

Sustainable Development **for** **Professional Sports Stadiums**

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List of Abbreviations

CBD	Central Business District
MARTA	Metropolitan Atlanta Rapid Transit Authority
MLB	Major League Baseball
MSA	Metropolitan Statistical Area
NFL	National Football League

Section 1: Introduction

“The modern era’s fixation with the object and its inversion of space has resulted in the loss of the traditional realm of public space found in the city. Gone are the places for public action and gathering: the streets and squares or, historically, the agora, forum, and piazza. In terms of building typology, the object has replaced the void as the central feature of the modern city” (Guskind 1984, 98). Professional National Football League (NFL) and Major League Baseball (MLB) stadiums house the largest crowds of almost any other American venue. The large investment dollars and high levels of public access through these spaces place importance on the way a stadium and its surrounding development is designed. Good urban design practice and successful economic development can create a robust stadium environment that attracts visitors and adds to both the utility and the economy of the city.

Both location and design affect the marketability of a place, so this paper evaluates NFL and MLB stadiums’ locations and urban design to ultimately form a list of recommendations for stadium planners and local decision-makers (Petersen 2001). First, a background presents the importance of the subject, followed by a description of the scope of this study. Next, precedents are studied through the lens of location type and site characteristics. Section 3 delves into three cities providing case studies under both the NFL and MLB that vary in success. The analysis focuses heavily on Atlanta as both of the city’s teams are moving homes in 2017. Recommendations and further implications follow, providing both general ideas and Atlanta-specific suggestions.

1.1: Background

“Attending the national pastime, a baseball game, is quintessentially a form of recreation in this country” states Tom Curvin a lawyer on a case for SunTrust Park, the future home of the Atlanta Braves (Williams 2015). Football stadiums and baseball parks, alike, “can, and in an ideal world should, be drivers of urban identity, public celebration—spaces that draw people from far and wide to celebrate the social practice of sport” (Flowers 2014). “The presence of a major league sports franchise can help make a metro area an attractive place to live... [b]ut because quality-of-life benefits are difficult to quantify, stadium proponents and critics usually pay them little attention beyond such acknowledgement” (Rappaport and Wilkerson 2001, 70). Cities with a low quality of life lose population, which lowers housing values, and both are bad for economic development. Planners can step in to prevent this. Cities may optimize livability and quality of life through the implementation of appealing urban design around the stadium.

It is often argued that professional teams are an economic loss overall for a city (Elgar 2012). This is chiefly due to the large cost of the stadium, so the longer a stadium is used without a new one constructed, the better the overall profit in the long run. In order to sustain a stadium, having optimal location and surrounding infrastructure is important. The phrase “sustainable design” is used in this paper to describe the permanence of the infrastructure/businesses surrounding the stadium site. Planners can make this happen through sustainable zoning, economic development, and urban design techniques.

Stadiums are naturally one of the largest structures in every city, and often become an icon for the city (Petersen 2001). The stadium, “prominent on the urban horizon,” provides a visual representation of civic pride, with the city’s large investment dollars at work on display

(Petersen 2001). It would make sense for the stadium’s activity and importance to the city to mirror its sheer size and investment dollars. One of the many roles of a city planner is to facilitate such an environment, so it is important to involve planners in stadium planning from the onset.

Be it positively or negatively, stadiums do affect a region’s economy. Dennis Coates’ work with economist Brad Humphreys has proven that while local residents lose money to certain taxes generated to benefit stadium costs, the stadium itself generates about the same amount of money per capita, so the cost is offset (Coates 2008). While the costs and benefits of the stadium alone break even, the profit of the supporting infrastructure, which does not cost residents, makes the stadium subsidization well worthwhile for the local economy.

The benefits of a stadium include its use as a public or semi-public building, the economic development it incurs (including tax revenues, increased property values, increased out-of-town overnight visitors bringing their money into the region, jobs, the introduction of high payrolls of players and upper-level staff, visiting team expenses, parking, radio and television broadcasting, concessions, tickets, team paraphernalia, advertising and sponsorship, boxes and suites, and additional events such as weddings, graduations, political events, etc.), public health promotion, and utility through entertainment. Furthermore, a stadium improves a city’s marketability for major events when choosing a city for a country-wide or global event, bringing more outside money into the region. “Executives regard the presence of a major-league team as a benefit for employees and as a valuable resource for entertaining clients” (Petersen 2001, 20); the “big-league image of the city created by the new team” and the city’s enhanced name recognition lures business locations (Petersen 2001, 20).

The costs of a professional sports stadium include the large investment dollars required and the large structure’s effect on the flow, contiguity, and adhesiveness of the urban fabric. It is important to keep costs down, but the higher the risk, the higher the reward. Finding a balance between the two can result in a successful stadium. But this paper is not to discuss the money behind stadium costs, rather things planners can do to use the stadium as a catalyst for economic development. The stadium design must take into account the adjacent land uses so that the stadium is not interruptive but rather works to improve the human interaction with the streetscape, so planners are perfectly fit for ensuring such livability.

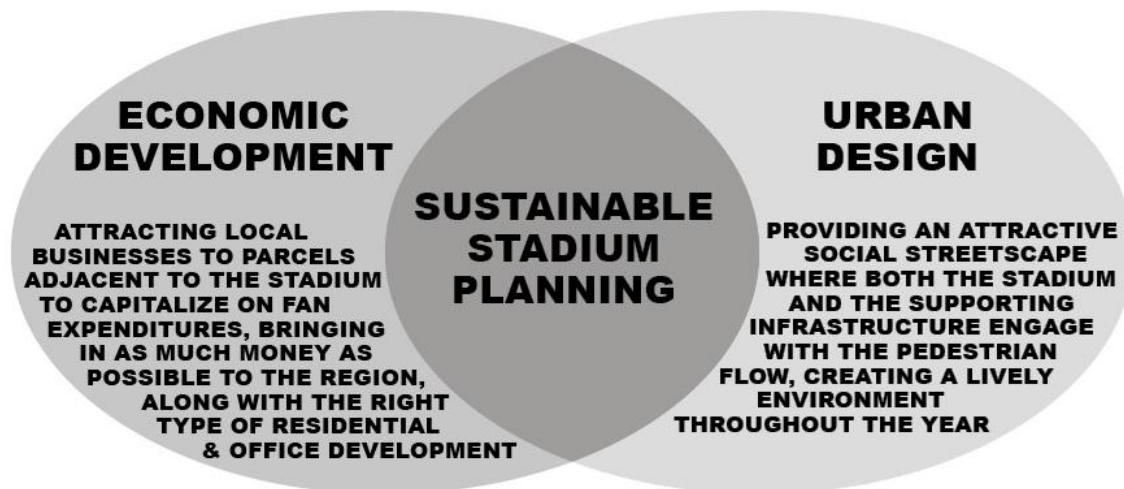


Figure 1. Economic Development Meets Urban Design

1.2: Objective and Scope

This study is not to persuade why a stadium is good or bad for a city; this paper serves to provide recommendations to stadium authorities, surrounding landowners, and public officials on how to treat the stadium perimeter in order to maintain the city's franchise(s). My focus is two-pronged: I study the site location as a whole and the existence and treatment of the stadium's supporting infrastructure. This paper recognizes the pressure to maintain the most up-to-date design and practices and assumes that a city desires to maintain their franchise(s) and present techniques that could help keep them. The subject is paramount right now as I write this paper in Atlanta, Georgia in 2014 and 2015, while both Atlanta's professional football and professional baseball teams construct new stadiums set to open in 2017.

Only National Football League (NFL) and Major League Baseball (MLB) teams and their respective stadiums receive focus in this paper because they are the only major, typically outdoor stadium structures utilized seasonally yet frequently in cities across America. I eliminated collegiate athletics from the study because of the complex zoning and ulterior motives of university systems, making the viability of economic development and certain urban design principles tough to compare. NASCAR stadiums have higher attendance per event on average than the professional football and baseball counterparts, but these events only occur once or twice a year per stadium and are typically located rurally, where economic development opportunities are incomparable.

It should be noted that some collegiate teams draw equal or higher attendance levels than some professional teams, providing opportunity for shared use. However, this paper does not discuss multiple purposes for stadiums. The use of professional stadiums for non-team events is endless, including concerts, weddings, graduations, conventions, religious, political/civic, social groups, high school teams, camps, etc. While this would only support my study even more, with definite increased visitor counts (demand) and more economic benefits, the pure presence of the professional team is enough to encourage my recommendations. This paper assumes the stadium is hosting as many events as possible, drawing the maximum number of visitors.

This paper does not discuss siting as it is debated from city to city, only siting within a city itself. While it is likely that a team may relocate in the near future (St. Louis Rams are the number one suspect), it is not foreseen that there will be a new NFL or MLB franchise in the near future. Thus, new stadium siting is less relevant than strategies planners can practice to enhance current stadium sites.

Neither of the two attribute analyses, site location and supporting infrastructure, discuss equity issues in terms of economic benefits, despite relative equity in economic costs. The overall location is only discussed with respect to the viability of a lively, year-round site. While it is impossible for the stadium benefits of the supporting retail and other activities to affect every resident equally, the concern of this paper is that the stadium benefits the area as a whole.

The stadium's architecture and engineering itself, including sight lines, number of seats, other sport usage accounted for in the design (such as the inclusion of a track around a football field), and programmatic organization, is not of concern to this paper, rather as a whole, the stadium's interaction within the urban fabric.

Stadium funding, while a heated subject, is not debated in this paper.

TEAM	STADIUM	CITY	OPEN	SEATING	ATTD AVG	ATTD ANNUAL	HOME WINS
Boston Red Sox	Fenway Park	Boston, Massachusetts	1912	39,928	36,494	2,956,089	52.80%
Chicago Cubs	Wrigley Field	Chicago, Illinois	1914	41,160	32,742	2,652,113	45.40%
Chicago Bears	Soldier Field	Chicago, Illinois	1924	62,114	61,681	493,449	54.80%
Green Bay Packers	Lambeau Field	Green Bay, Wisconsin	1957	80,735	78,139	625,114	83.70%
Los Angeles Dodgers	Dodger Stadium	Los Angeles, California	1962	56,000	46,695	3,782,337	55.60%
Oakland Raiders	O.co Coliseum	Oakland, California	1966	64,200	57,416	459,333	43.60%
Oakland Athletics	O.co Coliseum	Oakland, California	1966	35,067	25,045	2,003,628	59.30%
Los Angeles Angels of Anaheim	Angel Stadium of Anaheim	Anaheim, California	1966	45,483	38,221	3,095,935	55.30%
San Diego Chargers	Qualcomm Stadium	San Diego, California	1967	70,561	65,432	523,457	60.00%
Kansas City Chiefs	Arrowhead Stadium	Kansas City, Missouri	1972	76,416	74,967	599,743	53.70%
Buffalo Bills	Ralph Wilson Stadium	Orchard Park, New York	1973	71,857	67,522	540,180	50.00%
Kansas City Royals	Kauffman Stadium	Kansas City, Missouri	1973	38,030	24,154	1,956,482	50.10%
New Orleans Saints	Mercedes-Benz Superdome	New Orleans, Louisiana	1975	76,468	73,112	584,900	70.70%
Miami Dolphins	Sun Life Stadium	Miami Gardens, Florida	1987	80,000	70,035	560,280	45.00%
Toronto Blue Jays	Rogers Centre	Toronto, Ontario, Canada	1989	54,000	29,327	2,375,525	53.10%
Tampa Bay Rays	Tropicana Field	St. Petersburg, Florida	1990	34,078	17,857	1,446,464	55.80%
Chicago White Sox	U.S. Cellular Field	Chicago, Illinois	1991	40,615	20,896	1,650,821	50.10%
Atlanta Falcons	Georgia Dome	Atlanta, Georgia	1992	75,000	72,130	577,047	64.30%
Baltimore Orioles	Oriole Park at Camden Yards	Baltimore, Maryland	1992	48,876	30,805	2,464,473	53.90%
Cleveland Indians	Progressive Field	Cleveland, Ohio	1994	42,487	18,428	1,437,393	53.40%
Texas Rangers	Globe Life Park in Arlington	Arlington, Texas	1994	49,200	33,564	2,718,733	57.00%
St. Louis Rams	Edward Jones Dome	St. Louis, Missouri	1995	66,000	57,018	456,146	46.20%
Jacksonville Jaguars	EverBank Field	Jacksonville, Florida	1995	76,867	65,541	524,335	36.80%
Colorado Rockies	Coors Field	Denver, Colorado	1995	50,445	33,090	2,680,329	53.10%
Carolina Panthers	Bank of America Stadium	Charlotte, North Carolina	1996	74,455	73,607	588,861	47.60%
Atlanta Braves	Turner Field	Atlanta, Georgia	1996	50,097	29,065	2,354,305	61.00%
Washington Redskins	FedExField	Landover, Maryland	1997	85,000	77,964	623,715	34.10%
Tampa Bay Buccaneers	Raymond James Stadium	Tampa, Florida	1998	75,000	59,659	477,273	32.50%
Baltimore Ravens	M&T Bank Stadium	Baltimore, Maryland	1998	75,355	71,044	568,353	83.30%
Arizona Diamondbacks	Chase Field	Phoenix, Arizona	1998	49,033	25,601	2,073,730	52.30%
Cleveland Browns	FirstEnergy Stadium	Cleveland, Ohio	1999	73,200	67,425	539,400	42.50%
Tennessee Titans	LP Field	Nashville, Tennessee	1999	69,143	69,143	553,144	40.00%
Seattle Mariners	Safeco Field	Seattle, Washington	1999	47,476	25,485	2,064,334	46.70%
Cincinnati Bengals	Paul Brown Stadium	Cincinnati, Ohio	2000	65,535	60,703	485,628	60.00%
Houston Astros	Minute Maid Park	Houston, Texas	2000	42,060	21,627	1,751,829	42.00%
Detroit Tigers	Comerica Park	Detroit, Michigan	2000	41,681	36,014	2,917,209	60.90%
San Francisco Giants	AT&T Park	San Francisco, California	2000	41,503	41,588	3,368,697	57.20%
Pittsburgh Steelers	Heinz Field	Pittsburgh, Pennsylvania	2001	65,500	62,226	497,811	69.80%
Denver Broncos	Sports Authority Field at Mile High	Denver, Colorado	2001	77,046	76,939	615,517	68.90%
Pittsburgh Pirates	PNC Park	Pittsburgh, Pennsylvania	2001	38,496	30,155	2,442,564	54.70%
Milwaukee Brewers	Miller Park	Milwaukee, Wisconsin	2001	41,900	34,535	2,797,384	55.70%
Detroit Lions	Ford Field	Detroit, Michigan	2002	70,000	63,024	504,198	55.00%
Seattle Seahawks	CenturyLink Field	Seattle, Washington	2002	72,000	68,412	547,298	80.00%
New England Patriots	Gillette Stadium	Foxborough, Massachusetts	2002	68,756	68,756	550,048	87.50%
Houston Texans	NRG Stadium	Houston, Texas	2002	71,986	71,766	574,132	54.80%
Philadelphia Eagles	Lincoln Financial Field	Philadelphia, Pennsylvania	2003	69,194	69,596	556,768	45.20%
Cincinnati Reds	Great American Ball Park	Cincinnati, Ohio	2003	42,941	30,576	2,476,664	57.20%
San Diego Padres	Petco Park	San Diego, California	2004	42,445	27,103	2,195,373	53.10%
Philadelphia Phillies	Citizens Bank Park	Philadelphia, Pennsylvania	2004	43,651	29,924	2,423,852	55.20%
Arizona Cardinals	University of Phoenix Stadium	Glendale, Arizona	2006	78,600	61,979	495,835	67.50%
St. Louis Cardinals	Busch Stadium	St. Louis, Missouri	2006	46,861	43,711	3,540,649	62.50%
Indianapolis Colts	Lucas Oil Stadium	Indianapolis, Indiana	2008	70,000	65,375	523,004	67.40%
Washington Nationals	Nationals Park	Washington, D.C.	2008	41,888	31,844	2,579,389	57.20%
Minnesota Vikings	TCF Bank Stadium	Minneapolis, Minnesota	2009	52,525	52,238	417,906	53.80%
Dallas Cowboys	AT&T Stadium	Arlington, Texas	2009	105,000	90,069	720,558	51.20%
New York Mets	Citi Field	New York City, New York	2009	41,922	26,860	2,148,808	46.90%
New York Yankees	Yankee Stadium	New York City, New York	2009	50,291	42,520	3,401,624	59.70%
New York Jets	MetLife Stadium	East Rutherford, New Jersey	2010	82,566	78,160	625,280	55.00%
New York Giants	MetLife Stadium	East Rutherford, New Jersey	2010	82,566	78,967	631,738	56.10%
Minnesota Twins	Target Field	Minneapolis, Minnesota	2010	39,504	27,785	2,250,606	45.20%
Miami Marlins	Marlins Park	Miami, Florida	2012	36,742	21,386	1,732,283	46.50%
San Francisco 49ers	Levi's Stadium	Santa Clara, California	2014	75,000	70,774	566,192	70.70%
New Atlanta Braves	SunTrust Park	Cobb County, Georgia	2017	41,500	N/A	N/A	N/A
New Atlanta Falcons	Falcons Stadium	Atlanta, Georgia	2017	75,000	N/A	N/A	N/A

Table 1. List of Stadiums Examined

The last boundary of the scope of this paper is the time frame. Stadiums and teams are discussed on the basis of their status during 2014 and 2015. *Table 1* displays all NFL and MLB stadiums and teams in operation during this time frame, in chronological order of construction, which were all studied in this research. The lighter shade denotes MLB teams while the darker shade signifies NFL franchises.

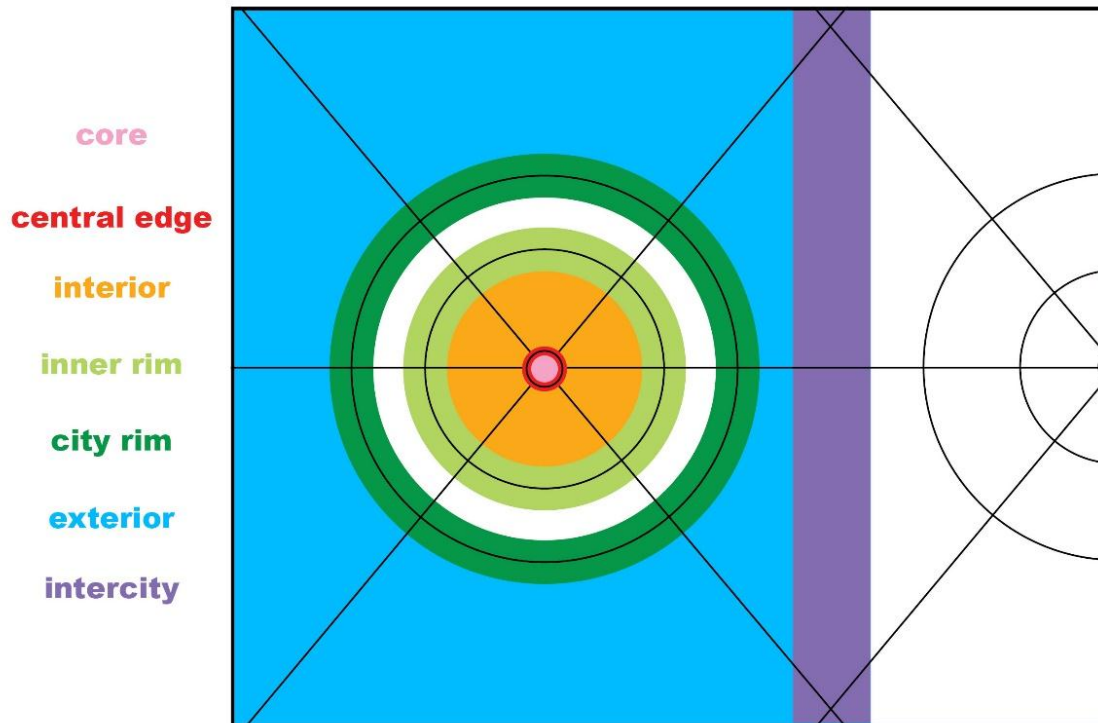
There is a missing link between the planning sector and the professional athletics network. The governing bodies are completely separate, and would benefit from some collaboration between the two. My goal is to investigate the state of today's professional sports world in conjunction with planning tactics. My hypothesis is that an optimal stadium site location with sustainable design is a catalyst for the region's economy and quality of life. I begin with a discussion of the state of all stadium sites as they exist today, introduce precedent literature pertaining to the topic, reveal results of my case study analyses, and conclude with recommendations for sustainable stadium planning.

Section 2: Precedent Analysis

The location type is discussed first because the location type names are referred to throughout the study. Next, the paper discusses urban design and land use planning surrounding stadiums, evaluating optimal development characteristics. Afterward, the study delves into the specific land uses surrounding a few of the stadiums.

2.1: Location Type

The bulk of the literature review discussion and analysis is based on a classification system I created to describe types of stadium locations within cities. Each classification is based on roads, rush hour traffic, transit, walkability (from Walkscore 2015) and development density. The gradient system consists of seven types ranging from “core” to “exterior” – referring to the locality of the stadium relative to the greater city. *Figure 2* shows the locational difference between the seven classification areas, coded by color.



(Black vectors = example of typical highway system)

Figure 2. Spatial Classification

One way to interpret the classification system is through accessibility implications. The closer the stadium is to the central business district (CBD), the greener the transportation options are to access the stadium; this assumes the greenest option is walking, next is biking, followed by transit, and contrasted with personal vehicle. Transit systems increase in coverage the more dense an area of the city is, so stadiums closer to the CBD are more likely to be served by transit. Table 2 conveys the spectrum across each of the location types.

	walk	bike	transit	drive
core	■	■	■	
central edge	■	■	■	■
interior		■	■	■
inner rim			■	■
city rim			■	■
exterior			■	■
intercity				■

Table 2. Locational Classes by Mode of Access

Population counts of each of the markets are not included in the study because it would be difficult to produce comparable numbers. Some stadiums are in Metropolitan Statistical Areas (MSAs) (ex: Atlanta), some stadiums share cities (ex: Chicago), and some stadiums are between cities (ex: San Francisco 49ers). Additionally, it would be difficult to define which satellite markets should be included in the population count; where is the line drawn? The following seven sections describe each classification, list the current NFL and MLB stadiums that fall under that classification (in these tables, light gray represents MLB stadium and dark gray represents NFL stadiums), deliver a visual representation of the classification with respect to the road network and the CBD, and provide an image of one of these stadium sites.

2.1.1: Core

TEAM	STADIUM	MARKETS
Toronto Blue Jays	Rogers Centre	1

Table 3. Core Stadium Sites

Only one stadium falls within the “core” classification, and it happens to be the one NFL or MLB stadium not in America, Rogers Centre. A core location means the stadium is located within the CBD and is still surrounded by a continuation of CBD development. This location is typically classified by an abundance of office land use, other public infrastructure, retail, access to transit, and many dispersed garage and on-street parking spaces. The marketability of this concept is simple, too; the parking locations’ access to regional mass transit, hotels, retail, and restaurants is attractive to fans, so the city center provides the most appreciated option overall (Petersen 2001). *Figure 3* presents the major road network related to the Toronto stadium (the southeast area is a body of water) and *Figure 4* displays a bird’s eye view of Toronto’s CBD. Due to the Rogers Centre’s location, there is a robust network of roads for people to access the site and the pre-game and post-game retail options are plentiful and most walkable. The downtown area is most likely highly supervised by the local police force, so the site can assume the highest level of safety.

In *Figure 4*, Rogers Centre is the low, white structure just beneath the needle-shaped skyscraper. It is proximate to a highway, but there is a buffer between the highway and the stadium, increasing the perceived level of safety while not sacrificing the accessibility. The surrounding skyscrapers require parking decks for the 9-to-5 employment, but since most games are on weekends or after 7 p.m., this parking may be shared between these buildings and the stadium. This bird’s eye view also reveals that Toronto is still able to maintain greenspace while developing densely.

