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An Ideal-Type through Innovation Diffusion: Recording the Construction History of Football Stadiums in the National Collegiate Athletic Association Division I Football Bowl Subdivision (FBS)

Patrick Michael Tutka
Louisiana State University and Agricultural and Mechanical College

AN IDEAL-TYPE THROUGH INNOVATION DIFFUSION: RECORDING THE CONSTRUCTION HISTORY OF FOOTBALL STADIUMS IN THE NATIONAL COLLEGIATE ATHLETIC ASSOCIATION DIVISION I FOOTBALL BOWL SUBDIVISION (FBS)

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Patrick Michael Tutka
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M.S. Louisiana State University, 2011
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This dissertation is dedicated to my wife Carrie Tutka, my mother Barbara Rocker, my second mother and father Debbie and Stephen Barlowe, and all the rest of my amazing friends and family that helped make this possible.

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Abstract

Dr. John Bale (1984) argued sport scholars need to examine whether innovation diffusion occurred in sport. Rogers (1962, 2003) argued innovation diffusion process involves the following: 1) an innovation; 2) an available communication system(s); and occurs 3) over time; and 4) among members of a social system (p. 11). This project also adds geography as suggested by Bale (1984) and Hagerstrand (1952, 1953) to the study of innovation diffusion. The purpose of the current project is to examine whether innovation diffusion exists within the strong social system of college football. The study involvess the collection of data on college football from 1869 to 2014 to examine whether the concept of diffusion of innovation theory can be found in Division I Football Bowl Subdivsion (FBS).

The investigation concludess that five stages exist concerning the development of the college football stadium. Stage One starts with the development of college football from its humble beginnings as temporary facilities until the development of Harvard Stadium, the first reinforced concrete and steel venue. Stage Two is the golden age of college football stadium construction as the innovation of reinforced concrete and steel diffused to universities around the United States. Stage Three acknowledges the innovations occurring during the Great Depression and how both federal and state governments invested in stadiums as part of public works projects. Stage Four examines technology innovations such as television, artificial turf, modern scoreboards, and luxury areas and their respective impacts on the stadium. The final stage, Stage Five, examines the additions of luxury spaces to almost every venue along with the development of the modern video board.

This project finds innovation diffusion occurrs throughout time within Division I FBS. The project also concludes that due to improved communications technology and easing of the

travel challenges, traditional geography as discussed by Bale (1984) influenced innovation diffusion in the earlier stages (i.e., Stages One through Three) while virtual geography influences innovation diffusion in later stages (i.e., Stage Four and Five). The project also finds that renovation was more common than new construction, and that rehabilitation occurs more than any other types of renovation.

Chapter One: Introduction

For many college football fans, the name of their home stadium triggers vivid memories and visions based on past experiences and iconic moments they experienced in person or via some communication technology (e.g., radio, television, and internet). These venues serve as social anchors for the universities they represent, capturing attention from their size as well as the atmosphere of memories created each fall (Riesman & Denney, 1951; Seifried & Clopton, 2013; Watterson, 2002). As an example, the events hosted within these facilities provide spectators with unique experiences due to the importance and/or uncertainty of outcomes and other associated spectacles such as tailgating, the playing of the band, and participating in cheers (Riesman & Denney, 1951; Schmidt, 2007; Sheard, 2001; Smith, 2005).

Interestingly, many works on intercollegiate football view stadiums as a critical part of institutional survival due to their revenue generating capacity, fundraising capability, and branding potential associated with the aforementioned entertainment values (Dunnavant, 2004; Gubi, 2011; Ingrassia, 2012; Oriard, 2001; Schmidt, 2007; Smith, 2005; Watterson, 2002). Strategically constructed at the center of an institution's campus for the university's fan base (e.g., alumni, students, and local community), it is important to note that stadiums regularly embraced innovations to meet spectator (i.e., live or remote) and participant preferences to help toward the goal of institutional survival (Ingrassia, 2012; Schmidt, 2007; Smith, 2008; Watterson, 2002). Moreover, these innovations were shared amongst the institution of college football to help the sport survive and advance into subsequent decades since the 1860s.

Sport Geographer John Bale (1984) argued the growth and spread of modern sport should be "conceptualized as a form of innovation diffusion" because it occurred through a somewhat predictable non-random "series of events" greatly influenced by technology, geographic location,

entrepreneurs, and environmental conditions (Bale, 1984, p. 38). Rogers (2003), attempting to define innovation diffusion, described it as "the process by which the adoption of innovation by member(s) of a social system is communicated through certain channels and over time triggers mechanisms that increase the probability of its adoption by other members who have not yet adopted it" (p. 20). Within, Rogers' (2003) Diffusion of Innovation Theory argued the innovation diffusion involves an: 1) innovation; 2) available communication system(s); and occurs 3) over time; and 4) among members of a social system (p. 11). Moreover, Rogers positioned innovation diffusion as a useful topic to study for a variety of disciplines such as management, public administration, communications, marketing, psychology, and technology.

Bale (1984) and Hong (2012) noted traditional diffusion research in sport is generally limited to anthropological or cultural-centered diffusion and lacks a broader conceptual or theoretical frame to describe the innovation diffusion process. This lack of attention is notable because of the prominent status sport plays to innovation and its ability to support unique future and concurrent products and services (Chacar & Hesterly, 2004; Seifried & Katz, 2015). Within the management field, several scholars note sport involves the development and spread of innovation, supporting a wide variety of different products and services going on simultaneously (Chacar & Hesterly, 2004; Seifried & Katz, 2015). Some examples of recent stadium innovations include revenue-producing club seats and suites, high definition video boards, new concessions options, and a higher degree of interactivity with both remote and live spectators (Seifried, 2010a; Williams & Seifried, 2013).

Purpose

The purpose of this dissertation is to analyze major American college football facilities of the Division I Football Bowl Subdivision (FBS) from the National Collegiate Athletic

Association (NCAA) during the late 19th century to 2015 in order to better understand the concept of innovation diffusion as a complete process. While several authors build on Rogers's theory (e.g., Damanpour, 1996; Wolfe, 1994), the Diffusion of Innovation Theory is incomplete. Of particular interest to the current dissertation is the changing nature of geography. The traditional view of geography within innovation diffusion (i.e., neighborhood effect and hierarchal effect) should be revised in light of the modernization of society. In essence, the way in which members of social systems share information has changed. No longer is geography limited by physical space for the diffusion of innovations. Due to communications technology, information can move rapidly from one region to another. "Virtual geography" allow members of the social system in remote locations and potentially far away from the innovation to acquire information about an innovation through advancements in communication and transportation technology (Seifried, 2011). This effort to better understand the impact and change of geography honors the call by Damanpour and Schneider (2009) who argued for more intense study of "innovation characteristics on innovation adoption in organizations" to help them achieve and/or fulfill their goals and/or mission (p. 497).

Within this dissertation, the historical method is used and an ideal-type is employed as a heuristic device to explain the various stages of college football stadium construction (i.e., evolution) within the framework of innovation diffusion. Seifried (2010a) noted the development of American sport facilities fits well into the concept of the ideal-type. The ideal-type device allows scholars to use simplified examples of real world change in flexible stages, providing readers a better understanding of facility development and innovation diffusion over time. This dissertation follows previous ideal-type facility studies conducted by Bale (2001) and Seifried (2010a). Both scholars implemented an ideal-type heuristic device to explain the changes in

facilities over the passage of time. Specifically, Bale's (2001) book, *Sport, Space, and the City,* analyzed the development of professional soccer facilities in England over four distinct stages. Seifried (2010a) used a similar approach to explain the growth and development of professional football and baseball stadiums in the United States. Within, Seifried (2010a) used modernization as a theoretical lens to identify eight stages of development. This dissertation will show that, over time, college football went from being played in open areas and multi-purpose facilities to highly developed modern stadiums complete with all the expected spectator and media amenities. Furthermore, this dissertation analyzes geography, particularly the change from physical geography to virtual geography, which allows interested parties from around the world inside venues through television, the internet and other mediums allows for the increased speed of diffusion across the social system.

The context of the NCAA Division I FBS is attractive because the history of college football stadiums readily shows efforts by institutions of higher education to address concerns and preferences of student-athletes, spectators (i.e., live and remote), the campus community, and other community partners (e.g., sponsors). The long and distinguished history related to college football corresponds with well-developed data and information. Within this point, a variety of other scholars (e.g., Oriard, 2001; Schmidt, 2007; Smith, 2001, 2005; Watterson, 2002) advocated that the NCAA Division I FBS is attractive because their data can help support future practices of athletic departments to make responsible decisions regarding ideas such as whether to renovate or planning to build new. Finally, based on the aforementioned gap of diffusion research and availability of college football stadium information, this dissertation will answer the following questions:

1. Why and how does an innovation (i.e., product or process)—or group of innovations—spread in a population (i.e., Division I FBS)?

- Why and how does geography, social systems (e.g., NCAA, coaches, student-athletes, etc.), and communication channels impact innovation diffusion?
- Can the diffusion of innovations be clusters according to time? If so, can these time periods be placed into the ideal-type as a heuristic device?

2. How were past trends regarding innovations (i.e., product or process) used to help with past facility construction decisions (i.e., renovate or build new) and what expectations does this provide for us regarding the future shape and purpose of college football stadiums and its impact on academics?

3. Are renovations related to college football stadium construction more related to preservation, restoration, reconstruction or rehabilitation or a combination thereof?

4. How does the changing nature of geography (neighborhood, hierarchical, virtual) impact innovation diffusion amongst college football stadiums?

Limitations

The current study involves the collection of archival data. One important limitation to the study is the lack of ability to visit every NCAA Division I FBS school (128 in total as of 2015). An additional limitation is lack of available data about early college sports in general. For most of its early history, college football received limited attention. Thus, many university archives contain limited information regarding their school's football team and stadium changes. Finally, university archives are limited in space, causing early documents to have been lost or damaged as they are stored or been thrown away due to a perceived lack of interest (Watterson, 2002).

Significance

The study provides the first significant usage of innovation diffusion literature in a sport context, as recommended by Bale (1984). Sport provided the researcher with an excellent place to study innovation diffusion, due to the strong social systems that exist in the sport context. Division I FBS is one of these strong social systems. Division I FBS members spend millions on college football and are invested in the construction and continued improvement of the college football stadium. The current study is significant because it uses the strong FBS social system to study the Diffusion of Innovations Theory (Rogers, 2003). The findings appear to support Rogers (2003) theory in that time, communication channels, and social system influence innovation diffusion. The study also supports Bale’s (1984) argument that innovation diffusion is influenced by geography, whether it is traditional geography or virtual geography.

The introduction of the concept of virtual geography is particularly significant, as little research has examined whether the interconnectedness of society has changed the traditional impacts of geography as discussed by Hagerstand (1952, 1953). The current study found support for the idea that geographic diffusion does not have to be spatial in nature, due to the ability because of television and the Internet for organizations far from the original innovator to adopt the new innovations. As Rogers (2003) suggested, organizations within a strong social system such as what is found in the current research, diffuse innovations across the organizational social system. The current study also finds that, as the limitations of geography and communication channels decline, the speed of innovation diffusion increases. Rogers (2003) and Bale (1984) called for other scholars to examine the Diffusion of Innovation theory’s main parts (time, communication channels, social system) and use it to explain the diffusion of innovations. The current study adds to the significant amount of literature on innovation diffusion in management,

marketing, communications and a wide variety of other areas. It builds on these studies through the inclusion of geography and the usage of a largely enclosed social system in NCAA Division I FBS. Through honoring the call of Bale (1984) to use diffusion in sports studies, the current project fills in a significant gap in the literature. For the first time, sport management has a significant study of innovation diffusion in sport. Hopefully the current study encourages future researchers to continue to examine innovation diffusion in the sport context, as undoubtedly other sports experience innovation diffusion. The research also honors the work done by Seifried (2005, 2010) in developing a historical ideal-type for the development of professional football and baseball facilities. The current study examined the multi-stage ideal-type used by Seifried (2005, 2010) to build a similar ideal-type for college football stadium development at the Division I FBS level. The call to use inter-disciplinary research in sport management has been on going for several years, and the current research addresses that gap as well, using history and management concepts to help understand how innovations diffuse through the college football stadium over the previous 140 years.

Summary

The overall purpose of this dissertation is to review the innovations that shaped college football stadiums in the U.S. from the 1860s to the current era and record the diffusion of these innovations from university to university to improve theory on innovation diffusion and advance facility management with respect to stadium renovation and construction. To examine the diffusion of innovations, this dissertation involves the gathering of archival data about stadium changes from universities within NCAA Division I FBS. The current study proposes innovation diffusion helps to explain the development of college football stadiums from the beginnings to modern day. Through the elements of time, communication channels, and geography, the social

system of NCAA Division I FBS adopts many technological innovations as well as various process innovations throughout the top level of college football in the U.S. As college football's popularity allowed the sport to move from a game controlled by students to one managed by university leaders, stadiums developed across the country (Ingrassia, 2012; Smith, 2005). Structures further moved from wood to concrete and steel, due to desires for large stadiums, less long-term maintenance cost and more profits for teams around the country (Schmidt, 2007; Smith, 2008). The development of mass media continued the changing nature of stadiums within college football as the need to provide space for news media, radio and eventually television shaped today's modern structures (Dunnavant, 2004; Watterson, 2002). This is just a sample of how facilities changed over the last 140 years.

Innovation diffusion will be used as the way to explain the spread of these changes and others around various parts of the country. Further, the current research is attractive because it will not only expand knowledge to sport management on innovation diffusion but will advance sport history's understanding of the importance of stadiums within college campuses. Within this point, college football provides sport researchers a different view of the development of stadiums because private donations and government subsidy have driven different types of renovations as opposed to its professional counterparts. As an example, college stadiums are concerned not only with spectators, the media, and participants, but the higher education community and university they represent.

Project Outline

This dissertation is divided into several chapters. Following the Introduction, Chapter Two provides a review of literature on innovation, innovation adoption, and innovation diffusion. The chapter also explains the various pieces of the innovation-decision process along

with adopter categories and other pieces of importance for innovation adoption (e.g., time, communication channels, social systems and geography).

Chapter Three focuses on the historical methodology used in this dissertation. The chapter explains the following five step process: 1) developing research questions; 2) collecting primary and secondary sources; 3) historically criticizing the documents; 4) triangulation of the documents that survive the criticism; and 5) creating a narrative from the triangulated documents. The explanation of the historical ideal-type and the importance of its use in academic storytelling appear in Appendix A.

The subsequent chapters (i.e., Four-Eight) discuss the various ideal-type stages developed as part of the study. For instance, Chapter Four focuses on the early development of college football and the creation of temporary facilities from the first college football game between Princeton and Rutgers in 1869 to the development of Harvard Stadium in 1903 (Ingrassia, 2012; Watterson, 2002). Harvard stadium is widely recognized at the watershed moment for the development of permanent homes for college football (Seifried, 2005). Chapter Five describes the movement toward permanent homes made of reinforced concrete and steel between 1903 and 1930. This covers the construction of Harvard Stadium through the building boom that ends with the beginnings of the Great Depression. Chapter Six reviews the development of college football stadiums during the Great Depression through World War II. This era is interesting because universities move away from self-funded facilities to public subsidies [primarily the Emergency Relief Agency (ERA)/ Works Progress Administration (WPA)] to build and expand facilities (Seifried, in press; Watterson, 2002). Chapter Seven analyzes the construction and/or renovation period after World War II until 1984. The NCAA maintained control over television broadcast rights starting in 1951, and maintained control until the NCAA v. Board of Regents of the

University of Oklahoma decision in 1984 (Jenkins, 2011; Watterson, 2002). Because of the change in control of television, universities could afford to significantly expand facilities. Chapter Eight explores the modern Division I FBS stadium from 1985 to present. Chapter Nine concludes this dissertation and focuses on the potential developments likely to occur with college stadiums moving forward. Moreover, the chapter explains the theoretical contributions of the study toward innovation diffusion.

Definition of Terms

National Collegiate Athletic Association (NCAA)

The NCAA is defined as the organization governing the top-level college football programs in all capacities since its original founding as the Intercollegiate Athletic Association of the United States in 1906 (Crowley, 2006; Watterson, 2002). This organization changed names to the NCAA in 1910 and has played a significant role in governing college football (Watterson, 2002).

Division I

Division I is the highest level of competition for all NCAA members. This divisional structure began in the 1950s when the NCAA created the University Division for larger universities and the College Division for smaller colleges (Falla, 1981; Watterson, 2002). A second reorganizational effort was engaged in 1973, leading to the creation of the current three-division structure (Katz & Seifried, 2014; Watterson, 2002). In terms of football, Division I is comprised of student-athletes participating on a full scholarship for the student's room, board and tuition (Crowley, 2006). Division I football was further divided in 1978 into Division I-A (now known as the Football Bowl Subdivision) and Division I-AA (now known as the Football Championship Subdivision) ("Divisional Differences," 2015; Watterson, 2002).

Football Bowl Subdivision (FBS)

As of 2015, the FBS is comprised of 128 Division I schools sponsoring football that are eligible to participate in postseason Bowl Games as sanctioned by the NCAA (Crowley, 2006; "Football," 2015; Watterson, 2002). These schools compete as part of one of the ten FBS conferences (e.g., American Athletic, Atlantic Coast, Big 12, Big Ten, Conference USA, Mid-American, Mountain West, Pac-12, Southeastern, and Sun Belt) or as an independent (e.g., Army, Brigham Young, and Notre Dame). FBS members must maintain an average attendance of 15,000 in actual or paid attendance at least once in a two-year period in order to maintain FBS status (NCAA, 2013). The current study used the 125 members that were part of the FBS subdivision in 2014.

Ivy League

Ivy League schools (i.e., Harvard University, Yale University, Princeton University, University of Pennsylvania, Dartmouth College, Columbia University, Brown University, and Cornell University) are important to the early development of college football (Watterson, 2002). For example, Walter Camp (Yale), Charles Eliot (Harvard), and other important leaders of Ivy League schools shaped the early rules and standards for college football stadia (Ingrassia, 2012). In 1954, the Ivy League schools agreed to de-emphasize sport by not providing scholarships to student-athletes (Watterson, 2002).

Power Five Conference

Power Five conferences are those whose champion automatically qualifies to be part of the College Football Playoff (CFP) bowl games. Participating schools come from the Atlantic Coast, Big 12, Big Ten, Pac-12, and Southeastern conferences as well as the independent

University of Notre Dame ("Overview," 2015). These schools received over $1.6 billion in 2015 from bowl games, equaling out to over $300 million per conference (Weinstein, 2015).

Non-Power Five Conferences

The Non-Power Five Conferences are those whose champions do not automatically qualify for the CFP bowl games. Instead, only one of the five champions can be guaranteed a spot in the CFP ("Overview," 2015). In comparison to the Power Five, Non-Power Five members received $81,071,601 from the CFP and other bowl games in 2015 (Dosh, 2015). Members of this group include the American Athletic, Conference USA, Mid-American, Mountain West and Sun Belt conferences, along with Army, Navy, and Brigham Young ("Overview," 2015).

Renovation

The decision made by an organization to repair and/or reconstruct a building in order to maintain or improve the structure for future use by members of society-at-large (Seifried, 2012; Weeks & Gimmer, 1995). Renovations are completed according to Weeks and Gimmer (1995) through preservation, reconstruction, rehabilitation, and restoration.

Preservation

Preservation is the attempt to maintain the existence of a building through actions to sustain "the existing form, integrity, and materials of a historic property" (Weeks & Gimmer, 1995, p. 16). An example of preservation would be the replacement of the windows in the dorm levels of Tiger Stadium at LSU. No attempt was made to change the structure, just to replace the windows in order to maintain the stability of the structure ("About the Tiger Stadium," 2014).

Reconstruction

Reconstruction is the act of "depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location" (Weeks & Gimmer, 1995, p. 164). For instance, following the collapse of a crane at Miller Park in Milwaukee, Wisconsin, which destroyed a section of the building and roof, the building's damage was rebuilt identically to the previously existing structure (Pahule, 2013).

Restoration

According to Weeks and Gimmer (1995), restoration is the act of "accurately depicting the form, features, and character of a property at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period," (p. 116). An example of restoration can be seen from Fenway Park, Home of the Boston Red Sox. Specifically, part of the Red Sox' $285 million renovation went toward preservation when the trees and lamps on Lansdowne Street were replaced with gas lamps and cherry trees to reconnect with the early 20th century when Fenway Park was built (Pfleegor, Seifried, & Soebbing, 2013).

Rehabilitation

Rehabilitation is the "act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values" (Weeks & Gimmer, 1995, p. 60). An example of rehabilitation involves the decision of Auburn University to construct a 190 feet by 57 feet video board in the North Endzone, prior to the 2015 season (Goldberg, 2015). In addition

to technology, other sample rehabilitation activities would include improvements to plumbing, concessions, seat options, and making use of renewable sources energy.

Temporary Facilities

Those facilities constructed from wood or other materials that could be easily constructed (i.e., replacement) due to damage, increasing maintenance costs, or lack of use (Seifried & Pastore, 2010).

Permanent Facilities

Those structures constructed from materials (i.e., stone, concrete, and steel) aimed to help sport organizations establish a permanent residence for generations (Seifried & Pastore, 2010). Adaptable to most any location, reinforced steel and concrete structures were preferred because they also were affordable, safer, and required less maintenance in comparison to other elaborate wood buildings that needed costly carpentry work (Seifried & Pastore, 2009).

Stage One Facility

Stage One facilities were facilities on or near campus that were enclosed by fencing and featured moveable temporary bleachers. These bleachers were constructed of wood and were in constant need of repair and upkeep.

Stage Two Facility

Stage Two facilities were facilities on or near campus constructed of reinforced concrete and steel. The stadiums were permanent structures and included structures such as the scoreboard and press areas. Stage Two structures were occasionally renovated to add additional seating, better quality scoreboards or new press areas.

Stage Three Facility

Stage Three facilities were constructed or renovated during the period from 1930-1945. Several of the Stage Three construction projects received funds from the Public Works Administration or Works Progress Administration. Stage Three venues included development of a space for the press (especially radio) along with additions of lights and electronic scoreboards. Stage Three venues were also among the first to have limited bathroom and concession spaces in some venues.

Stage Four Facility

Stage Four facilities were constructed or renovated during the period from 1946-1984. Stage Four facilities dedicated space inside the stadium for the new medium of television. Stage Four facilities also experienced significant additions to capacity due to the increase in the way spectators moved into the structure due to improvements in construction technology. Vertical circulation allowed the stadium to be significantly enlarged. Stage Four venues were where artificial turf and the large electronic score board were introduced into the venue.

Stage Five Facility

Stage Five facilities were constructed or renovated during the period from 1985-2014. Stage Five venues were the first to have significant luxury seating options inside the stadium. The modern video board, eventually with the ability to broadcast in high definition was also introduced into the Stage Five venue. Continued improvements for television occurred in the Stage Five venue, as did the development of new artificial turf surfaces. The Stage Five venue was a fully functional modern stadium, and many were similar in several ways to professional football and baseball venues of the era.

Major Renovation

According to the Department of Energy, major renovations involve significant changes to the building in an attempt to improve or upgrade the building's structure or uses (Boermans & Bettgenhauser, 2009; "Energy Efficiency," 2010). For sport facilities, Seifried (2005) previously defined a major renovation "as a situation where hundreds of thousands or millions of dollars are used to substantially alter the physical layout of the building in some manner" (p. 24). Examples included in that work prioritized major renovations as involving: large seating additions (1,000+), luxury accommodations, building supports/enclosures (e.g., office or administration buildings), technological innovations (i.e. lights, video boards, and score boards), field surface changes (i.e. Prescription Athletic Turf (grass), Astroturf, Fieldturf etc.,) locker room additions and renovations, and seating changes (i.e. metal bleachers, seatbacks and modern seats).

Chapter Two: Understanding Innovation Diffusion

The purpose of this chapter is to examine the theoretical framework of innovation diffusion. The chapter will first discuss the processes of innovation and innovation adoption in relation to organizations. The chapter continues with a review on innovation diffusion and its four key components (i.e., time, communication, social systems, and geography). Lastly, the section analyzes innovation diffusion in relation to previous studies inside sport management and identifies scholarly opportunities in the area.

Innovation

Innovation and technology are regularly interchanged with one another since many innovations relate to technology advancement. In this connotation, one may consider an innovation based in hardware (e.g., the physical object represented by the change) or software (e.g., the stored information needed to use the tool). However, technology represents actual physical products or change that may occur in business, industry, academics or sport as well as concepts or ideas that are significant to society-at-large (Gopalakrishnan & Damanpour, 1997; Greenhalgh, Robert, Macfarlane, Bate & Kyriakidou, 2004; Redmond, 2003). By contrast, innovation, as defined by Damanpour (1996), is "a process that includes the generation, development and implementation of new ideas or behaviors" (p. 694). Innovation should also be seen as distinctly different from invention as invention involves the first known incidence of a new concept; innovation reviews the implementation of an invention and how an organization can obtain the invention's full potential (Jalonen, 2012; Livia, 2014). Innovation is understood as an improvement for the organization over existing technology or operations (Jalonen, 2012).

Regarding innovation, Damanpour (1987) identified three major types: a) technological; b) administrative; and c) ancillary. Technological innovations are the "result of the use of a new

tool, technique, device or system" (Damanpour, 1987, p. 677). Administrative innovations occur when the innovation affects the organization's process of management, the allocation of resources, and/or the awarding of rewards (Evan, 1966; Kimberly & Evanisko, 1981). Ancillary innovations are technologies occurring outside of the normal organization's control.

Another way of defining innovation is through a review of process and product innovations (Damanpour & Gopalakrishnan, 2001). According to Utterback and Abernathy (1975), product innovations are those that center on the market itself and consumer needs and desires. In comparison, process innovations focus on the company itself as well as seek to improve efficiency of operations. Both process and product innovations can improve company performance, but often occur in different areas of a company's life cycle. Damanpour and Gopalakrishan (2001) argued product innovation is more likely to occur early in the business life cycle and has the ability to move from one company to another. Process innovation, on the other hand, occurs much later in the business life cycle and is usually specific to the company where it is created since the innovation is typically a solution to an internal issue (Wong, Lee & Foo, 2008). This difference establishes a clear distinction between product innovation and process innovation. Specifically, product innovation focuses on products or services for external stakeholders while process innovation seeks to improve goods and service creation through streamlining or enhancing production creation and efficiency (Damanpour, & Gopalakrishan, 2001).

Beyond these typologies, innovations can be developed based on the amount of change required. Gopalakrishnan and Damanpour (1997) identified two different types of innovations in relation to change firms analyze when considering adoption: a) radical and b) incremental. Radical innovations require organizations to move into new and possibly unknown and

uncomfortable directions as new and foreign practices or processes are quickly adopted by a firm (Chandy & Tellis, 2000; Lee, Smith & Grimm, 2003). Innovations that are analyzed by possible adopters as radical in nature create more uncertainty for the adopter, decreasing the likelihood of adoption (Lee et al., 2003). Even though radical innovations create uncertainty, radical innovations often have large impacts on organizations (Marvel & Lumpkin, 2007). Incremental innovations involve small changes to pre-existing systems. Many incremental innovations occur inside the organization itself due to the suggestion of key stakeholders (Damanpour, 1991; Gopalakrishnan & Damanpour, 1997). While incremental innovations are typically internal improvements, radical innovations provide firms with something new and different from any process previously used by the organization (Marvel & Lumpkin, 2007; Phillips, Noke, Bessant & Lamming, 2006).

Despite innovation type, firms that fail to adopt an innovation risk potentially seeing the new idea or concept disappear. The failure to adopt an innovation can lead an organization's stakeholders to feel frustration or dissatisfaction with the status quo. However, firm members can possibly feel similar frustration when managers introduce new ideas or concepts to employees to help improve the firm without information on why the change was necessary (Hassinger, 1959; Rogers, 2003). Because changes are necessary to facilitate and meet the needs of various stakeholders, businesses must be able to innovate in order to survive (Cardozo, McLaughlin, Harmon, Reynolds & Miller, 1993; Lanzolla & Suarez, 2012; Meyer & Goes, 1988). The need to innovate drives many firms to spend large amounts of time, capital, and energy on the process of improvement (Hong, 2012). Furthermore, a firm's ability to innovate increases the organization's ability to process information that can increase its cost efficiency and profitability (Dewett & Jones, 2001). The ability to innovate may also reposition the organization among others within

the same industry (Lanzolla & Suarez, 2012). Therefore, if a company fails to innovate, the organization may lag behind its competition, which could potentially lead to its demise (Christensen, 1992; Lanzolla & Suarez, 2012).

Such effort to avoid failure involves organizational innovation that is defined as the bringing of new products, processes or other innovations to the organization (Sarros, Cooper & Santora, 2008). Determinants of organizational innovation include strong organizational culture and transformational leadership (Sarros et al., 2008). Organizational innovation often occurs within companies that strongly push employees to create new concepts and ideas (Ahmed, 1998). Strong cultures allow organizations to accept the need and desire to innovate despite the challenges an innovation can bring (Sarros et al., 2008). Within large and small companies, transformational leaders willing to push and change the status quo are important to the success of an innovation and its eventual adoption (Sarros et al., 2008). Transformational leaders promote innovation through establishing a culture of creativity and inspiring employees to create products or approaches that improve the company (Greenhalgh et al., 2004; Howell & Higgins, 1990).

In order for firms to innovate, an organization must have the necessary resources and willingness to create new concepts and ideas in addition to transformational leaders (Damanpour, 1987; Kimberly & Evanisko, 1981; Vincent, Bharadwaj & Challagalla, 2004). The better the resources available to the organization, the more likely it is to innovate (Barney, 1991; Damanpour, 1992). To allow better understanding about the innovation, firms must gather knowledge about the device or idea from other organizations. One resource that is vital to innovation adoption is the firm's knowledge of the innovation (Marvel & Lumpkin, 2007). Knowledge seeking includes the process of gathering information on the innovation's workings and how the new concept or device can improve the firm. Without a complete understanding of

the innovation, usefulness of the device or idea becomes impossible to understand (Bathelt, Feldman & Kogler, 2011; Rogers, 2003). However, the decision to innovate, by itself, will not improve the organization. Only the actual implementation of the new concept will allow for successful innovation (Damanpour, 1987; Dewett & Jones, 2001). Without implementation, the new idea or product may disappear or be stolen by a competitor (Dewett & Jones, 2001). Challenges for organizations to innovate come from organizational complexity and the development of a bureaucracy (Damanpour, 1991). Research displays that the more flexible a firm, the more likely the organization is to innovate (Castellacci, Grodal, Mendonca & Wibe, 2005; Damanpour, 1991).

Recent research on innovation focuses on the challenges to organizations attempting to innovate amongst an increasingly competitive environment (Castellacci et al., 2005; Pravitt, 2005). Innovation research centers on the rising requirements of specialized knowledge to understand an innovation's application (Pravitt, 2005). Furthermore, due to increasing uncertainty amongst organizations, innovation requires organizations to learn new techniques while constantly attempting to adapt in order to survive (Castellacci et al., 2005; Jalonen, 2012).

Innovation Adoption

Innovation adoption occurs when an organization transforms a thought into an actual practice (Damanpour, 1987; Damanpour & Evan, 1984; Dearing, 2009). Successful organizations adopt innovations for a variety of reasons including necessity, competition, and the uniqueness of an idea (Rogers, 2003). However, innovation adoption rarely occurs without impetus within an organization. Often the organization needs a reason in order to adopt the innovation (Damanpour, 1991; Kimberly & Evanisko, 1981; Rogers, 2003). The goal of the

adoption of an innovation is generally to increase the performance or effectiveness of an organization (Damanpour, 1991).

Innovations contain characteristics that make a firm more or less likely to adopt the change (Dearing, 2009; Rogers, 1962, 2003). These characteristics include relative advantage, compatibility, complexity, trialability, and observability. Relative advantage explains the degree to which an organization perceives gain from the new concept (Greenhalgh et al., 2004). The higher the perceived advantage of the innovation, the more likely it is to be adopted (Acs & Audretsch, 1987; Premkumar, Ramamurthy & Nilakanta, 1994). Compatibility examines the consistency of the new idea with the values of the organization preparing to adopt (Rogers, 1962, 2003). The more compatibility an innovation has to the organization, the more likely the company adopts the idea (Imroz, 2013). In contrast, the less compatibility between a firm and innovation, the slower the organization moves to adopt the innovation (Imroz, 2013).

Complexity involves the difficulty of usage as perceived by the adopting organization (Rogers, 1962, 2003). Simple and/or incremental innovation adoption occurs at a quicker rate than adoption of radical ideas foreign to the firm (Damanpour, 1996; Hobday, 1998; Imroz, 2013). Highly complex innovations often diffuse slowly, but demonstrations along with practical experience can increase the diffusion of complex innovations (Greenhalgh et al., 2004). Trialability reflects the ease of the innovation's use on a temporary or limited level in order to test the success of the new concept (Rogers, 1962, 2003). Ideas that allow companies to adopt on a partial basis are more likely to advance than those that require adoption of the whole innovation at once. The trialability of an innovation removes the doubt from the adopter that the innovation can provide success (Ryan & Gross, 1943; Tornatzky & Klien, 1982). Lastly, observability involves the visibility of results to others from the innovation. The easier other

companies are able to see the success of the new idea, the more likely they are to adopt the innovation for their own organization (Lee et al., 2003; Rogers, 1962, 2003). As an example, observability can easily be with several firms adopting an innovation in close proximity (Meyer & Goes, 1988; Moore & Benbasat, 1991). Innovations viewed as having all five characteristics often adopt at a quicker rate than innovations lacking one or more of the elements (Rogers, 1962, 2003). Other research has also that the perceived risk involved with an innovation, along with consumer perceptions also influence innovation adoption (Agarwal & Prasad, 1997; Dearing, 2009; Dearing, Meyer & Kazmierczak, 1994).

Wolfe (1994) noted six factors that assist organizations to increase the potential rate of adoption: a) attributes; b) characteristics of the adopting organization; c) involvement with similar organizations; d) impact of the environment surrounding the firm; e) communication of the innovation to the adopter; and f) internal pressure to innovate. Rate of adoption involves how quickly organizations adopt the innovation. Rates of adoption increase based on the scope of the innovation (i.e., the larger the number of potential adopters, the quicker the rate of adoption) (Lee et al., 2003). Adoption rates also improve if the innovations are grouped together and adopted as a complete cluster instead of individually (Dearing, 2009; Rogers, 2003). Rogers (2003) called this the "package approach" and argued that it increases adoption (p. 249). By adopting a cluster of innovations, the organization brings about a variety of changes within a short period, limiting the perceived negative associated with multiple changes if occurring separately (Dearing, 2009). Innovation adoption studies that focus on these clusters of multiple adoptions often allow for a better understanding of the adoption process (Damanpour, 1991).

Wolfe suggested the rate of adoption includes five categories of adopters: innovators, early adopters, early majority, late majority and the laggards or last to adopt among similar

organizations (Wolfe, 1994). Figure 2.1 presents most innovations involve an S-curve of adoption developing over time as different users within similar organizations adopt an innovation (process, product or technology) (Abrahamson & Rosenkopf, 1993; Carey & Mason, 2014; Damanpour & Gopalakrishnan, 2001; Rogers, 2003).

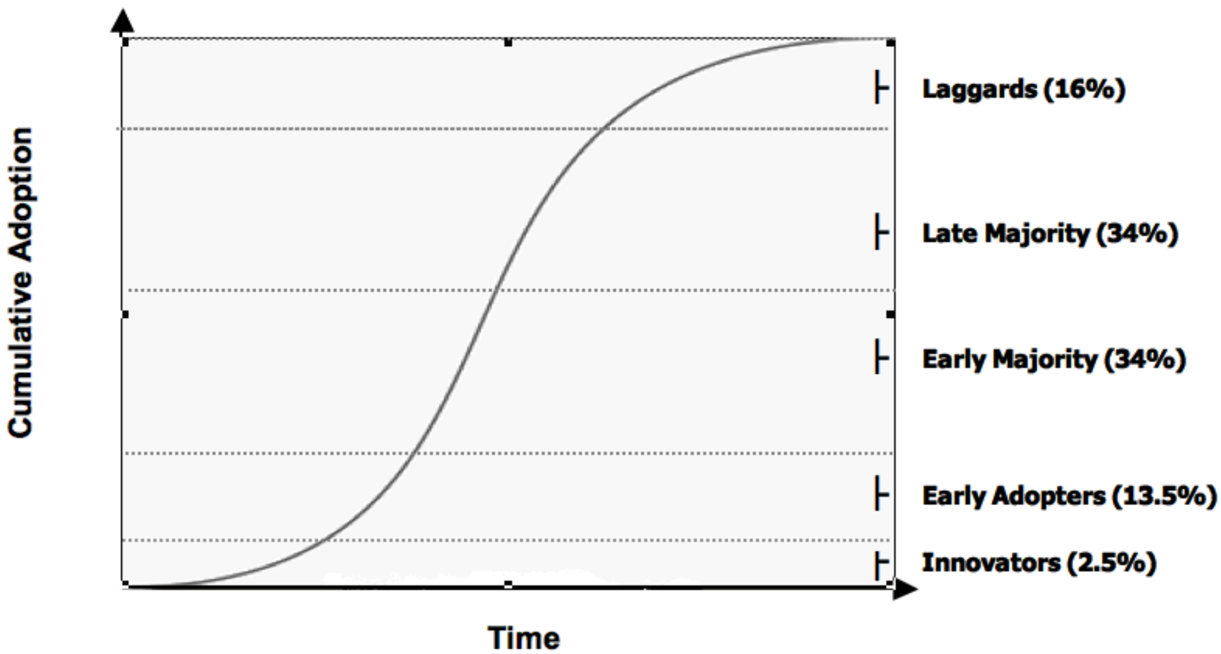

Figure 2.1 S-Curve of Adopter Categories

Adapted from Roger's (2003) *Diffusion of Innovations:* S-Curve with Adopter Categories

Innovators compose a small percent of the adoption groups and rarely face immediate mimicking because of how far ahead this group is in relation to other organizations. Innovators must be willing to break with tradition and habit in order to take on the innovation (Redmond, 2003). Innovators require shorter adoption periods than other categories of adopters (Rogers & Shoemaker, 1971). Because they are the first group to adopt an innovation, innovators tend to benefit from the novelty (Dearing, 2009). However, innovators do this often based on perceive advantages to be gained without any actual knowledge (Compagni, Mele & Ravasi, 2015). Early adopters learn about the innovation and are willing to experiment. These organizations explore

the organization field to discover recent innovations by competitors. Early adopters use significant amounts of interpersonal communication with members in similar organizations (social system) to find out about new ideas. Organizations that fall into the category of early adopters are impressed with the attributes of the innovation and biased towards its potential advantages (Compagni et al., 2015; Dearing, 2009). Typically, early adopters are opinion leaders amongst the social system and can help increase the rate of adoption (Rogers, 2003). Early adopters, like innovators before them, are willing to take on the uncertainty of an innovation failing (Redmond, 2003). The first two groups of adopters live with the risk of failure, separating them from future groups of adopters (Redmond, 2003).

Early majority adopters interact with peers and move slowly to adopt, preferably after watching all earlier users and opinion leaders gain success (Dearing, 2009). In comparison, late majority adopters face peer pressure to adopt in order to maintain economic survival in relation to early users (Ram & Jung, 1994). Finally, laggards adopt innovative practices well after others no longer consider the innovation useful in the organizational field, losing significant economic ground in the process (Rogers, 2003).

Rates of Adoption

Rates of adoption vary based on a wide variety of factors. These primarily involve management style, socio-economic status, and available resources (Rogers, 2003). With respect to size, Rogers (2003) argued larger companies enjoy more financial resources and staff that are available to develop innovations in similar fields. Other studies found that organizational size, slack and specialization influenced adoption (Damanpour, 1992; Greenhalgh et al., 2004). Further, successful organizations develop innovation leaders or champions through self-supported research opportunities and the creation of research and development offices (Burt,

1999; Fischer, 1994). Interpersonal communication becomes especially important for these innovation leaders, as it requires members of the organization to develop relationships at various levels and across divisions (Rogers, 2003).

Another important factor influencing rate of adoption is re-invention. Sometimes an original innovation contains a defect or issue that re-invention can fix (Greenhalgh et al., 2004). Defects occur because an organization is unable to foresee all problems that may appear in the development process (Dosi 1988). Uncertainty or risk decreases the adoption of an innovation (Greenhalgh et al., 2004; Jalonen, 2012). Thus, an innovation's re-development allows for the adoption of significant innovations to fit the needs of the society or organization adopting. Each adopter may change an innovation to suit their specific needs. Further, re-invention is more likely when an innovation is usable in a wide variety of fields in different ways (Rogers, 2003).

In many cases, more than 50% of innovations face re-invention in some form and thus re-invention may increase the likelihood of adoption (Charters & Pellegrin, 1972; Rogers, 2003; von Hippel, 1976). Take, for example, the use of football by the United States Armed Forces during and after World War II. During that time, military leaders used college football and the pageantry of bowl games to help shape successful leaders and soldiers around pre-established organizational goals (Seifried & Katz, 2015). Although the idea of football and bowl games were not new, they were re-developed to radically change how fighters trained for battle, followed instruction, and Americanized foreign populations (Seifried & Katz, 2015). Later outcomes of such re-development ultimately led to advancements in offensive and defensive schemes which prompted additional commercial interest in the activity as platooning, further specialization, and physical training all improved the game (Seifried & Katz, 2015). Re-invention is often the norm in innovation adoption and not the exception (Dearing, 2009; von Hippel, 2005).

Lastly, the rate of innovation within organizations of similar social systems is influenced by geography (Delre, Jager, Bijmolt & Janssen, 2010). The more impacts placed by external influences of society on the decision-making process of the organization, the less likely it is to follow a similar path as its peers (Delre et al., 2010). Key companies or hubs within a group's geographic are more likely to influence the rate of adoption. Moreover, peer organizations may be more likely to adopt similar innovations, contributing to the diffusion of the concept. Finally, the higher quality the innovation, the more likely local social pressures will help with the diffusion of the innovation across an organizational field (Delre et al., 2010).

Innovation Diffusion

Innovation diffusion research analyzes the types of firms involved and the types of innovation itself (Hong, 2012). Innovation diffusion is a theory based on change and the concept that as an innovation develops it grows to fit the needs of the social system (Carey & Mason, 2014). Rogers (1962, 2003) seminal piece on Diffusion of Innovation Theory served as a basis for related research across many disciplines, including management, technology, health care and communication (Greenhalgh et al., 2004; Premkumar & Ramamurthy, 1995; Tornatzky & Klien, 1982). Innovation diffusion as defined by Rogers (2003) involves the movement of an innovation through communication channels over time amongst a variety of members of a social system. Time, communication channels, and the system of organizations involved provide the basis of any study involving innovation diffusion along with the geographic location of a firm in relation to its peers (Bale, 1984; Rogers, 2003). Within this effort, Rogers (2003) examined innovation diffusion as a social process during which information about a new concept transfers from speaker to receiver and acknowledged five parts of innovation adoption (i.e., relative advantage, compatibility, complexity, trialability, and observability). However, for the purpose of this work,

it is necessary to discuss these four concepts (e.g., time, communication channels, social system, and geography) to better understand how organizations replicate effective innovations or practices from organizations (Dearing, 2009; Rogers, 2003). Further, how diffusion results from the need for organizations to limit uncertainty when interpreting new information and new innovations (Carey & Mason, 2014; Rogers, 2003).

Time

The first element that drives the success of innovation diffusion is time (Abrahamson & Rosenkopf, 1993; Rogers, 2003). The time component involves the innovation-decision process, the innovativeness and size of the organization, and the system involved in the adoption process (Rogers, 2003). Uncertainty plays a significant role in time within the innovation-decision process. As uncertainty dissipates, adoption time quickens (Compagni et al., 2015; Wolfe, 1994). Both the innovation-decision process along with the equally important innovation-development process influences the success of diffusion of an innovation. The innovation-decision process involves the time needed for an organization to go from knowledge of the innovation to the decision to adopt the actual concept (Dewett & Jones, 2001; Jalonen, 2012; Rogers & Shoemaker, 1971; Wolfe, 1994).

The innovation-decision process is a multi-step process organizations go through in order to understand the diffusion of an innovation from the firm’s peers. The innovation-decision process as defined by Rogers (2003) involves five steps. First, knowledge comes at the time the individual or organization first becomes aware of the innovation’s existence and understands exactly how the innovation functions. The ability of an organization to learn about the innovation lowers the uncertainty associated with the innovation for the organization (Dearing, 2009). Second, persuasion occurs when the decision maker forms an opinion about the innovation and

its impact on the individual or organization. The impact of innovation opinion leaders is clearly felt in the persuasion stage (Dearing, 2009). Third, the decision maker decides whether to accept the innovation. Fourth, implementation occurs if the innovation is accepted. Fifth, confirmation through assessment takes place when the decision maker sees the success or failure of the innovation (Rogers, 2003).

Diffusion studies examined the amount of time an invention sits before moving toward useful innovation. The process is the innovation-development process (Rogers, 2003). Time depends on the invention, the need for it in the marketplace, and the ease of the creation of production of the new concept (Isenson, 1969; Ryan & Gross, 1943). As part of the time element of innovation diffusion, it is important to note that the quicker an innovation diffuses, the less the advantage gained by innovators and early adopters (Lee et al., 2003). Understanding the differing rates of diffusion of an innovation allows researchers to examine the impacts of competition, bandwagon effects, and other characteristics of diffusion of innovation related to organizations (Lee et al., 2003). Using the time variable also allows diffusion researchers to analyze the reason for lag between adopters amongst the diffusion S-curve (Redmond, 2003). Lag involves not only the time for information to spread, but also the different communication channels in and between organizations (Redmond, 2003).

Communication Channels

The communication channel involves the concept moving from one individual to another (Rogers & Shoemaker, 1971). The mass media (e.g., major television networks, newspapers, websites, etc.) exist as most common examples of communication (McCombs & Shaw, 1972; Reardon & Rogers, 1998; Rogers, 2003). Mass media communication allows for the quick spread of information from the source of the communication to other members of a social

system. Use of mass media allows organizations to reach a wide variety of other people and is most effective in the knowledge-gathering stage (McCombs & Shaw, 1972; Reardon & Rogers, 1998; Rogers, 2003). Another type of communication channel is interpersonal communication. Interpersonal communication is typically one-to-one, done in person and is most important when the decision occurs to adopt the innovation. The ability to talk directly to a person in a similar situation allows decision makers to understand exactly how the innovation works and to accept the innovation quicker than if the interpersonal communication is not available (Bale, 1984; Rogers, 2003). One common way of interpersonal communication involves the demonstration of a possible innovation to a small group of potential adopters (Dearing, 2009).

Change agents often fill the role of communicating the innovation to possible adopters (Compagni et al., 2015; Magill & Rogers, 1981). Especially in the early stages of the diffusion process, change agents play a critical role in the success of the diffusion of an innovation (Compagni et al., 2015). The ability for the adopters to view the demonstration and talk directly with change agents increases the likelihood of the diffusion of the innovation (Greenhalgh et al., 2004; Magill & Rogers, 1981). Furthermore, change agents that already are deemed part of the social network of the adopter are more likely to be successful (Greenhalgh et al., 2004). Demonstrations are one example of formal communication between the change agent and possible adopter (Compagni et al., 2015). Professional associations along with conferences allow for both formal and informal communication between different members of organizations (Compagni et al., 2015). Professional associations and networks are particularly important to diffusion of innovations (Greenwood, Suddaby & Hinings, 2002; Rogers, 2003). Professional associations allow for the development of social networks where sharing of innovations and related experiences commonly occur (Greenhalgh et al., 2004).

While both systems allow for communication of innovations, two potential issues can affect the quality of interpersonal communication. The first issue focuses on who is in control the communication channel (i.e., the gatekeeper). The gatekeeper controls communication from the research and development teams to the potential adopter(s) and can significantly influence the successful adoption of an idea. If the idea is not fully developed and allowed to advance, the adoption will likely fail. Furthermore, the gatekeeper must also communicate with research and development to limit the time an idea remains in development. Otherwise, the innovation may fail because it is no longer new or successful (Rogers, 2003). Gatekeepers may have access to privileged information and how gatekeepers chose to share or not share privileged information has a distinct impact on the success of the diffusion (Carey & Mason, 2014).

The second communication issue focuses on the quickening ways of disseminating information to large numbers of people (Dearing, 2009). The Internet is still relatively new and always changing; thus, it provides many different opportunities for communication to occur. For example, the Internet has radically changed how communication occurs amongst members of a social system. Specifically, the Internet increased interpersonal communication using personalized emails, video, and social media aimed at a specific person, group or organization (Rosen, 2001). Moreover, the Internet has prompted some to use interpersonal communication because of the ease of learning through help from technology-assisted programming (Rosen, 2001). Interpersonal communication still best occurs in person where knowledge acquisition is more intimate and depth is easily explained through the channel (Morgan, 2004).

Social System

The next element of the innovation diffusion process involves the social system (Rogers, 2003). The social system comprises organizations that have similar common goals or purpose for

their existence (Brancheau & Wetherbe, 1990; Rogers, 2003; Rogers & Shoemaker, 1971, Wellin, 1955). Organizations cooperate on some levels to reach the common goal each needs to be successful long-term (Barcelona & Bocarro, 2004). The system allows for the easy diffusion of knowledge across firms of similar backgrounds or production (Nelson, 1993). Collaboration increases successful diffusion among companies within similar social systems (Dewett & Jones, 2001). However, boundaries can form within a social system preventing diffusion from moving past the edge of the system. For instance, the structure of the system can limit the ability of an innovation to spread beyond a certain point where it lacks value.

Social systems include communication methods that affect how information flows through an organization (Katz, 1961; Rogers, 2003). Organizations that are closely related or interconnected are more likely to take an innovation from a competitor rather than companies that are not closely related (Aiken & Hage, 1971; Compagni et al., 2015; Damanpour, 1987; Frambach & Schillewaert, 2002; Kimberly & Evanisko, 1981; Lanzolla & Suarez, 2012). These relationships allow for successful diffusion of concepts from one to another.

Within the social system, opinion leaders form to drive diffusion of innovations across members of the system (Dearing, 2009). Opinion leaders are usually part of the group of early adopters of an innovation and are viewed by their peers as having valuable opinions about the innovation (Carey & Mason, 2014). For highly complex innovations, opinion leaders drive adoption, because they demonstrate that the innovation is worth the cost involved (Greenhalgh et al., 2004; Sladek, Phillips & Bond, 2006; Thompson, Estabrooks & Degner, 2006). While opinion leaders are assumed to have a positive view of the innovation, this may not always be the case (Greenhalgh et al., 2004). Understanding the views of opinion leaders is important to understand the success or failure of diffusion. Further influencers within a social system are

known as societal sectors, or organizations whose place and connections amongst the social system provide these organizations with a larger influence (Argote & Ingram, 2000; Dearing, 2009). Of particular note is the importance of informal communication channels amongst members of a social system, as successful adoptions quickly diffuse because of this informal communication amongst members (Argote & Ingram, 2000; Carey & Mason, 2014).

Finally, it should be noted that inter-organizational communication increases the innovativeness of the firm and the likelihood of diffusion of the innovation (Castellacci et al., 2005). Furthermore, it is important to understand that even within a social system, organizations are heterophilous, or different in makeup from another organization within the system (Castellacci et al., 2005; Greenhalgh et al., 2004; Young, 2009). The argument is made that part of the reason why innovations diffuse is to make organizations more homophilous or similar to one another (Dearing, 2009; Greenhalgh et al., 2004; Rogers, 2003; Young, 2009).

Geography

As previously acknowledged, Rogers (2003) viewed the geographic proximity of an innovator to another as influential to the success of innovation diffusion. Geography at its core is concerned about space, place and region (Adams, 1995). Most commonly, geography associates particular groups with particular physical places (Adams, 1995; Bale, 1984; Kellerman & Paradiso, 2007). Diffusion research within geography has a long history and originally examined how spatial distance affected the diffusion of innovations (Bale, 1984, 1992; Hagerstrand, 1952, 1953, 1970). For example, Hagerstrand (1952, 1953), and later Johansson (2011) discussed the importance of the "neighborhood effect" which suggests there is an increased likelihood of adoption if two organizations were within close physical proximity of each other. Geographic closeness of organizations of similar identity (e.g., industry cluster) has also been recognized as

increasing the likelihood of adoption of an innovation (Comin, Dmitriev & Rossi-Hansberg, 2013). Therefore, as a component of diffusion, geography creates potential significance for a variety of settings (Bale, 1984; Hafner, 2011; Rogers, 2003).

Other evidence also supports the impact of physical geography. For instance, within technological innovation diffusion, geography was acknowledged as significant in the adoption of a new idea (Hagerstrand, 1952; Lanzolla & Suarez, 2012). In essence, the closer in proximity two organizations are to each other, the more likely the information successfully passes from one organization to the other and innovations are advanced (Hagerstrand, 1952; Lanzolla & Suarez, 2012). This successful passing of information happens because two organizations in close proximity are more likely to use similar technology due to the bandwagon effect that industry clusters promote (Abrahamson & Rosenkopf, 1993; Lanzolla & Suarez, 2012). Further work also shows that opinion leaders located in close proximity to other organizations increase the likelihood of knowledge transfer between firms (Autant-Bernard, Mairesse & Massard, 2007; Boschma, 2005; Comin et al., 2013; Feder & Savastano, 2004; Greer, 1988; Zhu, 2014).

Connecting to the knowledge transfer between firms, innovation research also finds a relationship between innovations and their spread to other regional organizations (Castellacci et al., 2005). Geographic clustering has commonly been acknowledged as existing in economic innovation research (Bathelt et al., 2011; Castellacci et al., 2005; Hafner, 2011; Johansson, 2011; Maskell & Malmberg, 1999; Morgan, 1997). Clustering is especially prevalent as the S-curve reaches the early majority adopters, where other organizations nearby have adopted the innovation, increasing knowledge and access to observe the innovation (Compagni et al., 2015; Johansson, 2011). Clustering also lends itself to the creation of maps, explaining the distance from the initial innovation that is common within traditional geography (Bale, 1992). Clustering

further allows for the increase in detailed understanding of knowledge, which is commonly discussed as a failure of virtual knowledge transfers (Johansson, 2011; Morgan, 2004; Spencer, 2011).

Regarding the concept of virtual knowledge, it is important to acknowledge the way geography is being conceptualized as an impact on the diffusion of innovations is changing greatly with advancements in communication and transportation technology (Bethlehem, 2014; Kellerman & Paradiso, 2007; Kwan, 2004). Creating what has been branded as "virtual geography," Seifried (2011) suggested members of the social system located far away from the innovation can acquire information about an innovation through remote communication tools like the television, radio, and the Internet (Seifried, 2011). Through the usage of such communication systems, organizations are able to connect with each other without being close geographically, thereby creating geographic closeness through virtual space (Bethlehem, 2014; Kwan, 2004).

Additional research analyzed the attempts of humans to overcome the issues of physical geography through virtual efforts to spread information (Adams, 1995; Hafner, 2011; Kellerman & Paradiso, 2007; Kwan, 2004). For instance, work on virtual networks presents members from around the world share information and innovations with one another through advancements in communication and transportation technology (Bathelt et al., 2011). Networks of people in related organizations are able to drive innovation, irrespective of geographic distance to create and maintain virtual geography (Autant-Bernard et al., 2007). This happens because virtual geography allows for organizations across the country or the globe to connect directly to problem-solve, in ways previously unavailable (Bethlehem, 2014; Hafner, 2011; Kwan, 2004; Seifried, 2011). Also presented as knowledge spillover, firms in related industries benefit from

knowledge gained through organizations involved in different industries that have relatable technological knowledge (Boschma, 2005; Boschma & Frenken, 2011; Spencer, 2011).

Overall, modern research must account for the impact of the ease of transfer of information without regard for boundaries (Asheim & Gertler, 2005). No longer must an organization be close to the innovation to quickly learn about the concept, due to the increasing interconnectedness of global society (Castellacci et al., 2005). The Internet is of particular importance to virtual geography, as it allows the transmission of live video directly from person to person, allowing interpersonal communication to happen anywhere in the world (Bathelt et al., 2011; Kellerman & Paradiso, 2007; Kwan, 2004). As boundaries dissipate, knowledge spreads quickly and regions used to having a geographical knowledge advantage lose some of that competitive advantage over other regions (Castellacci et al., 2005; Kellerman & Paradiso, 2007). Within this point, it appears virtual geography impacts hierarchical diffusion (Comin et al., 2013; Johansson, 2011). Hierarchical diffusion involves the spread of innovations from advanced or industrialized areas to less advanced or less industrialized areas (Hagerstrand, 1952, 1953; Hafner, 2011; Johansson, 2011).

Application and Opportunity with the Sport Context

Historical studies of innovation diffusion are commonly discussed amongst a variety of subject areas (Castellacci et al., 2005; Damanpour, 1991; Dearing, 2009; Freeman & Louca, 2001). Such studies have not occurred within a sport context. Instead, historical studies within sport have largely ignored innovation diffusion. Historical studies focused on the spread of sport rarely found a common pattern regarding the development of sport (Anthony, 1980; Walvin, 1975). However, Sport Geographer John Bale (1984) disagreed with this belief and argued sports spread through innovation diffusion. Specifically, Bale (1984) suggested the similarities within

the usage of innovation diffusion among different areas allow a framework to study sport and that it occurred "as a result of a learning and communications process," (p. 39). Through this concept, the arbitrary distribution of sport becomes a much less acceptable (Bale. 1984). As an example, modern sports have developed in distinct countries at different points of time, allowing sport to serve as an innovation. Once the sport develops, it spreads to other places, acknowledging the concept of diffusion of sport as it moves (Bale, 1984).

With resources comes opportunity and thus innovation diffusion research often focuses on general entrepreneurial and business innovation (Bale, 1984; Hong 2012; Ratten, 2011). Ratten (2011) found innovation was common throughout all areas of sport business along with actual on-field innovation. Specifically, Ratten (2011) argued modern sport continued to see the importance of the entrepreneurial spirit and the willingness to innovate to succeed. Entrepreneurial opportunities developed through both the creation of new products and the innovation of pre-existing products, services, or strategies in new and different ways (Bolton & Thompson, 2000). Firms willing to create new and unique opportunities fit the role of an entrepreneur (Ratten, 2011; Wennekers & Thurik, 1999). By nature, many entrepreneurs are risk takers, and sport organizations in many ways possess risk takers similar to other business organizations.

