

Lead Lockdown: The Effectiveness of “Parking the Bus” in English Football

Kelsey Chen

Harvard College
Cambridge, MA, USA

kelseychen1@college.harvard.edu

Helen Xiao

Harvard College
Cambridge, MA, USA

helenxiao@college.harvard.edu

Albert Qi

Harvard College
Cambridge, MA, USA

albertqi@college.harvard.edu

ABSTRACT

In the game of association football, what strategies prove to be effective? For example, when ahead late in a match, should teams opt to park the bus, or is the best defense a good offense? Football is a low-scoring game, meaning each goal is of utmost importance. With just one goal, the dynamic of a entire game can easily shift from one side to the other, especially within the last 15 minutes. So, what strategies should teams adopt near the end of a match? Specifically, should Premier League teams park the bus when leading late in a match?

To answer these questions, we utilize the Hudl StatsBomb dataset and look at the 2015-2016 Premier League season. Within this play-by-play dataset, we analyze each match and determine whether or not there is a decline in offensive intent before and after the 75th minute. If there is, then we label a team during that match as having “parked the bus”. By comparing the results in matches where teams park the bus to that in matches where teams do not park the bus, we ultimately show that parking the bus is not very effective, although it does have use cases in certain scenarios (e.g., knockout stages).

All source code can be accessed at <https://github.com/albertqi/parking-the-bus>.

1 INTRODUCTION

Association football (i.e., soccer) is a game of flow, improvisation, and relentless tactical adjustment. Unlike sports with more frequent stoppages or set plays, football unfolds continuously, demanding that players and coaches respond in real time to evolving dynamics on the pitch. Every phase of the match presents unique strategic challenges, but none more so than the final minutes. Fatigue sets in, the scoreline sharpens priorities, and the stakes rise dramatically. As the match nears its conclusion, decisions made in this narrow window can determine outcomes and, over the course of a season, shape the fate of entire campaigns.

In the Premier League, for example, the final 15 minutes of a match often carry outsized importance. Goals conceded or scored during this period can dramatically alter outcomes in a tightly contested table, and coaching decisions made in

the final minutes—whether to sit back or press forward—can be the difference between three points and one. For teams in the lead, one widely used tactical approach is to “park the bus”, a strategy focused on minimizing risk by defending deep, compressing space, and avoiding forward ventures. However, how well does this strategy actually work?

Take Liverpool vs. Chelsea in April 2014. At the end of the first half, Liverpool captain Steven Gerrard slipped, allowing Demba Ba to score on a counterattack. Chelsea then proceeded to play highly defensively, even deliberately ceding possession to simply focus on a compact, disciplined defensive structure. With a second goal from Chelsea in stoppage time, they were able to secure a 2-0 victory over Liverpool.

But, now take Manchester City vs. Queens Park Rangers in May 2012. Queens Park Rangers took a 2-1 lead in the second half and then opted to play ultra-defensively. However, this strategy ultimately backfired, with Manchester City scoring two goals in stoppage time and beating Queens Park Rangers 3-2.

So, does parking the bus actually work? While parking the bus is often perceived as the “safe” option, we are interested in examining whether or not it truly yields better outcomes in practice.

To do so, we use play-by-play data from StatsBomb in order to explore whether parking the bus is an effective late-game strategy for Premier League teams. First, we separate each match into two phases: one before the 75th-minute, and one after. Then, we compute three metrics during both phases: xG per minute of possession, shots per minute of possession, and forward pass rate. If we see a decline in these *offensive* metrics from before to after the 75th-minute, then we label a team as having “parked the bus”. Finally, we look at all matches where teams decide to park the bus and compare the outcomes of these matches to those where teams do not park the bus. Through this, we show that parking the bus is generally not very effective but still has its use cases nonetheless.

Overall, we make the following contributions within this paper:

- (1) We highlight the need to analyze the true efficacy of parking the bus.

- (2) We analyze event-level data from StatsBomb and perform exploratory data analysis.
- (3) We show that parking is bus is not very successful in regular league matches but might have use cases in knockout stages.

2 DATA AND EDA

We begin by describing the dataset that we used and outline some exploratory data analysis that we performed.

