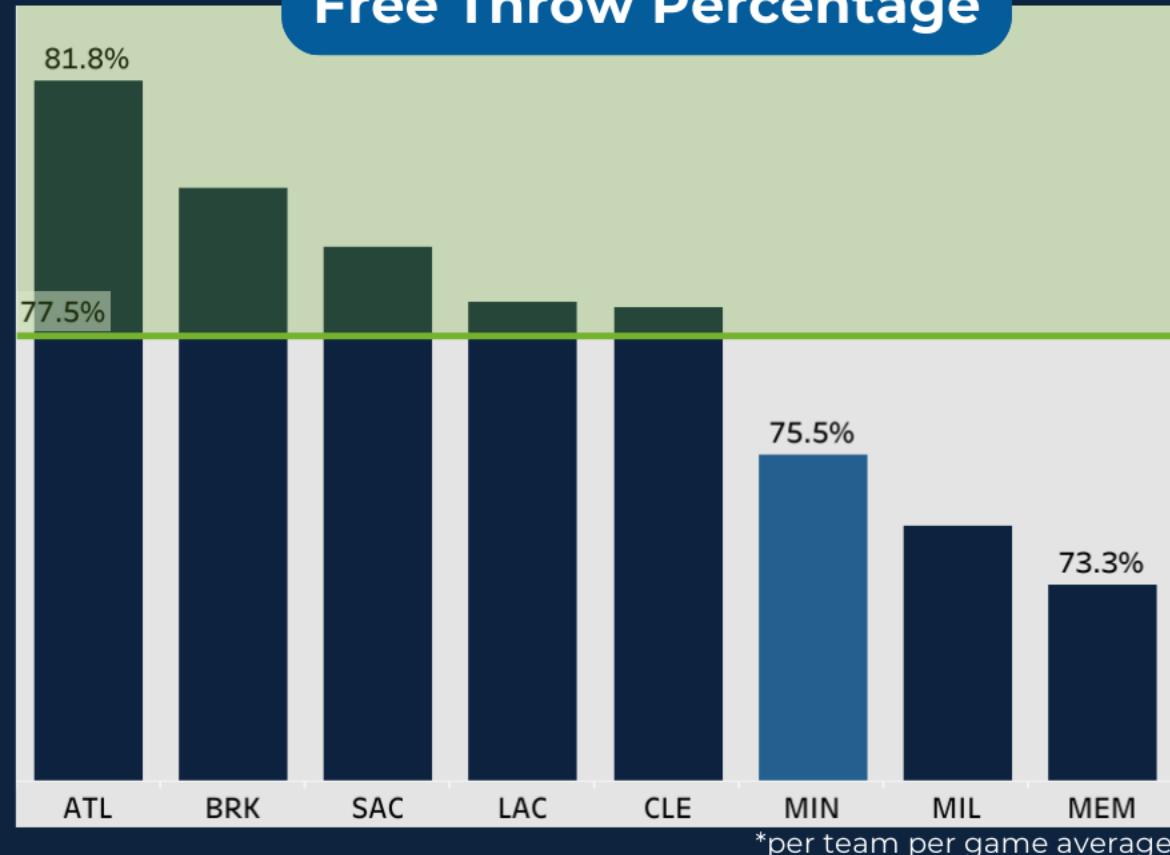
TEAM SELECTION



Effective Field Goal Percentage



Free Throw Percentage



Graphical comparison of teams that didn't advance in the first round of the 2022-23 playoffs.

The shaded green areas are the desirable above-average metrics.



