# The Relocation of the Chicago White Sox to Charlotte, North Carolina

A Data Driven Approach to Structuring a Relocation for the Organization

Cole Barber | MSDS 457 – Sports Management Analytics | June 5th, 2025

# Introduction

The Chicago White Sox are one of the MLB's oldest teams with as much history as any other club. Despite their rich history and a World Series in 2005, the organization has struggled mightily in the two decades since, both on the field and at the gate. Attendance has consistently declined, performance has dropped the team to record lows, and fan engagement continues to dwindle. These trends, when combined with constant financial and competitive instability, suggest that a relocation may be a viable strategic option for the franchise.

In this paper I explore the implications of relocating the organization to a new market – specifically Charlotte, North Carolina – with the goal of revitalizing the franchise's brand and maximizing long-term competitiveness. Utilizing data analysis strategies, the report is structured around four major components:

1. **Organizational Evaluation**: Analyzing the White Sox's current financial and roster situation using a constrained optimization model.
2. **Ticketing and Promotion Strategies**: An evaluation of current attendance drivers, promotional effectiveness, and dynamic pricing opportunities, based on league-wide data.
3. **Performance and Revenue Expectations**: A historical data-based projection of on-field performance and financial gains/losses, utilizing case studies from MLB and other professional sports relocations.
4. **Market Evaluation of Relocation Cities**: A metric-driven profile of Charlotte's, and other possible relocation sites', suitability as a relocation city, based on cost of living, population trends, and corporate presence.

Through this approach, the analysis aims to deliver clear and actionable recommendations to management, while also contributing to the broader discussion of team relocation within professional sports. This report seeks to provide a potential path forward for the White Sox organization, one that can help them reclaim the glory they once had.

# Literature Review

In terms of previous research on performing a deep dive into one specific team relocating to another city, there isn't much that has been done. However, there has been research in areas that are related to this project that I drew concepts from. *Depken (2000)* attempted to estimate relative fan loyalty for U.S. professional baseball teams by comparing fan loyalty to the outcomes of seeking public funding for new stadiums. While a relocation is different than an organization trying to build a new stadium, ideally, the city of Charlotte would help publicly fund the required infrastructure and a study of their fan loyalty to the Panthers and Hornets could provide knowledge into the likelihood of public funding approval. *Noll and Zimbalist (1997)*, in their book *Sports, Jobs, and Taxes*, argued that while relocations may improve team revenue, it doesn't typically translate into broader economic development unless the team is able to leverage corporate partnerships and local interest. Ingraining the White Sox into the Charlotte landscape would benefit both the city and team and should be considered when strategizing pre-relocation

and post-relocation techniques. Lastly, *Winfree and Fort (2008)* reported relevant findings for potential relocations in showing that loyalty and regional ties strongly influence attendance and engagement. While they studied how fans substituted hockey during the 2004-2005 NHL lockout, the principal findings could be applied here.

Many academia sources that have looked into relocations evaluated the economic conditions of host cities using metrics similar to the ones this paper explores. Another common practice is examining attendance patterns and team performance before and after a relocation to better understand the effect on the organization and city.

For this study, I directly used concepts and data from the following sources. A complete citations list can be found in the References section.

Retrosheet.org

Retrosheet provides a comprehensive compilation of MLB data, with game logs dating back to early 1900s. These logs include detailed, game-level data such as date, location, opponent, time of game, and attendance. For this project, I used the 2023 and 2024 game logs to analyze league-wide attendance trends and to isolate White Sox-specific patterns for further analysis. Retrosheet also provided me the data used to assess the performance trends of historical relocations, used to estimate the White Sox future performance upon relocating.

Spotrac.com

Spotrac is a leading source for team and player contract data across all of the major sports. I used it to collect MLB payroll data and win totals for all teams from the 2021 through 2024 seasons, allowing for an in-depth evaluation of the White Sox's financial efficiency by analyzing wins per dollar spent. Additionally, this source provided player-level salary data, which was merged with WAR data from Baseball-Reference to assess individual player performance relative to salary across the roster and allow for comparing of players with similar metrics. The merged dataset allowed for comparisons between White Sox players and other MLB players with similar salary and WAR profiles to determine relative value and create benchmarks.

Baseball-Reference.com

Baseball-Reference is a widely trusted database for historical and current baseball statistics. I used this source to collect the 2024 White Sox roster along with league-wide, player-level Wins Above Replacement (WAR) values. These metrics were then paired with salary data from Spotrac to evaluate individual player value and assess how the team's roster structure could be improved while utilizing a constrained optimization approach.

Miller, T. (2015)

Thomas Miller's book, *Sports Analytics and Data Science: Winning the Game with Methods and Models*, serves as a foundational guide to applying statistical techniques in sports contexts using R. This book covers basic descriptive statistics and ranges to predictive modeling and

optimization. This book was particularly helpful in informing the constrained optimization approach I used in modeling player salary versus performance. I used this text to understand applied methods that were then adjusted and utilized in the White Sox relocation analysis.

# Data

## Data Acquisition

Upon obtaining the desired data from Baseball-Reference, Spotrac, and Retrosheets, each dataset was processed to ensure it could be read into and analyzed within R. For a majority of the datasets, I had the ability to copy and paste or download into Excel to format and organize the data. This involved removing unnecessary columns, standardizing headers, and verifying cell formats, before importing to R.

After formatting, the data was read into R using the '`read_csv()`' or '`read_excel()`' functions. This process promoted consistency for the data analysis and ensured that the data sources were structured to utilize R's tidyverse functions.

For web-sourced and manually compiled data – such as salary totals, WAR stats, and relocation city metrics – Excel files served as the intermediary step before being imported into R for modeling.

## Data Preparation

Once the datasets were imported, several key steps were completed to clean and prepare the data for analysis in R. These steps fixed any formatting irregularities and created new factors critical to the project's objectives.

### Standardizing Variables

Across all datasets, column names were standardized for clarity and ease of use in the R environment. For example, variables such as "`D/N`" and "`W-L`" from the Retrosheet game logs were renamed to "`day_night_game`" and "`win_loss_record`". Whenever dates appeared in a dataset they were converted from character strings (e.g., "Thursday, Mar 28") to Date class objects using the '`as.Date()`' function, after appending the relevant year.

### Cleaning Attendance and Promotion Data

The White-Sox game-level attendance data required manual input to identify which games featured promotions. Using official promotional schedules for the 2023 and 2024 seasons, a "`promotion_type`" variable was created within the dataset. From there, a binary "`is_promo`" variable was added to flag games that featured a promotion, which was instrumental in evaluating marketing effectiveness.

**Feature Engineering**

Several new variables were created to capture meaningful folds within the data:

- "`day_of_week`" and "`month`" were extracted from the game date to allow for segmented analysis of attendance.
- "`opponent_group`" was created to categorize teams as "`AL Central`", "`big market`", or "`other`", enabling insight into how the opponent type influenced the attendance.
- "`WAR_percentile`" and "`Performance_Tier`" were computed to benchmark individual White Sox players against league-wide performance by position.

**Combining and Filtering Data**

For the analysis of historical relocations, team performance and payroll data from Spotrac and Baseball-Reference were merged using shared identifiers, such as team name and year.

For the city-level economic analysis, various external indicators were scaled using the '`scale()`' function in R and combined into a composite "`total_score`" index, allowing comparisons across potential relocation cities.

**Final Structure**

The cleaned and prepared datasets included:

- `white_sox_eval` for White Sox player performance, benchmarked by league-wide WAR and salary,
- `mlb_combined_war_salary` for all MLB players' WAR and salary data
- `white_sox_home` for 2023-2024 White Sox regular-season home games, with game-level details and promotions,
- `combined_games` for all regular-season MLB games (2023-2024), used for understanding league-wide trends and patterns in attendance,
- `relocation_data` for historical relocation team data,
- `city_data` for economic, demographic, and infrastructure indicators for Charlotte and other potential relocation sites,
- `combined_city_data` combining current MLB team cities (Milwaukee, Baltimore, Phoenix, Toronto, Los Angeles, Chicago, and New York) with possible relocation sites for benchmarking and comparisons.