2.1 Dataset

We use detailed event-level data from Hudl StatsBomb [1] for the 2015-2016 Premier League season. This dataset captures every on-ball action during a match, including passes, shots, dribbles, fouls, and goalkeeper actions, and it is widely used for tactical and performance analysis in professional football. Each row in the dataset represents a single event, and the dataset includes over 180 columns that capture contextual and technical information about the action.

Some of the key fields within the dataset include the following:

- **Match context:** period, minute, second, ElapsedTime, possession, and type.name (e.g., “Pass”).
- **Team and player metadata:** team.name, player.name, position.name, and tactics.formation.
- **Passing behavior:** pass.length, pass.angle, pass.outcome.name, and pass types (e.g., pass.through_ball, pass.cut_back, pass.cross).
- **Shooting behavior:** shot.statsbomb_xg (expected goals), shot.outcome.name, shot.body_part.name, and shot.technique.name.
- **Defensive actions:** clearance.body_part.name, interception.outcome.name, duel.outcome.name, and foul_committed.type.name.
- **Location data:** location.x, location.y, pass.end_location.x, pass.end_location.y, shot.end_location.x, and shot.end_location.y.
- **Advanced metrics:** TimeInPoss, DistToGoal, AngleToGoal, and DefendersBehindBall; these variables provide some insight into possession structure, shot difficulty, and defensive pressure.

2.2 Exploratory Data Analysis

After we filter the StatsBomb dataset to include just the 2015-2016 Premier League season, we end up with 1313783 rows and 185 columns. This is a very sufficient amount of data for our purposes.

Upon first glimpse of the dataset, we notice that many values seem to be NA. This is because certain fields are only

Table 1: Top 10 Most Common Event Types

Event Type	Count	Proportion
Pass	368619	0.281
Ball Receipt	340324	0.259
Carry	276949	0.211
Pressure	115402	0.0878
Ball Recovery	40943	0.0312
Duel	32290	0.0246
Clearance	21645	0.0165
Block	14839	0.0113
Dribble	13721	0.0104
Goal Keeper	11777	0.00896

relevant in specific contexts. For example, fields such as shot. {technique, body_part, outcome}. name or foul_committed. {card, type}. name are only populated when the associated event for the row is a shot or a foul, respectively. If the field is not relevant for the event, then it simply defaults to a value of NA.

It is worth noting that the shot_impact_height field is always NA; thus, we opt to drop it from the dataset. Additionally, competition_id and season_id are always equal to 2 and 27, respectively, since we filter the dataset to only include the 2015-2016 Premier League season. We drop these fields as well.

Finally, Table 1 outlines the top 10 most common event types in the dataset. Unsurprisingly, we see that passes are the most common action, with ball receipts and carries following closely behind.

3 METHODS

To determine whether or not parking the bus is truly an effectively late-game strategy, we need to (1) identify matches where teams opt to park the bus, and (2) compare the outcome of those matches to that of matches where no parking the bus is employed.

3.1 Identifying “Parking the Bus”

To identify instances of late-game “parking the bus” behavior, we decide to look at whether or not a team plays more defensively. If there is a shift towards more defensive behavior, then we can suspect that a team is effectively parking the bus.

Thus, we separate each match into two phases: early (0-74 minutes) and late (75-90+ minutes). For each team in each match, we compute three key *offensive* metrics during both phases:

- **xG per minute:** Total expected goals (xG) normalized by possession time in minutes.
- **Shots per minute:** Total shots taken normalized by possession time in minutes.
- **Forward pass rate:** Proportion of passes that were in the forward direction (angle within ± 45 degrees).

If we see a decline in these three offensive metrics, then we know that a team is playing more defensively. That is, we label a team as having parked the bus if all three of the following conditions are met in the final ≈ 15 minutes of the match (compared to the first 75 minutes):

- Lower xG per minute.
- Fewer shots per minute.
- Lower forward pass rate.