Today, sport organizations attempt to develop innovations to survive in a more competitive environment (Carey & Mason, 2014; Hong, 2012). Significant innovation has occurred through the construction of new facilities throughout professional sport leagues allowing for the creation of revenue generators such as club seats, luxury boxes, and new entertainment facilities (e.g., restaurants, bars, party decks) (Danielson, 1997; Rosentraub, 1997; Seifried 2010; Zimbalist, 1998). Hong (2012) argued that business clusters such as those

involved with intercollegiate or professional football and Major League Baseball are more likely to adopt similar innovations to maintain relative standing among their peer organizations.

The current research pursued by this dissertation builds on Hong's (2012) analysis, by including the concepts of virtual geography and the importance of strong social ties amongst sport organizations. The influence of social networks is common amongst many diffusion related studies (Argote & Ingram, 2000; Autant-Bernard et al., 2007; Carey & Mason, 2014). Facilities are also likely to adopt innovations that can easily be re-invented to fit the specific needs of their area or facility (Carey & Mason, 2014). The need to stay relevant among peers is a driving factor in the innovation decision, far above any other need a researcher may find (Lanzolla & Suarez, 2012). New product innovations allow teams to stay current, especially once fans, the media and the league itself easily understand its usage (Sweeney, 2007). In particular, collaboration between public universities and community recreation organizations is common as both have the desire for a healthy community. This desire increases the willingness of two organizations that have limited common basis for cooperation to work together to solve problems within the community (Barcelona & Bocarro, 2004).

Over time, consumers change both how they participate and interact with sport as well as the companies developing equipment and facilities (Hyysalo, 2009). Modern innovation studies demonstrate success achieved through traditional research, design attempts at innovation, and through discussion with actual product users to find new ways to improve the product (Chesbrough, 2003; West & Gallagher, 2006). A company's success depends on its ability to manage user innovation and turn it into successful information to improve overall product design (Hyysalo, 2009; von Hippel, 2005). Innovation within the sport world often comes from the

participants, who seek new ways to improve or change an existing sport (Hyysalo, 2009). Often these innovations occur through user-created designs or improvements (Hyysalo, 2009).

Other views of diffusion within sport traditionally focused only on the spread of sport across cultures (Bale, 1984; Riesman & Denny, 1951). Cultural diffusion focuses on the ethnic diffusion of talent, class conflicts, and affiliations tied to overall conceptual changes moving from one place or country to another. Within an athletic context, many sports diffused from Europe to North America and changed while maintaining some base of their cultural roots (Bale, 1984; Riesman & Denny, 1951). For example, rugby and association soccer in Europe changed over time to football in America (Watterson, 2002). The codification of rules from play to modern institutionalized rules occurs slowly (Frey & Eitzen, 1991; Watterson, 2002). The first "college football" game between Princeton and Rutgers in 1869 was a version of association soccer (Ingrassia, 2012). Due to a variety of factors including the significant innovations occurring within the workforce of America at the time, the sport quickly lost favor. Over the next 30 years, a variety of innovations to the playing field, the equipment, and the rules developed the game of football largely known today (Frey & Eitzen, 1991; Riesman & Denny, 1951; Watterson, 2002). The transformation from rugby and soccer to football serves as an example of innovation and re-invention. It also demonstrates the time between the original introduction of an innovation and the overall adoption among organizations within sport can lag significantly, as all sports are not exactly alike (Bale, 1984). The current study uses innovation diffusion to examine the spread of important innovations in stadium construction and the game of football itself as not just random, but instead in distinct patterns through time, across communication channels and with influences occurring from various geographic regions and peer groups.

Chapter Three: Methodology

de Wilde and Seifried (2012) studied the use of the historical method in leading sport management journals, such as the *Journal of Sport Management, European Sport Management Quarterly, Sport Management Review, and Sport Marketing Quarterly* for the years 2005 to 2009. During that time, they discovered only three out of roughly 400 published articles were written using historical methods as the primary approach, while noting that a good portion of those articles used historical data to complete their research (deWilde & Seifried 2012). de Wilde and Seifried's (2012) investigation was prompted by earlier work like that offered by Amis and Silk (2005), Seifried (2010b), and de Wilde, Seifried, and Adelman (2010), who each challenged the common ideology focusing only on the present. In particular, Amis and Silk (2005) described such a view as alarming and potentially harmful to the future development of sport management.

Meanwhile, de Wilde et al. (2010) highlighted the basic charter of the North American Society of Sport Management (NASSM) has strong links to historical perspectives and held an initial respect for the method. Featured within de Wilde et al. (2010) was the connection between some founding members of NASSM and their preference for the historical method. Seifried (2010b) also challenged the manner in which historical research has been viewed by sport managers and helped establish its scientific rigor by outlining the common accepted steps in the historical research process. Within, Seifried (2010b) further proposed the use of historical methods allows researchers to predict how the past ties to the present, and how information from the past can be helpful towards managing the future.

From another perspective, Bender (1986) argued that, in order to understand one part of history, one must be able to understand the whole story. As an example, understanding history requires us ". . . to call attention to certain of their qualities that gives a concreteness to the

emerging possibilities that seem to be beckoning a new kind of history, one seeking more complex narrative strategies based on a concern for the relation of the parts, smaller and homogeneous groups, *to* the larger and heterogeneous center" (Bender, 1986, p. 135). The call that Bender referred to was for researchers to make sure to view history as not just one individual episode but as many interactive stories that led to the final conclusion. Later work by Seifried (2005) similarly suggested that, "the appreciation about the changing nature of past and current sport facilities should be aided through historical sources because human culture does not comprise solely of a group of facts but consists of interconnecting human behaviors and actions throughout a historical pattern" (p. 37).

The goal of this dissertation is to embrace the challenge to uncover new and unseen thoughts about the development of sport through studying history and, specifically, how the past is able to explain the development and evolution of football stadiums on college campuses through today and beyond. In order to complete this task, this research endeavor will seek to explore many different stories to define and construct these conclusions. In essence, the goal of this study is to collect information on the past and present so that one continuous representation of stadium development can be created. To achieve this mission, the author will make use of Max Weber's (1948) ideal-type to explain the changing structure of college football stadiums throughout history from simple grass fields to massive structures or theatres for entertainment.

To close, it is critical to understand that this scholarly endeavor will be completed through examining history from an antiquarian viewpoint or one that views history in a loving and respectful way. Furthermore, a constructionist type of approach was selected based on Douglas Booth's (2005), *The Field: Truth and Fiction in Sports History*. Booth (2005) discussed three distinct historical analytic and writing styles (i.e., constructionist, reconstructionist, and

deconstructionist). Booth (2005) described the reconstructionist as serving as a narrative writer, rewriting history as it happened, and not adding any additional information or making use of emotive language. Deconstructionists were labeled as those opposing the cognitive power of narratives and avoiding the support of a single interpretation of historical phenomenon (Booth, 2005). Narratives are a popular way for history to be reported because it makes use of facts and includes a cast of characters (Booth, 2005). Constructionists, on the other hand, were identified as attempting to take history and analyze it in such a way that patterns, trends, and other growth could be seen throughout the study of history (Booth, 2005). Constructionists embrace the "concepts and theories of others as tools to propose and explain relationship between events" (Booth, 2005, p. 6). Moreover, constructionists believe that, although no two people or events emerge or develop identically, each will "follow a highly regular pattern to the point where their response can be predicted" or anticipated (Booth, 2005, p. 10).

It is the opinion of this author that this cursory perspective (i.e., constructionist) tends to best fit the development of college football stadiums, as models (i.e., ideal-type) can be inspired through the trends emerging from the history of construction of these venues. Furthermore, as Booth (2005) advocated, constructionists advocate and defend the use of theory because it: 1) involves abstract thinking to translate the development of concepts; 2) utilizes a large amount of data to help classify and explain; and 3) brings to the forefront the relationship of human experiences (p. 49). This research effort makes use of theory (i.e., diffusion) to explain the change in college football stadiums from the 19th century to the 21st century through collecting a large amount of information on Division I Football Bowl Subdivision (FBS) schools throughout the history of their football programs. Finally, human relationships and behaviors/actions are highlighted in this work to explain the evolution of the college football stadium.

In order to reduce potential bias associated with these foundations, this chapter will discuss the design of the research study and how it was conducted. In order to achieve this goal, the historical method will be described in much greater detail. Specifically, this work identifies what types of primary and secondary sources were collected and used. Next, the author will present the historical criticism and how it explains the historical method to be reliable in producing consistent and measurable data. Finally, further description of Weber's ideal-type is highlighted in Appendix A, published in *Quest* in 2015.

Research Design and Methodology

When doing historical research, one should immerse themselves into the process surrounding the historical method in order to ensure their results will not be found to be unacceptable. Historians are limited by the material they locate because past documents are often lost, damaged, stolen and/or otherwise destroyed. According to Goodman and Kruger (1988),

> The perception that historiography lacks ways of ensuring objectivity frequently educes feelings of distinct unease among social science researchers. Their concern appears to stem from two beliefs. First, they hold that social science research is driven by theory and data, whereas historical research is not. Second, statistical testing and inference are more "objective" than historiography and can be used to confirm hypotheses, whereas the results of historiography usually offer subjective narratives (p. 316).

Such is a common fear outside of the world of history. This work attempts to resolve this concern by following the approach and recommendations outlined in Seifried's (2010b) article.

Historical research and methodology is a respected way of study, which has been opened to exploration across a variety of fields, such as management, marketing, and information systems (Golder, 2000; Goodman & Kruger, 2006; Mason, McKenney & Copeland, 1997). What has been seen as lacking in the past was a consistent specific plan of study, like in other more quantitative research endeavors (Kaestle, 1992). As previously discussed, Seifried (2010b) created a basic historical approach for sports researchers to follow through a five step process.

This plan involves: 1) finding and narrowing the topic; 2) identifying primary and secondary sources to develop the topic; 3) critiquing the documents used to ensure they are accurate; 4) analyzing and interpreting the documents gathered; and 5) reporting the meaning or conclusions of the gathered documents into an interesting presentation. Collectively, this process demonstrates a very strong constructionist approach. Again, as Booth (2005) pointed out, the goal of constructionism is to construct a rational, open, and honest assessment of the sources to find patterns for explanation of some phenomena.

Primary and Secondary Sources

Each individual scholar creates their own distinct style of writing. To address this issue within historical research, McDowell (2002) proposed scholars start their investigation by reading many academic secondary sources in order to acquire important related ideas about the broad subject area of the scholar's interest. The reading of secondary sources around a broad topic helps achieve the first step in the historical method because it prompts researchers to eventually narrow their question. Best (1970) supported the necessity of this step because many historians create their questions in a way that is too broad. Seifried (2010b) further emphasized the importance of the study of secondary sources through commenting that their usage adds "value to research findings because they make efforts more convincing" (p. 7). Historical writing must be convincing to the reader, and the usage of secondary sources is one way to allow the reader to make conclusive judgments about the narrative (Seifried, 2010b). Using secondary sources allows scholars to see the bigger picture, and provides them through the bibliography or reference lists of the document access to possible primary source material as well.

To begin this research effort, the researcher sought out and identified a variety of secondary sources written by experts in the fields of college football history, sport management,

facility development, and architecture amongst other fields. For example, research on college football comes from notable historians like John Sayle Watterson, Michael Oriard, Ronald Smith, Mark Bernstein, and Alexander Weyand amongst others. The usage of such secondary sources is promoted as a strong and intelligent path to follow, as it eventually increased the generalization of conclusions (McDowell, 2002; Seifried, 2010b). Kuper (2003) also supports the usage of secondary sources in his book that focused on Holland's strange struggle with soccer during World War II. Within, Kuper (2003) noted the importance of using multiple sources to ascertain facts, as any one source may contain biases and inaccuracies. Furthermore, without secondary primary sources to back up primary sources, the conclusions generated may be inaccurate or wrong. In essence, as the researcher moves back through time, primary sources can be hard to find, lost, damaged or even hidden; thus, secondary sources are a great place to start to narrow the research question (Kuper, 2003; Seifried, 2010b).

Still, primary sources should be feverously pursued because they provide the information from the time the event happened and report time-specific reactions, decisions, and feelings from participants. Primary sources provide important detail and in many cases specifics that secondary sources lack (Jackson-Abernathy, 2013; Kraus, 2008). For historians, the use of primary sources is a required part of any significant research (Bender, 1986; Jackson-Abernathy, 2013). In the context of studying college football facility development, primary sources are much more likely to provide a complete picture of the facility, cost, and reasons for the development of the venue. The researcher relied heavily on primary sources to find data. Examples of types of primary sources used in the study include newspaper accounts, photographs, video, financing/financial statements, university reports, organizational memos, letters and correspondence, interviews, stadium planning documents and architectural plans or drawings. Primary source documents

usually either were from, or directly involved key participants in the construction process (i.e. coaches, athletic directors, university presidents, conference commissioners, leaders of the boards of control, and any important community leaders or fundraising groups). Understanding who was primarily engaged in discussions, allowed for better understanding of the decisions made by each university. Primary sources were used when venues were new or re-opened after a renovation. Seifried (2010b) highlighted that primary sources are by far the best accounts especially when multiple primary sources are found to provide similar data and/or information. The goal of historical research using primary sources, according to Jackson-Abernathy (2013) and Seifried (2010b), is to triangulate source data so that information from one source matches information found in another separate primary source. Triangulation of data allows the researcher to know the data they are using is accurate and removes criticisms the quantitative researchers have about historical qualitative research (Seifried, 2010b).

According to Seifried (2010b), good secondary sources of historical information are usually created from primary source data. Examples of these include journal articles, books, and reviews of research (Ary, Jacobs & Rasavieh 1996; Booth, 2005). These were also utilized in this work as excellent sources of information. Still, this work was mindful to review secondary sources before relying on them to contribute to this research project. For instance, Booth (2005) proposed some data collected may contain errors of fact and biases that may not be obvious during a first reading. In great detail, Booth (2005) discussed the importance of heavily scrutinizing secondary sources for errors and biases before using them as sources for any scholarly research. Seifried (2010b) similarly reported that the sport management profession may not be aware some primary sources are also subject to debate because journalists or eyewitnesses are not always impartial observers. Kuper (2003) provided an example of bias when he discussed

the history of Ajax, one of the largest soccer clubs in Holland. Ajax has existed for over one hundred years, yet according to the club's history it seems to have skipped the time period of nineteen forty to nineteen forty-five. Even when talking to the club historian, who was a member during the time period, it seemed to Kuper (2003) that the club was almost non-existent during these years. Appropriately, triangulating or comparing data against other sources is critical to discover or reveal accurate information. A third and equally important draw back to secondary sources can be the bias of the writer or eyewitness. Both Bale (2001) and Seifried (2010b) discussed secondary source biases by suggesting that often eyewitnesses and writers had a tendency to exaggerate to protect themselves and their own city or club, along with building up whatever community or event they represented. Recognizing biases when analyzing secondary sources allows the researcher to use correct information within the study.

The researcher spent time looking for strong primary and secondary sources that were useful in the discussion of the development of college football stadiums. In order to do this, the scholar found it necessary to explore bibliographic data about the college stadiums studied, by examining academic books and journals, newspaper articles and the internet. The researcher was able to find a several resources in ballparks.com and collegegridirons.com, along with other online data sources, to provide seating capacity, field surface specifics, and some historical data on the facility. In addition, it was possible to visit the websites of the various universities and athletic departments. After finding these primary and secondary sources, the scholar went to great lengths to cross-reference the information used to make sure it was reliable. The researcher also attempted to remove biases, exaggerations, and any other issues within those primary and secondary sources used. All of the work discussed fit into the next part of the chapter, which is known as historical criticism (i.e., third step in historical research process).

Historical Criticism

The historical criticism required the researcher to examine each document critically and to find other documents that supported its validity so that exaggerations and biases can be removed from the record (Golder, 2000; Mason et al., 1997; Seifried, 2010b). Park (1983) also discussed the concept by arguing that an author may not use documents that "selectively and uncritically use some evidence to favor some hypothesis" (p. 96). Booth (2005) and Seifried (2010b) similarly made the argument that it was important for the historical researcher to conduct a historical criticism because it allows the researcher to create a solid and unique hypothesis. Historical criticism is needed in the realm of college football stadium development because patterns can only be seen as emerging if the documentation surrounding the patterns was shown to be accurate and reliable.

In order to adequately complete a historical criticism, it is necessary to engage in an internal and external historical criticism of the sources. Internal criticism requires taking a source document and examining the integrity of the document as a whole. Does the document seem to make sense as written, or does it seem to be missing important pages or pieces, which could mislead the researcher (Kraus, 2008; Seifried, 2010b)? In essence, the researcher must ask if the terms mean then what they now are known to mean and do they understand the document as it was written. Internal criticism requires the researcher to remove possible misunderstandings based on the changing ideology and vocabulary of the time period and today (Golder 2000; Seifried 2010b; Struna, 2001). To address concerns about internal criticisms and misunderstandings, Golder (2000) advised that all historians use a dictionary from the time period. Using a dictionary from the time period ensures the researchers understanding of the

words and phrases used matches the understanding of the person writing the document during that time period (Golder, 2000).

External criticism, on the other hand, examines documents for forgery, or irregularities that would bring the document into question as far as accuracy or validity based on the time period (Seifried, 2010b). External criticism also examines if the document was possibly falsified, or in some other way incorrect in comparison to other documents during the time period (Berg, 1998). Researchers examines the signatures on the document to check for accuracy in comparison to other signatures by the same person, when the work was written in comparison to other works by the same author. Historical criticism also involves checking for historical integrity of the document (Seifried, 2010b). Checking the integrity of the document involves confirming that the paper matches the time period, along with exploring whether the historical information discussed matches the time of the document's publishing (Berg, 1998; McDowell, 2002). According to Seifried (2010b), historical criticism allows the historian to raise the level of validity in his work to that of a scientist, by having used a variety of ways to support the authenticity of a document. For this dissertation on college football facility development, it was important to complete the historical criticism process. The process included the examination of period specific photographs, videos, documents, and other memorabilia tied to the development of college football stadiums. Without the ability to support the accuracy of the document, it would be very difficult to incorporate the findings within the dissertation.

Another part of historical criticism required examining when the documents were written or printed in comparison to when the actual event occurred (McDowell, 2002). The author used documents written or published as close to the event as possible to improve upon the likelihood of recollection (McDowell, 2002). The researcher also realized, as Golder (2000) acknowledged,

in the technological age of today, online documents can be very easily forged. These documents include press releases, game notes, box scores, and other items found online, that can easily be edited and changed. All documents from the modern online era must be seriously scrutinized for reliability should they be used in any scholarly historical work (Golder, 2000; Seifried, 2010b). In this effort, the scholar sought out a wide variety of sources to collaborate works of the time period, especially when they involved eyewitness accounts, as these are most commonly the historical documents found with errors (Golder 2000; Seifried, 2010b).

External criticism for the primary sources used in the researcher's work was important for a variety of reasons. First and foremost, when examining documents from around the turn of the twentieth century, the scholar lacked the ability to go back and interview the original sources to make sure what was said in the document was accurate. Secondly, because of the sheer number of Division I institutions and the stadiums or field they played, it was impossible for the researcher to visit every stadium and view every resource to see if it was internally accurate and valid. Because of the sheer size of the Division I Football Bowl Subdivision, external criticism of the document became even more important to guarantee the accuracy of what was written in the paper. Lastly, external criticism allows the researcher to remove exaggeration and errors in the eyewitness accounts. Exaggeration and errors were a very common experience, especially in documents from the opening of new facilities or renovations, where the grandeur of the facility was often overstated due to the excitement and euphoria surrounding the event.

The last part of conducting historical criticism was to take the primary or secondary source and look for possible biases in the article from the author (Seifried, 2010b). It was important to look for slants brought on by particular social, economic, or political circumstances that the author of the primary source text may have dealt with during the time of the writing

(Von Mises, 1996). The history of college football stretches from the end of the Civil War, through the expansion of the country westward, two world wars, the Great Depression and the development of radio and television (Watterson, 2000). It also brings together changing styles of architecture, technology and financing (Seifried, 2010a). Berg (1998) mentioned the influence the social atmosphere, along with the religious mood the author was writing in, may have significantly influenced his or her writing of the document. Issues involving slant or bias were particularly important for the dissertation. When looking at the early development of college football stadiums, the scholar had to be aware of the time period in which the documents were written and the various social issues which influenced writers of documents. The researcher also needed to be aware of the changing acceptance, rules, and regulations that surrounded college football from the beginnings to the current day. A great example of changing acceptance of college football would be the many deaths that occurred during the early era of college football (Watterson, 2000). These deaths could easily influence a writer in how he or she worded a piece about the sport, the stadium, and the atmosphere surrounding the development of the game.

Data Collection/Analysis

The fourth step in the historical method centered on the collection and analysis of the data. According to Seifried (2010b), "The relative importance of this step involves the establishment of a relationship between the event and a larger theme or themes found" (p. 11). Bender (1986) stressed the importance of tying all parts of the story together instead of just focusing on one part of the story. The goal was to tie all parts of the development of college football stadiums together, instead of focusing on any one detail over all the rest. The researcher also wanted to ensure the material was analyzed in such a way that it created a logical thought process without making it too simple or straightforward. If the process was too simple or

straightforward the analysis becomes unusable or poor. Creating a logical flow follows ideology that finds itself in step with most other types of methodology within research as each method "…conducting research and writing summons the logical analysis of records and the synthesis of bits of information in a highly imaginative manner" (Seifried, 2005, p. 48). The goal of the researcher is to avoid incorrect or weak generalizations or underdeveloped premises within sentences and paragraphs. The scholar also wants to come to deductions or hypotheses reached properly linked to the context or incidents that occurred. The scholar also takes information and breaks it into ideas that are more or less true, or more or less likely and believable (Seifried, 2010b).

During the time period in which data was gathered, the researcher used the Louisiana State University (LSU) library system to learn the different facets and key pieces in the basic structure of college football stadiums. The scholar was successfully able to find documents on stadium construction, architecture, the history of college football, and the politics and money behind the development of sports facilities. In addition to the library system, the World Wide Web was used to find documents, photographs, and information, which were helpful. Finally, information from other university libraries, special collections/archives, and sport historians along with visits or tours to other college stadiums was conducted to find documents used in this work.

From this process, the next step involved the creation of an outline and spreadsheet to help identify key themes, time periods, changes, and events, which drove the development of college football stadiums. The dissertation followed Seifried's (2010a) ideal-type collection. Categories collected included school name, conference at time of change, facility name and city, type of construction with details about what changed, and then the associated category of change

(new construction, renovation (preservation, restoration, reconstruction, rehabilitation and/or combination). Other categories collected included, dome or outdoor venue, cost and cost per seat, when the change occurred (year), capacity, on-site parking, and surface area. Data collected also involved specific numbers related to the following areas of the stadium, luxury suites, club seats, press box(s) and video boards, wheelchair accessible seats, and restrooms and concession stands. The outline and spreadsheet allowed the researcher to explore overarching themes of dissertation, while also looking at the details each theme included, so that the paper can easily be turned into a logical document of intersecting ideas. It also provided the opportunity to examine which ideas and sources would be most useful for achievement of the goals of the study on college football stadiums. Next, it allowed the scholar to determine when and where each document can be best used, which helped determine the movement of the thoughts throughout the document (Seifried, 2010b). Booth (2005) recognized the importance of developing an outline, as it allows the author to place each document and source into a suitable classification, along with being in chronological or narrative order. As the outline and spreadsheets were formed, the researcher discovered associations in the material previously unseen from a boarder perspective but the detail necessary to explain the unique. Seifried (2010b) also promoted the outline as an opportunity to see where possible disagreements among sources occur and to work to settle discrepancies and the potential questions asked by other researchers.

As this researcher went through the study, it quickly became noticeable that several overarching themes developed. The advantage of historical research was that two scholars analyzing the same material were likely to find very similar, if not identical results from the sources collected and identified in this process. The ability of multiple researchers to come to

similar findings was one key advantage historical methodology offered over other types (Booth, 2005). One such theme is that renovations fell into five styles or types of renovation. The five styles were rehabilitation, preservation, reconstruction, restoration and some combination of the previous four styles. In particular, the triangulation of research using mixed quantitative and qualitative research helped reach the ultimate goal of legitimate conclusions. Triangulation allows the researcher to use both types of research designs to better the writer's outcome (Jick, 1979; Seifried, 2010b). In the example of college football facilities, the collection of changing structural size, construction costs, number of seats, number and type of suites, along with size of the actual acreage the facility consumed allowed the quantitative data to support and be backed by qualitative information discovered. The combination of these methodologies allowed the scholar to better understand the changing landscape of college football stadiums and in turn the evolution of college football. By examining the qualitative data already gathered, the researcher was able to see the changing structure, size, and general increasing scale of college football throughout the years. By including quantitative data as well, the author was easily able to see that the landscape of college football changed drastically, from small fields with minimal seating, to growing stadiums with some seating, to the modern behemoths full of commercial-based additions.

Before moving on, the researcher found in this study that not all college football stadiums are called stadiums to highlight the usefulness or utility of the various spreadsheets and outlines created. For example, a stadium may have changed names several times over its history. Bryant-Denny Stadium, home to the University of Alabama was also previously known as George Hutchinson Denny Stadium (Bryant Denny Stadium, 2012). Next, it was not uncommon for a university or college to have played in several different stadiums before playing in its current

facility. As an example, the University of Minnesota played games on a field "south of the Armory," Greater Northrop Field, Memorial Stadium, the Hubert H. Humphrey Metrodome, and TCF Bank Stadium during its one hundred and thirty year history (Greater Northrop Field, 2012; University of Minnesota Football History, 2012). Notably, several stadiums around the country also shared names. The University of Nebraska and the University of Indiana were amongst many others whose stadiums were named Memorial Stadium to honor the fallen and participants of World War I. Another example of the historical sharing of facility names ties to Spartan Stadium, which is used by Michigan State University and San Jose State University. Stadiums have used named a wide variety of names from donors, to team names, to coaches and a wide variety of other ways to identify the university facility. Table 3.1 below attempts to identify the many different names that stadiums were known by throughout the history of college football.

Table 3.1 College Football Facility Names

Alternative Facility Names	Examples (Location)
Stadium	Tiger Stadium (Baton Rouge, Louisiana)
Bowl	Rose Bowl (Pasadena, California)
Field	Kyle Field (College Station, Texas)
Dome	Hubert H. Humphrey Metrodome (Minneapolis, Minnesota)
Coliseum	Memorial Coliseum (Los Angeles, California)

Ideal-type

Please see that attached paper in the Appendix A for the discussion of the Ideal-type and the value of using heuristic devices such as the ideal-type in academic writing.

Chapter Four: The Humble Beginnings of College Football Facilities

Organized sport in America benefited from a combination of factors that drastically changed American life in the second half of the 19th century. For example, mass migration of immigrants into the United States from the 1820s to the 1880s and industrialization helped increase the population of America significantly from 9,638,453 in 1820 to 62,979,766 by 1890; including a 26% increase from 1870 to 1880 and a 25% increase from 1880 to 1890 (Diner, 2008; History, 2015). Within America, the population primarily shifted from rural locations to urban centers of the Northeast (e.g., Boston, New York City, Philadelphia) as roughly 40% of the country lived in cities by 1900, and over 60% of those people resided in the geographic Northeast ("Population: 1790 to," 1993; "Table 1," 1995).

Improvements in mass transportation also played a significant role in the development of the American city in the 1800s. For instance, with over 90,000 miles of railroad laid by 1880, railroads connected all the major cities of the Northeast (Lucas & Smith, 1978; "Railroad maps," 2015). For college sport, railroads connected university towns (e.g., Cambridge, MA; New Haven, CT; Princeton, NJ; New Brunswick, NJ) with major cities, allowing for quick movement from location to location ("Railroad maps," 2015). In particular, the combining of railways with streetcars in cities like New York and Boston increased the relative ease of traveling to and from contests. Railway access became especially important as college football gained popularity in the 1870s and 1880s, as major games would be held in New York City; New Haven, Connecticut; Boston; and Springfield, Massachusetts ("Football Game Between," 1875/2011; Ingrassia, 2012; Lewis, 1965; "The Yales Defeat," 1876/2011). College students in particular, often left campus in large numbers (250 or more) to travel to major games in the city (Young, 1887). For big games, train companies even dedicated special trains to take fans to the game (Lewis, 1965;

Smith, 1990). As an example, a 50-car train brought fans to the Harvard-Yale contest in Springfield, Massachusetts in 1892 (Lewis, 1965).

Along with the development of the railroad, communication technology improved. Of particular importance for sport in the late 19th century was the development of the telegraph, telephone, photography, film, and cheaper paper needed to rapidly produce newspapers (Rader, 1990; Watterson, 2002). Wire services and film spread information about the games in the east to newspapers around the country (Lewis, 1965). As communications technology became less expensive, the ease of usage and literacy increased. Communication channels like newspapers helped diffuse knowledge about sport. Further, by 1903, play-by-play stories were being written for major games, and daily newspapers in New York supported multiple reporters to cover college football in the fall (Lewis, 1965; Oriard, 1995).

College football also benefited from two other important pieces of life in the 19th century. First, baseball developed into a legitimate, professional game (Adelman, 1986; Seifried, 2005; Seifried, 2010a) in the 1870s with the creation of the National Association in 1871 (Seifried, 2005). Baseball helped legitimize large scale organized team sport as an acceptable event for members of American society to attend and enjoy. The popularity of professional teams led to the usage of venues that were enclosed in an effort to charge admission, starting in 1858 with Long Island's Fashion Race Course (Gershman, 1993; Riess, 1999). Baseball displayed that not only could sport draw the interest of the general public, but it could also generate revenue. Expectedly, an early and important intercollegiate sport was baseball in the 1860s as institutions like Harvard could draw over 10,000 spectators against both intercollegiate and professional teams from around the region (Harvard University, 2007; Riess, 1995). Many faculty spoke out openly against the professional game, and quickly moved to ban university teams from playing

against professional competition (Riess, 1995; Young, 1887). Faculty were concerned about open cheating found in the professional game (Riess, 1995; Young 1887). Even with the ban on playing professionals, college baseball increased in popularity (Riess, 1995).

The second important precedent for college football involved the development of intercollegiate regattas (rowing) in the 1850s ("Harvard-Yale Regatta," 2014; Lewis, 1965; Smith, 1990). The first Harvard-Yale competition took place on the water in 1852 on Lake Winnipesaukee, New Hampshire ("Harvard-Yale Regatta," 2014; Riess, 1995). By 1859, Brown, Trinity, Yale and Harvard came together in Providence, Rhode Island, to develop the College Union Regatta, the first true intercollegiate championship ("College Union Regatta," 1859; Smith, 1990). The inaugural race in Worcester, Massachusetts, drew over 15,000 spectators (Riess, 1995). By 1864, the regatta was an annual event, setting the stage for the development of other intercollegiate competition as an accepted part of college life ("Harvard-Yale Regatta," 2014; Riess, 1995; Smith 1990; Young, 1887). However, the college football game that developed in the late 19th century was unique and distinctly different from the association football (i.e., soccer) and rugby games most closely tied to the modern contest (Ingrassia, 2012; Watterson, 2002). Below are important recognized innovations involving intercollegiate football and ultimately the facilities where those contests were played. Innovation was rife in early college football; however, two innovations that effected facilities stand out: 1) the codification of rules; and 2) the enclosure of fields along with the addition of wooden bleachers.

Rules Development

Football developed in America through colleges, particularly in the Northeast (Oriard, 1995; Watterson, 2002). The first games were not competitions between schools but instead competitions between students at the same university ("Riot and Excitement," 1841/2011; Smith,

1990; “The Annual Foot-ball,” 1854/2011; “Yale Foot Ball,” 1852/2011). The first games developed spontaneously as a way for students to escape the rigors of university life. These games were played on open spaces either on campus (e.g., Delta at Harvard) or nearby city grounds (“The Annual Foot-ball,” 1854/2011; Weyand, 1955; “Yale Football Game,” 1852/2011). Games occurred between classes (i.e., Freshman versus Sophomore; Freshman/Junior versus Sophomore/Senior) and were usually played on the first Monday of the fall semester (Camp & Deland, 1896; Smith, 1990; “The Annual Foot-ball,” 1854/2011). These early games were developed and controlled by the students often without the permission or acceptance of the faculty of the college (“Harvard’s Foot-ball Buried,” 1860/2011; “Riot and Excitement,” 1841/2011). Further, these games could involve over 100 students and lacked any consistent rules from game to game or university to university (“A Sophomore In,” 1900; Camp & Deland, 1896; Smith, 1990). Field sizes for these games were developed based on the number of participants rather than any set standard (Camp & Deland, 1896; Oriard, 1995; Smith 1990). The fields were completely underdeveloped with no lines, goals, or any other designations to separate any potential spectators from the competition (Blanton, 2014; Seifried, 2005). The large size of the games and lack of officials or rules made them difficult to control, often leading to chaos (“The Annual Foot-ball,” 1854/2011; “Yale Football Game,” 1852/2011).

Observers argued these early football games were often closer to riots than actual football contests (Camp & Deland, 1896; Ingrassia, 2012; “Riot and Excitement,” 1841/2011). These games received limited coverage in the local and university press, although articles did appear about some contests in national papers such as *Harper’s Weekly* and *The New York Times* (Oriard, 1995; “The Annual Football,” 1854/2011; “The Illustration Which,” 1857/2011). While colleges did not play football games against each other during the sport’s formation, it seems

likely that through the sharing of information via newspapers and interpersonal communication, the diffusion of football spread to schools around the Northeast. Thus, by 1860, Brown, Harvard, Princeton, Rutgers and Yale were already involved in internal class contests on campus between students; laying the groundwork for competition between schools (Ingrassia, 2012; Smith, 1990; "The Annual Foot-ball," 1854/2011; "Yale Football Game," 1852/2011). Further, starting in 1860, university faculty and members of the local communities surrounding campus became involved in campus-based games (Camp & Deland, 1896; "Harvard's Foot-ball Buried," 1860/2011; "Trouble at Harvard," 1860/2011). For instance, fan interest in the game could not be contained so faculty became involved by requiring an official to oversee the games in an attempt to quell the violence that was a constant part of the game ("All Sorts and," 1870/2011; "The Annual Rush," 1876/2011).

The first intercollegiate football game took place on November 6, 1869, between Princeton University and Rutgers University. Roughly 50 members of Princeton and Rutgers met on a recreational field between College Avenue and Sicard Street in New Brunswick, New Jersey in front of about 100 spectators ("On Saturday, November," 1869/2011; Watterson, 2002). The game played that afternoon more resembled a soccer game (albeit with 25 players on each team) than the traditional football game most Americans understand today ("On Saturday, November," 1869/2011; Watterson, 2002). Specifically, both team captains agreed to follow the rules of the London Football Association, according to the Rutgers captain ("Rutgers 6, Princeton," 2015). Neither team wore a uniform, but the Rutgers players did wear red bandannas around their neck (Smith, 1990). The final score of the game was six to four in favor of Rutgers. The ball moved through kicking or batting of the ball with arms and other body parts. The field was 360 feet long by 225 feet wide, and was at least partially surrounded by a fence, as the game

story discusses the ball going over the fence and having to be retrieved for the game to continue ("On Saturday, November, "1869/2011; "Rutgers 6, Princeton," 2015; Smith, 1990). Although the players on the field may have enjoyed some understanding of what was going on, spectators clearly lacked understanding. According to the *Targum*, confusion reigned with the game explanation sounding more like chaos than an organized event ("On Saturday, November," 1869).

Starting in 1870s, other schools beyond Rutgers and Princeton also started to play intercollegiate football games. For instance, Rutgers and Columbia played on November 4, 1872, following traditional rugby rules, while Columbia and Yale played under merger of rules agreed upon by the captains ("The Foot-ball Contest," 1872/2011; "Yale Vs. Columbia," 1872/2011). The Columbia-Yale game saw a set field roped off that was pre-arranged by the captains ("Yale Vs. Columbia," 1872/2011). Even with pre-arranged rules and a roped off field, confusion still existed for spectators trying to understand what was legal and illegal under the rules ("Yale Vs. Columbia," 1872/2011). However, such confusion did not deter interest in the game. One commonality amongst the reports on the various games taking place from 1869 to 1872 was fan enjoyment and wonderment at the contest they were experiencing ("On Saturday, November," 1869/2011; "The Foot-ball Contest," 1872/2011; "Yale Vs. Columbia," 1872/2011). Furthermore, large numbers of spectators were noted as attending the games of this era with newspapers commenting on the likelihood that football could match the popularity of baseball in America soon ("Foot-ball: Its Laws," 1872/2011; Ingrassia, 2012; Smith, 1990).

As the game continued to grow in popularity, the popular press began to attempt to define the rules of the game ("Foot-ball: Its Laws," 1872/2011). The early rules of college football and the playing field were primarily shaped by the actions of Harvard University, Yale University,

and Princeton University (Smith 1990). An attempt by *The World* (1872) explained three basic rules that it viewed as standard: 1) a common field size (400 feet by 250 feet); 2) a common number of players (20, though captains may mutually agree to play less); and 3) how a goal is scored (by passing the ball ". . . between the goal posts and below the tape, not being thrown, knocked on or carried" ("Foot-ball: Its Laws," 1872/2011, p.38). In an attempt to create a unified set of rules for all colleges to follow, schools that played football were invited to New York in October of 1873 (Camp & Deland, 1896; "College Foot-ball," 1873/2011; Weyand, 1955). The game played by those who attended the convention continued to look much like the association soccer game previously discussed in *The World* ("College Foot-ball," 1873/2011; Watterson, 2002). Furthermore, the popular press, through the use of news wires, increased knowledge of the game outside Boston and New York through stories on the rules of football (Oriard, 1995).

The shift of football from a sport where the ball spent a majority of the time on the ground to one where the ball is carried occurred over May 15-16, 1874, when McGill University from Montreal challenged Harvard to a pair of football games (Oriard, 1995). Both games were played in Cambridge, Massachusetts, due to the insistence of Harvard faculty that the football team not travel to Canada during the spring term (Smith, 1990). McGill agreed to play one game following the rules Harvard used (a mix of soccer with the ability to carry the ball), while a second game was played using a version of rugby rules, which McGill played under ("Foot-ball", 1874/2011a; "Foot-ball, 1874/2011b; Smith, 1990). A newspaper account of the second game stated the McGill rules were at times ". . . intensely exciting" ("Foot-ball," 1874/2011b, p. 45). Of important note, several Yale athletes were in attendance for the two McGill-Harvard contests and were interested to see the actual differences between the two versions (Smith, 1990).

After playing McGill, Harvard's football leadership decided McGill's version of the game was more exciting, and they chose to adopt that style of play (Watterson, 2002; Weyand, 1955). Within this point, Harvard's leadership recognized spectator interest was important as admission fees were collected to help pay for equipment and the space to play games (Blanton, 2014; Ingrassia, 2012). Harvard played the first American game under their new rules against Tufts College in June 1875 (Weyand, 1955). Yale subsequently agreed to play Harvard the next two seasons under modified rules, combining parts of both the McGill rugby version and the aforementioned soccer-like game (Oriard, 1995; "The Harvard- Yale," 1875/2011). Like the McGill and Harvard games, Princeton players were similarly on hand to see the new version of the sport, which attracted over 4,000 in attendance at Hamilton Park in New Haven, CT (Smith, 1990; Weyand, 1955). Over time, the McGill version of football was adopted across other universities in the Northeast (Ingrassia, 2012; Smith, 1990; Watterson, 2002).

Formal adoption occurred in November 1876 when a meeting of representatives of Princeton joined Harvard and Columbia University in forming the first ICFA or Intercollegiate Football Association (Camp & Deland, 1896; Oriard, 1995; Watterson, 2002). The rugby style game involved 15 players on the field and 45-minute innings opposed to each inning ending when a goal was scored under the previous rules ("Foot-ball: It's Laws," 1872/2011; "The Harvard-Yale," 1876/2011). The field size moved to 330 feet by 160 feet with a crossbar ten feet high and uprights 18.5 feet apart (Camp & Deland, 1896; Danzig, 1956; Ryse, 1881/2011). The creation of the ICFA was a moment of great importance for the codification of rules for college football and ultimately the standardization of space (i.e., facilities).

While the development of the ICFA was of extreme importance, of equal or greater importance was a member of that committee, Walter Camp (Smith, 2005). Recognized as the

father of American football, Walter Camp played on the 1876 Yale team and served as an ICFA student representative (Smith, 2005). By 1878, Camp was captain of the Yale team and worked with the captains of Princeton and Yale to set a schedule for the 1878 season and the establishment of a ‘championship’ game at the St. George Cricket Grounds in front of at least 5,000 spectators (“Foot-ball Prospects,” 1878/2011a; “Princeton the Champion,” 1878/2011). In the end, the 1878 season saw almost two dozen teams playing football in the Northeast along with the initial start of the game to the Midwest (“Foot-ball Prospects,” 1878/2011b).

While Princeton won the first championship game, Yale’s influence over college football increased with Camp’s continued matriculation through Yale (Oriard, 1995; Smith, 1990; Watterson, 2002). As an example, Camp advanced the sport through proposed roster changes that reduced the active number of competitors from 15 to eleven (Ingrassia, 2012). According to Camp, the change was necessary for two reasons. First, getting permission from universities to allow players to leave campus was becoming increasingly difficult (Watterson, 2002). By moving the number of active competitors from 15 to eleven players, it was four less players who needed to leave campus during the school week (Ingrassia, 2012). Furthermore, eleven players on the field opened up more room on the field. The ICFA served as a gatekeeper to rules changes. Once the ICFA approved a rules change, schools desiring to play ICFA member schools quickly adopted the new rule changes.

The next significant rule change suggested by Camp surfaced in 1880 when he proposed for the team in possession of the ball to maintain control after they were tackled (Smith, 1990). The term down was developed to explain tackling, and rules were created to allow for the restart of the game at the point where the player was tackled (Camp & Deland, 1896; “Foot Ball,” 1880/2011; Weyand, 1955). The point where the ball was brought back into play became known

as a scrimmage point where the player put the ball in play by “1st kicking the ball 2d by snapping it back with the foot” (“Foot Ball,” 1880/2011, p. 83). The rule change produced unexpected consequences, which resulted in teams figuring out ways to hold onto the ball for an entire period or half of the game (Weyand, 1955). Resultantly, games in 1880 and 1881 were deemed to be of poor quality and lacking in excitement (“A Drawn Game,” 1881/2011; “Battling Without Result, 1881/2011; “Football in the,” 1880/2011).

One contest of particular note was the 1880 Thanksgiving Day game between Yale and Princeton. In the second half of the game and with the score tied, Princeton chose to not attempt to lateral or kick the ball for the entire second half. The Princeton team instead chose to hold onto the ball, guaranteeing Princeton would maintain possession and the game would end in a tie (Smith, 1990). Dull contests were becoming the norm following the rules changes of 1880 (Lewis, 1969). From a spectator perspective, the rule changes impacted pace of play, as teams no longer moved quickly up and down the field (Lewis, 1965; Smith, 1990). Rules changes allowed fans to stay seated in a centralized grandstand and watch the entire game, increasing the value of large bleachers centrally located on the sideline, where spectators could watch most of the action easily. With several thousand fans in attendance at Manhattan’s Polo Grounds, the 1881 championship game ended in a tie as well (“Battling Without Result.” 1881/2011; Smith, 1990). Change was necessary and by the start of the 1882 season, change would incorporate another rule that impacted the game significantly (Camp & Deland, 1896; Oriard, 1995; Smith, 1990).

For 1882, Camp suggested the creation of a set of three downs with a requirement to gain five yards to maintain possession (Ingrassia, 2012). The adoption of three downs to gain five yards increased the order and precision of the game (Ingrassia, 2012; Oriard, 1995). It also resulted in the field being lined into five-yard grids, helping coin the nickname of the gridiron for

a football field (Smith, 1990). Breaks between downs also encouraged fans to sit and watch the contest, as it moved from a high-tempo up and fluid sport, to a slower more methodical and execution-based sport. Camp desired for the game to be scientific in nature and worked with the ICFA to create a set of rules that allowed for the top teams to become extremely efficient in their actions (Camp & Deland, 1896, Ingrassia, 2012). Division of labor, and the development of plays and formations increased the machine like nature of college football, further distancing it from its starting point (Smith, 1990). Scoring started to change in 1883 with a goal kicked after a touchdown worth six points, a goal kicked from the field worth five points and a touchdown worth two points, and downing the ball in the team in possession's own goal area counting against the team (safety touchdown) (Camp & Deland, 1896). As rules such as downs and distance were added along with new ways of scoring, other rules limiting behaviors that were seen as anti-competitive focused on player safety (Watterson, 2002).

As part of the rules passed by the ICFA, formations were developed and practiced to increase the effectiveness of moving the football toward the opponent's goal (Watterson, 2002). The machine-like efficiency and execution sought to increase the chances of winning the game at whatever costs were necessary to achieve victory (Smith, 1990). One way teams were able to increase the chance of success was to create formations where players massed together and pushed to allow the ball carrier the chance to move toward the goal (Richards, 1886/2011). These formations created specific roles for each player in order to move the ball or stop movement of the ball, depending whether the player was on offense or defense (Ingrassia, 2012; Riess, 1991, 1995; Smith, 1990; Watterson, 2002).

From a rules perspective, mass plays increased the difficulty of enforcement of illegal play, as the referee could not always see what was happening between players in the middle of

the mass (Camp, 1887/2011; "The Development Of," 1889/2011). Another ICFA rule change further increased the danger of these mass plays. In 1888, the ICFA allowed for tackling between the waist and knees, which changed the previous rule of only allowing tackling above the waist (Camp, 1889/2011; Oriard, 1995). This rule was put in place to try to allow the defender a better chance to tackle a runner moving down the field (Smith, 1990). Instead, low tackling seemed to shift the advantage to the defender and encourage offensive teams to use mass plays to advance the runner down the field (Oriard, 1995). For example, Harvard developed a unique version of the mass play called the 'flying wedge' for the 1892 season.

The idea for the flying wedge came from Lorin Deland, a Boston businessman, who was interested in the application of military strategy to the game of football ("Flying Wedge," 1892/2011; Smith, 1990). The team held back the play until the 1892 clash with Yale ("Flying Wedge," 1892/2011). The 1892 Harvard-Yale clash occurred before over 20,000 spectators in Springfield, Massachusetts, at Hampden Park (McQuilkin & Smith, 1993). Over 300 members of the press sat in a special press enclosure for the game (McQuilkin & Smith, 1993). According to reports, Harvard opened the second half of the game with a kickoff, which at the time allowed the player kicking off to touch the ball with the foot and then pick it up and pass it to a teammate (Smith, 1990). Ten men then raced down field to collide with a defender in a wedge formation (Lewis, 1965; McQuilkin & Smith, 1993). The wedge led to a significant injury for one of Yale's players, requiring attention from a doctor (Lewis, 1965). Despite the brutality of the wedge formation, fans and media raved about the excitement of the play and produced gates of over \$20,000 for the biggest games of the 19th century (Danzig, 1956; McQuilkin & Smith, 1893; Watterson, 2002). For example, mass play attraction can be seen in the Thanksgiving Day game

of 1893, when over 50,000 would attend the eastern championship in New York City (Lewis, 1965).

Theodore Roosevelt, a decade before he became president of the United States, argued for the continued development of the game (Lewis, 1965). Roosevelt was one of many commentators who felt the game increased the toughness of the youth and allowed for the players to expend energy that otherwise would be used to create problems for society (McQuilkin & Smith, 1993). However, not everyone supported the view of Roosevelt and Parke Davis. Charles Eliot, President of Harvard, spoke out strongly against the brutality of the mass play version of football (Smith, 1990). Charles Young, a professor at Princeton, also was concerned about the physicality of the sport of football (Young, 1887). Unlike Eliot, who was an opponent of football, Young (1887) desired to find a way to keep football, while removing some of the less attractive parts of the game. The concerns voiced by faculty on campuses around the Northeast, involved time wasted on sport instead of studies, and the significant costs related to the game (McQuilkin & Smith, 1993; Smith, 1990; Young, 1887).

Notably, Camp released a book in 1894, presenting that overall former players supported the game and felt football's benefits far outweighed the dangers of the game (Ingrassia, 2012; Watterson, 2002). Camp chose to ignore several comments made about the dangers of the sport, and his book helped to limit the fears of many that football was too dangerous (Curtiss, 1893/2011; Smith, 1990). A new rules committee was formed in 1894 and removed formations like the flying wedge from the game (Danzig, 1956). However, other mass formations took the place of the flying wedge, causing the continuance of football's struggle with the brutality of mass plays (Danzig, 1956; Smith, 1990).

Schools around the country expectedly hired former Yale and Harvard players as coaches, spreading the mass play game from the Northeast to schools in the Midwest, South, and even West (Craig, 1893/2011; Ingrassia, 2012). Further, by the end of the 19th century, most football games were being played on college campuses around the country (Ingrassia, 2012; Lewis, 1965). Of note during the 1890s was the development of the Southern Intercollegiate Athletic Association in 1894 and Western Conference in 1895 (Revsine, 2014; "Southern Intercollegiate Athletic," 1895). These conferences emerged in response to the physical play of the early 1890s and formed rules to play that allowed them to play each other and to potentially better compete against those schools in the Northeast (Lewis, 1965, 1969; Revsine, 2014). The impact of conference development would not significantly impact football for several more years, but the regular meeting of schools that followed standardized rules and supported specially hired coaches only increased the spread of information about all aspects of football.

Early Venues

Most early games of football were played on land set aside for other purposes such as baseball or farming (Bernstein, 2001; Seifried, 2005). The effort to collect admissions at some locations meant the venues used for contests had to be enclosed by either a fence or some other structure that prevented access to the game except through the paying of a fee (Blanton, 2014; Seifried, 2005). These early enclosures were often owned by other organizations and were rented by the two teams participating. Early intercollegiate games commonly occurred in cities like New York, Hoboken, New Jersey, and Springfield, Massachusetts, where enclosed cricket or polo facilities already existed and not on campus (Smith, 1990; Watterson, 2002). Hamilton Park, where Yale played its early games, served as a great exemplar as a horse racing track surrounded a space 400 feet long by 250 feet wide for football (Bernstein, 2001; Danzig, 1956;

Weyand, 1955). At Hamilton Park, Yale sought out a way to pay the rent for the field so it started to charge $0.25 for spectators to attend games (Lewis, 1965). The first game Yale played at Hamilton Park was against Columbia, and it drew 400 paying spectators (Lewis, 1965). As individuals were willing to pay to watch college football, universities began to develop their own on-campus space to capitalize on the growing interest. Tables 4.1 and 4.2 provide information on the growing stadiums of Stage One (1869-1903).

The earliest on-campus environments for football were usually the college green in the center of campus or a park near campus and not conducive to commercial sale ("The Annual Foot-ball," 1854/2011; "Yale Foot Ball," 1852/2011). As noted earlier, the first intercollegiate football game occurred between Princeton and Rutgers in an open space 360 feet by 225 feet with a fence at least partially enclosing the space (Bernstein, 2001). Seifried (2005) noted the 1869 contest was a first, in that it created a fixed boundary between the playing field and spectators who watched the game. The separation of spectators from the field allowed these individuals to safely enjoy the physical game of football between Princeton and Rutgers. However, the separation was not complete and a few fans were knocked off the fence due to a collision between players and the fence (Danzig, 1956). As previously discussed, the games rules closely followed modern soccer with goals 25 feet apart at each end of the field (Danzig, 1956; "On Saturday, November," 1869/2011). Twenty-five players played on each team, requiring a large space to hold the players. No specific space, such as bleachers, was designed for the fans nor were spectators required to pay to watch the game. Some fans sought high ground by sitting on top the fence, while others scattered around the field and walked or ran to follow the flow of the action ("On Saturday, November," 1869/201; Lewis, 1965).

Table 4.1 Stage One Facilities (1869-1902) and Renovation Type

School	Stadium	New	Renovate	Preserve	Restore	Reconstruct	Rehabilitate	Combo
Rutgers	College Field							
Northwestern	Deering Meadow							
Yale	Hamilton Park							
Michigan	Baseball Diamond	X						
Harvard	Jarvis Field							
Princeton	St. George's Cricket Club							
Brown	Lincoln Field							
Navy	Navy Campus Field							
Princeton	St. George's Cricket Club		X				X	
Princeton	University Field							
Kentucky	Stoll Field							
Dartmouth	College Green							
California	San Francisco Recreation Grounds							
Harvard	Holmes Field							
Minnesota	Minnesota Driving Club							
Michigan	County Fairgrounds	X						

(Table 4.1 continued)

School	Stadium	New	Renovate	Preserve	Restore	Reconstruct	Rehabilitate	Combo
Michigan	Detroit Athletic Club Field							
Yale	Yale Field	X						
California	West Field	X						
Princeton	University Field		X				X	
California	West Field		X				X	
Indiana	Jordan Field	X						
Notre Dame	Open Field on Campus							
Penn State	Old Main Lawn	X						
Virginia	Madison Hall Field/ Bowl	X						
California	West Field		X				X	
Illinois	Illinois Field	X						
Miami of Ohio	Old Main							
Princeton	University Field	X						
Wisconsin	Camp Randall Stadium							
Missouri	Rollins Field	X						
North Carolina	North Carolina Campus Field							
Purdue	Lafayette YMCA Park							

(Table 4.1 continued)

School	Stadium	New	Renovate	Preserve	Restore	Reconstruct	Rehabilitate	Combo
Southern California	Local Field							
Syracuse	Syracuse Campus Field							
Army	The Plain							
Colorado	Gamble Field	X						
Iowa	University Field							
Kansas	Old Central Park	X						
Nebraska	Lincoln Park							
Ohio State	German Village Recreational Park	X						
Pittsburgh	Exposition Park							
Princeton	University Field		X				X	
Washington	Athletic Park							
Yale	Yale Field		X				X	
Northwestern	Sheppard Field	X						
Rutgers	Neilson Field	X						
Tennessee	Baldwin Park							
West Virginia	Show Lot							

(Table 4.1 continued)

School	Stadium	New	Renovate	Preserve	Restore	Reconstruct	Rehabilitate	Combo
Auburn	Auburn Athletic Field							
Colorado State	Football Ground south of Old Main							
Georgia	Herty Field	X						
Harvard	Jarvis Field		X				X	
Iowa State	State Field							
Kansas	McCook Field	X						
Maryland	Maryland Agricultural College fields							
New Mexico	University Field	X						
North Carolina State	Red Diamond Field							
Purdue	Stuart Field	X						
San Jose State	The State Normal School Field at San Jose							
South Carolina	Fairgrounds Field							
Stanford	Haight St. Grounds							
Texas A&M	Drill Field							

(Table 4.1 continued)

School	Stadium	New	Renovate	Preserve	Restore	Reconstruct	Rehabilitate	Combo
Texas Christian	Texas Christian Campus Field							
Utah State	University Quad	X						
Vanderbilt	Old Dudley Field	X						
Wyoming	University Field	X						
Alabama	The Quad-next to the Gymnasium							
Chicago	Marshall Field	X						
Dartmouth	Alumni Oval	X						
Idaho	Campus Field							
LSU	State Field	X						
Michigan	Athletic Field	X						
Oregon State	College Field	X						
Penn State	Beaver Field	X						
Texas	Varsity Athletic Field	X						
Tulane	Sportsman Park							
Arkansas	The Hill							
Kansas State	Athletic Park	X						
Nebraska	M Street Park							

(Table 4.1 continued)

School	Stadium	New	Renovate	Preserve	Restore	Reconstruct	Rehabilitate	Combo
New Mexico State	College Field/Miller Field							
Ohio	College Green							
Oregon	Stewart's Field	X						
Oregon	Multnomah Field							
Temple	Hunting Park							
Utah	Cummings Field	X						
Virginia Tech	Sheib Field							
Mississippi State	Hardy Field	X						
Missouri	Rollins Field		X				X	
Oklahoma	Field North of Holmberg Hall	X						
Ole Miss	Oxford University Park							
Penn	Franklin Field	X						
Texas Christian	Texas Christian Campus Field							
Washington	Denny Field	X						
Washington State	Soldier Field	X						
Georgia	Herty Field		X				X	
Miami of Ohio	Miami Field	X						

(Table 4.1 continued)

School	Stadium	New	Renovate	Preserve	Restore	Reconstruct	Rehabilitate	Combo
Michigan	Regents Field		X				X	
Michigan State	Old College Field							
Arizona State	Normal Field	X						
Harvard	Soldier's Field	X						
Nebraska	Antelope Field							
Notre Dame	Cartier Field	X						
Boston College	Field Outside Boston College Grounds							
Chicago	Marshall Field		X				X	
Iowa	Athletic Park	X						
Ohio State	Ohio Field at High and Woodruff	X						
Pittsburgh	Recreation Park							
Arizona	Carillo Gardens							
Baylor	Baylor Campus Field							
California	West Field		X				X	
Colorado State	Durkee Field	X						
Iowa	Athletic Park		X				X	
Minnesota	Northrop Field	X						
Purdue	Stuart Field		X					

(Table 4.1 continued)

School	Stadium	New	Renovate	Preserve	Restoration	Reconstruct	Rehabilitate	Combo
Texas	Varsity Athletic Field		X				X	
Brown	Andrews Field	X						
Clemson	Bowman Field							
Iowa	Athletic Park		X				X	
Michigan	Regents Field		X				X	
Washington State	Soldier Field		X				X	
Oklahoma State	North of Morrill Hall							
Virginia	Lambeth Field	X						
Baylor	Carroll Field	X						
Chicago	Marshall Field		X			X		
Cincinnati	Carson Field	X						
Columbia	South Field							
North Carolina State	North Carolina State Fairgrounds							
Virginia Tech	Gibboney Field	X						

Table 4.2 Stage One (1869-1902) Costs, Year of Construction and Capacities

School	Stadium	Nominal Cost ($)	Facility Change	Capacity
Rutgers	College Field		1869	0
Northwestern	Deering Meadow		1870	750
Yale	Hamilton Park		1872	
Michigan	Baseball Diamond		1873	
Harvard	Jarvis Field		1874	
Princeton	St. George's Cricket Club		1877	
Brown	Lincoln Field		1878	
Navy	Navy Campus Field		1879	
Princeton	St. George's Cricket Club		1879	
Princeton	University Field		1879	
Kentucky	Stoll Field	500	1880	3,000
Dartmouth	College Green		1881	
California	San Francisco Recreation Grounds		1882	300
Harvard	Holmes Field		1882	
Minnesota	Minnesota Driving Club		1882	
Michigan	County Fairgrounds		1883	
Michigan	Detroit Athletic Club Field		1883	4,000
Yale	Yale Field		1884	33,000
California	West Field		1885	450
Princeton	University Field	300	1885	1,800
California	West Field		1887	1,000
Indiana	Jordan Field		1887	
Notre Dame	Open Field on Campus		1887	
Penn State	Old Main Lawn	2,000	1887	
Virginia	Madison Hall Field/ Bowl		1887	0
California	West Field		1888	3,000
Illinois	Illinois Field		1888	300
Miami of Ohio	Old Main		1888	
Princeton	University Field	13,000	1888	12,000
Wisconsin	Camp Randall Stadium	25,000	1888	2,880
Missouri	Rollins Field	1,300	1889	200
North Carolina	North Carolina Campus Field		1889	800
North Carolina	North Carolina Campus Field		1889	800
Syracuse	Syracuse Campus Field		1889	
Army	The Plain		1890	

(Table 4.2 continued)

School	Stadium	Nominal Cost ($)	Facility Change	Capacity
Colorado	Gamble Field		1890	9,000
Iowa	University Field		1890	900
Kansas	Old Central Park		1890	
Nebraska	Lincoln Park		1890	
Ohio State	German Village Recreational Park	200	1890	0
Pittsburgh	Exposition Park		1890	16,000
Princeton	University Field	300	1890	20,000
Washington	Athletic Park		1890	5,000
Yale	Yale Field	4,000	1890	33,000
Northwestern	Sheppard Field		1891	1,000
Rutgers	Neilson Field	5,000	1891	6,000
Tennessee	Baldwin Park		1891	
West Virginia	Show Lot		1891	
Auburn	Auburn Athletic Field		1892	5,000
Colorado State	Football Ground south of Old Main		1892	
Georgia	Herty Field		1892	
Harvard	Jarvis Field		1892	4,000
Iowa State	State Field		1892	
Kansas	McCook Field	2,500	1892	1,000
Maryland	Maryland Agricultural College campus fields		1892	
New Mexico	University Field		1892	
North Carolina State	Red Diamond Field		1892	
Purdue	Stuart Field		1892	800
San Jose State	The State Normal School at San Jose		1892	
South Carolina	Fairgrounds Field		1892	2,000
Stanford	Haight St. Grounds		1892	10,000
Texas A&M	Drill Field		1892	0
Texas Christian	Texas Christian Campus Field		1892	0
Utah State	University Quad	100,000	1892	
Vanderbilt	Old Dudley Field		1892	
Wyoming	University Field		1892	0
Alabama	The Quad-next to the Gymnasium		1893	0

(Table 4.2 continued)

School	Stadium	Nominal Cost ($)	Facility Change	Capacity
Chicago	Marshall Field	1,210	1893	1,200
Dartmouth	Alumni Oval	17,000	1893	5,000
Idaho	Campus Field		1893	0
LSU	State Field		1893	
Michigan	Athletic Field	7,500	1893	400
Oregon State	College Field		1893	0
Penn State	Beaver Field	15,000	1893	500
Texas	Varsity Athletic Field	9,000	1893	0
Tulane	Sportsman Park		1893	1,500
Arkansas	The Hill	1,900	1894	300
Kansas State	Athletic Park		1894	
Nebraska	M Street Park		1894	
New Mexico State	College Field/Miller Field		1894	
Ohio	College Green		1894	
Oregon	Stewart's Field		1894	0
Oregon	Multnomah Field		1894	10,000
Temple	Hunting Park		1894	
Utah	Cummings Field		1894	2,000
Virginia Tech	Sheib Field		1894	0
Mississippi State	Hardy Field		1895	
Missouri	Rollins Field	1,300	1895	850
Oklahoma	Field North of Holmberg Hall		1895	0
Ole Miss	Oxford University Park		1895	6,000
Penn	Franklin Field	100,000	1895	24,000
Texas Christian	Texas Christian Campus Field		1895	4,000
Washington	Denny Field		1895	8,000
Washington State	Soldier Field		1895	
Georgia	Herty Field	1,900	1896	
Miami of Ohio	Miami Field		1896	
Michigan	Regents Field	1,370	1896	800
Michigan State	Old College Field		1896	6,000
Arizona State	Normal Field		1897	0

(Table 4.2 continued)

School	Stadium	Nominal Cost ($)	Facility Change	Capacity
Harvard	Soldier's Field	15,000	1897	8,000
Nebraska	Antelope Field		1897	8,000
Notre Dame	Cartier Field		1897	30,000
Boston College	Field Outside Boston College Grounds		1898	
Chicago	Marshall Field		1898	11,000
Iowa	Athletic Park	6,000	1898	
Ohio State	Ohio Field at High and Woodruff	1,950	1898	500
Pittsburgh	Recreation Park		1898	17,000
Arizona	Carillo Gardens		1899	0
Baylor	Baylor Campus Field		1899	
California	West Field		1899	5,000
Colorado State	Durkee Field		1899	1,000
Iowa	Athletic Park		1899	
Minnesota	Northrop Field		1899	8,000
Purdue	Stuart Field	500	1899	1,400
Texas	Varsity Athletic Field	350	1899	
Brown	Andrews Field		1900	1,200
Clemson	Bowman Field	400	1900	2,000
Iowa	Athletic Park	1,500	1900	4,000
Michigan	Regents Field	12,000	1900	15,000
Washington State	Soldier Field		1900	
Oklahoma State	North of Morrill Hall		1901	
Virginia	Lambeth Field	10,000	1901	1,000
Baylor	Carroll Field	1,500	1902	1,000
Chicago	Marshall Field		1902	11,000
Cincinnati	Carson Field	5,000	1902	
Columbia	South Field		1902	
North Carolina State	North Carolina State Fairgrounds		1902	
Virginia Tech	Gibboney Field		1902	

To realize potential profits from the commercial sale of football, the next step was to develop enclosed spaces on campus. Multiple sports (e.g., baseball, track and field, football)

were to be played in these early venues, necessitating that these be large open spaces with few structures on them. These early college venues thus had either no permanent bleachers or only a few hundred bleacher seats that were moveable depending on the sport being played (Lewis, 1965). While these structures were often on one side to allow for the playing of other sports in the facility, they sought to maximize seating where most of the action would take place (i.e., middle of the field). To call these places football venues or stadiums would be completely inaccurate. At best, these were open parks where a variety of sports took place, with football being less important than more popular sports such as college baseball and horse racing.