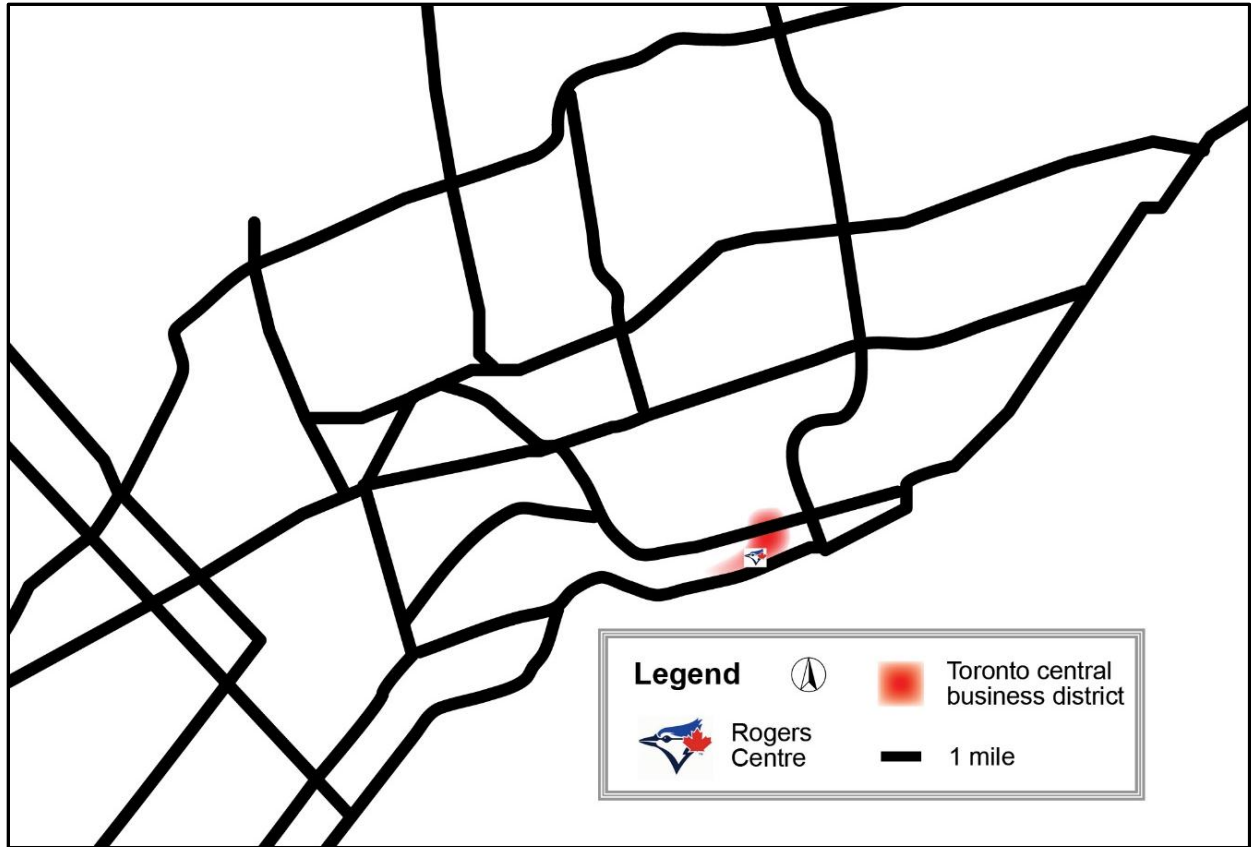


Figure 3. Toronto Stadium Relativity

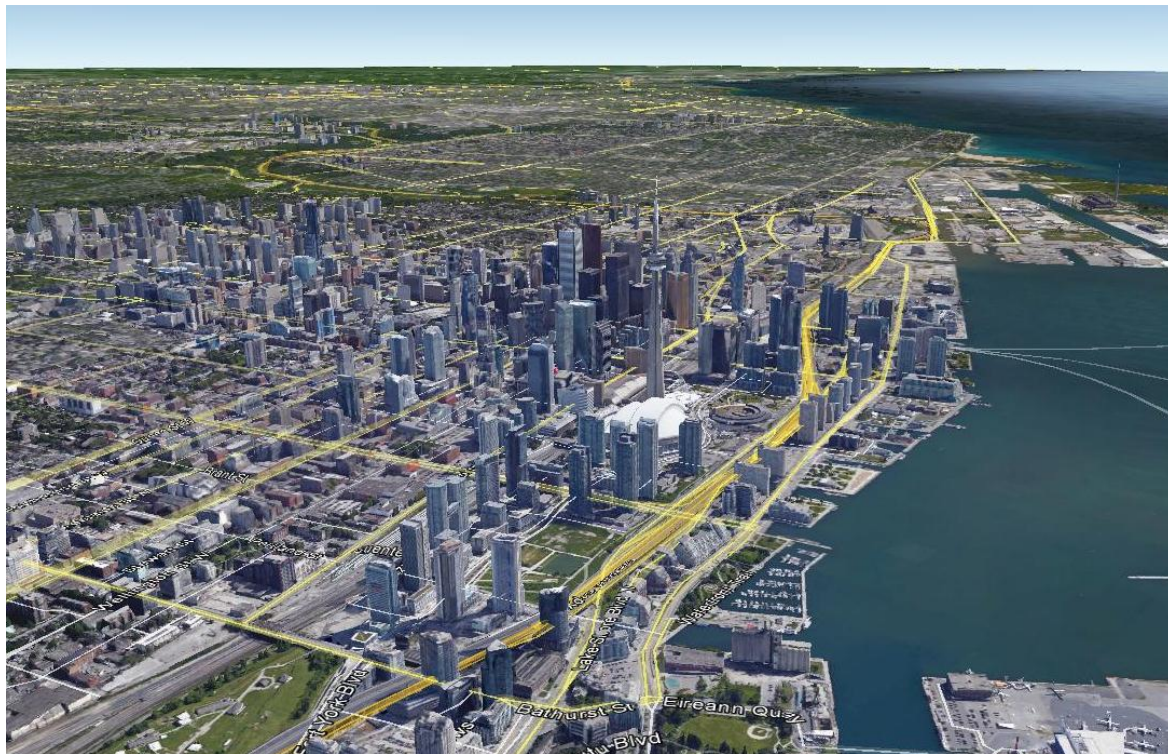


Figure 4. Downtown Toronto
(Source: GoogleEarth Pro 2015)

2.1.2: Central Edge

The majority of stadiums fall under the classification “central edge,” including the new Atlanta Falcons stadium under construction for 2017. These structures are located within the CBD but are not completely surrounded by the CBD, meaning they are situated along its edge. A trend seen in *Table 4* is the existence of both leagues with a city. This usually correlates with co-located stadiums.

Often there was difficulty in differentiating central edge and core sites. St. Louis in particular provides an example of a two-stadium city whose stadiums each have the proximity of a core site, but because of the land uses opposite the business district being residential, industrial, interstate roads, a body of water, or a mass expanse of surface parking lots, these locations are classified as central edge.

TEAM	STADIUM	MARKETS
Arizona Diamondbacks	Chase Field	1
Atlanta Falcons	Georgia Dome	1
Baltimore Orioles	Oriole Park at Camden Yards	1
Baltimore Ravens	M&T Bank Stadium	1
Carolina Panthers	Bank of America Stadium	1
Chicago Bears	Soldier Field	1
Cincinnati Bengals	Paul Brown Stadium	1
Cincinnati Reds	Great American Ball Park	1
Cleveland Browns	FirstEnergy Stadium	1
Cleveland Indians	Progressive Field	1
Colorado Rockies	Coors Field	1
Detroit Lions	Ford Field	1
Detroit Tigers	Comerica Park	1
Houston Astros	Minute Maid Park	1
Indianapolis Colts	Lucas Oil Stadium	1
Jacksonville Jaguars	EverBank Field	1
Minnesota Twins	Target Field	1
New Orleans Saints	Mercedes-Benz Superdome	1
Philadelphia Eagles	Lincoln Financial Field	1
Philadelphia Phillies	Citizens Bank Park	1
Pittsburgh Pirates	PNC Park	1
Pittsburgh Steelers	Heinz Field	1
San Diego Padres	Petco Park	1
St. Louis Cardinals	Busch Stadium	1
St. Louis Rams	Edward Jones Dome	1
Tampa Bay Rays	Tropicana Field	4 (Tampa & Clearwater & Bradenton)
Tennessee Titans	LP Field	1
Washington Nationals	Nationals Park	1
New Atlanta Falcons	Atlanta, Georgia	1

Table 4. Central Edge Stadium Sites

Rivers often run through downtown districts, which became an issue in the classification of each stadium. Often, a CBD is developed so densely that the stadium and other core development has spilled across the river. While this may be an extension of the core, some of these locations are classified as central edge based on the walkability of the connecting bridge(s).

For example, both Pittsburgh stadiums and the Nashville stadium are located on land contiguous to the CBD, but lay across a river. The John Seigenthaler Pedestrian Bridge spans the Cumberland River in Nashville, alleviating traffic around LP Field; this bridge provides safe, direct, enjoyable access between the stadium and the remainder of Nashville's CBD, where there exists an abundance of pre- and post-game activities and additional parking. The classification of PNC Park and Heinz Field in Pittsburgh proved for a difficult task. The two stadiums along with surface parking are co-located across the Allegheny River from the CBD, despite being considered part of the Pittsburgh CBD based on numerous sources. The reason both Pittsburgh stadiums are classified as central edge is because none of the Allegheny bridges are designed to focus on the pedestrian or biker's experience.

Both Cincinnati stadiums are contiguous to the core and are not separated from the CBD by its river, but there is one boundary almost just as interruptive, causing these stadiums to be classified as central edge despite their core location. This instance is shown in Figure 5. Eight-lane Interstate-71 runs between the stadium sites and the rest of the core. While it does run below grade from pedestrians (similar to the bridges over the I-75/I-85 Connector in Atlanta), there still exists the four-lane Third Street and five-lane Second Street which fans must cross just to reach the land between the two sites. Interstate-71 rises above grade to the west and to the east of the entire stadium area, allowing pedestrians traveling from the downtown core to take the streets that run under the interstate. This is an improvement from the bridges, however under-bridge locations bear negative safety implications.

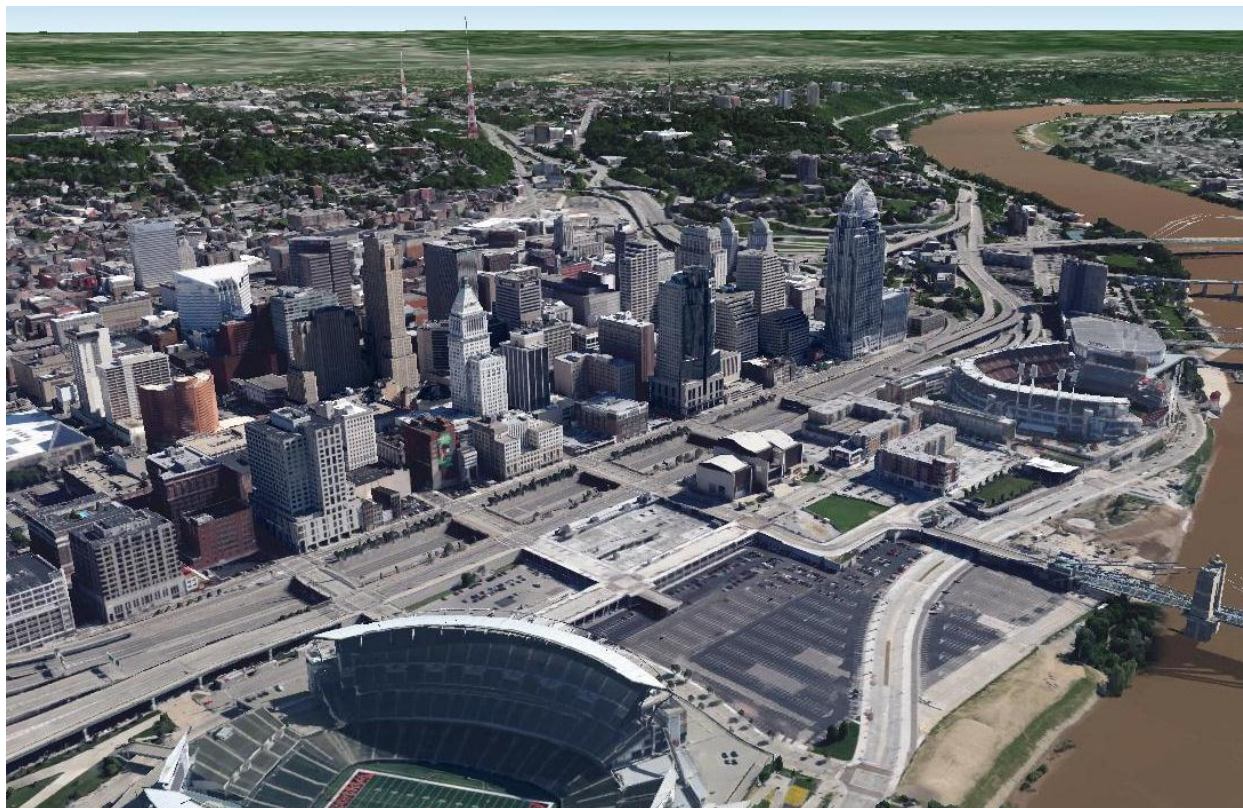


Figure 5. Downtown Cincinnati

Camden Yards in Baltimore was developed on a brownfield, a former railyard site, after the politics of sports resulted in the city's reward of an MLB team (Petersen 2001). The previous

stadium was in a residential neighborhood and had become “physically, functionally, and locationally obsolete,” much like Turner Field today. (Petersen 2001, 151). The decision-makers thought about capturing multiple markets and moving further south toward DC but they did not want to lose Baltimore fans and there were rumors at the time of DC acquiring a team, which did occur (Petersen 2001). They also did not want to upset the Washington Redskins, because there is a degree of territory across leagues (Petersen 2001). Baltimore also hoped to gain their own NFL team, so the former railyard site was chosen as it would provide ample space for two new single-purpose stadiums (Petersen 2001). This type of site has positive transportation implications, as its proximity to the railyard means high levels of multi-modal access to stadium through Amtrak, commuter rail, light rail, subway, and bus, as well as the interstate, and “extensive supply of nearby parking in the [CBD]” (Petersen 2001, 150). Not only was the site’s CBD location advantageous for attendees, with various retail options and attractive views of the city from inside the stadium, but it was also a catalyst for the city, as it extended the Inner Harbor, where the National Aquarium, retail shops, hotels, and restaurants are located (Petersen 2001).

The Arizona Diamondbacks’ stadium establishment was a part of Downtown Phoenix’s efforts to “establish an urban center” to enhance the entertainment district (Petersen 2001). The former food warehouse was preserved and designed into Chase Field, where it is used as a support for concessions. In addition to restaurants, it also includes a number of unique features, such as a multimedia museum (“DiamondTown”), retail shops, microbreweries, a swimming pool that can be rented by the game, and a spa in the outfield (Petersen 2001). The most special feature of this development is that most of these amenities are open year-round, attracting 2.5 to 4 million attendees per year. The stadium’s central edge location provides direct connection to Talking Stick Resort Arena (home to the NBA’s Phoenix Suns among other events) and widely shared parking (Petersen 2001).

Figure 6 displays the road network and CBD relation to both of Denver’s stadiums. Coors Field, home to the Colorado Rockies, is a central edge stadium, contiguous with the surrounding development as conveyed in Figure 7. Sports Authority Field at Mile High Stadium maintains relative proximity, however it is separated by major roadways, a body of water, seas of surface parking, abandoned infrastructure, and non-densely developed land, so it falls under the next classification, “interior.”

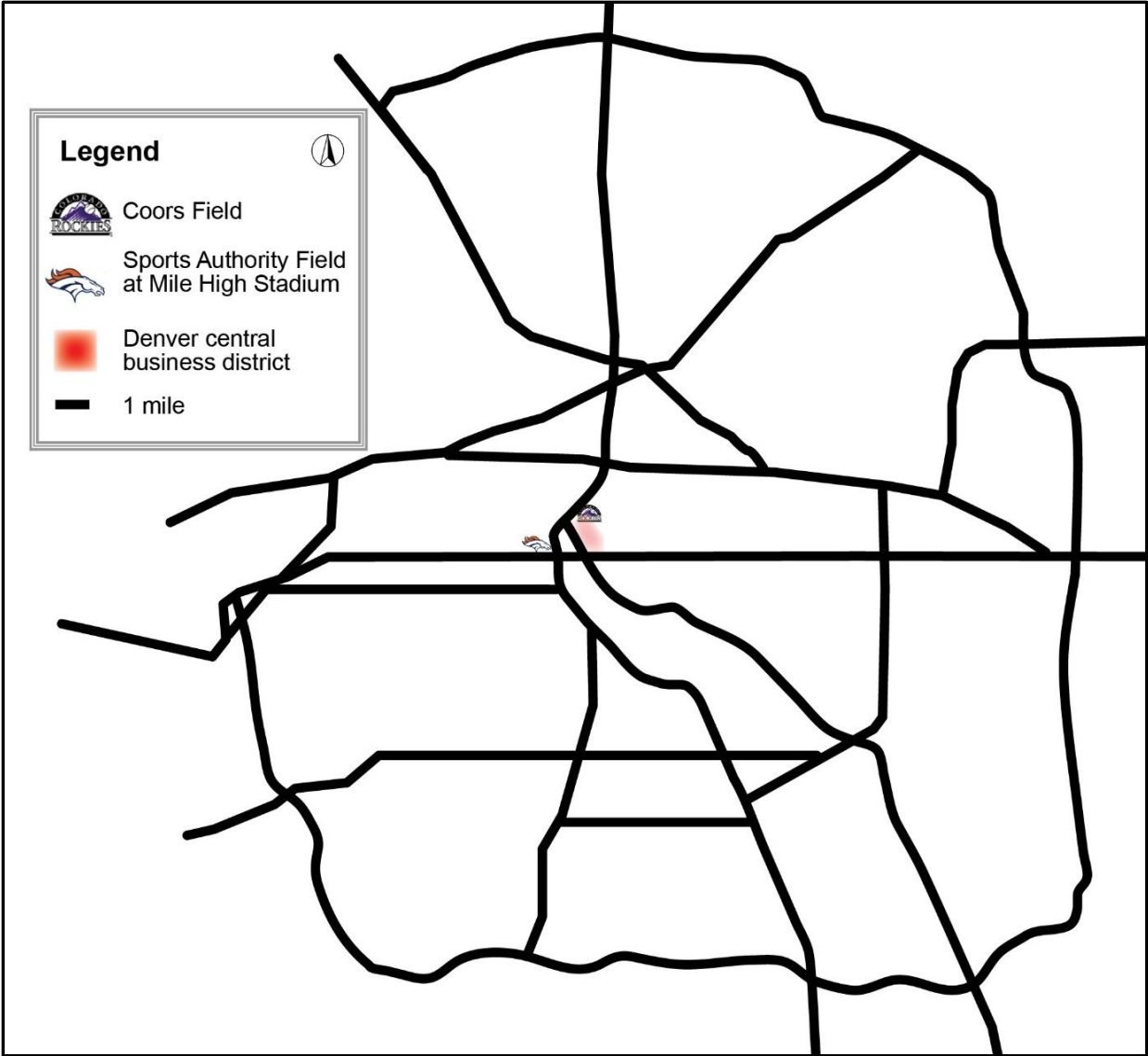


Figure 6. Denver Stadium Relativity



Figure 7. Downtown Denver and Surrounding Neighborhoods

2.1.3: Interior

TEAM	STADIUM	MARKETS
Atlanta Braves	Turner Field	1
Boston Red Sox	Fenway Park	1
Chicago Cubs	Wrigley Field	1
Chicago White Sox	U.S. Cellular Field	1
Denver Broncos	Sports Authority Field at Mile High	1
Green Bay Packers	Lambeau Field	1
Los Angeles Dodgers	Dodger Stadium	1+ satellites
Miami Marlins	Marlins Park	1
Milwaukee Brewers	Miller Park	1
Minnesota Vikings	TCF Bank Stadium	2 (St. Paul)
San Francisco Giants	AT&T Park	1
Seattle Mariners	Safeco Field	1
Seattle Seahawks	CenturyLink Field	1
Tampa Bay Buccaneers	Raymond James Stadium	3 (St. Petersburg & Clearwater)

Table 5. Interior Stadium Sites

Figure 6 showing the Denver stadium situation displays the Colorado Rockies’ optimal stadium location compared to that of the Denver Broncos. This image and Figure 7 show the meaning of the term “interior” – contiguity to no significant development but still nearby the CBD and away from the perimeter highway. Interior stadiums are still in the middle of the metropolitan area. Turner Field qualifies as an interior stadium, within walking distance to the CBD albeit unsafe walking distance, based on mileage, pedestrian infrastructure, and crime, to

be further discussed in the Comparison Study. Such locations are often in residential neighborhoods as found during the location classification process. There may or may not be a transit station in this type of location, as it is often the only destination in the vicinity.

2.1.4: Inner Rim

Many professional sports markets are in large enough cities where the local highway system forms more than one perimeter loop or semi-loop. Stadiums located along these perimeter roadways are classified as “inner rim.” They are typically viewed as suburban locations despite their tendency to still be addressed in the chief city. They are situated adjacent to the interstate, often at the intersection of the perimeter and a radial route running from the CBD, so personal vehicular access is maximized. There may or may not be a transit station in the area. Inner rim sites could either be part of predominantly residential areas, office or industrial parks, or suburban retail centers.

TEAM	STADIUM	MARKETS
Houston Texans	NRG Stadium	1+ satellites
Kansas City Chiefs	Arrowhead Stadium	1+ satellites
Kansas City Royals	Kauffman Stadium	1+ satellites
New York Mets	Citi Field	1
New York Yankees	Yankee Stadium	2 (Yonkers)
San Diego Chargers	Qualcomm Stadium	1+ satellites

Table 6. Inner Rim Stadium Sites

NRG Stadium of the Houston Texans is located at the innermost perimeter roadway, only about six miles from the CBD, so it is classified as an inner rim stadium. *Figure 8* overlays population density data along with the case location map to illustrate how it is necessary to study population patterns as well as the road network to figure out a stadium’s siting classification. In this figure, the darker the shade of blue, the higher the population density. Houston is characterized by sprawl and provides a unique situation with its lack of zoning. While the Houston Astros’ stadium carries all of the advantages of a central edge stadium, one benefit to the Texans’ location is its relativity to the population overall, assuming travel by personal vehicle. In Houston, fortunately, the inner rim site is adjacent to the Astrodome, Reliant Arena, and the Houston Livestock Show and Rodeo building (accompanied by seas of surface parking, confirming the assumption of personal vehicle domination), so the rail line includes a local stop and extends just one more station past this location. Quick access via rail out of the stadium location is necessary as there is no retail within reasonable distance from the stadium; the site is landlocked solely by other massive event buildings, surface parking, and apartments.