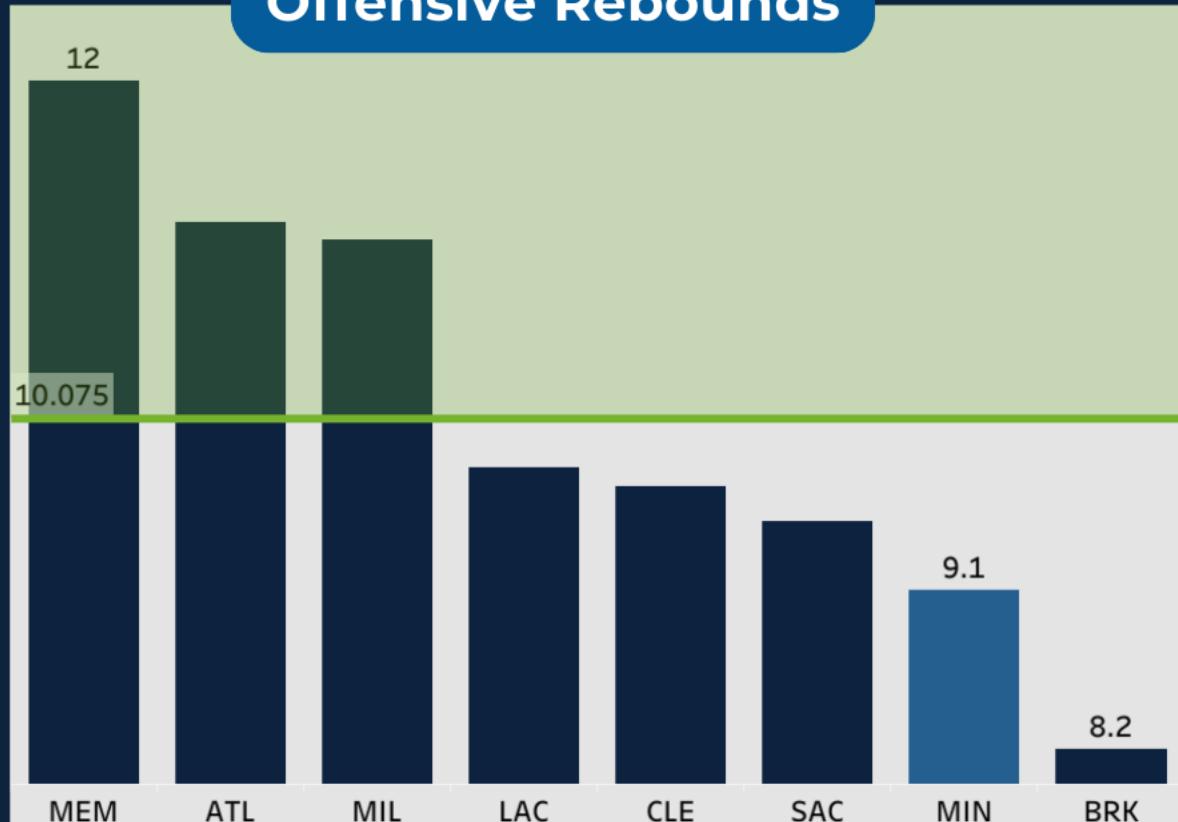
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TEAM SELECTION



Offensive Rebounds



Turnovers



*per team per game average

*per team per game average

Graphical comparison of teams that didn't advance in the first round of the 2022-23 playoffs.

The shaded green areas are the desirable above/below average metrics.



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TEAM SELECTION

Personal Fouls



Graphical comparison of teams that didn't advance in the first round of the 2022-23 playoffs. The shaded green areas are the desirable below-average metrics.

Minnesota Timberwolves

- First-round playoff exit (2022-2023)
- **Strong core**, but key **gaps** remain
- 42-40 record (51.2%) in 2022-2023 season
- MIN **struggles** in 4 of 5 key metrics
- **Weak** offensive rebounding
 - 9.1 per game
- **High** turnovers
 - 15.3 per game
- **Excessive** fouls
 - 21.6 per game
- **Below-average** free throw shooting
 - 75.5% overall



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RETURNING ROSTER



NAME	POS	G	MP	eFG%	FT%	ORB	TOV	PF
Nathan Knight	C	38	291	61.7%	68.4%	3.63	3.46	6.76
Naz Reid	C	68	1251	60.2%	67.7%	2.80	3.53	6.76
Rudy Gobert	C	70	2148	65.9%	64.4%	5.16	2.73	4.69
Karl-Anthony Towns	PF	29	957	56.5%	87.4%	2.41	4.31	5.57
Kyle Anderson	PF	69	1957	55.3%	73.5%	1.62	2.53	3.58
Taurean Prince	PF	54	1192	56.5%	84.4%	0.60	2.78	4.95

*per player per 48-minutes

Strengths

Minnesota has multiple experienced and reliable players at Center (C) and Power Forward (PF), with high minutes played and substantial contributions in field goal efficiency, rebounding, and defense.