These steps of preparing the data established a reliable foundation for the modeling and analysis that follows.

# Player Valuation and Roster Restructuring

## Background

The Chicago White Sox enter 2025 burdened by a payroll north of $140 million, ranking 18th in the league, yet delivered a historically poor season, culminating the worst record in MLB history in 2024. Some of the most observable problems with the way the team is structured is the several high-salary players contributing well-below-average performance. This alarming mismatch between spending and performance indicates a critical need for reevaluating the roster. This section aims to examine the current financial health and roster structure of the White Sox and apply a data-driven approach to explore more cost-effective alternatives. The ultimate goal is to restructure the team under a constrained payroll, while maximizing on field performance.

## Current Financial and Roster Situation

To evaluate each White Sox player's value relative to their cost, I combined salary data from Spotrac with WAR figures from Baseball-Reference. These datasets were merged and cleaned in R. From this, I constructed three key metrics:

- **WAR-per-million**: This is a custom metric created by dividing WAR by salary (in millions $), which is used to assess the player's cost efficiency,
- **WAR Percentile**: Each player's WAR was converted to a percentile rank relative to other MLB players at their position,
- **Performance Tiers**: Based on WAR percentile, players were grouped into "Top Performer" (85th percentile+), "Middle Performer" (25th to 85th percentile), and "Low Performer" (below 25th percentile).

This evaluation provided a foundation for finding overpaid underperformers and undervalued contributors. **Table 1** illustrates the disparity in players severely underperforming and those overperforming.

| Player | Position | Salary | WAR | WAR_percentile | Performance_Tier |
|---|---|---|---|---|---|
| garrett crochet | lhp | 800000 | 4.1 | 1 | Top Performer |
| erick fedde | rhp-s | 7500000 | 5.6 | 0.98181818 | Top Performer |
| michael kopech | rhp | 3000000 | 1.4 | 0.79081633 | Top Performer |
| jared shuster | lhp | 742500 | 1 | 0.78378378 | Top Performer |
| tim hill | lhp | 1800000 | 0.9 | 0.75675676 | Top Performer |
| sean burke | rhp | 740000 | 0.9 | 0.69387755 | Middle Performer |
| davis martin | rhp | 742500 | 0.9 | 0.69387755 | Middle Performer |
| dominic leone | rhp | 1500000 | -0.7 | 0.03061224 | Low Performer |
| deivi garcia | rhp | 740550 | -0.7 | 0.03061224 | Low Performer |
| nick nastrini | rhp | 740000 | -0.8 | 0.02040816 | Low Performer |
| omar narvaez | c | 7000000 | -0.9 | 0.01587302 | Low Performer |
| martin maldonado | c | 4000000 | -1.3 | 0 | Low Performer |
| eloy jimenez | dh-lf | 13833333 | -0.7 | 0 | Low Performer |
| corey julks | of | 742500 | -1.1 | 0 | Low Performer |

*Table 1: Top and Bottom 7 White Sox Players by WAR Efficiency*
*A full WAR-Salary table, Table A1, can be found in Appendix A.*

## Constrained Optimization

With an understanding of the inefficiencies of this roster, I turned to a constrained optimization model to explore a more efficient way to construct the 2025 White Sox roster. The objective was to maximize a total team WAR while staying under a budget of $120 million, about $21 million less than the 2024 payroll, to reflect a team in a rebuilding phase.

Using the `lpSolve` package in R, I implemented a binary integer linear programming model where each player in the league-wide dataset was either selected (1) or not selected (0). The objective function was defined as the sum of WAR for the chosen players, subject to several constraints:

1. **Salary Cap**: The total salary of the selected roster could not exceed $120 million,
2. **Roster Size**: The model was limited to 40 total players, to reflect the max active roster of an MLB team,
3. **White Sox Core Retention**: To maintain continuity, the top 17 White Sox players, ranked by WAR-per-million, were force-included in the final roster,
4. **Positional Balance**:
    i. A minimum of 17 pitchers was required,
    ii. A minimum of 20 positional players was required,
5. **Feasibility**: To prevent unrealistic selections (e.g., young superstars still on rookie contracts), all players earning less than $1 million were excluded from the candidate pool (unless already on the White Sox).

This approach prevented the model from simply selecting the most cost-efficient players, typically young stars still on rookie contracts, who would realistically be untouchable due to trade cost or team control. This allowed the model to focus on attainable players that could provide solid value.

The optimization modeling process included the following steps:

- Constructing a binary decision variable vector for each eligible player,
- Building a constraint matrix representing salary, roster size, positional minimums, and required players from the 2024 White Sox team,
- Running the `lp()` solver from the `lpSolve` package to find the roster combination that maximized WAR within the constraints,
- Interpreting and extracting the optimized roster.

The final output - **Table A2**, which can be found in the Appendix - was a 40-man, blended roster of retained White Sox players and additions who offered strong WAR-per-dollar value. The model picked up several under-the-radar and attainable players who could outperform their contracts and fit within a realistic team-building plan. By finding the White Sox who were underpaid overperformers, it also inversely found overpaid underperformers, which the organization should target for replacements. A visual displaying the efficiency of each roster, defined for this project as WAR per million spent, shows how much more WAR the optimized roster should achieve spending the same amount of money as the 2024 roster, and can be seen to the right.

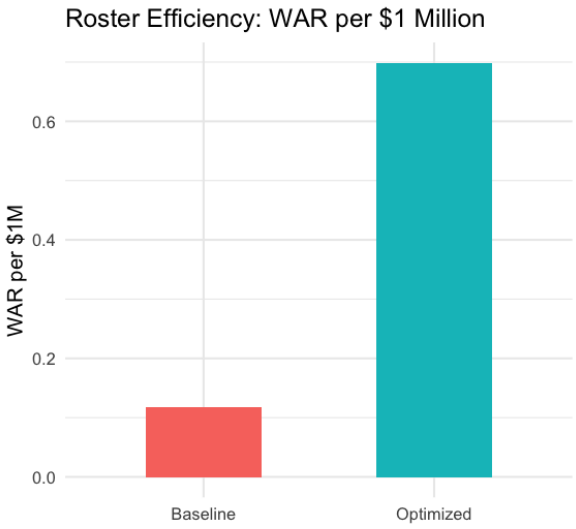


*Figure 1: Comparison of 2024 White Sox Roster to Optimized Roster, by WAR-per-million*

While optimizing a team's roster can improve the on-field performance, which improves ticket sales, it's not the only driver of attendance and overall organizational success. Some of the factors I've studied to better understand fan behavior and demand elasticity for certain games are discussed in the following section.

# Ticketing and Promotional Strategies

## Background

The White Sox, like most teams in the MLB, have seen a worrying decline in home attendance over recent seasons. After a historically poor on-field performance in 2024, fan interest in the team has dwindled. Attendance numbers have reflected this downturn, creating difficulties generating profit for the organization.

Attendance represents more than just tickets sold; it also encompasses gate receipts, concessions, and secondary spending within the ballpark. The financial health of the White Sox will not hold up if they aren't able to get people through their gates and into seats. Nowadays, national and local TV contracts make up a large majority of a team's revenue stream; however, local TV contracts are largely fixed revenue and profits from national TV contracts are typically shared amongst the leagues. Maximizing ticket revenue has become essential for rebuilding a franchise and establishing long-term sustainability.

As the team explores a potential relocation or rebranding, understanding what drives fans to attend games – and how promotions and pricing strategies affect that decision - becomes as important now as ever before. This section analyzes historical attendance data, evaluates the

impact of promotions and opponents, and proposes dynamic pricing and marketing strategies that align with fan demand and organizational needs.

## Modeling Attendance Trends and Promotional Impacts

To evaluate the drivers of home game attendance for the White Sox, I combined game-level data for the 2023 and 2024 seasons. Each home game was set to display a range of factors that are believed to influence fan turnout, creating a dataset to model and visualize trends.