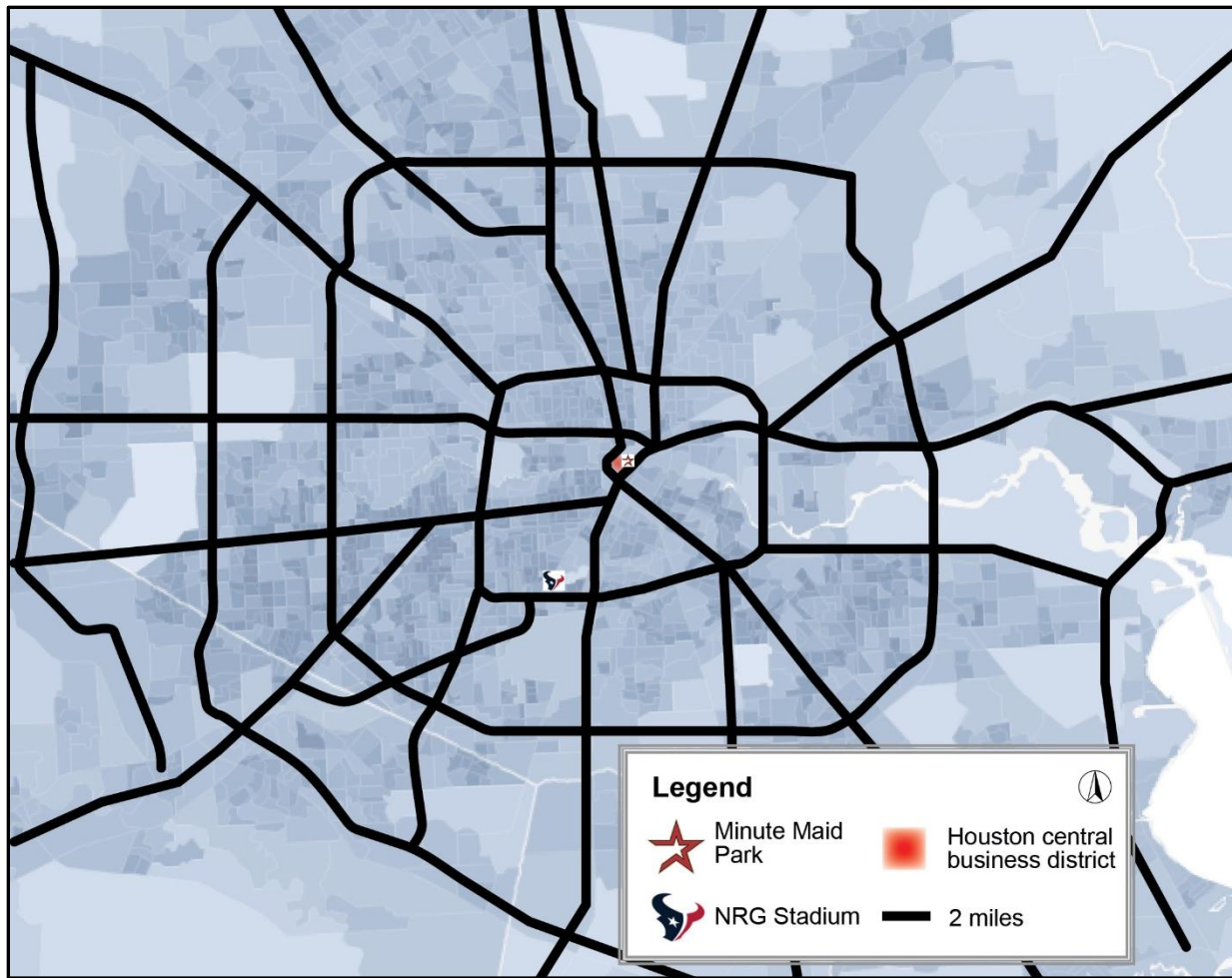


Figure 8. Houston Stadium Relativity

Qualcomm Stadium in San Diego provides the best example of a poor approach to an inner rim site. *Figure 9* provides an aerial of the location, and while access is obvious and seemingly efficient, there are no other pros to the location's environment. The stadium is landlocked by surface parking, bordered on three sides by major high-speed roads, and provides no other infrastructure for fans. It has its own exit off highway-like Friars Road; the only other development on this exit is a fire station and a Kinder Morgan site for petroleum tanks and loading rack services. The stadium site has effectively become an island.



Figure 9. Qualcomm Stadium

2.1.5: City Rim

TEAM	STADIUM	MARKETS
Arizona Cardinals	University of Phoenix Stadium	1+ satellites
Washington Redskins	FedExField	2 (Annapolis)
New Atlanta Braves	SunTrust Park	1+ satellites

Table 7. City Rim Stadium Sites

Only two current stadiums qualify under the “city rim” classification, and they are both of NFL teams. One characteristic among all three city rim locations is that they serve more than just one market – they are sited with consideration of satellite cities: FedEx Field is situated between DC and Annapolis, Maryland, while still located within DC’s Interstate-495 perimeter roadway; University of Phoenix Stadium is located at the cross between Phoenix, Peoria, Surprise, and Avondale along the Arizona 101 Loop; and SunTrust Park is located halfway between Atlanta and Kennesaw at the Interstate-75 and Interstate-285 loop intersection, closer to expanding Marietta, Roswell, Alpharetta, and Smyrna. The better of the three city rim locations is SunTrust Park due to its location at the cross of an interstate running radially from the Atlanta CBD as seen in *Figure 10*; the Cardinals’ and Redskins’ stadiums lay along perimeters with no other major highway for access. If these locations included transit stations, they would not need the sea of surface parking lots.



Figure 10. Atlanta Stadium Relativity

2.1.6: Intercity

TEAM	STADIUM	MARKETS
Dallas Cowboys	AT&T Stadium	3 (Arlington & Ft. Worth)
Los Angeles Angels of Anaheim	Angel Stadium of Anaheim	satellites
Miami Dolphins	Sun Life Stadium	2 (Ft. Lauderdale)
New England Patriots	Gillette Stadium	2 (Boston & Providence)
Oakland Athletics	O.co Coliseum	1+ satellites
Oakland Raiders	O.co Coliseum	1+ satellites
San Francisco 49ers	Levi's Stadium	satellites
Texas Rangers	Globe Life Park in Arlington	3 (Arlington & Ft. Worth)

Table 8. Intercity Stadium Sites

While the number of multi-team stadiums has decreased, the number of stadiums serving multiple markets has increased (Petersen 2001). When multiple markets are situated in close proximity to one another, sharing interstates and potentially transit systems, a stadium centrally-located with respect to all cities is possible. However, while the stadium receives compounded money due to the service of multiple markets, the money does not benefit either of the major cities' economies as significantly. The Dallas-Fort Worth street network map is shown in *Figure 11*. The locations of AT&T Stadium and Globe Life Park are virtually directly in the middle of these two population centers, in Arlington. City of Arlington Economic Development Manager Bruce Payne stated that Dallas and Fort Worth were both supportive of this location outside of their individual economic regions because neither region could support a fan base on its own (Payne 2014).

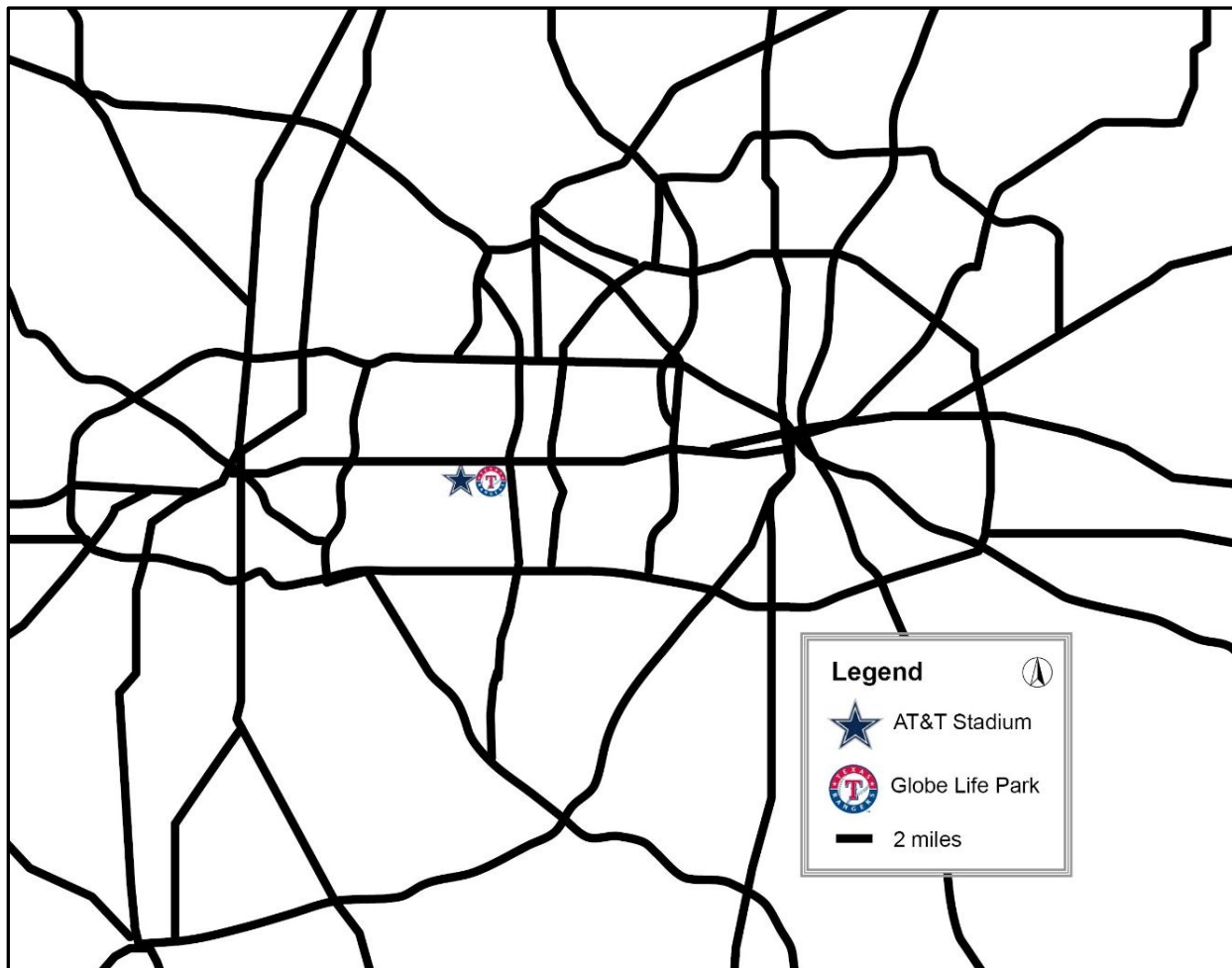


Figure 11. Dallas-Fort Worth Stadium Relativity

Sun Life Stadium is situated midway between Downtown Fort Lauderdale and Downtown Miami. It moved 17 miles north from its prior location at the Orange Bowl in order to be more central to season ticket holders, just like the explanation of the Atlanta Braves move (Petersen 2001). Sun Life Stadium was originally home to both the NFL's Miami Dolphins and the MLB's Florida Marlins until the latter became the Miami Marlins and built a new stadium at an interior location in Miami. It holds many events per year and even hosted the 15-hour "Comic Relief" event where more than \$2 million was raised for southern Florida residents

whose homes were destroyed during a hurricane (Petersen 2001, 149). While there is a shuttle bus from both jurisdictional bus systems, there has become a traffic problem due to the low number of access roads and a lack of off-site parking causing a sea of on-site parking appended to stadium site (Petersen 2001). If this stadium was located in more of a downtown location, the off-site parking availability would not be an issue. “Attendance at games reflects fans’ (and politicians’ and taxpayers’) support, and is directly proportional to the players’ payroll” (Petersen 2001, 149). There is concern that the number of Fortune 500 firms may be too low to support all four major franchises (the MSA including Miami and Fort Lauderdale currently has both an NBA and NHL team in addition to the Marlins and Dolphins), in which case the potential abandonment of Sun Life Stadium could become a detriment.

2.1.7: Exterior

TEAM	STADIUM	MARKETS
Buffalo Bills	Ralph Wilson Stadium	1
New York Giants	MetLife Stadium	1+ satellites
New York Jets	MetLife Stadium	1+ satellites

Table 9. Exterior Stadium Sites

The final classification for stadium sites is “exterior” in relation to the city structure. There are two stadiums (one is shared by two NFL teams) that qualify under this class, and this stadium shared by multiple teams is also sited to consider multiple satellite cities. Ralph Wilson Stadium is effectively the worst cited stadium according to my classification system; it resides outside of the outermost perimeter roadway, near the endpoint of major roads that radiate from the CBD, and is within an area having among the lowest population densities. *Figure 12* shows the relation of the Bills to Buffalo’s road network and density.

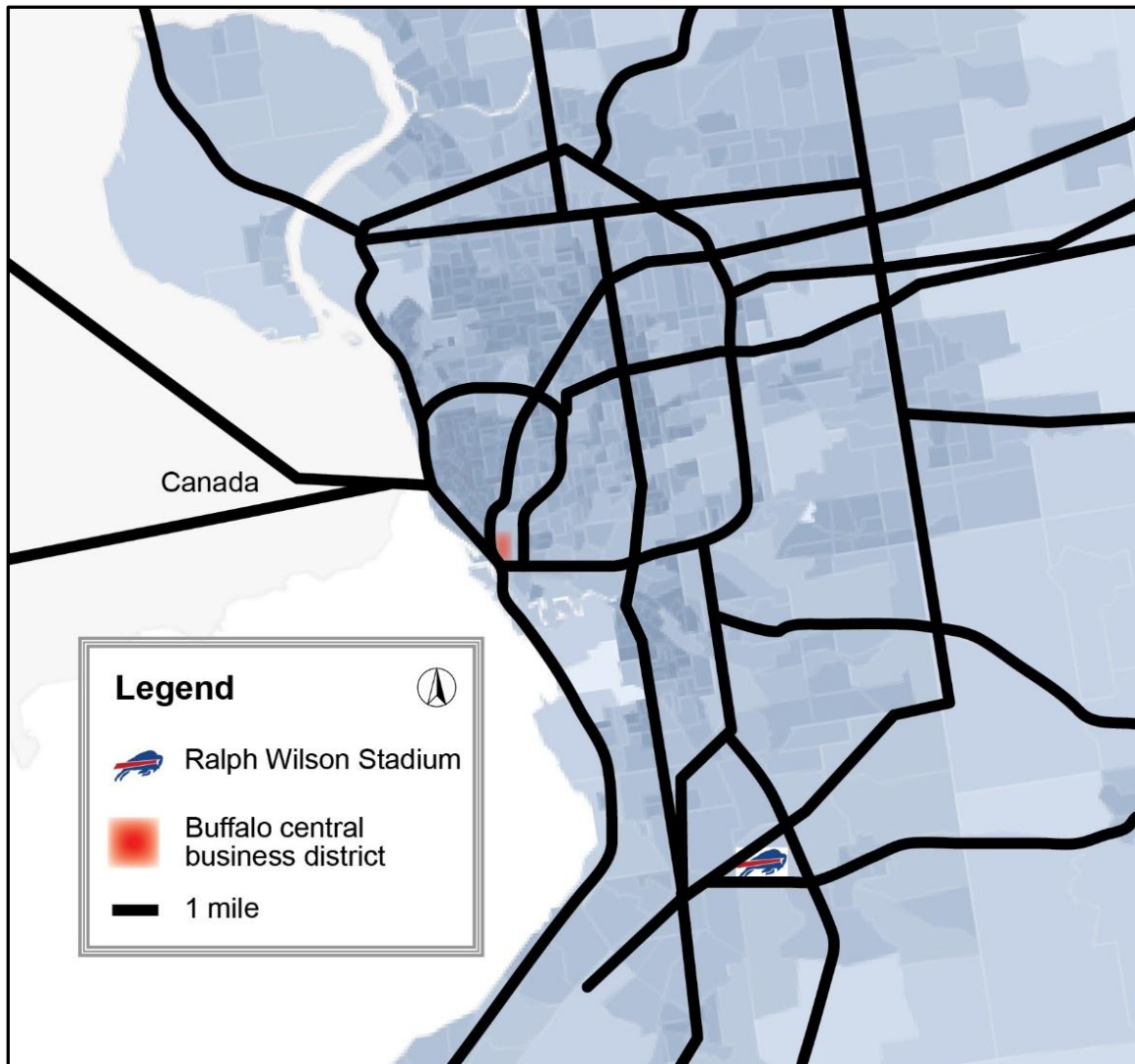


Figure 12. Buffalo Stadium Relativity

2.2: The Supply and Demand of Sports

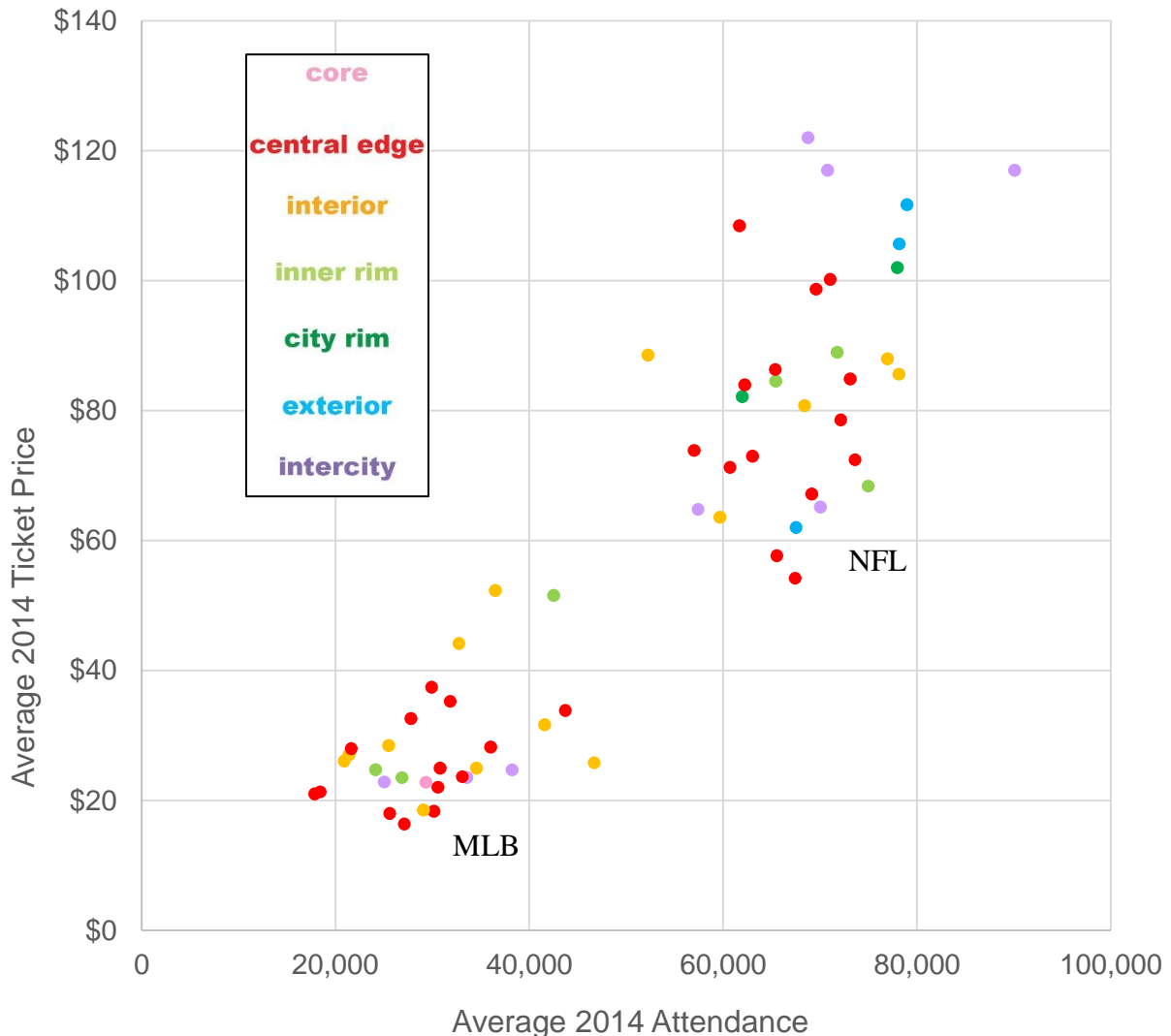


Figure 13. The Supply and Demand of the NFL and MLB

Figure 13 displays the average attendance related to the average ticket price for all NFL and MLB teams. Average ticket price is defined by the source as a weighted average of season ticket prices for general seating categories, not including premium seating and luxury suites (Team Marketing Report 2014 March and 2014 September). This relationship is positive; the more people that attend a game, the higher the average ticket price. The data is color-coded by stadium location classification and the pink and red (core and central edge) stadiums charge less overall per ticket while the costliest tickets are found in intercity and exterior locations. “Segmenting the market, that is, creating a fit between the product (sports facility), the price, and the user could be a crucial step to generating additional revenue from the facility” and garnering more public interaction/support” (Igo 2002).

2.3: Job Creation and Public Spending

“The most common measure of economic activity is the creation of new jobs” (Rappaport and Wilkerson 2001, 61). While a stadium is associated with players, staff, management, maintenance, and food and beverage workers, to name a few, maximizing the number of jobs that work outside of game hours is important; it would be tough to survive on the wage of a bartender working 10 home 4-hour-long football games per year. Not only does maximizing the number of events held at the stadium per year help employees, but it would benefit to keep the food and beverage service open on non-event days as well, so long as there is a population to serve, which is guaranteed more the closer it is to the CBD. This would be possible with proper marketing strategies and attractive qualities of the space, such as outdoor patios, balconies with a view, bars with local brews, a view inside the stadium, a sports/team theme to the restaurant, or appearances by the mascot or players. This idea will be discussed in further detail in the recommendations. “Depending on the specific design and location of a sports stadium, such spending may support a number of local businesses, such as parking lots, restaurants, nightclubs, and souvenir shops” (Rappaport and Wilkerson 2001, 62). Proper surrounding supporting land uses of retail and hotel provide a second wave of job creation.

Elgar sites several studies revealing no significant impact of the presence of stadiums and teams, hosting of events, employment, income, and tax revenues, but this could be due to poor stadium planning. If the local government implemented a plan to put the right businesses around the stadium site, local impact would be positive. Petersen studied regular season NFL home games and Super Bowl averages of visitor economic activity: spending per day per overnight visitor is \$100 (\$210 at the Super Bowl); 10 percentage of visitors stay overnight (90 percent for the Super Bowl); and visitors stay an average length of 1.5 days, also for the Super Bowl (Petersen 2001). Stadiums should maximize their capture of these overnight visitors’ spending (Petersen 2001).

It is important to play devil’s advocate in what would otherwise be an economically thriving situation. Three phenomena can offset successful economic development through crowding-out, substitution, and leakage: crowding-out occurs when new demand only replaces existing sources, lowering the existing businesses’ activity; substitution is when local residents attending the event would have spent their money there anyway; and leakage is when money does not circulate locally as anticipated, but actually flows out of the economy at hand (Elgar 2012). Two facts to consider in supporting infrastructure planning are that “economic impact is generated where the product is produced and where the revenue goes, not necessarily where it is purchased,” and league events that come to town (such as the Super Bowl or the MLB All-Star Game, etc.) keep their profit (made off ticket sales and other sources outlined in league contracts) and take it home to their headquarters (Elgar 2012, 259). So, in order to generate maximum local economic impact, it is important that what can be controlled is kept local.

Figure 14 provides a chart of the average game ticket price separated by league for each location type. Overall, the further the stadium from the CBD, the higher the ticket price. This is intriguing as stadiums closer to the CBD typically have higher land values and taxes and generate less income from parking lots. *Figure 15* displays the operating income of each team across each location type. This data was extracted from Forbes, which measured operating income as earnings before interest, depreciation, amortization, and taxes (Forbes 2014; Forbes 2015). The relationship of operating income to location is relatively steep. The ex-located

stadiums do typically have to spend time and money on constructing extra lanes, on- and off-ramps, roads, and surface parking lots and usually cover larger parcels of land, but this is likely less of a burden than inner-city tax rates and lower parking income. It would be interesting to study where this seeming surplus of further-located stadium money goes, in expanded research.