- Efficient Scoring
- Strong Offensive Rebounding
- Consistent Free Throws
- Low Turnovers



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RETURNING ROSTER



NAME	POS	G	MP	eFG%	FT%	ORB	TOV	PF
Jordan McLaughlin	PG	43	678	50.3%	83.3%	1.06	2.34	1.98
Mike Conley	PG	67	2029	53.9%	83.4%	0.78	2.44	3.29
Jaden McDaniels	SF	79	2416	59.1%	73.6%	1.83	2.23	5.40
Josh Minott	SF	15	96	52.8%	100.0%	2.50	1.50	5.00
Anthony Edwards	SG	79	2842	52.8%	75.6%	0.79	4.37	3.14
Wendell Moore	SG	29	153	44.2%	80.0%	1.25	2.51	4.08

*per player per 48-minutes

Strengths

Minnesota has strong depth at C and PF, with multiple experienced players excelling in scoring, rebounding, and defense. In contrast, Point Guard (PG), Shooting Guard (SG), and Small Forward (SF) rely on a single key player per position, creating a depth gap that needs to be filled.

- Proven Leaders in Key Roles
- Limited Backup Experience



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DEPARTING PLAYERS



NAME	POS	G	MP	eFG%	FT%	ORB	TOV	PF
Jaylen Nowell	SG	65	1252	50.2%	77.8%	1.38	2.49	3.87
Nickeil Alexander-Walker	SG	59	884	54.7%	66.7%	0.81	2.99	4.78
Austin Rivers	SG	52	1016	53.8%	76.9%	0.24	1.09	3.78
Luka Garza	C	28	243	60.3%	78.8%	6.52	2.77	8.49
Bryn Forbes	SG	25	268	44.6%	100.0%	0.72	2.15	3.94

*per player per 48-minutes

Gaps to Fill

Minnesota is losing four SGs, including three experienced players who had significant playing time. This creates gaps in scoring, playmaking, and defense, making it essential to strengthen the backcourt.

- Loss of Reliable Free-Throw Shooters
- Decrease in Ball Security



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CALLING THE SHOTS

Player Selection Process





GAPS TO FILL



Point Guard

- **Playmaker**
 - Runs the offense and distributes effectively
- **Smart Decision-Maker**
 - Limits turnovers and controls tempo
- **Reliable Shooter**
 - Hits open shots and complements the offense

Small Forward

- **Athletic Rebounder**
 - Aggressive rebounder and excels in transition
- **Efficient Shooter**
 - Spaces the floor with strong two- and three-point shooting
- **High-IQ Hustler**
 - Smart, high-energy play on both ends

Shooting Guard

- **Efficient Scorer**
 - Creates shots and maintains a high eFG%
- **Three-Point Threat**
 - Provides floor spacing and excels in perimeter shooting
- **Reliable FT Shooter**
 - Consistent and dependable throughout the game

Centers and Power Forwards were not considered in our selection process due to Minnesota having strong players in these two positions.