The following variables were included in this study:

- **Game Date and Time**: Used to determine day of the week, weekend vs weekday games, and month of the season,
- **Opponent Group**: Categorized as Big Market (Cubs, Yankees, Red Sox, Astros, Dodgers), AL Central (division rivals for the White Sox), or Other,
- **Promotional Games**: A binary variable based on the manual addition of promotional events at specific games,
- **Day or Night Games**: Used to examine attendance difference between games that start before 6:00 PM and games that start after that time.

### Modeling Approach

Using R, I first conducted an exploratory data analysis (EDA) to visualize attendance distributions by each factor. From there, I constructed a multiple linear regression model with attendance for a specific game as the dependent variables and the above factors as independent predictors. The model explained a meaningful portion of the variance in attendance (adjusted $R^2$ is ~49%), suggesting these independent factors are strong predictors of turnout, but potentially excluding a few additional factors.

The modeling approach allowed me to quantify the average attendance increase for games with promotional events. It also enabled me to measure the draw of different opponents, applying an average increase or decrease to the three opponent groups discussed above. Lastly, it clearly showed differences in calendar patterns, such as the difference seen in a spring, weekday, day game versus a summer, weekend, night game.

In addition to the regression model, I utilized summary statistics and visualizations to examine how different subsets of games performed, which helped uncover non-linear and context dependent effects that couldn't be captured by the model.

## Key Patterns in Attendance and Strategic Implications

The analysis revealed several actionable patterns in home-game attendance spanning the past two seasons. These insights form the foundation of my recommendations for a more targeted and effective promotional and pricing strategy.

**Promotional Events Drive Significant Attendance Gains**

Games that my binary variable `is_promo` flagged, whether it was a giveaway, fireworks night, or theme night, attracted approximately 5,300 more fans, on average, than non-promotional games. This uplift was most pronounced on low-attendance weekdays, such as Mondays and Wednesdays, where promotions nearly doubled average attendance compared to non-promotional games on those days. Surprisingly, Saturday promotional games underperformed, drawing around 5,800 fewer fans than their non-promotional counterparts. This is possibly due to an already high demand or competing weekend activities.

| Day of Week | Non-Promo Average | Promo Average | Difference |
|---|---|---|---|
| Monday | 15530.15 | 31179 | 15648.85 |
| Tuesday | 11609 | 18538.45 | 6929.45 |
| Wednesday | 15081.2 | 25954.33 | 10873.13 |
| Thursday | 14421.08 | 20493.6 | 6072.517 |
| Friday | 18857.71 | 21908.21 | 3050.496 |
| Saturday | 30955.5 | 25132.84 | -5822.66 |
| Sunday | 19442.65 | 20158.4 | 715.75 |

*Table 3: The Difference Between Promo and Non-Promo Games by Day of the Week*

When examining opponent type, home games against AL Central teams or non-big market teams saw around a 33% increase in attendance on promotional games. This clearly suggests that promotions are especially useful for games with weaker draws, as seen below in **Figure 2**. While promotional games increased attendance in every month, the most significant gains were seen in April and June, while May and September saw the smallest promotional impact. Lastly, day games saw a larger promotional increase than night games. Promotional day games actually outdrew promotional night games by about 2,000 fans, highlighting an opportunity to schedule more daytime promotional games.

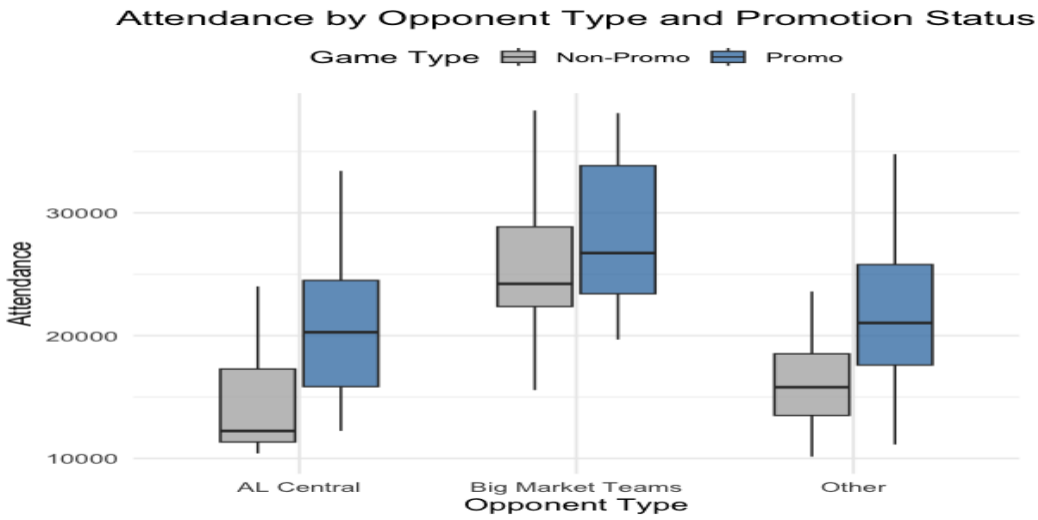


*Figure 2: Average Attendance by Type of Opponent, Filled by Promo or Non-Promo Game*

## Opponents' Market Size Matters

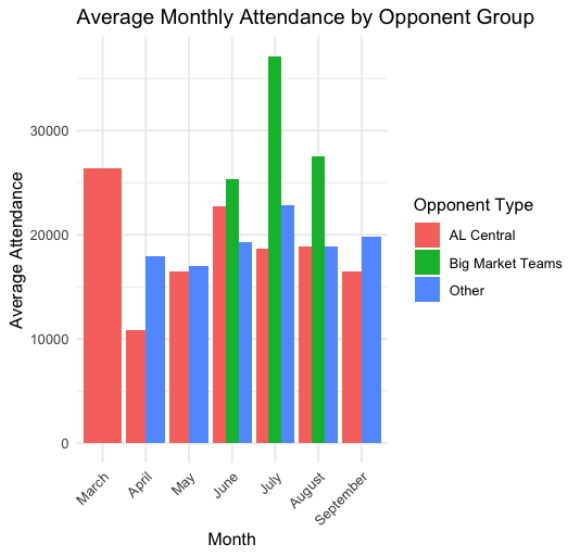


*Figure 3: Average Monthly Attendance by Opponent Group*

The opponents' market size had a measurable impact on the White Sox's home game attendance during the 2023 and 2024 seasons. Games played against big-market teams, averaging over 27,000 fans, consistently outperformed games against the White Sox's division rivals, averaging just 17,000, and all other 20 teams considered mid- or small-market teams, averaging around 18,500 fans. These findings highlight the strong influence that opponent brand power and market size has on average attendance. As discussed above, promotions had a much stronger impact for low-draw opponents, suggesting an opportunity to target promotional games on less-desirable games to boost attendance when these big-market teams are not in town. The visual to the left, **Figure 3**, shows average attendance by month, filled by the opponent group. This shows how influential these big-market teams coming to town can be for attendance. The visual also indicates that there is a small, but potentially negligible difference between AL Central and Other teams, suggesting that the real distinction may be between big-market and non-big market teams, regardless of the opponent's division.

## Day of Week and Seasonality Trends

The average attendance at White Sox home games varied meaningfully by both the day of the week and month of the season. This data can guide future scheduling and promotional efforts to place them more strategically throughout the regular season. Unsurprisingly, weekend games outdrew weekday games by an average of around 5,000 attendees, specifically Friday and Saturday night games. On the other hand, Tuesdays and Wednesdays saw significantly lower turnouts. This could suggest to management that scheduling premium matchups with big-market teams or placing promotional events earlier in the week could help address the lagging attendance. Looking at the data by month revealed many things as well. Attendance started relatively low and gradually increased until peaking in July, until finally tapering off in September. The combination of good weather, kids being on summer vacation, and more games against big-market teams, helped drive higher average attendances for the White Sox in the summer months. The patterns in this data display strategic windows in both the weekly and seasonal calendar where targeted promotions or dynamic pricing adjustments could maximize the profit and attendance for the organization. These patterns discussed can be visualized in the below figures (**Figure 4** and **Figure 5)**.