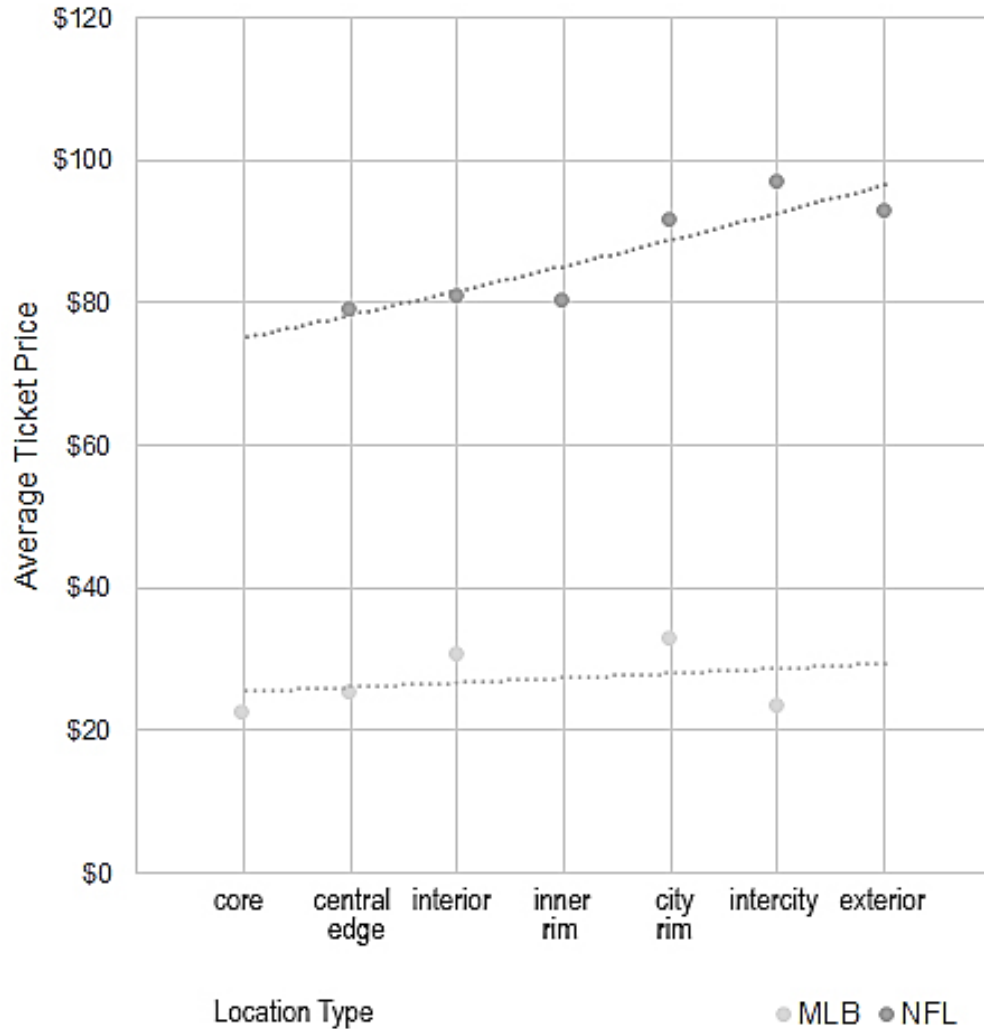


Figure 14. Average Ticket Price by Location Type by League

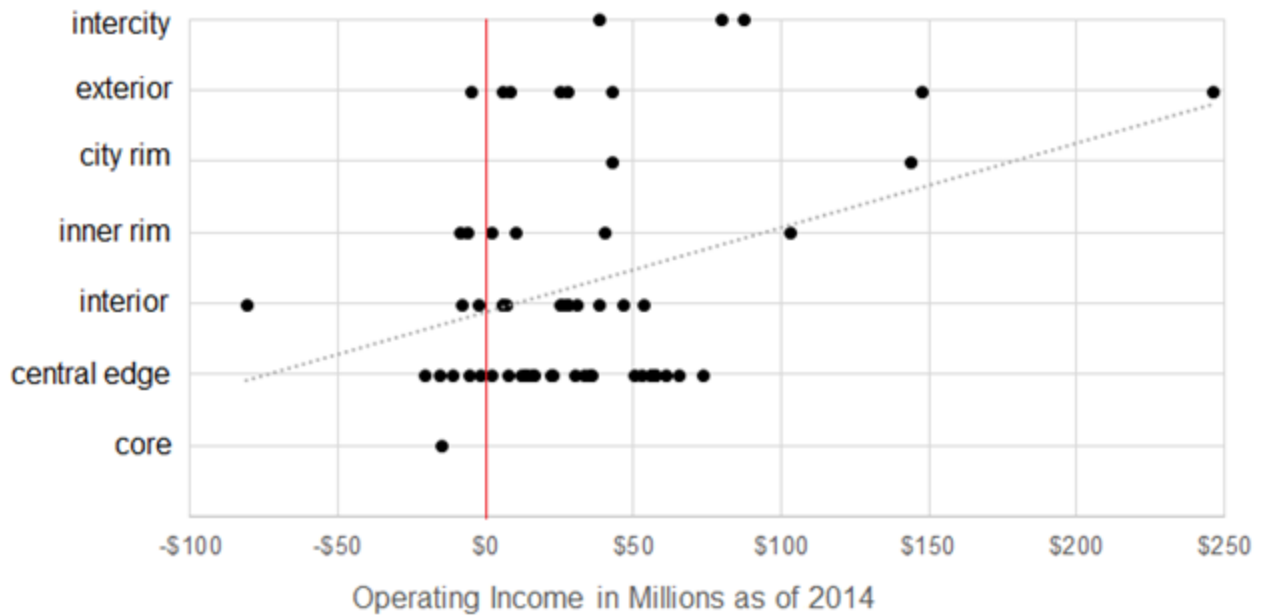


Figure 15. Operating Income by Location Type

2.3.1: History of Stadium Economic Development

Stadiums and economic development (job creation) were associated from the onset. One of the earliest stadium booms occurred just after the Great Depression as part of the era’s “make-work” programs and often involved construction to honor American soldiers (Coates 2008). This is why many stadiums have “Memorial Stadium” appended to the name. But today, “stadiums are largely the private domain of for-profit businesses that the public sector subsidizes, often with special taxes” (Coates 2008). *Figure 16* shows the first operating season of all 60 NFL and MLB stadiums utilized by these leagues today, organized by location type.

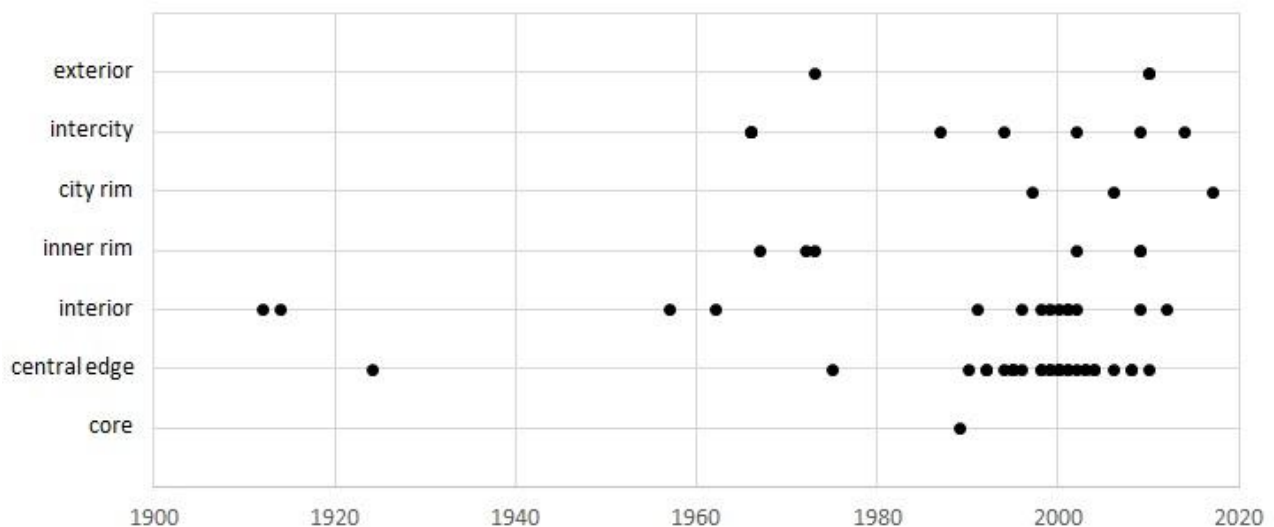


Figure 16. Opening Year by Location Type for Current NFL and MLB Stadiums

Many of these stadiums were funded by local, provincial, and national governments because they “were perceived as potential drivers for economic development” (Petersen 2001, 2).

“In the 20 years following the end of World War II, the center of growth in metropolitan areas moved from the central cities to the suburbs. The federal government responded with urban renewal programs whose local administrators recognized convention centers, arenas, and stadiums as attractive opportunities to reuse large tracts of land that had been assembled and cleared after blighted, vacant, and functionally obsolete buildings in the inner cities had been demolished” (Petersen 2001, 6). Baseball stadiums in particular have a history of location inside the city.

The early twentieth century baseball stadiums began to be utilized as an “education center” for immigrants (Guskind 1984, 17). “Familiarity with the regulations bestowed a certain brand of citizenship upon the spectators” (Guskind 1984, 17). Just like math, baseball is something that can be understood across every language. Baseball, and increasingly football, has become a more global sport (following the pattern of soccer, the first globalized sport). With the immigrant population growing, it is important to consider this phenomenon in stadium planning today by siting optimally, with maximum accessibility and attractive supporting adjacent land uses providing options for all walks of life.

2.4: Stadium-Only Sites

“Although the stadium no longer serves as an education center, it is still important as a consistent social event where urbanites come together as a whole to rally behind their respective teams... yet people no longer collectively congregate around the stadium before or after the game at nearby street corners, bars, or shops. The parking lot has become the only facility left to accommodate this activity” (Guskind 1984, 30). The stadium has become a space to watch the game – and that’s all. There is no more retail on the surrounding streets as it has all been internalized for the profit of the stadium. A successful stadium (successful, meaning an enjoyable, effective economic development tool for the area) provides goods and services during the hours well before and after the game, and even thrives during the off season.

Turner Field unfortunately provides a sterling example of the stadium sited purely as a space for the game – and that’s all. There are virtually no retail locations attracting fans or off-season spending, and the area really only sees movement during Braves games. As a six-year resident of Atlanta and regular Braves game attendee, I have learned to avoid the area during non-game hours, unless participating in the tailgating scene that exists across the mass expanse of surface parking. This is mainly due to the safety of the area, seen in *Figure 17*. Walkscore publishes crime rates relative to the rest of the neighborhood’s city, which is Atlanta in this case. Summerhill, the neighborhood within which Turner Field resides, is outlined in blue, and possesses personal crime rates in the 70th percentile and property crime rates at the 100th percentile (Walkscore 2015). A visual assessment of Summerhill further proves the area’s neglect. What appears to be a former mini-downtown strip along Georgia Avenue just one block west of the stadium site is now a series of dilapidated, graffiti-clad, closed businesses. If these buildings were in use and attracting residents, it could become a satellite of nearby Downtown and perhaps one day even be continuous dense development from Downtown to Summerhill. More activity typically leads to more policing, which helps the crime rate.



Figure 17. Turner Field Safety

(Source: Walkscore 2015)

Allowing room for stadium growth is not a concern in modern day professional stadium design as it was in earlier times, when planners also had to make sure the stadium could be expanded as the city grew or when “the university has graduated more enthusiastic alumni to add to those already crowding the bleachers for the big games” (Coates 2008). During this boom, there was a heavy focus on adaptability, with the aim “that the stadium may have as broad a use as possible” (Coates 2008). This is no longer the case, as stadiums are slowly leaving multi-purpose status as teams realize the ability to retain 100 percent of the generated revenue (Petersen 2001). So, the way to keep these venues multi-purpose but maintain their solo-sport condition is to focus on hosting other events during non-game days. Economic development entities can establish practices that lure musical artists, conventions, trade shows, increasing in popularity beerfests, and other activities to the venue, compounding the economic benefits gained by the region. A well-designed, interactive surrounding site increases the attractiveness of these venues for an event.

2.5: Community Welfare

As long as a stadium is utilized for public events on top of team events, it may be justified as a public-use facility and potentially funded by taxes. However, while a facility hosting public activities would constitute tax funding, “commercial type activities” should “pay the full cost of the services or facilities which are provided” says economist Ralph Wulz (Coates 2008). Thus, stadiums are often financed using a combination of sources, and between 2000 and 2008, public shares made up 61 percent of stadium funding (Coates 2008). This research is not intended to cover stadium funding, however monetary resources do come up in the question of the funding of supporting infrastructure.

Many members of the public are angered when they see the stadium investment dollar amount, arguing that the dollars would be better spent on improvements to schools or

transportation. But typically, the funding for stadiums does not come directly out of an existing government budget but rather from a new source of revenue, like special taxes on tickets or add-ons to the local sales tax (Coates 2008). These same angered members of the public argue that the stadium does not generate the economic impact needed to answer the stadium cost. Economic impact analyses and before-and-after studies of the stadium's construction have ended up both positive and negative (Elgar 2012). But “[i]f the consumption benefits derived from game attendance and the public-good benefits of having a franchise are greater than these costs, then the welfare of the community is enhanced by financing stadiums” (Coates 2008). Thus, the more profiting land uses exist surrounding a stadium site, the higher the consumption benefits. If these analyses included optimal supporting surrounding infrastructure (retail, hotels, and the right housing), they would conclude more positively.

Coates reports separate studies by planners Arthur Nelson and Charles Santo that “each find that teams that play in the [CBD] of a city tend to be associated with an increase in the metropolitan area's share of the regional income” (Coates, 2008). While intercity, exterior, or city rim stadiums have the advantage of capturing a wider range of attendees, the danger of ex-located stadiums is that their effects on the economy may not be impacting the local MSA economy as much as they could. For example, SunTrust Park is under construction in Cobb County after having been located in the City of Atlanta inside Fulton County for twenty years. Any spending related to the Braves – at restaurants, shopping, public transportation, gas stations, or hotels – will now go directly to the Cobb County economy as opposed to the central City of Atlanta and Fulton County economy. A small proportion of attendees will opt to stay in hotels in Atlanta and visit the other city attractions, however this will be much more unlikely as travel SunTrust Park from Downtown Atlanta will be over twenty minutes without traffic – a scenario that is almost non-existent in the area.

Stadiums are based around athleticism, a healthy practice. Parents take their kids to the games and local stars often become role models for children. The athletes inspire the kids and they want to play the sport, too. Then, local youth sports programs grow, increasing the health of the local public and the public support of new youth recreational infrastructure. This is often in the form of greenspace, due to the grass athletic fields and running/biking trails, which is viewed as a positive addition to a city. Additionally, the implementation of running and biking trails leads to more people becoming pedestrians and bikers to access services or commute, which alleviates traffic and is healthy for the city overall.

2.6: Site Characteristics

Stadiums are considered public assembly facilities, which are one-of-a-kind facilities that there generally are not more than one of in a city because they can usually accommodate more visitors than any other type of urban facility (James 1972, 15). But, “[i]t is only through proximity to, and interaction with, existing commercial development that public assembly facilities can achieve the level of beneficial economic impact that is typically claimed for them” (Petersen 2001, 44). “Stadiums have a positive impact on the desirability of the location, thus inflating sale and rent prices” as proven through various studies (Elgar 2012, 279). Petersen stresses how important location is for a stadium, because attendance is most affected by transportation, parking, and proximity to potential attendees, including security and safety of area and proximity to other destinations/attractions, hotels, restaurants, shops, and entertainment

(Petersen 2001). There are three tiers to a location: its relativity to the rest of the city, its surrounding land uses, and entrances/access points on the site itself.

“A public assembly facility can be an important component of a downtown revitalization or redevelopment plan.” (Petersen 2001, 101). Comerica Park in Detroit “was designed to be the center of an urban village that includes shops, restaurants, offices, and other attractions, such as a carousel, a Ferris wheel, and a water feature.” (Petersen 2001, 103) while Houston’s Enron Field ties into Union Station where ticketing, retail, and office space supporting the ballpark are located and even serves as an entrance to the stadium. The “essential generators of spending and demand” according to Petersen are nearby residential development, high levels of Class A office, and other visitor attractions (Petersen 2001, 105).

If a stadium is located poorly, this can cause several inconveniences to fans. The greater the non-monetary costs of transportation, food and drink availability, and other game-related logistics, the less likely consumers are to value future facility events (Igo 2002). “Available parking and the volume of people within the area must be taken into consideration because transportation difficulties facilitate consumer aggravation, decreasing the potential value the consumer places on attending the events of the venue” (Igo 2002). A bad reputation for a multi-million dollar stadium can cause a snowball effect of problems.

2.6.1: Public Services

To begin with the basics, a stadium site needs “adequate mass transportation facilities, fire and police protection, and... water, sewage, electricity, gas, and telephone service” (James, 49). The more centrally located a stadium is, the more it can save on costs to extend any of these three categories to meet the stadium’s needs. Downtown cores typically have a robust road network and transit service, emergency service fleets, and utility lines. The further a new stadium locates from the CBD, the more likely it is that the stadium’s construction will include new public infrastructure such as roads or utility extensions. This should convince stadium planners to select non-sprawl sites.

2.6.2: Accessibility

A maximum number of expressways and arterial roads outward from a stadium site is essential to alleviate congestion. Downtown CBDs already possess multiple points of access while exurban stadiums are accessed by one or two highways generating bottleneck traffic (Petersen 2001). Proximity to the highway is important to the stadium for both access and visual reasons. “Besides facilitating cars, the highway provides a visual approach to the stadium” (Guskind 1984, 45). However, the benefits of locations proximate to highways are offset by the negative effects provided by a tangential interstate system. When one or two sides of a stadium’s perimeter is an interstate, pedestrian potential is interrupted.

Transit service must also be considered in the comparison between downtown and non-downtown stadiums. Successful transit design for stadiums depends on the preexisting system service area, well-located park-and-ride lots, parking limitations, system familiarity, and public belief in its safety and reliability (Petersen 2001). Metropolitan Atlanta Rapid Transit Authority (MARTA) rail experienced a 78 percent increase in ridership during the 2013 Men’s NCAA Final Four Tournament compared to a normal weekend (MARTA 2014). Unfortunately, teams do not always stay in the same city forever. If a team is outside the urban center, it would be sustainable to extend the rail system (which hopefully exists in a city big enough for an NFL or

MLB franchise) to the stadium site to relieve congestion and alleviate the need for mass expanses of surface parking lots. The implementation of a station at a stadium and even named after it establishes a sense of permanence.

Petersen states that people do travel to nearby cities for events that are not held in their own city having no sufficient venue (Petersen 2001, 99). Attendees for professional football games tend to come from a wider geographic area than for professional baseball games, enabling a professional football team to “operate in a smaller metropolitan area” (James 1972, 24). The Green Bay Packers, Buffalo Bills, and New Orleans Saints provide examples of teams able to thrive in relatively minor markets, as their respective cities have a population below 1 million people. [The six football stadiums sited outside the city, for the New England Patriots, Dallas Cowboys, San Francisco 49ers, Oakland Raiders, Miami Dolphins, and MetLife Stadium shared by the New York Giants and Jets, are located within large metropolitan statistical areas (MSAs); the Buffalo stadium is also located outside of the city. The three baseball stadiums sited outside their respective cities are of the Texas Rangers, co-located with the Dallas Cowboys, the Oakland As who share a stadium with their football counterpart, and the Los Angeles Angels of Anaheim, which are all also located within larger MSAs. The least populous location for a MLB franchise is Milwaukee, which has an MSA population of 1.6 million residents.] This has implications for stadium site design. “Going to a football game is a weekend event for many fans” and becomes a planned event (James 1972, 24), so it is even more vital to intensify attractive support venues to encourage traveling fans to make an entire weekend out of what was originally a four-hour Sunday afternoon game. As many of these attendees will turn the game into a road trip, the fans likely assume parking at the stadium, but designing an entertainment center where fans may park at their hotel and walk everywhere all weekend is better planning, decreasing the amount of surface parking necessary.

Stadiums are most successful in the city center where parking supply is sufficient, however parking should not all be adjacent to the stadium because then there is no opportunity for retail. Petersen’s best examples of professional sport cities having a successful Downtown parking situation include Charlotte, Cincinnati, Cleveland, Indianapolis, Minneapolis, New Orleans, St. Louis, and Atlanta. All fourteen of the stadiums represented by these cities are located in central edge locations, except three: the Minnesota Vikings’ TCF Bank Stadium and both the Atlanta Braves’ Turner Field and SunTrust Park, but Petersen must be referring to the other stadium found in both of these cities. TCF Bank Stadium is located intercity sensibly, as it serves the population of Minneapolis’ twin city St. Paul as well. Turner Field is located on the interior and SunTrust Park is a city rim stadium aiming to capture the satellite population, but failing to keep the economic impact within the major city. Thus, in cities having preexisting shared parking, stadiums are best located at the core or the central edge (Petersen 2001). Bank of America Stadium, Charlotte’s central edge site, provides parking for daytime office workers, which generates more income for the stadium. The parking area is heavily landscaped, which is good for tailgating as well as aesthetics and the environment (Petersen 2001). Parking designated for adjacent use as well increases property values, a real estate measure of successful economic development practice.

2.6.3: Hotels

The construction of hotels adjacent to stadiums has monetary benefits other than hotel tax revenue – it also convinces out-of-state fans to attend the game and keeps their spending money

in the region. Hotels situated in close proximity to stadiums convince non-local fans to attend games by providing an easy boarding option within walkable distance. If a fan has to search for a hotel several exits down the interstate from the stadium or within any unsafe walking distance, the trip may be too much trouble to justify. Additionally, housing fans close to the stadium site means they can walk to the game, and often this means they will access the walkable supporting retail, benefitting the downtown economy (Payne 2014). If fans stay in a hotel outside the city, the only walkable option is the use of public transit to access the stadium. The other options are to rent a car (often from the airport, which does not directly benefit the downtown economy) or take a taxi service – the latter of which is the only benefit to the local economy. However, fans staying outside the downtown stadium district will likely spend their money there instead, not helping the downtown economy. Fans will also be more convinced to stay in a nearby hotel if the supporting infrastructure provides 24-hour options (daytime/pre-game activities, such as museums or other points of interest, and nighttime/post-game services, like bars and clubs).

2.6.4: Robust Retail and other Points of Interest

The existence of 24-hour supporting development is crucial to creating a robust and lively downtown district. “Fans arrive at the stadium over a three- to four-hour period before the event starts. Suburban sites tend to have earlier arrivals” (Petersen 2001, 49). This could be due to people accessing nearby retail beforehand as opposed to tailgating at personal vehicles in fields of parking. In Detroit, local bars and restaurants offer free parking and shuttle service to Ford Field and Comerica Park, which is a mutually beneficial setup: congestion around the stadium is somewhat alleviated and less parking spaces are needed, and bars and restaurants are guaranteed retail spending by their shuttle riders.

Because post-game traffic is inevitable, residents can be kept busy at nearby retail while waiting for the traffic to subside. Similarly, some people will choose to arrive early in order to avoid getting caught in the pre-game traffic rush. Nearby restaurants, shopping, and other events will entice these fans to arrive early, providing an array of activities to keep them busy.

There exists a population of fans that will attend the pregame activities and other tailgating events but not dish out the cash to attend the game itself. Nearby restaurants such as sports bars benefit from this group of fans as they will capture their service for around three to four hours, watching the game on the restaurant’s televisions.