As college football gained in popularity during the 1870s, schools around the Northeast adopted the sport in order to be able to play Harvard, Yale and Princeton (Smith, 1990; Watterson, 2002). Geography, linked by various transportation and communication technologies, played a large role in the spread of football (Lewis, 1965). However, to support football development at Harvard, the University developed the Harvard University Football Club in 1860 and charged members $1 for the chance to participate (Weyand, 1955). Princeton similarly created a football association for its students in 1871 by Yale did so a year later in 1872 (Lewis, 1965). School football associations helped to fund the significant costs of football, particularly the large travel expenses (often hundreds of dollars), incurred by teams traveling to play opponents in New York, Springfield, Massachusetts, and Hoboken, New Jersey (Lewis, 1965; Young 1887).

The aforementioned Harvard-McGill series brought in revenue as about 500 spectators paid $0.50 each to watch the two teams play at Jarvis Field on Harvard's campus (Smith, 2005). Harvard and Yale met at Hamilton Park during the fall of 1875, drawing over 2,000 fans that paid $0.50 for the opportunity to watch the two teams play (Lewis, 1965). Harvard brought $70

back to Cambridge from the game, which was their share of the gate (Lewis, 1965). The financial profitability of football produced several consequences. First, students from other schools attended games and brought football home to their institution. Second, university presidents and other leaders quickly understood the sport could provide financial benefit to universities struggling to pay the expenses of running a college or university (Ingrassia, 2012; Smith, 1990). Third, institutions recognized they needed to control the event to capture revenue from the sport and to protect the student (Camp & Deland, 1896; Lewis, 1965; Young, 1887).

Following the development of the ICFA in 1876, most games between Harvard, Yale, and Princeton were played at large venues in neutral cities (Oriard, 1995; Smith, 1990). Venues such as Hampden Park (Springfield, Massachusetts), St. George's Cricket Ground (Hoboken, New Jersey), and the Polo Grounds (New York City) hosted those large games played often on Thanksgiving Day (McQuilkin & Smith, 1993; Smith, 1990). Crowds came by special trains to attend these neutral site games (Lewis, 1965). A crowd at St. George's Cricket Ground for the 1878 Thanksgiving Day contest numbered over 5,000 paying spectators ("Princeton the Champion," 1878/2011). Admission fees of $0.50 to several dollars were charged in order to attend games at neutral sites and to pay for the cost of the facility along with travel to the venue (Blanton, 2014; Ingrassia, 2012). Rent of $300 was paid for the usage of St. George's Cricket Ground for the 1878 contest (Presbrey & Moffatt, 1901). Fans surrounded the early games with horse drawn carriages using the vehicles to sit and watch the game (Smith, 1990). By 1883, over 15,000 attended the Yale-Princeton championship at the Polo Grounds, which brought over $1,000 to each school (Lewis, 1965; Smith, 1990).

While playing games away from campus created profits (e.g., Yale netted over $10,000 from the Thanksgiving day game in 1892), it did not maximize profits, as the schools were

required to pay rent to the facilities (Ingrassia, 2012). The 1896 Yale-Princeton game at the Polo Grounds in Manhattan cost the teams $10,000 in rent (Lewis, 1965). The challenge for institutions was to seek out how to increase on-campus attendance. Oriard (1995) suggested increased on campus attendance occurred through efforts to increase interest in the game, generated in a large part by the expanded interest that newspapers and magazines that took part in the game.

Invitations to campus by university administrators to the local media allowed universities to argue that moving the games back to campus would decrease the poor behavior of students while also increasing control for the university over football and the profits derived from the game (Lewis, 1965). Faculty members at respective schools also did not approve of what they considered to be significant betting and excessive partying by students ("College Men At," 1879/2011; Smith, 1990; "Yale Again Victorious," 1883/2011; Young, 1887). Thus, by the 1880s, faculty encouraged all games be played on college campuses (Ingrassia, 2012; Young, 1887). Soon after the decision to move games on campus, Yale earned $2,674.49 in 1885, which matched the expenses incurred for the season. By 1892, the profits were quite large with Yale athletic department earning over $22,000. Ingrassia (2012) and Lewis (1965) suggested most games were moved to campus sites by the mid-1890s; however, these initial efforts involved some level of investment into existing campus fields such as improving bleacher seating (i.e., quality and quantity).

The Move to Campus

On campus football venues begin Stage One of this ideal-type. Jarvis Field, on the campus of Harvard University, was an excellent example of an early Stage One facility (See Tables 4.1 and 4.2). The fenced field was home to Harvard's baseball team, track team, and the

football team (Blanchard, 1923; Harvard Memorial Society, 1907). Harvard practiced on Holmes Field, a neighboring patch of ground that was unsuitable for competition (Blanchard, 1923). Jarvis Field was developed as a baseball field due to the popularity of the Harvard baseball team and potential for football game profitability (Smith, 2005). One of the first major football contests for Jarvis Field was the 1874 Harvard-McGill game, with no stands for spectators and a rudimentary wooden fence surrounding a wide-open space (Blanchard, 1923). Fans, generating $500 in revenue, moved with the action, following it up and down the field (Blanchard, 1923; Morse, 1924).

In the 1870s, schools slowly developed spaces on campus to host games. Often these early venues hosted second tier games against lower level opponents, where renting the Polo Grounds or St. George's Cricket Ground made little financial sense. Princeton constructed such a field just for sports near campus in 1877 known as University Field (Presbrey & Moffatt, 1901). The facility incorporated a picket fence to keep fans from viewing the games that did not pay admission. Inside the fence, a baseball diamond was designed along with a quarter-mile track and space for football as well (Presbrey & Moffatt, 1901). A covered grandstand that could seat 150 was built on the grounds with the total cost of grading and construction ending at $13,000 (Presbrey & Moffatt, 1901). The funds for this venture came from Princeton alumni, an important shift from the student run facilities developed prior to this point (Lewis, 1965). The University of Pennsylvania (Penn) provided another example of a large-scale investment in facilities (Cheyney, 1940). Penn started playing intercollegiate football in 1876, commonly playing against Princeton, Yale, and Harvard, either away from home or at a neutral site (Weyand, 1955). Over $15,000 was raised for the building by alumni of the university (Cheyney, 1940). The goal was to move games from off-campus sites to campus as part of an effort to

invite alumni back to campus (Lewis, 1965; Weyand, 1955). The facility opened in the spring 1885 and was home to the Penn for the next decade (Cheyney, 1940). Overall, the enclosed college venues were rudimentary in comparison to the large-scale private venues in major cities with usually little more than a fence and a few bleachers. However, enclosed campus facilities allowed universities to profit from the sports played within while also controlling when, where, and who participated (Blanton, 2014).

Of equal importance to the development of facilities during the 1870s and 1880s was who paid for the construction of the new venues. The cost of early facility development came from admission fees and membership dues collected from university football association (Ingrassia, 2012; Smith, 1990). Yet, by the 1880s, a decade of football playing alumni graduated and worked in businesses throughout the Northeast (Ingrassia, 2012; Sack 1974). These alumni desired to give back to the university and the football program in particular. As alumni gave money back, new and better facilities developed on university campuses in what could be considers an early 'arms race'. The pattern of facility development followed the pattern of football development with the football playing schools of the Northeast building new facilities first, followed by the West and South (Lewis, 1965). Control over athletics also shifted away from the students toward faculty and alumni (Ingrassia, 2012; Sack, 1974; Smith, 1990). At many other schools, the shift toward faculty and alumni influence increased the development of new or renovation of existing facilities and helped to pay for other university building projects (Blanchard, 1923; Lewis, 1965; Shaw, 1920).

Evidence of this point is strong during the 1880s as the development of new fields at Harvard (1874), Princeton (1877), Yale (1884) and Penn (1885) all occurred within a decade but subsequent renovations highlight alumni competitions. As an example, Harvard's Jarvis Field

received a $13,000 rehabilitation project in 1883, improving the field and constructing larger bleachers (Weyand, 1955). University Field at Princeton also underwent repairs in 1885, including improvements to the development of another set of bleachers at a cost of $300 (Presbrey & Moffatt, 1901). Yale further invested $4,000 from its $36,000 in profits from the 1890 season into bleachers at Yale Field, with leftover money going into other campus building projects (Ingrassia, 2012; Lewis, 1965). By 1897, Yale was investing $100,000 in the construction of wooden stands for the Yale-Princeton and Yale-Harvard games at Yale Field (Lewis, 1965). Furthermore, Yale hired a group of people to patrol the stands prior to contests to prevent fire from destroying the bleachers and ruining the potential significant profits that could be realized from the games (Lewis, 1965).

University Field at Princeton was rehabbed in 1890 when the facility was completely redone with new bleachers and a fresh one-third mile track (Presbrey & Moffatt, 1901). At Harvard, Soldier's Field was developed in the 1890s to support the growing interest in football (Blanchard, 1923). Soldier's Field was donated by Major Henry Higgginson of the class of 1885 as a space for athletic contests (Brown, 1903). The 20 acres used for the field was described as flat and treeless land that flooded easily (Beale, 1896; Brown, 1903). Soldier's Field was located across the Charles River from the Harvard campus (Beale, 1896; Smith, 2005). Soldier's Field became the home field for all Harvard games starting in 1894 with the erection of a fieldhouse and bleachers that sat 4,000 for a cost of $15,000 (Bealle, 1948; Blanchard, 1923). The football field was surrounded by a cinder track and space for a baseball diamond was also found inside the facility (Brown, 1903). No longer was baseball the primary determination of where bleachers were built. The 4,000 bleacher seats were built centrally for football (Brown, 1903; Smith, 1990; Watterson, 2002). Soldier's Field was capable of holding more than 20,000 spectators with the

construction of short-term temporary bleachers for the bi-annual Yale contest in Cambridge (Bealle, 1948). Finally, following the trend set at Harvard, Penn built Franklin Field on a piece of land that was unable to be used for housing on the edge of the university campus in 1895 at a cost of approximately $100,000 (Cheyney, 1940).

Expectedly, admission prices continued to increase with construction and renovation efforts but additional fans continued to attend the spectacle (Lewis, 1965). By the 1890 Yale-Princeton contest, admission prices were between $1 and $2 for box seats (Lewis, 1965). As attendance increased along with admission prices, so did profits for the universities. Athletics became a strong source of revenue for schools, especially those who played high level schedules against teams like Harvard and Yale (Ingrassia, 2012). Football games also became social happenings in the late 1890s as newspapers began to cover not only the game but also who was in attendance (Oriard, 1995). By the late 1890s, even Princeton and Yale, the last two major programs still playing games on neutral fields moved their Thanksgiving Day contests to their respective campuses on a rotating basis (Ingrassia, 2012; Lewis, 1965).

In the 1890s, no longer were just Harvard, Yale, Penn, and Princeton building venues to host football games in the Northeast. Other schools started to develop facilities to host games and gain the profits found at peer schools in the region. Dartmouth College built the Alumni Oval, a multi-purpose home to its baseball, track, and football programs in 1893 (Shribman & DeGange, 2004). Prior to the opening of Alumni Oval, Dartmouth played most of its games on the road due to the lack of a suitable facility to host games (Shribman & DeGange, 2004). Brown University developed a seven-acre site in 1899 naming it Andrews Field after its president (Mackie, 2010). Bleachers were built on the site with several moveable sections to adjust for the various sports played (Mackie, 2010).

Following the passage of the Morrill Act in 1862, public universities elsewhere around the country slowly developed. Professors moved west from the institutions in the Northeast, bringing the traditions developed at the eastern institutions westward (Lewis, 1965). The westward movement of football involved the adoption of football by public institutions (e.g., University of Michigan, Minnesota, and California-Berkeley) (Lewis, 1965). Daily newspapers and monthly magazines such as *Harpers Weekly* and *St. Nicholas* discussed the game of football and its rules throughout the late 19th century, increasing the popularity of the game amongst the hundreds of thousands of readers across the country (Bull, 1890/2011; de Thulstrup, 1889/2011; Oriard, 1995). Michigan played Racine College on May 30, 1879 in the first Midwest intercollegiate football game (Lewis, 1965). Michigan brought a team east to play Harvard, Princeton, and Yale in 1881 ("Student Life And," 1958). Minnesota formed a team in 1882 and gained significant support for the team following the hiring of President Wallace Northrop from Yale (Thwing, 1906). By 1887, schools in Indiana, Maryland, North Carolina, and Virginia were also competing in intercollegiate football (Lewis, 1965).

As football spread, the need for people who understood and could teach the game increased significantly (Ingrassia, 2012). Schools looking to adopt football hired former players from the eastern schools (in particular, Yale, Harvard and Princeton) to teach the game to their players (Lewis, 1965). North Carolina (Hector Cowan), Missouri (Austin McRae), and the University of Chicago (Amos Stagg) all hired coaches from the eastern schools (Lewis, 1965). William Harper Rainey's hiring of Amos Stagg for $2,500 to head the athletic program at the University of Chicago was particularly shocking as the average professor at the time made less than $1,500 (Lewis, 1965; Stagg & Stout, 1927). Football spread to the West Coast in 1892, with Stanford and California-Berkeley playing their first game on March 19, 1892, in front of 10,000

at the Haight Street Grounds ("Foot Ball On," 1892; "History and Tradition," 2015; Morse, 1924). By 1893, both Stanford and California hired coaches from Yale (in the case of Stanford, Walter Camp) to improve the style of football played for the spring 1893 game (Lewis, 1965).

As former players moved west, so did information about how teams played and what 'modern' facilities teams needed in order to be able to compete (Ingrassia, 2012; Lewis, 1965; Morse, 1924). Former players also constantly wrote back and forth to each other, sharing information about the latest advances in the game, from formation development to improved technique (Ingrassia, 2012; Lewis, 1965; Stagg & Stout, 1927). The spread of information quickened through the development of an informal network of former eastern players, with techniques such as the flying wedge spreading rapidly to schools around the country (McQuilkin & Smith, 1993; Morse, 1924; Revsine, 2014).

The diffusion of football westward in the 1880s led to the development of facilities in the early 1890s. At Northwestern, Sheppard Field was constructed in 1892 with an elaborate grandstand that sat 1,000 people ("Historic Sites of," 2015). These structures sat hundreds and were often set in places, which featured football, following the trend of the venues built in the Northeast. In 1893, the University of Michigan developed Regents Field for athletics ("The Michigan Stadium," 2007). The university purchased ten acres of land for $7,500 and constructed a fence to surround the field along with simple bleachers (Lewis, 1965). By 1903, the 400-seat bleachers had been expanded to seat 8,000 at a cost of almost $100,000 ("The Michigan Stadium," 2007). Kansas, at this time, spent $2,500 to buy twelve acres of land to build a 1,000-seat grandstand named McCook Field (Lewis, 1965). In 1893, the University of Chicago constructed its first playing ground, one without bleachers, using donated land from Marshall Field (Stagg & Stout, 1927). By 1894, Stagg worked with the University of Chicago to

construct a 1,200-seat grandstand (Lewis, 1965). Further west, the University of Utah used $300 of credit from a local lumber company to construct a fence and a set of bleachers for 2,000 on Cummings Field for the 1894 season (Chamberlin, 1960). The lumber company agreed to fund the field in return for a share of the admissions fees until the debt was paid in full (Chamberlin, 1960).

Several other schools around the country rushed to build improved wooden structures right at the turn of the century. For example, Rollins Field was constructed at Missouri in 1895 through $1,300 from the legislature and volunteer work from the Rollins brothers and engineering students. The facility was named after the Rollins brothers because of their work both grading the field and helping construct the bleachers (Mizzourah!, 2003). In 1897, Notre Dame purchased six acres of land and built an enclosed facility through the donation of Warren Cartier class of 1887 (Blanton, 2014; Peck, 1899). Northrop Field opened at the University of Minnesota in 1899 with bleacher seating for 8,000 on a six-acre site ("Greater Northrop Field," 2015). Finally, the Michigan Agricultural College (i.e., Michigan State) built Old College Field on wastelands next to the Cedar River in 1902 ("It's A Beautiful," 2011). It should be noted that stands were enlarged significantly such as the 11,000-seat bleachers at the University of Chicago's Marshall Field and the 8,000 seats at the University of Michigan's Regents Field (Ingrassia, 2012; Pack, 1937). Each of these venues provided the university with a place to play high-level home games, which could also generate significant revenue for their respective university.

While grandstands were constructed and enlarged as needed (Ingrassia, 2012), their continued expansion was both a significant expense and a significant risk for universities. Most grandstands were constructed out of wood and were susceptible to fire, quicker erosion, and

collapse (Trumpbour, 2007). One specific example of a grandstand failure occurred November 1, 1902, at the University of Chicago's Marshall Field during a game between The University of Wisconsin at Madison and The University of Michigan (Ingrassia, 2012). In this contest, an entire section of bleachers at Marshall Field collapsed, causing injuries and an eventual lawsuit due to the failure (Lewis, 1965). Such failures led to worries from administration over safety and expense of maintaining a wooden structure, leading to the eventual search to replace the wooden structure with more durable materials (Trumpbour, 2007). Another common occurrence was the destruction of bleachers by fire such as one at The University of Michigan's Regents Field in 1895 and Dartmouth in 1902 (Shribman & DeGange, 2004; "The Michigan Stadium," 2007). Even when the bleachers survived a season without fire or collapse, they were in constant need of repair, costing hundreds to thousands of dollars depending on the size of the structure (Ingrassia, 2012; Lewis, 1965). The expense related to bleacher upkeep caused Harvard Athletic Committee Chairman Joseph Beale to look for materials that would increase the profits from football while developing a structure that would "dignify the game" (Smith, 2005, p. 41).

Stage One Conclusions

The average Stage One facility (n = 120) cost $3,002 and produced an enclosed capacity of about 5,700 spectators (See Tables 4.1 and 4.2). Capacity during this period often involved both those seated in bleachers and overflow that stood. Bleacher seating was often significantly smaller than the reported numbers available during the period. The average renovation to those facilities (n = 15) discovered by this investigation cost approximately $978. Of the 15 renovations occurring in Stage One, 14 were rehabilitations, involving bleacher expansions, and one was a reconstruction, following the bleacher collapse at the University of Chicago's

Marshall Field. Initial construction (n = 48) cost on average $6,144. The other fields (n = 57) were preexisting on or near campus structures that were used by university football teams.

Stage One facilities were constructed exclusively of wood, first starting with fences to enclose the facility. As the popularity of football increased, bleachers constructed of wood emerged. Usually these structures were temporary in nature, so that they could easily be moved to accommodate the different sports being played in Stage One multipurpose venues (Lewis, 1965). For example, Camp estimated that bleacher maintenance cost Yale over $1,000 per year (Lewis, 1965). Another example, from the University of Arkansas indicated the cost of rebuilding bleachers was between $200 and $1,900 per year (Wilson, 1923, 1924). As college football generated more and more revenue, soon larger bleachers were built, focused primarily on football, built near the middle of the field where most of the action occurred (Bernstein, 2001; Seifried, 2005). Rules innovation directly impacted the development of facilities, both in size of venue and the placement of bleachers. The spread of innovations in both the development of rules of football and the construction of venues to host college football are discussed below. The four key concepts that are the basis of innovation diffusion (i.e., social system, communication channels, time and geography) and their synergy help explain how football and football facilities spread across the country (Bale, 1984; Rogers, 2003).

Social System

The social system involves organizations with similar goals and purpose that cooperate on some level to achieve desired outcomes (Barcelona & Boccaro, 2004; Rogers, 2003; Rogers & Shoemaker 1971). As college football moved toward a codified set of rules, a clear social system started to develop: members of the ICFA and those schools wishing to compete with the member schools. The ICFA met to develop a set of rules in 1876 that allowed the big four

schools (Harvard, Yale, Princeton, and Columbia) to compete against one another fairly (Lewis, 1965). Those four schools were located in the Northeast, and due to geographic proximity other schools (e.g., Brown, Cornell, Dartmouth, Pennsylvania) adopted the same rules in order to compete against the ICFA members. Through meetings with the ICFA, the big four shared information on the rules of football and how to improve them for the common good of the member schools. As other schools developed football programs, they followed the ICFA rules in order to be able to play games against Harvard, Yale, Princeton, and Columbia (Lewis, 1965). The ICFA schools were the most financially successful football schools and playing a game against Harvard, Yale, Princeton, or Columbia would provide significant financial gain for the opponent. Furthermore, newspapers covered games involving the ICFA schools, which meant that those other schools received coverage in the national press, further increasing the value of playing games against the ICFA members.

This encouragement led to almost every school playing by ICFA rules by 1880. Through competition against schools we now identify as the Ivy League, other institutions learned not only how the best teams played but also the facilities needed to bring in significant revenue from the sport. Elsewhere, conferences were formed in the Midwest (Western Conference) and the South (Southern Intercollegiate Athletic Association), which created social systems of member institutions as well. New conferences allowed members to share information about the rules of football, how the sport is played, and the facilities each school built to play sport.

Another important part of the social system was the spread of former Harvard, Yale and Princeton players to schools around the country (Lewis, 1965). University presidents and leading members of alumni groups sent letters to Walter Camp at Yale and to athletic committee leaders at Harvard and Princeton requesting former players come to their schools and teach the game

(Ingrassia, 2012). As coaches left the Northeast, knowledge of the rules and facilities used by Harvard, Princeton and Yale were shared with the hiring institutions. Due to geographic proximity, as coaches were hired by institutions in a region, other schools benefited as well. Through attendance at games and interpersonal communications between these coaches, other institutions were able to quickly learn about the sport and how the leading schools in the Northeast played it.

From a facilities perspective, revenue earned from admission fees encouraged the development of structures on campus to host large-scale games. By hosting games on campus, schools no longer had to pay rental fees, and could generate increasing revenues through the construction of larger bleachers each season. Early games between Harvard, Yale and Princeton were played at neutral sites which cost anywhere from a few hundred dollars to several thousand dollars (Ingrassia, 2012; Lewis, 1965). During this period, universities needed revenues as they had limited endowments due to small numbers of students and graduates (Princeton had an endowment of a $1,443,000 in 1888) (Lewis, 1965). Football was a new revenue generator, and sharing as little as possible with outside sources was financially expedient.

As schools such as Harvard, Princeton, and Yale moved football competitions on campus, the rest of the social system followed, due to the ability to increase revenue while limiting the expenses (once the structure was built, maintenance costs were covered by one average gate leaving the rest of the season to generate profits for the school). Through the coverage of games involving schools in the Northeast, interested newspaper and magazine readers around the country learned about college football, expanding the knowledge base. Coaches at these schools were competitive, and desired to learn from peers any advantage they could obtain from other institutions. The social system thereby included communications

occurring between coaches, often in letters, about the latest developments in how to play the game (Lewis, 1965; Smith, 1990). Lastly, the development of conferences and other opportunities for school leaders to come together and meet, only strengthened the development of the social system of intercollegiate sports, and in turn bolstered the sharing of information about facility construction and development. The development of social systems dedicated to college football were critical for the development of the game, as was the communication that occurred through these social systems.

Communication Channels

In order for the sport of football to spread, knowledge of the game needed to disperse to all parts of the country. Part of the success of football was tied to the development of mass communication technology that quickly spread information about the games across the country. The first intercollegiate college football game only received coverage in the local university newspaper ("On Saturday, November," 1869/2011). However, by the turn of the century, major newspapers supported several dedicated writers just to cover football (Lewis, 1965; Oriard, 1995). The importance of mass media in the spread of football was significant. Technology such as the telegraph and newswires eased the spread of information across the country. A story published in New York would either be directly reprinted or rewritten by writers for publication in local newspapers due to wire services (Oriard, 1995). Newspapers dedicated the front page to coverage of college football, particularly involving major games (especially those involving Harvard, Yale, Princeton and Penn) and players (Lewis, 1965). Significant coverage often included several pages in major newspapers too. The location of the major college football programs near big cities also increased coverage of the game. With Yale and Princeton near New York City, Harvard near Boston and Penn in Philadelphia, coverage of the early college football

games benefited from geographic proximity. Significant space in magazines was also dedicated to football. For instance, Walter Camp wrote well over 200 magazine articles and thousands of stories (Oriard, 1995). Camp and others also spent significant amounts of print space explaining the rules of football to masses through *Harper's Weekly, Outing,* and the *Century* magazines (Camp 1887/2011, 1889/2011; Lewis, 1965). Oriard (1995) argued the coverage of college football by newspapers in the 1880s and 1890s had a significant impact on the growth college football across the country.

Newspapers fit the definition of mass media, with one voice speaking to a great number of people reading a single story (Rogers, 2003). Newspapers and magazines also influenced the development of facilities as sketches of games regularly appeared in newspapers and major magazines depicting not only the game but also the big grandstands of people in the background ("Foot-ball—"Collared,"" 1883/2011; Frost, 1879/2011). By the 1890s, newspapers and magazines displayed actual game pictures with thousands in attendance watching the play on the field (Camp, 1894/2011; "Proud Blue," 1892/2011). Articles also occasionally discussed the playing field in some detail (i.e., "A Drawn Game," 1881/2011; "On Saturday, November," 1869; "The Harvard- Yale," 1875/2011), usually as a small part of a larger story on the game. Through stories and pictures, ideas about the proper construction of football facility spread to communities around the country and prompted individuals to check out the spectacle.

Interpersonal communication also helped spread the rules of the game and the development of temporary facilities. Through rule meetings, specifically those meetings that occurred after the creation of the ICFA in 1876, leaders of various football programs around the country came together to discuss the rules of football (Lewis, 1965). Membership in the ICFA included several eastern schools and the University of Chicago (Lewis, 1969). Furthermore,

following the creation of conferences in the Midwest (i.e., Western Conference) and the South (i.e., Southern Intercollegiate Athletic Association), football-playing schools met regularly (Smith, 1990; Watterson, 2002). While not discussed explicitly, it seems likely that schools shared information with each other about how they played, where they played, and other information. Most likely, these meetings followed similar patterns in other management research, where members came together and discussed innovations with peers (Dearing, 2009; Magill & Rogers, 1981). Schools often followed the path of other schools in their associations in construction patterns. For example, following the creation of the Western Conference in 1895 (i.e., Big Ten), seven member schools either constructed new venues or made renovations to existing venues that were of similar size in the next five years.

Interpersonal communication also occurred as teams traveled to play one another. Teams traveling to play opponents would learn about how the opponent played, as well as their current venue. The railroads linked Harvard, Yale, Princeton and Penn to each other, and major cities. The reasons for playing major games in New York, Hoboken, and Springfield involved reasons beyond just the facilities. The host facility was close to a railroad hub and directly connected by streetcar, which allowed spectators to easily travel from university campuses or other locales to the venues. The ease of transportation by railroad encouraged opponents to come watch games involving rival schools, such as Yale players attending the Harvard-McGill contest at Jarvis Field in Cambridge. Princeton players also traveled to Springfield to watch the first Harvard-Yale game using rugby-style rules. The railroad increased travel, and therefore increased interpersonal communication due to the ease of movement throughout the Northeast.

As other schools began to express an interest in football, these schools slowly formed teams, and football association heads and university presidents reached out to the social system

(e.g., coaches) for help (Lewis, 1965). In particular, these schools outside of the Northeast sought former players from the Northeastern schools to explain how to play the game to students at their own institution. The railroad allowed players to easily move from the Northeast to the Midwest, the West coast and even the South by the turn of the century. Former players often traveled to coach a school for a few months and then traveled back home, due to the ease of transportation through railroads (Ingrassia, 2012; Lucas & Smith, 1978).

By 1900, schools across the Midwest, West, and South all had coaches from Northeastern schools. Amos Stagg headed to Chicago to develop the program at the University of Chicago (Stagg & Stout, 1927). Stanford encouraged Walter Camp to come west and teach the students how to play the game in 1892, 1894, and 1895 (Camp & Deland, 1896). Maybe no coach better explains how coaches helped to diffuse the sport than Glenn ‘Pop’ Warner. Between 1895 and 1903, the former Cornell player coached Iowa State, Georgia, Cornell, and Carlisle (Lewis, 1965). Elsewhere, Vanderbilt, North Carolina, and Auburn amongst others all hired coaches from the Northeast to teach them the game (Lewis, 1965; Smith 1990). As these coaches moved away from the Northeast, they also brought expectations for facilities necessary for teams to be competitive (Lewis, 1965; Stagg & Stout, 1927). At the University of Chicago, President Harper encouraged Stagg to make the football team profitable (Lewis, 1965; Revsine, 2014). In return, Stagg requested the construction of a facility to host games, arguing playing at home would increase the profits of the program (Lewis, 1965; Stagg & Stout, 1927). Schools like the University of Michigan traveled east to play Harvard, Yale and Princeton, and brought back with them what the Northeastern schools were doing to gain relative advantage over other schools throughout the country. The railroad eased travel of teams to play intercollegiate contests both within a region and between schools of different regions. The ability to travel increased the

strength of the social system of football, as did improving communication channels. Because of newspapers, magazines and technology like the newswire and railroads, communication was easier than ever before. College football directly benefited from the development of these technologies, which increased the rate of adoption of football over time.

Time and Geography

The diffusion of football occurred slowly at first as teams learned about the game. While Rutgers and Princeton first played in 1869, it was not until the 1880s that a significant number of teams in the Northeast started playing football (Lewis, 1965; Smith, 1990). Due to the challenges of travel, teams were limited in who they could play (Lewis, 1965). Even the first football playing schools (Harvard, Yale, Princeton and Rutgers) only played opponents in close geographic proximity during the early period. Many games were scheduled against local athletic clubs and other groups instead of collegiate teams due to the challenges of travel. Once major newspapers began to cover the game, the rate of adoption significantly increased due to increased knowledge about the game. People around the country learned about the sport from local newspapers, which printed news wire stories about the Northeastern schools and football. The news wire was one of the first technological advancements that helped to overcome the barrier of neighborhood geography on diffusion. Next, as former players travelled to other universities to teach the game, the quality of football improved. As previously discussed, schools from around the country interested in the adoption of football sent letters to Walter Camp and other influential Northeastern football leaders asking for suggestions on possible coaches to teach the sport at their institution (Lewis, 1965). Camp, like others from the leading Northeastern schools, responded to these letters with suggestions, and through the usage of the railroad,

former players traveled to teach football. Trialability and observeability increase the speed of adoption and the relative advantage held by the Northeastern schools disappeared.

Facility development followed a similar pattern as rules adoption by institutions. Development of on-campus facilities occurred slowly in the Northeast, with ten years passing between the usage of Jarvis Field on campus at Harvard for football and the construction of Yale Field. Over the next two decades, schools built venues (n = 45) on or near campus for football, often geographically clustered (particularly in the Midwest and the Pacific Coast). These facilities developed quickly following the adoption of the sport by a university. Table 4.3 explores the significant time elements found in Stage One of the study.

Table 4.3 Timeline of the Development of Football Rules and Facilities From 1869-1902

Year	Event	Activity
1869	Rutgers-Princeton football game	First intercollegiate football contest
1873	Meeting of representatives (Yale, Princeton, Columbia) in New York	First attempt to create a standard set of rules
1874	Jarvis Field used for football	First on campus venue used for a football contest
1874	Harvard-McGill contest	First rugby-style game played involving US intercollegiate team
1876	Formation of the Intercollegiate Football Association between Harvard, Princeton and Columbia (Yale participates but does not join)	Rules organization developed, encouraging rules codification
1880	Rules change creates a scrimmage point	First significant rules change, moved the sport away from rugby
1882	Rules change requires the gaining of five yards or the losing of ten in three downs	Further changed the game from rugby toward a more precise game, slowed action down, encouraged use of bleachers as majority of action occurred centrally
1883	$13,000 rehabilitation of Jarvis Field	Addition of larger bleachers, moveable for baseball, track and football, improved fence enclosing facility

(Table 4.3 continued)

Year	Event	Activity
1884	Yale Field developed	Bleacher seating for several hundred, moveable
1892	Sheppard Field developed at Northwestern	First western school to develop an on campus venue focused on football, bleacher seating for 1,000
1894	Formation of the Southern Intercollegiate Athletic Association	Development of the first football association outside of the ICFA
1895	Fire destroys bleachers at Regents Field	First significant reported destruction of bleachers at an on campus facility

Stage One on-campus facilities followed a similar trend to the diffusion of football itself established in the Northeast. For example, in 1874, Harvard's Jarvis Field became the first on campus venue used for football and a cluster of construction slowly developed amongst the Northeast schools. In 1877, University Field was built on campus at Princeton University after Princeton visited Harvard in 1876 (Presbrey & Moffatt, 1901). The first significant renovation of an on-campus venue occurred in 1883 at Jarvis Field, which later prompted the construction of Yale Field in 1884 (Cohane, 1951; Weyand, 1955). University Field at Princeton was renovated in response during 1885 for $300, and Yale Field was freshly graded and added new bleachers in 1890 at a cost of $4,000. Additional venues built at Dartmouth (1893) and Brown (1899) also clearly demonstrate geography and communication channels played a distinct role in the development of facilities and that this affected the time to construction for new and renovated university buildings.

Next, it should be noted that a cluster of facilities also developed in the Midwest in the 1890s that followed the Northeast models. Schools in the Midwest (n = 9) developed venues such as Northwestern's Sheppard Field in 1892, Michigan's Regents Field in 1893, and the University of Chicago's Marshall Field in 1893. By 1900, Michigan Agricultural College (1896),

Notre Dame (1897), Iowa (1898), Ohio State (1898), Minnesota (1899), and Purdue (1899) all either developed new on campus venues or renovated existing venues to increase capacity. For instance, before the end of the century, several schools from the Midwestern cluster including Michigan (1896), the University of Chicago (1898), Iowa (1899), and Purdue (1899) all rehabilitated their facilities with new bleachers. Those schools often traveled to play against each other, which allowed for interpersonal communication to help geographically close members learn about facility development. Further west, another cluster of facilities developed amongst schools on the Pacific Coast following the construction of the transcontinental railroad and invention of telegraph (Blanton, 2014; Lucas & Smith, 1978). Specifically, California-Berkeley developed West Field in 1885, which was followed by Oregon State (1893), Oregon (1894), Washington (1895), Washington State (1895), Arizona State (1897), and Arizona (1899) respectively. Interestingly, interest in developing football facilities was more limited in the South, which this work attributes partially to remaining damage on railroads and other infrastructure from the American Civil War (Blanton, 2014; Lucas & Smith, 1978).

Collectively, the synergy among social systems, time, geography, and communication channels influenced the spread of the East Coast style of football and the construction of football facilities. Beginning with Harvard, Yale, and Princeton, many teams in the Midwest and West Coast mimicked the advancements of the Northeast to provide spectators with a better viewing experience (Watterson, 2002). As such, institutions developed wooden grandstands built to hold spectators willing to pay to observe contests. The failures of grandstands to support larger crowds, however, led officials from across the country to examine stronger and longer lasting materials for grandstand structures like that offered by reinforced concrete and steel. The

construction of venues with a football focus followed the increasing profits earned by those schools playing football against other regional and national powers.

Chapter Five: Reinforced Concrete and Steel (1903-1929)

Following the successful adoption of football and the development of temporary facilities in Stage One, Stage Two begins with the building of Harvard Stadium, the first reinforced steel and concrete stadium in the U.S. Stage Two covers the years 1903 (the opening of Harvard Stadium) until 1929 (the stock market crash and the start of the Great Depression). The period from 1903 to 1929 would see several significant developments that would change the game on the field and the facility hosting those contests. First, the population explosion occurring in the late 19th century continued during the first 30 years of the 20th century. The population of the U.S. in 1900 was approximately 76 million, and thirty years later grew to over 123 million (U.S. Census Bureau, 2000). Additional information explains eight percent of workers worked less than 55 hours a week in 1910, with over 75% working less than 55 hours by 1920 (Lucas & Smith, 1978; Rader, 1990). As workers spent less time at work, they had more time to spend on recreational activities. Incomes also increased during the period, allowing more people to use their discretionary money to attend contests (Seifried, 2005). The railroad expanded its reach allowing several thousand fans to attend important contests around the country ("4,000 Cornell Men," 1914; "Snow and Rain," 1914). Special trains for games became the norm for railroad companies around the country and they began to work with schools to establish site-seeing weekends (Blanton, 2014; Smith, 2008). Highway systems were also being constructed as the automobile was introduced during the period (Allen, 1952). Combined, such factors encouraged over 450 colleges to support football by 1925 (Betts, 1974).

The development of alumni interest in football occurred in the previous stage as alumni paid at least part of the construction of many temporary fields that made up Stage One. For Stage Two, alumni paid either the entire construction amount of the facility or a very large portion

(Blanton, 2014). For example, Harvard received well over $100,000 in alumni donations and funded the rest of the $320,000 Harvard Stadium through the collection of admission fees. Yale sold subscriptions, primarily to alumni, from $100 to $1,000 to pay for the construction of the Yale Bowl ("Sons of Eli," 1922). California Memorial Stadium was built through a subscription process where the buyer of a subscription gained the right to the Stanford-California game for ten years (Siegal & Strain, 1999). The University of Michigan sold bonds to alumni and local community leaders to raise the $1,500,000 estimated cost of the new stadium ("The Michigan Stadium," 2007). Despite these differing plans, the alumni at various institutions helped to fund the construction costs of the new stadium and continued to gain more influence over the stadium, its construction and renovation, and the football program.

The stated goal of the alumni and the athletic departments was to build a structure that would serve as a central monument to the strength of the university and its alumni (Blanton, 2014). Alumni viewed the permanent stadium as an important part of campus and were more willing to donate to the stadium than any other part of the university during this time (Blanton, 2014). Further, stadiums also became another way for universities to compete against one another, with early financiers pointing out this notion during fundraising campaigns ("College Athletes in," 1914).

The need to earn as much money as possible and to quit paying rent to off-campus venues also drove the construction of permanent on-campus venues (Blanton, 2014). Admission fees were an important revenue source for the university. The facility had improve the venue in order to secure continued commitment by prospective fans. In this point and for the first time, universities attempted to provide limited amenities (bathrooms, concession stands) in the permanent structures of Stage Two (Blanton, 2014). The movement away from structures of a

temporary nature constructed of wood to modern stadiums constructed of concrete and steel notably fit well into the desire to create monuments that developed university pride (Seifried, 2005). College football facilities followed other great public structures like skyscrapers and bridges in the adoption of new materials improving the permanence of the structure (Rader, 2002; Seifried, 2005). As attendance and profits skyrocketed in early innovators, interest and confidence in using permanent materials also increased amongst later adopter (Seifried, 2005). Another driving force behind the permanence movement involved the reduction in cost of materials needed for construction and efforts to decrease maintenance costs (Riess, 1999; Seifried, 2005). The placement of steel rods directly inside concrete increased its flexibility and reduced maintenance costs because of their strength (Blickstein, 1995; Seifried, 2005; Serby, 1931). In the end, profits grew exponentially for many, which caused other universities to tolerate the potential danger of construction debt (Blanton, 2014; Ingrassia, 2012).

Another specific concern addressed during this era involved the dishonest and dirty play that seemed to increase as victory became more important to fill the growing stadiums (Blanton, 2014; Smith, 1990). Concern over the dangers of football, both physically and morally, mounted at the beginning of the 20^{th} century. Newspaper coverage focused on the injuries and deaths related to football (Watterson, 2000). Charles Eliot, Harvard's President and one of football's biggest critics, continually discussed additional concerns over the lack of honor found amongst players at colleges around the country (Ingrassia, 2012). Eliot attempted to end the playing of football at Harvard several times during his tenure from 1869 to 1909, citing the serious risk of injury found in the game as well as the increased loss of moral values (Ingrassia, 2012). Cheating, improper recruiting, and the paying of players became common prompting both scholars and the press to claim those excesses needed better control (Blanton, 2014; Needham,

1905; Smith, 1990). Discussion occurred amongst university leaders about these problems at the many regional associations (i.e., ICFA, SIAA, and Western Conference); ultimately forming a new organization to govern intercollegiate football (Smith, 1990).

The Financial Success of Football

By 1903, college football programs around the country were generating significant profits for their universities (Watterson, 2002). Of particular importance to the development of football, programs such as Harvard and Yale were investing heavily in football and benefiting from the investment (Lewis, 1965). As an example, the 1890 Yale season earned a profit of $18,392, including $11,185 from the Yale-Princeton game played at Eastern Park in Brooklyn, New York ("Yale Football Timeline," 2014). The 1891 Harvard-Yale game played at Hampden Park in Springfield, Massachusetts, generated $119,000 in total revenue for the game (Lewis, 1965; Watterson, 2002). The 1892 Yale-Princeton game played at Manhattan's Polo Grounds netted $10,553.65 for Yale, after a $10,000 rent payment to the Polo Grounds (Ledger Sheet, 1892). Reserved seats for the 1893 Yale-Princeton contest went for $15 and reserved boxes cost $150, and the 1893 Harvard-Yale game played at Hampden Park in Springfield, Massachusetts, generated $15,409.15 for Harvard (Davis, 1893). Collectively, these game revenues produced over $32,000 for Yale from the 1893 season (Athletics, 1894). Schools outside of the Northeast were also using football to help pay the bills of the university but struggled to make a profit until a significant home venue to play games emerged (Lewis, 1965; Stagg & Stout, 1927). For instance, Stagg constructed a 1,200 seat bleacher section in 1893 at Marshall Field, allowing the University of Chicago to earn a profit of $1,339 with 4,000 spectators paying $0.50 a piece to watch Michigan play Chicago (Stagg & Stout, 1927). Elsewhere, Wisconsin earned $4,000 for

the 1896 season, including $1,500 for the game against Minnesota at Camp Randall Stadium (Curti & Carstensen, 1949).

By the 1897 season, Yale and Princeton decided to move the contest between the two schools back to their home facilities, where revenue no longer needed to be shared with the facility lease owners (Lewis, 1965). After the move on campus, Yale's profits continued to soar, as the 1900 season produced $27,032 in net earnings for the entire athletic department. These earnings almost exclusively came from the over $50,000 in football revenue generated from admission fees into Yale Field (Blanton, 2014; Cohane, 1951). By 1904, Yale was generating over $30,000 annually in profits from football contests (Blanton, 2014).

In 1902, the Harvard-Yale contest played at Yale Field drew over 30,000 spectators, with reserved seats costing $20 and general admission going for $1 ("Yale Football Team," 1902). Bleacher seating was full over an hour before the time of the game, with standing fans filling every available space including in between bleacher seating and under the stands ("Yale Football Team," 1902). For the 1903 season, Harvard realized a $42,559 profit (Needham, 1905). A year later, profits increased to almost $58,000 (Needham, 1905). During the same period, the Arts and Sciences College at Harvard lost over $30,743 (Lewis, 1965; Needham, 1905). Football moved to the point where it no longer just funded itself but was a significant contributor to the financial welfare of the institution as well.

Popular schools were also being paid significant guarantees to come play smaller schools, especially on the West Coast. Stanford became known for making trips to the Rocky Mountains to play guarantee games against schools (Lewis, 1965). Stanford was paid $1,000 and 60% of the gate receipts to come play in Salt Lake City against the University of Utah in 1902 (Lewis, 1965). Even after paying Stanford the promised sum, Utah made $200 from the game (Lewis,

1965). In 1904, Stanford rode the train to Denver to play the University of Colorado in front of 15,000 spectators ("Fifteen Thousand Football," 1904). The popularity of college football here and elsewhere reached such a high point that information about the game drew fans to remote locations away from the game. As an example, hundreds of fans gathered in Omaha to follow newswire reports of the 1903 Nebraska-Minnesota game played in Minneapolis (Lewis, 1965).

One of the largest expenditures facing universities on a yearly basis for football was facility upkeep and protection (i.e., fire patrols during games to prevent spectators from smoking on the bleachers) (Lewis, 1965; Smith, 1990; Wilson, 1923, 1924). Fire destroyed bleachers at the University of Michigan's Regents Field in 1895 and Dartmouth's Alumni Oval in 1902 (Shribman & DeGange, 2004; "The Michigan Stadium," 2007). The University of Chicago's Marshall Field experienced a bleacher collapse during the Michigan-Wisconsin game on November 2, 1902 (Ingrassia, 2012). Facility managers were constantly concerned wooden structures would be destroyed by fire or by storms (Ferry, 1915). Due to the challenges of the wooden structure at Soldier's Field, Harvard professor Joseph Beale, the chairman of Harvard's athletic faculty committee, argued for the construction of a venue that would dignify the spectacle of the game (Smith, 2005). The product, Harvard Stadium, built on the site of Soldier's Field, transformed the construction of college football facilities permanently (Ingrassia, 2012; Lewis, 1965).

The rest of the chapter examines the two major innovations of Stage Two. The first major innovation is the development of a national governing body, which grows to represent almost all college football playing schools by the end of the period. The second is the development of permanent stadiums constructed from materials that would not require the constant care and yearly expenses of the temporary structures found in Stage One. Both innovations were

significant for the development of college football. By the end of Stage Two, the NCAA would exist to govern intercollegiate sport. Also, reinforced concrete and steel structures would tower over campuses across the country, playing host to football contests on Saturdays in the fall and reminding students and alumni of the importance of football to the universities that played the sport (Ingrassia, 2012).

The Crisis of 1905 and the Birth of the National Collegiate Athletic Association

At the end of Stage One, football while increasingly popular was also viewed as increasingly violent and dangerous (Lewis, 1965). Newspaper coverage of the games often noted injuries that delayed contests as part of the normal coverage of the sport (Oriard, 1995). Each season became increasingly violent due to the continued use of mass plays (Lewis, 1965). By the start of the 1905 season, several newspaper articles decried the lack of significant rules changes to the increasingly violent and undignified game ("A Few Football," 1905; "New Football Rules," 1905). In late fall of 1905, articles appeared in newspapers around the country decrying the dangers inherent in football (Watterson, 2000). According to newspaper coverage of the era, over 25 people were killed playing football during the 1905 season (Watterson, 2000). Other coverage included stories of poor player decorum (Blanton, 2014). For example, a Harvard ball carrier had his nose broken on an illegal hit during the Harvard-Yale contest (Ingrassia, 2012).

President Theodore Roosevelt became involved in the discussions related to the professionalization of football, inviting coaches and selected faculty from Harvard, Princeton, and Yale to attend a conference on football held at the White House (Lewis, 1965). Roosevelt was particularly concerned about the poor behavior exhibited by football players who were willing to cheat in order to be successful ("Brutality to be," 1905). Following a meeting involving Walter Camp, Harvard coach William Reid, and other representatives from the three

schools, released a statement promising to "carry out in letter and in spirit the rules of the game of football ("A Football Congress," 1905, p. 9). Roosevelt stressed that it was not the fault of the sport of football but instead the players and coaches participating in the game (Blanton, 2014). Roosevelt argued the players who were willing to win at all costs distorted the game, ruining it for the rest of society ("A Football Congress," 1905; Lewis, 1969: Needham, 1905).

In the subsequent meetings, leaders of college football discussed their perspectives on the needed changes. Camp argued for harsher penalties for hitting below the knees along with moving the required distance to gain to ten yards from five ("Camp Talks Of," 1905; "Football Rules Makers," 1906). The universities meeting ultimately voted to form the Intercollegiate Athletic Association of the United States (IAAUS) without support of the early football-playing schools (Watterson, 2000, 2002). Its first president, Army Major Palmer Pierce, promised to work with schools around the country to make the game safer along with increasing the morality of the football playing schools (Ingrassia, 2012). The organization voted to form a new rules committee, which was in direct competition with the old rules committee made up of leaders of the Northeastern schools and Amos Stagg of Chicago (Carter, 2006; "Rules Committee Frames," 1906). President Roosevelt stepped in to encourage the formation of a joint rules committee, which occurred in the spring 1906 (Crowley, 2006; Ingrassia, 2012; "Rules Committees Merge," 1906).

The new joint rules committee was named the American Intercollegiate Rules Committee (AIRC) (Carter, 2006). The first official meeting of the IAAUS took place the following December, with 28 colleges and universities represented (Crowley, 2006). Almost all of the original members to the IAAUS were not part of conferences, increasing the value of the IAAUS to those institutions (Carter, 2006; Lewis, 1965). Rules improvements suggested by AIRC

included the creation of a neutral zone between the offensive and defensive teams, changing the distance needed for a first down from five to ten yards, and the addition of a fourth down to gain the ten yards (Carter, 2006; "New Football Game," 1906). Many on the rules committee originally called for the widening of the field to limit mass play ("Camp Talks Of," 1905; Lottman, 1959). The problem was that Harvard Stadium, built in 1903, could not support the widened field (Lottman, 1959). Thus, the rules committee suggested the forward pass (Lottman, 1959; "New Football Game," 1906; "Rules Committee Frames," 1906). The forward pass was suggested to remove all 22 players from massing in the same area, and instead allowing for players to spread out, increasing player safety ("New Football Game," 1906). The forward pass was also suggested to hopefully create a more exciting and interesting game for spectators to watch (Ingrassia, 2012).

The forward pass slowly spread to schools across the country. The play was very risky as an incompletion gave possession of the football to the other team ("Football Committee Announces," 1906; Watterson, 2002). Diffusion of the forward pass occurred differently than the traditional pattern before the innovation. The forward pass first developed at universities where coaches quickly realized successful deployment of the forward pass would allow for the team to move much quicker down the field than the traditional running offense (Smith, 1990). As schools in close geographic proximity adopted the pass, other schools nearby did as well to limit the advantage held by the first adopters of the new innovation. The original rules changes limited when and where the forward pass could be used on the field ("Football Committee Announces," 1906). By 1910, Henry Williams of Minnesota became the head of the rules committee and removed many of the limits placed on the forward pass, increasing the interest in its usage (Ingrassia, 2012). Also of interest, end zones were created to allow for the usage of the forward

pass near the goal line with the field shortened by ten yards to make room for the end zones (Ingrassia, 2012).

Even though the IAAUS was formed to improve the sport of football, several schools were still unhappy with the inherent dangers of the game. Only 39 member institutions of the original 62 schools attending the first IAAUS meeting had ratified the IAAUS constitution by the end of 1906 (Carter, 2006). Some schools moved in 1905 to ban football until the safety of all players could be guaranteed (Watterson, 2000). Columbia in New York City and Stanford and California on the West Coast abolished football ("Committee Favors Rugby," 1906; "Football Is Abolished," 1905; Schmidt, 2007). Stanford and Cal moved to playing rugby and continued to draw large crowds at contests for the next decade (Watterson, 2000). Other schools on the West Coast followed suit, and rugby contests became the norm for the West Coast (Watterson, 2002). These schools were largely removed from the rest of the country because of geography, making intersectional contests with eastern schools incredibly difficult (Ingrassia, 2012). Attendance at meetings such as the IAAUS was also challenging due to the long distances that had to be covered to attend meetings in New York (Ingrassia, 2012). Both of those issues helped the Western schools move to rugby and away from football.

The rules changes between 1905 and 1906 hoped to limit the deaths and significant injuries associated with football (Watterson, 2002). Unfortunately, the 1909 season was the worst season yet for deaths with 26 at all levels, including ten at the college level (Watterson, 2000). The presidents of Harvard, Princeton, and Yale met and agreed with the IAAUS that continued rules reform was necessary (Ingrassia, 2012). Harvard was the first of the three leading Northeastern schools to join the IAAUS in 1909 (Crowley, 2006). At the same time, the IAAUS was working to expand membership, inviting all universities and colleges to join along with

sharing the minutes of the national meetings free of charge to any university that would accept them (Carter, 2006). By 1910, 67 schools were members of the newly renamed National Collegiate Athletic Association (NCAA) (Carter, 2006; Crowley, 2006).

Unlike the modern NCAA, the early version possessed extremely limited power ("Proceeding of the," 1907, 1908). Early convention meetings involved discussions of ideals for member schools to follow along with the sharing of information between universities of how each operated (Carter, 2006; "Proceedings of the," 1907, 1908). The organization sought to limit payments to athletes and other eligibility issues but ultimately lacked any significant authority to enforce the limits it sought (Carter, 2006). Most limits on eligibility and other related issues came from the conferences, which had to garner support only from eight to ten schools instead of 60 or more ("Big Ten Athletic," 1925; Carter, 2006).

Another major concern expressed as part of discussions at the NCAA national convention was the significant costs of stadium construction around the country ("Proceedings of the," 1921; 1928). Universities in favor of stadium construction pointed out football teams often led to improvements in academic areas due to interest in college football ("Proceedings of the," 1928). Proponents of the development of college football stadiums often identified the development of professional football and baseball facilities and argued, if colleges and universities did not build the structures, teams of a potential professional league would (Carter, 2006). By the early 1920s, spectator interest was so high that universities around the country felt pressure to build larger facilities to support the increasing crowds and take advantage of available profits from football (Ingrassia, 2012). Harvard University became the first school to build a structure made of durable materials that would limit maintenance costs on the structure, which revolutionized the

building of stadiums around the U.S. (Seifried, 2005). For a complete list of stadiums constructed during the period, please see Table 5.1 and Table 5.2.