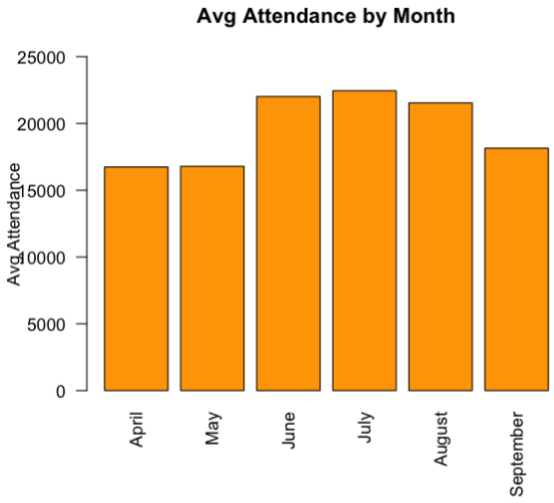


*Figure 4: Average Attendance by Month of Season*

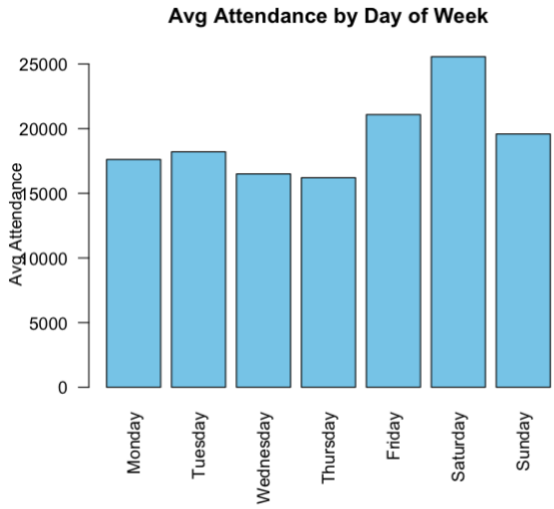


*Figure 5: Average Attendance by Day of the Week*

The combined insights from regression modeling, visual analysis, and promotional trends make it clear that the White Sox could significantly influence their attendance, on a per-game basis, through strategic scheduling and placement of promotional games. Promotions are the most effective strategy to improve the attendance of games with a low baseline demand, such as weekday afternoon games or small-market teams. Contrarily, promotions could be steered away from big-market teams as they inherently draw strong crowd and are less resistant to the discussed factors. The analysis also demonstrated that seasonality and day of the week matter, with summers and weekends performing best. These insights provide a roadmap for optimizing game-day strategy, from placing promotional games to adjusting the tiers of a dynamic pricing model.

While refining an organization's ticketing and promotions strategy offers short-term revenue gains, the broader question facing this organization is whether these strategies, paired with a relocation, are enough to reverse declining interest. To address this, the next section aims to examine historical franchise relocations, and which cities make sense to consider for relocation. This will provide context for what a potential move could mean financially for the organization.

# Additional Analysis

## Background

The topic of relocation has gained serious traction within the White Sox organization as the franchise continues to battle financial strain and record-low attendance in the years since its World Series in 2005. While upgrading Guaranteed Rate Field or pursuing a rebranding effort may offer marginal improvements, shifting to a more favorable market - one in which they aren't overshadowed by their crosstown rival - could present the best opportunity for long-term revenue growth. This section evaluates the potential implications of a relocation by analyzing historical franchise moves and assessing Charlotte, a fast-growing, sports-hungry city, as a leading relocation candidate.

## Historical Franchise Relocation Case Studies

Franchise relocation has long been used as a reset for struggling organizations, offering a chance to reach a new market, fan base, and revenue stream. While typically driven by financial pressures or disinterested fanbases, relocation brings questions of how performance and investment evolve after the move. By examining past examples across major U.S. sport leagues, there can be a better understanding of the outcomes that tend to follow a major organizational shift.

Through an analysis of four franchise relocations across the MLB, NBA, and NHL, mixed outcomes of on-field performance following the move emerged. The Seattle SuperSonics, who became the Oklahoma City Thunder, experienced the most substantial increase in on-court performance, increasing their average wins per season by 14 games after their relocation. This is in part to how historically bad the SuperSonics were but is still worth noting. Conversely, and more commonly, the post-relocation franchise did not sustain their average wins per season. As seen below, the Texas Rangers (formerly the Washington Senators) and the Washington Nationals (formerly the Montreal Expos) saw declines in performance, dropping 8 and 2.7 wins per season on average, respectively. The Thrashers' relocation to Winnipeg only resulted in a decrease of 1.7 average wins per season. These results suggest that while relocation can offer upside, it is not a guaranteed path to moving forward.

| Franchise | Post-relocation | Pre-relocation | win_change |
|---|---|---|---|
| Expos/Nationals | 75 | 77.66667 | -2.666667 |
| Senators/Rangers | 65 | 73 | -8 |
| Sonics/Thunder | 42.66667 | 28.66667 | 14 |
| Thrashers/Jets | 32.66667 | 34.33333 | -1.666667 |

*Table 4: Average Wins Before and After Franchise Relocation*

The bar chart to the left reveals a consistent trend across multiple franchises: relocation often comes with an increase in average team payroll. One thing to note is that the Rangers and Senators have super low values, as the relocation occurred in 1972, due to the much lower organization payrolls seen at the time. However, the other three relocations experienced significant jumps in their payrolls post-relocation. This trend implies that relocation can lead to increased financial commitment from ownership. This is likely driven by access to larger markets, improved facilities, and/or enhanced revenue opportunities within the relocation city.

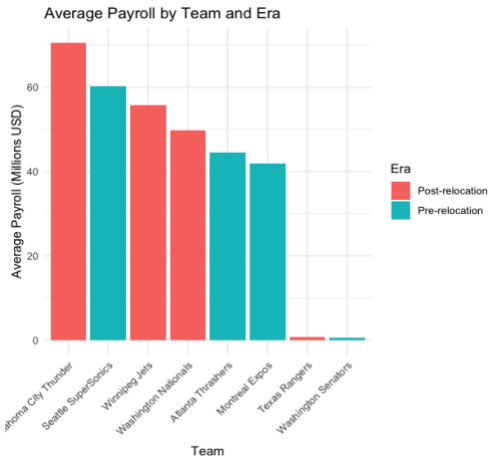


*Figure 6: Average Payroll by Team, filled by Era*

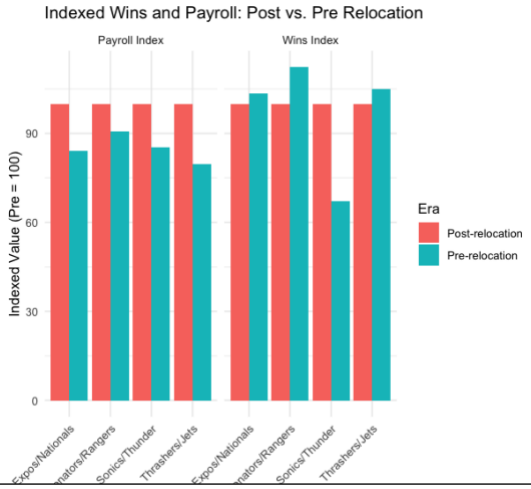


*Figure 7: Indexed Comparison of Avg Wins and Avg Payroll Before and After Relocation*

The indexed comparison to the left offers a standardized view of franchise changes across leagues and eras. In this chart, each franchise's pre-relocation average for both wins and payroll was set to a baseline 100 to account for scale differences between sports (number of games in season) and eras (difference in payroll size), enabling more meaningful cross-team comparisons. It's clear that the Thunder, enjoyed a well-leveraged move as their payroll and wins post-relocation significantly increased. In contrast, the Nationals and Rangers experienced increased spending with a decrease in average wins. Overall, this illustrates that relocation offers financial growth but does not inherently lead to on-field success.

This analysis of four major U.S. franchise relocations reveals that while financial investment and the amount of capital available often increases after a relocation, the return on investment is not guaranteed. It cannot be overlooked that a door is opened to financial gain, and in the Thunder's case performance gains as well, but successful outcomes hinge on post-move strategy, market engagement, and long-term planning.

This next section turns to evaluates Charlotte, a leading candidate for the White Sox Relocation, using city-level economic, demographic, and market data to project its viability as a future MLB city.