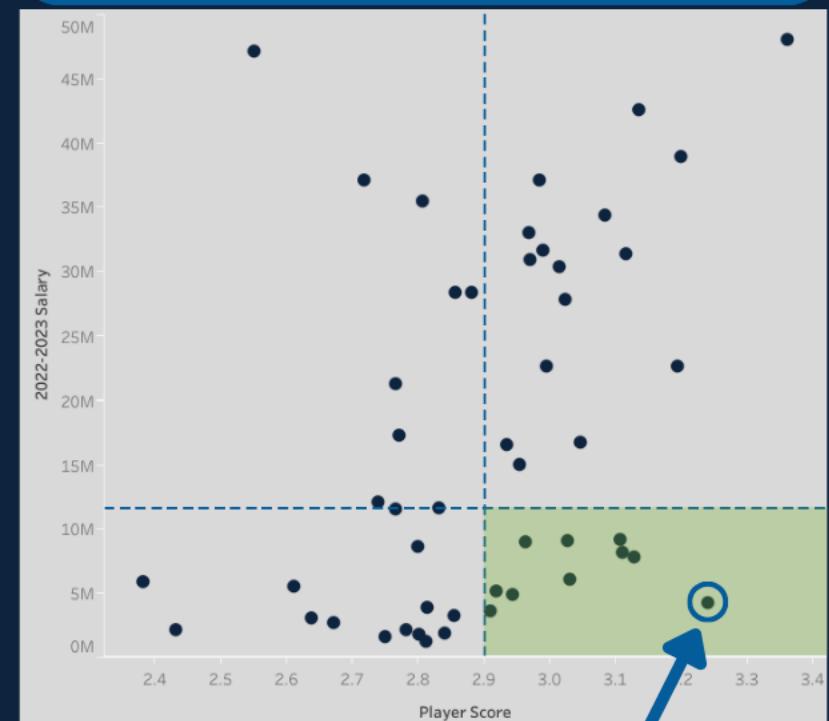
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PLAYER SCORE