The Development of Harvard Stadium

The first permanent structure for college football was developed in Cambridge, Massachusetts, at Harvard University in 1903 (Lewis, 1965; Seifried, 2005). The original plan called for seats of concrete and steel initially funded by $33,000 in gate receipts from the previous year (Smith, 2005). Harvard Professor Ira Hollis and New York architect Charles McKim designed the final plans for the reinforced concrete and steel structure built on the location of Soldier's Field ("In the Football," 1903). The class of 1879 donated $100,000 toward the construction of the venue in 1901 (Smith, 2005). By the time the venue was completed, it cost over $320,000 with Harvard University having no financial responsibility for the structure (Lewis, 1965; Smith, 2005). However, the development of Harvard Stadium required the Athletic Association to take out loans of $100,000 (Needham, 1905).

According to *The New York Times,* the stadium was designed to not only be the grandest stadium ever built but to also mimic structures built during ancient times ("In the Football," 1903; Ingrassia, 2012). The structure was to have 37 rows of seats around the horseshoe structure ("In the Football," 1903). Thirty-eight stairways were constructed to move spectators from the ground to their seats (Smith, 1920c). Entrances were built into the structure approximately one-third and two-thirds of the way up to allow for spectator access to the seating. A promenade was built at the top of the structure to serve as protections for fans from poor weather conditions ("In the Football," 1903). A second promenade was constructed approximately two-thirds of the way up, reached by staircases in both towered ends and in the middle of the circular end of Harvard Stadium (Smith, 1920c). The stadium supported seating for 23,000 spectators (Ingrassia, 2012;

Smith, 1920c). Along with the football field, a running track for the track program was found in the structure that notably did not support baseball (“In the Football,” 1903). The first row of seats sat elevated nine feet above the field, increasing the sight lines for fans sitting in the first rows (Smith, 1920c). The U-shape allowed for the construction of 7,000 temporary seats on the track, increasing the capacity of Harvard Stadium for more prestigious opponents like Yale (Smith, 1920c).

In order to help generate the revenues necessary to pay for its construction, Harvard Stadium was designed to allow for spectators to be as close to the action as possible (Smith, 1920c). The quality of seating allowed the university to charge more for those seats on the sidelines, especially between the 30-yard lines where the majority of the action occurred (Ingrassia, 2012; Smith, 1920c). The venue opened hosting games against Dartmouth and Yale (Smith, 2005). Of interest to modern scholars was the lack of media coverage of the opening of the new stadium at Harvard (Trumpbour, 2007). The opening received only limited coverage and virtually no national coverage beyond a mention in the game story (“Dartmouth 11, Harvard,” 1903; Trumpbour, 2007). Two years after Harvard Stadium’s opening, Professor Ira Hollis, the director of the faculty athletic committee at the time of construction, felt the structure had been a waste of funds due to the aforementioned problems with violence (Needham, 1905; Smith, 2005). Several other Harvard leaders agreed including President Lowell, who followed President Eliot as the leader of the University (Smith, 2005). Still, few realized the facility would set the standard for stadium construction well into the century (Seifried, 2005; Smith, 1920c).

Syracuse followed Harvard by constructing its own on-campus U-shaped facility called Archbold Stadium in 1907 (Blanton, 2014). Archbold Stadium sat approximately 25,000 spectators and was constructed of reinforced concrete and steel (Blanton, 2014; Ferry, 1915).

The stadium cost approximately $400,000 and produced space on the open end of the horseshoe ultimately for a new gymnasium ("Archbold Aids Syracuse," 1905). Designed by Syracuse University professors Frederick Revels and Earl Hallenbeck, the facility was constructed in ten months ("The Legend Of," 2016). John Archbold, the primary donor for the project, suggested the new venue after several visits to New York and Boston to watch football contests.

The structure was built into the natural depression, easing the construction requirements and related costs ("Archbold Aids Syracuse," 1905). Over 200,000 cubic yards of earth was removed to allow for the construction of Archbold Stadium ("Syracuse University Buildings," 2010). Syracuse reinvented the stadium to fit the needs of their university, using the same shape but using a dugout hillside to lessen the concrete necessary to support the structure. The stadium supported several unique features such as spaces on the north side of the stadium for horses and carriages to be driven right up to the edge of the stadium to watch the game ("The Legend Of," 2016). Another unique feature was a covered southern grandstand that seated 3,000 spectators ("The Legend Of," 2016). Overall, Archbold Stadium architects were not afraid to reinvent structures to fit the unique needs of Syracuse University.

The Yale Bowl and Subsequent Building Boom

Following the construction of stadiums at Harvard and Syracuse, a few other universities moved to develop permanent on campus football facilities. Much like the movement on campus, the diffusion of reinforced concrete and steel amongst universities was very slow although professional baseball built several between 1909 and 1914 (e.g., Shibe Park and Forbes Field - 1909, Comiskey Park - 1910, Griffith Stadium - 1911, Fenway Park and Tiger Stadium - 1912, and Ebbets Field - 1913). In 1914, Harvard's two biggest competitors, Yale and Princeton, built permanent concrete and steel structures (Smith, 2005). Following the completion of the Yale

Bowl, over $2,000,000 had been raised to fund the construction of Northeastern stadia ("College Athletes in," 1914). Construction on the Yale Bowl started in July 1913 and ended in time for the 1914 season finale against Harvard (Ferry, 1915; "Harvard and Yale," 1914). The Yale Bowl, designed by engineer and Yale graduate Charles Ferry and Yale graduate architect Donn Barber, was distinctly different from Harvard Stadium (Branch, 2014; Smith, 2005). The Yale Bowl was oval shaped and completely enclosed (Ferry, 1915). With a capacity of over 70,000, the Yale Bowl was also the largest venue yet built for football (Watterson, 2002). Each of the 70,000 seats was made of two foot by ten-foot Douglas fir boards attached to the concrete base (Atwood, 1914; Ferry, 1915). One common concern was spectators seated in the top rows were 150 feet away from the action, a significant distance in comparison to the old temporary structure (Smith, 1920b). The facility covered a space the size of 12.5 acres, which was fenced in to control spectator access ("Harvard and Yale," 2014; Smith, 1920b).

The Yale Bowl was paid for with alumni support led by the Committee of 21 (Cohane, 1951). The Committee of 21 was formed with the purpose of redeveloping Yale's athletic facilities that were considered outdated and dilapidated (Blanton, 2014). According to the Committee of 21, the new facilities would allow Yale to return to winning, which the poor facilities were preventing (Cohane, 1951). Seats cost $2.00 for the 1914 opening of the Yale Bowl (Ferry, 1915). Yet for the opening game, spectator interest was so high that over 10,000 fans that requested tickets were left without ("70,055 Seats In," 1914). Several fans hoping to gain tickets, offered as much as three times the original price for the opportunity to enter into the new facility for the Harvard-Yale clash ("Harvard and Yale," 1914). Students with tickets were warned that missing the contest or selling of tickets to others would have them blacklisted from access to future contests (Snow and Rain," 1914). Ticket distribution was determined for the

Yale Bowl based on financial generosity of the alumni toward the construction of the stadium (Blanton, 2014). The earlier the donation, the better seat received by the donor (Cohane, 1951).

Over 300 members of the press attended the contest ("70,055 Seats In," 1914). Following that provided by professional venues, space was built into the structure to house 600 members of the media with another 50 spaces for photographers (Ferry, 1915). Over 35,000 fans traveled from New York and Boston by special trains to watch the contest with 25 special trains departing from New York City and ten more from Boston ("Harvard and Yale," 1914). Also, due to the rising popularity of automobiles, special parking areas were set up to handle the hundreds of automobiles descending on New Haven ("Harvard and Yale," 1914). Specifically, twelve acres were set aside with dirt from the construction for parking to accommodate 8,000 automobiles (Atwood, 1914; "Defeat Hits Hard," 1914). Further, a staff of over 1,400 was hired to handle the admission of fans into the facility and to maintain order ("70,055 Seats In," 1914).

Upon admittance into the stadium, fans entered the facility through 30 tunnels ("Harvard and Yale," 1914). Twenty-five rows of seats were below the tunnel entrance while 35 seating rows were located about the 30 tunnel entrances (Atwood, 1914; "Harvard and Yale," 1914). Unlike Harvard Stadium, the Yale Bowl was sunken into the ground with ground level being approximately half way up the stadium seating, allowing for tunnel access to seats for spectators (Ingrassia, 2012). The use of 175,000 cubic feet of earth to support the structure was much cheaper than the Archbold and Harvard Stadium examples (Ferry, 1915; Smith, 1920b). It also created an exterior surface that would not collapse or be damaged easily by weather conditions (Ferry, 1915). The dirt served as the support system for the stands and removed the need for several additional tons of reinforced concrete that would have been required if the structure was built above ground, saving about $65,000 (Ferry, 1915). The tunnels were reinforced concrete on

all sides, guaranteeing the stability of the tunnel entrance to the facility (Ferry, 1915). Two other tunnels allowed access directly to the field, one for workers to access the field and the other for players (Atwood, 1914). Each of the tunnels supported electric lighting to allow all patrons, players, and staff to see as they entered the structure (Ferry, 1915).

The facility itself had over 75,000 square feet of turf and could be surrounded by a running track 200 feet short of the normal 440-yard track (Ferry, 1915; "Harvard and Yale," 1914). The turf was crowned twelve inches from the center to sidelines to help with drainage and hydrants were placed inside the stadium to allow for watering of the grass during the spring and summer (Atwood, 1914). In order to protect the turf for games, the Yale Bowl turf was covered with hay stored in the facility ("Snow and Rain," 1914). Surrounding the inside of the bowl was a 27-inch retaining wall to keep spectators off the field (Atwood, 1914; Ferry, 1915). Outside of the stadium, a concourse constructed of broken stone surrounded the field (Atwood, 1914).

Memorial Stadiums

A lag period in the diffusion of steel and concrete stadiums occurred following the completion of the Yale Bowl, at least partially related to WWI. However, following the end of WWI, many schools in the Midwest and on the West Coast built structures (i.e., monuments) dedicated to the deceased soldiers from the war, with spaces set aside as memorials for the sacrifice of the soldiers who died during the conflict (Blanton, 2014). Many of these stadiums were built in small Midwestern communities that were dwarfed by the new stadium. These stadiums became commonplace across the country with at least a dozen stadiums built sharing the Memorial Stadium name. The end of the war also saw an increase in interest in football as newspaper coverage switched back to college football from the war effort (Oriard, 2001). Improved technology from railroads and the development of the automobile also increased the

ease of transportation across long distances (Lucas & Smith, 1978). Thus, intersectional games against well-known opponents drew large crowds, increasing the demand for these contests as ways for universities to pay for the stadium construction boom of the 1920s (Carter, 2006).

Stanford Memorial Stadium opened in fall 1921 for the Stanford-California contest ("Annual Report of", 1921). The facility cost $210,200 of which $100,000 was raised by subscription and the rest borrowed against future admission fees (Siegal & Strain, 1999). The $110,200 borrowed was paid back after the 1921 Stanford-California game, following a profit of over $209,000 earned from the event (Siegal & Strain, 1999). Stanford Stadium was constructed into a hillside and seated over 60,000 ("Annual Report Of," 1921). The stadium was a bowl shaped stadium with an open corner for a 220-yard track ("Stanford Stadium," 2013). The stadium also included a large parking lot for automobiles, which were becoming a common way for wealthy fans to arrive at games (Ingrassia, 2012). Stanford Stadium was the first of the memorial stadiums to open, followed shortly thereafter by their rival California-Berkeley.

California Memorial Stadium was built in Strawberry Canyon, which was on the edge of campus (Siegal & Strain, 1999). Land was purchased from community members to extend campus to build Memorial Stadium. State taxpayers purchased the 22-acres of land for the university, prior to the site being finally chosen as the building spot for the stadium (Smyth, 1923). The stadium designed by John Galen Howard, who was the architect of several buildings on the Berkeley campus ("The House that," 2010). Educated on the east coast at Massachusetts Institute of Technology, Howard had been exposed to the Yale Bowl, which California Memorial Stadium shared many similarities (Siegal & Strain, 1999). The structure was built as a memorial to those University of California alumni who died during WWI ("The House that," 2010).

As previously discussed, California Memorial Stadium was funded through the sale of bonds guaranteeing fans access to the Stanford-California game for the next decade whether the game was played at Berkley or Stanford ("California's Memorial Stadium," 1921). Over 6,900 subscriptions were quickly sold, raising over $800,000 for the stadium (Siegal & Strain, 1999). The stadium's size was designed to take advantage of the large crowds between Stanford and California, with the realization that the venue would rarely sell out beyond once every two years ("New Design for," 1923). The venue was designed so that the sun would not impact the contest between Stanford and California each November ("New Design For," 1923). Over 280,000 cubic yards of soil and rock were removed from the canyon to make room for Memorial Stadium (Smyth, 1923). According to Siegal and Strain (1999), 62% of the structure was supported by earth and 38% was supported by reinforced concrete. The structure was finished in time for the 1923 Stanford-California game and shared the spotlight with several other facilities that emerged primarily in the Midwest.

Kansas Memorial Stadium opened on Armistice Day, November 11, 1922, four years after the end of WWI (McCool, 2016). The drive to build the new stadium to honor the war dead of the University of Kansas from WWI was launched in 1920, with several local newspaper articles calling for the University of Kansas to have its own version of the Yale Bowl or Harvard Stadium (McCool, 2016; "Memorial Stadium," 2014). Over $900,000 was pledged toward the construction of the stadium (McCool, 2016). Kansas broke ground to build Memorial Stadium on May 10, 1921, with the building opening 18 months later ("Memorial Stadium," 2014). The ground breaking was unique as the university allowed the students to tear down the fence and bleachers that existed from McCook Field prior to the groundbreaking ceremony (McCool, 2016). Over 4,000 students took part in the destruction of the old facility. The U-shaped stadium,

designed by Kansas professors LaForce Bailey and Clement Williams and under the direction of athletic director Forrest "Phog" Allen, was built with space for track & field too ("Memorial Stadium," 2014). Interestingly, the university struggled to collect pledges (i.e., less than $700,000 by the end of 1931), which created financial problems for the university (McCool, 2016).

Illinois Memorial Stadium, built in 1922, seated over 60,000 in a town with a population of a little more than 12,000 people (Lester, 1999). The decision to build a stadium in memorial to the University of Illinois's active involvement in World War I was undertaken in 1919 (ExploreCU, 2016). The athletic director at Illinois, George Huff, sought to build Illinois its own Yale Bowl as early as 1915 ("Hope To Have," 1915). The construction of Illinois Memorial Stadium began September 11, 1922, and was completed in time for the opening game to be played November 3, 1923 (Kacich, 2002). The stadium's construction required over 2,700 tons of steel, and 800 tons of reinforced concrete (ExploreCU, 2016; Kacich, 2002).

Ohio Stadium, opened in the fall of 1922, was another revolutionary structure (Ingrassia, 2012). The stadium was a double-decked horseshoe, the first of its kind ever built in the U.S. ("A Walk in," 2010). The plan for the stadium was announced in 1920, with the goal of raising $1 million in one year through pledges to the construction of the stadium (Ingrassia, 2012). One million was pledged within seven months but over $200,000 was never collected ("A Walk in," 2010). A further $300,000 overrun in construction costs left the university athletic board with $550,000 in debt in January of 1923 (Ingrassia, 2012). The debt was paid off within five years due to the over 63,000 spectators that often packed Ohio Stadium for significant games ("A Walk In, 2010). The stadium was constructed of 40,000 cubic yards of concrete and 4,000 tons

of steel, which fully supported the structure as it was built completely above ground ("A Walk In," 2010). The double-deck horseshoe was copied several times around the country.

One other significant project occurred in the Midwest during the late 1920s at Ohio State's rival The University of Michigan. In 1927, the University built Michigan Stadium at a cost of $1,131,733 ("The Michigan Stadium," 2007). Michigan Stadium was constructed to replace Ferry Field, which with 45,000 seats could not adequately seat the growing crowds that Michigan drew for major games (Blanton, 2014). The University of Michigan bought over 100 acres of land, 15 of which was used for the new stadium (Blanton, 2014).

The new stadium was paid for with 3,000 $500 bonds, which guaranteed the owner access to seating between the 30-yard lines for the next decade ("The Michigan Stadium," 2007). The facility was significant for its large size, with concrete seating of 72,000 and additional wooden seating bringing the capacity to over 87,000 seats ("Stadium History, Part," 2016). The stadium also followed Stanford and a few other stadiums in mixing the large size of the bowl shape construction with the straight-sideline stands of the horseshoe shaped Harvard Stadium. The Osborn Company of Cleveland designed the stadium ("The Michigan Stadium," 2007). The Osborn Company designed a large number of facilities of the era including facilities at the University of Minnesota, the University of Kentucky, and the United States Military Academy along with several professional baseball venues ("The Michigan Stadium," 2007). Michigan Stadium contained 440 tons of reinforced concrete in order to build 72 rows of seats in 44 separate sections ("Stadium History, Part," 2016). Michigan Stadium opened October 1, 1927, as the largest stadium in the country and two weeks later, Ohio State visited the facility for the official grand opening of the structure ("Stadium History, Part, 2016). General admission seating cost $3 for the game, and over 85,000 attended the dedication of Michigan Stadium ("The

Michigan Stadium," 2007). Overall, the construction of permanent stadiums (n = 53) following WWI confirmed the large investment in college football. However, embedded in the period following WWI was the first wave of renovations. For example, starting in 1920 with a significant number (n = 108) of rehabilitation projects occurring in stadia around the country, the rehabilitation projects focused primarily on seating expansions.

The South Becomes Serious

A total of 17 new stadiums were built in the South during Stage Two and most after 1920 (Oriard, 2001; Schmidt, 2007). Many of the early venues constructed in the South were multi-purpose in nature and built with expansion in mind such as Grant Field at Georgia Tech. Grant Field was constructed in 1913 with a $25,000 donation from John Grant and $30,000 in labor from prisoners of the local jail (Ingrassia, 2012). The structure was designed by Charles Leavitt, the designer of Forbes Field in Pittsburgh, and constructed of reinforced concrete and steel (Ingrassia, 2012). Another $20,000 was raised to complete the West stands in 1915, raising the capacity of Grant Field to approximately 12,000 (Wallace, 1963). The renovation was driven by the growing popularity of football at Georgia Tech and the hiring of John Heisman who coached several successful teams (Ingrassia, 2012; Wallace, 1963).

Several other stadiums built in the South during Stage Two of particular interest to the current study involved the construction of Shields-Watkins Field in Knoxville, Tennessee, and Tiger Stadium in Baton Rouge, Louisiana. Shields-Watkins opened in 1921, after construction of an $80,000 west grandstand that seated 3,200 spectators. Following the pattern of most early southern venues, Shields-Watkins was significantly smaller than venues built during this time in other parts of the country (Ingrassia, 2012; Parker, Hood & Ward, 2000). The early structure was very primitive in nature but served to provide the University of Tennessee with some revenue

(Parker et al., 2000). To increase revenues, Shields-Watkins was renovated with the addition of the east stands in 1926, doubling the capacity to 6,800.

Further to the Southwest, another prominent reinforced concrete and steel structure opened in November of 1924 for LSU and their rivalry game with Tulane University (Seifried, in press). Tiger Stadium took eleven months to construct, with a capacity of approximately 12,000 in the mostly completed venue (Seifried, 2012; “Splendid Service Arranged,” 1924). The game drew approximately 18,000 spectators and generated $30,000 in gate receipts (Boyd, 1924; Seifried, in press). Seating extended from end zone to end zone on each side of Tiger Stadium, constructed of reinforced concrete and steel (Seifried, 2012). Theodore Link, the LSU campus architect, designed Tiger Stadium (Seifried, 2012). Eleven total sections were constructed with wooden bleacher seating for each row of stands attached to the reinforced concrete base (Link, 1923). Ramps of over 65 feet led spectators into the first row of seating with other ramps located on the back of the structure leading fans to the top rows of each section (Seifried, 2012). Twenty-five rows were built on each side, and 16 toilets were found underneath the west side of the facility, a significant modern convenience of the era as the Yale Bowl, for example, did not possess any restrooms (Link, 1923). The facility cost approximately $130,087.70, which included a track (Louisiana State University, 1926).

Overall, structures built by Southern universities lacked the grandeur and architectural beauty of their Northeastern, Midwestern, and Western competitors (Ingrassia, 2012; Schmidt, 2007). Stadiums in the South were often small and cost less than $100,000 to construct, a significantly smaller number than other steel and concrete facilities around the rest of the U.S. As another example, Denny Stadium at the University of Alabama opened two sidelines to produce a capacity of 12,000 (“Alabama Gets 6,” 1929). The University of Arkansas constructed

a steel grandstand for its football facility Bailey Stadium in 1927 that seated only 5,000. Function was what mattered to schools in the South. Still, the growing popularity of the Southern game would allow schools in the South to quickly renovate their small facilities within a few years of initial construction. These renovations mark the last significant descriptor of Stage Two.

Renovations to Permanent Structures

By the end of Stage Two, schools were making renovations to their permanent structures. Almost all of the renovations that occurred during Stage Two were rehabilitations (n=102) with one preservation project and five restoration projects. The average renovation cost approximately $129,966 and most were expansions of at least 3,000 seats increased capacities to 16,988. Some temporary expansions were larger. For example, Harvard constructed approximately 20,000 temporary wooden seats in order to accommodate demand (Smith, 1920a). The construction of seating along the colonnade that surrounded the stadium, the roof of the colonnade and in the open end of the U-shaped stadium increased the capacity of the venue to over 50,000 (Smith, 1920a). Similar rehabilitation projects were of a temporary nature and cheaply made from wood.

Once proven successful, these temporary additions were torn down and rebuilt using reinforced concrete and steel. One such example was found at Oklahoma Agricultural & Mechanical College (Oklahoma State) where Lewis Field underwent an 8,000-seat reinforced concrete and steel expansion at a cost of $500,000 (Baldwin, 2003). This rehabilitation expanded the capacity of Lewis Field to 13,000. The renovation of Lewis Field followed the University of Oklahoma's renovation of Oklahoma Memorial Stadium in 1928, which doubled the capacity of the stadium, from 16,000 to 32,000 at a cost of $293,000 ("Stadium History," 2016).

As was often the case, schools within close geographic proximity renovated within a year of each other. For instance, in Kansas, four rehabilitation projects (two each at the University of

Kansas and at Kansas State University) surfaced between 1924 and 1928. Kansas State renovated Memorial Stadium with the construction of reinforced concrete and steel west grandstands in 1924 at a cost of $260,000 ("Memorial Stadium," 2015). The University of Kansas followed with a rehabilitation of its Memorial Stadium in 1925 with a $325,000 expansion of the east stands ("Memorial Stadium," 2014). The University of Kansas continued the development of Memorial Stadium with the addition of a $260,000 North Bowl expansion in 1927 ("Memorial Stadium," 2014). Kansas State finished off the four-year period of renovations with the addition of a press box to Memorial Stadium at Kansas State University. The use of renovations to try to develop the best possible stadium in relation to peer institutions was a common issue during the last decade of Stage Two (Schmidt, 2007).

Conclusions for Stage Two

As college football moved toward the 1930s, college football had become big business, generating thousands of dollars for highly successful programs (Blanton, 2014). Alumni donated funding for the construction of permanent concrete and steel stadiums around the country. In return, those alumni received access to some of the best seating in the venue (Blanton, 2014). Diffusion of reinforced concrete and steel truly defined modern college football (Gumprecht, 2003; Smith, 2008). Concrete and steel stadiums were erected around the country initially following the Harvard/Yale models. (See Tables 5.1 and 5.2.)

Table 5.1 Stage Two- New Construction Reinforced Concrete and Steel Venues

School	Stadium	Location	Year
Harvard	Harvard Stadium	Cambridge, MA	1903
Syracuse	Archbold Stadium	Syracuse, NY	1907
Mississippi State	Scott Field	Starkville, MS	1914
Princeton	Palmer Stadium	Princeton, NJ	1914
Yale	Yale Bowl	New Haven, CT	1914
Clemson	Riggs Field	Clemson, SC	1915

(Table 5.1 continued)

School	Stadium	Location	Year
Cornell	Schoellkopf Field	Ithaca, NY	1915
Mississippi	Hemingway Stadium	Oxford, MS	1915
Wisconsin	Camp Randall Stadium	Madison, WI	1917
Oklahoma A&M	Lewis Field	Stillwater, OK	1919
Oregon	Hayward Field	Eugene, OR	1919
Oregon State	Bell Field	Corvallis, OR	1920
Washington	University of Washington Stadium	Seattle, WA	1920
Kansas	Memorial Stadium	Lawrence, KS	1921
Southern California	Los Angeles Memorial Coliseum	Los Angeles, CA	1921
Stanford	Stanford Stadium	Stanford, CA	1921
Tennessee	Shields-Watkins Field	Knoxville, TN	1921
Illinois	Memorial Stadium	Champaign, IL	1922
Kansas State	Memorial Stadium	Manhattan, KS	1922
Ohio State	Ohio Stadium	Columbus, OH	1922
Penn	Franklin Field	Philadelphia, PA	1922
Vanderbilt	Dudley Field	Nashville, TN	1922
California	Memorial Stadium	Berkeley, CA	1923
Columbia	Baker Field	New York City, NY	1923
Dartmouth	Memorial Field	Hanover, NH	1923
Maryland	Byrd Stadium	College Park, MD	1923
Nebraska	Memorial Stadium	Lincoln, NE	1923
Army	Michie Stadium	West Point, NY	1924
Cincinnati	Nippert Stadium	Cincinnati, OH	1924
Colorado	Folsom Field	Boulder, CO	1924
LSU	Tiger Stadium	Baton Rouge, LA	1924
Minnesota	Memorial Stadium	Minneapolis, MN	1924
Purdue	Ross-Ade Stadium	West Lafayette, IN	1924
Texas	Memorial Stadium	Austin, TX	1924
West Virginia	Mountaineer Field	Morgantown, WV	1924
Brown	Brown Stadium	Providence, RI	1925
Colorado State	Colorado Field	Fort Collins, CO	1925
Indiana	Memorial Stadium	Bloomington, IN	1925
Oklahoma	Oklahoma Memorial Stadium	Norman, OK	1925
Pittsburgh	Pitt Stadium	Pittsburgh, PA	1925
Brigham Young	Hillside Stadium	Provo, UT	1926
Fresno State	College Stadium	Fresno, CA	1926
Northwestern	Dyche Stadium	Evanston, IL	1926
Southern Methodist	Ownby Stadium	Dallas, TX	1926

(Table 5.1 continued)

School	Stadium	Location	Year
Texas Tech	Tech Stadium	Lubbock, TX	1926
Tulane	Tulane Stadium	New Orleans, LA	1926
Virginia Tech	Miles Stadium	Blacksburg, VA	1926
Michigan	Michigan Stadium	Ann Arbor, MI	1927
North Carolina	Kenan Memorial Stadium	Chapel Hill, NC	1927
Utah	Ute Stadium	Salt Lake City, UT	1927
Temple	Beury Stadium	Philadelphia, PA	1928
Alabama	Denny Stadium	Tuscaloosa, AL	1929
Arizona	Arizona Stadium	Tucson, AZ	1929
Duke	Duke Stadium	Durham, NC	1929
Georgia	Sanford Stadium	Athens, GA	1929
Iowa	Iowa Stadium	Iowa City, IA	1929
Ohio	Ohio Stadium	Athens, OH	1929
Texas A&M	Kyle Field	College Station, TX	1929

Table 5.2 Stage Two (1903-1929) New Construction- All Venues

School	Stadium	Nominal Cost ($)	Open Date	Capacity
Harvard	Harvard Stadium	310,000	1903	23,000
California	California Field		1904	17,000
Northwestern	Northwestern Field		1905	10,000
Oklahoma	Boyd Field	112	1905	1,000
Stanford	Stanford Field	213,000	1905	13,000
Texas A&M	A&M Field/Kyle Field	700	1905	500
Florida	Fleming Field		1906	
Michigan	Ferry Field	30,000	1906	18,000
Oregon State	College Field		1906	1,000
Syracuse	Archbold Stadium	600,000	1907	25,000
Penn State	New Beaver Field	8,000	1908	1,200
Nebraska	Nebraska Field		1909	16,000
Pittsburgh	Forbes Field	2,000,000	1909	23,000
South Carolina	Davis Field		1909	3,000
Tulane	Tulane Athletic Field	18,000	1909	10,000
Oregon State	Bell Field		1910	3,000
Wyoming	Cowboy Field	9,000	1910	2,000
Auburn	Drake Field		1911	10,000
Georgia	Sanford Field		1911	
Kansas State	Ahearn Field	10,000	1911	
Colorado State	Colorado Field		1912	1,000

(Table 5.2 continued)

School	Stadium	Nominal Cost ($)	Open Date	Capacity
Navy	Thompson Stadium		1912	12,000
Rice	Rice Field		1912	1,000
Georgia Tech	Grant Field	50,000	1913	5,600
Oklahoma State	Lewis Field		1913	
Utah State	Adams Field	3,200	1913	
Alabama	University Field		1914	1,000
Idaho	MacLean Stadium		1914	
Iowa State	Iowa State Stadium	60,000	1914	10,000
Mississippi State	Scott Field	275,000	1914	20,000
Princeton	Palmer Stadium	300,000	1914	42,000
Yale	Yale Bowl	750,000	1914	70,869
Boston College	Alumni Field		1915	2,200
Clemson	Riggs Field	10,000	1915	3,000
Cornell	Schoellkopf Field	70,000	1915	9,000
Ole Miss	Hemingway Stadium	100,000	1915	14,000
Southern Methodist	Armstrong Field	1,500	1915	2,000
Wisconsin	Camp Randall Stadium	40,000	1917	10,000
Oklahoma State	Lewis Field		1919	
Oregon	Hayward Field	11,500	1919	6,000
Washington	University of Washington Stadium	323,577	1920	30,000
Kansas	Memorial Stadium	291,000	1921	22,000
Southern California	LA Memorial Coliseum	954,873	1921	75,690
Stanford	Stanford Stadium	573,470	1921	60,000
Tennessee	Shields-Watkins Field	80,000	1921	3,200
Illinois	Memorial Stadium	1,700,000	1922	55,524
Kansas State	Memorial Stadium	240,809	1922	17,000
Ohio State	Ohio Stadium	1,491,761	1922	66,210
Penn	Franklin Field	798,343	1922	54,000
South Carolina	Melton Field		1922	4,800
Vanderbilt	Dudley Field	1,500,000	1922	20,000
Wake Forest	Gore Athletic Field	14,000	1922	
Wyoming	Corbett Field	10,000	1922	4,000

(Table 5.2 continued)

School	Stadium	Nominal Cost ($)	Open Date	Capacity
California	Memorial Field	1,437,696	1923	72,609
Columbia	Baker Field	700,000	1923	15,000
Dartmouth	Memorial Field	270,000	1923	16,600
Maryland	Old Byrd Stadium/Field	69,500	1923	5,000
Michigan State	College Field	160,000	1923	15,000
Nebraska	Memorial Stadium	447,000	1923	30,000
Army	Michie Stadium	300,000	1924	21,000
Cincinnati	Nippert Stadium	250,000	1924	12,000
Colorado	Folsom Field	65,000	1924	26,000
LSU	Tiger Stadium	130,088	1924	12,000
Minnesota	Memorial Stadium	665,000	1924	52,809
Purdue	Ross-Ade Stadium	460,000	1924	13,500
Texas	Memorial Stadium	275,000	1924	27,000
West Virginia	Mountaineer Field	740,000	1924	20,000
Brown	Brown Stadium	541,246	1925	16,400
Indiana	Old Memorial	500,000	1925	24,000
Pittsburgh	Pitt Stadium	2,100,000	1925	67,000
Brigham Young	Hillside/B.Y.U. Stadium	10,000	1926	5,000
Fresno State	Fresno State College Stadium	300,000	1926	
Hawaii	Honolulu Stadium	150,000	1926	10,000
Northwestern	Dyche Stadium	1,467,207	1926	45,000
Southern Methodist	Ownby Stadium	222,680	1926	17,780
Temple	Vernon Park		1926	3,000
Tulane	Tulane Stadium	295,968	1926	35,000
Virginia Tech	Miles Stadium	101,344	1926	3,750
Arizona State	Irish Field		1927	2,000
Michigan	Michigan Stadium	1,131,733	1927	87,000
North Carolina	Kenan Memorial Stadium	303,000	1927	24,000
Utah	Ute Stadium	135,239	1927	20,000
Temple	Beury Stadium	350,000	1928	34,200
Alabama	Denny Stadium	196,000	1929	12,000
Arizona	Arizona Stadium	166,888	1929	7,000

(Table 5.2 continued)

School	Stadium	Nominal Cost ($)	Open Date	Capacity
Duke	Duke Stadium	4,000,000	1929	25,000
Georgia	Sanford Stadium	360,000	1929	30,000
Iowa	Iowa Stadium	497,151	1929	50,000
Ohio	Ohio Stadium	185,000	1929	12,000

Through the construction of permanent venues, many schools were able to increase revenues gained through admission fees to improve the university as a whole (Blanton, 2014; Ingrassia, 2012). The average new construction (n = 88) cost $361,711, with an average capacity of 19,812. Of these new constructions, facilities (n = 58) constructed of reinforced concrete and steel made up a majority of the total. The difference between a permanent structure and temporary was best explained by the difference in cost. Stage One new constructions cost an average of $6,144 in comparison to the Stage Two cost of $361,711. At least 108 renovations occurred during the era with 102 of the renovations surfacing as rehabilitations of existing structures (i.e., additions to seating, press areas, and scoreboards being most common), four combination renovations, one preservation, and one restoration. See Table 5.3 for information specific to renovations. See Table 5.4 for size in acres facilities covered in Stage Two.

Notably, some universities added restroom and concession facilities to venues during renovations. Specifically, at least eight venues added restrooms (e.g., Brown, California, Harvard, Iowa, LSU, Northwestern, Stanford, and Virginia). Some already made use of the amenity. For instance, LSU constructed a total of 22 restrooms during the period, and Stanford included 19 when it opened Stanford Stadium. Regarding concession stands, this work found nine stadiums added that amenity during this era (e.g., California, Iowa, LSU, Northwestern, Ohio State, Pittsburgh, Purdue, Stanford, and Texas). Interestingly, concession stands emerged in

Table 5.3 Stage Two (1903-1929) Renovations

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Michigan	Regents Field				X		70,000	1903	15,000
Minnesota	Northrop Field				X		30,000	1903	20,000
Missouri	Rollins Field				X		2,250	1903	1,150
Virginia Tech	Gibboney Field				X			1904	1,200
Yale	Yale Field			X	X	X	14,636	1904	33,000
Missouri	Rollins Field			X	X	X	175	1905	1,150
California	California Field				X			1906	20,000
Kansas State	Athletic Park				X			1906	
Missouri	Rollins Field				X		1,100	1907	3,000
North Carolina State	New Athletic Field				X			1907	5,000
Texas A&M	A&M Field/Kyle Field				X		313	1907	500
California	California Field	X					18,000	1908	20,000
Oregon	Kincaid Field				X		1,000	1908	4,000
Cincinnati	Carson Field				X		367	1909	
Harvard	Harvard Stadium				X		50,000	1909	23,000
Southern California	Bovard Field				X		3,500	1909	7,500

(Table 5.3 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Virginia Tech	Miles Field				X		1,600	1909	1,200
California	California Field				X			1910	20,000
Purdue	Stuart Field						237,500	1910	5,000
Texas	Clark Field				X		900	1910	2,000
Utah	Cummings Field				X			1910	2,000
Missouri	Rollins Field				X		267,000	1911	9,000
Oklahoma	Boyd Field				X		3,300	1911	3,000
Penn State	New Beaver Field			X	X	X	5,500	1911	1,900
Michigan	Ferry Field				X		37,000	1912	21,000
Ohio State	Ohio Field at High and Woodruff				X			1912	14,000
Cincinnati	Carson Field				X		1,234	1913	1,144
Oregon State	Bell Field				X			1913	3,000
Virginia	Lambeth Field				X		35,000	1913	8,000
Arizona State	Normal Field				X			1914	1,000
Illinois	Illinois Field				X			1914	4,000
Michigan	Ferry Field				X		150,000	1914	25,000
Penn	Franklin Field				X		500,000	1914	
Washington State	Rogers Field				X			1914	6,000
California	California Field				X			1915	21,500

(Table 5.3 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Georgia Tech	Grant Field				X		20,000	1915	5,600
Iowa	Athletic Park				X			1915	12,400
Oregon	Kincaid Field				X		10,000	1915	8,000
Texas A&M	A&M Field/Kyle Field				X			1915	8,500
Cincinnati	Carson Field				X			1916	
Kentucky	Stoll Field				X		5,000	1916	5,000
Southern California	Bovard Field				X			1916	10,000
Illinois	Illinois Field				X			1917	17,000
Texas	Clark Field				X		10,000	1917	7,500
Tulane	Tulane Stadium				X		27,700	1917	2,500
Arkansas	The Hill				X		15,200	1918	3,000
Missouri	Rollins Field				X			1919	15,000
Purdue	Stuart Field				X		3,000	1919	5,000
Alabama	Denny Field				X			1920	5,000
Baylor	Carroll Field				X		7,500	1920	5,000
Cincinnati	Carson Field				X		145,463	1920	8,000
Oregon State	Bell Field				X			1920	7,000
Penn State	New Beaver Field				X		10,000	1920	5,500
Rice	Rice Field				X			1920	19,000
Texas	Clark Field				X		5,000	1920	20,000
Tulane	Tulane Stadium				X		18,300	1920	11,000

(Table 5.3 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Cincinnati	Carson Field				X			1921	8,000
Colorado State	Colorado Field				X			1921	5,400
Michigan	Ferry Field				X		380,000	1921	42,000
Oregon	Hayward Field				X		10,000	1921	15,000
Penn State	New Beaver Field				X		2,400	1921	12,000
Washington State	Rogers Field				X		20,000	1921	10,000
Wisconsin	Camp Randall Stadium				X		25,000	1921	14,000
Iowa	Iowa Field				X			1922	12,400
Oregon State	Bell Field				X		21,000	1922	18,000
Penn State	New Beaver Field			X	X	X	21,660	1922	14,778
Rutgers	Neilson Field				X		150,000	1922	6,000
Southern Methodist	Armstrong Field				X		8,500	1922	3,000
Navy	New Thompson Stadium				X		32,400	1923	9,000
Oklahoma	Oklahoma Memorial Stadium				X		293,000	1923	16,000
Washington	University of Washington Stadium				X		15,000	1923	30,000

(Table 5.3 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Clemson	Riggs Field				X			1924	10,000
Cornell	Schoellkopf Field				X			1924	21,500
Georgia Tech	Grant Field				X		300,000	1924	30,000
Kansas State	Memorial Stadium				X		260,000	1924	22,481
Kentucky	Stoll Field/McLean Stadium				X		137,000	1924	10,400
Michigan	Ferry Field				X		500,000	1924	46,000
Oklahoma State	Lewis Field				X		50,000	1924	5,000
Wisconsin	Camp Randall Stadium				X		20,000	1924	33,000
Colorado State	Colorado Field				X			1925	7,500
Iowa State	Iowa State Stadium				X		37,000	1925	20,000
Kansas	Memorial Stadium				X		325,000	1925	22,000
LSU	Tiger Stadium				X		30,000	1925	12,000
Oklahoma	Oklahoma Memorial Stadium				X		650,000	1925	16,000
Penn	Franklin Field				X		1,000,000	1925	70,000
Stanford	Stanford Stadium				X		211,346	1925	70,200

(Table 5.3 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Texas A&M	A&M Field/Kyle Field				X		345,002	1925	26,600
Missouri	Memorial Stadium				X		365,000	1926	26,000
Northwestern	Dyche Stadium				X		206,062	1926	57,300
Tennessee	Shields-Watkins Field				X		24,395	1926	6,800
Texas	Memorial Stadium				X		125,000	1926	40,500
Washington State	Rogers Field				X			1926	18,000
Arkansas	The Hill				X		16,700	1927	5,000
Harvard	Harvard Stadium				X		175,000	1927	57,166
Kansas	Memorial Stadium				X		260,000	1927	35,000
Stanford	Stanford Stadium				X		578,000	1927	85,500
Texas A&M	A&M Field/Kyle Field				X		76,719	1927	33,000
Columbia	Baker Field				X			1928	32,000
Kansas State	Memorial Stadium				X		276,000	1928	22,481
Miami of Ohio	Miami Field			X			25,000	1928	7,240

(Table 5.3 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Oklahoma	Oklahoma Memorial Stadium				X		293,000	1928	32,000
South Carolina	Melton Field				X			1928	8,000
Clemson	Riggs Field				X			1929	10,000
Mississippi State	Scott Field				X		15,000	1929	20,000
Ohio State	Ohio Stadium				X			1929	66,210
Oklahoma State	Lewis Field				X		500,000	1929	13,000
Syracuse	Archbold Stadium				X			1929	25,000
Texas A&M	A&M Field/Kyle Field				X		259,694	1929	35,000

Table 5.4 Stage Two (1903-1929) Reported Acreage Size

School	Stadium	Acreage
Alabama	Denny Stadium	3.13
Arizona	Arizona Stadium	8.6
Baylor	Cotton Palace	5
Baylor	Carroll Field	3
Boston College	Municipal Field on Campus	9.22
Boston College	Alumni Field	4
Brown	Brown Stadium	7
California	California Field	5.31
California	California Memorial Stadium	8.63
Cincinnati	Carson Field	7.8
Cincinnati	Nippert Stadium	7.8
Clemson	Riggs Field	9.18
Harvard	Harvard Stadium	5.55
Hawaii	Honolulu Stadium	6
Illinois	Memorial Stadium	8.91
LSU	Tiger Stadium	6
Maryland	Old Byrd Stadium	5
Michigan	Regents Field	10
Michigan	Ferry Field	10
Michigan	Michigan Stadium	15
Minnesota	Northrup Field	6
Minnesota	Memorial Stadium	11
Nebraska	Memorial Stadium	3.2
North Carolina	Emerson Field	3.62
North Carolina	Kenan Memorial Stadium	6
Ohio State	Ohio Field	5.5
Ohio State	Ohio Stadium	9.8
Oklahoma	Boyd Field	9.18
Oregon	Kincaid Field	4
Oregon	Hayward Field	35
Penn	Franklin Field	6.38
Penn State	New Beaver Field	4
Pittsburgh	Pitt Stadium	10.42
Princeton	Palmer Stadium	7.78
Purdue	Stuart Field	16
Purdue	Ross-Ade Stadium	6.59
Southern California/UCLA	Los Angeles Memorial Coliseum	17.59
Southern Methodist	Armstrong Field	3
Southern Methodist	Ownby Stadium	3

(Table 5.4 continued)

School	Stadium	Acreage
Stanford	Stanford Field	11.5
Stanford	Stanford Stadium	18.4
Syracuse	Archbold Stadium	6.5
Temple	Vernon Park	11
Temple	Beury Stadium	5.67
Tennessee	Shields-Watkins Field	7.23
Texas	Memorial Stadium	5
Texas A&M	Kyle Field	3.67
Texas A&M	Kyle Field	5.74
Utah	Cummings Field	3
Utah	Ute Stadium	5
Virginia	Lambeth Field	16
Wake Forest	Gore Athletic Field	5.58
Washington	University of Washington Stadium	9.64
Washington State	Rogers Field	15
West Virginia	Mountaineer Field	10
Wisconsin	Camp Randall Stadium	6.5
Yale	Yale Bowl	12.5

the Midwest and mostly followed the development of the first professional outdoor sport facility concession stands at Wrigley Field in 1914 (Seifried, 2005). As with restrooms, some facilities remained ahead of others. For example, Pitt Stadium supported 14 concessions stands when it opened in 1925 and California Memorial Stadium possessed 13. Also, based on the lists above, the importance of geographic proximity and conference association likely influenced the diffusion of these structures. See Table 5.5 for universities with restrooms and concession stands, along with numbers of each.

Table 5.5 Stage Two (1903-1929) Facilities With Restrooms and/or Concession Stands

School	Stadium	Restrooms	Concession Stands
Brown	Brown Stadium	5	0
California	California Memorial Stadium	9	13
Harvard	Harvard Stadium	6	0

(Table 5.5 continued)

School	Stadium	Restrooms	Concession Stands
Iowa	Iowa Stadium	15	8
LSU	Tiger Stadium	22	2
Northwestern	Dyche Stadium	13	4
Ohio State	Ohio Stadium	0	2
Pittsburgh	Pitt Stadium	0	14
Purdue	Ross-Ade Stadium	2	1
Stanford	Stanford Stadium	19	10
Texas	Clark Field	0	1
Virginia	Lambeth Field	2	0

Next, it should be acknowledged that during Stage Two facilities limited space for the press was included. As more newspapers began to cover college football, the need for space specifically for writers grew in importance. Providing writers with a dedicated space was beneficial to the university, as a way to encourage positive coverage from the press (Oriard, 2001). Over 60 universities added press spaces to their stadiums during Stage Two. However, it should be noted that many of these early structures were nothing more than space set aside for the press, or a closed off area where only the press could go (Smith, 1990). Few added press only structures, and those that did were usually quite small, as most universities only had a few newspapers covering their events (Oriard, 2001). These areas should not be considered luxury boxes. Facilities at this time did not support luxury boxes or club seating in the modern sense. Some facilities, such as Harvard Stadium, set aside open air ‘boxes’ that were reserved for spectators willing to pay a higher price (Lewis, 1965). No information exists on what was included in a box seat, other than that it was set aside and often located under cover, such as at the top of Harvard Stadium (Smith, 1990). See Table 5.6 for information on Press Boxes.

Another important addition during this period was an electric scoreboard. This work found over 50 schools added one scoreboard and Cal added a second scoreboard during a

renovation. Most of these scoreboards were very basic, with just information about the score and time, but a few were more advanced. One such example was at LSU, where the Grid Graph scoreboard was installed in the original construction of the venue (Seifried, 2012). The Grid Graph was twelve feet long and 15 feet tall and used electricity to light up light bulbs allowing spectators to know the type of play, players involved and where on the field the ball was positioned for the play (Seifried, in press). The structure cost approximately $1,000 in 1924 (Seifried, 2012). Although in their infancy, scoreboards were an important device for spectator control as information was shared with the crowd through one space in the stadium (Seifried, 2010a). See Table 5.6 for information on Scoreboards.

Table 5.6 Stage Two (1903-1929) Facilities With Press Boxes and/or Scoreboards

School	Stadium	Press Box	Scoreboard
Alabama	Denny Stadium	Yes	No
Arizona	Arizona Stadium	No	Yes
Arizona State	Irish Field	Yes	Yes
Arkansas	The Hill	Yes	Yes
Army	Michie Stadium	Yes	Yes
California	California Field	No	Yes
California	California Memorial Stadium	Yes	Yes
Cincinnati	Nippert Stadium	Yes	Yes
Clemson	Riggs Field	Yes	No
Colorado	Folsom Field	No	Yes
Colorado State	Colorado Field	Yes	No
Columbia	Baker Field	Yes	Yes
Cornell	Schoelkopf Field	Yes	Yes
Dartmouth	Dartmouth Field	Yes	Yes
Duke	Duke Stadium	Yes	No
Fresno State	Fresno State College Stadium	No	Yes
Georgia Tech	Grant Field	Yes	Yes
Harvard	Harvard Stadium	Yes	Yes
Idaho	MacLean Stadium	No	Yes
Indiana	Old Memorial	Yes	Yes
Iowa	Iowa Stadium	Yes	Yes
Iowa State	Iowa State Stadium	Yes	No

(Table 5.6 continued)

School	Stadium	Press Box	Scoreboard
Kansas	Memorial Stadium	Yes	Yes
Kansas	McCook Field	Yes	No
Kansas State	Memorial Stadium	Yes	Yes
Kentucky	Stoll Field	Yes	No
Kentucky	McLean Stadium	Yes	Yes
LSU	Tiger Stadium	No	Yes
Maryland	Old Byrd Stadium	Yes	Yes
Maryland	Oriole Park	Yes	Yes
Maryland	Homewood Field	Yes	Yes
Miami of Ohio	Miami Field	Yes	Yes
Michigan	Ferry Field	Yes	No
Michigan	Michigan Stadium	Yes	No
Michigan State	College Field	Yes	Yes
Minnesota	Memorial Stadium	Yes	Yes
Missouri	Memorial Stadium	No	Yes
Navy	Thompson Stadium	Yes	Yes
Navy	New Thompson Stadium	Yes	Yes
Nebraska	Memorial Stadium	Yes	Yes
North Carolina	Kenan Memorial Stadium	Yes	No
Northwestern	Northwestern Field	Yes	Yes
Northwestern	Dyche Stadium	Yes	Yes
Ohio	Ohio Stadium	Yes	No
Ohio State	Ohio Stadium	No	Yes
Ohio State	Ohio Field	No	Yes
Oklahoma	Memorial Stadium	No	Yes
Ole Miss	Hemingway Stadium	Yes	Yes
Ole Miss	Fairgrounds Field	No	Yes
Oregon	Hayward Field	Yes	No
Oregon State	Bell Field	Yes	Yes
Penn	Franklin Field	Yes	Yes
Penn State	New Beaver Field	Yes	Yes
Pittsburgh	Forbes Field	Yes	Yes
Pittsburgh	Pitt Stadium	Yes	Yes
Princeton	Palmer Stadium	Yes	No
Purdue	Stuart Field	Yes	No
Purdue	Ross-Ade Stadium	Yes	No
Rice	Rice Field	Yes	No
Rutgers	Neilson Field	Yes	Yes
South Carolina	Melton Field	Yes	No

(Table 5.6 continued)

School	Stadium	Press Box	Scoreboard
Southern Methodist	Ownby Stadium	Yes	Yes
Stanford	Stanford Stadium	Yes	Yes
Temple	Beury Stadium	Yes	Yes
Texas	Clark Field	Yes	Yes
Texas	Memorial Stadium	Yes	Yes
Texas A&M	Kyle Field	Yes	Yes
Tulane	Tulane Stadium	Yes	Yes
Utah	Ute Stadium	No	Yes
Vanderbilt	Dudley Field	Yes	Yes
Virginia	Lambeth Field	Yes	No
Virginia Tech	Miles Stadium	Yes	Yes
Washington	University of Washington Stadium	Yes	No
Washington State	Rogers Field	No	Yes
Wisconsin	Camp Randall Stadium	Yes	Yes
Wyoming	Corbett Field	No	Yes

Social System

Prior to the development of the IAAUS in 1906, no national organization existed for the purpose of overseeing intercollegiate athletics. The old football rules committee, the ICFA, and other conference organizations existed to impact the regional spread of football. The rules controversy of 1905 led to the eventual development of the IAAUS at the end of 1905. As discussed earlier, membership grew significantly during the period (Carter, 2006). Renamed the NCAA in 1910, the association helped develop a distinct social system. For instance, at least once every year, at the National Convention, member institutions came together to discuss the challenges and successes of intercollegiate sport. According Damanpour (1987) and Kimberly and Evanisko (1981) organizations in competition with each other are more likely to adopt innovations from competitors. It makes sense that schools also joining conferences discussed

ideas and adopted innovations from competitors. Those innovations involved not only how to play the sports but also how to construct venues.

Greenhalgh, Robert, Macfarlane, Bate, and Kyriakidou (2004), argued opinion leaders drive the diffusion of innovations. With university leaders consistently meeting with other university officials, it was very likely that the diffusion of innovations surrounding the development of facilities spread. Schools in direct competition with each other often built facilities within a short time period of each other as they did not want to fall behind their direct competition (Ingrassia, 2012; Smith, 2008). The National Convention meeting notes provided by the IAAUS/NCAA also allow for the mass spread of information to even schools that chose not to participate in the convention (Carter, 2006; “Proceedings of the,” 1907, 1908; “Proceedings of the,” 1921, 1928).

Lewis (1965) directly discussed the importance of conferences such as the Western Conference (i.e., Big Ten), and the Southern Intercollegiate Athletic Association on the diffusion of college football. As conferences formed, members regularly came together and met to discuss common problems (Ingrassia, 2012; Watterson, 2002). While these meetings were on going, it was extremely likely the interpersonal communication also involved sharing of athletic facility information. Conference schools were in close geographic proximity and usually played most of their football games against other conference members. The ties of conferences increasingly helped the spread of the sport and facility construction, which is presented in Table 5.1. The conference social systems also benefited from newspaper coverage, especially the Western Conference, which was in and around major cities. The conference had two schools in Chicago (i.e., University of Chicago, Northwestern University), meaning the newspapers of Chicago provided significant coverage of the Western Conference (Oriard, 1995, 2001). Similar coverage

occured along the East Cost for Harvard, Yale, Princeton, Penn and several other schools located near Boston, New York, and Philadelphia. The social system was further helped by the news wires that carried stories written in these large cities out to the many daily and weekly newspapers that developed around the country by the turn of the century and would continue to grow throughout this period (Lewis, 1965; Oriard, 1995, 2001).

From a facilities perspective, the increasing ease of transportation encouraged visitors to travel from further distances to attend football games (Schmidt, 2007). Significant development occurred as railroad tracks spread to more places across the country. The automobile also eased transportation to the stadium for spectators. As the automobile diffused across the U.S., so did the development of spaces at stadiums to host automobiles ("Defeat Hits Hard," 1914; "The House That," 2010). The easing of transportation increased the amount of intersectional games played amongst members of the social system. The first bowl game also developed during this period, with teams from the east going west to play a school from the West Coast in Rose Bowl (Moran, 2013). By the end of Stage Two, intersectional contests had become the norm, with schools often traveling hundreds of miles to play a game against quality opponents (Schmidt, 2007). The social system of college football was strongly developed by end of Stage Two and would only increase in strength moving forward.

Communication Channels

By the start of Stage Two, mass media communication was heavily invested in college football. Major newspapers around the country dedicated significant space to covering the sport (Lewis, 1965; Oriard, 1995, 2001). As newspapers continued to grow in popularity (*The New York Daily News* hit a circulation of one million in 1926), more people used mass media to gather information about what was going on in society (Oriard, 2001). Sport figured prominently

in newspaper coverage with as much as 50% of the newspaper dedicated to the coverage of sport and entertainment news (Oriard, 2001). The sport section developed during Stage Two and included both articles written by local writers along with national pieces retrieved off news wires that transmitted stories across the country (Oriard, 2001). The newspaper became the most important mass media source for information about sports, including college football.

Universities used mass media to help spread knowledge about football teams and the university as a whole. The development of the on-campus permanent stadium allowed for universities to promote the university as a whole. Football teams were used as a vehicle to go around the region and even country in some instances to try to recruit students to the university itself ("Five Football Games," 1915; Oriard, 1995; Watterson, 2002). In the Midwest, stadiums were developed to be significantly larger than the surrounding community with the whole purpose of bringing alumni and future students to university for football games. The stadium along with the football team served at least partially as a recruitment tool (Ingrassia, 2012; Toma, 2003).

Interestingly, journals specifically related to sport were published for the first time. These mass media journals were developed for persons specifically interested in sport, operations, and facility development. From a facilities perspective, *The Athletic Journal* was of particular relevance. The journal was first published in 1921, and each issue throughout the 1920s shared information about stadiums being developed around the country. For example, the September 1926 journal shared information about the construction of the University of Minnesota's Memorial Stadium (Steward, 1926). The two-page article shared specifics related to the size of the venue and the costs of construction. Other examples include information about Nippert

Stadium and night football along with the Los Angeles Coliseum (Chambers, 1926; Farmer, 1926).

Other journals also shared information about the construction of college football venues. Two that shared a significant amount of information were the *American Architect* and *Engineering News-Record.* The *Engineering News-Record* shared information related to the actual construction of stadia, focused specifically on the related engineering needs to construct the venue. One such example was found related to the construction of Palmer Stadium at Princeton ("The Palmer Memorial," 1914). The article related construction information on venue from costs to structural designs and even the length of wire used to tie together rods of steel to reinforce the concrete ("The Palmer Memorial," 1914). While targeted at engineers and contractors, the *Engineering News-Record* provides even a novice reader with an intricate understanding of the construction process regarding stadia.

The *American Architect* also devoted space to the construction of college football venues, including Harvard, Yale, Princeton, Brown, Northwestern, and several other venues. One particularly interesting series written in 1920 by Howard Dwight Smith discussed a tour he took of Harvard Stadium, Palmer Stadium, the Yale Bowl, and the College of the City of New York's stadium (Smith, 1920a, 1920b, 1920c). The five-part series discussed the specific stadiums and the challenges found with each build from an architectural perspective as Smith was a noted architect of the time (Smith, 1920a, 1920b, 1920c). Smith also shared general thoughts on the construction of college stadiums, and the possible next steps to improve construction moving forward (Smith, 1920d). The *American Architect* also published articles on the construction of specific venues such as Dyche Field at Northwestern University (Rogers & Hadden, 1928).

The authors of those articles were usually the architect and/or engineer who designed the structure, which allowed for the reader to truly understand the challenges and requirements of constructing such a venue. The readership of journals such as the *Engineering News-Record* and the *American Architect* was architects and engineers, increasing the value of these publications in helping the diffusion of modern stadium construction around the U.S. Through articles in trade specific journals, engineers and architects learned what others were doing around the country related to the construction of stadiums. Because of journals such as *Engineering News-Record* and the *American Architect,* interested architects and other construction personnel could learn the proper construction techniques without visiting the specific stadium they wished to copy. Another important note is that Osborn Engineering designed and constructed several professional and college structures during Stage Two (Seifried, 2005). One construction company designing and constructing multiple venues meant that those structures likely shared many similarities. Combined with the knowledge shared and found in journals of the era, the usage of the same engineering firm helped to explain the diffusion of similar structures around the country. Further, many engineering and architecture faculty were involved in the designs of individual facilities. Faculty traveled to conferences and meeting with other faculty, increasing the likelihood of diffusion of knowledge related to stadium construction and design.