## Charlotte's Market Potential for a MLB Relocation

Charlotte, North Carolina has gained a lot of traction in discussion of relocation sites for current MLB teams. Its combination of rapid population growth, economic momentum, and strong corporate presence make it a compelling future home for an MLB franchise, hopefully the White Sox. This section evaluates Charlotte's market potential using a range of city-level indicators obtained from the `city_data` dataset by comparing to other relocation candidates. Comparisons are also made to current cities with an MLB team using similar city-level indicators from the `combined_city_data`. The table below (Table 5) details city-level rankings of potential relocation cities. A table of their scaled score and total score (**Table A3**) as well as the tables containing 7 cities with MLB teams (**Tables A4 and A5**) can be found in the appendix.

| City | Population | Tourism Rank | Cost Index | Fortune 1000 Companies | Pop. Growth Rate (%) | Household Income | # of Pro Teams | TV Market Rank |
|---|---|---|---|---|---|---|---|---|
| San Antonio, TX | 1496876 | 45 | 70 | 6 | 4.339 | 62917 | 1 | 31 |
| Nashville, TN | 715891 | 23 | 74 | 2 | 3.821 | 75197 | 2 | 27 |
| Charlotte, NC | 897720 | 18 | 73 | 13 | 2.646 | 78438 | 2 | 21 |
| Glendale, AZ | 252381 | 65 | 68 | 0 | 1.633 | 70139 | 1 | 11 |
| Oklahoma City, ( | 681054 | 65 | 69 | 4 | 0.985 | 66702 | 1 | 45 |
| Sacramento, CA | 524943 | 49 | 78 | 0 | 0.873 | 83753 | 1 | 20 |
| Orlando, FL | 309154 | 1 | 74 | 4 | 0.514 | 69268 | 1 | 17 |
| Columbus, OH | 906528 | 40 | 71 | 11 | 0.086 | 65327 | 1 | 32 |
| Memphis, TN | 633104 | 65 | 67 | 5 | 0.041 | 51211 | 1 | 51 |
| St. Paul, MN | 311527 | 65 | 75 | 5 | -0.329 | 73055 | 1 | 15 |
| Indianapolis, IN | 880621 | 47 | 70 | 6 | -0.791 | 62995 | 2 | 27 |
| Newark, NJ | 311549 | 65 | 79 | 2 | -1.383 | 48416 | 1 | 1 |
| Buffalo, NY | 255284 | 65 | 68 | 1 | -8.286 | 48050 | 2 | 53 |

*Table 5: City-Level Indicators for Potential MLB Relocation Cities*

### Demographics and Growth

Charlotte's population is approaching 900,000 and continues to grow at one of the fastest rates among U.S. metropolitan areas. With a population growth rate of 2.65%, Charlotte ranks third in emerging cities within the list of potential relocation cities. On top of that, Charlotte is attracting people and families with money to spend as its household income of $78,438 ranks second, just behind Sacramento, which could be high based on the increased salaries seen in California due to such high taxes. These metrics equate Charlotte very similarly to Phoenix, a city with an MLB team that has increased average attendance per game every year, since the 2020 COVID year. Many US cities with an MLB team, such as Baltimore, Milwaukee, Chicago, and New York, have seen stagnant or declining population growth since 2020. On top of that, when compared to a few other cities with a MLB team, Charlotte only trails Toronto, New York, and Los Angeles in terms of median household income.

### Economic Strength and Corporate Presence

Charlotte ranks first among all candidate cities in the number of Fortune 1000 companies headquartered locally, with 13, reflecting a growing economic base. This has the potential to provide significant upside not only for corporate partnerships and luxury suite sales but also for

long-term stadium financing and media rights deals. While Charlotte's cost of living is relatively high (6th in potential relocation cities) it can be considered offset by the high median household income. Also, when compared to current cities with MLB teams it is about average, ranking under New York, and Los Angeles, and on par with Chicago.

**Tourism and Media Reach**

Charlotte ranks 18th in national tourism ranking, significantly higher than all other potential relocation cities, besides Orlando (1st). This is a promising sign that out-of-town visitors could be a good source of revenue as prospective ticket sales and could lead to a number of event-based revenue streams. Due to Charlotte's TV market rank falling short of most current MLB cities (21st), the organization's national exposure could be limited, but does allow room for growth if the relocated franchise can generate sustained regional interest. This would most likely entail taking fans in the region from the Braves, as most of the Carolinas and Tennessee are fans of the Atlanta-based team due to a lack of team(s) in the region.

**Total Score Analysis**

When aggregating city-level indicators into a composite total score, Charlotte ranks first in total score, and near the top of all scaled indicator scores – outpacing other solid potential relocation cities such as Nashville, Columbus, OH, and Orlando. The city's big advantages in economic strength, income levels, and corporate presence gives it a great blend of market readiness for an expansion team.

Charlotte currently hosts the Triple-A affiliate of the White Sox, the Knights, who play in the heart of the city at Truist Field. A promising sign for the potential relocation is that the Knights ranked 10th in all of the minors in attendance last season, demonstrating the city's commitment to its teams and interest in baseball. Although the Charlotte's Knights stadium was not initially built to accommodate a MLB franchise, it doesn't eliminate the city or field's possibility of expansion. If upgraded, it would provide one of the most scenic backdrops in the MLB, as it is situated squarely in the middle of downtown Charlotte.

# Conclusions and Recommendations

## Restructuring the Roster

### Optimizing Roster Efficiency

Utilizing the created metric, WAR-per-million, and a constrained optimization model, the analysis identified a way to assemble a more competitive White Sox roster within a constrained budget. The recommendations focus on improving roster efficiency without relying on unrealistic acquisitions or a complete, 6+ year rebuild:

- **Cost-Efficient Acquisitions**: Prioritizing players who deliver high WAR-per-million values, or any other metrics one may be interested in (wOBS, SLG, etc.). Many of these players are attainable, mid-tier veterans who offer solid production at a reasonable salary. Players that fit this mold are Gavin Lux, Jose Iglesias, Miguel Rojas, and Zach Little, just to name a few.
- **Targeted Replacements**: Actively seek to replace the lowest-tier players (bottom quartile of WAR efficiency) with similarly priced players outside the organization who offer better value. White Sox players like Andrew Benintendi, Mike Cleavinger, Martin Maldonado, and Touki Toussaint who have relatively high salaries but are producing horrendous WAR numbers are great players to target for replacement.
- **Maintain Core Value**: It is not feasible to create a brand new 40-man roster within a year, even only maintaining 17 players is a bit extreme, but it sets the precedent of keeping players that performed above or equal to their salary expectations. This maintains roster continuity and allows for restructuring around these players to enhance team performance.
- **Avoid Overcommitting to Star Power**: There is always the temptation to overpay for the game's best players in an effort to jumpstart a roster. However, the teams that tend to go after these types of players contain a lot of depth and balance across their roster. The White Sox don't have much of that, and for the near-future, should focus on adding depth and positional coverage.

### Long-Term Strategy

The constrained optimization approach that was implemented in this study offers a replicable tool to reassess the entire roster, as well as MLB, each season and adjust to changes in market salary, player performance, and payroll constraints. The White Sox should embed this model into their annual roster planning and financial analysis, particularly in years when there are an abundance of free agents or heavy trade activity is expected.