The challenge is the demand for these restaurants during the off-season. Two planning schemes can help this deficit: year-round uses designed into the stadium, and other destinations located by the stadium. Coors Field provides a great example of a year-round use designed into the stadium. The Blue Moon Brewing Company at the Sandlot used to be in the basement of a five-story brick warehouse (Shikes 2011). When the stadium was built, the structure was restored and integrated into the Coors Field architecture. The brewery, which also serves food, is open every Tuesday through Saturday from 2 p.m. to 8 p.m. year-round, except on game days, when it is open only to ticket holders beginning 90 minutes prior to game start (Colorado Rockies 2014).

The spurring of retail due to stadium presence can be seen even just by looking at the names of restaurants. Just one block north of AT&T Stadium in Arlington, Texas is the Tailgate Tavern. Because it there are no other sports bars located within a block of the stadium, albeit through a sea of surface parking for AT&T Stadium and Walmart, Tailgate Tavern gets overcrowded; when I visited in December 2014 four hours prior to the start of the home

Cowboys game against the Indianapolis Colts, not only did my party wait an hour to be seated in the sea of tables so close together that the servers had trouble accessing customers, but the staff asked that we share a table with another party. The building was outstandingly decked out in Cowboys paraphernalia and showed every other NFL game on their many televisions, making for an entertaining and fun experience overall, but the area would greatly benefit from the addition of other sports bars in the area to meet the observed demand. The Tailgate Tavern survives during non-home game days by hosting events, featuring karaoke and poker nights, and broadcasting the Cowboys' away games on their big screen (Tailgate Tavern 2015).

Uncovered stadiums provide the opportune atmosphere for sports-bar retail. "Adverse weather tends to have a detrimental effect on baseball attendance," where the majority of stadiums are outdoors, without a shield from rain (James 1972, 22). Often, if a game continues in the rain, spectators will leave the stadium to avoid the inclement weather. Many fans leave their seat to crowd under aisle overhangs, as witnessed throughout years of experience. Adjacent sports bars should capitalize on this situation by advertising the game broadcast in a warm, dry space but still in an atmosphere filled with team spirit and comradery.

2.6.5: Residential Land Use

Residential proximity to the stadium is a delicate issue. While residential land use is one of the "essential generators of spending and demand," it is imperative that the site not be strongly residential, and where it does exist, it is best designed as mixed-use development (Petersen 2001, 105). While "nonresident spending is usually the very reason that most centers are built," supporting stadium retail needs the guaranteed spending by residents year-round, so residential development is best near a stadium, but not directly adjacent, foremost due to a right-of-way issue (Petersen 2001, 47): "residential streets... should not be used to accommodate stadium traffic or provide stadium parking areas (James 1972, 51). The only exception is mixed-use development, which already assumes and accommodates for visitor parking spaces.

Cities that only built the stadium and did not also restore residential property were set back (Petersen 2001). The residential neighborhood surrounding the Chicago Cubs has come to be known as Wrigleyville and features over twenty restaurants and bars. "After a Cubs game, these establishments are full of sports fans and tend to be extremely festive in nature. There are several sports-themed bars which act as popular pre- and post-game hangouts" as well as popular music venues and Cubs-themed retail located in close proximity to Wrigley Field (Chicago Traveler 2015). The Cubs organization is currently undergoing stadium expansion and the construction of a nearby hotel, shopping, and entertainment center within the neighborhood fabric (Cromidas 2015). The "Wrigley Roof" is perhaps the one phenomenon that truly exemplifies the Cubs organization's support of the neighborhood: many of the homes have rooftop bleacher seating providing extra space to view the game when it is sold out or tickets are too expensive; the Cubs support this happening despite the loss of money for Wrigley Field (Chicago Traveler 2015). "Wrigleyville is certainly one of Chicago's most spirited neighborhoods. Those who live here are bound by their love of the team that calls the area home, and visitors who make pilgrimages to the shrine of the Cubs are welcomed as part of this family" (Chicago Traveler 2015). Summerhill has not become Turnerville, despite the vacant parcels of opportunity.

2.6.6: Class A Offices

There is a strong connection between business and sports, a connection of economic nature. “Hotels and entertainment facilities create an attractive environment for Class A office space, which in turn reinforces and augments support for more hotels, shops, and restaurants” (Petersen 2001, 101). Not only does corporate sponsorship and advertising exist, but corporate businesses bring much revenue to the stadium through suite rental both during and outside game days. The provision of corporate office space in close proximity to the stadium is mutually beneficial for the business and the stadium. Businesses like to locate offices near Class A retail due to the nature of business lunches and other events, so a stadium with enticing surrounding retail is an attractive neighbor.

2.6.7: Downtown Location

Public assembly facilities gave downtowns a reason to be, historically (Petersen 2001). That’s why development costs and ownership shifted from team owners to local governments who held the goal “to stimulate the revitalization of the center city and to foster the diversity of pedestrian-oriented uses on which successful and growing center cities depend” (Petersen 2001, 6).

Coates reports that planner Charles Santo and economists Ziona Austrian and Mark Rosentraub have suggested that the issue with siting in non-downtown locations is the question of whether a stadium helps the redevelopment of an area that actually needs redevelopment: “to them, a downtown area is deserving of help even if that help comes at the expense of the rest of the area. From this perspective, the studies that find little economic growth flowing from stadiums and sports franchises are not relevant. Instead, the mere possibility that a new stadium will aid urban redevelopment in a central city or downtown area is a sufficient rationale” (Coates 2008). Additionally, as sprawl became a common occurrence in many cities, downtowns have lost employment, so any economic development to the area will help the region as a whole.

A more centrally-located stadium can also decrease sprawl. Besides home price, people often choose their residence based on proximity to work – somewhere they visit multiple times a week, all year long. Not including any postseason games, season ticket holders of Major League Baseball teams have 81 home games to attend each year. While National Football League season ticket holders only have 10 non-postseason home games to attend each year, this only provides more opportunity for the stadium to host other events, which is also easier due to its design being more optimal for concerts, political events, shows, and competitions, to name a few potential uses. Attractive retail will draw people to dine in the restaurants and host events such as banquets or celebrations in the spaces. The combination of the number of games attended, number of other stadium events attended, and number of other trips to the local retail could be enough to sway a residential choice closer to the stadium. The baseball season ticket holder could potentially access the area over a third of the time they access his or her place of work (working 5 days a week for 52 weeks a year results in 260 work days, and subtracting an average 15 days of vacation and holidays leaves 245 days attending work, and a third of this number is 82). The desirability of residents to live closer to stadiums, and thus closer to the city core (optimally), is catalyzed by a stadium that hosts a multitude of other events or supplies desirable retail. The more residents a stadium area attracts, the less sprawl that occurs.

The location of a stadium at the city center relieves the pressure to ensure year-round use of the adjacent parcels. Downtown cores have infrastructure that is already associated with year-round use, while a location such as one in the interior is mostly only accessed by those who live or work in the common warehouses nearby – a very small population compared to that of the rest of the city. If a stadium is sited in this interior location, it will only become relevant while in season, rendering the site dead space during the off-season. Similarly, hotels will be full on select days during the year and monetary losses the remainder of the year. There is the possibility to implement certain economic development and urban design practices at that location to make it a year-round-accessed locality, but the creation of what is essentially a new satellite town center hurts transportation, because cars are traveling somewhere they would not otherwise be traveling. A downtown stadium location is in an area most locals already travel.

Planner William James wrote in 1972 that “[s]tadiums in outlying suburban locations, such as Candlestick Park in San Francisco and Robert F. Kennedy Stadium in Washington, [D.C.], do not appear to attract any significant types of land uses [hotels, restaurants, and, in some cases, office buildings]” (James 1972, 19). Ironically, neither stadium houses their former professional football or baseball teams anymore; Candlestick Park lays dilapidated and Robert F. Kennedy Stadium is home to a professional men’s soccer team after the Redskins moved to a stadium in Maryland and the Senators moved to Arlington to become the Texas Rangers of today.

There is an unfortunate trend in stadium site selectors choosing cheaper land further from CBDs for new stadium sites for the sake of saving money (Petersen 2001). But this upfront cost savings actually leads to increased expenses over time that would not otherwise be incurred, such as the expansion of road infrastructure, utilities, and public services, and vehicular emissions added since attendees must drive further. Additionally, a cheaper/further site also ignites the issue of a location to where shops and restaurants do not want to locate. A less significant site reduces marketability and economic benefits (Petersen 2001).

2.6.8: Lively Streetscape

Often a stadium’s appearance closely resembles its structure – walls, columns, ramps, stairwells, escalators, and seating tiers (Guskind 1984). This shows that the stadium designers and planners had no intention of designing with respect to the street, only so to the event going on inside the stadium itself. The stadium’s supporting infrastructure – which hopefully exists – can not simply stop at the stadium’s property line. The problem of engaging the surrounding land uses with the stadium lies in the massive walls battling the pedestrian scale (Petersen 2001). “The early ballparks,” in a more sustainable environment than today with their central location and non-reliance on personal vehicular travel, “had an urban expression that responded to the street” (Guskind 1984, 39). The stadium was a catalyst to cities’ placemaking strategies. A successful sporting environment engages the street with both the surrounding land uses and the stadium site itself, forming a lively streetscape.

In order to engage the fan, successful infrastructural practices that can be added on to the bare stadium structure include maximizing screens, optimizing the food and beverage ratio per guest, providing a variety of premium seating, and constructing the maximum number of seats in preferred viewing locations (Petersen 2001). Allowing teams to develop adjacent to the stadium site can contribute to a healthy stadium context, perhaps through a sort of tax cut deal as part of a tax-allocation district or through another outlet that would attract the team to further develop.

The implementation of dynamic public spaces, swing-space infrastructure, and a slew of retail for fans to circulate alleviates the sidewalk crowding experience of fans with no place to go (Igo 2002). By creating an active streetscape, “an area they want their fans to go through on the way to the stadium,” a team is increasing their attendance levels (Igo 2002). *Figure 18* and *Figure 19* support the statement that higher attendance levels lead to more home wins, and a successful team is more likely to stay in their market. Since more MLB stadiums are located toward the CBD, perhaps this is why the home advantage (home wins related to home game attendance) is even higher.

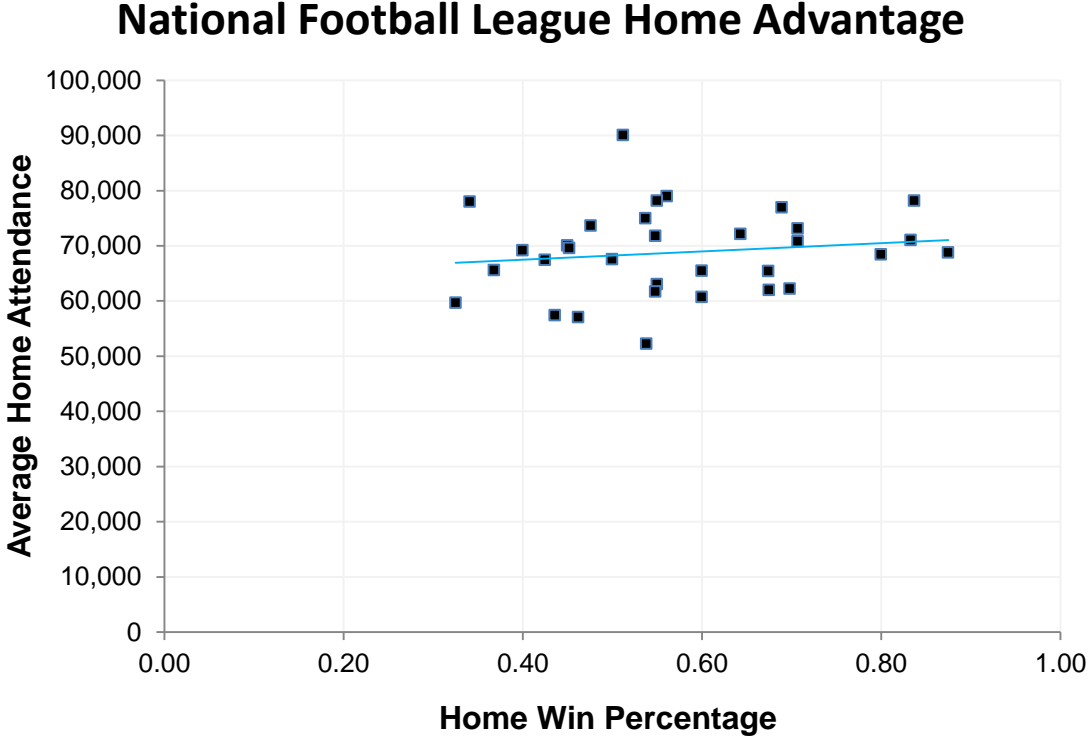


Figure 18. NFL Home Advantage

Major League Baseball Home Advantage

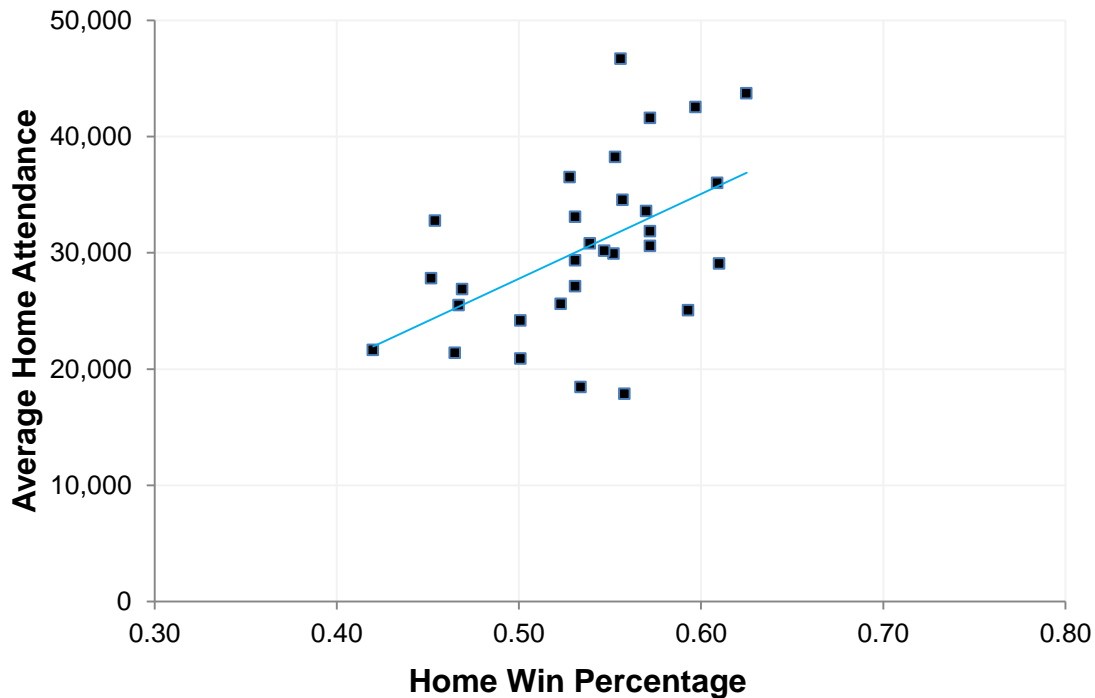


Figure 19. MLB Home Advantage

Section 3: Comparison Study

Dallas, Texas aims to have over 50,000 residents within its urban core by 2017 (Auer 2015). Downtown Dallas, Inc. is concentrating on diverse retail and “activity with something to fit every company’s needs” in order to become not a drive-through city but a destination by creating “critical mass Downtown and to give people a reason to be there” (Auer 2015). If the Dallas Cowboys or Texas Rangers had sited their stadium in the core or central edge of Dallas, the city could have over 50,000 visitors – not just residents – every game day, and such a stadium certainly provides an activity to fit companies’ needs and would turn Downtown Dallas into more of a destination. In the same article, Downtown Dallas Inc. representatives are quoted saying “[o]ur competition is not among North Texas cities; it’s in Atlanta... and Denver” (Auer 2015), but through the professional sports provision lens, Atlanta and Denver both have a leg up on Dallas.

Two sets of figuregrounds for the featured case studies of Dallas (Arlington), Denver, and Atlanta have been produced in order to study the stadium surroundings: the predominantly black-and-white figuregrounds display the accessibility network and the color-coded figuregrounds display the infrastructural usage. In the latter set of figuregrounds, the negative space reveals right-of-way (interstates, roads, plazas, and other through spaces) and natural earth (grass, dirt, or bodies of water). It is important to note that the residential buildings are not precisely drawn due to heavily detailed shapes, but the buildings of other land uses and parking

lots were drawn with optimal precision. The perimeter of each location is based on relative scale and stadium shape.