Interpersonal communication remained incredibly important during Stage Two. As previously discussed, IAAUS/NCAA conventions served as places where university leaders were able to meet and discuss important events ongoing at universities around the country (Carter, 2006; “Proceedings of the,” 1907, 1908; “Proceedings of the,” 1921, 1928). In innovation diffusion research, conventions and other large meetings are considered extremely important to the diffusion process (Dearing, 2009; Magill & Rogers, 1981). When organization leaders meet,

these change agents are able to expose other leaders to new innovations that will improve the success of each organization (Dearing, 2009; Magill & Rogers, 1981). The National Convention became such a place. Leaders of universities around the country (over 150 by the end of Stage Two) met at least once a year to discuss problems and concerns along with innovations developed at each leader's individual university. Those conventions became places for knowledge sharing, increasing the ease of the diffusion of innovations. As transportation improved and more schools were connected to major cities by railway lines, attendance at national conferences increased significantly (Carter, 2006; Lucas & Smith, 1978). The interconnectedness caused by the development of improved transportation technology helped to eliminate some of the negative impacts of geography.

Another important area for the diffusion of innovations was the development of regional conferences, which started in Stage One but continued to strengthen in Stage Two. Conferences were made up of schools in close geographic proximity to each other (Lewis, 1965). The most well-known was the Western Conference or Intercollegiate Conference of Faculty Representatives (i.e., Big Ten) (Carter, 2006). Schools included in the conference were Purdue, the University of Chicago, Illinois, Michigan, Minnesota, Northwestern, Wisconsin, Indiana, and Iowa ("Big Ten History," 2016). Those schools met to develop regulations to govern eligibility and rules for competition ("Big Ten History," 2016; Carter, 2006). These meetings also served as informal interpersonal communication opportunities where leaders from member schools could share information about innovations that were successful and those that had failed. As those schools consistently played against one another, they regularly visited each other's campuses and saw the development of facilities by member schools.

The last piece of interpersonal communication that needs to be mentioned is the interpersonal communication occurring as universities traveled to play intersectional competition in football. As transportation technology improved, more intersectional games occurred during the latter part of Stage Two (Schmidt, 2007). As football teams traveled to other parts of the country, so did alumni and school leaders (Schmidt, 2007). Influential alumni and school leaders would most likely converse with leadership and alumni at the institution they were visiting and would learn about innovations occurring at the host school. This two-way interpersonal communication helped to spread innovations within stadium technology quickly across the country. Architects and engineers often visited new venues to learn about the construction techniques and engineering requirements needed to construct the new venue (Moran, 2013; Smith, 2008). While not explicitly built for a specific institution of higher education, the Rose Bowl (Pasadena, CA) surfaced after architect Myron Hunt visited the Yale Bowl for the explicit purpose of learning how the venue was constructed (Moran, 2013).

Time and Geography

The diffusion of innovations during the second stage occurred slowly at first and was impacted significantly by geography. Following the construction of Harvard Stadium in 1903, four years passed before another reinforced concrete and steel structure was built for college football ("Archbold Aids Syracuse," 1905; Ingrassia, 2012; Watterson, 2002). Another seven years passed before the construction of the Yale Bowl and Palmer Stadium in 1914. Three more major stadiums were built in 1915 (See Table 5.1). Following the end of WWI in 1918, the reinforced concrete and steel stadium boom occurred in college football. According to Table 5.1, 42 stadiums were built between 1919 and 1929 at universities all across the U.S.

Following the construction of the Yale Bowl in 1914, mass media heavily covered the construction of stadiums around the country ("70,055 Seats In," 1914; "Fifteen Thousand Football," 1915; "New Design For," 1923; Smith, 1920a, 1920b, 1920c, 1920d, etc.). Information about the design, related costs, and the engineering requirements quickly reached influential people in multiple cities around the U.S. No longer was the reinforced concrete and steel stadium limited by geography. Due to coverage in specific technical journals like *Engineering News-Record* and the *American Architect* amongst others, architects and engineers learned what was necessary to construct reinforced steel and concrete sport venues in their city.

As part of the diffusion process, four time-based geographic clusters emerged. The first emerged slowly in the Northeast with Harvard Stadium (1903), Archbold Stadium (1907), the Yale Bowl (1914), Palmer Stadium (1914) and Schoellkopf Field (1915) built before WWI. Other schools in the Northeast also built reinforced concrete and steel stadiums following WWI, including Penn (1922), Columbia (1923), Dartmouth (1923), Army (1924) and Brown (1925). These stadiums, with the exception of the Yale Bowl, were structures that sat 42,000 or less people when originally constructed, and lacked any spectator amenities. Press facilities in these structures involved a set aside area, usually uncovered as previously discussed. Only Harvard and Brown had restrooms, and none of the Northeastern schools had concession stands. The Northeast cluster was groundbreaking in the concept of using concrete and steel to create a permanent structure, but that is where their modernization largely ended.

The second geographic cluster developed in the Midwest following WWI, with the building of Memorial Stadiums at Kansas (1921), Illinois (1922), Kansas State (1922), Nebraska (1923), Minnesota (1924) and Indiana (1925). Non-Memorial Stadiums were also built in the Midwest during the 1920s with Ohio Stadium (1922), Nippert Stadium (1924), Ross-Ade

Stadium (1924), Pitt Stadium (1925), Dyche Stadium (1926), Michigan Stadium (1927), Iowa Stadium (1929), and Ohio (University) Stadium (1929). The lone steel and concrete structure developed during WWI in the Midwest occurred at the University of Wisconsin in 1917. Stadiums in the Midwest cluster were usually larger than those in the Northeast, with an average capacity of 39,575, with seven of the venues in this cluster having a capacity of over 45,000. The largest structure of the era was from the Midwest, the 87,000 Michigan Stadium. Midwestern stadiums were more likely to include restrooms and concession stands in their permanent structures as previously discussed. Almost all of these facilities included covered space for the press and scoreboards, making them more complex than the Northeast cluster. Lastly, Midwestern Stadiums were unique in that they were often constructed in cities that had less than 15,000 people, meaning that the stadiums were built with the concept of drawing people in to attend games from great distances. The large Midwestern stadium highlights just how improved the transportation and communication channels were during Stage Two.

A West Coast geographic cluster also forms following WWI with Oregon (1919), Washington (1920), Stanford (1921), California (1923), Fresno State (1926), and Arizona (1929) all building reinforced concrete and steel stadiums during Stage Two. The West Coast cluster lacked any clear geographic conformity, with the facilities at Stanford and California being quite large, and rather complex, and the rest of the structures found on the West Coast being much simpler and smaller. Stanford and Cal were notably in communication with eastern and Midwestern schools (especially following the development of the Rose Bowl game in 1916), as Midwestern and Northeastern schools traveled out to play Stanford, California and other West Coast schools (Moran, 2013). Interpersonal communication between these teams would help explain the diffusion of more complex reinforced concrete and steel stadiums at Stanford and

California. Another reason for the larger structures at Stanford and California was the yearly game between the two schools that drew significant crowds, unlike any other game on the West Coast (Brodie, 1949; Lewis, 1965).

Lastly, a loose geographic cluster forms in the South of smaller venues, stretching from West Virginia (1924) to Texas (1924). Each of these clusters experienced a large building boom, with most of the stadiums being constructed after 1920. The Southern structures were usually very simple in construction, lacking in any amenities beyond seating. One notable exception was in Baton Rouge, where LSU developed spaces for restrooms and concession stands in the 1924 development of Tiger Stadium (Seifried, 2012, in press). Beyond LSU, most of the other structures were very small, seating less than 15,000. Even Tiger Stadium followed the other Southern schools in only developing seating along the sidelines. Many of the southern facilities were still multipurpose in nature, with football sharing the space with track and often baseball.

A similar set of clustered renovations occurred in various parts of the country in the late 1920s. Schools in the South moved to expand the small original structures with larger more elaborate venues as the popularity of the game in the South continued to grow. Another cluster occurred amongst Big Ten schools as the popularity of the game encourage expansion along with the addition of press facilities to allow for press coverage of games. The coverage by the press then informed the country of the success of those schools, increasing the value of devoting specific space for the press. Other renovations occurred on the West Coast involving seating expansions along with features such as the addition of public address equipment. Almost all of the renovations were rehabilitation efforts aimed at improving the original structure to meet the needs of the ever-expanding population of spectators who wished to attend games. Renovations

often included the addition of restroom and concession space, a novel concept for college football facilities.

As was discussed previously, the growth of intersectional play during the period also helped to decrease the limiting factor of geography as schools began to play other universities from greater distances away. The growth of intersectional play was possible due to the continued improvement of transportation including the significant expansion of railroads and the development of the car (Lucas & Smith, 1978; Schmidt, 2007). When intersectional games occurred, both institutions benefited from the knowledge transfer occurring at those contests. By the end of Stage Two, only the Rocky Mountain region of the country lacked significant reinforced concrete and steel stadiums with structures only at Colorado, Brigham Young, and Utah by the end of 1929. It is likely that the physical challenges of constructing transportation such as railroads into the Rocky Mountains and the small population made the development of stadia in the region unrealistic.

Again, as competitors developed a new concrete and steel venue, schools within close proximity felt the pressure to also conduct a similar construction project (Boyd, 1924; Smith, 2008; Watterson, 2002). In addition to geography, the diffusion of stadium innovations occurred quicker in Stage Two than in Stage One due to the strengthening of the social system, and improving transportation and communication channels. By the end of Stage Two, new construction and renovation was happening at a rapid pace; however, the Great Depression started with the stock market crash of 1929 to end Stage Two (i.e., 1903-1929). The Great Depression would bring new challenges and prompt new technologies to impact the development of college football.

Chapter Six: Radio and Public Works Projects 1930-1945

College enrollment was at an all-time high at the start of 1930 with over twelve percent of the nation's population of 18 to 21 year olds enrolled in college compared to four percent at the turn of the century (Schmidt, 2007). American interest in college football continued to grow throughout the 1920s, drawing record crowds to new stadiums built (n = 58) exclusively for the sport (Schmidt, 2007; Smith, 2008). Expectedly, expansion of stadiums began in the late 1920s to match the demand, while several new stadiums were in the early stages of planning and development.

Combining increased enrollment with a population that was significantly more mobile also helped improve ticket demand for college football contests (Schmidt, 2007). Helping to fuel the popularity of college football was the ease in transportation to and from games (Schmidt, 2007). The automobile, prior to World War I, was an object exclusively for the elite (Allen, 1952). Following the war, Henry Ford's Model T was affordable to the middle class consumer and allowed for personal transport from place to place (Fischer, 1992). Many cars, built after the war were covered, making travel in cold temperatures significantly easier (Schmidt, 2007). Investment was also made into the development of the highway system, allowing easier travel from city to city (Allen, 1952). For example, the State of Missouri invested over $60 million in highway building efforts during the 1920s (Allen, 1952). The federal government also helped to fund highway building starting in 1921, further increasing the amount of available and stable roadways and the diversity of the spectator group (Schmidt, 2007).

While the sport experienced significant growth during the 1920s, college football was not without its criticisms. The same stadium construction that was bringing significant and new revenues to universities drew the attention of critics who argued schools generating profit off the

college game could hardly call themselves amateurs (Lucas & Smith, 1978). Upton Sinclair, author of the best-selling book *The Jungle* and noted critic of the leaders of industry, joined several other critics in arguing that college sports were controlled by the leaders of major industry and prevented other students from learning (Hart, 1922; Sinclair, 1926). Following the continued concerns of such Progressive era scholars, the American Association of University Professors and the Carnegie Foundation for the Advancement of Teaching began to examine problems within college football (Lucas & Smith, 1978). Many of the basic tenets of the Carnegie Report had been discussed during prior controversies. As an example, in Stage Two, the NCAA is founded partially as an attempt to control some of the excesses of college football.

The 1929 Carnegie Report emerged as one product of this inquiry and found significant abuses within the college game (Cowley, 1930). The report encouraged college and university presidents to remove the commercialism defining the college game and return it to its more amateur roots (Lucas & Smith, 1978). According to the Carnegie Report, the game represented the evils of professional sport and prevented the athlete from being a proper student (Cowley, 1930). Furthermore, coaches were deemed to have influence over athletes and practiced immoral recruiting that was harmful to the college game (Savage, 1929). Alumni were also viewed to have too much influence while the publicity around the sport was believed to be increasingly harmful for the athletes (Savage, 1929). The report further argued many of the athletes who attended college to play sport were not truly qualified for college life (Cowley, 1930). Big Ten Commissioner John Griffith was a strong proponent of the Carnegie Report (O'Toole, 2013). For example, Iowa was suspended before the release of the Carnegie Report by the conference for recruiting and continued paying of athletes in violation with the Big Ten agreements (O'Toole, 2013). Overall, the report was a scathing assessment of college football and caused significant

media coverage around the country (“American College Athletics,” 1929; “Overdone College Athletics,” 1930; “Start Drive to,” 1930). However, the actual impact of the Carnegie Report was limited in comparison to the controversy it caused (Watterson, 2002). College athletics largely continued to operate in the same way as before the report with more care in hiding some of the dirty and immoral behavior reported (Lucas & Smith, 1978; Schmidt, 2007). Thus, while some might view the Carnegie Report as impactful on campus stadium construction decisions, another event occurring at the same day as the release of the report would have a far larger impact on America and on college football facilities.

The release date of the Carnegie Report was October 29, 1929, the same day of the stock market crash that led to the Great Depression (Lucas & Smith, 1978). From a sport perspective, the stock market crash and Great Depression limited the amount of income available to be spent on non-necessity or discretionary goods, of which sport is classified (Lucas & Smith, 1978). College football was further impacted due to the imbalance of wealthy and poor spectators attending games (Schmidt, 2007). The national average income was cut in half from 1929 to 1932 making it difficult to purchase tickets, travel to events, and help pay down stadium construction debt (Lucas & Smith, 1978; Tunis, 1932; Watterson, 2002). Attendance at college football dropped over 30% in 1933 (Tunis, 1932; Watterson, 2002).

Following the election of Franklin Roosevelt to President in 1932, the federal government contributed significant funding to help Americans get back to work (Lucas & Smith, 1978; Taylor, 2008). The Federal Government invested billions into sports and recreation through a variety of Federal Government Programs (Cozens & Stumpf, 1953; Taylor, 2008). Of particular interest to the current research are the Works Progress Administration (WPA) and the Public Works Administration (PWA), both of which were involved in the construction and

expansion of college football facilities as a way to place unemployed workers into jobs (Lucas & Smith, 1978; Seifried, in press; Taylor, 2008). In the case of the PWA, approximately $40 million was spent on the improvement of athletic facilities (Lucas & Smith, 1978). Between 1935 and the start of World War II in 1941, roughly $1 billion was spent building sport and recreation facilities by the WPA (Cozens & Stumpf, 1953). Through expansion and new construction projects, university stadiums continued to grow and develop into larger and more complex structures (Lucas & Smith, 1978; Seifried, in press; "The Great Depression," 2001).

In order to support the continued growth of the stadium, universities needed to find new revenue sources beyond only federal and state public works projects. The radio, originally developed before 1900, began to provide significant value to society. As college football attempted to deal with the Great Depression and the financial problems related to the economic decline, colleges explored radio as a potential revenue source (Oriard, 2001; O'Toole, 2013; Watterson, 2002). The following section provides a basic understanding of the development of the radio. The section further examines the role of radio as a revenue source for college football, along with examining the development of spaces for radio inside the stadium.

Radio

Guglielmo Marconi is considered by many as the father of radio as he developed a vertical antenna to transmit radio waves (Ruben, 2010). The technology was originally developed to allow for the wireless transmission of telegraph messages and initially advanced to help with communications between ships at sea (Barboutis, 2013; Rueben, 2010). By 1901, Marconi was able to transmit messages across the Atlantic Ocean wirelessly and was even paid $5,000 to send results of the America's Cup races from sea to the offices of the *New York Herald,* allowing the newspaper to print the results before the ships returned from the

competition each day (Smith, 2001). By the turn of the century, wireless communication between people was common as the development of the wireless telegraph spread throughout most of the western hemisphere (Barboutis, 2013). However, the commercial usage of radio to broadcast to multitudes of people occurred much slower.

Initially, amateurs began to broadcast radio transmissions for bible readings and to play music during the first decade of the 20th century (Ruben, 2010). As Marconi worked on improving his technology, others continued to experiment with the technology (Smith, 2001). The experiments themselves offered only limited results, but the curiosity of universities in the technology would assist with the diffusion of the technology (Smith, 2001). In particular, the movement toward one sender to multiple receivers started in 1906 with the development of the triode vacuum tube (Barboutis, 2013). The triode allowed radio waves to be broadcast at higher frequencies, increasing the distance the waves could cover (Berg, 1999). The triode also amplified the voice, which allowed for signal receivers to better understand the message being sent (Berg, 1999). One of the first events that radio helped to provide information about was the 1912 sinking of the Titanic, whose radio signals reached New York (Archer, 1938). The transmissions allowed New York newspapers to announce deaths and other related information directly from radio signals from ships helping to rescue people from the disaster (Archer, 1938). By 1912, a radio station (SJN developed by C. Herrold) was broadcasting daily programming (Barboutis, 2013). By the time of WWI, significant radio towers were developed across Europe and the U.S. for commercial use (Berg, 1999).

Following WWI, radios emerged in homes when the superheterodyne receiver was created (Barboutis, 2013). The Westinghouse Company, based in Pittsburgh, Pennsylvania, was first to commercially broadcast with the development of KDKA in 1920 (Barnouw, 1966; Berg,

1999). KDKA provided Westinghouse with unprecedented success, and as a result the company built several other stations near major cities (Smith, 2001). Other companies quickly followed suit with General Electric and the Radio Corporation of America (RCA) both establishing stations near major cities during the early 1920s (Barnouw, 1966).

Starting in 1922, the U.S. government began to license radio broadcasting stations to operate in the country (Ruben, 2010). In March 1922, there were 98 licensed stations. Between 1922 and 1923, the number of radio receivers owned in the U.S. jumped from 60,000 to 1.5 million (Ruben, 2010). By 1924, over 1,400 stations were broadcasting in the U.S. (Ruben, 2010). Early radio station license owners included radio manufacturers, newspapers, department stores, colleges, and even the YMCA (Berg, 1999). By 1927, both Columbia Broadcasting System (CBS) and the National Broadcasting Company (NBC) were broadcasting radio signals to listeners (Ruben, 2010). WWJ in Detroit was the first radio station developed by a newspaper (*The Detroit News*) and readers confirmed the enjoyment of the radio broadcasts from the station in letters (Berg, 1999). Of particular interest to the current research was the broadcasting of sport results and related news (Barboutis, 2013; Berg, 1999). Sports were brought from the stadium to the house through the technology of the radio (Barboutis, 2013).

Radio as a commercial device developed during the 1920s as a way for news and entertainment to reach consumers around the Northeast and slowly the rest of the country (Berg, 1999; Oriard, 2001; Ruben, 2010). Radio allowed listeners to feel like they were directly in communication with the broadcaster, creating a one-way interpersonal communication system (Barboutis, 2013; Berg, 1999; Oriard, 2001). Until the development of radio, all voice communication occurred either in person or through a phonograph record played on a machine, with one other important exception, significant to the development of radio. By 1900, long-

distance telephone wires had spread across the United States and reached every major city and most smaller cities (Barnouw, 1966). The telephone wire was capable of transmitting radio broadcasts across the country from one radio station or site to another (Barnouw, 1966; Berg, 1999; Oriard, 2001). The radio was a significant change for the listener and grew in popularity (Berg, 1999; Oriard, 2001). Radio also allowed for companies to use the technology to directly reach into the consumer's home with individual businesses often purchasing broadcasting time to sell products to consumers or to sponsor a program of music or other content (Smith, 2001).

Early radio presented some difficult challenges to the consumer as well. Early broadcasts were only sent out over two wavelengths, meaning certain factors such as the time of day, location of the radio, and what stations were broadcasting could entice radio listeners to switch between stations without any control (Lescarboura & Goldsmith, 1930). One solution to this problem was the decision by the U.S. government to allow for larger stations (broadcasting at 500-1000 watts power) to broadcast on a separate wavelength from the smaller stations (Berg, 1999). Soon though, in larger cities, this range became crowded as well (Lescarboura & Goldsmith, 1930). In May 1923, the U.S. government worked with the U.S. Navy to release a wider band of wavelengths, eventually establishing a 530-1500 band of wavelengths for stations to broadcast (Berg, 1999). This expansion relieved a significant amount of the challenges for individual stations as they now had somewhat unique frequencies on which to broadcast (Berg, 1999). The Federal Radio Act of 1927 was passed to establish the Federal Radio Commission (FRC) (now the Federal Communication Commission) to control all aspects of radio communication (Berg, 1999). At the time of its passage, over 700 commercial stations were broadcasting with an additional 200 in the process of developing broadcast abilities (Berg, 1999).

The Midwest was home to a significant amount of early radio broadcasting (Berg, 1999). Some of the earliest broadcasters were colleges broadcasting farm reports, weather, and sport scores (Frost, 1937). The first college football broadcast on radio occurred in 1912 as an experiment at the University of Minnesota when two professors broadcasted several games ("KUOM Celebrates," 2012; Smith, 2001). Because of the small amount of consumers owning a radio and its limited broadcast range (often only a few miles), only a few dozen fans listened to the contest (Smith, 2001). As the amount of radios available to the public grew in the 1920s beyond just those in the Northeast, so did the need for programming to broadcast. Sports programming was quickly adopted as sports provided an inexpensive form of broadcasting, allowing stations to fill hours of programming through the coverage of a sporting event (O'Toole, 2013). Radio allowed spectators outside the stadium to enjoy the game as it happened (Hawkins, 1924). As university leaders learned radio had significant interest from the public, they examined ways to generate revenue from the medium (O'Toole, 2013).

The first schools to negotiate for over the air broadcasts of college games on commercial channels were in the Northeast (i.e., Harvard, Yale, Penn, etc.) due to the large amount of interest generated by these teams (O'Toole, 2013). The broadcasts of games usually involved no commercials due to the intense dislike of commercials by listeners and the government alike during the early era of radio broadcasting (O'Toole, 2013). These Northeastern schools received no financial revenue from the game broadcast. The "Game of the Century," a contest between the University of Chicago and Princeton, was one of the first games to be broadcasted in multiple cities (Oriard, 2001; Smith, 2001). The game generated such interest in Chicago that the University of Chicago received over 100,000 ticket requests, more than enough to fill Stagg Field over three times (Smith, 2001). The broadcast moved over telephone wires from Chicago

to New York and was transmitted by AT&T's station in New York, WEAF. WEAF even established a broadcast spot on Park Row where loudspeakers announced the game to the thousands that gathered (Oriard, 2001; Smith 2001). The 1927 Rose Bowl Game was broadcast across several NBC stations and the 1928 contest notably produced an estimated listening audience of 25 million (Poindexter, 1978; Schmidt, 2007). The game moved from the stadium in Pasadena to radio stations around the country via telephone (Barnouw, 1966; Poindexter, 1978). Games like the Chicago-Princeton Game and the Rose Bowls highlighted the tremendous popularity of college football and interest in interregional games (Oriard, 2001).

Broadcasts of games by radio stations like WEAF included commercials (O'Toole, 2013; Smulyan, 1994). For example, companies like Goodrich Tires and Eveready batteries were willing to pay for opportunities to promote their products through radio programs (Smith, 2001). However, many universities allowed games to be played on radio without receiving any form of financial payment. According to Smith (2001), Lee (1952), and Tyler (1933), the universities argued the publicity from having the game on radio provided enough value to allow the broadcast because it developed publicity and generated goodwill for the university as a whole. In essence, the university radio station became a point of pride for the university community, and broadcasting of college sporting events were a highlight of the early university station existence (O'Toole, 2013; Tyler, 1933).

By 1925, 129 universities held licenses to broadcast (O'Toole, 2013). Many land grant universities around the country also broadcasted games over their own student-run radio stations to assist educational training opportunities (O'Toole, 2013). In the case of the Big Ten, schools either aired their football games on their own station or allowed a local commercial station to broadcast as long as the game was commercial free (Griffith, 1929). Further, these college

stations and others were developed and built by the university science and engineering students and faculty (Seely, 1923; Tyler, 1933).

By 1929, one-third of American homes owned a radio, up from one in 400 nine years earlier (McChesney, 1989). Oriard (2001) further stated over twelve million homes possessed a radio by 1930. The growth would continue by over two million sets a year until 1934 (Smith, 2001). The combination of the popularity of college football, the need to fill time with valuable programming, and the desire of universities to expose consumers to their product proved to be very successful (Smith, 2001). Prior to the Great Depression, almost all games were broadcast without commercials, with neither the station nor the school earning revenue from the broadcast (Smith, 2001). This changed when the average broadcast hour generated over $500 for a station in 1930 (Smith, 2001). Due to the need to generate revenue during the Great Depression, commercial broadcasting with the interspersed advertisements in the middle of games became the norm by the early 1930s (O'Toole, 2013). Commercial stations such as KDKA in Pittsburgh and WJZ in New York broadcasted college games by the end of the decade (Smith, 2001). College football was able to generate significant interest both from the listener and from companies willing to pay money to sponsor games on the radio (Oriard, 2001; Watterson, 2002).

Both broadcasting companies and universities were ready and able to take advantage of this new product. Universities quickly examined ways to make money from radio broadcasts (O'Toole, 2013). Rights to broadcast games were sold to increase revenues for institutions in desperate need of the development of new revenue sources in the middle of the decline in attendance in the early 1930s (Smith, 2001). One of the first conferences to encourage its membership to sell broadcasting rights was the Big Ten (O'Toole, 2013). Big Ten Commissioner

John Griffith believed developing relationships with corporate America would be financially beneficial for member institutions (O'Toole, 2013).

Midwestern radio stations faced difficult challenges in comparison to Eastern stations due to the relationship between the FRC and the Eastern stations (Smith, 2001). Many of the FRC board members were tied to the Eastern radio companies such as RCA, CBS, and NBC (O'Toole, 2013). These commercial stations believed radio should be dominated by those stations that sought to profit from radio and not by the college stations found on campus of many institutions (McChesney, 1993). This rationale went against the concept of college radio, whose goal was to provide information to the community and experiences for students (O'Toole, 2013).

Many university leaders across the country were concerned in the beginning that radio broadcast would hurt game attendance (Oriard, 2001; Smith, 2001). Griffith, like many others, suggested a more pragmatic approach, allowing broadcasting of games and analyzing the results (O'Toole, 2013). Due to hard economic times, most educational institutions gave up their broadcast licenses by the early 1930s (McChesney, 1993). Because of the Great Depression, universities were financially hurt by poor attendance at games and declining revenues from state governments (O'Toole, 2013; Smith, 2001). Universities began to sell rights to broadcast games to local commercial stations in return for much needed revenue (O'Toole, 2013). One such example was found at the University of Minnesota, ("KUOM Celebrates," 2012). Minnesota sold the rights to broadcast the 1931 and 1932 football seasons to a local commercial radio station for $500 a season (O'Toole, 2013). Pressure mounted on Big Ten schools to allow for commercials in broadcasts, something they had not previously allowed (O'Toole, 2013).

Following another rough season with declining ticket sales, many institutions began to wonder if radio was part of the reason for the declining sales (Smith, 2001). The Big Ten

followed many Eastern schools in examining ways to increase gate receipts for the 1932 season ("Big Ten Favors," 1932). Several eastern and southern schools voted in the winter of 1932 to ban radio broadcasting due to fears of radio being the sole reason for lost ticket sales (Smith, 2001). Small schools were particularly concerned as broadcast of games between larger schools nearby were feared to limit attendance at small school games ("Proceedings of the," 1932). The NCAA met in 1932 with the express purpose of examining the challenges of attendance (Smith, 2001). Many athletic directors argued broadcasts were almost as good as being at the stadium, especially when the weather was poor ("Proceedings of the," 1932). Others argued the radio broadcasts, no matter the risks of lost attendance, were beneficial to the university as a whole as a publicity tool (Smith, 2001). Most realized banning radio would be harmful as fans expected radio broadcasts of games ("Proceedings of the," 1932). Furthermore, significant concern was expressed about making alumni unhappy, a group that was needed to help fund all parts of the university, not just athletics ("Proceedings of the," 1932).

Griffith chaired the committee on NCAA radio broadcasting and pushed it toward a solution that involved commercial radio broadcasts as a revenue producer (O'Toole, 2013). Only the Southern Conference voted to ban radio broadcasts for the 1932 season (O'Toole, 2013). The Pacific Coast Conference (PCC) went in the complete opposite direction, agreeing to create the first conference-wide radio deal and pushing other schools around the country to create similar broadcasting arrangements (Smith, 2001). The PCC negotiated a deal with Associated Oil Company that in return for $65,000 of pre- and during game advertisements, the conference would allow for broadcasting of football games (O'Toole, 2013). One novel feature at the time was the game announcer would encourage listeners to "get Associated with football" (Deal, 1932, p.10). Games were broadcast in regions close to the participating schools, with only one

game broadcast throughout the Pacific Coast region: the Stanford-California game, played on a weekend when no other games scheduled (Smith, 2001). The relationship also included broadcasts every Thursday focused on a member institution and included music along with an interview with the school's coach (Smith, 2001). Griffith reached out to NBC to examine whether a similar agreement was possible for the Big Ten (O'Toole, 2013). Iowa, a Big Ten school, sold its rights to Maytag to be broadcast on a local station for a generous fee (Smith, 2001). Radio as a mass media communications tool had significant value for schools as they could promote their university and its accomplishments to a local or national audience.

In 1934, Chevrolet agreed to pay for the rights to broadcast seven different games each week with each game being a game of importance to at least one region of the country ("Chevrolet Sponsors 56," 1934). The 56 games included schools from the Southwest Conference, Eastern schools, and four schools from the Big Ten (e.g., Michigan, Minnesota, Chicago, and Northwestern) (O'Toole, 2013). Chevrolet also paid $20,000 for the broadcast sponsorship rights for the University of Michigan football games on WWJ Radio in Detroit (McChesney, 1989). At the same time, members of the PCC were generating over $100,000 from broadcasts of most of the PCC's football games each fall ("Refining influence," 1936; Smith, 2001). Griffith went to the presidents of the Big Ten in 1935 with the idea of trying to develop a radio agreement for the entire conference (O'Toole, 1935). The University of Minnesota's president spoke out against the commercialization of college athletes even while admitting his university sold rights and sponsorships for broadcasting (O'Toole, 2013). While the conference ultimately decided not to support a conference-wide agreement, other schools in the Big Ten followed those around the country and found willing broadcasters to pay for the rights to broadcast games (Smith, 2001). The Ohio State University received $10,000 for broadcasts in

1935, while Yale and Penn earned $20,000 and $10,000 respectively in 1936 with monies provided to all three schools by commercial sponsors (Smith, 2001). Unlike other sport broadcasts during the era, college football broadcasts spent additional time describing the bands, crowds, and other spirit related pieces related to the sport (Oriard, 2001).

The commercialization of college sport was fully moving forward when universities agreed to allow for sponsors to buy rights to radio broadcasts (O'Toole, 2013). By the mid to late 1930s, over 13 million consumers listened to college football on the radio because schools were in desperate need of income ("Colleges Upheld on," 1936; Smith, 2001). Additional support from the NCAA in late 1936, fully sanctioned the commercialization of college football as it was one of the most popular programs used to draw listeners to stations around the country. ("Colleges Upheld on," 1936). Continued interest at the start of WWII (over 56 million radios were in use) allowed almost every team to earn money from radio broadcasts in an effort to also prove that their institution belonged with other great schools around the country (Smith, 2001).

In order to support radio broadcasts, universities around the country reserved space and added the necessary structures into their stadiums (Smith, 2001). The university worked with the radio broadcasters to install the equipment for radio broadcasts (Seifried, 2005). Harvard and Yale were among the first to invest in wiring the stadium to support radio broadcasts ("Radio to Broadcast," 1923). Telephone lines were installed in the stadium, which allowed broadcaster to call the game across the telephone to the station via the long distance telephone exchanges of the era ("Engineer Explains How," 1926). Telephone microphones were also wired around the stadium, and the audio engineer in the booth with the announcers controls the amount of each sound sent from the stadium to the various radio stations broadcasting the game ("Engineer Explains How," 1926). As radio broadcast became revenue generators, other universities worked

with their broadcast partners to develop the best broadcast possible (Oriard, 2001; Seifried, 2005). The press box developed a reserved space specifically for radio, with enough room for the announcers and their equipment (Oriard, 2001). The development of unique spaces for radio was an important part of the renovations of Stage Three. Stadiums needed not only press boxes, but also the ability to support microphones in a variety of places, increasing the complexity of the stadium wiring, and in turn further increasing the size and complexity of the venue.

The First Projects of the Stage

At the beginning of Stage Three, facility construction occurred through funding from alumni and other traditional forms. Many early renovations involved small changes from a structural perspective. As an example, several universities constructed press facilities along with electronic scoreboards during this era (Hicks, 1938; Seifried, 2012, in press). Some schools also added lights to their stadiums, allowing games to be played in the evening and making attendance by those working Saturday during the day possible (Seifried, in press). These additions were a significant step forward in stadium innovations. Stage Two facilities often had little if any space for the press. Scoreboards were usually manually controlled and provided limited information. Both would improve significantly during Stage Three. While the additions of scoreboards and lights were common during the era, limited information remains on specific details related to their construction. The following is an attempt to combine what information is known about scoreboards and lights as they are constructed and replaced during Stage Three.

The scoreboard commonly constructed during the era was often rather simple in comparison to what is modernly thought of when discussing scoreboards. The scoreboard has always served as a crowd control device even in its early forms (Seifried & Pastore, 2009). This research found several schools maintained or added scoreboards to their permanent structures

during Stage Three. For instance, the state-of-the-art scoreboard that replaced a pre-existing structure at LSU in 1934 provides an important example of how a scoreboard of the era appeared to the spectator and was operated by the staff of the university. Information incorporated on the scoreboard included the team lineup, penalty information, position of ball on the field, ball possession, down and distance to go, and time remaining in the game (Seifried, 2012; Seifried, in press). The scoreboard was 44 feet, ten inches tall and 44 feet wide and constructed of steel and iron (Seifried, in press).

Lights to allow for night play of college football also became a common development of the Stage. A couple of schools (Cincinnati and Syracuse) added lights in Stage Two, with limited success. An analysis of the data for Stage Three indicates that eleven schools added lights to their permanent structures. One of the earliest examples of the erection of lights can be found at Tiger Stadium in Baton Rouge, Louisiana. In 1931, lights were placed on towers 50 feet high over the east and west stands at a cost of $7,500 (Spencer, 1931). The two towers that held each set of four rows of lights were attached to the top of the stands, allowing the lights to shine down from almost 100 feet above the stadium (Seifried, 2012). The lights were designed to allow for excellent sight during the night game for both the player on the field and the spectator (Spencer, 1931). The lights at Georgia, constructed in 1940, were similar to those constructed in Baton Rouge with one major difference. The ten single wooden light poles at Sanford Stadium were placed on the sidelines, not on top of the bleachers (Magill, 2009). The poles held four lights across three rows with five of the poles on each side of Sanford Stadium (Magill, 2009). Lights were also installed at Arizona State (1930), Hawaii (1930), North Carolina State (1930), Oregon State (1930), Temple (1930), Texas Tech (1936), Arizona (1938), Washington (1938), and Brigham Young (1940).

Press box facilities also became a common building addition during Stage Three, as of the 89 projects developed in Stage Three, only twelve lacked press facilities. Tiger Stadium added a new press box in 1932 to the West side stands of the stadium (Seifried, in press). Arkansas, as part of the construction of Bailey Stadium in 1938, built what was considered a state-of-the-art press facility (Hicks, 1938). The two-deck structure provided a large amount of space for radio, journalists, and photographers (Hicks, 1938). Denny Stadium at the University of Alabama also renovated its press box, originally built in 1929 ("Denny Stadium,"1937). Boxes were specifically built into separate spaces at Denny Stadium to house radio broadcasts along with the public address system ("Denny Stadium," 1937). Space was needed for the broadcaster and at least one assistant with a clear view of the field (Smith, 2001). These press facilities allowed for better radio transmissions as they controlled the amount of sound that the microphone could accidently record ("Engineer Explains How," 1926). By the end of the era, almost all facilities had separate enclosed press spaces that allowed for the separation of the press from the crowd, and better broadcasts of the game on radio.

Other additions in the construction of facilities for sport stadia included restrooms and concession stands. For example, Bailey Stadium on the campus of the University of Arkansas included areas for restrooms and concessions (Farmer, 1938, Hicks, 1938; "Under Construction," 1937). Denny Stadium's 1936 expansion also included spaces built underneath the concrete bleachers for restrooms ("Denny Stadium," 1937). Nine projects during this Stage included additions to the restroom facilities, many serving as the first ever set of restrooms at the stadium. Ten projects included either the development or the expansion of concessions facilities at the stadiums. Please see Table 6.1 for specifics on the additions of restrooms and concession stands to venues. It is important to note that many of the projects did not record the addition of restroom

or concessions, which could mean restrooms were not constructed or no records of the era noted their construction. Related to the development of highways, parking emerged as an important addition. The limited data available for Stage Three indicates (Table 6.2) that the average stadium provided approximately 5,000 spaces for parking, ranging from 87 to 10,000 spaces.

Table 6.1 Stage Three (1930-1945) Facilities With Restrooms and/or Concession Stands

School	Stadium	Restrooms	Concession Stands
Alabama	Denny Stadium	2	0
California	California Memorial Stadium	9	13
Clemson	Memorial Stadium	16	4
LSU	Tiger Stadium	22	2
Ohio State	Ohio Stadium	0	2
Purdue	Ross-Ade Stadium	2	1
San Jose State	Spartan Stadium	2	1
Texas Christian	Amon G. Carter Stadium	6	6
Virginia	Scott Stadium	0	8
Wake Forest	Groves Field	10	8
Yale	Yale Bowl	16	5

Table 6.2 Stage Three (1930-1945) Facilities With Parking

School	Stadium	Parking Spaces
Boston College	Alumni Field	3,000
California	California Memorial Stadium	10,000
Clemson	Memorial Stadium	9,500
Hawaii	Honolulu Stadium	87
Ohio State	Ohio Stadium	10,000
Purdue	Ross-Ade Stadium	250
Rice	Rice Field	10,000
Rutgers	Rutgers Stadium	5,000
Southern California/UCLA	Los Angeles Memorial Coliseum	7,000
Tulsa	Skelly Field	2,500
Virginia	Scott Stadium	5,000
Yale	Yale Bowl	6,000

Government Uses Universities to Create Jobs

As part of the New Deal in 1932, several federal government programs were developed to place people back to work. Universities around the country would receive a large amount of the money spent by these programs ("Hopkins, Crutcher," 1936; Toledo Athletics, 2007). Of importance to the current project was the passage of the National Industrial Recovery Act (NIRA) of 1933, the Federal Emergency Relief Act (FERA), and the Emergency Relief Appropriations Act (ERAA) of 1935 ("FDR Creates the," 2016; McElvaine, 1993; Shlaes, 2007). These three acts led to the creation of the PWA, the Civil Works Administration (CWA) and the WPA respectively ("FDR Creates the," 2016; McElvaine, 1993; Shlaes, 2007). Each of these agencies put unemployed workers to work on projects that were deemed to improve the country (McElvaine, 1993; Shlaes, 2007). Jobs included the construction of dams, national parks, and naval ships among other projects (McElvaine, 1993). Over four million people were employed by these projects at the height of the New Deal with over $1.5 billion invested in public works projects (Campagna, 1987).

Most of the projects run through either the PWA or WPA involved Federal funding along with state or local government funding for required materials and some financial match ("Digging Out of," 2009; McElvaine, 1993; Sansing, 1999; Seifried, in press). The Federal Government spent $50 billion during the 1930s in order to fund the New Deal (Campagna, 1987; Powell, 2009). Of the $50 billion in Federal Government spending in the 1930s, public works spending accounted for almost $20 billion (Smith, 2006). The WPA spent $13.4 billion alone to fund thousands of public works projects across the country that put over 8.5 million Americans to work (Campagna, 1987; Smith, 2006). Henry Hopkins would oversee the federal WPA program and decide what groups would receive WPA funding; meaning politics influenced WPA

dollars (Seifried, in press; Taylor, 2008). For states like Louisiana, politics would limit access to federal public works money until either new politicians were elected to state office or other issues caused change (Amenta, Dunleavy & Bernstein, 1994; Taylor, 2008). University presidents and other community leaders pled with Hopkins and Harold Ickes (the Secretary of the Department of the Interior, which oversaw all federal public works projects) to fund their particular project (Ickes, 1953). Hopkins controlled where money was spent, as previously mentioned, and Ickes through his diaries, provides a better understanding of the decisions Hopkins made on which projects to fund (Ickes, 1953; Taylor, 2008). Example university projects included renovations at LSU and the University of Mississippi (Leuchtenburg, 1995; Seifried, in press). Other projects, such as the one at the University of Arkansas, constructed brand new facilities for college programs (Hicks, 1938). Whether the project was a renovation or a new construction, universities benefitted greatly from the construction in time.

Three early examples of PWA or WPA projects occurred at North Carolina State, the Rose Bowl and at the University of Kentucky. Riddick Field, home to North Carolina State, received WPA funding for a new grandstand and field house that were constructed during summer 1935 ("Recreational Facilities," 2006). The construction costs were approximately $64,000 for the complete project, which also included a press box and an electronic scoreboard ("Riddick Stadium," 1936a, 1936b). The Rose Bowl also saw several restroom and concession facilities constructed along with four pedestrian bridges as part of a WPA project in 1936 (Department of the Interior, 1997; Moran, 2013). Another renovation project occurred at McLean Stadium on the campus of the University of Kentucky (Moyen, 2011; Stanley, 1996). The WPA helped to construct a new reinforced concrete press box at McLean Stadium along with a new running track (Moyen, 2011; Stanley, 1996). The WPA provided $20,041.35 with the

city of Lexington paying $7,151.11 for the completion of the project (Moyen, 2011; Stanley, 1996).

In the case of the University of Arkansas, the WPA became involved in the construction of a stadium starting in 1936, when it received over $300,000 to construct a set of bleachers, a field house and a dormitory on the Fayetteville campus ("Contracts for Buildings," 1936). The field was viewed as a temporary fix as the WPA had not yet decided on a larger stadium proposed by the University (Futrall, 1936). By December of 1936, an additional $17,600 came from the WPA, which was combined with $37,000 from the university in order to construct a new 8.5-acre stadium on the Fayetteville campus ("Further Funds Granted," 1936; Hicks, 1938). The final structure included 13,520-seats in a horseshoe shaped construction along with 2,000 spaces for car parking ("Further Funds Granted," 1936; Hicks, 1938). The University provided approximately 22% of the total funds to construct the new venue (named after the Governor Carl Bailey) with the other 78% of the funding coming from the WPA (Hicks, 1938).

The construction of the venue at the University of Arkansas received coverage by the regional press, providing an almost complete explanation of the facility constructed by the WPA. The facility had 16 rows of concrete seating on the east and west sidelines with another 15 rows of steel seating (Farmer, 1938, Hicks, 1938; "Under Construction," 1937). The north end was enclosed with a berm covered by grass and the south end was left open at Bailey Stadium (Farmer, 1938, Hicks, 1938; "Under Construction," 1937). The stadium also included men's and women's restrooms, concession stands, a first aid facility, and public telephones (Farmer, 1938, Hicks, 1938; "Under Construction," 1937). The field was Bermuda grass with ten inches of topsoil and a gravel drainage structure underneath (Farmer, 1938, Hicks, 1938; "Under Construction," 1937). The stadium also included a running track, with the east side having eight

lanes with a 220 yard straightaway and the west side of the track having a 150 yard straightaway for seven lanes (Farmer, 1938, Hicks, 1938; “Under Construction,” 1937). The facility also included a state of the art press box with two decks and over 60 feet in length (Hicks, 1938). An electric scoreboard was constructed at Bailey Stadium and designed by Arkansas physics professor Dr. Wesley Roberds, which was controlled by a remote control from the press box (Hicks, 1938). The game-clock was operated down at field level through the usage of another remote control (Hicks, 1938). The new facility was impressive for the era in the south.

Another new construction occurred as part of the WPA in Waco, Texas. Waco Municipal Stadium was constructed for a cost of $58,133, of which $39,000 was a federal government loan and $16,000 was a federal government grant (PWA, 1937). Both federal government funding sources were part of the WPA. The stadium opened in fall 1937 for Baylor football games and other events (“Bringing Football Back,” 2007; PWA, 1937). The stadium sat 20,000 and would be home to Baylor football until after WWII. Both the Baylor and Arkansas projects represent the scope of construction during the era. The projects were usually inexpensive and constructed of materials readily available at the site. The workers usually constructed the project through manual labor with no machinery (PWA, 2007). However, the projects were of significant importance to the workers who were able to earn income as well as the universities who gained new and larger facilities in which to play football.

The WPA also funded large scale renovations. One such school that received funding from the WPA was LSU for its north end project (Seifried, in press). Previously, the university expanded Tiger Stadium using state funds for dormitories, placing the dorms underneath the stadium and allowing for a seating expansion (Schmidt, 2007). The dorms supporting seating concept would be used for the north end expansion of Tiger Stadium as well (Agnew, 1936). The

total cost of the dormitory and seating expansion was $700,000 with the university and athletic department funding 45% and the WPA funding 55% ("Hopkins, Crutcher Featured," 1936, Seifried, in press). The expansion included 61 rows of seating in the North end of the stadium with 250 rooms on five floors of dormitories underneath the expansion (Seifried, in press). On the bottom floor of the new expansion, room was left for training rooms and locker rooms, along with storage space, lecture and study halls, and a small gymnasium (Seifried, in press; Smith, 1937). The stadium expansion also allowed for the construction of larger restrooms on the north side of the facility (Seifried, in press). The plan supervisor noted that the structure was shaped in an ellipse to allow for better views for spectators (Blitzer, 1998).

Similarly, the University of Washington Stadium received two expansions from the WPA during 1937 and 1938 ("U. W. Build," 1937; WPA, 1937). A 1937 WPA project added 14 rows of seats to the stadium, adding 8,000 seats at a cost of $27,000 ("U.W. Build," 1937). A further expansion happened in time for the 1938 season. This time the WPA funded $23,345 in improvements to University of Washington Stadium combined with $32,549 of state funds ("More Seats Planned," 1937; WPA, 1937). The second expansion included the construction of a three-story building at the entrance to University of Washington Stadium, which housed ticket offices and restrooms on the first floor, a caretaker's apartment on the second floor, and space on the third floor for a press facility which included a Public Address system (WPA, 1937). Lighting was added to the top of the structure to allow for games to be played at night (WPA, 1937). Like other projects, the University of Washington Stadium additions were constructed of materials available nearby, with bleachers and the new three-story structure constructed from wood available near the facility ("More Seats Planned, 1937; "U.W. Build," 1937; WPA, 1937). The continuation of a project over multiple years of funding was common under the WPA

(Taylor, 2008). The University of Washington Stadium additions involved over 100 people to work for almost a year combined between the two projects (“U.W. Build, 1937; WPA, 1937).

Overall, the Federal Government was involved in several projects within college football, which was of significant benefit to universities and the state workforce alike. It is also important to note that each state had separate government public works agencies that were encouraged under President Hoover in 1929 to undertake public works projects (“Hoover Asks States,” 1929; Smith & Walch, 2004). When elected in 1932, President Roosevelt used the state public works agencies to assist with WPA and PWA construction, along with funding some of their own public works projects (Seifried, 2012; Taylor, 2008).

Conclusions for Stage Three

Stage Three involved the construction of 23 new structures and the renovation of 89 existing structures. The average new construction cost was $223,996 with eleven of the new constructions involving some level of government funding in the construction costs (See Table 6.3). The eleven new construction projects involving federal public works funds cost on average of $213,167. All public works projects involved some amount of state and/or local match monies, meaning that none of the eleven new constructions were completely funded by the federal government. The same concept applied to the renovations that follow as well. The average renovation cost was $216,986, with 17 of the renovations connected to federal public works funding. The 17 projects tied to federal public works dollars cost $108,769. The renovations during Stage Three involved 85 rehabilitation projects and two reconstruction projects and two combination projects. See Table 6.4 for information about renovation projects.

Stage Three facilities continued the trend of Stage Two with new constructions made from reinforced concrete and steel. It is important to note many of the WPA renovations often

involved the continued use of wood as a construction material. The material was used because it was readily available and cheap to procure, lowering the costs required to renovate the venue (PWA, 2007; Taylor, 2008). Rock and other materials that were close to the venue were also often used during public works projects during the 1930s due to the low costs of transport to the area of construction (Taylor, 2008).

As previously discussed, Stage Three experienced a significant investment into lights, scoreboards, and the start of the development of press boxes in a modern form of the concept. Prior to Stage Three, press boxes were often open spaces reserved for the press with limited wiring for transmission of information from the stadium. Due to the incorporation of radio, press boxes were often enclosed spaces with wiring and phones dedicated especially for the press. Furthermore, some stadiums began to build separate boxes just for radio broadcasts ("Denny Stadium," 1937; Hicks, 1938). Most facilities also included at least one electric scoreboard during the period, though little is known about the look of the scoreboards themselves beyond a few surviving pictures and descriptions (Seifried, 2012; Seifried, in press). Scoreboards were found mainly in the geographic clusters of the Midwest, South and to a lesser extent on the West Coast. The biggest number of scoreboards occurred amongst Southern universities. Lights were installed in twelve stadiums during Stage Three, allowing those schools to play games at night, which was increasingly important as workers attempted to work as many hours as possible to

Table 6.3 Stage Three (1930-1945) New Constructions

School	Stadium	Nominal Cost ($)	Open Date	Capacity
Florida	Florida Field	118,300	1930	21,769
Notre Dame	Notre Dame Stadium	750,000	1930	59,075
Texas Christian	Amon G. Carter Stadium	470,000	1930	19,691
Tulsa	Skelly Field	275,000	1930	14,500
Utah State	Old Romney Stadium		1930	
Virginia	Scott Stadium	300,000	1931	22,000
San Jose State	Spartan Stadium (WPA)		1933	4,000
South Carolina	Columbia Municipal Stadium	82,000	1934	17,500
Arizona State	Goodwin Stadium (WPA)	92,000	1936	4,000
Baylor	Waco Stadium (WPA)	58,133	1936	20,000
Texas Tech	Tech Stadium (WPA)	80,000	1936	12,000
Washington State	Rogers Field (WPA)	110,000	1936	23,500
Idaho	Neale Stadium	47,770	1937	25,000
Miami	Burdine Stadium (WPA)	340,000	1937	23,300
Arkansas	University Stadium (WPA)	368,000	1938	13,250
New Mexico	Zimmerman Field (WPA)		1938	16,000
Rutgers	Rutgers Stadium (WPA)	1,234,707	1938	23,000
Texas-El Paso	Hendricks Field(1932)/ Kidd Field (1933) (WPA)	2,000	1938	15,000
Auburn	Auburn Stadium (WPA)	60,000	1939	7,290
Western Michigan	Waldo Stadium	250,000	1939	15,000
Wake Forest	Groves Field	105,000	1940	15,400
Clemson	Memorial Stadium	125,000	1941	23,000
Kent State	Memorial Stadium	60,000	1941	5,600

Table 6.4 Stage Three (1930-1945) Renovations

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Arizona State	Irish Field				X			1930	4,000
Hawaii	Honolulu Stadium				X		10,000	1930	25,000
Illinois	Memorial Stadium				X		500,000	1930	71,119
Michigan	Michigan Stadium				X		15,000	1930	87,000
North Carolina State	Riddick Field				X		25,000	1930	19,000
Oregon State	Bell Field				X			1930	18,000
Penn	Franklin Field				X			1930	81,000
Purdue	Ross-Ade Stadium				X		70,000	1930	23,074
Southern California	LA Memorial Coliseum				X		950,293	1930	101,574
Temple	Temple Stadium				X		60,000	1930	34,200
Tennessee	Shields-Watkins Field				X			1930	17,860
UCLA	Los Angeles Memorial Coliseum						950,293	1930	101,574
Yale	Yale Bowl				X			1930	
LSU	Tiger Stadium				X		373,000	1931	22,000
Washington State	Rogers Field				X		20,000	1931	18,000

(Table 6.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Boston College	Alumni Field				X		360,000	1932	12,500
California	Memorial Field				X			1932	72,609
Boston College	Alumni Field				X			1933	16,000
North Carolina State	Riddick Field (WPA)				X		40,000	1933	19,000
LSU	Tiger Stadium				X			1934	22,000
Tennessee	Shields-Watkins Field				X		60,000	1934	19,360
Arkansas	The Hill (WPA)			X	X	X	10,000	1935	5,000
Michigan State	Macklin Field				X			1935	26,000
North Carolina State	Riddick Field				X		34,000	1935	19,000
Southern California	LA Memorial Coliseum				X		1,750,000	1935	105,000
Brigham Young	Hillside/B.Y. U. Stadium				X			1936	5,000
Cincinnati	Nippert Stadium (WPA)				X		135,000	1936	24,000
LSU	Tiger Stadium (WPA)				X		700,000	1936	46,000
Mississippi State	Scott Field (WPA)				X		70,000	1936	27,000

(Table 6.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
North Carolina State	Riddick Field (WPA)				X		30,000	1936	19,000
Purdue	Ross-Ade Stadium (WPA)				X		100,000	1936	32,000
San Jose State	Spartan Stadium (WPA)				X			1936	8,500
Texas Tech	Tech Stadium				X			1936	12,000
Alabama	Denny Stadium (WPA)				X		230,000	1937	24,000
Kentucky	Stoll Field/McLean Stadium (WPA)				X		27,192	1937	10,400
Oregon	Hayward Field				X			1937	15,000
Rice	Rice Field				X		160,000	1937	30,000
San Jose State	Spartan Stadium (WPA)				X			1937	11,000
Tulane	Tulane Stadium/ Sugar Bowl				X		500,000	1937	49,000
Vanderbilt	Dudley Field				X			1937	20,000
Washington	University of Washington Stadium (WPA)				X		27,000	1937	48,000

(Table 6.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Arizona	Arizona Stadium				X		4,800	1938	10,000
Georgia Tech	Grant Field (WPA)				X		80,000	1938	30,000
Ohio State	Ohio Stadium				X			1938	66,210
Tennessee	Shields-Watkins Field				X		250,000	1938	31,390
Washington	University of Washington Stadium (WPA)				X		55,894	1938	40,000
Iowa State	Clyde Williams Field				X		10,000	1939	20,000
South Carolina	Carolina Stadium				X		80,000	1939	17,500
Tulane	Tulane Stadium/ Sugar Bowl				X		550,000	1939	69,000
Auburn	Auburn Stadium (WPA)				X		160,000	1940	11,890
Brigham Young	Hillside/B.Y. U. Stadium				X			1940	8,500
Georgia	Sanford Stadium				X			1940	30,000
Ole Miss	Hemingway Stadium (WPA)			X			150,000	1940	26,000

(Table 6.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Southern California	LA Memorial Coliseum				X			1940	103,000
Wisconsin	Camp Randall Stadium				X		560,000	1940	45,000
Arizona State	Goodwin Stadium				X		95,000	1941	9,500
Fresno State	Ratcliffe Stadium				X		13,500	1941	13,000
Texas Tech	Tech Stadium				X			1941	12,000
Kentucky	Stoll Field/McLean Stadium				X		50,000	1942	20,000
Miami	Burdine Stadium				X		87,000	1944	35,030
Clemson	Memorial Stadium				X			1945	26,000

Table 6.5 Stage Three (1930-1945) Reported Acreage Sizes

School	Stadium	Acres
Alabama	Denny Stadium	4.27
Arizona	Arizona Stadium	8.6
Boston College	Alumni Field	4
California	California Memorial Stadium	8.63
Cincinnati	Nippert Stadium	7.8
Clemson	Memorial Stadium	13
Hawaii	Honolulu Stadium	6
Illinois	Memorial Stadium	8.91
LSU	Tiger Stadium	7.7
Notre Dame	Notre Dame Stadium	12.49
Ohio State	Ohio Stadium	9.8
Purdue	Ross-Ade Stadium	6.59
Rutgers	Rutgers Stadium	8
Southern California/UCLA	Los Angeles Memorial Coliseum	17.59
Temple	Temple Stadium	5.67
Tennessee	Shields-Watkins Field	7.23
Virginia	Scott Stadium	17
Wake Forest	Groves Field	7
Washington	University of Washington Stadium	9.64
Washington State	Rogers Field	15
Wisconsin	Camp Randall Stadium	6.5
Yale	Yale Bowl	12.5

earn enough money to survive during the Great Depression (Taylor, 2008). Most of the schools that installed lights were located in the geographical clusters emerging in the South and West.

Social System

By Stage Three, the social system was clearly established. The NCAA met at least once a year to deal with issues from the membership. The membership had grown significantly from the approximately 150 members that were part of the NCAA in Stage Two to over 300 members by the end of Stage Three (Crowley, 2006). Furthermore, most universities were either directly tied to a conference or were closely working with members of an existing conference on scheduling (Carter, 2006; Crowley, 2006; Smith, 2001). Strong ties existed between these members, who

met often to discuss problems. According to Damanpour (1987) and Kimberly and Evanisko (1981), competitors in close competition are more likely to adopt innovations from each other. It would seem likely schools meeting often would discuss what each school was doing and adopt innovations from other conference members.

Improvements in communication technology also increased the strength of the social system in Stage Three. Competitors in close regional proximity could listen to each other's games on the radio (Oriard, 2001; Smith, 2001). University leaders could easily pick up the telephone and call other schools to ask specific questions related to any issue (Smith, 2001; Taylor, 2008). By Stage Three, meetings at conventions were not the only way leaders could come together to solve problems. Because of improvements in communications technology, university leaders now had a variety of ways to discuss problems and work together across conferences or even the NCAA to solve the problems of the day and to overcome the barrier of geography.

Stage Three also introduced a new member to the social system: the Federal Government. As part of Stage Three, the Great Depression changed all parts of American life including the university (McElvaine, 1993; Taylor, 2008). For university athletics, the Great Depression had two important impacts. First, fewer people attended events. Secondly, the Federal Government, through public works projects, became a part of the social system of intercollegiate athletics by awarding (and refusing to award) projects to universities. No matter who was involved in the social system during Stage Three, there is no question that the social system of college athletics was strong and would increase in strength through the continued development of the NCAA and of conferences.

Communication Channels

By Stage Three, the mass media was invested in college football on many levels. Newspapers still spent significant financial and physical capital covering the game (Oriard, 2001; Smith, 2001). Multiple pages of the newspaper were often dedicated to college football, especially during the fall months (Smith, 2001). Through the continued spread of the population and the growth of the newswire systems, more locations had access to current news of the day (Oriard, 2001). Newspapers were also invested in coverage of the Great Depression and would often discuss the construction projects funded by Federal public works organizations that involved their local university ("Denny Stadium," 1937; Hicks, 1938; Taylor, 2008). Newspapers were still incredibly important for the sharing of pertinent information about the sport of college football. However, the development of mass media communications technology in the 1920s helped revolutionize news coverage and college football in the 1930s.