## Ticketing and Promotions

### Dynamic Ticket Pricing

The analysis of the attendance data for the past two White Sox regular seasons revealed a substantial variation in demand based on the day of the week, opponent, and promotional status. A static pricing model, or a dynamic pricing model with few adjustments, ignores these differences and leaves potential revenue for the organization on the table. A dynamic pricing model can optimize gate revenue while maximizing attendance on low-demand games when ticket prices are adjusted based on:

- **Day of the Week**: Higher priced tickets on Fridays, Saturdays, and Sundays, with discounts on Tuesday and Thursday games
- **Opponent Type**: Big-market teams, such as the Cubs, Yankees, Astros, Dodgers, and Red Sox, should be priced at a premium, while games against small-market teams, such as the Athletics, Royals, Brewers, and Pirates, should be discounted
- **Promotional Impact**: Promotions showed the largest difference in attendance for games that were promotion-based versus games that weren't and should be moderately increased to reflect the difference
- **Seasonality**: Games that take place in June, July, and August should be priced higher, while games in April and May should be discounted. If the team is out of the playoff hunt by September, it could be considered discounting those as well as the White Sox dipped in September, in which they were out of contention for both seasons the data covered

### Strategic Placement of Promotional Dates

Promotions were proven to significantly boost attendance, especially on low-demand weekdays and games against non-big market teams. However, when applied to already high-demand games (Saturdays and games against big-market teams), the return on investment may be diminished, or in some cases, negative. The following are ways to strategically utilize promotions to maximize average attendance:

- Promotional events in the early week, specifically Mondays and Wednesdays, can increase the average attendance on these low-demand weekday games
- Focused promotions on games against AL Central rivals or other small-market teams could generate an uplift to the low attendance seen when non-marquee teams are in town
- Day-time promotions should be utilized at a higher clip as they saw higher relative gains than promotions used during night games
- Weekend promotions should be deprioritized unless they are bundled with premium matchups

## Market Relocation and Revenue Potential

### Realistic Expectations of Relocating

The historical franchise relocations studied in this paper offer mixed results, but a few firm takeaways. In the case of the Thunder, immediate on-court performance can be seen when the gathering of talent and leveraging of the new market are utilized jointly. However, in the more common cases seen in the Nationals' and Rangers' relocations, payroll will increase as the team attempts to jumpstart their new franchise with positive performance, but see negligible performance increases, even a step back in certain cases. These case studies suggest:

- **Relocation does not guarantee on-field success**. However, a relocation executed with a strategic vision can generate renewed fan interest and open doors to corporate partnerships that sets the team up for future success.
- **Market context matters**. Cities with stronger economic foundations and media markets are better positioned to capitalize on relocation and find immediate on-field success.

The White Sox should use these studies to determine their plan of attack upon relocating to Charlotte. They could take the Thunder approach and immediately pour money into their roster in an attempt to boost on-field performance quickly. On the other hand, the White Sox can reserve money for a couple years in an attempt to build funds as well as establishing themselves within their community and corporate landscape. Once they have a solid foothold, they can begin spending their money to build a championship caliber roster.

### Charlotte's Strategic Advantages

Based on the comparative analysis of the 13 potential relocation markets, Charlotte emerged as a clear favorite based on key metrics like population growth rate, median household income, corporate presence, and tourism rank:

- **Strong Corporate and Economic Profile**: Charlotte leads all markets in number of Fortune 1000 companies headquartered in the city and ranks second in median household income. Both of these indicators are key to predicting how accessible long-term sponsorship and media deals will be to a franchise in the city. The largest Charlotte-based company, Bank of America, is already partnered with the FIFA World Cup in 2026, The Masters, Chicago and Boston Marathons, and many local sport teams. They've shown an interest in partnering with and sponsoring some of the biggest sporting events in the U.S. and may be a prime sponsorship target for an MLB team that shares a home city with its headquarters,
- **Fan Acquisition Potential**: Charlotte is in a region with little MLB competition. As discussed earlier, a lot of fans in this region are Braves fans, even though they are a 4–7-hour drive to the city, because there isn't a closer team to be a fan of. The White Sox

could capitalize on this by attracting fans from neighboring states that currently lack a local MLB team (South Carolina, Tennessee, Kentucky),

- **Balanced Market Profile**: Charlotte ranked at or near the top of all scaled metrics within the analysis, outperforming other high-profile candidates such as Nashville and Orlando. With a balanced profile, the White Sox wouldn't need to rely specifically on one or two market factors to generate revenue but would find themselves in a favorable position of being able to utilize many different facets of their market to increase profits.

**Relocation Recommendations**

Through the analysis of potential markets, I think the White Sox should pursue Charlotte as the primary relocation market. Its balanced strength across city-level metrics make it an ideal candidate to refresh a storied franchise. In order to capitalize on these strengths, the White Sox must plan for long-term brand building, including regional marketing and partnerships with Charlotte-based corporations. The organization can learn from past relocations by ensuring early investments in player development and fan engagement initiatives to extend fan interest beyond the first few seasons, to combat the fact that on-field performance may remain similar.

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# Appendix

**Table A1. White Sox 2024 Roster with calculated WAR Percentile and Performance Tier**
*This figure shows how the entire 2024 White Sox Roster compared to benchmarked WAR number by position.*

| Player | Position | Salary | WAR | WAR_percentile | Performance_Tier |
|---|---|---|---|---|---|
| erick fedde | rhp-s | 7500000 | 5.6 | 0.98181818 | Top Performer |
| garrett crochet | lhp | 800000 | 4.1 | 1 | Top Performer |
| michael kopech | rhp | 3000000 | 1.4 | 0.79081633 | Top Performer |
| jared shuster | lhp | 742500 | 1 | 0.78378378 | Top Performer |
| tim hill | lhp | 1800000 | 0.9 | 0.75675676 | Top Performer |
| jonathon cannon | rhp-s | 740000 | 1.9 | 0.66363636 | Middle Performer |
| chris flexen | rhp-s | 1750000 | 1.6 | 0.58181818 | Middle Performer |
| luis robert jr | cf | 12500000 | 1.4 | 0.59375 | Middle Performer |
| michael a taylor | cf | 4000000 | 0.9 | 0.46875 | Middle Performer |
| paul dejong | ss | 1750000 | 0.9 | 0.44642857 | Middle Performer |
| davis martin | rhp | 742500 | 0.9 | 0.69387755 | Middle Performer |
| sean burke | rhp | 740000 | 0.9 | 0.69387755 | Middle Performer |
| michael soroka | rhp-s | 3000000 | 0.7 | 0.41818182 | Middle Performer |
| matt thaiss | c | 770000 | 0.6 | 0.38095238 | Middle Performer |
| mike tauchman | cf | 1950000 | 0.6 | 0.4375 | Middle Performer |
| justin anderson | rhp | 755750 | 0.5 | 0.55102041 | Middle Performer |
| enyel de los santos | rhp | 1160000 | 0.4 | 0.51020408 | Middle Performer |
| kevin pillar | cf | 1000000 | 0.4 | 0.34375 | Middle Performer |
| prelander berroa | rhp | 742500 | 0.4 | 0.51020408 | Middle Performer |
| alex cobb | rhp-s | 10000000 | 0.3 | 0.27272727 | Middle Performer |
| travis jankowski | cf | 1700000 | 0.3 | 0.3125 | Middle Performer |
| yoan moncada | 3b | 24800000 | 0.3 | 0.425 | Middle Performer |
| gus varland | rhp | 800000 | 0.3 | 0.45918367 | Middle Performer |
| matt foster | rhp | 750000 | 0.3 | 0.45918367 | Middle Performer |
| andrew vaughn | 1b | 3250000 | 0.2 | 0.34482759 | Middle Performer |
| nicky lopez | 2b | 4300000 | 0.2 | 0.32 | Middle Performer |
| tanner banks | lhp | 755050 | 0.2 | 0.32432432 | Middle Performer |
| zach remillard | 1b | 742500 | 0.2 | 0.34482759 | Middle Performer |
| chad kuhl | rhp | 950000 | 0.2 | 0.3877551 | Middle Performer |
| fraser ellard | lhp | 740000 | 0.2 | 0.32432432 | Middle Performer |
| john brebbia | rhp | 4000000 | 0.1 | 0.34183673 | Middle Performer |
| oscar colas | of | 742500 | 0.1 | 0.40540541 | Middle Performer |
| brad keller | rhp | 1000000 | 0.1 | 0.34183673 | Middle Performer |
| drew thorpe | rhp | 740000 | 0.1 | 0.34183673 | Middle Performer |
| jairo iriarte | rhp | 740000 | 0.1 | 0.34183673 | Middle Performer |
| jacob amaya | ss | 740000 | 0 | 0.28571429 | Middle Performer |
| tommy pham | of | 3000000 | 0 | 0.35135135 | Middle Performer |
| bryan ramos | 3b | 720000 | -0.2 | 0.35 | Middle Performer |
| danny mendick | 3b | 1300000 | -0.3 | 0.325 | Middle Performer |
| lenyn sosa | 3b | 747500 | -0.4 | 0.25 | Middle Performer |
| korey lee | c | 741850 | 0.1 | 0.22222222 | Low Performer |
| ky bush | lhp | 740000 | 0.1 | 0.24324324 | Low Performer |
| sammy peralta | lhp | 742500 | 0.1 | 0.24324324 | Low Performer |
| brooks baldwin | 2b | 740000 | 0 | 0.24 | Low Performer |
| jake eder | lhp | 740000 | 0 | 0.16216216 | Low Performer |
| robbie grossman | of | 1500000 | -0.1 | 0.24324324 | Low Performer |
| zach deloach | of | 720000 | -0.1 | 0.24324324 | Low Performer |
| mike clevinger | rhp | 4000000 | -0.1 | 0.17857143 | Low Performer |
| austin slater | of | 4000000 | -0.2 | 0.13513514 | Low Performer |
| duke ellis | of | 740000 | -0.2 | 0.13513514 | Low Performer |
| rafael ortega | cf | 1500000 | -0.2 | 0.1875 | Low Performer |
| bryan shaw | rhp | 1500000 | -0.2 | 0.14795918 | Low Performer |
| dominic fletcher | rf | 742500 | -0.3 | 0.19047619 | Low Performer |
| touki toussaint | rhp | 1300000 | -0.3 | 0.12755102 | Low Performer |
| jordan leasure | rhp | 740000 | -0.4 | 0.10204082 | Low Performer |
| jake woodford | rhp | 825000 | -0.4 | 0.10204082 | Low Performer |
| chuckie robinson | c | 742500 | -0.5 | 0.11111111 | Low Performer |
| braden shewmake | ss | 740350 | -0.6 | 0.08928571 | Low Performer |
| steven wilson | rhp | 751900 | -0.6 | 0.06122449 | Low Performer |
| deivi garcia | rhp | 740550 | -0.7 | 0.03061224 | Low Performer |
| dominic leone | rhp | 1500000 | -0.7 | 0.03061224 | Low Performer |
| eloy jimenez | dh-lf | 13833333 | -0.7 | 0 | Low Performer |
| andrew benintendi | lf | 17100000 | -0.8 | 0.07142857 | Low Performer |
| nick nastrini | rhp | 740000 | -0.8 | 0.02040816 | Low Performer |
| omar narvaez | c | 7000000 | -0.9 | 0.01587302 | Low Performer |
| gavin sheets | 1b | 756950 | -1 | 0.03448276 | Low Performer |
| miguel vargas | 3b | 742500 | -1 | 0.075 | Low Performer |
| corey julks | of | 742500 | -1.1 | 0 | Low Performer |
| martin maldonado | c | 4000000 | -1.3 | 0 | Low Performer |
| nick senzel | 3b | 2000000 | -1.4 | 0.05 | Low Performer |