We label the teams via a binary variable `park_the_bus` as follows:

```
df <- df %>%
  mutate(
    park_the_bus = case_when(
      xg_per_min.y < xg_per_min.x &
      shots_per_min.y < shots_per_min.x &
      forward_pass_rate.y <
        forward_pass_rate.x ~ TRUE,
      TRUE ~ FALSE
    )
  )
```

This self-relative heuristic identifies teams that reduce attacking intent late in the match, regardless of their baseline style; this avoids conflating inherently defensive teams with those that make in-game tactical adjustments. A team is labeled if and only if it intentionally becomes more defensive relative to how it played earlier. Thus, we do not misclassify low-possession teams who always play defensively as “parking the bus” unless they actually shift tactics late in games.

3.2 Evaluating Efficacy

To assess the effectiveness of parking the bus, we match the `park_the_bus` indicator with game state at the 75th minute (i.e., winning, drawing, or losing) and compare the following metrics:

- Final result (i.e., win/draw/loss).
- xG conceded in the final 15 minutes.
- Difference in xG generated vs. conceded post-75’.

For example, we might compare the xG conceded by teams in the lead who park the bus to the xG conceded by teams in the lead who do not park the bus.

We visualize these comparisons across game states using boxplots and proportion bar charts. Our analysis focuses

on whether parking the bus increases the likelihood of preserving a lead, avoiding defeat, or limiting quality chances conceded.

4 RESULTS

This paper examines the effectiveness of “parking the bus”—a late-game tactical shift toward more defensive play—using event-level data from the 2015-2016 English Premier League season. We define “parking the bus” as a relative reduction in attacking intent after the 75th minute, operationalized by simultaneous drops in expected goals (xG) per minute, shots per minute, and forward pass rate compared to the team’s own performance earlier in the match. This self-relative approach ensures that our definition captures in-game strategic decisions rather than baseline team styles. We now discuss the implications of parking the bus.

4.1 Analysis of xG

Our findings reveal several important insights. First, Figure 1 shows us that parking the bus is associated with a modest reduction in xG conceded in the final 15 minutes, particularly for teams that are drawing or winning at the 75-minute mark. This suggests that the strategy may be defensively effective in limiting the quality of opposition chances.

However, when we look at Figure 2, we can also see that the difference in xG in the final 15 minutes is about equal to 0 for teams that are drawing or winning at the 75-minute mark. This means that while parking the bus might reduce opposing chances to score, it also reduces a team’s own chances to score offensively. Thus, whether a team decides to park the bus or not does not seem to affect the difference in xG in the final 15-minutes of a match. Parking the bus does, however, reduce the variance in the difference in xG, which may be important during critical matches.

Note that teams that are losing at the 75-minute mark and decide to park the bus both have an increase in xG conceded and a negative difference in xG.

Coach insight: Parking the bus can help stabilize outcomes and prevent defensive collapses when leading or drawing. However, it should only be considered when a team is content with the current result, such as when protecting a lead late in a knockout-stage match or holding a draw as an underdog.

4.2 Analysis when Leading at 75’

The broader implications for match outcomes are less favorable. Figure 3 tells us that teams that park the bus while leading at 75’ are slightly *less likely* to secure a win compared to teams that maintain their standard level of attacking intent. These teams are also *more likely* to lose and *less likely* to draw.