By the 1930s, radio as a way to communicate across large distances was not a new innovation (Barboutis, 2013; Smith, 2001). Marconi and others had been effectively using the technology to share information across large bodies of water and to and from ships since the turn of the century (Berg, 1999). What changed in the 1930s was the number of consumers who had access to radios (over twelve million homes by 1930; Oriard, 2001) and the number of stations that desired to profit from the usage of the device with as many as 1,000 stations by 1930 (Berg, 1999). Following the development of the FRC and the agreement to allow the broadcasting of stations over a wider band of wavelengths, radio stations were able to reach a significant portion of the population (Berg, 1999).

From a stadium development standpoint, radio allowed the broadcaster to provide a verbal picture of the stadium, the crowd, the band, and the game on the field (Oriard, 2001;

Smith, 2001). Interested persons could learn about games that were occurring great distances away (Berg, 1999; Smith, 2001). During the early years of radio broadcasts of college football, commercials were not common (Oriard, 2001). The lack of commercials left the broadcaster with significant time to fill between plays and at breaks in the action such as halftime (Oriard, 2001; Smith, 2001). One way to fill breaks was to discuss what the broadcaster experienced, from the crowd, the cheerleaders, the band, and even the stadium (Oriard, 2001). By the mid-1930s, teams were often being paid hundreds to thousands of dollars depending on the school for the rights to broadcast games from their venues. While not the direct interest of the broadcaster, undoubtedly stories about the stadiums where the games occurred moved into the broadcast in order to fill time between plays (Oriard, 2001; Smith, 2001). This increased knowledge about other stadiums around the country encouraged diffusion of concepts such as lights and new scoreboards.

The importance of radio as a mass media communications channel for universities is presented in two ways. First, colleges received large sums of money for the broadcast rights of their football games. Advertisers were willing to pay a significant sum in the middle of terrible economic times for the opportunity to be part of broadcasting college football. Commercial organizations found value in being associated with those colleges and universities whom they paid. Universities needed a way to increase revenues especially in middle of an economic decline and commercial partners helped the university achieve financial success. The diffusion of commercial relationships between businesses, radio stations, and universities occurred rapidly.

Again, the development of a unique space in the stadium devoted especially for the press remains important to acknowledge. College football stadia were not the first to develop spaces as professional baseball facilities had already done so (Seifried, 2005). The press box became an important part of the college football stadium. Press were allowed unique access and treated

better than the common fan (Oriard, 2001; Smith, 2001). The press box was one example of this special treatment as it was a space removed from the common fan, where the working press was able to write and transmit information about the game (Oriard, 2001). As radio continued to develop, press boxes developed with the technology. Radio broadcasters were often separated from the rest of the press with unique spaces. The separation as previously discussed, allowed for a better quality broadcast, which hopefully would generate more listeners and more revenue for the radio station and ultimately the university (Smith, 2001).

The relationship with the press and the development of a special space for the press inside the stadium also helps to emphasize the importance of interpersonal communication during this period. Even though radio developed to allow mass media communications with large audiences quickly, interpersonal communication was still very important to the successful diffusion of concepts related to stadium construction. Of particular importance during this period were interpersonal relationships with the Federal Government and the directors of federal public works projects. Harry Hopkins, the national director of the WPA program, controlled where money from the program went (Seifried, in press; Taylor, 2008). As previously, mentioned, each state had a WPA program coordinator; James H. Crutcher was a great example as he was the coordinator for Louisiana during the expansion of Tiger Stadium ("Hopkins, Crutcher, Featured," 1936; Seifried, 2012, in press). Communication from the Federal Government to public works units throughout the country allowed for the sharing of collective knowledge and for the spread of new construction developments.

Interpersonal communication also went on between university leaders and Hopkins, Harold Ickes, and others within the Federal Government (Ickes, 1953; Hicks, 1938). Ickes diary provided an interesting insight into why projects were chosen or ignored by the WPA and other

public works projects (Ickes, 1953). Letters and telegraph cables remain as records of some of the conversations between these groups (Futrall, 1929, 1936; Ickes, 1953); however, the telephone was also commonly used, as by the beginning of 1940, almost 30 million telephones were in use in the U.S. (Fischer, 1992). The telephone, as previously discussed through the stringing of long distance wires had reached a significant part of the country by Stage Three and was very important to the development of radio (Barnouw, 1966). The same technology that allowed stations to connect with one another, allowed university leaders to connect with each other and Washington, D.C. and/or the various state capitals around the country. The telephone was a form of interpersonal communication that allowed people in different parts of the country to directly speak to one another. While the visual cues that made in-person verbal communication so valuable were lost, the telephone provided an important way for leaders from around the country to quickly connect and solve problems.

Collectively, interpersonal communication could happen quite quickly over a greater distance and increased the likelihood of its opinion leaders to help the diffusion of knowledge about stadiums, especially about the development of scoreboards, lights, press spaces, and the importance of restrooms and concessions to the future of new and developing facilities. Discussion was constantly ongoing amongst conference members, and amongst NCAA members. The social system's strength increased the amount of communication ongoing, increasing the rate of diffusion. The development of technology to allow people to communicate from greater distances apart lessened the challenges of geography on diffusion.

Time and Geography

The Federal Government funded 28 projects through public works project grants or loans with the express goal of helping unemployed persons earn a paycheck. Two clusters of public

works projects developed in the South and the West. One cluster of public works projects can be found in Alabama, Arkansas, Georgia, Kentucky, Louisiana, North Carolina, Mississippi, and Texas between 1933 and 1940. The Southern cluster involved several renovations to existing permanent structures, along with the new construction of venues at Arkansas, Auburn, and in Miami. The neighbor effect concept seems to be occurring in the south, as schools in relative close proximity to each other innovate within a short period. These renovations added several thousand seats to the existing structures, bringing the size of stadiums in the South more in line with stadiums in the Northeast and the smaller stadiums in the Midwest, both that had developed in Stage Two. The new facilities at Arkansas and Auburn, along with the development of the municipal facility in Miami, were all smaller structures, seating less than 15,000 when opened originally. The renovation and new development of stadiums in the Southern cluster highlights that the South was attempting to bring their facilities in line with others around the country. The public works projects significantly helped Southern stadiums begin to have similar capacities as those found in the Northeast, with most schools seating more than 20,000 and a few with capacities over 40,000. The second cluster occurs on the West Coast with projects in Arizona, California, Utah, and Washington between 1933 and 1940. Those projects included both new constructions of venues along with expansions. The stadiums along the West Coast were also traditionally smaller simple structures, with the notable exception of the University of Washington, which saw its stadium expanded to over 40,000 seats as previously.

Another cluster, which develops and helps present the impacts of radio and telephone technology, is the spread of lights. For the first time, no true geographic pattern exists in the spread of a stadium technology. Traditional spatial geography as discussed by Hagerstand (1952, 1953) fails to influence the spread of lights across college football. Instead, a form of virtual

geography develops, where universities learn about what peer institutions are doing through the medium of radio along with magazine and newspaper coverage and then adopt it themselves. In 1930, lights were installed at Arizona State, Oregon State, and Hawaii, along with at North Carolina State and Temple. These schools were innovators when lights were added, as they were the first adopters in college football. That was a new phenomenon, as most previous innovations involved similar facilities developing in the same part of the country. The first adoption of lights primarily involved universities that were a part of the West Coast geographic cluster that developed in Stages One and Two. College football was the first major team sport to adopt lights with at least seven schools adopting lights prior to the Cincinnati Reds adoption of lights in 1935 (Seifried, 2005). While it is difficult to know exactly how each school found out about the value of lights, various issues of *Athletic Journal* included advertisements about lighting during the period along with articles about the successful use of lights at the University of Cincinnati (Chambers, 1926; Steward, 1926). The diffusion of lights also presented the impacts of the Great Depression on the diffusion of innovations during the era. Adoption of lights at seven schools occurred prior to 1931, yet the next school did not adopt lights until 1936. The Great Depression and the loss of revenue at the gate hurt many schools in the early 1930s, which limited the amount of available revenue for universities to spend on adoption of lights and other innovations. It also gave those schools who were early adopters a distinct advantage over their peers as they could play at night where neighboring institutions lacked the ability to do so. The diffusion of lights demonstrates geography was not the limiting factor that it was in previous stages. Advancement in communications technology and a strengthening social system allowed for universities across the country to learn and quickly adopt lights. Lights would be the first of many technologies where geography was not as impactful as it was in Stage One and Stage Two.

Investment in scoreboards, as previously discussed, was an important part of Stage Three. Scoreboards spread sporadically during the stage due to the challenges of the Great Depression. Yet, the technology was considered important enough that LSU, as previously discussed, added a new scoreboard in 1934, in the worst period of the Great Depression. Interestingly, the Northeast schools were absent in the spread of scoreboards. Schools in the Midwest, South and along the West Coast either maintained or added scoreboards during Stage Three. The neighbor effect seems to be present amongst adopters of scoreboard technology, especially amongst schools in the Midwest and South. On the West Coast, the diffusion seems to follow the patterns suggested by the hierarchical effect, where California adopted the scoreboard, and then several other schools followed California's lead at institutions whose stadiums were less advanced than California Memorial Stadium (Hagerstand, 1952, 1953). The scoreboard is the first of several innovations that will move the innovators (the first adopters) to other parts of the country than the traditional Northeast. As the power of many Northeast schools began to decline during this era, so did the investment in stadium improvements. Harvard, Yale and Princeton combine for one renovation project in Stage Three. The traditional Northeast cluster really begins to disappear from stadium development in the stage, and will continue to do so moving forward.

Finally, while many universities struggled with attendance through at least the beginning of the Great Depression, universities that received those expansions benefited greatly as employees began to work again. Particularly following WWII, universities would need the increased stadium capacities as more people went to college. Stage Three was a very limited stage as far as renovations or new constructions due to the challenges of the Great Depression. Public works projects as previously discussed would benefit college football after WWII. The stage is important for the involvement of the federal government in stadium construction, along

with the development of radio. Yet, by the early 1950s, radio was old technology following the development of television. Furthermore, millions of new college students would be admitted to universities around the U.S. due to the G.I. Bill. Those two significant changes would begin to revolutionize college football in Stage Four.

Chapter Seven: Post-War Expansion, Television and Technology

Stage Four started as the U.S. exited World War II (WWII) and involved various social and technological changes. Below is information on those events, actors, and inventions that imposed changes on college football stadiums.

United States Armed Forces

WWII radically changed American life, with 12,209,238 men and women enlisted in the armed service in 1945 ("By The Numbers," 2016). During this time, it is important to note that more than 80% of the schools that played college football at the top level ceased to play the sport from 1942-1945 (Salaga, 2015). However, after the war and by 1947, over ten million troops had been demobilized and returned to America (Mossman, 2007).

An important part of the training of troops during WWII involved the use of football as a strengthening and teaching mechanism (Seifried & Katz, 2011, 2015). Following the end of WWI, Americans were "shocked to learn of young men who failed to qualify physically as good soldiers" (Portal, 1941, p. 3). The failing of military preparedness for WWI motivated the U.S. military to seek soldiers that were more ready for future wars (Portal, 1941; Seifried & Katz, 2015). In order to fix American troops, the U.S. military sought out opportunities to increase the competitiveness (Seifried & Katz, 2011). Douglas MacArthur, the acting Superintendent of West Point believed that competition would help develop courage, the ability to think quickly and problem solve and increase aggressiveness that was important to the future success in war (Seifried & Katz, 2011, 2015).

U.S. War Department Army Training Activities Director, Joseph E. Raycroft encouraged universities and colleges to adopt physical sports (i.e., football, boxing, wrestling) to improve physical conditioning as well as the resolve of the university student (Fosdick, 1918; Kleeberger,

1918; Pope, 1995; Wallenfeldt, 1994). Raymond Fosdick, Chairman on Training Camp Activities of the Army and Navy Department in 1918, also argued that sport was useful for the maintenance of morale (Allen & Fosdick, 1918). Emphasizing team sports, football was used after the conclusion of WWI in Europe to entertain troops, along with improving troop readiness (Gunn, 1992; Pope, 1995; Seifried & Katz, 2011).

Following the attack on Pearl Harbor in December of 1941, the United States joined WWII. President Roosevelt suggested that sport should be used to improve the abilities of soldiers (Jones, 2009). One person who was very interested in the usage of college football to train American troops was the Commissioner of the Big Ten and member of the Joint Army-Navy Committee on Welfare and Recreation (JANC), John L. Griffith (Seifried & Katz, 2015). College and university campuses were already designed to support large numbers of students in dorms, and had significant space set aside for sport and recreation (Seifried & Katz, 2011). The universities worked with the Navy, Marine Corps and Coast Guard to bring officer training schools to college and university campuses (Seifried & Katz, 2015). Football coaches Clark Shaughnessy and Harry Stuhldreher made the argument that football was the perfect tool to help prepare troops for war due to the necessity of strategy development and usage of formations ("Gridiron Training," 1942; Jones, 2009; Warnecke, 2002). American pilot William R. Kane argued that the "timing and coordination" necessary for flying could also be learned through football (Kane, 1945, p. 43).

The NCAA also realized the military's investment in football, especially on college campuses was a boon for the continuation of the college game during WWII (Seifried & Katz 2011). The game, which struggled with significant losses of players right after Pearl Harbor, was able to survive the war largely because of the usage of U.S. colleges and universities as training

sites for officers (Da Grosa & Hall, 1946). For example, football was used by the Navy (along with the Marine Corps and Coast Guard) because it encouraged the development of loyalty along with the respect for authority necessary (Seifried & Katz, 2011). In order to develop the best football players possible, the various military groups hired or enlisted top college coaches to teach football (Rominger, 1985).

As part of the usage of university campuses for training, 131 teams were developed at colleges and universities during officer training (Seifried & Katz, 2011). Each of the teams was involved in competition against other military teams, increasing the readiness of troops for battle, along with improving troop morale (Seifried & Katz, 2015). The military teams were incredibly successful, beating most college opponents and often achieving high rankings in the Associated Press polls of the 1940s (Seifried & Katz, 2011). As part of the development of military football teams, the military began to develop bowl games (similar in concept to the Rose, Orange and Sugar bowls developed in the interwar period) to entertain troops and maintain troop readiness during lulls in the fighting (Seifried & Katz, 2011, 2015).

The development of roughly 100 military bowl games benefited college football because knowledge about football increased interest (Seifried & Katz, 2011, 2015). As an example, the United States Office of War Information (OWI) provided troops with several football stories each day as part of its news coverage (Jones, 2009; Wakefield, 1997). Many of the bowl games were also broadcast on the radio so that troops could listen to the game as a form of entertainment (Seifried & Katz, 2011). One such example was the 1945 Poi Bowl, held in Hawaii that was broadcast via radio to a large audience ("Attendance Records," 1945; Down the Runway," 1945; "Navy Beats AAF," 1945). The OWI used the notoriety of the significant number of known college players playing in those games to help increase the prestige of the

contests (Seifried & Katz, 2011). Coverage of games also occurred in American papers such as the *New York Times, Chicago Tribune, Washington Post, Los Angeles Times* and *Boston Globe* amongst many others (Seifried & Katz, 2015). The *Chicago Tribune's* Arch Ward (1942) noted that football would help "determine the outcome of the war" (p. 1). Arthur Daley of the *New York Times* (1943) was encouraged by the interest college coaches had in the training of pilots for war as part of their experiences on campus (Seifried & Katz, 2015).

Ultimately, the successful usage of football as a training mechanism during the war was a significant part of the growth of the sport following WWII (Noverr & Ziewacz, 1983). Significant numbers of servicemen returned from war wanting to continue to play the sport they had learned during the war years (Oriard, 2001). Players came to college campuses ready to play, with new and different styles learned during competition as part WWII, which increased the quality of the sport in the post-war era (Seifried & Katz, 2011). One important development during WWII was the development of the platoon system, where offensive and defensive players no longer played on both sides of the ball (Jones, 2009). The specialization of players on offense and defense increased the complexity of schemes and significant changes in offensive and defensive play following WWII (Jones, 2009).

The military's usage of football helped the continued growth of football during and after the war. Many servicemen who served during WWII would benefit from another government program that would further encourage an interest in university life and in college football. The U.S. government passed the Servicemen's Readjustment Act of 1944 (The G.I. Bill) for servicemen who served during the war so that they may receive tuition assistance to attend university classes following the war ("Education and Training," 2013). The Federal Government paid for one year of school for any soldier that served 90 or more days during the war (Salaga,

2015). An additional month of service equaled an additional month of school up to four full years for those who served 48 months or more (Salaga, 2015). To understand the impact of the G.I. Bill, in 1947 veterans accounted for almost half of the admitted students into colleges and universities ("Education and Training," 2013). Millions of students attended college on the GI Bill following WWII, including thousands that played college football in the post-war period as a result of their exposure to football during the war (Salaga, 2015; Seifried & Katz, 2011, 2015).

Transportation

Other important developments during Stage Four included the continued growth of the interstate automobile transportation system. A program of road building was suggested and promoted leading up to and during WWII ("Interstate Highway System," 2015). Many soldiers, including American General Dwight Eisenhower, experienced the impressive road systems developed in European countries while involved in WWII ("Interstate Highway System," 2015). The first period of development of Federal Highways occurred following the passage of the Federal-Aid Highway Act of 1944, which was responsible for the development of 44,000 miles of roads completed in 1955 ("Interstate Highway System," 2015). Eisenhower continued the development of the modern interstate with the help of Congress, passing the Federal-Aid Highway Act of 1956, which set aside 90% of a new ten-cent Federal Highway Tax to build interstates (Pfeiffer, 2006). By 1981, the system was largely complete and had cost federal and state officials approximately $129 billion to build over 46,000 miles of interstate to modern standards (Pfeiffer, 2006). The population growth was supported by the continued development of transportation infrastructure. Less than 60% of Americans owned a car in 1950 yet, by 1960, 78.47% of Americans had an automobile, and by 1980, 87.08% had an automobile (Chase, 2014;

“Journey to Work,” 2003). The development of the interstate system, combined with increasing numbers of people with cars connected society.

Another important transportation development was the development of air travel as a legitimate way to travel from place to place. Air travel had arrived as a common way for wealthy and even upper-middle class people to travel. The popularity of airline travel really developed in the 1960s. In 1954, the first year such data was gathered, 35 million Americans flew on airlines (Bureau of Transportation Statistics, 2016a). Yet by 1965, airlines flew over 102 million people in the United States (Bureau of Transportation Statistics, 2016a). By 1983, over 317 million people flew on airlines in the United States (Bureau of Transportation Statistics, 2016b). Air travel became a common way for people to move from place to place including college football teams. Air travel had several significant benefits, including significantly decreasing travel times, and lowering the amount of time lost to travel. Air travel encouraged intersectional play because of the relative ease of travel, making early season games common between intersectional opponents before the start of conference play. For instance, schools such as Michigan would travel to the West Coast to play on a Saturday, and schools from the North such as Notre Dame would travel South and West to play high quality opponents (Oriard, 2001; Smith, 2001). No longer was geographic distance a limiting factor for large football schools with significant revenues.

U.S. Population and College Enrollments

The population of the U.S. also grew significantly during Stage Four. In 1946, the U.S. population was estimated to be 141,388,566 (U.S. Census Bureau, 2000). By 1965 the population of the United States was approximately 196 million (U.S. Census Bureau, 2000). The post WWII population boom has been called the baby-boomer generation, with the largest

generation of American born people in history from 1946 to 1964 ("Baby Boomer Generation," 2015). Another area where the spike in population was obvious was in the numbers of students attending colleges or universities. In 1940, prior to WWII, 1,494,203 students were enrolled in college (National Center for Education Statistics, 1993). In 1949, approximately 2.5 million were enrolled in college (National Center for Education Statistics, 1993). By 1969, just over 8 million were enrolled in college (National Center for Education Statistics, 1993). College moved from being something experienced by less than two percent of the population to over four percent of population experiencing a college education, a significant growth in 20 years.

Further increasing access to higher education was significant increases in spending on higher education starting with the passage of the GI Bill as previously discussed and continuing with the passage of the Higher Education Act of 1965 (Brock, 2010). Federal spending on higher education went from $655 million in 1956 to $3.5 billion in 1965 (Brock, 2010). Policies allowing for open admissions to all high school graduates became common at public institutions in the 1970s, increasing the number of students on a college campus (Brock, 2010). More students attending college meant more students on campus and more students attending college football games, which increased the need for space for students to attend games. Interestingly, decreased revenue was likely a result of increased enrollments as students paid less than non-students (Seifried, 2012).

Modernist Architecture and Technology

Stage four further brought along a changing style of architecture. The Harris County Domed Stadium (Astrodome), which opened in 1965 highlighted the presence of modernist architecture commonly found amongst professional stadiums of the era (Seifried, 2005). The goal of modernist architecture related to stadium construction was to develop clearly defined

boundaries between the stadium and its surroundings (Seifried, 2005). The modernist movement further sought to eliminate any effect weather might have on sport (Bale, 1992). The professional facility designed by modernist architects often included domed structures, and were often viewed as sterile environments, much like office buildings that were very predictable in nature (Bess, 1999; Seifried, 2005). Modernist architecture also embraces the development of technology inside the venue. The rest of this chapter will look at the various technologies accompanying modernist architecture. Specifically, this work reviews innovations related to television, artificial surfaces, early precursors to luxury boxes (i.e., president's boxes), and scoreboards.

Television

Perhaps no one change in technology had a larger impact on college football than the development of television. Television, over time would help the NCAA move from an organization with little power to one with great influence (Dunnavant, 2004; Smith, 2001). Television would eventually allow audiences to watch games taking place thousands of miles away from the home of the spectator (Dunnavant, 2004). Yet, it would also require stadiums to be redesigned, so that television would have a natural space to broadcast from inside the venue (Seifried, 2005; Smith, 2001). The following section examines the birth of television and the radical changes that it helped to usher into college football. The maturation of television as an important part of the college game would incrementally change the game, especially following the decision by the NCAA to take control over the broadcasting of television contests in 1950 (Dunnavant, 2004; Smith, 2001).

The first sports broadcast on American television was a college baseball game between Columbia and Princeton on May 17, 1939, at Columbia's Baker Field (a multipurpose facility also home to the football team) ("First Television of," 1939). A single camera was set up along

the third baseline, less than 60 feet from home plate and provided very little for the viewer, as the ball was almost invisible (“First Television of,” 1939; Smith, 2001). The first pictures were blurry and required the watcher to listen to the play-by-play of the event to understand what was going on (Smith, 2001). Professional baseball first appeared on television in 1939, using two cameras to cover the game between the Brooklyn Dodgers and Cincinnati Reds at Ebbets Field in Brooklyn (Ritter, 1992). In this instance, a new lens was used, allowing for a clearer understanding of the action (Smith, 2001). The game also featured an important moment in sports advertising, with Red Barber (1985) eating Wheaties on the air, telling the audience that it was the “Breakfast of Champions,” (p. 134).

The first football game broadcast on television was actually a professional game between the Brooklyn Dodgers and the Philadelphia Eagles at Ebbets Field in Brooklyn (Smith, 2001). Fewer than 1,000 televisions were able to view the game broadcast by the National Broadcasting Company (NBC) in New York (Patton, 1984; Whittingham, 1984). Again, two cameras were used, one at the 50-yard line and one where the play-by-play broadcaster was located (Patton, 1984). As the game progressed, cloud cover limited the light, until a point was reached that the picture provided no true image of the action (Whittingham, 1984).

The first broadcasts of college football occurred on station W3XE, an experimental station out of Philadelphia that presented the University of Pennsylvania’s games (Smith, 2001). The first game featured Penn and Maryland from Franklin Field on October 5, 1940 (Dunnavant, 2004). Those early games were paid for by the Atlantic Refining Company and an advertising agency (Smith, 2001). Approximately 700 viewers were able to see the contest, the first of an eleven-year partnership between Penn and what became known as Channel Three in Philadelphia (Zimbalist, 1999). Two cameras, one at each 25-yard line were used to broadcast the Penn-

Maryland contest (Smith, 2001). One of the two cameras had a telescopic lens, allowing for close-up shots of the action, while the other covered the overall play (Smith, 2001). The broadcast went from the camera to a tower which transmitted the signal via shortwave radio to the Philco television plant, which in turn sent the signal out for broadcast to televisions around the Philadelphia region (Fisher & Fisher, 1996; Schatzkin, 2004). Television seemed to be developing as a mass media communications device as the Federal Communications Commission (FCC) agreed to allow commercial broadcasting of television shows on July 1, 1941 (Dunnavant, 2004). Unfortunately for those invested in television, Pearl Harbor occurred in December of 1941, and television's development was placed into a holding pattern (Fisher & Fisher, 1996; Schatzkin, 2004).

Following the defeat of Germany and Japan in WWII, television in America grew at an incredible rate. Televisions went into mass production in 1946 (Smith, 2001). By 1950, 9.2 million television sets existed in the U.S., up from just above 7,000 in 1947 (Dunnavant, 2004). Thousands of miles of coaxial cable also surfaced to allow for improvements in the quality of the broadcast (Smith, 2001). Original coaxial cable could carry over 480 telephone conversations at once without interference or one television program ("Communications History," 2005). The year 1947 started with two major television networks (NBC and CBS) and two more that were growing rapidly American Broadcasting Company (ABC) and Du Mont (Smith, 2001). Du Mont was broadcasting a variety of sporting events including college football (Dunnavant, 2004; Sperber, 1998). Sporting events were one of the primary reasons consumers bought televisions after the war (Smith, 2001). Bars were some of the first groups to buy televisions, realizing that their presence would encourage men to stay longer and drink more alcohol, thereby increasing profits (Smith, 2001). In the Chicago area, the Catholic Church was so concerned that Notre

Dame fans would attend bars to watch Notre Dame games that churches themselves bought televisions so interested spectators could come to church to see the game (Sperber, 1998).

Notre Dame was one of the first universities to have its games broadcast, due to the popularity of the university (Sperber, 1998). Three games were broadcast in 1947, with an estimated audience of 165,000 per game in the metropolitan Chicago region (Smith, 2001). For the 1948 season, Notre Dame received significant financial offers to agree to grant one company exclusive rights to broadcast their football games (Smith, 2001). Notre Dame decided to allow multiple companies to broadcast their games, and earned $1,800 for the 1948 season from home broadcasts, and another $6,600 from the broadcast of the Notre Dame at Navy football contest (Smith, 2001). The decision to work with several broadcasters in 1948 cost Notre Dame thousands of dollars (Sperber, 1998). By 1949, Notre Dame agreed to exclusivity with Du Mont Television and Chevrolet, with Notre Dame receiving a minimum of $36,000 and an additional $2,150 for every extra station Du Mont could get to agree to broadcast the 5-game home schedule ("Du Mont Television," 1949). Penn was also being broadcast during the beginnings of Stage Four, with commercial television broadcasting the games from 1941 to 1949 (Smith, 2001). Both Notre Dame and Penn were in unique positions, receiving revenue from television broadcasts. No other major football playing school received any significant revenue from television broadcasts (Sperber, 1998).

Like radio, discussions related to the impacts of television on attendance began during a special meeting on the subject held by the NCAA in 1948 (Crowley, 2006; Watterson, 2002). Schools that experimented with broadcasting spoke up in defense of television, stating that it had not hurt their schools (Crowley, 2006). Discussion amongst member institutions involved whether the NCAA should become more involved in the control of television (Smith, 2001).

Prior to the 1948 convention, the NCAA had practiced a policy of 'home rule,' allowing schools to act in their own individual self-interests (Smith, 2001).

Conferences also began to discuss the value of televised football. The Eastern College Athletic Conference's (ECAC) commissioner questioned the value of televising games as early as 1947 (Smith, 2001). However, as Penn was a member of the conference, its experience with television allowed its athletic director Jamison Swarts to state that Penn had not suffered significant attendance declines related to television (Smith, 2001). During the late 1940s, Penn averaged more than 60,000 fans at Franklin Field (Dunnavant, 2004). Unfortunately for Penn and Notre Dame, other universities were experiencing significant declines in attendance, especially in the Northeast, where television was most prevalent (Smith, 2001). Attendance had begun to decline at many universities around the country, with the traditional Ivy League schools (Harvard, Yale, Princeton, etc.) experiencing a 25% decline, and the Pacific Coast Conference (PCC) experiencing a 7% decline during the period from 1947 to 1950 ("Attendance Figures in," 1951). Many universities (especially those in the Northeast where the ECAC was located) argued that the attendance decline was directly related to increased television coverage (Dunnavant, 2004). Surveys conducted amongst East Coast residents supported the arguments made by the ECAC and other schools (Sperber, 1998; Watterson 2002; "Yearbook of the," 1951). The University of Washington lost over $50,000 in 1948 and 1949 on football, and the University of Oklahoma experienced a 15,000-seat decline in total ticket sales during the 1949 season (Dunnavant, 2004). Both schools joined in with many others to blame television for the lack of fans attending the game live in person (Smith, 2001).

On the other end of the spectrum, Notre Dame and Penn were heavily invested in televising football. Notre Dame had worked with Du Mont to develop spaces inside Notre Dame

Stadium for cameras to sit on game days, and for broadcasting space (Sperber, 1998). Furthermore, Du Mont invested money into running coaxial cable to Chicago from South Bend, Indiana thereby increasing the number of stations reached by a high quality television broadcast from Notre Dame Stadium (Smith, 2001). Du Mont worked to bring Notre Dame football to 43 different stations along the East Coast and in the Midwest (Sperber, 1998). Du Mont outbid both NBC and ABC for the rights to broadcast five Notre Dame games for $185,000 (Smith, 2001). The Big Ten asked Notre Dame to meet to discuss possible limitations to broadcasts in the Big Ten media markets and Notre Dame refused (Hesburgh, 1950). The Big Ten responded by allowing theaters to present Michigan games in Detroit and Northwestern and Illinois games in Chicago with a 30-second delay in the broadcast (Smith, 2001). Penn, the other perennial football broadcasting school received $150,000 from ABC for the rights to broadcast its 1950 home games (Dunnavant, 2004). Television was quickly providing revenue to Notre Dame and Penn, while most other schools received little to no financial benefit from the broadcasting of football games (Sperber, 1998).

Big Ten schools were particularly concerned about the success of Notre Dame as it related to television broadcasts. As many of the schools had television stations in nearby cities broadcasting the Notre Dame game, Big Ten schools feared that television would limit attendance at Big Ten contests (Sperber, 1998). The Big Ten was far from alone in this sentiment by 1950, as several other conferences including the ECAC and the Southern would express concerns related to football television broadcasts and its impact on game attendance (Smith, 2001). Before the 1950, significant talk had occurred amongst members of several conferences regarding televising of football games but by the end of the 1950 season, member schools were

willing to act on the issue of television in order to protect the interests of college football as a whole, and member institutions individually (Watterson, 2002).

The 1951 NCAA convention brought significant change to the relationship between television and college football. One of the first actions of the 1951 NCAA convention was for the membership to vote to grant almost total control over television to the three-member Television (TV) committee appointed in 1950 (Dunnavant, 2004; NCAA, 1951). For the second time in three years, and in violation of the original doctrine of home rule, the NCAA membership decided that the national organization needed to take control over the divisive new technology (Smith, 2001). The vote was not close, with 161 of the 168 members in attendance supporting the motion to grant the TV Committee control over television (NCAA, 1951). The original motion encouraged the committee to blackout television all together for the 1951 season (NCAA, 1951). The TV Committee decided to enact an experimental television package with Westinghouse Corporation, including one weekend of total television blackout in November, to test the impact of television on attendance (Watterson, 2002).

Notre Dame quickly agreed to the new policy, due to pressures from schools on its schedule who threatened to pull out of games against Notre Dame (Smith, 2001). Penn, who had received $850,000 from Du Mont for the rights to televise games over the next three seasons, decided to challenge the decision of the TV committee (Watterson, 2002). Five institutions decided to drop Penn from their 1951 schedule following the decision of Penn to challenge the new rules (Smith, 2001). Penn quickly backed down and agreed to follow the new NCAA television policy (Dunnavant, 2004). The original deal from Westinghouse earned the NCAA $679,800 (Smith, 2001). After infighting amongst members and the NCAA, the proceeds were split with 82% going to the schools that were broadcast each week, and 18% to the NCAA itself

(Smith, 2001). The 1951 season passed with several small controversies, each handled as a unique case by the TV committee (Watterson, 2002). Attendance overall fell by six percent during the 1951 season, a significantly worse decline than the previous season (Dunnavant, 2004). The overall results disclosed that television was not the problem that many leaders within college sports believed it was, and that deeper issues were limiting attendance at college games (Watterson, 2002).

When the NCAA met at its convention in January of 1952, it once again voted to grant control to the TV committee for decisions on the televising of games (Smith, 2001). The TV Committee decided to only allow one national game a week for the 1952 season, allowing a team to only appear once for the season (Dunnavant, 2004). The 1952 National Opinion Research Center (NORC) report seemed to support the national television plan proposed by the TV committee, as teams that were mediocre or truly bad were harmed at a much higher rate by television competition than teams with excellent records (Watterson, 2002). Officials at Notre Dame and Penn amongst others hoped that the actions of the NCAA would be found to be in violation of federal anti-trust laws, and would allow for open competition (Smith, 2001). A 1953 court case involving the National Football League (NFL) and monopolies ended the hopes of the schools, as the courts decided it was legal for the NFL to monopolize television broadcasts in similar ways to how the NCAA was controlling television (Dunnavant, 2004).

The NCAA, with challenges from time to time by various colleges and conferences would rule over television until the 1980s. Universities received funding based on number times they played on television, and appearances were usually limited to a certain number of times during a year, or in later contracts per length of the contract (Smith, 2001; Watterson, 2002). The attendance decline abated and attendance began to increase slowly, helping to quell any leftover

anger from the schools and conferences (Smith, 2001). By the mid-1950s, 65% of American households owned a television, and by the later part of Stage Four, 93% of household owned a television set (Lichty & Topping, 1975). Television provided extra revenue for many institutions over the next three decades, and in return it required new and larger spaces in the modern stadium.

Space for Television

As television becomes commonplace on university campuses in the 1950s, space was needed to house cameras, wiring, and space for game commentators (Dunnavant, 2004; Smith, 2001). One of the most significant challenges to early broadcasts of televised games after WWII was the lack of space available for cameras (Sullivan, 1987). Also due to the nature of the game, football was significantly easier to follow on television than baseball, something that helped explain the large sums of money offered to Notre Dame and Penn for football broadcasts (Rader, 2002). Spaces began to be reserved in the stadium specifically to house cameras and their operators (Seifried, 2005). One notable example was the expansion of the press box in Husky Stadium at the University of Washington by 54 feet to make room for cameras, operators and broadcasters (Seifried, 2005). Many other facilities followed suit, as press box development and expansions were common renovations during Stage Four.

In this study, it was discovered that 61 of the 364 construction projects during Stage Four specifically listed the press box as either the main renovation or as an important part of the renovation. Another 47 new stadiums were constructed, with a press box and space for radio and television included in the development of those facilities. The average press box specified renovation cost $1,505,107. One example of the expansion of the press box was found at the University of Michigan. Michigan underwent two renovations to the press box during Stage

Four, one prior to the 1946 season, and another prior to the 1956 season ("The Michigan Stadium," 2007). The press box that existed prior to the 1946 addition was two stories, with space for 240 press members, three radio booths and two private telephone booths, along with restroom facilities for the press ("The Michigan Stadium," 2007).

The 1946 addition added a third deck with space for cameras and camera operators, along with enclosing the second deck with glass ("The Michigan Stadium," 2007). In 1956, a $700,000 Sports Communication Center (SCC) was constructed in place of the old press box ("Stadium History, Part," 2016). The new center was four levels, and was 186 feet in length ("The Michigan Stadium," 2007). The first level of the SCC was reserved for the President, while the second level had space for 202 members of the working press ("The Michigan Stadium," 2007). Wire and telephone access was available to all the press. The third deck required space for 38 cameras and photographers ("The Michigan Stadium," 2007). The top level included space for 17 booths, including space for both radio broadcasts and television broadcasts ("The Michigan Stadium," 2007). The facility also included space for photography dark rooms and eating facilities for the press ("Stadium History, Part," 2016).

A second example of press box renovation was found at Los Angeles Memorial Coliseum in 1948. The renovation cost $950,000 and included space for 250 members of the press (Cowell, 2013). Also included in the structure was space on the roof for television cameras, and the addition of an elevator to reach the press box (Cowell, 2013). Similar additions were made at North Carolina. One of the few articles of the era that covered the opening of new press facilities occurred in Chapel Hill, North Carolina, at the University of North Carolina (UNC) ("New Press, Guest," 1949). The new facility cost UNC $150,000 and was constructed on the south side of Kenan Memorial Stadium ("New Press, Guest," 1949). The facility was paid for by donations

from alumni including the stadium namesake William Kenan Jr., and included three decks, with space for 68 people and wells for television cameras along with four booths set aside for broadcasts from the stadium ("New Press, Guest," 1949).

Each of the new press structures was striking in that, for the first time dedicated space was made available not only just for newspaper writers and radio broadcasters, but also television cameras and broadcasters. It is important to note that while the changes noted here were to the press box itself, other changes to the facility were occurring as well to support television. Spaces were set aside for cameras, often sacrificing space that had previously been used for others, such as concession stands or booths in the press box (Oriard, 2001; Seifried, 2005). Finally, the television booth itself was equipped with monitors and other items that helped in the broadcast of the game by the announcers (Seifried, 2005). Press spaces continued to develop throughout college football. Press spaces were now almost exclusively enclosed and provided space for radio and television broadcasters, along with space for camera locations. Every facility by the end of Stage Four had at least one press box, and a few had multiple locations inside the stadium. The press box had developed into an exclusive space by Stage Four, where only members of the press and invitees by the university were allowed.

President's Boxes but not Quite Luxury Suites

A few professional facilities that developed in the first decades of the 20th century had limited luxury spaces, but the Astrodome set a new standard for luxury facilities in American sport (Seifried, 2010; Smith, 2003). The Astrodome included 55 luxury boxes, built to encourage wealthy fans to buy access to those unique spaces (Seifried, 2005). Luxury boxes as constructed during this Stage included comfortable seating, special access to different food than commonly found in the rest of the venue, and private restroom facilities (Seifried, 2010). Professional

venues were able to sell these spaces for $20,000 or more for a season following their construction (Voigt, 1983). For the first time, due to the expense of these facilities, corporations and other businesses were investing in sport seating at a significant level (Voigt, 1983).

Interestingly, colleges and universities slowly began to invest in these structures, and the new forms of revenue they brought to college football. However, records do show that some universities quickly moved to added luxury type spaces to host high level alumni or donors. The University of Georgia opened the President's Champions Club in 1967 as part of a $2,969,000 renovation of Sanford Stadium. The stadium expansion included space for the press and the Champions Club was noted as a President's box in the news coverage of the expansion ("Georgia Plans Expansion," 1966; McCarthy, 2015). The President's box at the University of Georgia provided 110 seats in the space, reserved for high level donors and other special guests of the President (McCarthy, 2015). A few other venues (n = 8) developed similar spaces during Stage Four.

As an example, Louisiana State University (LSU) added luxury spaces in 1978 to Tiger Stadium. The renovation included two presidential suites on the press box level of the stadium (Seifried, in press). Elsewhere, Virginia added 132 club seats to Scott Stadium in 1980 ("Carl Smith Center," 2016). The University of Oregon added a 381 seat President's space to Autzen Stadium for $650,000 in 1981. Furthermore, the Barker Stadium Club was added to the East end zone, and used as a meeting area during non-game days ("Oregon's Autzen Stadium," 2016). Such spaces provided universities with new sources of revenue that allowed for universities to pay of existing debt and continue to improve venues. See Table 7.1 for schools that added President's Boxes/Clubs.

Table 7.1 Stage Four (1946-1984) Facilities With President's Boxes/Clubs

School	Stadium	President's Box/Club
North Carolina	Kenan Memorial Stadium	Yes
Ole Miss	Hemingway Stadium	Yes
Utah	Ute Stadium	Yes
Louisiana State	Tiger Stadium	Yes
Georgia	Sanford Stadium	Yes
Brigham Young	Cougar Stadium	Yes
Oregon	Autzen Stadium	Yes
Hawaii	Aloha Stadium	Yes

Scoreboards

The next important innovation to discuss in Stage Four was the expansion of the scoreboard. As previously discussed, the scoreboard had long been used as a communication device for crowd control by sports teams at all levels (Seifried, 2005). Comiskey Park in Chicago and the Astrodome in Houston moved the scoreboard from a relatively simple device to an integral part of the spectacle that high-level sports became during the second half of the 20th century (Jares, 1965; Seifried, 2005; Smith, 2003). The scoreboard became an entertainment device, and an important center of advertisement revenue for professional and college programs (Jares, 1965). The scoreboard encouraged fan engagement in the contest, while allowing for the quick and easy dissemination of information to fans throughout the venue.

In college sports, schools moved to install new scoreboards in their venues throughout Stage Four. Examples included an enlarged scoreboard in the South end zone at Ross-Ade Stadium for Purdue in 1969 as part of a $980,000 expansion (Kriebel, 2009). Michigan State University spent $175,000 enlarging the scoreboard at Spartan Stadium in 1973 to make it more spectator-friendly (Van Stratt, 2014). The University of Toledo installed an electronic message board in the Glass Bowl in 1975 at a cost of $120,000, allowing for easier communication with spectators ("Glass Bowl," 2016). Stanford also added a very large scoreboard at a cost of

$750,000 in 1978 (Ostiller, 1978). Their scoreboard allowed the university to share messages with the fan base, share out of town scores and sell advertising through the new scoreboards installed in the stadium (Ostiller, 1978). Overall, this work found 27 renovations involved the addition of scoreboards with an average cost of $2,663,333. It is important to note that several of the scoreboard improvements were part of larger projects involving expansions and other significant facility improvements. The scoreboard improvements of Stage Four were important for two reasons. First of all, the use of electronics increased the amount of information that could be shared by the university to fans via the scoreboard, allowing for advertising and other usages of the scoreboard (Ostiller, 1978; Smith, 2003). Secondly, as fans adapted to the scoreboard providing entertainment, the move to the video scoreboard in Stage Five was a natural progression.

Artificial Turf

The last significant innovation of Stage Four was the most widespread and quickly diffused innovation of the Stage. Artificial Turf adoption occurred at 51 schools and 26 of these schools replaced the artificial turf with a new version of the surface during this time. The average cost of a renovation involving artificial turf was $485,726. The history of artificial turf is a very interesting example of innovation diffusion, and the role of geography in impacting the diffusion of an innovation. The first official adoption of artificial turf occurred in 1966 inside the Houston Astrodome (Ritter, 1992). The surface was known as Astroturf due to its usage at the Astrodome. The surface was placed directly over the concrete surface of the Astrodome, and would be placed directly over hard surfaces in stadiums around the country (Ritter, 1992; Yellon, 2012).

Artificial turf was an important advancement in field surfaces, as for the first time natural light was not necessary for surfaces involving football and baseball (Seifried, 2005). As such,

dome stadiums were now possible for football teams. Houston, Tulane, Syracuse, Idaho and Minnesota all either built enclosed stadiums or shared new constructed enclosed venues with professional teams. Outdoor venues adopted artificial turf as well. The first schools to adopt were Tennessee, Vanderbilt, Washington and Wisconsin all in 1968, two years after the original adoption of the surface in the Astrodome. The diversity of locations means that physical geography was not a barrier. By 1969, nine more schools adopted artificial turf (i.e., Alabama, Arkansas, Michigan, Michigan State, Northern Illinois, Oregon, Oregon State, Texas and West Virginia), from locations in the Midwest, Northwest and South. By 1970, twelve more facilities had installed artificial turf, meaning that within the first five years of the original adoption, 25 schools had adopted the surface at universities around the country. The average cost of artificial turf for Stage Four was $457,703 involving 77 total projects. Table 7.2 provides information about turf related projects.

The diffusion of Astroturf is a surprising piece of the current study. The expected influence of neighborhood effect (i.e., schools closest by adopting first) did not occur with Astroturf. The surface diffuses across the country to schools with no geographical ties, bringing in the importance of virtual geography. Due to television, schools were able to learn about turf via watching games on the new communications medium. Interested schools could then reach out to the school with the innovation and ask further questions via the telephone, or if necessary in person. Virtual geography is the most likely explanation for how schools became aware of artificial turf.

One important note is that by 1970, Astroturf had been reinvented by at least two other companies (surfaces called Tartan Turf and SuperTurf). Reinvention is an important part of the diffusion process for any innovation (Rogers, 2003). As discussed previously, by the end of

Stage Four over 50 schools adopted various versions of artificial turf. The surface's ability to stand up to significant use was one of the significant benefits for outdoor facilities adoption of artificial turf (Blickstein, 1995; Ritter, 1992). The addition of turf also significantly lowered the maintenance costs associated with the traditional grass surface. The traditional surface needed constant cutting and other maintenance that the artificial surface no longer needed. For example, the 1966 season at War Memorial Stadium in Little Rock, Arkansas, cost $60,000 in maintenance for the season, including both field repairs and building maintenance (Balch, Pratt, Priddy & Co., 1966). Turf significantly lowered the year-to-year costs of the stadium, further improving the bottom line for the university, in a period of serious economic concern. In cold climates such as at the University of Pittsburgh, artificial turf could be as much as 20 times cheaper than natural grass as far as maintenance costs were concerned (Seifried & Pastore, 2009). Turf was a significant technological improvement, and was quickly adopted as an innovation around the country.

Table 7.2 Stage Four (1946-1984) FacilitiesThat Added or Replaced Artificial Turf

School	Stadium	Year	New or Renovated	Nominal Cost ($)
Houston	Astrodome	1966	New	
Tennessee	Shields-Watkins Field	1968	New	200,000
Vanderbilt	Dudley Field	1968	New	250,000
Washington	University of Washington Stadium	1968	New	300,000
Wisconsin	Camp Randall Stadium	1968	New	180,000
Alabama	Denny Stadium	1969	New	172,000
Arkansas	Razorback Stadium	1969	New	700,000
Michigan	Michigan Stadium	1969	New	250,000
Michigan State	Spartan Stadium	1969	New	250,000
Northern Illinois	Huskie Stadium	1969	New	
Oregon	Autzen Stadium	1969	New	

(Table 7.2 continued)

School	Stadium	Year	New or Renovated	Nominal Cost ($)
Oregon State	Parker Stadium	1969	New	
Texas	Memorial Stadium	1969	New	1,700,000
West Virginia	Mountaineer Field	1969	New	233,000
Auburn	Cliff Hare Stadium	1970	New	850,500
Cincinnati	Nippert Stadium	1970	New	250,000
Indiana	Memorial Stadium	1970	New	535,000
Kansas	Memorial Stadium	1970	New	2,000,000
Kansas State	KSU Stadium	1970	New	250,000
Minnesota	Memorial Stadium	1970	New	360,000
Nebraska	Memorial Stadium	1970	New	232,855
Oklahoma	Memorial Stadium	1970	New	250,000
Ole Miss	Hemingway Stadium	1970	New	300,000
Pittsburgh	Pitt Stadium	1970	New	500,000
Rice	Rice Stadium	1970	New	500,000
South Carolina	Carolina Stadium	1970	New	165,750
Southern Methodist	Cotton Bowl	1970	New	
Texas A&M	Kyle Field	1970	New	1,840,000
Washington State	Joe Albi Stadium	1970	New	294,500
Boston College	Alumni Stadium	1971	New	800,000
Colorado	Folsom Field	1971	New	345,000
Florida	Florida Field	1971	New	200,000
Georgia Tech	Grant Field	1971	New	
Oklahoma State	Lewis Field	1971	New	2,500,000
Toledo	Glass Bowl	1971	New	405,000
Tulane	Tulane Stadium	1971	New	225,000
Baylor	Baylor Stadium	1972	New	400,000
Idaho	Idaho Stadium	1972	New	
Iowa	Kinnick Stadium	1972	New	1,760,000
Ohio State	Ohio Stadium	1972	New	535,000
Tulsa	Skelly Stadium	1972	New	300,000
Washington	University of Washington Stadium	1972	Renovated	
Michigan State	Spartan Stadium	1973	Renovated	175,000

(Table 7.2 continued)

School	Stadium	Year	New or Renovated	Nominal Cost ($)
Northwestern	Dyche Stadium	1973	New	500,000
Texas Christian	Amon G. Carter Stadium	1973	New	
Alabama	Denny Stadium	1974	Renovated	485,000
Illinois	Memorial Stadium	1974	New	550,000
Texas-El Paso	Sun Bowl Stadium	1974	New	
Virginia	Scott Stadium	1974	New	785,000
Michigan	Michigan Stadium	1975	Renovated	250,000
Army	Michie Stadium	1977	New	750,000
Nebraska	Memorial Stadium	1977	Renovated	
Oregon State	Parker Stadium	1977	Renovated	
Washington	Husky Stadium	1977	Renovated	
Colorado	Folsom Field	1978	Renovated	
Ohio State	Ohio Stadium	1979	Renovated	453,490
Washington State	Martin Stadium	1979	Renovated	3,000,000
Florida	Florida Field	1980	Renovated	300,000
Kansas State	KSU Stadium	1980	Renovated	350,000
Wisconsin	Camp Randall Stadium	1980	Renovated	550,000
California	California Memorial Stadium	1981	New	650,000
Iowa	Kinnick Stadium	1981	Renovated	
Oklahoma	Memorial Stadium	1981	Renovated	423,000
Virginia	Scott Stadium	1981	Renovated	300,000
Louisville	Old Cardinal Stadium	1982	New	4,000,000
Michigan	Michigan Stadium	1982	Renovated	
Toledo	Glass Bowl	1982	Renovated	420,000
Tulsa	Skelly Stadium	1982	Renovated	375,000
Army	Michie Stadium	1984	Renovated	950,000
Nebraska	Memorial Stadium	1984	Renovated	
UNLV	Sam Boyd Stadium	1984	New	1,200,000
Northwestern	Dyche Stadium	1984	Renovated	
Oregon	Autzen Stadium	1984	Renovated	363,000
Oregon State	Parker Stadium	1984	Renovated	320,000
Pittsburgh	Pitt Stadium	1984	Renovated	1,525,000
Washington State	Martin Stadium	1984	Renovated	500,000

Other Continued Improvements: Expansions and New Constructions

During Stage Four, significant seating expansions accompanied other construction projects at universities. Some of the new stadium constructions involved programs that were either examining a move up in football competition or were newly creating football programs. Schools such as Florida State, East Carolina and Wyoming constructed new facilities during this era as part of the wave of programs attempting to establish themselves as serious competitors in college football. Several other schools built new reinforced concrete and steel structures to replace existing facilities, often on the same exact site. Other universities used modern construction concepts to build larger facilities on campus for football, such as Penn State and Maryland. Many of these structures share in the modernist architecture that was common as part of the professional stadium building during Stage Four of this ideal-type (Seifried, 2005).

In East Lansing, Michigan, on the campus of Michigan State University, Macklin Stadium was constructed as a concrete and steel horseshoe right after WWII, opening in 1948 at a cost of $500,000 with a capacity of 50,011 (Van Stratt, 2014). Even following the opening of the new stadium in 1948, the facility was not large enough to handle the crowds for the Michigan game ("Subject-Athletic Facilities," 2009). A new structure was needed, and a renovated Macklin Stadium, now known as Spartan Stadium, opened in 1956 with a capacity of 76,000 ("Subject- Athletic Facilities," 2009). To allow for the extra spectators, a second deck was added to the structure using the new construction technologies in use during Stage Four ("Subject-Athletic Facilities," 2009). Another example of the usage of a second deck to increase capacity occurred with the addition of an upper deck and press space to Amon G. Carter Stadium on the campus of Texas Christian University. The addition added over 8,000 seats to the stadium and cost $1.2 million to construct ("Amon G. Carter," 2016; "Remembering Amon G.," 2012).

Spartan Stadium in East Lansing, Michigan, and Amon G. Carter Stadium in Fort Worth Texas, both benefited from a significant improvement in engineering technology, the use of computers to help in understanding of weight distribution and structure size (Smith, 2003; Sullivan, 2001). The modern design allowed for the addition of a second deck without the traditional steel support beams attaching to the first level, creating obstructed seating (Seifried, 2005; Smith, 2000). Both Spartan Stadium and Amon G. Carter Stadium benefited from this improvement in technology, as did many other Stage Four facilities.

Conclusion for Stage Four

Overall, these additions and environmental influences meant the modern facilities were larger and seated more people than previous stages (Rader, 2002). However, the average acreage sizes are similar, as Stage Three venues averaged 9.82 acres while Stage Four averaged 10.85 acres; yet, the average capacity of a Stage Three venue was 26,335 and in Stage Four it was 48,495. Please see tables 7.3, 7.4, and 7.5 for more information. Total acreage was not significantly increased due to the location of many stadiums in the heart of campus, but capacity increased significantly. Stage Four also brought other important innovations into the modern stadium, including improvements for the spectator. For the first time, a significant number of stadiums had restroom and concession facilities. Specifically, the averages for Stage Four facilities following additions were 16.11 restrooms and 14.07 concession stands from 50 restrooms and 53 concession stand additions. See Table 7.6 for specific stadium numbers.

Table 7.3 Stage Four (1946-1984) New Constructions

School	Stadium	Nominal Cost ($)	Open Date	Capacity
Florida State	Centennial Field	14,000	1947	
Texas Tech	Jones Stadium	400,000	1947	27,000
East Carolina	College Stadium	26,000	1949	2,000

(Table 7.3 continued)

School	Stadium	Nominal Cost ($)	Open Date	Capacity
Baylor	Baylor Stadium	1,127,188	1950	50,000
Florida State	Doak Campbell Stadium	250,000	1950	15,000
Maryland	Byrd Stadium	1,000,000	1950	34,680
Rice	Rice Stadium	3,295,000	1950	68,794
Wyoming	War Memorial Stadium	1,533,333	1950	20,000
Houston	Rice Stadium		1951	70,000
Oregon State	Parker Stadium	300,000	1953	25,000
Wake Forest	Bowman Gray Stadium	100,000	1956	16,000
Boston College	Alumni Stadium	350,000	1957	26,000
Louisville	Old Cardinal Stadium	16,000,000	1957	36,103
Arizona State	Sun Devil Stadium	1,000,000	1958	30,000
Navy	Navy/Marine Corp Memorial Stadium	3,000,000	1959	34,000
Indiana	Memorial Stadium	4,500,000	1960	48,344
New Mexico	University Stadium	4,000,000	1960	31,218
Penn State	Beaver Stadium	1,583,797	1960	46,284
Air Force	Falcon Stadium	3,500,000	1962	40,828
East Carolina	Ficklen Stadium	283,387	1963	17,000
Texas-El Paso	Sun bowl Stadium	275,000	1963	30,000
Brigham Young	Cougar Stadium	1,500,000	1964	28,812
North Carolina State	Carter Stadium	3,700,000	1964	45,600
Houston	Astrodome	35,000,000	1965	62,439
Memphis	Memphis Memorial Stadium	3,700,000	1965	50,160
Bowling Green	Doyt Perry Stadium	3,000,000	1966	23,272
Oregon	Autzen Stadium	2,500,000	1967	40,000
Colorado State	Hughes Stadium	2,800,000	1968	30,000
Kansas State	KSU Stadium	1,600,000	1968	35,000
Kent State	Dix Stadium	3,500,000	1968	30,520
Utah State	Romney Stadium	3,000,000	1968	15,000
Wake Forest	Groves Stadium	4,000,000	1968	31,500
Virginia Tech	Lane Stadium/Worsham Field	2,113,047	1969	35,050
Nevada-Las Vegas	Las Vegas Stadium	3,500,000	1970	16,000
Idaho	Idaho Stadium	3,300,000	1971	16,000
Utah	Rice Stadium	52,000,000	1972	32,500
Kentucky	Commonwealth Stadium	12,000,000	1973	57,800

(Table 7.3 continued)

School	Stadium	Nominal Cost ($)	Open Date	Capacity
Hawaii	Aloha Stadium	37,000,000	1975	50,000
Iowa State	Cyclone Stadium	7,600,000	1975	42,500
Tulane	Louisiana Superdome	134,000,000	1975	73,208
New Mexico State	Aggie Memorial Stadium	4,000,000	1978	30,343
Temple	Veterans Stadium	63,000,000	1978	65,356
Fresno State	Bulldog Stadium/Jim Sweeney Field	7,000,000	1980	30,000
Syracuse	Carrier Dome Stadium	26,850,000	1980	49,262
Vanderbilt	Vanderbilt Stadium	10,100,000	1981	40,550
Minnesota	Hubert H Humphery Metrodome	82,000,000	1982	62,218
Miami of Ohio	Yager Stadium	13,500,000	1983	25,000

It is important to note that universities found places on their campuses for spectators to park in large numbers. Stage Four facilities also provided on average 6,875 parking spots for spectators attending college football games. See Table 7.7 for information on specific stadium parking. The modern passion for cars, as discussed previously, meant more and more fans were arriving at venues by cars. The increased number of fans arriving by automobile required the university to find places on campus for parking. Many of these spaces were on campus, as spaces were needed for students to park cars, both for commuters (30% by the 1960s and rising) and those staying on campus (Kim & Rury, 2011). By Stage Four, over 200 universities reported numbers of parking spaces for spectators. Many of these spaces would develop into ways for universities to increase revenues, as spectators were willing to pay to park near the stadium (Seifried, 2005).

The reasons for the expansions were multifold. First as previously discussed, the GI Bill led to thousands of new students attending college for the first time, many with knowledge and interest in football. Secondly, the post WWII era experienced improvements in transportation that allowed more and more fans to reach the stadium. Television, after an early attendance

decline, also seemed to help increase interest in the game. Overall, 421 total projects occurred during Stage Four. The breakdown involved 47 new constructions, 364 renovations an ten teams that moved into facilities that were already in existence. Of the renovations, eight preservation projects, one restoration project, ten reconstruction projects, 34 combination projects and 311 rehabilitation projects. Interestingly, a significant number of preservation projects began to appear in the later part of Stage Four, with ten independent preservation projects and another 14 projects pair with another type of renovation to create a combination project. As the stadium aged, universities were forced to spend significant sums of money on preserving the existing structure of the facility (Pfleegor, Seifried & Soebbing, 2013; Seifried, 2012). The average renovation cost was $1,416,333 in comparison to $216,986, in Stage Three, a significant increase in cost from Stage Three to Stage Four. The average new construction project cost $12,278,277 in comparison to $223,996 in Stage Three. Even accounting for the changing value of the dollar during the period, these show a significant increase in investment in Stage Four facilities. Many of these renovations were paid for by alumni donations, with a few being paid for by state tax dollars. The facility renovation revolution that had started in Stage Three continued in Stage Four and would continue into Stage Five, as new technology began to significantly influence college football stadiums.