**Table A2. Optimized White Sox Roster**

*This table shows the output from the constrained optimization method of the White Sox Roster discussed in the Roster Restructuring section.*

| Player_clean | Team.x | Position | Salary | WAR | WAR_per_million | Force_include |
|---|---|---|---|---|---|---|
| ketel marte | ARI | 2B | 13,600,000 | 6.8 | 0.5 | FALSE |
| luis robert jr. | CHW | CF | 12,500,000 | 1.4 | 0.112 | TRUE |
| yordan alvarez | HOU | DH | 10,833,333 | 5.4 | 0.49846155 | FALSE |
| erick fedde | STL | SP | 7,500,000 | 5.6 | 0.74666667 | FALSE |
| miguel rojas | LAD | SS | 5,750,000 | 3.4 | 0.59130435 | FALSE |
| tanner scott | SD | RP | 5,700,000 | 4 | 0.70175439 | FALSE |
| daulton varsho | TOR | CF | 5,650,000 | 5 | 0.88495575 | FALSE |
| will smith | KC | C | 5,625,000 | 3.5 | 0.62222222 | FALSE |
| tanner scott | SD | RP | 5,700,000 | 4 | 0.70175439 | FALSE |
| andres gimenez | CLE | 2B | 5,621,429 | 4 | 0.71156284 | FALSE |
| michael harris ii | ATL | CF | 5,000,000 | 3.2 | 0.64 | FALSE |
| kirby yates | TEX | RP | 4,500,000 | 3.3 | 0.73333333 | FALSE |
| nicky lopez | CHW | SS | 4,300,000 | 0.2 | 0.04651163 | TRUE |
| alec bohm | PHI | 3B | 4,000,000 | 3 | 0.75 | FALSE |
| corbin carroll | ARI | RF | 3,625,000 | 3.4 | 0.93793103 | FALSE |
| andrew vaughn | CHW | 1B | 3,250,000 | 0.2 | 0.06153846 | TRUE |
| michael soroka | CHW | SP | 3,000,000 | 0.7 | 0.23333333 | TRUE |
| jurickson profar | SD | LF | 2,500,000 | 3.6 | 1.44 | FALSE |
| jackson chourio | MIL | LF | 2,250,000 | 3.8 | 1.68888889 | FALSE |
| david peterson | NYM | SP | 2,150,000 | 2.9 | 1.34883721 | FALSE |
| zack littell | TB | SP | 1,850,000 | 2.8 | 1.51351351 | FALSE |
| chris flexen | CHW | SP | 1,750,000 | 1.6 | 0.91428571 | TRUE |
| ezequiel tovar | COL | SS | 1,714,285 | 3.8 | 2.21666759 | FALSE |
| edmundo sosa | PHI | 3B | 1,700,000 | 2.3 | 1.35294118 | FALSE |
| jose iglesias | NYM | 3B | 1,500,000 | 3.1 | 2.06666667 | FALSE |
| randal grichuk | ARI | RF | 1,500,000 | 2.2 | 1.46666667 | FALSE |
| ceddanne rafaela | BOS | CF | 1,250,000 | 2.8 | 2.24 | FALSE |
| gavin lux | LAD | 2B | 1,225,000 | 2.1 | 1.71428571 | FALSE |
| enyel de los santos | CHW | RP | 1,160,000 | 0.1 | 0.0862069 | TRUE |
| matt foster | CHW | RP | 750,000 | 0.3 | 0.4 | TRUE |
| korey lee | CHW | C | 745,000 | 0.1 | 0.13422819 | TRUE |
| davis martin | CHW | SP | 740,000 | 0.9 | 1.21621622 | TRUE |
| drew thorpe | CHW | SP | 740,000 | 0.1 | 0.13513514 | TRUE |
| fraser ellard | CHW | RP | 740,000 | 0.2 | 0.27027027 | TRUE |
| jairo iriarte | CHW | RP | 740,000 | 0.1 | 0.13513514 | TRUE |
| jared shuster | CHW | RP | 740,000 | 1 | 1.35135135 | TRUE |
| jonathan cannon | CHW | SP | 740,000 | 1.9 | 2.56756757 | TRUE |
| justin anderson | CHW | RP | 740,000 | 0.5 | 0.67567568 | TRUE |
| prelander berroa | CHW | RP | 740,000 | 0.4 | 0.54054054 | TRUE |
| sean burke | CHW | SP | 740,000 | 0.9 | 1.21621622 | TRUE |