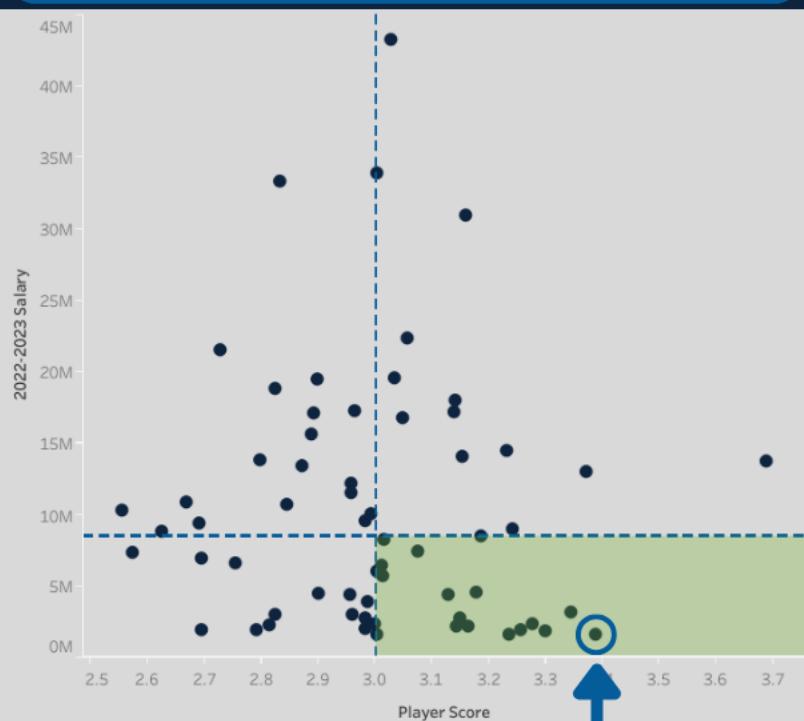
Point Guard: Salary Vs Player Score



Tyrese Haliburton

Player Score: 3.24
Average Player Score: 2.90

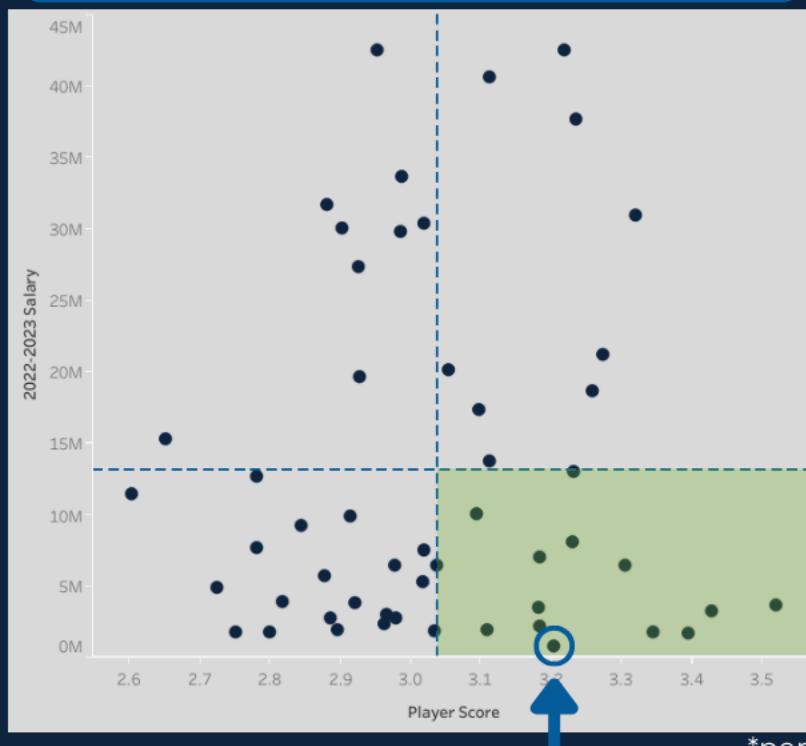
Shooting Guard: Salary Vs Player Score



Austin Reaves

Player Score: 3.39
Average Player Score: 3.00

Small Forward: Salary Vs Player Score



Anthony Lamb

Player Score: 3.20
Average Player Score: 3.04

*per
48-min

The player score metric is an arbitrary ranking system using non opponent variables in the model to determine how much of an impact each individual player is making.



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PLAYER SELECTION PROCESS



531 players
24,812,745 combos

All available players after **excluding current MIN team members**

327 players
5,774,275 combos

Removal of all players that are **centers or power forwards**

165 players
735,130 combos

Removal of all players with **under 1,000 minutes played** last season

37 players
1,700 combos

Removal of all players that are **below average** in the **player score metric** & restricted to **one** of each **position**

16 players
17 combos

Removal of all combinations with a **lower WL %** than last season & any **exceeding** our **salary cap limits**.

3 players
1 combo

Removed any options that **required more than one trade deal** to lower risk



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OPTIMAL PLAYER SELECTION



Tyrese Haliburton
Point & Shooting Guard



Austin Reaves
Shooting Guard



Anthony Lamb
Small Forward



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TYRESE HALIBURTON



	eFG%	FT%	ORB	TOV	PF
Tyrese	58.6%	87.1%	0.8	3.6	1.8
NBA PG	52.7%	83.1%	1.1	3.4	3.5

*per 48-min

22-23 Season Stats

Games Played: 56

Position: Point Guard & Shooting Guard

Current Team: Indiana Pacers

Status: In contract for 23-24

Years in NBA: 3 years

Age: 22



All-Star
Team
22-23

W Defensive
Consistency

O Expanding
Scoring
Arsenal

T Injury
Risk



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AUSTIN REAVES



	eFG%	FT%	ORB	TOV	PF
Austin	61.6%	86.4%	0.9	2.6	2.8
NBA SG	53.8%	81.4%	1.1	2.6	3.4

*per 48-min

22-23 Season Stats

Games Played: 64

Position: Shooting Guard

Current Team: Los Angeles Lakers

Status: Free Agent at the end of 22-23

Years in NBA: 2 years

Age: 24



6th Man of
the Year
22-23



Defense
Versatility



Fan
Likability



Injury
Risk



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ANTHONY LAMB



	eFG%	FT%	ORB	TOV	PF
Anthony	58.8%	76.7%	2.3	2.2	5.4
NBA SF	54.5%	80.6%	1.5	2.2	3.7