Change occurred quickly during Stage Four as universities quickly realized that there were significant financial benefits for allowing broadcasting of games from the stadium. The 1952 television contract was worth $1.14 million to the NCAA and its member schools (Dunnavant, 2004). This meant that the University of Arkansas could receive $90,000 for the

Table 7.4 Stage Four (1946-1984) Renovations

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Alabama	Denny Stadium				X			1946	31,000
Arizona State	Goodwin Stadium				X		275,000	1946	15,000
Iowa	Iowa Stadium				X			1946	53,000
Michigan	Michigan Stadium				X			1946	87,000
Ohio	Ohio Stadium				X			1946	19,000
Texas-El Paso	Kidd Field				X			1946	15,000
Alabama	Denny Stadium				X		26,000	1947	31,000
Arizona	Arizona Stadium				X		14,800	1947	14,000
Arkansas	Razorback Stadium				X		36,000	1947	20,000
California	Memorial Field			X	X	X	1,000,000	1947	80,000
Cornell	Schoellkopf Field				X			1947	25,597
Georgia Tech	Grant Field			X	X	X	600,000	1947	40,000
Miami	Burdine Stadium				X		1,069,000	1947	59,578
Oklahoma State	Lewis Field				X			1947	30,000
Oregon State	Bell Field			X				1947	21,000
Purdue	Ross-Ade Stadium				X		150,000	1947	32,000

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Southern California	LA Memorial Coliseum				X		173,000	1947	101,671
Tulane	Tulane Stadium/ Sugar Bowl				X		500,000	1947	74,000
Tulsa	Skelly Stadium			X	X	X		1947	19,500
UCLA	Los Angeles Memorial Coliseum				X		173,000	1947	101,671
Utah	Ute Stadium				X			1947	30,000
Colorado State	Colorado Field				X			1948	14,000
Kentucky	Stoll Field/McLean Stadium				X		814,944	1948	37,500
Michigan State	Macklin Stadium				X		1,250,000	1948	51,000
Mississippi State	Scott Field				X		500,000	1948	35,000
Oklahoma	Oklahoma Memorial Stadium				X		1,200,000	1948	55,647
San Jose State	Spartan Stadium				X			1948	18,155
Tennessee	Shields-Watkins Field				X		1,500,000	1948	46,390
Texas	Memorial Stadium				X		1,300,000	1948	60,130
Texas Christian	Amon G. Carter Stadium				X		250,000	1948	30,500

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Arizona	Arizona Stadium				X		620,000	1949	22,700
Auburn	Cliff Hare Stadium				X		200,000	1949	21,500
Clemson	Memorial Stadium				X			1949	35,000
Georgia	Sanford Stadium				X			1949	36,000
Michigan	Michigan Stadium				X		831,000	1949	97,239
Missouri	Memorial Stadium				X			1949	37,000
North Carolina	Kenan Memorial Stadium				X		150,000	1949	24,000
Ole Miss	Hemingway Stadium				X		300,000	1949	34,500
Penn State	New Beaver Field				X		20,000	1949	28,000
Purdue	Ross-Ade Stadium				X		340,000	1949	23,074
South Carolina	Carolina Stadium				X		175,000	1949	34,000
Southern Methodist	Cotton Bowl				X			1949	75,504
Texas A&M	A&M Field/Kyle Field				X			1949	35,000
Vanderbilt	Dudley Field				X		155,000	1949	27,901
Arizona	Arizona Stadium				X		900,000	1950	27,000
Arkansas	Razorback Stadium			X	X	X	250,000	1950	21,200

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Florida	Florida Field				X		435,000	1950	40,116
Kent State	Memorial Stadium				X		75,000	1950	7,000
Miami	Burdine Stadium				X		18,000	1950	64,552
Ohio State	Ohio Stadium			X	X	X		1950	66,210
Oklahoma State	Lewis Field				X			1950	39,000
Purdue	Ross-Ade Stadium				X			1950	51,295
Syracuse	Archbold Stadium				X			1950	40,000
Washington	University of Washington Stadium				X		1,750,000	1950	55,000
Arkansas	Razorback Stadium				X		28,900	1951	21,200
Arkansas	Razorback Stadium				X		212,000	1951	21,200
Harvard	Harvard Stadium		X					1951	30,323
Wisconsin	Camp Randall Stadium				X		568,000	1951	51,000
Southern California	LA Memorial Coliseum				X		950,000	1952	101,528
Texas Christian	Amon G. Carter Stadium				X		200,000	1952	36,881
UCLA	Los Angeles Memorial Coliseum				X		950,000	1952	101,528

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Rutgers	Rutgers Stadium				X			1953	27,120
Texas A&M	A&M Field/Kyle Field				X		346,000	1953	41,500
Tulane	Tulane Stadium/ Sugar Bowl				X		500,000	1953	80,985
Cincinnati	Nippert Stadium				X		170,000	1954	28,000
East Carolina	College Stadium				X			1954	8,000
Kent State	Memorial Stadium				X		150,000	1954	12,000
LSU	Tiger Stadium				X		686,863	1954	67,720
Vanderbilt	Dudley Field				X			1954	27,901
Auburn	Cliff Hare Stadium				X		275,000	1955	34,500
Baylor	Baylor Stadium				X		68,000	1955	50,000
Miami	Burdine Stadium				X		750,000	1955	76,280
Purdue	Ross-Ade Stadium			X	X	X	630,000	1955	51,295
Texas	Memorial Stadium				X		200,000	1955	60,130
Texas Tech	Jones Stadium				X		239,000	1955	34,000
Colorado	Folsom Field				X			1956	45,000
Iowa	Iowa Stadium				X			1956	60,000
Michigan	Michigan Stadium				X		700,000	1956	101,001
Michigan State	Spartan Stadium				X		1,750,000	1956	60,000

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Texas Christian	Amon G. Carter Stadium				X		1,200,000	1956	46,083
Arkansas	Razorback Stadium				X		220,000	1957	30,000
Michigan State	Spartan Stadium				X		1,500,000	1957	76,000
Oklahoma	Oklahoma Memorial Stadium				X		149,000	1957	61,826
Tulane	Tulane Stadium/ Sugar Bowl				X		168,000	1957	80,985
Clemson	Memorial Stadium				X		300,000	1958	46,000
Georgia Tech	Grant Field				X			1958	44,105
Iowa	Iowa Stadium				X		490,600	1958	60,000
Oregon State	Parker Stadium				X			1958	28,000
Southern California	LA Memorial Coliseum				X		950,294	1958	101,528
UCLA	Los Angeles Memorial Coliseum				X		950,294	1958	101,528
Wisconsin	Camp Randall Stadium				X		482,000	1958	63,710
Baylor	Baylor Stadium				X		100,000	1959	50,000
East Carolina	College Stadium				X		20,000	1959	8,000

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Navy	Navy/Marine Corp Memorial Stadium				X		2,100,000	1959	34,000
South Carolina	Carolina Stadium				X		300,000	1959	42,517
Texas Tech	Jones Stadium				X		2,000,000	1959	41,500
Auburn	Cliff Hare Stadium				X		500,000	1960	44,500
Clemson	Memorial Stadium				X		300,000	1960	53,247
Miami of Ohio	Miami Field				X		135,000	1960	14,800
Rutgers	Rutgers Stadium				X			1960	31,219
South Carolina	Carolina Stadium				X		150,000	1960	43,099
Stanford	Stanford Stadium				X		325,000	1960	85,500
Utah	Ute Stadium				X			1960	30,000
Vanderbilt	Dudley Field				X			1960	34,000
Alabama	Denny Stadium				X		408,000	1961	43,000
Florida State	Doak Campbell Stadium				X		400,000	1961	21,000
Iowa State	Clyde Williams Field				X			1961	29,000
Northwestern	Dyche Stadium				X			1961	55,000
Army	Michie Stadium				X		2,300,000	1962	26,491
Georgia Tech	Grant Field				X		600,000	1962	53,300

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
LSU	Tiger Stadium	X			X	X	176,883	1962	67,720
Mississippi State	Scott Field				X			1962	35,000
New Mexico State	"Old" Aggie Memorial Stadium				X			1962	12,155
Tennessee	Shields-Watkins Field at Neyland Stadium				X		1,000,000	1962	51,527
Brigham Young	Hillside/B.Y.U. Stadium	X					10,000	1963	8,500
Kansas	Memorial Stadium				X		1,600,000	1963	44,900
Missouri	Memorial Stadium				X		336,900	1963	47, 628
North Carolina	Kenan Memorial Stadium				X		1,000,000	1963	48,000
West Virginia	Mountaineer Field				X		160,000	1963	38,000
Florida State	Doak Campbell Stadium				X		698,000	1964	37,500
Georgia	Sanford Stadium				X			1964	43,621
Nebraska	Memorial Stadium				X		350,000	1964	48,000
Purdue	Ross-Ade Stadium				X		556,000	1964	55,500

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Southern California	Los Angeles Memorial Coliseum	X			X	X	4,800,000	1964	93,971
UCLA	Los Angeles Memorial Coliseum	X			X	X	4,800,000	1964	93,971
Arizona	Arizona Stadium				X		1,401,317	1965	32,700
Florida	Florida Field				X		785,000	1965	62,800
Kansas	Memorial Stadium				X		1,300,000	1965	51,500
Michigan	Michigan Stadium			X				1965	101,001
Missouri	Memorial Stadium				X		250,000	1965	51,223
Nebraska	Memorial Stadium				X		225,000	1965	52,455
North Carolina State	Carter Stadium				X		290,000	1965	45,600
Ohio State	Ohio Stadium			X	X	X		1965	85,200
Oregon State	Parker Stadium				X			1965	33,000
Tulsa	Skelly Stadium			X	X	X	1,250,000	1965	40,235
Wisconsin	Camp Randall Stadium				X		2,430,000	1965	75,935
Alabama	Denny Stadium				X		1,700,000	1966	59,000
Houston	Astrodome				X			1966	62,439

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Iowa State	Clyde Williams Field				X		32,000	1966	35,000
Miami	Orange Bowl			X	X	X	544,000	1966	76,280
Nebraska	Memorial Stadium				X		350,000	1966	62,644
South Carolina	Carolina Stadium				X		110,572	1966	43,212
Temple	Temple Stadium				X		334,000	1966	34,200
Tennessee	Shields-Watkins Field at Neyland Stadium				X			1966	57,122
Toledo	Glass Bowl				X			1966	15,900
Tulsa	Skelly Stadium				X			1966	40,235
Arkansas	Razorback Stadium			X	X	X	414,000	1967	38,000
Colorado	Folsom Field				X		277,355	1967	51,000
Duke	Wade Wallace Stadium				X			1967	44,000
Georgia	Sanford Stadium				X		2,969,000	1967	59,000
Georgia Tech	Grant Field				X		1,300,000	1967	58,121
Illinois	Memorial Stadium				X			1967	71,227
Nebraska	Memorial Stadium				X		200,000	1967	64,170

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Oregon State	Parker Stadium				X			1967	40,953
Southern California	LA Memorial Coliseum				X			1967	94,500
Texas	Memorial Stadium	X					200,000	1967	60,130
Texas A&M	A&M Field/Kyle Field				X		56,000	1967	47,000
UCLA	Los Angeles Memorial Coliseum				X			1967	94,500
Washington State	Rogers Field				X		35,000	1967	23,500
Brigham Young	Cougar Stadium				X			1968	35,000
Colorado	Folsom Field			X	X	X		1968	51,000
East Carolina	Ficklen Stadium				X		300,000	1968	20,000
Miami	Orange Bowl				X		335,649	1968	80,010
Michigan	Michigan Stadium				X		75,000	1968	101,001
Missouri	Memorial Stadium				X		460,000	1968	51,223
Southern Methodist	Cotton Bowl				X			1968	72,032
Tennessee	Shields-Watkins Field at Neyland Stadium				X		200,000	1968	64,429
Vanderbilt	Dudley Field				X		250,000	1968	34,000

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Washington	University of Washington Stadium				X			1968	59,000
Washington	University of Washington Stadium				X		300,000	1968	59,000
Wisconsin	Camp Randall Stadium				X		180,000	1968	76,129
Alabama	Denny Stadium				X		172,000	1969	59,000
Arkansas	Razorback Stadium				X		700,000	1969	42,678
Army	Michie Stadium				X		4,000,000	1969	41,684
Kansas	Memorial Stadium				X		125,000	1969	51,500
Michigan	Michigan Stadium				X		250,000	1969	101,001
Michigan State	Spartan Stadium				X		250,000	1969	76,000
Northern Illinois	Huskie Stadium				X			1969	20,257
Oregon	Autzen Stadium				X			1969	40,000
Oregon State	Parker Stadium				X			1969	40,953
Penn State	Beaver Stadium				X		416,937	1969	48,344
Purdue	Ross-Ade Stadium			X	X	X	980,000	1969	68,000
Texas	Memorial Stadium				X		1,400,000	1969	65,200

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Texas A&M	A&M Field/Kyle Field				X		1,840,000	1969	48,000
Texas-El Paso	Sun bowl Stadium				X			1969	30,000
West Virginia	Mountaineer Field				X		233,000	1969	38,000
Auburn	Cliff Hare Stadium				X		850,500	1970	61,261
Cincinnati	Nippert Stadium				X		250,000	1970	28,000
Indiana	Memorial Stadium				X		535,000	1970	52,324
Kansas	Memorial Stadium				X		2,000,000	1970	51,500
Kansas State	KSU Stadium				X		250,000	1970	42,000
Minnesota	Memorial Stadium				X		360,000	1970	56,652
Nebraska	Memorial Stadium				X		232,855	1970	64,170
Oklahoma	Oklahoma Memorial Stadium				X		250,000	1970	61,826
Ole Miss	Hemingway Stadium				X		300,000	1970	34,500
Pittsburgh	Pitt Stadium				X		500,000	1970	60,000
Purdue	Ross-Ade Stadium				X		583,000	1970	69,200
Rice	Rice Stadium	X			X	X	500,000	1970	68,794

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
South Carolina	Carolina Stadium				X		165,750	1970	43,099
Southern Methodist	Cotton Bowl	X		X	X	X		1970	72,032
Texas A&M	Kyle Field				X		1,840,000	1970	49,000
Washington State	Joe Albi Stadium				X		294,500	1970	25,000
Wyoming	War Memorial Stadium			X	X	X	1,100,000	1970	25,500
Boston College	Alumni Stadium				X		800,000	1971	32,000
Colorado	Folsom Field				X		345,000	1971	51,000
Florida	Florida Field				X		200,000	1971	62,800
Georgia Tech	Grant Field				X			1971	58,121
Oklahoma State	Lewis Field			X	X	X	2,500,000	1971	50,440
Penn State	Beaver Stadium				X		1,042,239	1971	48,344
South Carolina	Williams-Brice Stadium				X		8,881,060	1971	53,865
Texas	Memorial Stadium				X		17,000,00 0	1971	77,809
Toledo	Glass Bowl				X		405,000	1971	18,500
Tulane	Tulane Stadium/ Sugar Bowl				X		225,000	1971	80,985
Baylor	Baylor Stadium				X		400,000	1972	49,000
Clemson	Memorial Stadium				X		2,500,000	1972	53,247

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
East Carolina	Ficklen Stadium				X		450,000	1972	20,000
Idaho	Idaho Stadium				X			1972	16,000
Illinois	Memorial Stadium			X			1,000,000	1972	71,227
Iowa	Kinnick Stadium				X		1,760,000	1972	60,000
Nebraska	Memorial Stadium				X		1,500,000	1972	73,650
Ohio State	Ohio Stadium				X		535,000	1972	85,200
Southern California	LA Memorial Coliseum				X			1972	93,000
Tennessee	Shields-Watkins Field at Neyland Stadium				X		1,641,369	1972	70,650
Texas Tech	Jones Stadium				X			1972	47,000
Tulsa	Skelly Stadium				X		300,000	1972	40,235
UCLA	Los Angeles Memorial Coliseum				X			1972	93,000
Washington	University of Washington Stadium				X			1972	59,000
Washington State	Martin Stadium			X	X	X	1,500,000	1972	26,500
Western Michigan	Waldo Stadium				X			1972	25,000

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Michigan	Michigan Stadium				X			1973	101,701
Michigan State	Spartan Stadium				X		175,000	1973	76,000
Northwestern	Dyche Stadium				X		500,000	1973	55,000
Texas Christian	Amon G. Carter Stadium				X			1973	46,083
Alabama	Denny Stadium				X		485,000	1974	59,000
Illinois	Memorial Stadium				X		550,000	1974	70,563
Maryland	Byrd Stadium				X			1974	40,000
Ohio State	Ohio Stadium	X					1,400,000	1974	85,200
Penn State	Beaver Stadium				X		10,000,000	1974	57,468
Texas-El Paso	Sun bowl Stadium				X			1974	30,000
Toledo	Glass Bowl	X			X	X	929,000	1974	18,500
Virginia	Scott Stadium				X		785,000	1974	25,000
Arkansas	Razorback Stadium				X		2,600,000	1975	42,678
Idaho	Kibbie Dome				X		4,200,000	1975	16,000
Miami	Orange Bowl				X		1,600,000	1975	80,010
Michigan	Michigan Stadium				X		250,000	1975	101,701
Northwestern	Dyche Stadium	X					675,000	1975	55,000
Oklahoma	Oklahoma Memorial Stadium				X		5,726,345	1975	71,187

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Purdue	Ross-Ade Stadium				X		125,000	1975	67,861
Toledo	Glass Bowl				X		120,000	1975	18,500
Washington State	Martin Stadium				X		200,000	1975	26,500
Arizona	Arizona Stadium				X		9,000,000	1976	49,700
Arizona State	Sun Devil Stadium				X		11,000,000	1976	70,491
Colorado	Folsom Field			X				1976	52,005
Iowa	Kinnick Stadium	X			X	X	1,700,000	1976	60,000
Iowa State	Jack Trice Stadium				X			1976	46,000
Michigan	Michigan Stadium	X		X		X	250,000	1976	101,701
New Mexico	University Stadium				X		1,800,000	1976	31,670
Southern Mississippi	M.M. Roberts Stadium			X			6,300,000	1976	33,000
Tennessee	Shields-Watkins Field at Neyland Stadium				X		8,100,000	1976	79,250
Army	Michie Stadium				X		750,000	1977	41,684
East Carolina	Ficklen Stadium				X		2,500,000	1977	35,000
Florida State	Doak Campbell Stadium				X		2,000,000	1977	47,413

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Illinois	Memorial Stadium				X			1977	69,200
Minnesota	Memorial Stadium				X		150,000	1977	56,652
Nebraska	Memorial Stadium				X			1977	73,531
Oregon State	Parker Stadium				X			1977	40,953
Southern California	LA Memorial Coliseum				X		9,500,000	1977	92,604
UCLA	Los Angeles Memorial Coliseum				X		9,500,000	1977	92,604
Virginia Tech	Lane Stadium/Worsham Field				X			1977	35,050
Washington	Husky Stadium				X			1977	59,000
Clemson	Memorial Stadium				X		2,934,499	1978	53,306
Colorado	Folsom Field	X						1978	52,005
Kansas	Memorial Stadium	X		X	X	X	1,800,000	1978	51,500
LSU	Tiger Stadium				X		11,500,000	1978	78,000
Miami	Orange Bowl	X		X	X	X	18,500,000	1978	80,010
Missouri	Faurot Field at Memorial Stadium				X			1978	62,023

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Nevada-Las Vegas	Las Vegas Silver Dome				X			1978	16,000
Oklahoma State	Lewis Field				X			1978	50,440
Penn State	Beaver Stadium				X		4,900,000	1978	83,770
Pittsburgh	Pitt Stadium				X		250,000	1978	56,400
San Diego State	San Diego Stadium			X				1978	50,000
Stanford	Stanford Stadium				X		750,000	1978	85,500
Toledo	Glass Bowl				X			1978	18,500
Wyoming	War Memorial Stadium				X		2,200,000	1978	33,500
Ohio State	Ohio Stadium				X		453,490	1979	85,200
Toledo	Glass Bowl	X		X	X	X	400,000	1979	18,500
Tulsa	Skelly Stadium	X					375,000	1979	40,235
Washington State	Martin Stadium			X	X	X	3,000,000	1979	37,600
Arizona State	Sun Devil Stadium	X					500,000	1980	70,491
Auburn	Jordan Hare Stadium				X		7,000,000	1980	72,169
Florida	Florida Field				X		300,000	1980	62,800
Florida State	Doak Campbell Stadium				X			1980	51,094
Kansas State	KSU Stadium				X		350,000	1980	42,000
Miami	Orange Bowl				X		440,000	1980	80,010

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Oklahoma	Oklahoma Memorial Stadium				X		4,100,000	1980	75,004
Oklahoma State	Lewis Field				X		1,800,000	1980	50,440
Ole Miss	Hemingway Stadium				X			1980	41,000
San Jose State	Spartan Stadium				X		5,600,000	1980	18,155
Tennessee	Shields-Watkins Field at Neyland Stadium				X		8,700,000	1980	89,749
Texas A&M	Kyle Field				X		26,000,000	1980	70,008
Tulsa	Skelly Stadium				X		350,000	1980	40,235
Utah State	Romney Stadium				X		500,000	1980	25,000
Virginia	Scott Stadium				X		3,175,000	1980	40,000
West Virginia	Mountaineer Field				X		22,000,000	1980	50,000
Wisconsin	Camp Randall Stadium				X		550,000	1980	76,219
Baylor	Baylor Stadium				X			1981	49,000
California	Memorial Field				X		650,000	1981	80,000
Georgia	Sanford Stadium				X		11,500,000	1981	82,122
Georgia Tech	Grant Field				X			1981	58,121

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Iowa	Kinnick Stadium				X			1981	60,000
Oklahoma	Oklahoma Memorial Stadium				X		423,000	1981	75,004
Oregon	Autzen Stadium				X		650,000	1981	40,000
Texas	Memorial Stadium				X		200,000	1981	77,809
UCLA	Rose Bowl			X	X	X	1,500,000	1981	88,565
Virginia	Scott Stadium				X		300,000	1981	40,000
Virginia Tech	Lane Stadium/Worsham Field				X		3,170,000	1981	52,500
Arizona	Arizona Stadium				X			1982	49,700
Bowling Green	Doyt Perry Stadium				X			1982	30,599
Brigham Young	Cougar Stadium				X		15,000,000	1982	65,000
Duke	Wade Wallace Stadium	X			X	X	4,000,000	1982	33,941
Florida	Florida Field				X		11,000,000	1982	72,000
Florida State	Doak Campbell Stadium				X			1982	55,246
Georgia	Sanford Stadium			X			1,000,000	1982	82,122
Louisville	Old Cardinal Stadium				X		4,000,000	1982	36,103

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Michigan	Michigan Stadium				X			1982	101,701
Northern Illinois	Huskie Stadium				X			1982	30,998
South Carolina	Williams-Brice Stadium				X		11,300,000	1982	72,400
Texas A&M	Kyle Field			X				1982	72,387
Texas-El Paso	Sun Bowl Stadium				X		6,500,000	1982	51,171
Toledo	Glass Bowl				X		420,000	1982	18,500
Tulsa	Skelly Stadium				X		375,000	1982	40,235
Utah	Rice Stadium			X	X	X	3,100,000	1982	32,500
Virginia Tech	Lane Stadium/Worsham Field				X		400,000	1982	52,500
Boston College	Alumni Stadium	X			X	X		1983	32,000
Bowling Green	Doyt Perry Stadium			X				1983	30,599
Clemson	Memorial Stadium				X		13,500,000	1983	78,000
East Carolina	Ficklen Stadium				X		160,000	1983	35,000
Iowa	Kinnick Stadium				X		1,900,000	1983	70,397
Kansas State	KSU Stadium				X		420,091	1983	42,000
Mississippi State	Scott Field				X			1983	32,000
South Carolina	Williams-Brice Stadium				X		400,000	1983	72,400

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Southern California	LA Memorial Coliseum	X			X	X	21,500,000	1983	92,516
Texas Christian	Amon G. Carter Stadium				X			1983	46,083
Virginia	Scott Stadium				X		500,000	1983	40,000
Army	Michie Stadium				X		950,000	1984	41,684
Cincinnati	Nippert Stadium	X					250,000	1984	28,000
Duke	Wade Wallace Stadium				X		500,000	1984	33,941
Georgia	Sanford Stadium				X		386,390	1984	82,122
Memphis	Liberty Bowl Memorial Stadium				X			1984	50,160
Nebraska	Memorial Stadium				X			1984	73,531
Nevada-Las Vegas	Sam Boyd Silver Bowl				X		1,200,000	1984	16,000
Northwestern	Dyche Stadium				X			1984	49,256
Ohio State	Ohio Stadium				X		2,400,000	1984	85,200
Ole Miss	Vaught-Hemingway Stadium				X			1984	41,000
Oregon	Autzen Stadium				X		363,000	1984	40,000
Oregon State	Parker Stadium				X		320,000	1984	40,953
Penn State	Beaver Stadium				X		574,000	1984	83,770
Pittsburgh	Pitt Stadium	X			X	X	1,525,000	1984	56,400

(Table 7.4 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehabilitate	Combo	Nominal Cost ($)	Facility Change	Capacity
Rutgers	Rutgers Stadium	X			X	X	3,000,000	1984	31,219
San Diego State	Jack Murphy Stadium				X		11,000,00 0	1984	60,794
Southern California	LA Memorial Coliseum	X			X	X	17,000,00 0	1984	92,516
Tulsa	Skelly Stadium				X			1984	40,235
Washington	Husky Stadium			X			532,643	1984	59,000
Washington State	Martin Stadium				X		500,000	1984	37,600

Table 7.5 Stage Four (1946-1984) Reported Acreage Sizes

School	Stadium	Acres
Alabama	Denny Stadium	4.27
Alabama	Denny Stadium	5.21
Alabama	Denny Stadium	7.18
Arizona	Arizona Stadium	8.6
Arizona State	Sun Devil Stadium	12.78
Arkansas	Razorback Stadium	11
Auburn	Jordan Hare Stadium	10.67
Baylor	Baylor Stadium	4.47
Boston College	Alumni Stadium	6.32
Bowling Green	Doyt Perry Stadium	6.61
Brigham Young	Cougar Stadium	11.02
California	California Memorial Stadium	8.63
Cincinnati	Nippert Stadium	7.8
Clemson	Memorial Stadium	13
Colorado	Folsom Field	5
Colorado State	Hughes Stadium	12
Harvard	Harvard Stadium	5.5
Houston	Astrodome	9.5
Idaho	Idaho Stadium	4.45
Illinois	Memorial Stadium	8.91
Iowa State	Jack Trice Stadium	8.26
Louisiana State	Tiger Stadium	8.7
Louisiana State	Tiger Stadium	9.9
Maryland	Byrd Stadium	6.04
Memphis	Memphis Memorial Stadium	7
Minnesota	Memorial Stadium	11
Minnesota	Hubert H. Humphrey Metrodome	20
Nevada-Las Vegas	Sam Boyd Stadium	3.34
North Carolina	Kenan Memorial Stadium	6
North Carolina	Kenan Memorial Stadium	8.75
North Carolina State	Carter Stadium	10
Ohio State	Ohio Stadium	9.8
Ole Miss	Vaught-Hemingway Stadium	8.75
Oregon	Autzen Stadium	22
Penn State	Beaver Stadium	14
Pittsburgh	Pitt Stadium	10.42
Purdue	Ross-Ade Stadium	6.59
Rice	Rice Stadium	6.7

(Table 7.5 continued)

School	Stadium	Acres
Rutgers	Rutgers Stadium	8
San Diego State	Jack Murphy Stadium	15
San Jose State	Spartan Stadium	3.01
Southern California/UCLA	Los Angeles Memorial Coliseum	17.59
Southern Methodist	Cotton Bowl	24
Stanford	Stanford Stadium	18.4
Syracuse	Archbold Stadium	6.5
Syracuse	Carrier Dome	7.7
Temple	Temple Stadium	5.67
Temple	Veterans Stadium	14.5
Tennessee	Neyland Stadium	5.5
Texas A&M	Kyle Field	30.42
Tulane	Louisiana Superdome	52
UCLA	Rose Bowl	14
Utah	Ute Stadium	5.38
Utah State	Romney Stadium	32
Virginia	Scott Stadium	17
Virginia	Scott Stadium	18.5
Virginia Tech	Lane Stadium	8.26
Wake Forest	Bowman Gray Stadium	7
Wake Forest	Groves Stadium	9.9
Washington	University of Washington Stadium	9.64
Washington	University of Washington Stadium	12.05
Washington State	Rogers Field	15
West Virginia	Mountaineer Field	10
West Virginia	Mountaineer Field	20
Wisconsin	Camp Randall Stadium	6.5
Wisconsin	Camp Randall Stadium	7.32
Wyoming	War Memorial Stadium	4

Table 7.6 Stage Four (1946-1984) Facilities With Restrooms and/or Concession Stands

School	Stadium	Year	Restrooms	Concession Stands
Air Force	Falcon Stadium	1962	2	2
Alabama	Denny Stadium	1946	8	2
Alabama	Denny Stadium	1961	16	6
Alabama	Denny Stadium	1966	31	12
Arizona State	Sun Devil Stadium	1980	60	
Baylor	Baylor Stadium	1955	11	8

(Table 7.6 continued)

School	Stadium	Year	Restrooms	Concession Stands
Bowling Green	Doyt Perry Stadium	1966	8	8
Brigham Young	Cougar Stadium	1964		8
California	California Memorial Stadium	1947	9	13
Cincinnati	Nippert Stadium	1984	2	2
Clemson	Memorial Stadium	1949	16	4
Clemson	Memorial Stadium	1960	18	5
Colorado State	Hughes Stadium	1968	4	4
East Carolina	Ficklen Stadium	1959	8	13
Florida State	Doak Campbell Stadium	1977		36
Fresno State	Bulldog Stadium	1980	9	9
Harvard	Harvard Stadium	1951	6	7
Hawaii	Aloha Stadium	1975	36	13
Houston	Astrodome	1965		42
Idaho	Idaho Stadium	1971	8	4
Iowa	Iowa Stadium	1946	15	8
Iowa	Kinnick Stadium	1983	23	8
Iowa State	Jack Trice Stadium	1976	20	
Kent State	Dix Stadium	1968	8	4
Louisiana State	Tiger Stadium	1954	34	4
Louisiana State	Tiger Stadium	1962	40	11
Louisiana State	Tiger Stadium	1978	48	23
Maryland	Byrd Stadium	1950	20	15
Memphis	Memphis Memorial Stadium	1965	10	19
Miami	Burdine Stadium	1950	20	
Miami	Orange Bowl	1978	36	
Miami of Ohio	Yager Stadium	1983	4	4
Nevada- Las Vegas	Las Vegas Stadium	1970	13	18
New Mexico	University Stadium	1960	10	8
New Mexico State	Aggie Memorial Stadium	1978	4	4
North Carolina	Kenan Memorial Stadium	1963	4	6
North Carolina State	Carter Stadium	1964	6	2
Northwestern	Dyche Stadium	1961	13	4
Ohio State	Ohio Stadium	1950		2
Ohio State	Ohio Stadium	1972		80
Oregon	Autzen	1967	12	20

(Table 7.6 continued)

School	Stadium	Year	Restrooms	Concession Stands
Oregon State	Parker Stadium	1953	4	4
Oregon State	Parker Stadium	1965	4	8
Penn State	New Beaver Field	1949	1	2
Penn State	Beaver Stadium	1960	10	
Penn State	Beaver Stadium	1969	11	
Penn State	Beaver Stadium	1978	22	9
Penn State	Beaver Stadium	1984	25	13
Pittsburgh	Pitt Stadium	1970		14
Purdue	Ross-Ade Stadium	1947	2	1
Purdue	Ross-Ade Stadium	1955	12	
Purdue	Ross-Ade Stadium	1970	16	14
Rice	Rice Stadium	1950	22	13
San Diego State	San Diego Stadium	1978	74	52
San Diego State	Jack Murphy Stadium	1984	96	52
San Jose State	Spartan Stadium	1948	13	6
Stanford	Stanford Stadium	1960	19	10
Syracuse	Carrier Dome	1980	14	34
Temple	Veterans Stadium	1978		64
Texas Christian	Amon G. Carter Stadium	1948	6	6
Texas Christian	Amon G. Carter Stadium	1973	12	6
Texas- El Paso	Sun Bowl Stadium	1980	12	18
Toledo	Glass Bowl	1966	6	2
Toledo	Glass Bowl	1979	6	4
Tulsa	Skelly Stadium	1965	8	
Tulsa	Skelly Stadium	1980	8	10
UCLA/Southern California	Los Angeles Memorial Coliseum	1967		62
UCLA	Rose Bowl	1981	40	15
Utah	Rice Stadium	1972	30	16
Vanderbilt	Vanderbilt Stadium	1981	10	7
Virginia	Scott Stadium	1974	52	8
Virginia	Scott Stadium	1983	95	8
Wake Forest	Bowman Gray Stadium	1956	12	8
Wake Forest	Groves Stadium	1968	14	10
Washington State	Joe Albi Stadium	1970	10	3
Washington State	Martin Stadium	1975	25	11
Western Michigan	Waldo Stadium	1972	6	3

Table 7.7 Stage Four (1946-1984) Facilities With Reported Parking Numbers

School	Stadium	Year	Parking
Air Force	Falcon Stadium	1962	11,400
Alabama	Denny Stadium	1946	10,000
Arizona State	Sun Devil Stadium	1980	3,500
Baylor	Baylor Stadium	1950	2,715
Bowling Green	Doyt Perry Stadium	1966	1,200
Brigham Young	Cougar Stadium	1964	2,000
California	Memorial Stadium	1947	10,000
Clemson	Memorial Stadium	1949	9,500
Clemson	Memorial Stadium	1972	10,885
Clemson	Memorial Stadium	1978	13,327
Clemson	Memorial Stadium	1983	19,500
Colorado State	Hughes Stadium	1968	4,500
Duke	Wallace Wade Stadium	1967	2,000
East Carolina	College Stadium	1949	2,500
East Carolina	Ficklen Stadium	1963	2,500
Florida	Florida Field	1980	20,000
Florida State	Doak Campbell Stadium	1961	2,050
Florida State	Doak Campbell Stadium	1964	4,500
Fresno State	Bulldog Stadium	1980	4,200
Georgia	Sanford Stadium	1981	14,000
Hawaii	Aloha Stadium	1975	8,000
Houston	Astrodome	1965	24,000
Idaho	Idaho Stadium	1971	1,700
Indiana	Memorial Stadium	1960	8,000
Indiana	Memorial Stadium	1970	12,000
Iowa	Iowa Stadium	1958	3,500
Kansas State	KSU Stadium	1968	13,000
Kentucky	Commonwealth Stadium	1973	10,000
Louisville	Old Cardinal Stadium	1957	7,000
Louisiana State	Tiger Stadium	1954	1,350
Louisiana State	Tiger Stadium	1978	2,400
Memphis	Memphis Memorial Stadium	1965	7,000
Miami	Burdine Stadium	1950	2,600
Miami	Orange Bowl	1968	3,600
Minnesota	Hubert H. Humphrey Metrodome	1982	500
Nebraska	Memorial Stadium	1977	2,000
Nevada-Las Vegas	Las Vegas Silver Bowl Stadium	1978	16,000

(Table 7.7 continued)

School	Stadium	Year	Parking
New Mexico	University Stadium	1960	4,000
New Mexico State	‘Old’ Aggie Memorial Stadium	1962	1,000
New Mexico State	Aggie Memorial Stadium	1978	5,000
North Carolina	Kenan Memorial Stadium	1963	3,500
North Carolina State	Carter Stadium	1964	8,000
Northern Illinois	Huskie Stadium	1969	2,200
Oregon	Autzen Stadium	1967	8,400
Penn State	Beaver Stadium	1960	10,000
Penn State	Beaver Stadium	1969	14,000
Penn State	Beaver Stadium	1974	16,000
Penn State	Beaver Stadium	1978	20,000
Pittsburgh	Pitt Stadium	1970	14,000
Purdue	Ross-Ade Stadium	1947	250
Purdue	Ross-Ade Stadium	1950	2,787
Rice	Rice Stadium	1950	7,700
Rutgers	Rutgers Stadium	1953	5,000
San Diego State	San Diego Stadium	1978	18,500
South Carolina	Williams-Brice Stadium	1971	4,500
Southern California/UCLA	Los Angeles Memorial Coliseum	1977	19,000
Southern Methodist	Cotton Bowl	1949	20,000
Southern Mississippi	M. M. Roberts Stadium	1976	5,000
Stanford	Stanford Stadium	1960	10,000
Syracuse	Carrier Dome	1980	8,000
Temple	Veterans Stadium	1978	16,000
Tennessee	Neyland Stadium	1976	10,750
Texas	Memorial Stadium	1948	500
Texas A&M	Kyle Field	1980	3,550
Texas Christian	Amon G. Carter Stadium	1948	5,000
Texas Christian	Amon G. Carter Stadium	1973	4,000
Texas- El Paso	Sun Bowl Stadium	1963	7,900
Toledo	Glass Bowl	1971	5,500
Tulane	Louisiana Superdome	1975	5,000
Tulsa	Skelly Stadium	1947	2,500
UCLA	Rose Bowl	1981	20,000
Virginia	Scott Stadium	1974	5,000
Wake Forest	Groves Stadium	1968	9,899
Washington State	Martin Stadium	1972	3,743
West Virginia	Mountaineer Field	1980	5,000
Wisconsin	Camp Randall Stadium	1951	4,000
Wyoming	War Memorial Stadium	1970	4,159

broadcast of its October 1953 game against the University of Mississippi (Henry & Bailey, 1996). By 1954, ABC paid $2.5 million for the rights to be the sole broadcaster of college football games (Smith, 2001). Six years later, ABC paid $6,251,114 to the NCAA for the rights to broadcast the 1960 and 1961 seasons (Dunnavant, 2004). By the 1980s, television was generating over $250 million over the four-year period from 1982 to 1985 (Dunnavant, 2004). Universities were encouraged to develop spaces for television in order to get part of the money earned through the television deal.

Innovation Diffusion

Over the 37-year period covered by Stage Four, innovation diffusion was evident in each of the five significant innovations discussed. Television diffused quickly following WWII, moving from major cities, especially those on the East Coast, toward less populated places as availability of televisions and related technology became available to more and more Americans (Barnouw, 1968; Fisher & Fisher, 1996). Television also significantly impacted the diffusion of other innovations, as television became a primary communication channel for innovations. Construction technology allowed larger facilities to be built within smaller spaces without creating obstructed views. A relationship likely exists between the construction of municipal venues for professional teams that occurred during Stage Four and similar construction that occurred at universities around the country. Technological improvements that developed in Stage Four, particularly artificial turf diffused very quickly in Stage Four. Electronic scoreboards and luxury seating spread slower than artificial turf, and would not become common at all venues until Stage Five. The impact of social system, communication channels, time and geography were significant in the diffusion of innovations during Stage Four.

Social System

The social system of the NCAA was strongly developed by the start of Stage Four, with almost 200 members by 1950, and grew increasingly over Stage Four (Crowley, 2006). For instance, NCAA membership by the beginning of the 1980s was over 900 members and included 300 schools in Division I that played football (NCAA v. Board, 1984). Annual meetings allowed schools to come together to discuss problems common amongst football playing schools, and amongst all the membership institutions of the NCAA.

Another important part of the strengthening of the social system was the continued growth of conferences by the end of Stage Four. By 1983, most of the modern conferences commonly discussed by scholars related to college football were formed. The Atlantic Coast Conference (ACC) was formed by a group of seven members from the old Southern Conference in 1953 (Gall, 2014). The Big Ten, Big Eight, Pacific Coast Conference, Southwest Conference and the Southeastern Conference were already in existence prior to Stage Four. The conference membership met regularly, along with consistent communication via phone. Conference members usually played other conference members every year in the sports sponsored by the conference, thus diffusion was likely high. Visits to opposing conference schools were increasingly common for leadership of traveling universities. Also due to bowl game ties and other traditional relationships, intersectional games between certain conferences became common. One such example was games occurring between the PCC and the Big Ten. The combination of a strong powerful national organization and strong conferences created a very strong social system that significantly influenced the diffusion of innovations during Stage Four.

Communication Channels

No previously developed communication channel had the impact that television did on the diffusion of innovations. For the first time, interested spectators from around the country could directly view via the television, what was occurring inside the football stadium. This meant from a diffusion standpoint, opinion leaders at other universities could watch a game on television and learn about stadium improvements at other universities. One particular innovation where the impact of television seems most clear is the innovation of artificial turf. Artificial turf, as previously discussed was developed for the Astrodome in Houston, Texas. Undoubtedly, as part of the television package for Major League Baseball (MLB) at least one game was broadcast from the Houston Astrodome during the 1966 and 1967 seasons, exposing hundreds of thousands of spectators to the new surface (Gowran, 1966; Strecker, Gietschier, Nathanson Fortunato, & Surdam, 2015). Most likely opinion leaders at universities that were early adopters either watched the broadcast or heard other reporting about the surface. The schools learned about cost from other members, but also about the reduction of maintenance costs as previously discussed.

The lowered cost of maintenance was particularly important due to the rising costs of college sports during Stage Four (“Expenses, Income of, 1970; Seifried, 2012, in press; Williamson, 2012). Universities were no longer making money off athletics, but instead were losing money on college sports (Williamson, 2012). Part of this loss was on the increasing enrollments on college campuses, which meant fewer seats inside the football stadium could be sold to the general public (Seifried, in press). Other pressures included the passage of Title IX and the continued addition of non-revenue generating sports (“Expenses, Income of, 1970; Forest & Kisner, 2002; Williamson, 2012). The importance of technological innovations that lowered costs such as artificial turf were increasingly important during Stage Four.

Due to television, geographic proximity had far less influence in the spread of innovations in Stage Four than in the previous stages. As previously discussed, artificial turf quickly spread to schools all across the country within five years of the original innovation. The speed of diffusion increased rapidly following the improvements in mass media communications, primarily the television. Virtual geography began to flourish in Stage Four. Mass media communications allowed universities around the country to learn about innovations happening inside other university stadiums. The interested university could then contact the innovator and learn more about the innovation, through a simple telephone call. Turf and its different diffusion pattern are clearly impacted by the development of the television as a mass media communication device.

The television also brought other technological improvements discussed previously into the home as well. The television allowed remote viewers to become a part of the action of the game hundreds of miles away (Seifried, 2011). From a diffusion standpoint, television served as mass media communication to universities across the U.S. about the success of innovations. Opinion leaders were able to experience how new scoreboard technology engaged the in-stadium fan during a contest, as often the camera would present the viewer with an image of the scoreboard while the crowd was quite loud. Opinion leaders would then share the impact of what they experienced with others at their institution, leading to the adoption of a new scoreboard with similar technology at the university. The importance of television as a mass media communications device for innovation diffusion is difficult to understate. No longer did an opinion leader have to either be in direct attendance or imagine the image of what an improvement looked like. Television allowed the viewer to experience exactly what the

innovations brought to the stadium and the spectator, increasing the likelihood of adoption of the innovation.

While television became the mass media communication device of choice during Stage Four, it is important to remember that radio and the newspaper continued to share information about the development of stadiums as part of their coverage of college football. Finally, consistent space was used in newspapers discussing improvements to facilities, along with pictures of the new venues ("Gators Dedicate New," 1951; "Georgia Plans Expansion," 1966; Ostiller, 1978, etc.). As Stage Four progressed, newspaper coverage of expansions and stadium improvements increased greatly. And as news wires continued to share stories with other papers around the country, it is certainly possible that others learned of innovations through the newspaper. Radio also continued as an important medium for the spread of information. As automobiles continued to gain popularity, many began to have radios built into the structures of the vehicle (Lendino, 2012). By the 1950s, AM and FM radio receivers were common in most cars (Lendino, 2012). This meant that an interested listener could listen to a sporting event while traveling.

While mass media communication played a significant role in the development of the modern stadium, it is important to note that interpersonal communication was important during the period. As previously examined, opinion leaders were in constant communication as members of both the NCAA and conference organizations. These organizations met regularly to discuss important issues impacting college football and other sports sponsored by the university. As previously mentioned, when television became a controversial topic in 1950, both the NCAA and several conferences met to discuss ways to handle television and the challenges it brought to universities around the U.S (Smith, 2001).

Interpersonal communication also commonly occurred at games, where the home university hosted important leaders from the visiting university, especially inside the President's boxes developed at eight universities during the Stage (Dunnavant, 2004; Oriard, 2001; Smith, 2001). No doubt many of the conversations that occurred during visits to opposing schools, whether the opponent was a conference school or an out of conference school revolved around the important events of the day. Unquestionably, the challenges of television would have been discussed, as most likely would stadium improvements and other innovations in technology. Interpersonal communication also allowed the visiting dignitaries to experience the innovation in person, as travel became increasingly easier as time moved through Stage Four.

Time and Geography

The diffusion of the innovations found in Stage Four occurred at a quicker rate than in previous stages. Television in particular diffused at an extremely rapid rate. In 1939, around 1,000 spectators were able to watch the first football broadcast on television (Patton 1984; Whittingham, 1984). Yet within the first five years following WWII, over 9.2 million televisions were owned in America (Dunnavant, 2004). The diffusion of television across the U.S. was unlike any other innovation previously discussed. The diffusion started in the cities, especially along the east coast, where large numbers of consumers were in close geographic proximity, providing a larger audience for broadcasters. Quickly the television spread westward and South, into both highly populated areas and less densely populated areas.

One key change in the diffusion of the innovations of Stage Four was the development of time-geography clusters of innovations. Television represents one such innovation, where New York, Philadelphia and Boston were among the first cities to develop significant television stations (Barnouw, 1968; Dunnavant, 2004). As was common in previous Stages, the diffusion of

television was influenced by the neighborhood effect. Television stations tended to develop in close proximity to other television stations. Though, it is important to note that college football broadcasting did not originally occur at Harvard, Yale or Princeton, as many previous innovations. Diffusion away from these large cities occurred quickly, but still in the cluster format found commonly in earlier stages. In Stage Four, the East coast and the Midwest dominated television ownership and viewership, helping to explain how Penn and Notre Dame became the two universities to profit the greatest from the early development of television. Penn with its location in Philadelphia was located in the heart of where most of the televisions were located during Stage Four. Notre Dame, which was near Chicago, was able to connect through coaxial cable to Chicago and broadcast its games to the East coast, where a large portion of the population was Catholic, and therefore interested in Notre Dame football (Dunnavant, 2004). The Northeast cluster focused on Penn, Columbia and other universities that were in large towns. Notre Dame, while found in the Midwest, attempted to establish itself as part of the Northeast cluster, due to the high number of Catholics found in the Northeast (Dunnavant, 2004; Smith, 2001). While Du Mont was willing to pay Notre Dame a significant sum of money, it was only willing to do so because it could broadcast those games to the Northeast, where most of the televisions were found in 1950.

Unlike any previous innovation, the social system dominated the adoption of television. When the NCAA TV committee decided in 1951 to control television, it also in many ways controlled the diffusion of television and the required press box and camera spaces to university campuses. Universities that were broadcasting games consistently as part of the NCAA television package added spaces for television. In many ways it was a form of Hagerstand's hierarchical diffusion in action. Universities that were the strongest football powers received

relatively more broadcasts than smaller schools and in turn were the first to adopt spaces for television (Dunnavant, 2004; Smith, 2001). The rules of the television agreement guaranteed that schools not traditionally viewed as football powers would be broadcast occasionally, and in turn developed smaller, less advanced spaces for television. No clear geographic pattern developed for television, beyond the early development of the Northeastern cluster, and a limited development of a Midwestern cluster around Chicago.

By Stage Four, at least partially due to television, the geographic cluster of innovation seems to disappear for the first adopters. As previously discussed, the first adoption of artificial turf occurred in the deep South at the Houston Astrodome (Ritter, 1992). Yet by 1968, schools on the West Coast, Midwest and Southeast had all adopted turf. These universities were innovators according to Rogers (2003) adopter categories. For the first time, the Northeast lagged behind the rest of the country in innovation diffusion. Many of the traditional schools of the Northeast cluster de-emphasized football in Stage Four, and those that were left often shared venues with professional teams. Northeastern schools that had on campus football stadiums adopted turf later than those in other parts of the country, with most falling into the early majority adopter category. The second wave of adoption started to form more of the cluster experienced during previous stages, with schools close to the first adopters adopting the surface following some sort of experience with the innovation. Some of the traditional neighborhood effect was found in the second wave of turf adoptions. However, unlike previous Stages where the time-geography cluster was very clear, clustering found in Stage Four was much more limited, and geographically diverse. Due to improvements in communication technology, universities no longer needed to be in close geographic proximity to learn of the development of an innovation.

Television and other mass media communication devices allowed for the quick diffusion of turf, new scoreboards and to a lesser extent, luxury suites. Rates of adoption increased significantly due to the development of television as a mass media communications tool. Virtual geography began to limit the impact of traditional spatial geography on the development of the stadium. Stage Four significantly changed the stadium to resemble a structure much closer to the modern stadium than any previous Stage. At the end of Stage Four, many of the structures expected in a modern stadium, from the press box, to concessions and restrooms were constructed. Other amenities were yet to come, and Stage Five would bring the development of the stadium to the modern standard. It is important to note that by Stage Four, stadiums were large and in many ways very similar to the stadiums of the current era. Stage Four facilities were complex structures. Television and radio could broadcast from most universities, and spectators could enjoy amenities traditionally lacking before Stage Four. The diffusion of basic spectator amenities had occurred rapidly by Stage Four, and Stage Five would see a significant increase in the importance of spectator amenities, as athletic departments attempted to raise more and more money to fund stadium improvements and other athletic expenditures through alumni donations.

Chapter Eight: The Development of the Spectator Driven Stadium

Much like previous stages, innovation adoption and diffusion occurred at least partially because of other important trends in the U.S. For instance, by 2014, the U.S. Census Bureau (2015) estimated that the American population was 318 million people, up from 234 million in 1984, the first year of Stage 5 (U.S. Census Bureau, 2000). In 1984, 10.9 million students were enrolled in colleges and universities with 8.059 million enrolled in four-year universities at either the undergraduate or graduate level (Bureau of the Census, 1984). The 8.059 million enrolled was a growth of 6 million four-year institution students over the previous 30 years. By 2013, college and university enrollment grew to 19.5 million with 14.2 million enrolled as either undergraduate or graduate student at four-year universities (U.S. Census Bureau, 2014). Correspondingly, attendance at college football games grew during this period. As an example, in 1984, 105 teams in Division I-FBS generated attendance from over 25 million fans to average 42,548 per game (NCAA, 2009). By 2014, 125 teams involved in Division I-FBS produced attendance over 37 million and an average of 44,603 per game ("2014 National College," 2015).

Stage Five represents the development of the modern stadium, where both overt structures (e.g., luxury and club seating, advertising, scoreboards and ribbon boards) and latent structures (e.g., restrooms, concessions, and security) developed to significantly change the shape of the modern college football venue. As Seifried (2005, 2010a) suggested for professional sport, universities built college football stadiums to generate more revenue. Previously, universities lost significant money on athletics for a variety of reasons such as Title IX related expenses, coaching salaries, and cost of scholarship ("Expenses, Income of," 1970; Forest & Kisner, 2002; Williamson, 2012). From an innovation perspective, several important spectator-related innovations significantly improved the in-stadium spectator experience and sought to

mirror stadiums of professional sport. For example, innovations in scoreboard technology, seating options, and sound systems improved the game day experience for the live spectator. Lastly, significant improvements inside the stadium allowed for the continued development of the facility as a broadcast studio to provide entertainment for remote spectators around the country (Seifried, 2011).

Unlike professional sport venues, university venues were primarily constructed before Stage Five, and thus renovation was the primary source of change. Specifically, only 15 new venues out of the 691 total projects during the Stage Five, were new construction and those were mainly associated with new start-up Division I-FBS programs or institutions that transitioned into Division I-FBS (e.g., Florida Atlantic, Florida International, Central Florida, South Florida, South Alabama, University of Texas San Antonio, Connecticut, and Massachusetts). Virtually every stadium in use during Stage Five received at least one renovation, with several receiving multiple renovation projects over the course of the stage. Many of these projects were funded by fundraising organizations (i.e., non-profit tax exempt foundations), which moved from being booster groups often loosely associated with the athletic program and alumni to organizations that provided significant private funding through businesses, alumni, and non-alumni (Benedict & Keteyian, 2013; Wetzel, Peter & Passan, 2011). It is important to note the role that these foundations such as the Louisiana State University's Tiger Athletic Foundation (LSU TAF) amongst many others had in the development and design of renovations during Stage Five (Clotfelter, 2011). TAF was founded as a 501(c)3 non-profit status organization with the goal of raising funds to support Louisiana State athletics, particularly aimed at the renovation of existing stadiums and the development of new facilities for the athletic department (Seifried, in press; "Tiger Athletic Foundation," 2011).

Another important note in the development of the modern stadium was the importance of the stadium to the university. Seifried and Clopton (2013) noted the importance of the stadium as a social anchor for the university community. Fan nations develop a common association with a physical location (i.e., the stadium) through an emotional link developed from repeated visits to the location (Milligan, 1998). Seifried (2011) further pointed out that the link between the fan nation and the stadium can develop without ever visiting the venue, because of the development of the stadium as a broadcast studio allows the remote fan to feel a part of the action ongoing inside the venue. Toma (2003) further argued that stadiums allow disparate groups to unite in the stadium around the university, and in particular the football team. The stadium became an important part of the university community after decades on campus, and in many ways, became one of the key rationales when universities decided to expand or renovate the current structure instead of building a new structure at a different site (Seifried & Clopton, 2013).

The development of the modern stadium inside the structure of a facility created many unique and difficult challenges. Thus, universities chose to attack their challenges in very diverse ways, from additions to the existing superstructure (Seifried, in press) to tearing down the structure and completely reconstructing the venue on the same site ("Husky Stadium to," 2013; Johnson, 2006). Each project brought different and unique challenges, but one constant found at most university campuses was the relative inability to enlarge the site of the stadium, as the university campus surrounded the location of most of the venues by the start of Stage Five. Available information on Stage Four venues shows the average acreage size was 10.85 for the average 48,495-seat stadium. In Stage Five, for the 691 venues included in the study, the average size of the changed facility was 11.9 acres despite the fact many more amenities were added and

the average capacity increased to 53,316. Please see tables 8.1 and 8.2 for information on acreage size of venues in Stage Five.

Table 8.1 Stage Five (1985-2014) Reported Acreage Sizes- New Construction

School	Stadium	Acres
Akron	InfoCision Stadium	5.74
Baylor	McLane Stadium	93
Central Florida	Brighthouse Networks Stadium	25
Connecticut	Rentschler Field	8.5
Florida Atlantic	FAU Football Stadium	10
Minnesota	TCF Bank Stadium	27.4
North Texas	Apogee Stadium	46
Pittsburgh	Heinz Field	34.2
Southern Methodist	Gerald Ford Stadium	3
Stanford	Stanford Stadium	18.4
Temple	Lincoln Financial Field	43
Washington	Husky Stadium	12.05

Table 8.2 Stage Five (1985-2014) Reported Acreage Sizes- Renovation

School	Stadium	Year	Acres
Akron	Rubber Bowl	1991	13.79
Alabama	Bryant-Denny Stadium	1988	7,18
Alabama	Bryant-Denny Stadium	1998	8.1
Alabama	Bryant-Denny Stadium	2006	9.2
Alabama	Bryant-Denny Stadium	2010	10.1
Arizona	Arizona Stadium	1989	8.6
Arizona	Arizona Stadium	2013	12.6
Arizona State	Sun Devil Stadium	1988	12.76
Arkansas	Razorback Stadium	1985	11
Arkansas State	Indian Stadium	2001	10,9
Army	Michie Stadium	2004	7.81
Auburn	Jordan Hare Stadium	1987	10.67
Baylor	Floyd Casey Stadium	1990	4.47
Boston College	Alumni Stadium	1988	6.32
Boston College	Alumni Stadium	2005	7.91
Bowling Green	Doyt Perry Stadium	1986	6.61
Brigham Young	Cougar Stadium	1997	11.02
Buffalo	UB Stadium	1999	3.4

(Table 8.2 continued)

School	Stadium	Year	Acres
California	California Memorial Stadium	1995	8.63
Central Michigan	Kelly/Shorts Stadium	1986	4.59
Cincinnati	Nippert Stadium	1992	7.8
Clemson	Memorial Stadium	1990	13
Colorado	Folsom Field	1989	5
Colorado	Folsom Field	1991	11.82
Colorado State	Hughes Stadium	2005	12
Florida	Ben Hill Griffin Stadium	1991	10.83
Fresno State	Bulldog Stadium	1992	8.38
Houston	Astrodome	1988	9.5
Idaho	Kibbie Dome	2002	4.45
Idaho	Kibbie Dome	2010	5
Illinois	Memorial Stadium	1985	8.91
Iowa	Kinnick Stadium	1990	11.02
Iowa State	Jack Trice Stadium	1994	8.26
Kansas State	KSU Stadium	1991	12.05
Kansas State	Bill Snyder Family Stadium	2013	17.65
Louisiana-Lafayette	Cajun Field	2008	4.2
Louisiana State	Tiger Stadium	1985	9.9
Louisiana State	Tiger Stadium	2014	15.85
Maryland	Byrd Stadium	1991	7
Maryland	Byrd Stadium	2009	9.27
Memphis	Liberty Bowl Memorial Stadium	1986	7
Michigan State	Spartan Stadium	1998	5.97
Minnesota	Hubert H. Humphrey Metrodome	1987	20
Nevada-Las Vegas	Sam Boyd Stadium	1996	3.34
North Carolina	Kenan Memorial Stadium	1988	8.75
North Carolina	Kenan Memorial Stadium	2007	10.37
North Carolina State	Carter-Finley Stadium	2000	10
North Texas	Fouts Field	2003	21
Notre Dame	Notre Dame Stadium	1997	12.49
Ohio State	Ohio Stadium	1989	9.8
Ohio State	Ohio Stadium	2001	14.5
Oklahoma	Memorial Stadium	1999	15

(Table 8.2 continued)

School	Stadium	Year	Acres
Oklahoma State	Boone Pickens Stadium	2004	13.77
Ole Miss	Vaught-Hemingway Stadium	1988	8.75
Oregon	Autzen Stadium	1988	22
Pittsburgh	Pitt Stadium	1987	10.42
Purdue	Ross-Ade Stadium	1985	6.59
Rice	Rice Stadium	1996	6.7
Rutgers	Rutgers Stadium	1994	8
San Diego State	Qualcomm Stadium	1997	15
San Jose State	Spartan Stadium	1985	3.01
South Florida	Raymond James Stadium	2009	37.88
Southern California	Los Angeles Memorial Coliseum	1992	17.59
Southern Methodist	Ownby Stadium	1989	3
Southern Mississippi	M. M. Roberts Stadium	2002	4.4
Stanford	Stanford Stadium	1985	18.4
Syracuse	Carrier Dome	1989	7.7
Temple	Veterans Stadium	1985	14.5
Tennessee	Neyland Stadium	1987	5.5
Texas A&M	Kyle Field	1987	30.42
Texas Christian	Amon G. Carter Stadium	1996	6.21
Texas State	Bobcat Stadium	2012	24
Tulane	Louisiana Superdome	1996	52
UCLA	Rose Bowl	1992	14
Utah	Rice Stadium	1989	5.38
Utah	Rice-Eccles Stadium	1998	9
Utah State	Romney Stadium	1997	32
Virginia	Scott Stadium	1985	18.05
Virginia	Scott Stadium	2000	21.5
Virginia Tech	Lane Stadium	1991	8.26
Wake Forest	Groves Stadium	1998	9.9
Washington	Husky Stadium	1987	12.05
West Virginia	Mountaineer Field	1985	20
Wisconsin	Camp Randall Stadium	1990	7.32
Wyoming	War Memorial Stadium	2001	4

Stage Five starts with the luxury seating area construction boom first demonstrated in the South starting in 1985. The popularity of football in the South had grown significantly and their stadiums grew to be as complex as other venues around the country. The first part of Chapter Eight deals addresses the development of luxury seating occurred because they produced an incredible new source of revenue. Another important source of revenue emerged through television contracts established between conferences (and in the case of Notre Dame, an individual university) and broadcasting companies. In order for the conferences to be able to work with broadcasting companies to broadcast games, stadiums had to better support television. The second section of Chapter Eight briefly examines the break of NCAA control over television contracts through the U.S. court decision NCAA v. Board of Regents of the University of Oklahoma (NCAA v. Board of Regents) and comments on what this meant for college football stadium construction. The third section of this chapter covers additional amenities and technological changes to the stadium such as video boards, disabled seating, restrooms, concessions, and the field surface. Finally, this chapter concludes with a short section on the emergence of a new renovation trend called reconstruction.