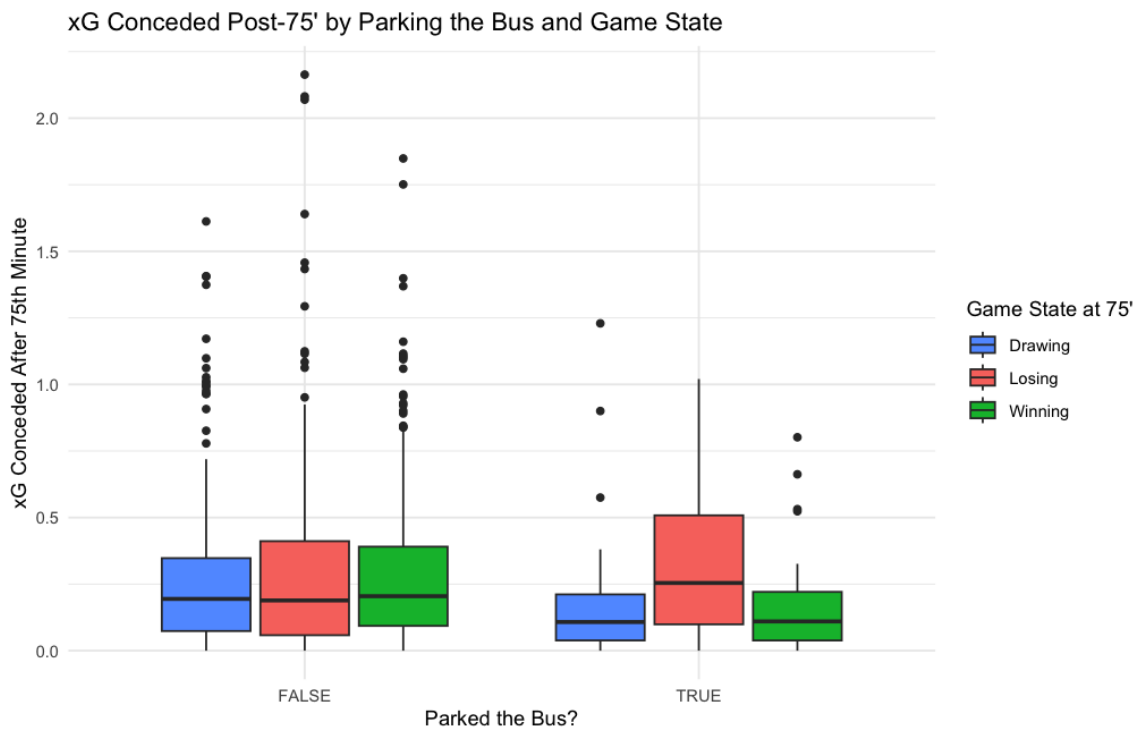


Figure 1: xG Conceded Post-75' by Parking the Bus and Game State

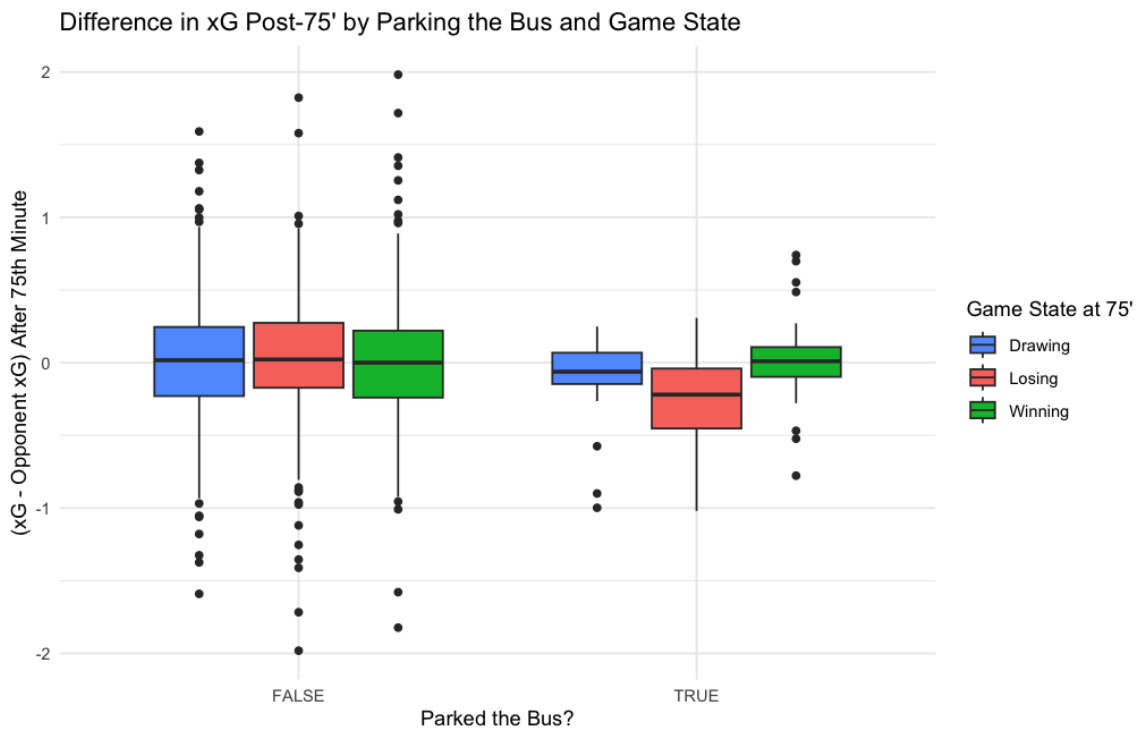


Figure 2: Difference in xG Post-75' by Parking the Bus and Game State

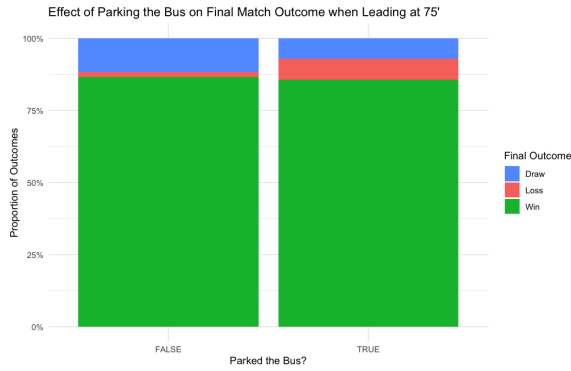


Figure 3: Parking the Bus when Leading at 75'

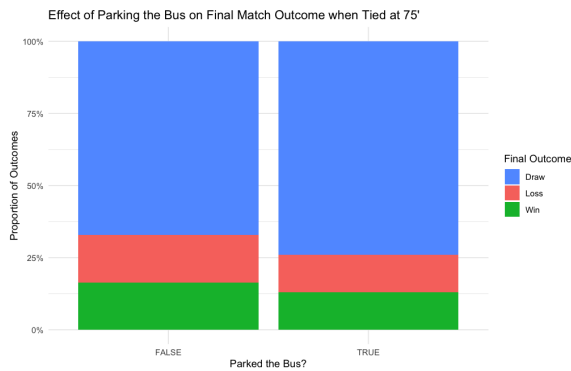


Figure 4: Parking the Bus when Tied at 75'

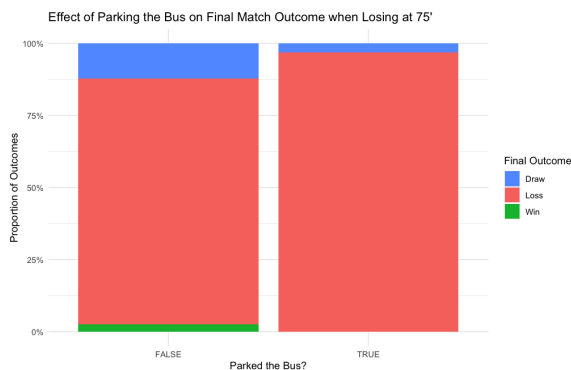


Figure 5: Parking the Bus when Losing at 75'

Coach insight: If a team is narrowly ahead, then fully retreating into a defensive shell may backfire. While it limits xG conceded, it also invites pressure and increases the chance of conceding a late equalizer or winner. A balanced or proactive approach may better preserve the lead by maintaining field position and possession.

4.3 Analysis when Tied at 75'

As we can see from Figure 4, teams that park the bus while tied at 75' are more likely to settle for a draw, with reduced chances of securing a late victory. A loss, however, is also less likely.

Coach insight: When drawing, parking the bus limits both offensive and defensive volatility. This may be acceptable for underdogs, but for favorites or teams seeking three points, the tactic can eliminate the possibility of a decisive breakthrough.

4.4 Analysis when Losing at 75'

Finally, Figure 5 tell us that teams that park the bus while losing at 75' are overwhelmingly likely to remain behind, indicating that the strategy is counterproductive when chasing a result. This is unsurprising since we expect teams to be more offensive when behind late-game.