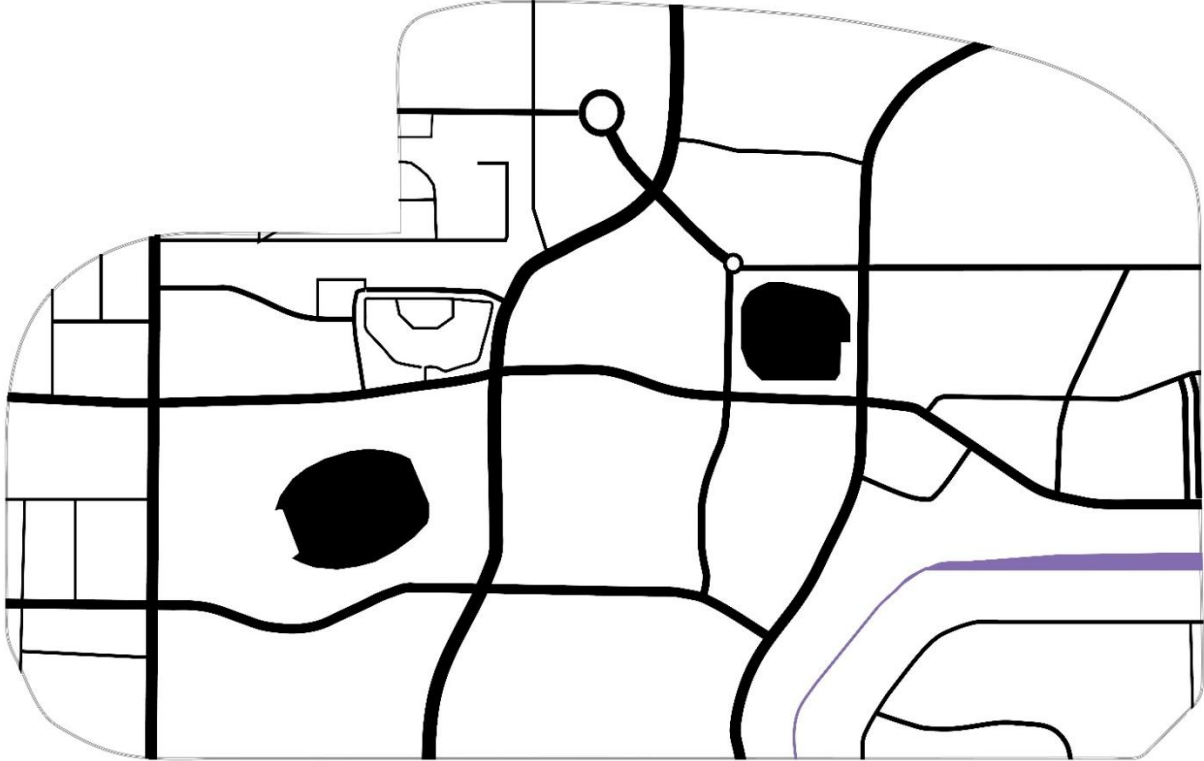


Figure 20. Arlington Accessibility Network

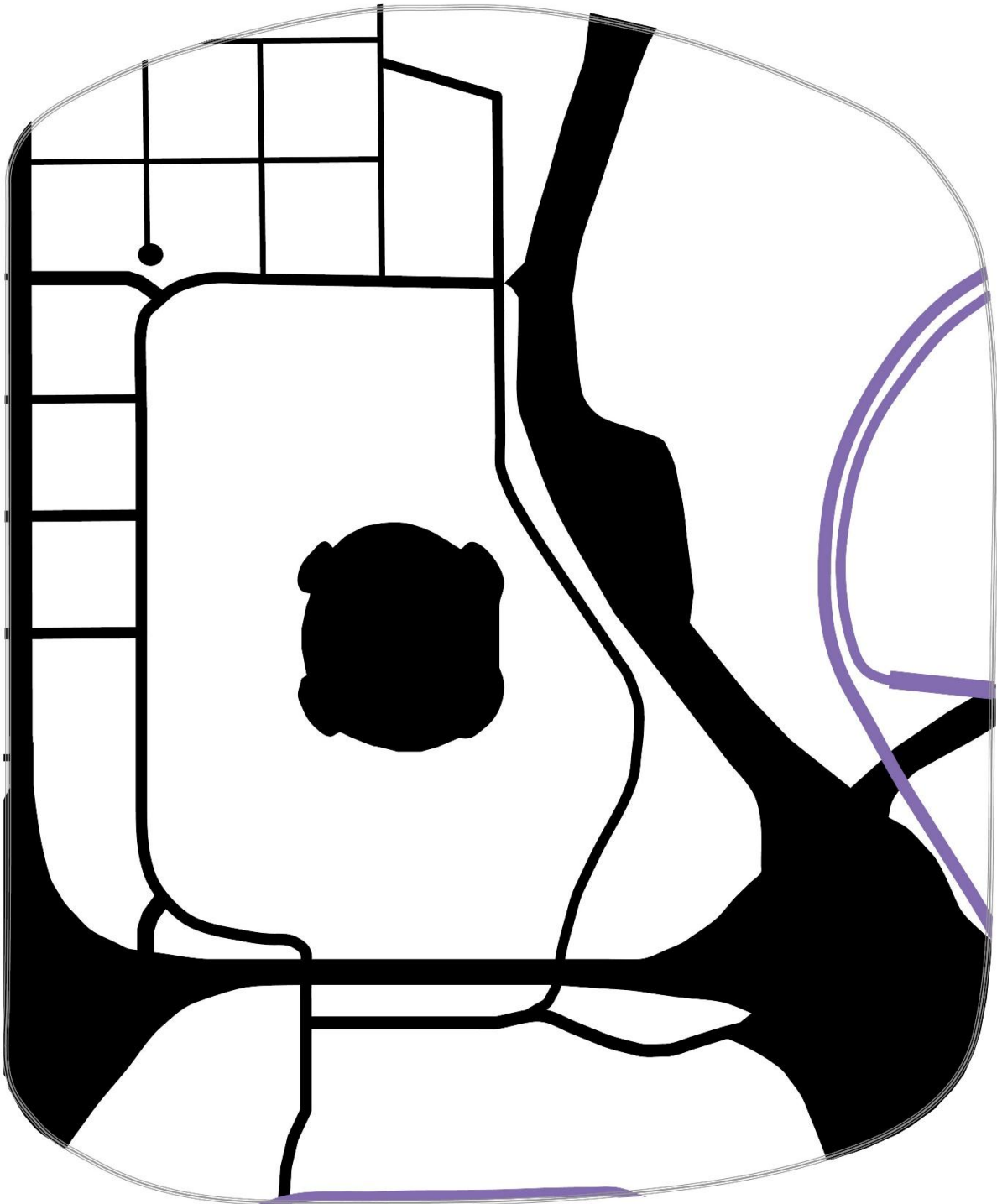


Figure 21. Sports Authority Field at Mile High Stadium Accessibility Network

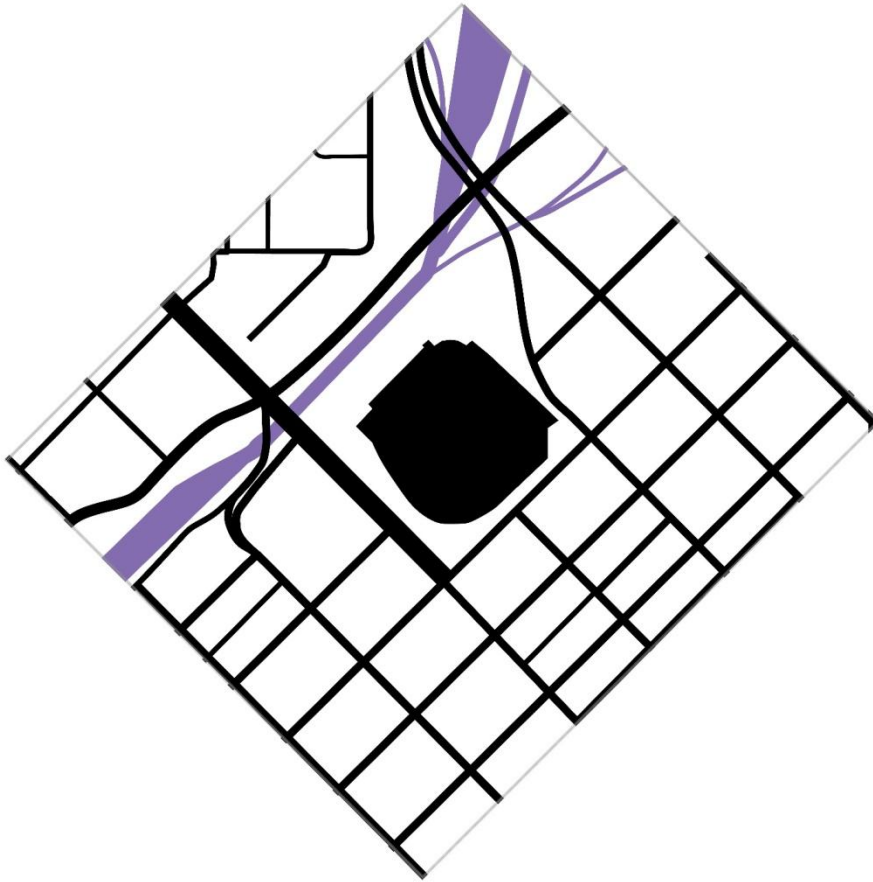


Figure 22. Coors Field Accessibility Network

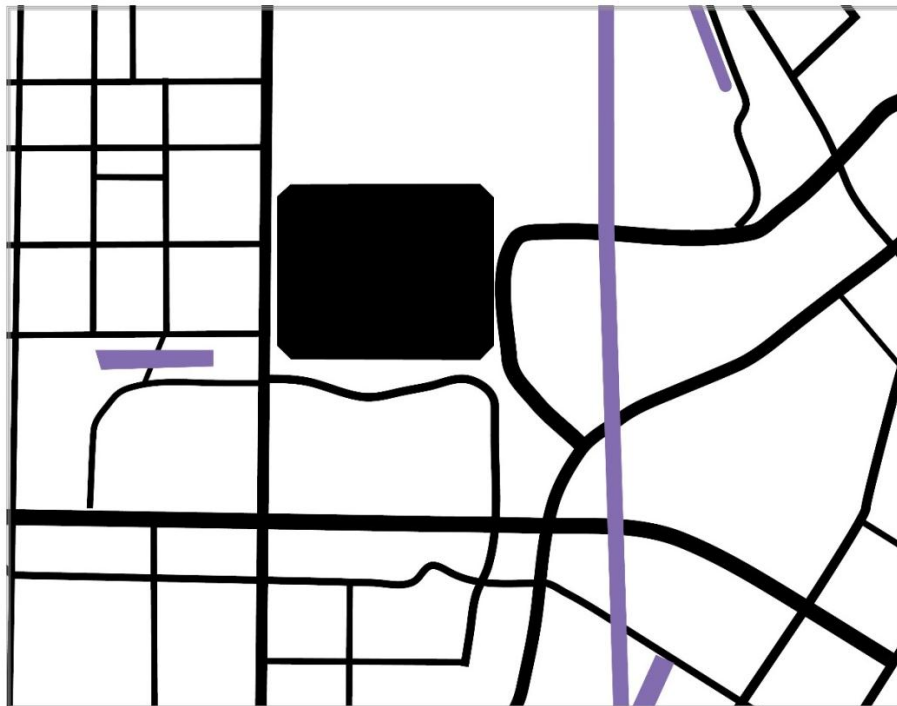


Figure 23. Georgia Dome Accessibility Network

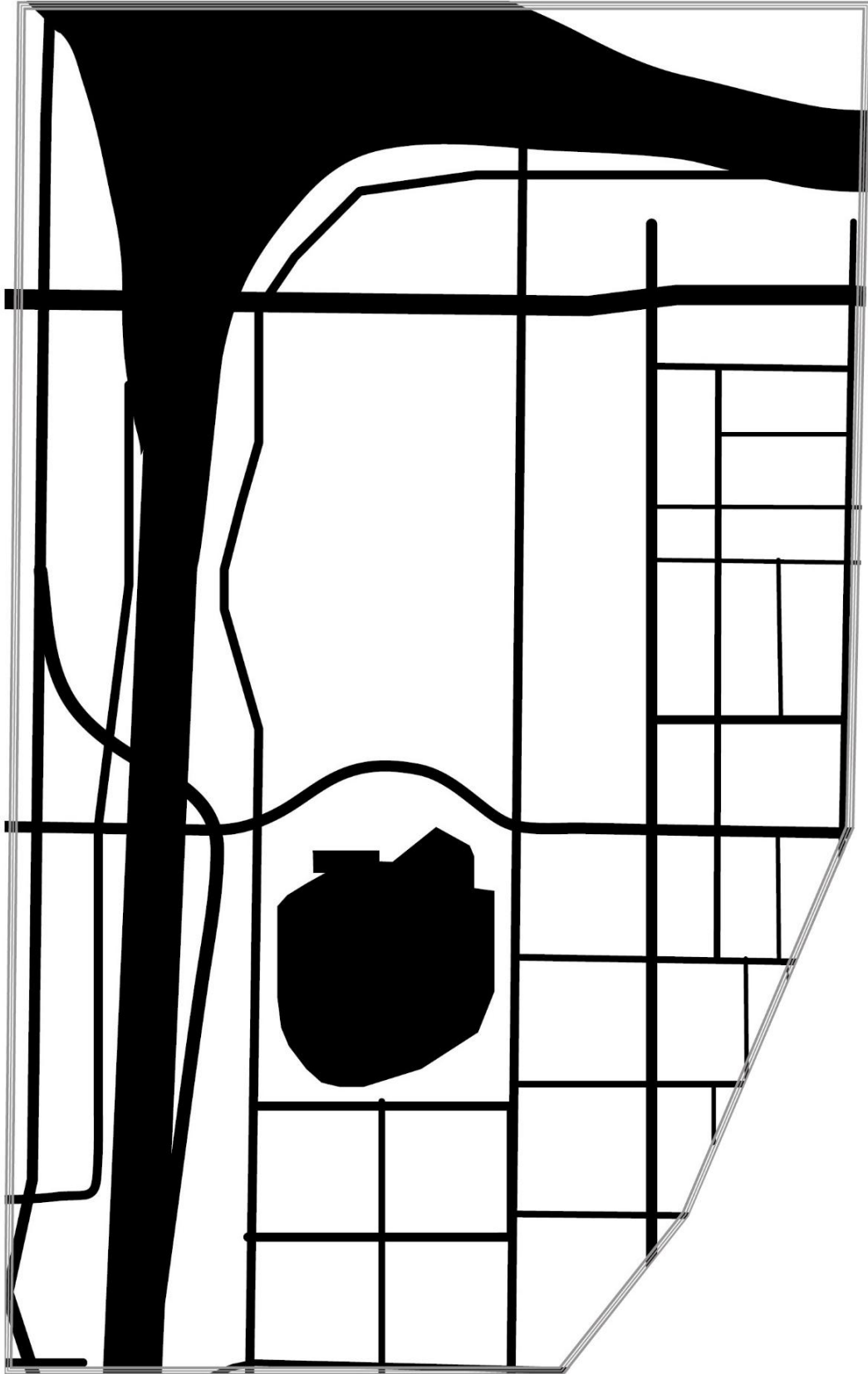
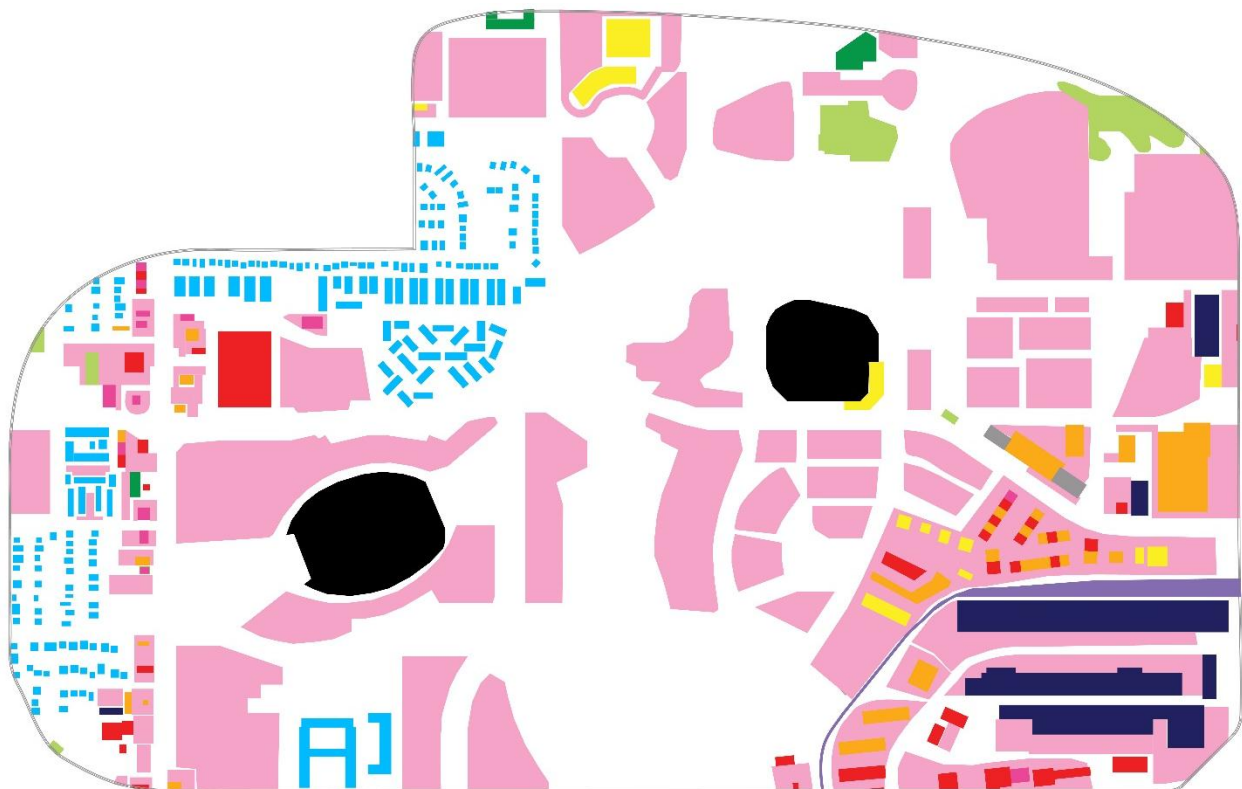


Figure 24. Turner Field Accessibility Network

In the following set of figuregrounds, the color coding of land uses is maintained across each figure. The stadiums are outlined in black, and light pink represents parking lots (some are parking garages in the Coors Field diagram). Dark green is used for hotels and the light green “point of interest” category includes other major destinations, including performance venues, convention centers, amusement parks, churches, and schools. Offices are shown in yellow and non-traditional offices (retail) are orange, red, and dark pink: orange retail services includes places like banks, car shops, health services, nursing homes, and gyms; red commercial retail is shopping establishments; and dark pink signifies dining and drinking establishments. Plum-colored mixed use is residential with ground-floor retail while navy conveys warehouses and industrial buildings. Purple is the same geometry of rail lines found in the previous set of transportation figuregrounds. Finally, gray is used for dilapidated or visibly vacant structures. The level of dilapidation varies across locations. Gray is also used to convey storage buildings, because this land use is useless for a stadium’s economic development and urban design.



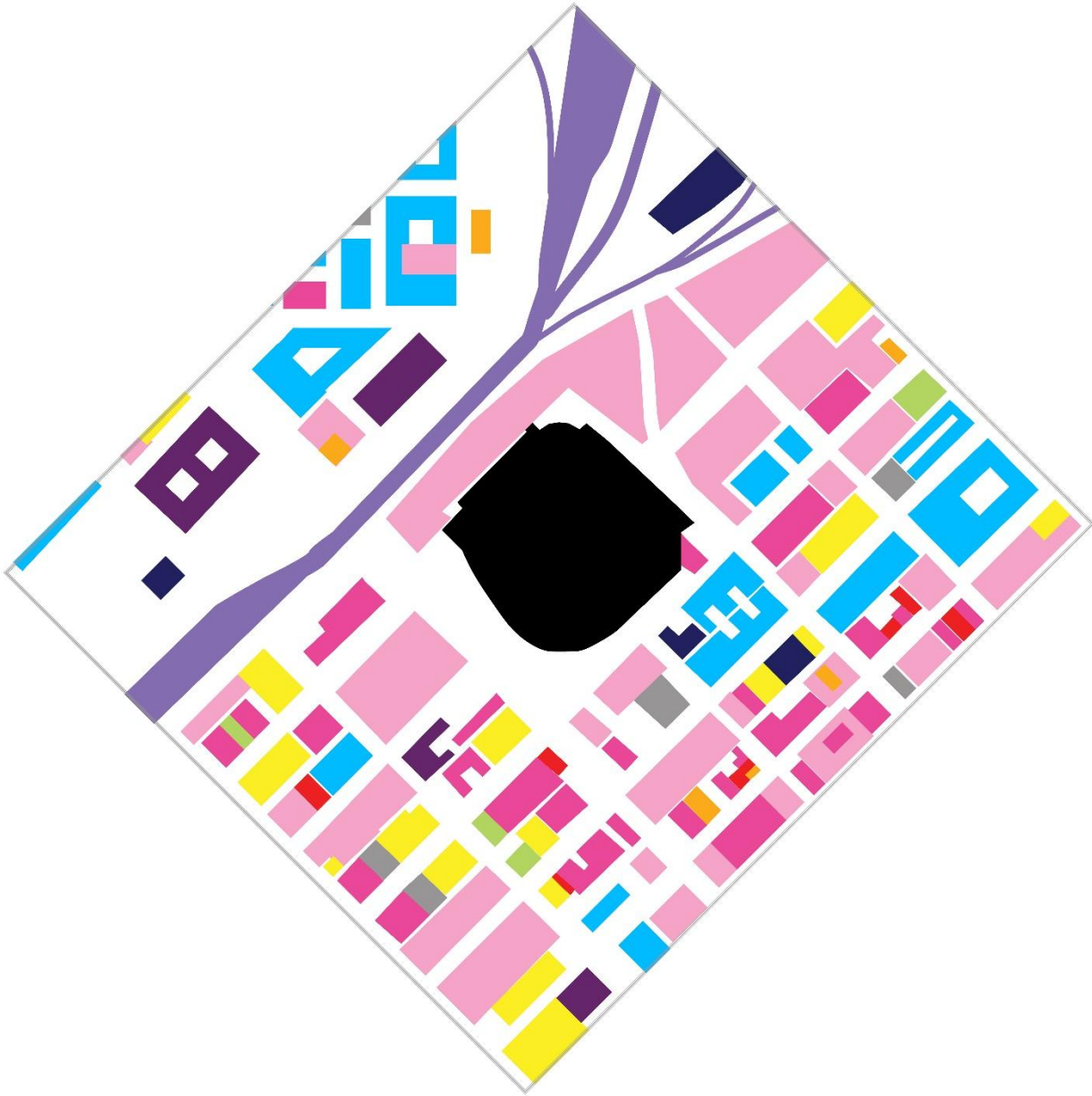
stadium · residential · hotel · point of interest · office · retail services · commercial retail · dining/drinking · mixed-use · warehouse/storage · rail · parking · dilapidated/vacant

Figure 25. Arlington Surrounding Land Use



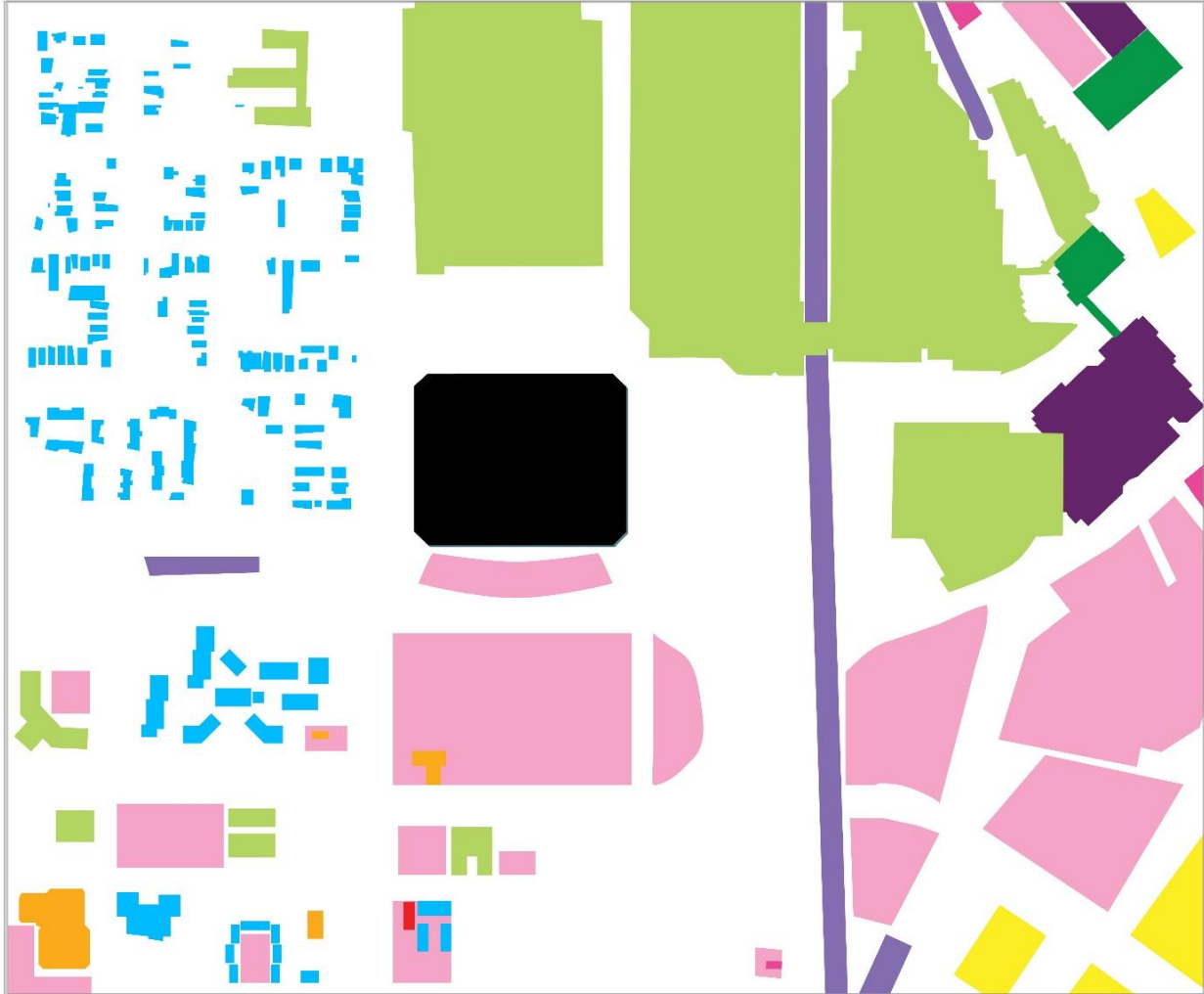
stadium • residential • hotel • point of interest • office • retail services • commercial retail • dining/drinking • mixed-use • warehouse/storage • rail • parking • dilapidated/vacant

Figure 26. Sports Authority Field at Mile High Stadium Surrounding Land Use



stadium · residential · hotel · point of interest · office · retail services · commercial retail · dining/drinking · mixed-use · warehouse/storage · rail · parking · dilapidated/vacant

Figure 27. Coors Field Surrounding Land Use



stadium • residential • hotel • point of interest • office • retail services • commercial retail • dining/drinking • mixed-use • warehouse/storage • rail • parking • dilapidated/vacant

Figure 28. Georgia Dome Surrounding Land Use



stadium · residential · hotel · point of interest · office · retail services · commercial retail · dining/drinking · mixed-use · warehouse/storage · rail · parking · dilapidated/vacant

Figure 29. Turner Field Surrounding Land Use

3.1: Arlington

After touring Globe Life Park and attending a Cowboys game at AT&T Stadium in December 2014, it is evident that the intercity Arlington stadium area is heavily visitor-focused. The neighborhood is also home to a Six Flags amusement park and water park and the Arlington Convention Center. The infrastructural make-up of the area includes these widespread land uses, large intersections for the six-lane roads with medians, and hotels – the recipe for a personal vehicle-gearred tourism center. The City of Arlington established this neighborhood as the Entertainment District with the main marketing objective of promoting large hotels (Payne 2014). City of Arlington Economic Development Manager Bruce Payne states that sporting activities do not support hotels because the teams eventually leave, both during the off-season and potentially forever (Payne 2014). Sustainable development including proper land uses, urban design, and the provision of a transit station could solve this issue. However, providing transit service to the stadium site produces an operational problem for both Arlington stadiums, whose primary revenue stream is parking fees (Payne 2014).

3.1.1: City of Arlington Zoning

The zoning in Arlington’s Entertainment District is dominated by four classes: residential, commercial, planned development, and industrial manufacturing, as seen in *Figure 30*. Globe Life Park is properly zoned in a planned development but AT&T Stadium lays across two zoning classifications: multi-family residential and single-family residential. AT&T Stadium falls in violation of the city’s current zoning code, as it holds no residential qualities.

Perhaps Arlington is well on its way to a well-designed and well-developed stadium site. “Champions Park” was heard at a City Council meeting in December 2014 with the proposal to site several phases of different combinations of mixed-use development one mile north of AT&T Stadium (Shrock 2014). There is one major issue with this development: it lays across Interstate-30 from the rest of the Entertainment District. The aforementioned dangers of such a proximity support the slight relocation of this development.

The presence of Dr. Ronald Cluck Linear Park is not characteristic of this type of development but is a great strategy in the implementation of an Entertainment District. It was established as part of an ecosystem restoration schema and includes a 1.09-mile trail along a wetland, covering a total of 73.8 acres (Arlington Parks & Recreation 2015). While this is good practice for sustainable transportation, it does not mesh with the surrounding fabric; once users exit the linear system, they are faced with the vast six-lane roads and thin sidewalks.