**Table A3. City-Level Comparison Scores for Potential Relocation Markets**

*Standardized score comparisons across eight city-level indicators for 13 potential MLB relocation cities.*

| City | Tourism Score | Cost Index Score | Fortune 1000 Score | Pop Growth Score | Income Score | Pro Team Score | DMA Score | Total Score |
|---|---|---|---|---|---|---|---|---|
| San Antonio, TX | 0.100299 | 0.519291 | 4.811407 | 1.298071 | -0.25823 | 0.640513 | -0.2583 | 0.372001 |
| Nashville, TN | 1.124785 | -0.51929 | 0.728871 | 1.130801 | 0.839705 | -1.44115 | 0.29755 | -0.64611 |
| Charlotte, NC | 1.357622 | -0.25965 | 4.82127 | 0.751375 | 1.129479 | -1.44115 | 0.38743 | 2.153691 |
| Glendale, AZ | -0.83105 | 1.038582 | 0.497369 | 0.424262 | 0.387476 | 0.640513 | 1.03315 | -1.15516 |
| Oklahoma City, OK | -0.83105 | 0.778936 | -0.27188 | 0.215012 | 0.080179 | 0.640513 | -1.1623 | -0.13705 |
| Sacramento, CA | -0.08597 | -1.55787 | -0.21036 | 0.178846 | 1.604686 | 0.640513 | 0.45201 | -1.15516 |
| Orlando, FL | 2.14927 | -0.51929 | 2.268123 | 0.062919 | 0.309602 | 0.640513 | 0.64572 | -0.13705 |
| Columbus, OH | 0.333137 | 0.259645 | 3.203827 | -0.07529 | -0.04276 | 0.640513 | -0.3229 | 1.644637 |
| Memphis, TN | -0.83105 | 1.298227 | -1.70782 | -0.08982 | -1.30485 | 0.640513 | -1.5497 | 0.117474 |
| St. Paul, MN | -0.83105 | -0.77894 | -0.51524 | -0.2093 | 0.648192 | 0.640513 | 0.77487 | 0.117474 |
| Indianapolis, IN | 0.007164 | 0.519291 | -0.45721 | -0.35849 | -0.25126 | -1.44115 | 0.28995 | 0.372001 |
| Newark, NJ | -0.83105 | -1.81752 | -3.95663 | -0.54965 | -1.55475 | 0.640513 | 1.67888 | -0.64611 |
| Buffalo, NY | -0.831051 | 1.0385816 | -0.900634 | -2.77873906 | -1.5874712 | -1.44115 | -1.6789 | -9.21173 |

**Figure A4. City-Level Comparison Rankings for Potential Relocation Markets and Current MLB Host Cities**

*Ranking comparisons for potential relocation cities with current MLB host cities included.*

| City | Population | Tourism Rank | Cost Index | Fortune 1000 | Growth Rate (%) | Household Income | # of Pro Teams | TV Market Rank |
|---|---|---|---|---|---|---|---|---|
| Buffalo, NY | 255284 | 65 | 68 | 1 | -8.286 | 48050 | 2 | 53 |
| Charlotte, NC | 897720 | 18 | 73 | 13 | 2.646 | 78438 | 2 | 21 |
| Columbus, OH | 906528 | 40 | 71 | 11 | 0.086 | 65327 | 1 | 32 |
| Glendale, AZ | 252381 | 65 | 68 | 0 | 1.633 | 70139 | 1 | 11 |
| Indianapolis, IN | 880621 | 47 | 70 | 6 | -0.791 | 62995 | 2 | 27 |
| Memphis, TN | 633104 | 65 | 67 | 5 | 0.041 | 51211 | 1 | 51 |
| Nashville, TN | 715891 | 23 | 74 | 2 | 3.821 | 75197 | 2 | 27 |
| Newark, NJ | 311549 | 65 | 79 | 2 | -1.383 | 48416 | 1 | 1 |
| Oklahoma City, OK | 681054 | 65 | 69 | 4 | 0.985 | 66702 | 1 | 45 |
| Orlando, FL | 309154 | 1 | 74 | 4 | 0.514 | 69268 | 1 | 17 |
| Sacramento, CA | 524943 | 49 | 78 | 0 | 0.873 | 83753 | 1 | 20 |
| San Antonio, TX | 1496876 | 45 | 70 | 6 | 4.339 | 62917 | 1 | 31 |
| St. Paul, MN | 311527 | 65 | 75 | 5 | -0.329 | 73055 | 1 | 15 |
| Milwaukee, WI | 563531 | 65 | 61 | 8 | -2.5 | 51888 | 2 | 37 |
| Baltimore, MD | 568271 | 36 | 67 | 3 | -3 | 59623 | 2 | 28 |
| Phoenix, AZ | 1673164 | 7 | 67 | 7 | 4 | 77041 | 3 | 11 |
| Toronto, ON | 2794356 | 41 | 65 | 0 | 0.5 | 84000 | 6 | 7 |
| Los Angeles, CA | 3878704 | 3 | 77 | 6 | -0.5 | 80366 | 5 | 2 |
| Chicago, IL | 2721308 | 12 | 72 | 25 | -1 | 75134 | 6 | 3 |
| New York, NY | 8478072 | 2 | 100 | 78 | -3.7 | 79713 | 6 | 1 |

**Figure A5. City-Level Comparison Scores for Potential Relocation Cities and Current Host Cities**

*Standardized score comparisons across city-level indicators for potential relocation cities and current MLB host cities.*

| City | Tourism Score | Cost Index Score | Fortune 1000 Score | Pop Growth Score | Income Score | Pro Team Score | DMA Score | Total Score |
|---|---|---|---|---|---|---|---|---|
| Buffalo, NY | 1.058625 | -0.5335 | -0.483884 | -2.797091 | -1.72866 | -0.18989 | 1.908679 | -3.38144 |
| Charlotte, NC | -0.85137 | 0.094148 | 0.2157073 | 0.9394504 | 0.883284 | -0.18989 | -0.06157 | 0.747168 |
| Columbus, OH | 0.04267 | -0.15691 | 0.0991088 | 0.0644461 | -0.24365 | -0.73242 | 0.615703 | -0.58908 |
| Glendale, AZ | 1.058625 | -0.5335 | -0.542183 | 0.5932085 | 0.169959 | -0.73242 | -0.67727 | -1.28082 |
| Indianapolis, IN | 0.327137 | -0.28244 | -0.192388 | -0.235311 | -0.44409 | -0.18989 | 0.307852 | -1.00059 |
| Memphis, TN | 1.058625 | -0.65903 | -0.250687 | 0.0490652 | -1.45696 | -0.73242 | 1.785539 | -0.62568 |
| Nashville, TN | -0.64818 | 0.219678 | -0.425585 | 1.3410638 | 0.60471 | -0.18989 | 0.307852 | 0.832773 |
| Newark, NJ | 1.058625 | 0.847329 | -0.425585 | -0.437656 | -1.6972 | -0.73242 | -1.29298 | -3.26643 |
| Oklahoma City, OK | 1.058625 | -0.40797 | -0.308986 | 0.371723 | -0.12546 | -0.73242 | 1.416117 | 0.876678 |
| Orlando, FL | -1.54222 | 0.219678 | -0.308986 | 0.2107359 | 0.095094 | -0.73242 | -0.30785 | -2.95376 |
| Sacramento, CA | 0.408414 | 0.721799 | -0.542183 | 0.3334416 | 1.340125 | -0.73242 | -0.12314 | 0.93014 |
| San Antonio, TX | 0.245861 | -0.28244 | -0.192388 | 1.5181154 | -0.45079 | -0.73242 | 0.554133 | 0.688152 |
| St. Paul, MN | 1.058625 | 0.345208 | -0.250687 | -0.0774 | 0.420599 | -0.73242 | -0.43099 | -0.25363 |
| Milwaukee, WI | 1.058625 | -1.41221 | -0.075789 | -0.819445 | -1.39877 | -0.18989 | 0.923555 | -2.36981 |
| Baltimore, MD | -0.11988 | -0.65903 | -0.367285 | -0.990344 | -0.73392 | -0.18989 | 0.369422 | -3.14436 |
| Phoenix, AZ | -1.29839 | -0.65903 | -0.134088 | 1.4022457 | 0.763208 | 0.352649 | -0.67727 | -0.13118 |
| Toronto, ON | 0.083308 | -0.91009 | -0.542183 | 0.2059507 | 1.361356 | 1.980257 | -0.92355 | 1.955923 |
| Los Angeles, CA | -1.46094 | 0.596268 | -0.192388 | -0.135848 | 1.049002 | 1.437721 | -1.23141 | 1.325564 |
| Chicago, IL | -1.0952 | -0.03138 | 0.9152986 | -0.306747 | 0.599295 | 1.980257 | -1.16984 | 1.554691 |
| New York, NY | -1.50158 | 3.483463 | 4.00516 | -1.229603 | 0.992875 | 1.980257 | -1.29298 | 10.08569 |