Coach insight: Parking the bus when trailing is almost always a mistake. It suppresses any attacking threat and eliminates comeback potential. In these situations, teams should push forward, take risks, and pursue attacking solutions.

4.5 Summary

Taken together, these results suggest that while parking the bus can reduce defensive risk, it also suppresses offensive output and may limit a team's ability to influence the match positively. The strategy may be most justifiable in scenarios where preserving a result is paramount (e.g., knockout stages or relegation battles), but it appears suboptimal in regular league matches where maximizing points is the goal.

Table 2 outlines some good rule-of-thumb guidelines for when and when not to park the bus.

5 LIMITATIONS

While this paper provides new insight into the effects of late-game defensive tactics, several limitations still remain. First, the use of a fixed 75th-minute cutoff to define the onset of "parking the bus" may not fully capture tactical shifts that occur earlier or later. A more flexible or dynamic segmentation of match phases could improve the precision of tactical identification.

Second, while our heuristic definition captures relative reductions in attacking intent, it may miss more nuanced tactical adjustments, especially those that are not well represented in summary statistics. Additionally, it assumes that reduced offensive output reflects intentional defensive posture rather than fatigue, opponent pressure, or other contextual factors.

Third, the analysis does not incorporate contextual information such as substitutions, opponent strategy, or game

Table 2: Rule-of-Thumb Guidelines for Parking the Bus

Game State at 75'	Park the Bus?	Reasoning
Winning	Caution	Slightly higher chance of losing despite defensive gains; may be better to stay balanced.
Drawing	Avoid	Increases draw rate but lowers win probability; only viable if draw is acceptable.
Losing	Never	Severely limits comeback chances; no tactical benefit in this scenario.
Elimination Match	Situational	Useful for preserving a lead when outcome preservation (not maximizing points) is the priority.

momentum, all of which may influence both the decision to park the bus and its success.

Fourth, our analysis relies on data from the 2015-2016 Premier League season. This is rather old and might not reflect new changes in strategy over time. For example, different rule changes over the years might cause some strategies to be more effective than others.

In the future, we would like to leverage tracking data or positional information to more precisely quantify defensive posture (e.g., block height, player density behind the ball). Additionally, controlling for team strength, match incentives, and league context would help isolate whether parking the bus is more effective for certain types of teams or match situations. Finally, applying this framework across multiple seasons or leagues could test the generalizability of these findings and refine tactical guidance for diverse coaching contexts.

6 CONCLUSION

In the modern game of association football, strategic adjustments in the final minutes can profoundly impact match outcomes. Among these, “parking the bus” is one strategy that has been assumed to offer security for teams seeking to preserve a result. Yet, despite its popularity, the true efficacy of this tactic remains debated. When leading in the last few minutes, should teams park the bus, or is it rather the case that the best defense is a good offense? In this paper, we aim to empirically evaluate whether parking the bus actually improves outcomes for Premier League teams late in matches.

To do so, we analyze play-by-play data from the 2015-2016 Premier League season using a self-relative definition of parking the bus. We identify teams that exhibit a measurable drop in attacking intent after the 75th minute, based on declines in xG per minute of possession, shots per minute of possession, and forward pass rate. We then examine how teams in these matches fared against teams in matches that

did not adopt this strategy, comparing xG conceded, xG difference, and final results.

Our findings reveal a nuanced picture. While parking the bus reduces the variance of late-game xG and may help prevent defensive collapses in certain situations, it also suppresses offensive output and can increase the risk of conceding goals when ahead. Teams that park the bus while winning at the 75th minute are slightly more likely to lose than those that maintain standard attacking patterns. The tactic also proves counterproductive when teams are tied or trailing, reducing both comeback potential and late-match dynamism.

Taken together, these results suggest that parking the bus is not universally effective. It may have situational value (particularly in knockout competitions or when preserving a draw is tactically sufficient), but in general league play, it appears to be a suboptimal approach for teams aiming to maximize points.

REFERENCES

- [1] Hudl Statsbomb. 2023. The 2015/16 Big 5 Leagues Free Data Release: Premier League. <https://statsbomb.com/news/the-2015-16-big-5-leagues-free-data-release-premier-league/>