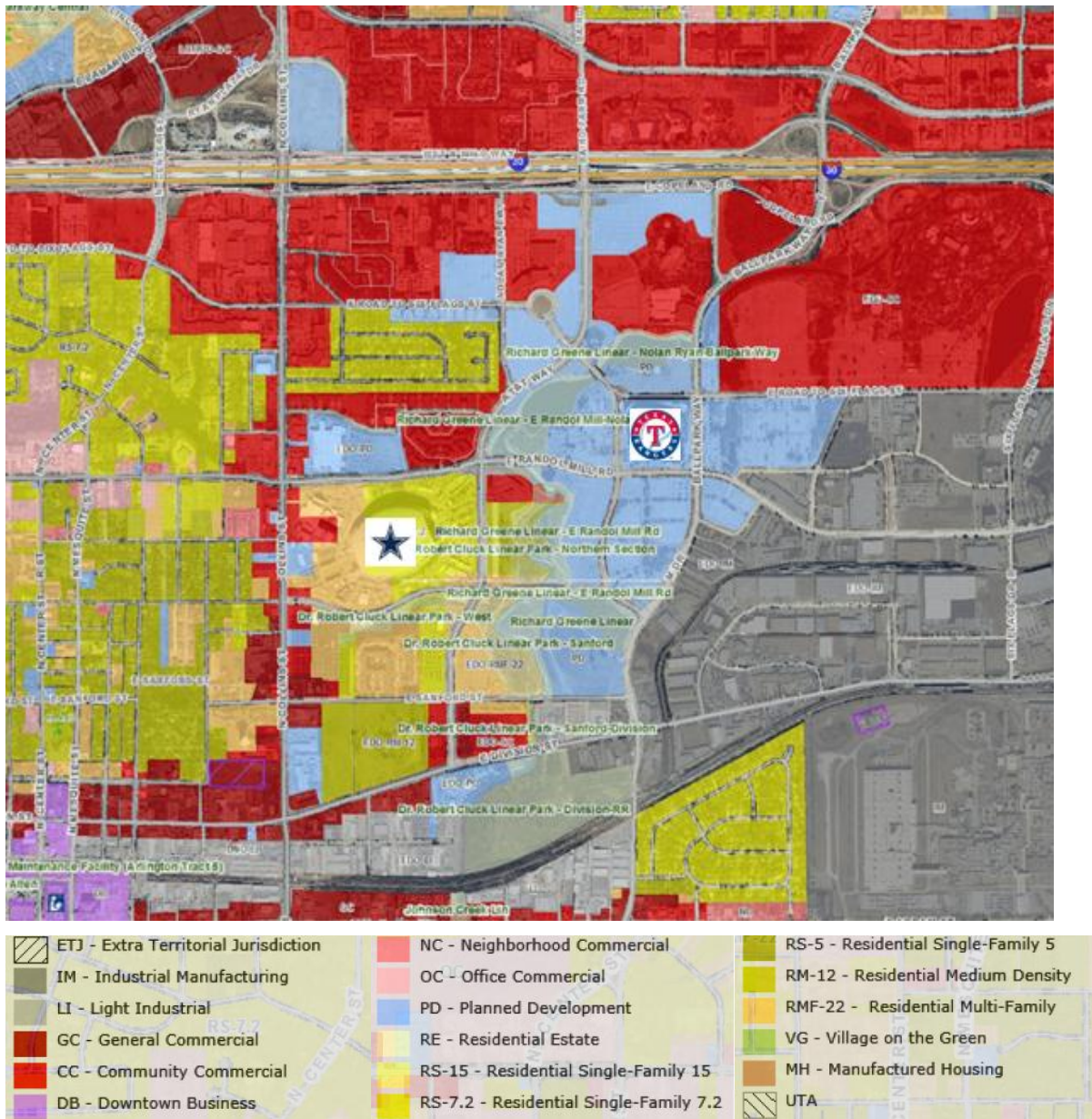


Figure 30. Arlington Zoning

3.1.2: Globe Life Park

In 1994, Globe Life Park was established as part of the Entertainment District. It is owned by the City of Arlington and leased to the team, and President George Bush was an owner and actually helped push to get the stadium built in its beginnings (Globe Life Park 2014). The stadium is considered an office to many; there exists real estate offices and a law firm on top of the Rangers corporate offices, in addition to athletes, grounds crew, cleaning services, media, coaching staff, and other employment roles found throughout the stadium (Globe Life Park 2014). The players each get two underground parking spaces per day, but the remaining stadium staff must pay to park in the surface lots every day (Globe Life Park 2014).

One feature of Globe Life Park that is not found in many stadiums, including AT&T Stadium, is the allowance of outside food as a way to encourage family attendance. The stadium does miss out on concessions income, but as a result the stadium is closer to capacity and people are more likely to become team supporters and attend more games.

Figure 20 reveals a rail station in close proximity to Globe Life Park and two large blocks away from AT&T Stadium. While it is not a transit rail line, the preexisting infrastructure provides opportunity for potential future passenger rail. This station is actually closer than some of the parking lots used for AT&T Stadium events, so its usage for both stadiums and even the Convention Center and Six Flags is feasible.

The land use map of the co-located stadiums conveys the surface parking lot problem of the area. The parking provided for the retail and office land uses is justifiable, but the seemingly endless sea of concrete lots is unnecessary. It creates a stressful barrier for pedestrians and could only possibly be attractive to the eye when filled with tailgaters those few days of the year. Similarly, the large industrial land use to the southeast of the complex creates a large barrier. Users of these industrial services are most likely not affected by the stadiums' proximity, so these parcels would be better served as different activities.

Some dining is currently available to the north and west of AT&T Stadium and southeast of Globe Life Park, although the orientation of this southeastern retail suggests it is geared for the contiguous office and service land uses. Because of the nature of AT&T Stadium, with many activities, retail, dining, and drinking opportunities within the structure, such land uses are not completely necessary in order to please crowds. The implementation of these services would show the City of Arlington's support of the stadiums, but may anger the stadium organizations because they would effectively lose concessions money.

3.1.3: AT&T Stadium

When construction on AT&T Stadium began in 2005, preexisting infrastructure moved to accommodate the new stadium siting (Payne 2014). Bonds financed half of AT&T Stadium and the remainder came from a sales tax (Payne 2014). So, the public funded half of the stadium, which makes more revenue and operating income both by a margin than any of the other 60 stadiums analyzed in this paper. Since the net operating income of the stadium is so high, perhaps some of this originally public money can be allocated to improve the surrounding infrastructure.

The stadium's presence did improve the area overall, as it used to be covered in dilapidated housing (Payne 2014). Eminent domain turned 167 properties, after which a constitutional amendment was passed to ban the use of eminent domain for purely economic development reasons (Payne 2014). The alternative action is to negotiate with the property owners. Now, the overall land use structure surrounding the two sites together seems to be residential and restaurants to the northwest, other points of interest to the northeast, and industrial warehouses and services to the southeast, leaving a confused zone to the south (see *Figure 25*). One thing to note about the northwest residential and retail is that there is almost as much signage in Spanish as there is in English. This reveals the demographic displaced by the incoming stadium, and leaves equity up for question. Related, many of the orange service land uses in *Figure 25* are car shops, pawn shops, and other LULUs (locally unwanted land uses).

Nicknamed “Jerry World” after Cowboys owner, GM, and subsequent real estate mogul Jerry Jones, AT&T Stadium is intended to provide a professional experience like no other. And I paid less than the average ticket price at any football stadium – only \$30 – to be admitted into the “Party Plazas.” This “Party Pass” does not guarantee purchasers a seat, rather the ability to stand within marked zones on each tier of the stadium at both endzones. AT&T Stadium was the first to implement this level in the ticketing structure. Fans are able to experience a Cowboys game at a very cheap rate, generating added income for the organization, without the expense of more tiered seating.

Just when America thought Jerry World was over-the-top, Mr. Jones announced plans for the Dallas Cowboys Headquarters 40 miles northeast of Arlington, in Frisco (see *Figure 31*). This 91-acre site titled “The Star in Frisco” will include a 12,000-square-foot multipurpose indoor stadium, practice fields, a conference center, and office buildings, with the remainder of the site under private development by the Jones’ family business (Wigglesworth 2014). Will this become a trend throughout the League? And what kind of economic development opportunities does this entail? This is one type of urban design implementation that would make it difficult for a franchise to leave. Perhaps it is not ironic that the plans for Champions Park moved forward shortly after The Star in Frisco finalized its plans. “Officials said the five points in the star represent five key traits for the Frisco project: performance, amateur competition, health and wellness, engagement and entertainment” (Wigglesworth 2014) – traits on which other stadium locations may greatly improve.



Figure 31. The Star in Frisco

3.2: Denver

While Arlington provides an example both of intercity site locations and of co-located stadiums, Denver, Colorado features a central rim stadium and an interior stadium on almost

opposite sides of the CBD, despite being just 1.5 miles apart. After touring both Sports Authority Field at Mile High Stadium and Coors Field and attending a Denver Broncos game in December 2014, the differences in the stadium locations are noticeable and reflected throughout each stadium’s design. The City and County of Denver provides an example of middle-of-the-road siting in the Denver Broncos’ stadium and an example of a well-planned location by Coors Field.

3.2.1: City and County of Denver Zoning

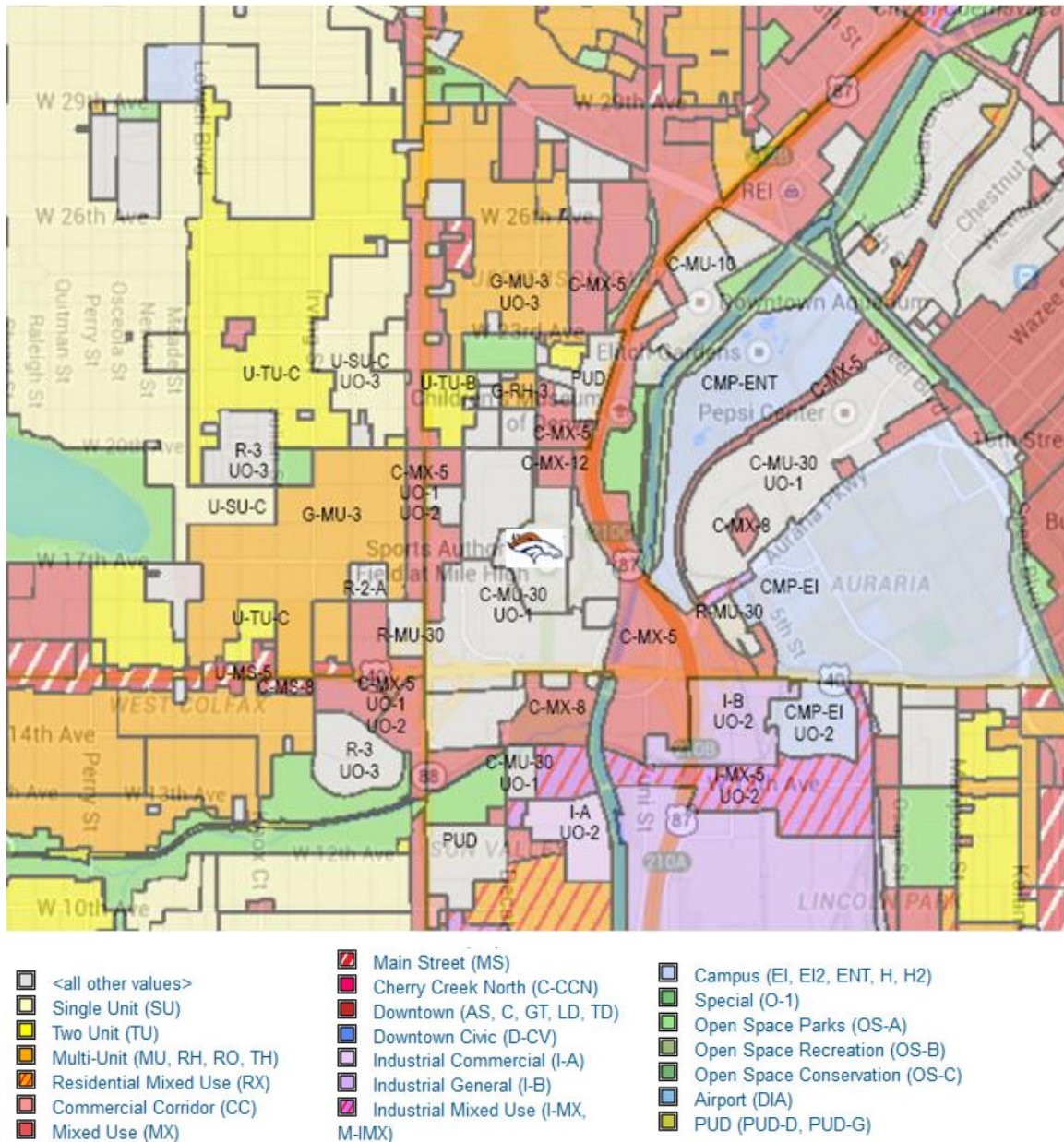


Figure 32. Sports Authority Field at Mile High Stadium Zoning

Figure 32 and Figure 33 display the zoning of the stadiums’ neighborhoods. While the Broncos’ neighborhood is covered in segmented mixed-use, the Rockies’ neighborhood is dominated by it. The football stadium is seemingly surrounded by rings of different land uses;

mixed-use, open space and parks, college campus, multi-family residential, two-unit housing, and single-unit housing radiate outward from the site. One exception is the pink industrial parcel southeast of the stadium. Meanwhile, Coors Field is segmented directionally: mixed-use development commands the south and the west; multi-family housing is found in the east; and both industrial and industrial mixed-use are to the north. Parks and open space are sprinkled throughout, providing equitable access. It is expected that the industrial land use continues to phase out as the relatively new downtown district surrounding Coors Field continues to grow (Sugar 2014).

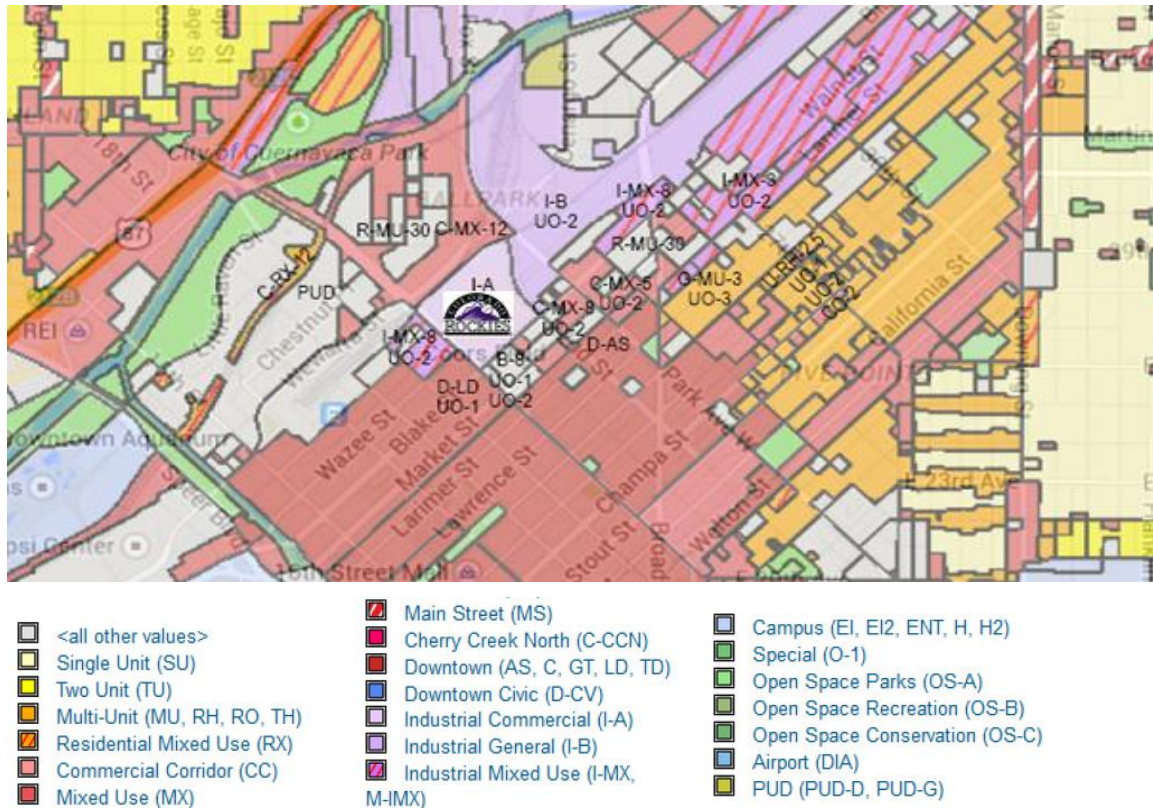


Figure 33. Coors Field Zoning

3.2.2: Sports Authority Field at Mile High Stadium

The current Denver football stadium was developed adjacent to the former home of the Denver Broncos after narrowly passing in a much debated public referendum vote, partly due to the team’s undefeated status late in the season (Sugar 2014). The previous stadium underwent many expansions before a new stadium became economically sensible (Sugar 2014). But because of the wide opposition, the stadium decision-makers employed certain methods to turn the area into a space for the public such as selling the old stadium’s seats to fund public art in the plaza and providing greenspace often used to enhance the tailgating experience (Sports Authority 2014). During the tour, there were several events going on despite it being less than 48 hours until the next home game, including a high school dance and a corporate party. The stadium is also home to the professional lacrosse team, the Denver Outlaws (Sports Authority 2014). Sports Authority Field at Mile High Stadium has developed a reputation for big business and now moves at least 300 people through its doors every day as any space except the Broncos’ locker room and the owner’s suite may be booked (Sports Authority 2014).

These trends are sustainable practice for the Denver Broncos, however once visitors step outside of the stadium, there is not much else to do. The site is serviced by Denver's light rail system and pedestrian paths have formed a lengthy stride to Denver's Downtown district, "LoDo," (nicknamed from "Lower Downtown") but the surrounding buildings exist across surface parking lots and do not provide the most desirable of services. In studying the surrounding land uses, the area is currently undergoing change. There is a theme of business incubators, specialty hospitals, shared parking lots used as other event space, and most prominently new multi-family residential buildings. Such a large amount of new residences implies that the area is desirable and the local planners and developers are attempting to upgrade the space. An interesting change noticed regarding the site's roadways is that many blocks have been cut in half by new streets in recent years and often to serve the new denser development. Historically, the set of parcels comprising this area were large and almost completely owned by the City, the Denver Housing Authority, and Xcel Energy (Sugar 2014). So, the subdivision of these parcels signifies a move toward smaller land uses thus more dense and sustainable development.

Sports Authority Field at Mile High Stadium is currently looking at the potential for the south side of the stadium, where there is the Decatur-Federal Station light rail line, two connecting linear parks along the South Platte River, undeveloped parcels, and dilapidated buildings (Sugar 2014). The biggest barrier is the major right-of-way, but proper urban designing can belittle the roadway giant and alter the pedestrian experience.

3.2.3: Coors Field

In order to attract a baseball team, Denver knew it had to follow the lead of other cities and construct a baseball-only facility. A one percent sales tax vote passed in 1990 and construction began in 1992 (Coors Field 2014). Coors Field is located in what was once an old, dilapidated warehouse district having cheap land prices (Coors Field 2014). Once the neighborhood was named as a priority of the mayor, the stadium was established and has driven the development of "LoDo," which is considered the CBD of the Denver metropolitan area (Sugar 2014). Coors Brewing Company, headquartered in nearby Golden, Colorado and the largest single brewery in the world, had room to grow, so they bought the team, but not the stadium, and built the first brewery that was part of an athletic stadium, eventually becoming Blue Moon Brewing Company (Coors Field 2014). Following suit, the area is now characterized by one of the highest densities of liquor licenses, as reflected by the wealth of dining establishments arising in *Figure 27* (Sugar 2014).

The light rail line contributed to the success of the stadium states (Sugar 2014). Union Station, a convening point for Denver's light rail lines, is just two blocks from Coors Field, helping increase attendance and establishing a sense of permanence. Adjacent to this station and northeast of Coors Field exists a surge of new residential development in the form of apartments, condos, and lofts. An increase in demand for residential land use in an area is one signal of an area's success; something about the neighborhood makes people want to be there all the time.

While *Figure 27* may display substantial parking, it is deceiving because it is segmented and spread throughout the grid of streets. Additionally, most of this parking belongs to the adjacent retail, office, and residential buildings. Dining and drinking establishments dominate the land, paralleling the area's reputation of having a high number of liquor licenses. The

location quotient of breweries in the Denver MSA is extremely high at 4.95, supporting this case (Bureau of Labor Statistics 2014).

3.3: Atlanta

Atlanta professional sports teams are prominent in business news today because both football and baseball teams are currently constructing new stadiums. The Falcons and the Braves are set to move into new stadiums for the 2017 season; the Falcons' new stadium is due south of its current stadium but the Braves new stadium is in a different county, 11.5 linear miles from the team's longtime home at Turner Field (Google Earth Pro 2015). If the current Atlanta Braves stadium had implemented sustainable surrounding development, both the game attendance rates and the neighborhood would be better for it.

3.3.1: City of Atlanta Zoning

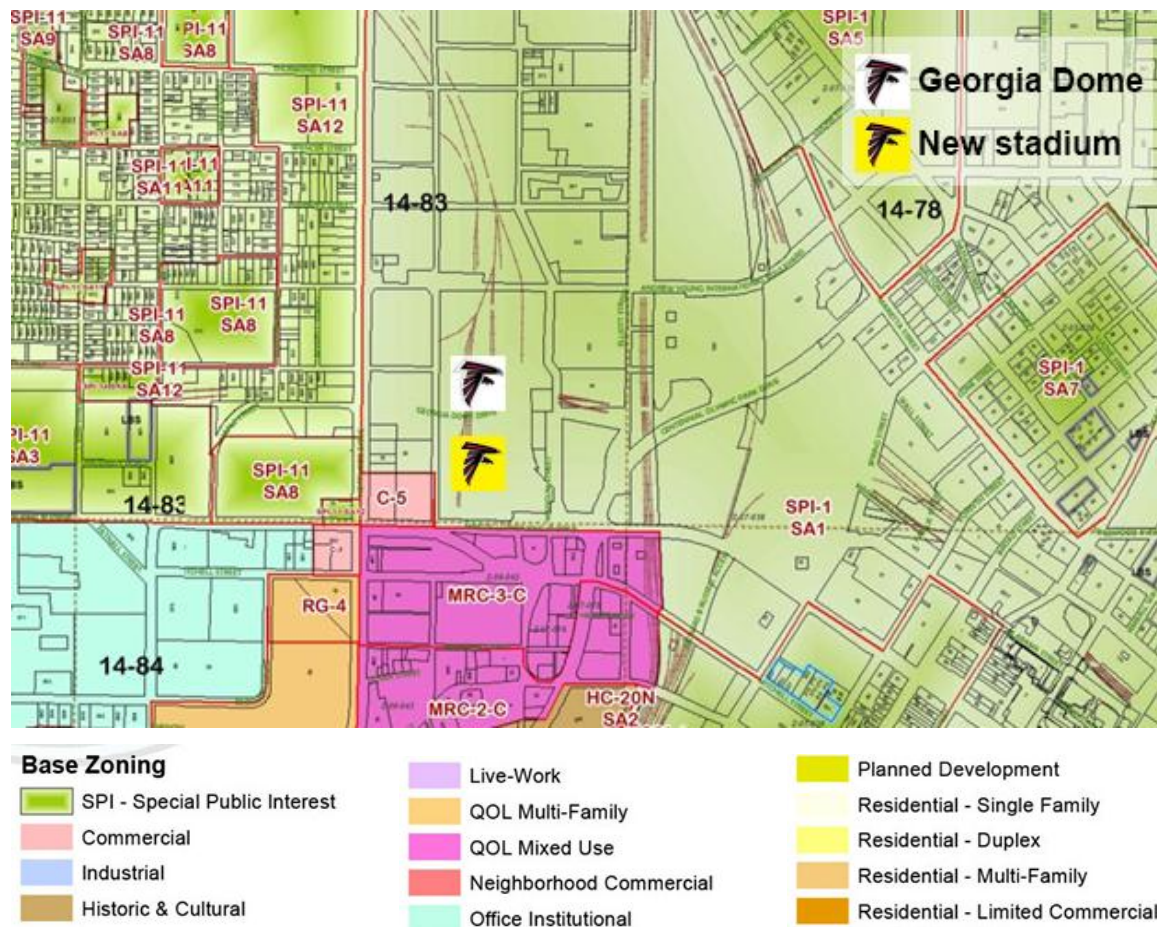


Figure 34. Georgia Dome Zoning

While the surrounding lands of both the Georgia Dome and Turner Field are comprised predominantly of special public interest, mixed-use, some multi-family housing, and small representation by office institutional zoning, the areas have different land use patterns. The Georgia Dome in Figure 35 is properly located in a special public interest zoning district. The interesting thing about this zoning classification in this area is that both the low-income housing to the west and the downtown gridded streets to the east are zoned the same despite having very

different environments – small, single family homes versus densely packed skyscrapers. Similar to the campus zoning found to the west of Sports Authority Field at Mile High Stadium, the Georgia Dome has the Atlanta University Center southwest of its site (the zoning colored blue in *Figure 34*). The presence of mixed-use zoning with some commercial zoning by the stadium parallels the precedent recommendations found in the literature review. Fortunately, there is no industrial zoning present in the viewport.