*per 48-min

22-23 Season Stats

Games Played: 62

Position: Small Forward

Current Team: Golden State Warriors

Status: Free Agent at end of 22-23

Years in NBA: 2 years

Age: 25



Rebounding Ability



Fouling



Potential 3&D Player



Injury Risk



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NET GAINS

Improvement Prediction & Financial Impacts





TEAM IMPROVEMENT STRATEGY



	MIN 22-23 Team	MIN 23-24 Returning + New Team	Changes
eFG %	56.10%	57.20%	+ 1.10%
FT %	75.50%	77.17%	+ 1.67%
ORB	9.10	9.61	+ 5.60%
TOV	15.30	14.59	- 4.64%
PF	21.60	22.07	+ 2.18%

By using the 22-23 season as our baseline and comparing it to the 23-24 season with new players, we can effectively measure the impact of roster changes and any systematic improvements.

*per game

Changes

Improvements:

- More accurate shooting
- Better rebounding
- Fewer turnovers
 - Due to **new player strength** in the respective metrics

Deficits:

- **Slight increase** in personal fouls
 - Due to the players leaving from 22-23 having a lower than average PF metric

These changes reflect a more controlled style of play.



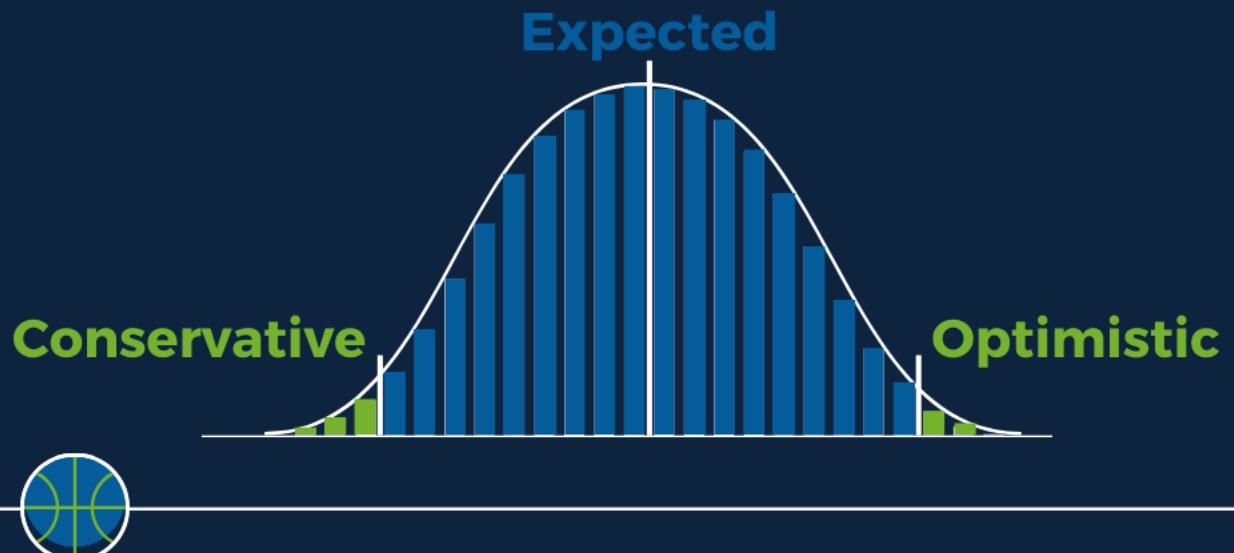
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PREDICTION RESULTS



	Conservative	Expected	Optimistic
Actual 22-23 WL %	51.2%		
Predicted 23-24 WL %	54.2%	63.0%	71.7%
Improvement	+ 3%	+ 11.8%	+ 20.5%



We estimate that Minnesota's win-loss percentage will fall between **54.2% and 71.7%** with 95% confidence. The conservative projection corresponds to the 2.5th percentile, while the optimistic projection corresponds to the 97.5th percentile.



