



WHAT MAKES A BASEBALL PLAYER VALUABLE? A SIMPLER WAY TO UNDERSTAND WAR

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WHAT IS WAR?

The Basics

1. **Hitting**
2. **Baserunning**
3. **Fielding**
4. **Pitching**

Complexity

1. **Park Factor**
2. **Defensive Adjustments**
3. **Many more**



RUNS ABOVE REPLACEMENT

● Batting Runs

$$\text{Bat Runs} = 0.9*1B + 1.25*2B + 1.6*3B + 1.95*HR + 0.7*(BB + HBP + IBB + CI) - 0.25*Outs - 0.35*K$$

Where: Outs = AB - H - K

● Fielding Runs Saved

$$\text{Fielding Runs} = \text{Statcast Fielding Run Value} + \text{Positional Adjustment}$$

● Baserunning Runs

$$\text{Baserunning Runs} = 0.2*SB - 0.4*CS$$

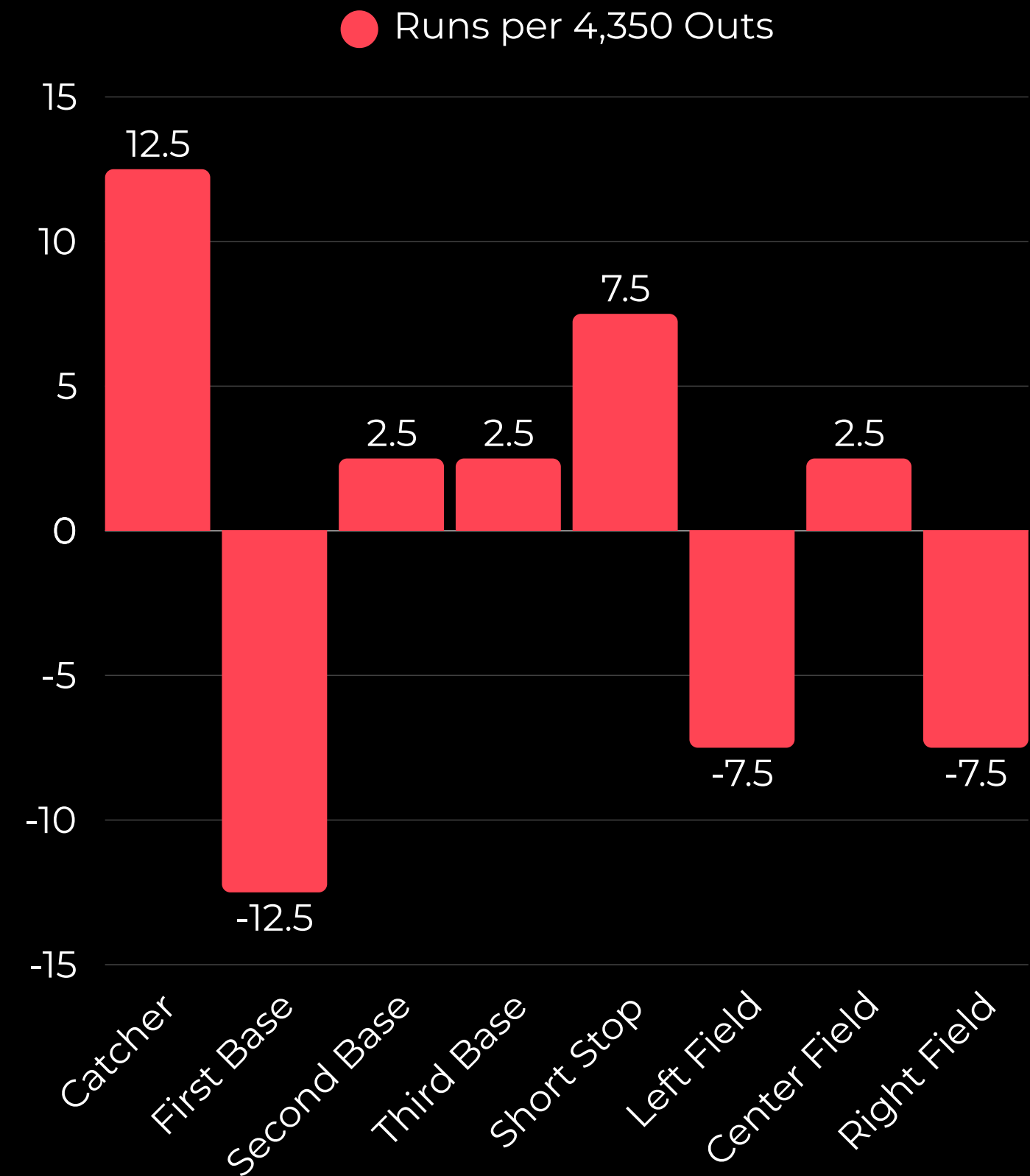
● Replacement-Level Adjustment

$$\text{Replacement Level Adjustment} = (PA / 600)*(-20)$$

● Runs Above Replacement

$$RAR = \text{Batting Runs} + \text{Baserunning Runs} + \text{Fielding Runs Saved} - \text{Replacement-Level Adjustment}$$