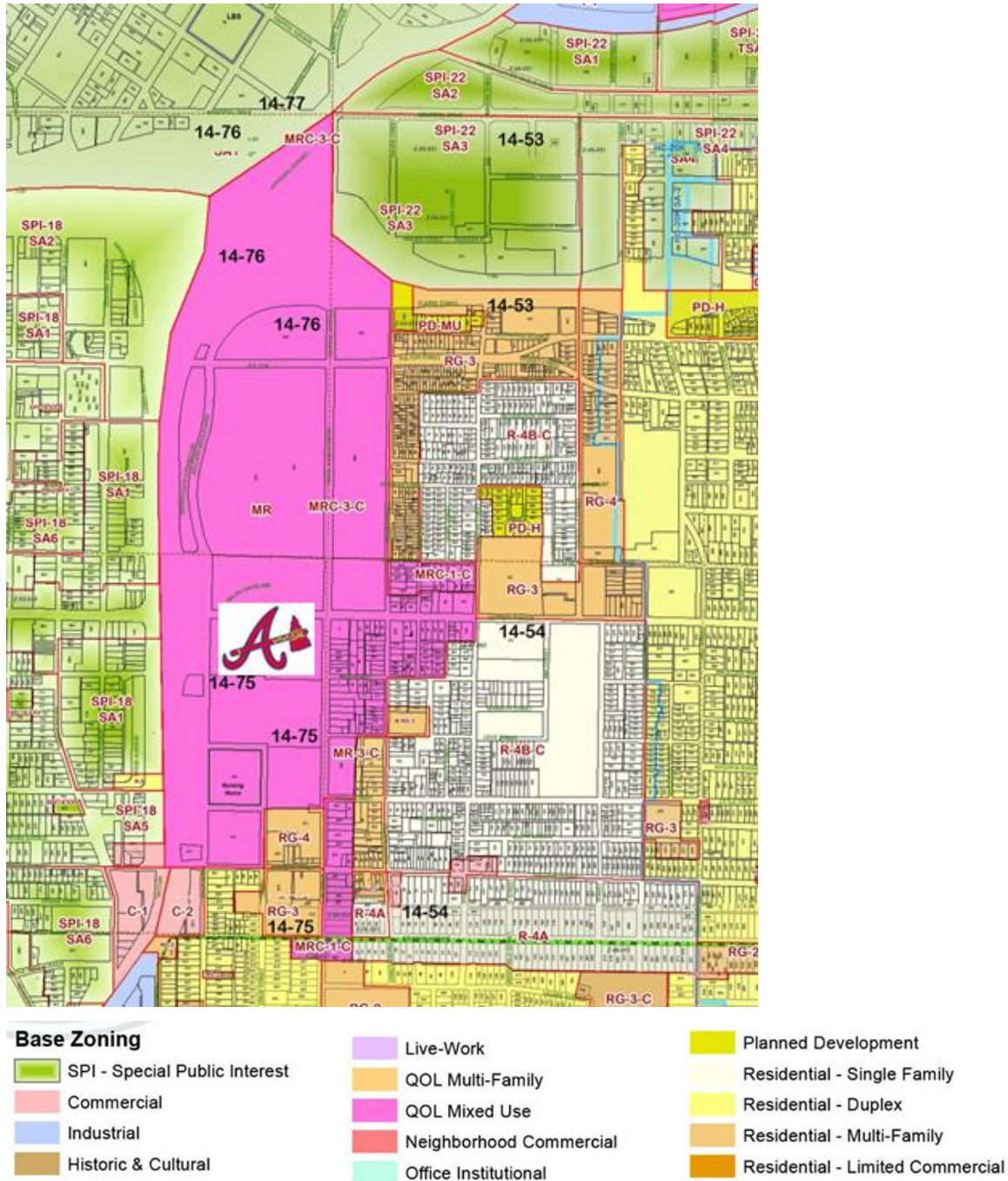


Figure 35. Turner Field Zoning

The zoning found around Turner Field is quite contrasting (see *Figure 35*). While it is predominately zoned for single-family housing, unlike the same development zoned special

public interest to the east of the Georgia Dome, the square mileage of these parcels combined with the other residentially zoned parcels is much greater than the literature recommends. Special interest zoning appears in this area, too, but it is only found across Interstate-75/85 to the west of the stadium and across Interstate-20 to the north of the stadium within this viewport. Also unlike the Georgia Dome site, there exists some industrial zoning to the northeast and southwest. There is even less commercial zoning and the stadium grounds are peculiarly zoned mixed-use. Technically, the stadium provides retail, dining, offices, and recreational activities, but the retail, dining, and recreational activity are only open during games. Also, the majority of this mixed-use-zoned land is actually surface parking.

3.3.2: Georgia Dome

Figure 23 displays the nearly complete, larger-blocked grid structure of the Atlanta Falcons' neighborhood. The grid can not continue due to large land uses including the Georgia World Congress Center to the north and Philips Arena to the east, for example, both displayed as points of interest in *Figure 28*. Similar to the pattern found northwest of Sports Authority Field at Mile High Stadium, the primarily residential streets (also to the northwest) have small streets within the established grid, presumably to increase density.

This neighborhood displays the largest percentage of points of interest than any of the other study areas; there are two schools, three churches, one of the largest and busiest convention centers in the world, the home of the National Basketball Association's Atlanta Hawks, and the newly completed College Football Hall of Fame. Points of interest are characterized by high volumes of people accessing the site year-round, and this area certainly carries that characteristic.

3.3.3: Turner Field

Contrasting the Falcons' neighborhood, the only point of interest found in the Turner Field area is a church located west of Turner Field, across Interstate-75/85. Almost all of the infrastructure in *Figure 29* is surface parking, residential, or dilapidated buildings, while the remaining land uses are only each represented by one or two buildings, besides the small group of offices located northwest of the stadium across the interstate. The development that does exist is not characterized by density, which is not sustainable stadium design. These vacant lots are often kept for parking because the money generated is more profitable to the family that owns most of the parcels, but a disadvantage of this occurrence to the economy is the fact that this abundance of vacant land is not subject to paying taxes (Bascuñana et al. 2014).

Certain land uses discourage economic development-gearred land uses to the area, which needs to change (Bascuñana et al. 2014). The existence of multiple funeral & assisted living homes, no rail station, dilapidated buildings, and graffiti covering these buildings are not characteristics of an environment facilitating active livable urban design that would attract visitors.

The Summerhill stadium was constructed as a track stadium for the 1996 Olympics using the "Overlay Method," meaning it was first designed as baseball stadium, and then altered to meet the requirements of its Olympic use (Petersen 2001). "When it was built, Turner Field offered more amenities and entertainment options than any other major-league ballpark," including the two-level Chophouse pub, the Braves Museum and Hall of Fame, Scout's Alley,

and Cartoon Network's Tooner Field, all employed to encourage fans to arrive early to games (Petersen 2001).

Perhaps too much focus was on the multi-purposeness of the stadium, leaving what is outside the stadium in the dust. In a study of neighborhood home prices done by Forbes and Trulia across all American ballparks (so Toronto is the only stadium left out), it is revealed that the Atlanta Braves' neighborhood has the second cheapest rate overall at just \$64 per square foot (Kolko 2015). The least expensive is Kauffman Stadium's neighborhood in Kansas City at \$28 per square foot and the most expensive is the San Francisco Giants' AT&T Park at \$653 per square foot, with the average cost at \$216 per square foot (Kolko 2015). For comparison to the other case studies, Globe Life Park resembles Turner Field with the fifth cheapest rate of \$86 per square foot but Coors Field is the eighth most expensive at \$240 per square foot (Kolko 2015). The new SunTrust Park is developing in Cobb County, an area of metropolitan Atlanta with typically higher residential costs, and it is also constructing its own nearby residential development that is expected to have high rents. While it is improved sustainable economic development for the Atlanta Braves to locate in a higher affluence area, Summerhill will be depleted of almost all life come time for the Braves move in 2017.

An attempt was made at turning Summerhill into more of a destination with the implementation of Fanplex. This "entertainment center" opened through a \$2.5 million investment a few years after the Braves began playing at Turner Field and shut down after two years of operation, reaching a deficit of half of a million dollars (Bennett 2006). Fanplex provided 11,000-square-feet that included a miniature golf course and an arcade, attempting "to pump economic activity into the depressed area around the stadium" (Bennett 2006). The failure is blamed on its non-proximity to fans, but Fanplex is located across the street from the stadium, so it is clear that the Turner Field planners failed to engage the entire perimeter of the site. After laying dilapidated for years, a construction firm began basing a team out of the building during the company's project to construct a 5-million-gallon underground storage tank in the media lot across Hank Aaron Drive (Bennett 2006). That same month, November 2013, the Braves announced plans to leave Turner Field. The Atlanta Braves ended up with a stadium at Turner Field that completely internalized all area retail and does not open up for business on non-game days.

"Sports teams were a critical element of putting Atlanta at another level as a national and international city... It was one of the main ingredients in creating this atmosphere of a city coming into its own" stated former Atlanta Commissioner of Industry, Trade, and Tourism George Berry (Wenk 2015). The establishment of the Atlanta Braves made it easier for Atlanta to attain other professional teams including the Falcons, the NBA's Hawks, and in 2017 a Major League Soccer team and became instrumental in transforming Downtown Atlanta into a top tourism, office, and convention destination (Wenk 2015). The Atlanta Braves also alleviated racial tensions in the southern city, when Hank Aaron became a role model to all through his success on the field and good reputation off the field (Wenk 2015).

Sustainability of the Atlanta Braves was dependent upon business mogul Ted Turner, foremost by his Braves broadcasts on his station across America, forming the basis of widespread "Braves Country"; "If it wasn't for him, I think the Braves would have moved somewhere else" said Phil Niekro, former Braves pitching star (Wenk 2015). As of a 2013 study, an estimated 300,000 fans visit from outside Georgia with over a third of them staying in local hotels (Wenk 2015). But the development of supporting infrastructure has lagged behind

the heavily spirited support of the team. For years, it was argued that Summerhill receive its own MARTA station to support Turner Field, but it never happened. “Developers like the certainty of a rail line” stated MARTA CEO Keith Parker, so this lack in Summerhill drove some potential ex-stadium development away (Parker 2015). In 2013, the Atlanta Braves surprised everyone when they officially decided to end their lease at Turner Field and develop a mixed-use stadium park in an adjacent county outside of Atlanta.

There exists a job mismatch in Summerhill: businesses that desire to locate near the stadium do not have jobs that match the skills and education of the neighborhood residents (Bascuñana et al. 2014). The stadium does bring low-income jobs but does not facilitate the development of such skills into higher paying jobs, which would improve the neighborhood. The stadium jobs keep the residents at the poverty level; the masterplan lacks job diversity (Bascuñana et al. 2014). The new stadium’s location’s “labor market has gotten off to a solid start in January and February [2015] and it continues to strengthen and should create between 250,000 and 275,000 net new jobs per month” stated Reis economist and research director Ryan Severino (Sams 2015).

Turner Field is not a failure by any means. In fact, it noticeably excels in one area other arenas do not typically, perhaps besides the existence of the Blue Moon brewery in Coors Field: the use of local dining and retail options at the stadium. As discussed in the literature review, income to a stadium is no good if it is just going to be spent outside the market, exiting the local economy. Turner Field employs several Atlanta-based retail options inside its stadium: Holeman and Finch Public House (known for their burgers and buns, specifically); Chick-Fil-A and Waffle House, both widespread chains that are headquartered inside Atlanta; the restriction of non-alcoholic beverages to Coca-Cola, also headquartered in Atlanta; and pouring rights to the nationally expanding Sweetwater Brewing Company, headquartered in Atlanta as well.

3.3.4: SunTrust Park

The new Braves stadium is to include a hotel, restaurants, shopping, housing, offices, and outdoor public gathering spaces. “It’s an attempt for the Braves to have more control over its revenue inside and outside the ballpark [after] efforts to spark redevelopment around Turner Field didn’t get off the ground in Atlanta” (Wenk 2015). However, the Braves are making one mistake that presents a threat to the sustainability of the team in the location: there are no current plans for MARTA bus or rail connections to SunTrust Park (Parker 2015). “Although there have been some notable large lease transactions over the past couple of years in the suburbs, more companies continue to focus on intown areas offering mass transportation options (such as MARTA) to better recruit and retain young talent, said Logan Menne, research manager with Cushman & Wakefield Atlanta” (Sams 2014). If Cobb County can approve the extension of MARTA along the Interstate-75 corridor, which extends from Downtown Atlanta up through SunTrust Park’s neighborhood and directly to the major suburbs of Marietta and Kennesaw, the stadium’s city rim location classification could be more successful.



Figure 36. SunTrust Park Relation to Atlanta and Buckhead

(Source: Atlanta Braves 2014)

To a city planner, the rendering of *Figure 36* is not attractive; rather than conveying its relation to major activity centers, the highlighted interstates accentuate the dreaded distance that must be traveled by personal vehicle. The lack of proximity is not only a negative traffic implication, but provides negative safety implications as well. The more people on the road means more road accidents. Additionally, Braves games are a social experience to many, which is accentuated by the stadium's heavy advertisement of alcohol, and many game goers today rely on public transportation to avoid DUI incidences. And the Braves deliberate intentions to provide other dining and drinking establishments in the stadium's surrounding developments only further supports the case for an Interstate-75 corridor rail line accessing the stadium. Additionally, as aforementioned, if this line included a stop especially for the stadium area and perhaps named after it, the Braves will be more likely to stay rather than shock the public with another move in the future.



Figure 37. SunTrust Park Development
(Source: Atlanta Braves 2015).

Section 4: Conclusion

“At the end of the day, the stadium should be an opportunity to accelerate change,” states Atlanta businessman Arthur Blank (Saporta 2015). Often, decision-makers and the voting public see a large investment number and shut down the proposal without question. But, it is important to consider the initial cost savings versus the savings over time, and how the sustainable planning of a stadium can result in positive changes to the city’s economy, accessibility, equity, sustainability, utility, and livability. Once this hurdle is realized and crossed, the ability for positive change becomes more feasible. I have developed a list of recommendations that would improve the sustainability of professional athletic stadium sites within the United States.

4.1: Recommendations

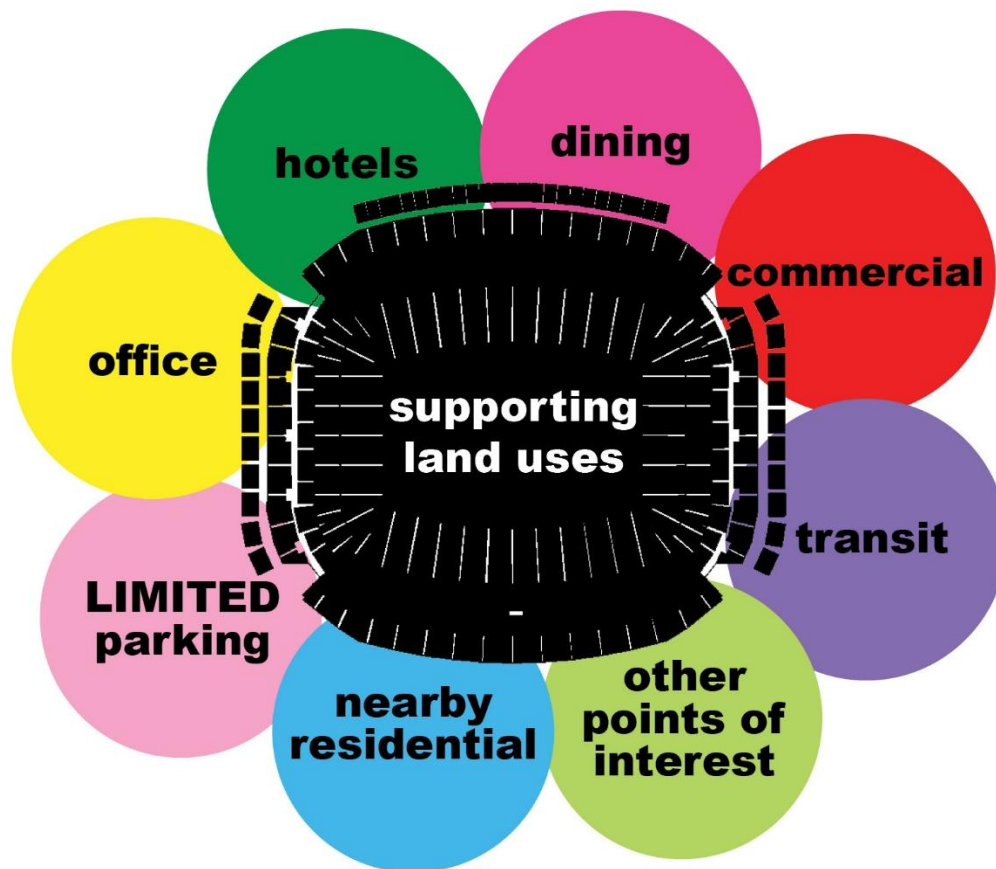


Figure 38. Optimal Surrounding Land Uses for Stadiums

1. Locate adjacent to the eight prime land uses.

Land use is examined throughout this paper through the lenses of zoning, access, program attributes, and relation to the stadium program. *Figure 38* depicts each land use color coded to match the figuregrounds created in the study. The importance of each land use has been conveyed throughout the study, but best stadium planning practice considers each land use’s influence on one another as well. Each land use interacts with every other land use to form an

interactive urban fabric. The only missing link in this interaction is the people, who will arrive once this environment is created and attracts them.

2. Site in the core or at the central edge.

The location classification study reveals that 47 percent of today's 62 NFL and MLB teams are based in stadiums within their city's CBD (core or central edge locations). This is a common location historically, but over time, teams have moved further and further away from CBDs, including the Atlanta Braves. Turner Field did not gain adjacent development and SunTrust Park does not have plans for rail or BRT (bus rapid transit) MARTA service, so the Braves should have constructed the new stadium by the new Falcons stadium. The baseball team could have taken over and redeveloped the existing Georgia Dome which is already scheduled to be demolished and become parking that serves the adjacent new Falcons stadium. Not only would this bulk up the entertainment district, but it would add to the number of other points of interest for both stadium sites. Turner Field and SunTrust Park have no other points of interest in close proximity; the closest location for either stadium is the Cumberland Mall, sited three-quarters of a mile southwest of SunTrust Park, across major Interstate-285 and twelve-lane Cobb Parkway, implying low walkability. This location already has established offices, hotels, dining, retail, residential, network of downtown parking, and its own MARTA rail station, covering all eight of *Figure 38*'s optimal surrounding land uses for stadiums.

3. Locate at a transit station or establish a new transit station at the stadium.

Bus stations are relatively simple to connect to stadium sites while rail stations establish a sense of permanence, especially if the station is named after the stadium, like the Georgia Dome. Locating where there is already a transit station avoids the politics, money, and time that comes with the addition of a new facility. Even though stadiums benefit greatly from parking fees, ignoring transit access to the stadium increases traffic on the road network, increases the amount of necessary parking facilities, eliminates the ability for some fans to attend games, and heightens the possibility for reckless driving and/or driving under the influence. The benefit of locating closer to the CBD is that it increases the likelihood of a preexisting transit stop, so the team would not need extra money to extend the line and construct the facility. The inclusion of the land uses from *Figure 38* around the stadium supplies even more travelers who would use the transit station. Having a transit station is significant to the team's sustainability in the town.

4. Form an aesthetically pleasing atmosphere of local retailers that turns the stadium inside-out.

No major sport is year-round, but restaurants and retail normally are. Food and beverages compose 35 to 55 percent of gross sales at stadiums (Petersen 2001). This profit streams directly to the stadium, but fans could spend it at places outside the stadium instead, generally for much cheaper. While a higher cost means higher taxes going back to the city, the fact that the money could become income for local shops becomes an argument for equity. For example, the cheapest beer available for purchase during games for all 62 teams costs an average of 44 cents per ounce (\$5.28 for a 12-ounce pour), as calculated from Team Marketing Report data. Tailgate Tavern, the closest pre-game location to the Arlington stadiums, advertised their 2015 Texas Rangers Opening Day beer prices at \$2.00 per draft (Tailgate Tavern 2015). Fans will be more likely to attend the game if they can spend less on food and beverage before and after the game instead of inside the expensive stadium. Some stadiums like the Rangers' Globe

Life Park allow outside food and non-alcoholic beverages, which is something the adjacent retail can market and capitalize on. But none of this benefits the local economy significantly unless these vendors are local. Turner Field fortunately employs Holeman and Finch, Chick-Fil-A, Waffle House, Coca-Cola, and Sweetwater, whose local headquarters spend their income within the market they reside – Atlanta. Not only does this benefit the economy, but it provides local familiarity and generally has a good reputation with local fans.

Urban design plays a large part in this recommended retail environment. Instead of massive stadiums towering over the street with seemingly endless blank walls, the programs on the other side of these walls could open up to the street. This engagement would benefit the stadium because then its client base extends from fans to fans and neighborhood visitors. And if the stadium's neighborhood is the CBD, then this number skyrockets. Building interaction with the street creates a more livable aesthetic, especially if these vendors included attractive dining characteristics like outdoor patios, balconies with a view, bars with locally-brewed options, a view inside the stadium, a sports, league, or team theme to the restaurant, and appearances by the mascot or players. Sufficient marketing of these spaces will both attract fans to the retail, and attract retail customers to attend the game. Thus, revenue is increased for both the stadium and the retailers.

In order to have a stadium site that is heavily accessed year-round, not just during the sport's season, it is important to cater to other events including concerts, conventions, trade shows, food and beer festivals, youth and collegiate athletic competitions, and national championships. Having a stadium that engages well with the city's urban fabric and provides supplemental activities such as dining, shopping, and sightseeing for visitors is a convincing factor in event planners' quest for a site. Not only does this keep the location lively, but it also invites more visitors to insert money into the local economy via retail and parking fees.

4.2: Future Implications

This study presents many opportunities for further research. The principal missing link the affecting the robustness of this study was the inability to visit all 62 stadiums. It would be beneficial to visit each stadium and experience a game, the surrounding neighborhood, and the roadway and transit conditions. Stadium tours become helpful on top of the game experience because they provide information and access to spaces regular game goers do not experience. The most important component outside the scope of this study is economic analysis. While approaches to measurement of economic benefits are hotly debated, further studies on this topic could explore what levels of revenue come from what sources and where that money is spent in order to evaluate the economic impacts of stadiums and teams. The third and final desirable in-depth study related to sustainable stadium planning is the urban design aspect. Stadium architecture, supporting infrastructure design, and neighborhood planning must respond to one another to maximize the utility of all residents, workers, and visitors. In order to sustainably site a stadium with its surrounding development, it is important to fully understand how economic development and urban design can mutually benefit and work together to improve the city as a whole.

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