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PLAYOFF PROBABILITY



	WL %	Playoff Round 1	Playoff Round 2	Playoff Round 3	Playoff Round 4
MIN 22-23 Team	51.20%	0.51%	0.01%	<0.01%	<0.01%
MIN 23-24 Returning + New Team	63.00%	52.49%	13.76%	4.61%	0.65%
Improvement	+ 11.80%	+ 51.98%	+ 13.75%	+ 4.61%	+ 0.65%

Playoff probabilities were calculated using the past 10 years of NBA WL % averages for Western Conference teams, since Minnesota is part of this conference. Each probability was determined using a 95% confidence interval, with conservative and optimistic projections as bounds, to estimate Minnesota's **likelihood of making the playoffs** for both last year's team and the new 2023-24 roster.



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PLAYER ACQUISITION INVESTMENT



Player	22-23 Salary	Current 23-24 Salary	% Increase	23-24 Offer
Tyrese Haliburton	\$ 4,215,120	\$ 5,808,435	10%	\$ 6,389,278
Austin Reaves	\$ 1,563,518	No Contract	20%	\$ 1,876,221
Anthony Lamb	\$ 694,878	No Contract	10%	\$ 764,365
Suggested Player Acquisition Investment				\$ 9,029,865

Luxury Tax Implications

This **player acquisition strategy** will position the team over the Luxury Tax Cap by \$1,121,015. While it is not ideal to be over this threshold, we believe the revenue these players will generate for the franchise will **substantially cover this additional expense**.



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23-24 INCOME PROJECTIONS



	Conservative @ 45 Wins	Expected Base @ 52 Wins	Optimistic @ 59 Wins
Revenue			
Ticket Sales	\$42,900,000	\$44,850,000	\$46,800,000
Other Revenue	\$242,000,000	\$253,000,000	\$264,000,000
Total Revenue	\$284,900,000	\$297,850,000	\$310,800,000
Expenses			
Player Salaries	(\$166,121,015)	(\$166,121,015)	(\$166,121,015)
Luxury Tax	(\$1,681,523)	(\$1,681,523)	(\$1,681,523)
Other Expenses	(\$73,297,780)	(\$76,629,497)	(\$79,961,214)
Total Expenses	(\$241,100,317)	(\$244,432,034)	(\$247,763,752)
Operating Income	\$43,799,683	\$53,417,966	\$63,036,249

Assumptions

Other Revenue includes:

- media
- sponsorships
- advertising deals
- merchandise
- concessions & parking
- playoff revenue

Other Expenses includes:

- operating expenses
- team staff costs
- non-team staff costs

Both revenue and expenses will increase the further the team advances into the playoffs.



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FINAL BUZZER

Roster Composition

Player Acquisition:

- Tyrese Haliburton (PG)
- Austin Reaves (SG)
- Anthony Lamb (SF)

Metric Improvements:

- eFG%
- FT%
- ORB
- TOV

Enhances the team's offensive efficiency and competitive success.

Financial Efficiency

Player Investment:

- \$9,029,865

Luxury Tax Implication:

- \$166,121,015

Operating Income:

- \$53,417,966

Substantial increase in revenue generated from multiple streams and a deeper postseason run for minimal cost outlay.

Competitive Edge

Projected WL % Increase:

- 22-23 = 51.2%
- 23-24 = 63.0%

Projected Playoff Probability Increase of Advancing to the First Round:

- 22-23 = 0.51%
- 23-24 = 52.49%

Significantly improving the team's likelihood of making a postseason run.



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STATEMENT ON AI USAGE



Throughout this project, our team utilized AI (ChatGPT Pro) as a **supplementary tool** to deepen our understanding of key concepts and troubleshoot coding errors. Specifically, AI was used to define unfamiliar terms related to the sport of basketball, troubleshoot coding errors within the statistical software R, and refine wording for clarity and professionalism. These applications were **limited to** supporting our comprehension and improving the presentation of our work. All analysis, problem-solving, and strategic recommendations were **developed independently by our team.**

This project reflects our original ideas, critical thinking skills, technical training, and analytical approach to solving the case. While AI-assisted in error resolution and language refinements, the core research, insights, and solutions presented are the result of our **own efforts** and **intellectual contributions.**



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THANK YOU!

Let us know if you have
questions or clarifications.