POSITIONAL ADJUSTMENT

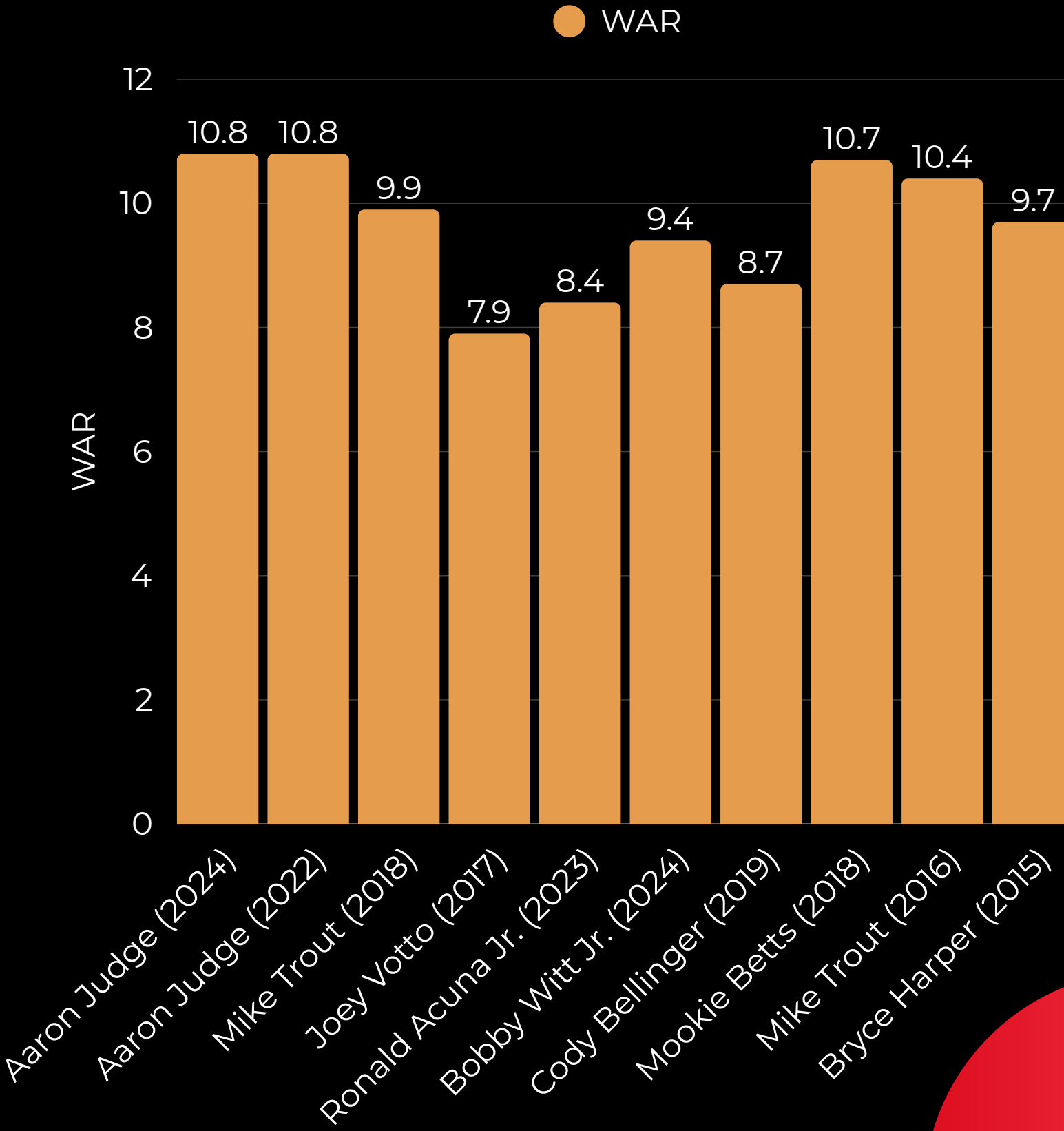
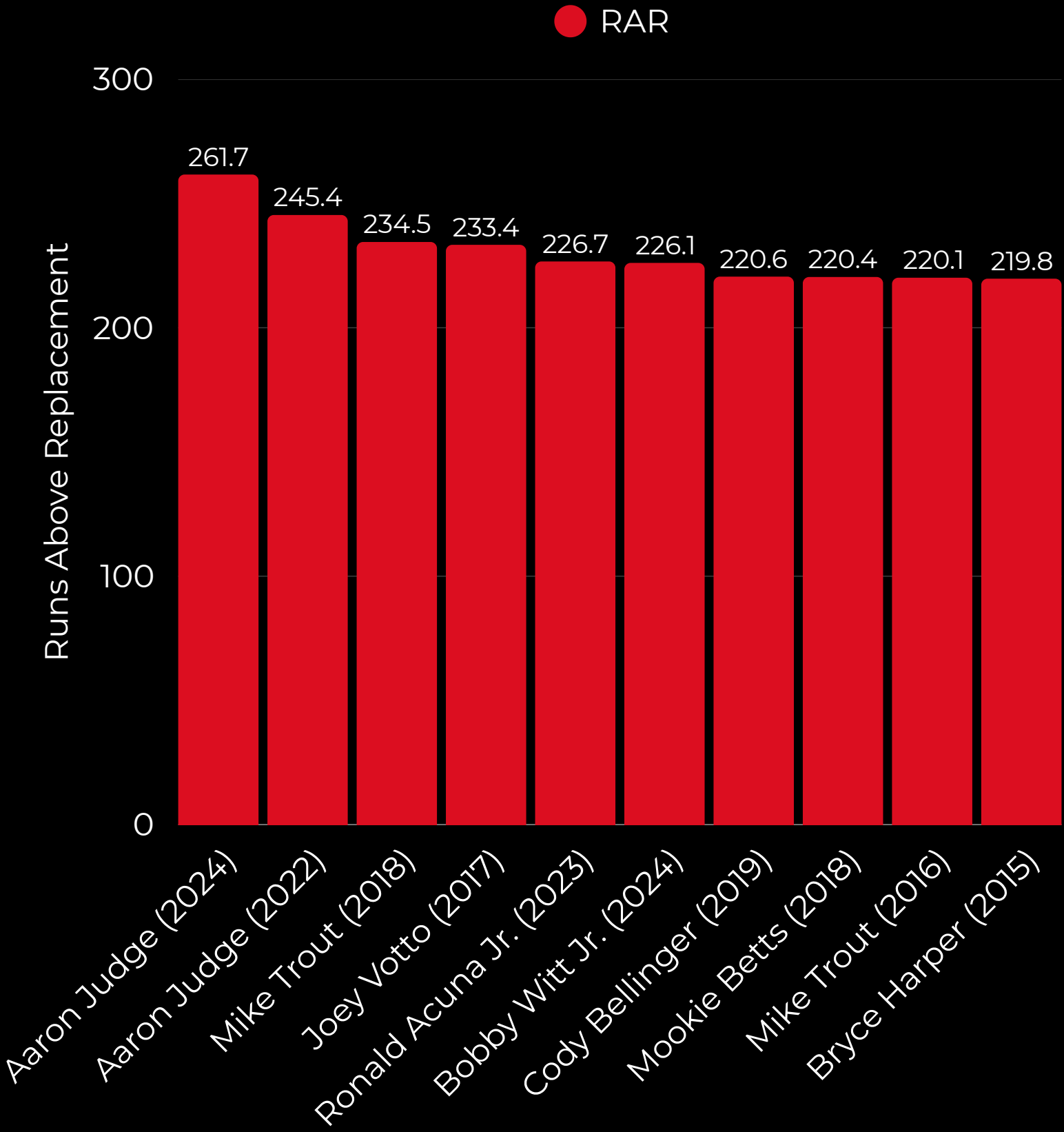


RESULTS AND INTERPRETATION

- **3,260 Player-Seasons**
- **Median RAR: ~57.0 runs**
- **Mean RAR ~66 Runs**
- **MVP-caliber seasons surpassing 215 RAR**

RAR RANGE	TIER	# OF PLAYERS
>150	Superstar	184
105-149	All-Star	535
50-104	Starter	1315
10-49	Role Player	1400
<10	Replacement Player	186

BEST PERFORMERS





CONCLUSION

Limitations

- No park or league adjustments
- Fielding values rely on raw run value
- Baserunning is simplified (no extra bases taken, etc.)

Future Work

- Park factors
- League normalization
- Home/Away Splits