Luxury and Club Seats

Following the addition of limited luxury seating to the Houston Astrodome in the 1960s, professional sport venues began to add luxury seating options to stadiums as a way to generate new revenue sources for the franchise (Seifried, 2005). Starting in 1985, universities similarly began to adopt luxury suites and club seating, two new luxury options commonly found in professional venues. In the end, over 180 projects specifically mentioned the construction of luxury areas, with several more projects likely including the introduction of the spaces from 1985 to 2015. By the end of 2015, only five Division I FBS programs did not have luxury or club

seating out of 125 programs. At the start of 1985, only eight university controlled venues had President's Boxes. As shown in Chapter Seven, previous space set aside for the university President and a few donors or visiting guests identified as the President's box were the lone example of luxury seating. The following section will examine the wide variety of club and luxury suite offerings developed during Stage Five, from the very simple club seating options developed at several smaller FBS programs to the extensive projects developed at major FBS programs like Louisiana State, Texas and Alabama amongst many others.

The process to incorporate luxury suites started at schools in the South, where the popularity of the college game had grown significantly. However, projects would eventually spread around the country. Before going into the specific examples, it is necessary to provide a basic definition of what is meant by club seats and luxury suites. Club seats usually involve a large enclosed space shared by all who have access to the area, sometimes including unique food and beverages (Seifried, 2012; "Stadium Club and," 2016; "TCF Bank Stadium," 2016). Seating was often available on the outside of the club, though not always ("Seating and Parking," 2016; Seifried, 2012; "Stadium Club and," 2016). Luxury suites were considered a step above club seating, and came in a variety of options. Some early representatives such as the Loge Boxes at the University of Colorado were small four seat sections separated from other groups by some sort of divider ("Touchdown Loge Boxes" 2016). Contemporary luxury suites were later developed as individual room spaces seating from 15-40 people, usually entered separately from the rest of the venue ("Stadium club and," 2016; "TCF Bank Stadium," 2016). Suites usually have two spaces, one inside with seating and televisions with access to the game broadcast and many offer traditional cable or satellite ("Cyclone Club," 2016; "Suites," 2016). An outside

seating space is usually offered, either with traditional stadium seating, theater style padded seating or bar seating for the ticketholders ("Cyclone Club," 2016; Muret, 2012; Seifried, 2012).

The University of Arkansas was an innovator in the usage of luxury suites as defined by Rogers (2003). They were classified as an innovator because they were one of the first universities to adopt luxury seating with the development of 36 sky boxes as part of a $10 million project to add seats and update the press box on the west side of Razorback Stadium (Connors, 1994; Ward, 1983). The spaces rented for at least $10,000 for the season when they opened, meaning they generated at least $360,000 for the university in extra revenue each season (Charton, 1985). The $10 million was funded by the State of Arkansas as part of a 10,000-seat addition to Razorback Stadium (Connors, 1994; Ward, 1983). In return, the owner received access for 24 guests to the space (Charton, 1985).

A second wave of luxury construction for the University of Arkansas would start in 1999 and completely change the facility. The new additions included luxury spaces at Razorback Stadium as part of a $110 million project ("Donald W. Reynolds," 2016). The total addition included 19,000 seats and the south end zone was completely enclosed ("Saturday Down South," 2016). Specifically, the renovation included the addition of over 9,000 club seats and 70 more luxury suites (Cook, Dungan & Moody, 2001; Schroeder, 2005). Two unique club spaces were developed as part of the renovation. A letterman's club was developed on the east side of the stadium, a 3,600-square foot space with room for 1,594 seats outdoors and another 2,200 indoors (King, 2001). Elsewhere, 40 suites were included in the east side expansion (Cook et al., 2001). Another club was also included in the newly enclosed south end zone, including 3,720 outdoor seats that supported another 1,700 seats indoors (Schroeder, 2005). In the south end zone, 30 luxury suites were included to complete the complex (King, 2001). The value of the stadium

luxury spaces provided significant revenue. For example, in 2015 Tyson Foods paid $69,300 for a suite in Donald W. Reynolds Razorback Memorial Stadium, while a total of 20 more donors paid over $648,000 combined for access to individual suites in the stadium (Joyner, 2015). The total amount paid for the 126 suites leased for the 2015 season inside the stadium was $4,055,700 (Joyner, 2015).

Arkansas was hardly alone amongst Southern schools investing in the development of luxury spaces. For example, the University of Alabama adopted luxury boxes in 1998 at a cost of $15 million for 85 total boxes on the east side of Bryant-Denny Stadium (Latta, 2006; Low, 2007). These first sky boxes were described as being apartment-like, with plush carpet and comfortable couches (Parrott, 2003). Suite leaseholders paid $35,000 a year for the 20-seat box and $75,000 a season for a 50-seat box in 1998 (Parrott, 2003). Each of the 85 had their own personal restroom space, and included windows that could be opened by the suite-holder (Latta, 2006). The spaces also included televisions and access to bring in alcohol during the week for game day and sold out quickly (Latta, 2006; Low, 2007; Parrott, 2003).

The 1998 project was so successful that the university added 36 more as part of the 2006 addition to the north end zone of Bryant-Denny Stadium (Latta, 2006). The $47 million project added over 8,000 bleacher seats, a club area with 15,500-square feet of enclosed space and 1,690 outdoor seats and 38 luxury suites ("Bryant-Denny Stadium," 2010; "Bryant-Denny Stadium," 2016; Crimson Tide Hospitality, 2012). The 15,500-square foot luxury club allowed for the university to reach donors that were unable to afford the more expensive suites, or remained on the long waiting list for the spaces ("Bryant-Denny Stadium," 2010; Crimson Tide Hospitality, 2012; Low, 2007). The club space was equipped with several restrooms, multiple televisions and access to a buffet, along with personal lockers for each ticketholder (Crimson Tide Hospitality,

2012). The 38 luxury suites included in the north end zone project were different from those previously constructed in Bryant-Denny Stadium. For one thing, each suite did not have its own restroom, but instead shared restroom facilities with other suites (Latta, 2006). Interestingly, each skybox required a one-time $500,000 pledge and, in 2007, cost $38,500 for the year for the box and another $6,400 for the tickets to the suite (Low, 2007). Each suite holder was able to design their suite to their personal taste following the $500,000 payment (Low, 2007). On the rare occasion a suite became available, the next person on the waiting list had to pay the $500,000 and the cost of the suite and tickets for the year in order to secure the box (Latta, 2006; Low, 2007). The popularity of the suites and club spaces were immense, causing Alabama to seek a way to increase the spaces available for sale to Crimson Tide spectators.

Following the success of the 2006 renovation the north end of Bryant-Denny Stadium, the University of Alabama decided to develop similar spaces on the south end of the stadium. That $65 million project included the development of two club spaces and 36 luxury suites, including four larger party boxes (Davis Architects, 2013; Dugan, 2012). The total capacity increased by over 9,000 bringing Bryant-Denny to over 101,000 total seats ("Bryant-Denny Stadium," 2016). The south end zone project also included the development of the south zone, a club very similar to the already developed north zone club (Crimson Tide Hospitality, 2012). The south end zone project meant that Bryant-Denny had over 3,000 club seats and 159 luxury boxes (Dugan, 2012). All of the spaces were sold out before the building ever opened, and provided the university with millions of extra revenue from luxury seating (Casagrande, 2010; Low, 2007). Furthermore, the development of Alabama's Bryant-Denny Stadium involved the expenditure of over $120 million, paid for by private donations first to the University of Alabama Athletic

Department and then following its creation in 2002 to the Crimson Tide Foundation (Casagrande, 2010).

The development of the Crimson Tide Foundation to pay for the expansion of Bryant-Denny Stadium followed the development of LSU TAF to pay for expansions to Tiger Stadium starting in the 1970s (Redman, 1986). Tiger Stadium has undergone three renovations in Stage Five that included luxury seating. The first was started in 1998 and completed 30 months later, opening for the 2001 season (Seifried, in press). The new east side upper deck cost slightly less than $50 million with $43,575,000 issued in bonds by TAF, and included the addition of 9,000 (Anders, 2002; Tiger Athletic Foundation, 2004). Exactly 70 skyboxes were added as part of the east upper deck project ("LSU's Tiger Stadium," 2016). The boxes included seating varying from 19 seats in the smallest suites to 40 in the largest of the 'Tiger Den' suites (Rabalais, 2000). The east upper deck suites include spaces for outside seating, an enclosed indoor space with a television and seating areas as part of the two rows of 35 suites (Seifried, 2012).

Following the successful completion of the east upper deck project at Tiger Stadium, the athletic department and TAF moved to replace the aging west upper deck. The original west upper deck was constructed in 1978, and seated 8,200 spectators (Seifried, 2012). The space included improved press facilities, as previously discussed, and club seating (Seifried, in press). The project cost TAF approximately $60 million, and in many ways mirrored the east upper deck previously constructed ("LSU Hires Yates," 2003; Seifried, 2012). The project included 3,200 club seats, with wider seats, and wider aisles in order to provide more comfort to the club seat-holder (Anders, 2002). A special dining area was included in the club area, to allow for club members to enjoy unique food different from the rest of the stadium (Seifried, 2012). Also included on the press deck were suites for the university president, athletic director, head coach

and visiting dignitaries ("West Side Tiger," 2011). The project was completed in time for the 2006 season, after delays due to Hurricane Katrina and other issues prevented its original planned 2005 opening (Seifried, 2012). Tiger Stadium now had two distinct luxury areas, and soon would add a third.

The continued luxury development of Tiger Stadium involved the construction of club and luxury seating in the south end zone of the stadium. Opening in time for the 2014 season, the south end zone expansion cost TAF $80 million (Kleinpeter, 2014). The new space included 66 suites, 3,000 club seats and 1,400 tradition seats located in a new upper deck area of the stadium ("The Preservation of," 2012). The new spaces were all sold prior to the beginning of the construction, helping to fund the development (Kleinpeter, 2014). The new space brought the capacity of Tiger Stadium above 100,000, and the new spaces would generate over $14 million a year for the athletic department (Dellenger, 2014). The space was reached by elevators unique to the levels, and was supported by over 300 staff members of TAF, providing food, beverages and other needs to the new development (Dellenger, 2014; Kleinpeter, 2014).

The Southeastern Conference experienced significant development of luxury spaces inside its stadiums throughout Stage Five. The conference benefited from several significant television deals and a big increase in the popularity of college football in the south over the last several decades of the 2000s. It is important to note that while many projects developed in the SEC during this period (all 14 SEC schools would add and renovate luxury spaces during Stage Five), they were far from alone.

Maybe the most impressive structures developed in college football are found in Fort Worth, Texas, on the campus of Texas Christian University. As part of a $164 million project to completely renovate Amon G. Carter Stadium in 2012, six donors paid $15 million each for the

right to have perpetual access to the Founders Club (Muret, 2012; Stevenson, 2012). The $90 million paid by the elite group of six eliminated a significant portion of the debt from the renovation to prepare Carter Stadium for the Big 12 (Stevenson, 2012). The Founders Club is a 6,400-square feet space with a brick fireplace, along with spaces to easily accommodate the 120-150 people who use the room on a home game day (Curtis, 2012; Muret, 2012). Hidden in the walls of the club are six steel doors that access each of the separate Founders Suites (Curtis, 2012). The donor designed each suite with the suite representing the interests of the individual suite owner, including unique art and furniture (Muret, 2012). Each suite also includes 24 theater style seats and 20 bar stools, which provide outstanding views as the six suites stretch from the 30-yard line to the 30-yard line, eleven rows from the field (Curtis, 2012; Muret, 2012). The suites are part of a larger project intended to turn Amon G. Carter Stadium into one of the top venues in college football, and set a standard for future stadium development in college football (Muret, 2012). As part of the renovation of Amon G. Carter Stadium, 19 additional suites were developed for smaller donors along with 2,200 club seats (Newcomb, 2014). Each of the 19 suites was paid for by donors at a cost between $1 million and $5 million per suite for ten years (Muret, 2012). The west side further includes 2,220 club seats that sold for $1,000 to $3,000 annually (Muret, 2012). The luxury suites and club seating contracts between the university and the donors left the university with no significant debt (Curtis, 2012; Muret, 2012).

On the other end of the spectrum, smaller schools such as the University of Toledo have also constructed luxury spaces for their donors. At the Glass Bowl, an $18.5 million project was started in 1989 and finished in 1990, involving the development of 45 suites and a 300-seat stadium club (“Glass Bowl,” 2016). The stadium club includes an enclosed 300-seat theater style seating space, televisions with game coverage and access to special food and other amenities

including special parking (“Glass Bowl Stadium,” 2016). The suites include tickets for 24 to University of Toledo football games and other events at the stadium, along with a pregame buffet and food and beverage service (“Glass Bowl Stadium,” 2016).

Another example of a smaller FBS school’s premium seating can be found at the University of Wyoming. The Wildcatter Stadium club and suites was added to War Memorial Stadium prior to the start of the 2010 season (“Facilities,” 2016). The space includes 256 club seats and twelve luxury suites as part of an expansion to the upper east side of the venue (Pelzer, 2010). The Wildcatter Club includes 256 theater style seats, 20 televisions, a premium all-you-can-eat buffet, bar access and private access via elevators (“Wildcatter Stadium Club,” 2016). Each of the twelve suites includes a separate enclosed space with two flat-screen televisions, a refrigerator, windows that can be controlled from the suite electronically and unique bar and food access (Pelzer, 2010; “Wildcatter Stadium Club,” 2016). The cost of the total space was $22 million, with suites costing $40,000 a season and club seats costing $2,500 a ticket for the season (Pelzer, 2012). The combination development was common at the lower levels of FBS football, usually as part of an improvement to the press box (“Glass Bowl,” 2016; Pelzer, 2010). The spaces are often used by the university for receptions and other events during days when the stadium is not in use for football, allowing revenue to be generated from the spaces year-around (Pelzer, 2010). Luxury spaces developed as ways to increase the revenue brought into the athletic department by the stadium. Luxury spaces are one of many revenue generators for the athletic department. Another important part of the modern FBS athletic budget is television revenues. The control over televising of college football and the related revenues shifted from the NCAA to the individual schools at right before the start of Stage Five. The shift and its consequences will be discussed ahead.

The Continued Growth of Television

The NCAA maintained control over the televising of college football until the NCAA v. Board of Regents decision in 1984 (NCAA v. Board, 1984). Following the decision, control over television rights was altered significantly when institutions (i.e., schools and conferences) began to manage their own television broadcasts (Oriard, 2009; Smith, 2001; Watterson, 2002). After initially fearing television would harm game attendance, universities discovered being on television provided them multiple benefits (Smith, 2001). Networks favored schools with large fan nations and alumni groups for televised games whenever possible as it generated the largest audiences from a broadcast perspective (Dunnavant, 2004). During the early 1980s, cable television developed into an important alternative to traditional over the air television (Parsons & Frieden, 1998). Cable television allowed for signals to be carried hundreds of miles from one broadcast point, allowing a station to reach across the country (Dunnavant, 2004). This meant that in theory, a game broadcast in one part of the country could be carried by cable television to the rest of the country to expand the possible number of channels and games to be watched (Smith, 2001).

The NCAA's television policy limited the number of times a school could appear on television during a specific period (Smith, 2001). Thus, every year at the NCAA convention significant time was spent discussing the limits on appearances by each institution (Smith, 2001). Although revenue from television increased over time, pressure from cable companies and other groups continued to push for multiple broadcasting agreements or to allow schools and conferences to set up their own deals (Smith, 2001). As an example, between 1982 and 1985, television generated over $260 million for NCAA member schools (Dunnavant, 2004). While this money was split among the member schools, overall unhappiness led many schools to

question whether NCAA control over television was necessary or even legal (Smith, 2001). Many universities felt more income could be generated if the schools themselves controlled their broadcast rights instead of the NCAA (Dunnavant, 2004).

The College Football Association (CFA) formed in December 1976 and led the challenge to end the NCAA's control over television (White, 1976). The CFA was built by several of the top college football playing schools, based on wins and attendance (Smith, 2001). Conferences included in the CFA were the Atlantic Coast (ACC), Southeastern (SEC), the Southwest (SWC), the Big 8, the Western Athletic (WAC) and two independent universities, Notre Dame and Penn State (White, 1976). The CFA slowly worked to undermine the NCAA and its role in control over television rights. In 1980, it commissioned a study that showed that as CFA members appearances on television declined, so did ratings (Smith, 2001). The CFA argued that its membership, along with the Big Ten and the Pacific Athletic Conference Ten (PAC-10) were the primary schools that spectators tuned in to television to watch play (White, 1981a).

In 1981, the CFA signed a separate deal with the National Broadcasting Company (NBC) for $180 million shared amongst its 63 members ("C.F.A. Conducts TV," 1981; White, 1981b). The decision to sign with NBC drew threats of expulsion from the NCAA, causing the University of Georgia, and the University of Oklahoma to lead a class-action lawsuit against the NCAA over violations of the Sherman Antitrust Act (Dunnavant, 2004; Watterson, 2002). The subsequent court battle took over three years (Watterson, 2002). In the end, the U.S. Supreme Court decided the NCAA violated the Sherman Antitrust Act, providing individual schools the right to sell their respective television broadcast rights (NCAA v. Board, 1984.). Ownership of television rights was returned to the individual universities (Smith, 2001; White, 1984). The

ruling opened up competition between networks for games and ultimately led to important investments into the stadium to better capture the remote spectator.

The Improvements Needed for Television

By working to develop the stadium to better fit the needs of the television broadcaster, universities were able to improve the experience for those watching at home, potentially gaining hundreds of thousands, if not millions, of additional fans (Seifried, 2011). Significant investment occurred initially through the development of the press box as a space where television could successfully broadcast high quality events. The press box itself was largely a Stage Four innovation, but the development of the modern broadcast studio is an important part of Stage Five. Most of the projects below focus on the continued improvement of the press box, but it is important to note that significant money has been invested in developing other infrastructure to support high definition and 3-dimensional television broadcasting.

Regarding the press box, 85 of the 676 renovations discovered in this investigation during Stage Five specifically involved improvements to this area. Again, at the University of Arkansas, the aforementioned 1985 project that improved Razorback Stadium involved the installation of better lighting and increased space for television to accommodate more night games (Bordelon, 2013; Ward, 1983). At Stanford University in 1985, roughly $2.3 million was spent renovating the Stanford Stadium to improve communications equipment on the expanded second and third floors of the press box (Dufresne, 1985). Stanford's new press facility was able to seat 800 to 1,000 members of the press, including unique spaces for television broadcasting (Dufresne, 1985; Green, 1984).

Later renovations to the press areas focused on developing a unique viewpoint for television, with the television booth usually located directly at midfield, to provide the best

access possible for carriers (Moseman, 2015; Seifried, in press; "TCF Bank Stadium," 2016). Notre Dame, one of the first universities to receive significant funding from their own television contract, opened a new three-deck club and press area in 1997 ("Facts and Figures," 2016). The press space included three television booths to support NBC and other broadcast organizations, along with five radio broadcast booths ("Facts and Figures," 2016). The addition to Notre Dame Stadium in 1997 was the first addition to the venue since its original construction in 1930 and cost the university $50 million ("Notre Dame Stadium," 2016). Another example at Tiger Stadium on the campus of Louisiana State in 2006 occurred as part of the rehabilitation of the West Upper Deck of the stadium (Seifried, 2012, in press). The $60 million dollar project included space for 200 working press, and booths specifically for television broadcasting (Seifried, 2012). At Kansas State University, a $90 million project completed in 2014, completely renovated the whole west side of the venue (Zetmeir, 2014). Like the others, this project included the complete demolition of the existing press facility and the building of a state-of-the-art facility including spaces for broadcast booths and television cameras along with production capabilities (Robinett, 2013). The press facility spread end zone to end zone which allowed television cameras to be positioned in a wide variety of places, creating different views for television (Robinett, 2013).

The development of increased competition for broadcast rights forced networks to work with college facilities in order to find new angles for cameras and to improve the infrastructure for television in stadiums (Clotfelter, 2011). Of particular importance was the further development of the slow-motion replay, which started in 1960 (Smith, 2001). The replay, while not instant, allowed for better explanations of how and why the play developed, increasing the understanding of the spectator of the sport and providing television with the need for more places

to place cameras to provide unique viewpoints of important plays (Patton, 1984). As technology improved, so did the needs of television. More camera spaces were needed in the stadium, spaces for screens showing instant replays were needed inside the broadcast booth (Smith, 2001). Modern stadiums regularly support the wiring for 30 or more cameras, including a camera hung over the field itself that moves up and down the field following the play (Moseman, 2015). The stadium is also usually hardwired, meaning that the wiring is already built into the stadium, for most of the cameras and camera locations (Milian, 2013; Moseman, 2015; "TCF Bank Stadium," 2016). Furthermore, permanent and temporary wiring includes millions of feet of cable to support the various broadcasts at the venue (Moseman, 2015; "TCF Bank Stadium," 2016).

TCF Bank Stadium, home to the University of Minnesota football team, opened in 2009 (Populous, 2016a). The stadium was designed with usage for television broadcasts in mind. The venue has over 382 miles of cable to support the various requirements for television broadcasts and other uses ("TCF Bank Stadium," 2016). The horseshoe shaped stadium also has a mid-field television broadcast booth for network broadcasts, along with significant space for other broadcast groups (Populous, 2016a; "TCF Bank Stadium," 2016). Another venue that opened during Stage Five was built in Houston, Texas, for the University of Houston. The venue opened in 2014, and included space for 70 members of the working press, along with a separate wired field level working press room for post game press conferences ("TDECU Stadium," 2016; "TDECU Stadium Press," 2014). The stadium also supported several areas around the stadium dedicated to housing cameras for television broadcasts ("TDECU Stadium," 2016).

Because multiple games could be broadcasted simultaneously, competition for television viewers increased, requiring a higher quality product from the television companies. As an example, Michigan State University ("Facilities," 2014), the University of Kansas ("Facilities-

Memorial," 2014), and the University of Oregon ("Oregon's Autzen," 2014) all conducted expansion projects during this time focused on the development of improved television capabilities. Television dictated most changes to existing facilities in order to allow as many games as possible to be broadcasted (Smith, 2001). For instance, many stadiums in the South, Midwest and West installed lights for games so contests could be played at night ("Facilities-Memorial," 2014; "Oregon's Autzen," 2014). Stadiums that traditionally had been resistant to night time football, such as the University of Michigan and Notre Dame, installed lights during the last few years of Stage Five in order to allow for different broadcast times ("Big House to," 2010; "Irish to Play", 2011). The universities benefited from primetime broadcasts, usually with fewer games going on at the same time, increasing interest in one particular game ("Big House to, 2010; Sandomir, 2006).

It is important to note that television has undergone significant changes since 1985. In 2003, ESPN became the first major sports broadcaster to begin to broadcast games in High Definition (HD), providing a sharper picture quality than traditional broadcasts (ESPN, 2016). Improvements in HD technology have continued to provide a sharper and sharper technology, as long as the consumer has a television that is capable of broadcasting the improved image (ESPN, 2016; Katzmaier, 2015). Another important technology innovation was the attempt by televisions to begin to broadcast games in three dimensions in 2007 (Dachman, 2013; Seifried, 2011). The advent of three-dimensional (3-D) television required additional spaces for (n = 8 or more) television cameras and additional space outside the stadium for a separate production truck to broadcast the image in 3-D (Seifried, 2011). The technology has found mixed success, but it is important to note that television is constantly attempting to improve and evolve as both HD and 3-D technologies have shown (ESPN, 2016; Seifried, 2011). From a stadium perspective, 3-D

television required the university to find extra space for cameras along with another necessary equipment. As television advanced, it continued to need more and more space inside and outside the venue, a trend unlikely to stop.

The changes noted above all came because of actual or potential television revenue. NBC helped begin the surge in attention to television when it agreed to pay Notre Dame at least $35 million over 5 years for the exclusive rights to broadcast Notre Dame home games starting in the 1991 season ("Talking Deals," 1990). Other television contracts for the 1991 season included the CFA's deal with ABC for $37 million a year and ESPN's deal with the CFA for $25 million a year for five years ("Talking Deals," 1990). By 2007, the Big Ten developed its own network (with Fox), of which it owned 49%, along with selling a separate package of games to ESPN for $1 billion over ten years (Sandomir, 2011). The Pac-10/12 sold rights to a select number of games to Fox and ESPN for $3 billion over twelve years, while maintaining complete ownership over its own network that launched in 2012 (Sandomir, 2011). Texas was also given $15 million a year by ESPN for the rights to broadcast all Texas Longhorn events not carried by other networks (the Big 12 has an agreement with Fox as well) (Thamel, 2011). Finally, the SEC launched a Network with the help of ESPN in 2014, as part of a 20-year agreement with the network (Glass, 2014). The combined values of the SEC's deals with ESPN and CBS are estimated to be worth more than $400 million annually (Glass, 2014).

Video Boards and Other Structures

The development of the modern video board followed closely the pattern of the large scoreboards that developed in Stage Four. Video boards, according to Seifried (2005), were designed to engage the audience along with providing new sponsorship and revenue spaces for the university. The development of video board technology allowed the university to sell time to

sponsors for advertisements to run inside the stadium, increasing revenue generation (Smith, 2000). The video board first developed in the 1980s, with both Sony and Mitsubishi developing competing products that were used in stadiums around the country (Seifried, 2005). The early video boards were able to show stats as well as images of individual players, along with game images and replays (Seifried, 2005). Universities once again followed the trend developed by professional sport venues and quickly added video boards in Stage Five. Over 160 renovation projects either were exclusively the development or improvement of video boards or the video board improvement was part of a larger project.

One of the first college venues to adopt the new video board technology was Auburn University. Auburn added a modern video board as part of a $30,115,000 addition to Jordan-Hare Stadium. Coca-Cola paid one million dollars for the stadium in return for being the exclusive soft drink available inside the stadium (Plexico, 2012). The new video board contained no advertising on its structure, nor did any other part of the stadium, as the university did not permit advertising inside Jordan-Hare Stadium (Plexico, 2012). While quite a simple structure by modern standards it signified a significant investment by a company into the stadium as the ten-year soft drink agreement proved. Auburn was one of the first, but definitely not the only college football venue to add a new video board during Stage Five.

Purdue University added a new scoreboard and message center in 1990. The $1 million project allowed for the university to share ads and other simple computer designed images with the spectators at Ross-Ade Stadium ("Ross-Ade Stadium," 2016a). The scoreboard was further improved in 1997, when Purdue installed a large Sony Jumbotron video board in the south end zone of the stadium (Zawisza, 1997). The new video board was paid for and owned by Action Sports and cost $3 million ("Ross-Ade Stadium," 2016a). Like many other boards of the 1990s,

it provided ads and live action replays to the spectators inside of Ross-Ade Stadium ("Ross-Ade Stadium," 2016b). A further $1.7 million was invested into a 31 foot by 68 foot Daktronics video board in 2007 ("Ross-Ade Stadium, 2016b"). The new video board provided high definition (HD) video replays and live coverage of the events occurring inside the venue ("Ross-Ade Stadium," 2016b). Purdue was one of many universities to invest in upgrades in video board technology during Stage Five.

Several other venues have recently set the new standards for video board technology during the last decade to capitalize on not only high-definition broadcasts, but opportunities for interaction. The University of Texas unveiled 'Godzillatron' in 2006, a 55 foot by 134-foot video board in the south end zone of Darryl K. Royal Texas Memorial Stadium ("Texas Installs Gigantic," 2006). The video board allows for multiple images to be shown in HD at the same time, allowing for ads and live action or replays to be going on simultaneously (Aschoff, 2014). The new video board inside Texas's Darryl K. Royal Texas Memorial Stadium cost $8 million ("Darryl K. Royal," 2014). The scoreboard is one of ten upgrades Texas added to Darryl K. Royal Texas Memorial Stadium since 2006 ("Darryl K. Royal," 2014). Similarly, the University of Michigan's Michigan Stadium received significant upgrades in video technology. Michigan Stadium received two 4,000-square feet scoreboards prior to the 2011 season as part of a $20 million upgrade to the video technology within Michigan Stadium, Crisler Center, and Yost Arena (Woodhouse, 2012). Following suit, Michigan State added three new video boards to Spartan Stadium by the start of the 2014 season, including a 5,300 square feet video board in the south end zone ("Facilities," 2014). While those structures were impressive, Texas A&M set the standard for video board technology when it constructed a 47 foot by 163 foot video board as part of a $450 million upgrade that partially opened in 2014 (the rest was finished following the

completion of the current project (Aschoff, 2014). The Daktronics LED video board had a 1080 resolution, providing fans with the same type of resolution many had on their home televisions (Aschoff, 2014; Newton, 2015).

The development of wireless communications technology (cellphones, wireless internet) has also significantly impacted the renovations to the stadium late in Stage Five. The press box moved from a place where communication was done through a telephone at nearly every seat to where the Internet was an expected standard. Universities quickly followed professional teams in adding wired and eventually wireless Internet to the press box, allowing for reporters to communicate what was occurring on the field as it was happening to readers (O'Keefe, 2015; Wailgum 2008). By the second decade of the 21st century, spectators were able to use their phones to access the internet, browse websites and share content (Daly, 2013; Steinbach, 2013). Universities have invested significant amounts of money in improving both the signal capacity for cellular telephones, along with strengthening the wireless networks inside the stadium (Beahm, 2014; Daly, 2013). The increased capacity allowed for the spectator to keep up with live stats, events occurring outside of the stadium and around the country (Beahm, 2014; "Memorial Stadium Fan," 2014). Universities invested millions into improved spectator amenities, such as $12.3 million at Nebraska and $2.5 million at Alabama (Gribble, 2014; "Memorial Stadium Fan," 2014). Much of the cost was in the installation of new cellular antennas all around the stadium, increasing the usability of cellular devices inside college stadiums.

Another interesting development within the college stadium was the continued development of the field surface. Following the successful innovation adoption of Astroturf and other similar products in the 1960s to the 1980s, some universities became concerned about the safety of artificial turf fields (Claudio, 2008; Sherman, 1991). From 1988 to 1999, 24 universities

moved from artificial surfaces back to natural grass. A new type of artificial turf was also developed in the late 1990s, using a surface that mimicked natural grass with plastic grass like fibers sticking up from the turf and the usage of rubber pellets to soften the surface (Fordyce 2015; "How Fieldturf Works, 2016; Rappleye, Monahan & Gosk, 2015). The reinvention of the whole artificial turf industry led to even more schools adopting or replacing existing surfaces with new artificial surfaces. Over 250 renovation projects involved the installation of new artificial turf surfaces, with many universities renovating the surfaces two or three times or more during Stage Five.

One of the reasons for the installation of new turf was to improve the visuals provided by the turf field for the remote television viewer (Seifried, 2005). Some modern turf fields have fiber optic cables installed in the surface in order to increase the visual look of the field (Belisle, 2013). The turf surface with fiber optics built-in, appears sharper and nicer on television than the surfaces lacking the fiber optics (Belisle, 2013; Burke, 2006; Roenigk, Cypher & Brauner, 2012). The eventual goal of the product is to allow for the turf to serve as a television surface, allowing for advertising to be shown through the fiber optics built into the surface (Belisle, 2013; Burke, 2006). Statistics for the game, video images and other pieces of information are shown on the surface (Roenigk et al, 2012). The fiber optics also allow the officials improved ability to determine plays involving placement on the field (i.e., whether a player stepped out of bounds, crossed the goal line, etc.) (Belisle, 2013; Burke, 2006; Grass Valley, 2014). Interestingly, the technology also allows for a computer to use the cables to provide lines on the field for venues in which multiple teams from different sports share the space, removing the need for repainting and different colored lines on the field depending on the sport (Roenigk et al., 2013). While the

technology is still largely in its early stages of development, the innovation of fiber optics in the turf is an important development for the modern fully developed stadium.

Next, disability seating arrived as a major innovation part of Stage Five facilities following the passage of the Americans with Disabilities Act of 1990 (ADA) ("Information and Technical," 2016). The ADA required new stadiums to create seating for the equivalent of one percent of the stadium capacity that was wheelchair accessible and had wheelchair companion seats ("Section-by-Section," 2010). Some venues had already started to develop disability seating in Stage Four (average of 250 seats). However, these were primarily located in one area of the stadium. The ADA required that all areas of the stadium should have disability seating including luxury areas, and that the sight lines for disability seating must allow for those seated in those areas to overlook the stadium without interference from spectators seated in front of them (Seifried, 2005). The impact for universities was generally found during renovations to existing stadiums as any area of the venue renovated following the passage of the 1990 law was required to follow the guidelines (Section-by-Section, 2010). College stadiums were grandfathered in under the ADA law, and so many of the older stadiums of Stage Five lack the one percent seating requirement of the ADA (B. Broussard, personal communication, July 8, 2015; Section-by-Section, 2010). However, the law did require any stadium that undergoes a significant alteration (such as Michigan's $226 million project in 2010), to become fully compliant under the law (Gershman, 2008; "Michigan Stadium Reduces," 2015; Steinbach, 2007). Expectedly, the growth of ADA seating was still significant in Stage Five as the average facility supports 387.83 wheelchair accessible seats. For information related to specific disability seating numbers please see Tables 8.3 and 8.4.

Finally, Stage Five experienced a continued growth in structures such as restrooms and concession stands. Stage Five venues averaged 25.69 restrooms, and 22.01 concession stands, a significant improvement from Stage Four. Restrooms were now commonly available for all at

Table 8.3 Stage Five (1985-2014) Disability Seating- New Constructions

School	Stadium	Year	Disability Seats
Akron	InfoCision Stadium	2009	3,000
Baylor	McLane Stadium	2014	540
Central Florida	Brighthouse Networks Stadium	2007	450
Connecticut	Rentschler Field	2003	
Florida Atlantic	FAU Football Stadium	2011	301
Houston	TDECU Stadium	2014	465
Louisville	Papa John's Cardinal Stadium	1998	342
Minnesota	TCF Bank Stadium	2009	1,000
North Texas	Apogee Stadium	2011	434
Pittsburgh	Heinz Field	2001	650
Southern Methodist	Gerald Ford Stadium	2000	
Stanford	Stanford Stadium	2006	502
Temple	Lincoln Financial Field	2003	685
Tulane	Yulman Stadium	2014	300
Washington	Husky Stadium	2013	700

Table 8.4 Stage Five (1985-2014) Disability Seating- Renovations

School	Stadium	Year	Disability Seats
Air Force	Falcon Stadium	1988	400
Air Force	Falcon Stadium	1994	522
Akron	Rubber Bowl	1991	3,100
Alabama	Bryant-Denny Stadium	1998	392
Alabama	Bryant-Denny Stadium	2006	590
Alabama	Bryant-Denny Stadium	2010	788
Arizona	Arizona Stadium	1991	305
Arizona State	Sun Devil Stadium	1992	3,500
Arkansas	Razorback Stadium	2000	328
Arkansas State	Indian Stadium	2001	300
Army	Michie Stadium	1992	210
Baylor	Floyd Casey Stadium	1990	445
Boston College	Alumni Stadium	1994	450
Bowling Green	Doyt Perry Stadium	1992	306
Bowling Green	Doyt Perry Stadium	2004	240
Brigham Young	Cougar Stadium	1997	58
Brigham Young	LaVell Edwards Stadium	2003	80
California	California Memorial Stadium	1995	840

(Table 8.4 continued)

School	Stadium	Year	Disability Seats
California	California Memorial Stadium	2012	950
Central Florida	Florida Citrus Bowl	2002	412
Central Michigan	Kelly/Shorts Stadium	2007	172
Colorado	Folsom Field	1991	93
Duke	Wallace Wade Stadium	1990	380
East Carolina	Ficklen Stadium	1991	200
East Carolina	Dowdy-Ficklen Stadium	2010	400
Eastern Michigan	Rynearson Stadium	1991	85
Florida	Ben Hill Griffin Stadium	1991	405
Fresno State	Bulldog Stadium	1992	169
Georgia	Sanford Stadium	1991	189
Georgia Tech	Bobby Dodd Stadium	1995	52
Georgia Tech	Bobby Dodd Stadium	2001	184
Hawaii	Aloha Stadium	2003	424
Idaho	Kibbie Dome	2010	125
Indiana	Memorial Stadium	2003	343
Iowa State	Jack Trice Stadium	1994	540
Kansas	Memorial Stadium	1997	185
Kansas	Memorial Stadium	2008	240
Kent State	Dix Stadium	2005	200
Kentucky	Commonwealth Stadium	1997	235
Louisiana-Monroe	Malone Stadium	2007	100
Louisiana Tech	Joe Aillet Stadium	2006	135
Louisiana-Lafayette	Cajun Field	2008	130
Louisville	Papa John's Cardinal Stadium	2010	342
Louisiana State	Tiger Stadium	2014	446
Marshall	Joan C. Edwards Stadium	2000	300
Maryland	Byrd Stadium	1991	200
Memphis	Liberty Bowl Memorial Stadium	1999	160
Memphis	Liberty Bowl Memorial Stadium	2012	564
Miami	Orange Bowl	1994	800
Miami of Ohio	Yager Stadium	1996	60
Michigan	Michigan Stadium	1991	329
Michigan	Michigan Stadium	2012	447
Michigan State	Spartan Stadium	2005	298
Middle Tennessee State	Johnny "Red" Floyd Stadium	2006	233
Minnesota	Hubert H. Humphrey Metrodome	2003	32
Mississippi State	Davis Wade Stadium	2013	264
Missouri	Farout Field	1995	140

(Table 8.4 continued)

School	Stadium	Year	Disability Seats
Missouri	Farout Field	2009	365
Navy	Navy Marine Corps Memorial Stadium	2010	40
Nebraska	Memorial Stadium	1994	42
Nebraska	Memorial Stadium	2006	134
Nebraska	Memorial Stadium	2013	289
Nevada	Mackay Stadium	2006	150
Nevada-Las Vegas	Sam Boyd Stadium	1999	400
New Mexico	University Stadium	2001	4,000
New Mexico State	Aggie Memorial Stadium	1992	430
North Carolina	Kenan Memorial Stadium	2007	154
North Carolina State	Carter Finley Stadium	2000	688
Northern Illinois	Huskie Stadium	2000	65
Notre Dame	Notre Dame Stadium	1997	400
Oklahoma	Gaylord Family-Oklahoma Memorial Stadium	2004	475
Oklahoma State	Boone Pickens Stadium	2009	175
Oregon	Autzen Stadium	1998	417
Oregon	Autzen Stadium	2002	540
Oregon State	Parker Stadium	1991	150
Oregon State	Reser Stadium	2005	450
Penn State	Beaver Stadium	2001	248
Penn State	Beaver Stadium	2011	331
Pittsburgh	Pitt Stadium	1995	18
Purdue	Ross-Ade Stadium	1990	1,868
Rutgers	Rutgers Stadium	1994	400
Rutgers	Rutgers Stadium	2009	500
San Diego State	Qualcomm Stadium	1997	715
San Diego State	Qualcomm Stadium	2011	610
San Jose State	Spartan Stadium	1998	64
South Carolina	Williams-Brice Stadium	1997	315
South Carolina	Williams-Brice Stadium	2011	345
South Florida	Raymond James Stadium	2009	712
Southern California	Los Angeles Memorial Coliseum	1992	172
Southern Mississippi	M.M. Roberts Stadium	1998	33
Southern Mississippi	M.M. Roberts Stadium	2007	56
Stanford	Stanford Stadium	1994	67
Temple	Veterans Stadium	1990	256
Tennessee	Neyland Stadium	1994	200
Texas	Darryl K. Royal Texas Memorial Stadium	2009	735

(Table 8.4 continued)

School	Stadium	Year	Disability Seats
Texas Christian	Amon G. Carter Stadium	2008	222
Texas Christian	Amon G. Carter Stadium	2012	342
Texas Tech	Jones AT&T Stadium	2010	390
Texas- El Paso	Sun Bowl Stadium	2001	30
Toledo	Glass Bowl	1990	150
Tulane	Louisiana Superdome	1996	50
Tulsa	Skelly Stadium	1991	181
Tulsa	H.A. Chapman Stadium	2008	267
UCLA	Rose Bowl	1992	950
Utah	Rice Stadium	1995	93
Utah State	Romney Stadium	2000	54
Virginia	Scott Stadium	1994	30
Virginia	Scott Stadium	2000	500
Virginia Tech	Lane Stadium	2005	420
Wake Forest	Groves Stadium	1998	215
Washington State	Martin Stadium	2000	327
Western Michigan	Waldo Stadium	1995	100
Wisconsin	Camp Randall Stadium	1999	318
Wyoming	War Memorial Stadium	2010	72

most major venues. Furthermore, portable restrooms were used to overcome shortages of permanent restroom facilities (Purdy, 2012; Truman, 2011). Concession stands were also viewed as an expected part of the game day experience (Seifried, 2005). One interesting minor innovation in concessions was the branding of concession stands with regionally known companies (Mattson-Teig, 2015; Steinbach, 2008). Universities once again followed professional sport trends by partnering with local companies to offer their products in special branded concession stands (Steinbach, 2008). Local companies gain access to the stadium consumer, and the university receives a significant part of the game day sales from the branded concession stands, creating a mutual benefit for both (Mattson-Teig, 2015).

The Demolition/New Construction

The last innovation trend during this era is the complete reconstruction of existing stadiums. Three universities in particular (i.e., Stanford University, University of California at

Berkeley, and the University of Washington) underwent complete or almost complete reconstructions of their stadiums within the past ten years ("Husky Stadium," 2013; Johnson, 2006; Taylor, 2012). Stanford Stadium began the trend after the completion of the 2005 season, when the old 85,500-seat Stanford Stadium was torn down (Johnson, 2006). In its place, a $100 million, 50,424-seat facility opened on the same site as the old stadium in time for the start of the 2006 season ("Stanford Stadium," 2015). The stadium has seven suites, 400 club seats, and two HD video boards ("Stanford Stadium," 2015). The most impressive part of the Stanford project was the timeline, which was completed in less than ten months (Johnson, 2006).

Cal opened its newly renovated Memorial Stadium during the 2012 season after almost two years of construction. Cal faced many difficult challenges in renovating over 60% of the structure ("Kabam Field," 2014). For example, the west side of the stadium was rebuilt in order to meet modern earthquake requirements since the facility is built on an active fault. Concourses around the stadium were widened, and a new press box and suite area was installed ("Kabam Field," 2014; Taylor, 2012). The project involved 50,000 cubic yards of concrete and 14 million pounds of steel (Taylor, 2012). The total budget for the project was $321 million and included the installation of three club levels for elite donors ("Kabam Field," 2014). The original 1921 east side structure was largely left unchanged by the renovation except for the removal of wooden bleachers that were replaced by aluminum ("Kabam Field," 2014; Taylor, 2012). The old stadium sat 80,000 and the new venue following the rehabilitation was almost 17,000 seats smaller at 63,186 ("Kabam Field," 2014; Taylor, 2012). Part of the decrease was due to the 950 wheelchair accessible seats found inside the new venue (Taylor, 2012). Furthermore, the size was decreased due to increased seat size (Dinkelspiel, 2012).

The University of Washington opened a $280 million reconstruction of Husky Stadium in 2014 ("Husky Stadium," 2013; Jude, 2013). As part of the reconstruction, the track traditionally surrounding the field was removed, bringing fans closer to the contest ("Husky Stadium," 2013). The field was lowered four feet, and 93 suites were included in the redesign (Jude, 2013). In addition, 2,507 club seats were added to Husky Stadium ("Husky Stadium", 2013). A 32 feet by 108 feet video board was added to the east end of the stadium along with 700 flat screen televisions throughout the stadium (Jude, 2013). With the new accommodations, Husky Stadium is the epitome of a fully developed modern stadium within college football today. Each seat was wider and included more legroom than the old stadium (Jude, 2013). The venue's capacity shrunk by about 2,000 seats, which when combined with the loss of the track around the field allowed each seat to be closer to the field than in old Husky Stadium (Jude, 2013).

As these PAC-12 schools highlight, innovation adoption and diffusion occurred rapidly during the current era of college football. Within a ten-year period, three different PAC-12 schools decided to adopt similar plans to completely renovate or rebuild their facilities. All three added luxury seating, large video boards, and several other modern amenities found at peer institutions around the country. Texas A&M had plans to completely renovate Kyle Field following the similar path of the three PAC-12 stadium, with plans to spend $450 million to completely reconstruct a new venue in the existing space of Kyle Field.

Conclusions

Stage Five involved the construction of 15 new venues and 676 renovations. The 15 new constructions produced an average cost of $150,593,643, a significant increase from the $12,278,277 spent on new construction in Stage Four even when accounting for cost inflation. The new facilities in Stage Five also included significant numbers of luxury seating (42.21 suites

and 2,078.79 club seats), supporting the argument for the importance of the development of those options in Stage Five. New venues also included often more than one scoreboard, and more than the minimum one percent disability seating requirement (capacity average of 43,008 and disability seating average of 720.69). Many of the new stadiums were developed by universities (Washington, Minnesota, California, Stanford), with traditional football heritage, attempting to develop new venues to help in the rebranding or redevelopment of the importance of college football on the university campus. Stage Five new constructions also included significant numbers of restrooms and concession stands. The average Stage Five new construction venue contained 29.92 restrooms and 38.06 concession stands. Another interesting note was the number of parking spaces available at Stage Five new constructions in comparison to Stage Four. Stage Five new constructions had 9,135 spaces available while Stage Four had 7,489 spaces available. The Stage Five venue fails to meet the industry rule of thumb of one parking space for every four spectators, but it should be noted that depending on the size of the student body, the average stadium might actually meet the rule of thumb. Students would not need parking spots, as they would already have existing space on campus to park (especially at universities with a majority of its students living on-campus). If students are removed, the one parking spot for every four people standard is very close to what is found at the college facility. It is safe to say that the Stage Five venue was a very complex structure, developed to meet the needs of a variety of different groups. The Stage Five venue was the first new construction to consistently include luxury seating, increasing the revenue generated from the stadium. Furthermore, with multiple video boards common in new construction Stage Five venues, meaningful new revenue could be generated from selling advertising space either directly on the board's support beams, or through advertising time on the board itself. The inclusion of a significant number of parking spaces and

concession stands also increased the amount of revenue generated for the athletic department by the stadium. Please see Tables 8.5, 8.6, and 8.7 for information related to Stage Five new constructions.

Table 8.5 Stage Five (1985-2014) New Constructions

School	Stadium	Nominal Cost ($)	Open Date	Capacity
Louisville	Papa John's Cardinal Stadium	63,000,000	1998	42,000
Southern Methodist	Gerald Ford	57,000,000	2000	32,000
Pittsburgh	Heinz Field	281,000,000	2001	65,050
Connecticut	Rentschler Field	91,200,000	2003	38,066
Temple	Lincoln Financial Field	512,000,000	2003	68,532
Stanford	Stanford Stadium	100,000,000	2006	50,000
Central Florida	Bright House Networks Stadium	55,000,000	2007	45,301
Akron	InfoCision Stadium - Summa Field	61,600,000	2009	30,000
Minnesota	TCF Bank Stadium	288,500,000	2009	50,805
Florida Atlantic	FAU Football Stadium	70,000,000	2011	29,419
North Texas	Apogee Stadium	79,011,000	2011	30,850
Washington	Husky Stadium	280,000,000	2013	70,138
Baylor	McLane Stadium	250,000,000	2014	45,000
Houston	TDECU Stadium	128,000,000	2014	40,000
Tulane	Yulman Stadium	73,000,000	2014	30,000

Table 8.6 Stage Five (1985-2014) New Constructions- Parking and Luxury Areas

School	Stadium	Facility Change	Parking	Suites	Club Seats
Louisville	Papa John's Cardinal Stadium	1998	7,000	30	4,000
Southern Methodist	Gerald Ford	2000	3,500	24	560
Connecticut	Rentschler Field	2003	10,600	38	635
Temple	Lincoln Financial Field	2003	22,000	172	10,828
Stanford	Stanford Stadium	2006	10,000	7	437
Central Florida	Bright House Networks Stadium	2007	12,000	24	822

(Table 8.6 continued)

School	Stadium	Facility Change	Parking	Suites	Club Seats
Akron	InfoCision Stadium - Summa Field	2009	10,000	17	522
Minnesota	TCF Bank Stadium	2009	17,000	36	1300
Florida Atlantic	FAU Football Stadium	2011	10,000	23	372
North Texas	Apogee Stadium	2011	1,789	21	754
Washington	Husky Stadium	2013		92	2507
Baylor	McLane Stadium	2014	2,000	39	1100
Houston	TDECU Stadium	2014	3,735	68	766
Tulane	Yulman Stadium	2014		0	4500

Table 8.7 Stage Five (1985-2014) New Constructions- Restrooms and Concessions

School	Stadium	Facility Change	Restrooms	Concession Stands
Louisville	Papa John's Cardinal Stadium	1998		
Southern Methodist	Gerald Ford	2000	25	25
Connecticut	Rentschler Field	2003	9	17
Temple	Lincoln Financial Field	2003	84	
Stanford	Stanford Stadium	2006	29	20
Central Florida	Bright House Networks Stadium	2007	21	11
Akron	InfoCision Stadium - Summa Field	2009	21	10
Minnesota	TCF Bank Stadium	2009	22	43
Florida Atlantic	FAU Football Stadium	2011	23	11
North Texas	Apogee Stadium	2011	21	23
Washington	Husky Stadium	2013	48	27
Baylor	McLane Stadium	2014	40	35
Houston	TDECU Stadium	2014	56	
Tulane	Yulman Stadium	2014	20	13

The average renovation to Stage Five facilities cost $13,477,537. Stage Five renovations were significantly more expensive than Stage Four, which cost an average of $1,416,333. It is also important to note that almost twice as many renovations happened in Stage Five (676) versus Stage Four (364). For the first time, a significant variety of renovation types occurred in

Stage Five. As facilities aged (many were at least 50 years old by the start of Stage Five), preservation efforts were necessary to prevent the stadium from becoming unusable. For instance, this work found at least eleven exclusive preservation renovation projects occurred in Stage Five, with 30 more included as part of a larger combination renovation. It is also likely that many other projects occurred during Stage Five, but were small enough in scope that they were unreported by the press or the university. Stage Five renovations also included two restoration projects and one combination restoration and rehabilitation project. Partial reconstruction was a common occurrence in Stage Five with 68 total projects (42 combination projects and 26 reconstruction only projects. Rehabilitation, as with the previous stages, was the most common type of renovation. This work found 636 of the 677 projects involved a rehabilitation project, with 65 of the projects involving some sort of combination, meaning that 571 projects were exclusively rehabilitation projects. The total number of combination projects was 67. Please see tables 8.8, 8.9, and 8.10 for information on renovations for Stage Five.

Several other interesting numbers come out of the renovations of Stage Five facilities. Stage Five facilities experienced the development of a large number of luxury seating options (25.61 suites and 855.04 club seats on average), but that the average renovation developed significantly less of each than the average new construction. The average capacity of a renovated Stage Five facility was 53,529; a slight increase over the Stage Four renovated facility (51,182). Stage Five renovations also averaged 24.68 restrooms and 21.39 concessions stands, in comparison to Stage Four renovations that had 17.09 restrooms and 14.25 concession stands. Please see tables 8.8, 8.9 and 8.10 for information on renovations for Stage Five. The increase demonstrates the continued importance placed on the necessity of significant numbers of these structures in the modern stadium. Also of interest in Stage Five renovations was the number of

disabled seating, as many of these facilities were originally constructed prior to the passage of ADA in 1990. The average Stage Five renovation contained 366 disabled seats, below the one percent requirement for modern facilities. Yet as previously discussed, facilities built prior to the passage of ADA are not required to meet the full one percent unless their facility undergoes substantive change (Step-by-Step, 2010). One last interesting number for Stage Five renovations was the number of parking spaces available. The average Stage Five renovation had 6,835 parking spaces available near the stadium, in comparison to 6,843 available as part of Stage Four renovations.

Overall, Stage Five venues were significantly more advanced than any previous stage. The Stage Five venue transitioned into a revenue-producing environment, where the university generated monies from ticket sales, parking, luxury areas, concessions and advertising revenue. The stadium was now a commercial vehicle, very similar to the modern professional “fully loaded” stadium. One important difference between the two, as previously noted, was college stadiums chose to renovate instead of building new. The reasons were many but were at least partially tied to Seifried and Clopton’s (2013) concept of the college stadium being a social anchor for the university community and the inability of a university to relocate.

Social System

The social system in Stage Five was as clearly established as before, except now the social system was influenced and dominated by the conferences. Schools were sharing revenue through conferences, with several conferences providing equal or near-equal splits of revenues to all members (Dosh, 2014; Wilner, 2014). Many schools also agreed hand to over television rights to the conferences and let the conferences negotiate the best deal possible for all member

Table 8.8 Stage Five (1985-2014) Renovations

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Arkansas	Razorback Stadium				X		10,000,000	1985	52,680
Florida State	Doak Campbell Stadium				X		7,000,000	1985	60,519
Georgia Tech	Grant Field				X		11,000,000	1985	46,000
Hawaii	Aloha Stadium	X					80,000,000	1985	50,000
Illinois	Memorial Stadium				X		7,000,000	1985	70,053
Indiana	Memorial Stadium				X		2,000,000	1985	52,324
Iowa	Kinnick Stadium				X		576,000	1985	70,397
Louisiana Tech	Joe Aillet Stadium				X			1985	23,000
LSU	Tiger Stadium				X		3,500,000	1985	80,150
Missouri	Faurot Field at Memorial Stadium				X		800,000	1985	62,023
Oklahoma State	Lewis Field				X		750,000	1985	50,440
Purdue	Ross-Ade Stadium				X		554,000	1985	67,861
San Jose State	Spartan Stadium				X			1985	31,218
Stanford	Stanford Stadium			X	X	X	2,300,000	1985	85,500
Temple	Veterans Stadium				X		10,000,000	1985	65,356
Texas Christian	Amon G. Carter Stadium	X			X	X		1985	46,083
Virginia	Scott Stadium	X			X	X	5,065,000	1985	40,000
West Virginia	Mountaineer Field				X		3,000,000	1985	50,000
West Virginia	Mountaineer Field				X		7,500,000	1985	57,500

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
West Virginia	Mountaineer Field				X		650,000	1985	63,500
Bowling Green	Doyt Perry Stadium			X			30,000	1986	30,599
Central Michigan	Kelly/Shorts Stadium				X		140,000	1986	20,000
Indiana	Memorial Stadium				X		4,000,000	1986	52,324
Memphis	Liberty Bowl Memorial Stadium				X		19,500,000	1986	62,370
Mississippi State	Scott Field				X		7,200,000	1986	40,656
Ohio	Peden Stadium			X	X	X	3,800,000	1986	19,000
Tennessee	Shields-Watkins Field at Neyland Stadium				X		400,000	1986	89,749
Texas	Memorial Stadium				X		7,000,000	1986	77,809
Auburn	Jordan Hare Stadium				X		30,115,000	1987	85,214
Bowling Green	Doyt Perry Stadium				X		12,000	1987	30,599
Kansas	Memorial Stadium				X		250,000	1987	50,250
LSU	Tiger Stadium	X			X	X	1,722,000	1987	80,150
LSU	Tiger Stadium				X		1,722,000	1987	80,150
Minnesota	Hubert H Humphery Metrodome				X		1,350,000	1987	64,172
Oklahoma State	Lewis Field				X		400,000	1987	50,440

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Oregon State	Parker Stadium			X	X	X	4,000,000	1987	40,953
Pittsburgh	Pitt Stadium				X		750,000	1987	56,400
Tennessee	Shields-Watkins Field at Neyland Stadium				X		8,320,000	1987	91,110
Texas A&M	Kyle Field				X		900,000	1987	72,387
Washington	Husky Stadium				X		12,900,000	1987	72,500
Air Force	Falcon Stadium				X		2,400,000	1988	40,828
Alabama	Bryant-Denny Stadium				X		14,580,000	1988	71,123
Arizona State	Sun Devil Stadium				X		6,300,000	1988	71,706
Boston College	Alumni Stadium				X			1988	32,000
Boston College	Alumni Stadium				X			1988	32,000
East Carolina	Ficklen Stadium				X			1988	35,000
Florida State	Doak Campbell Stadium				X		400,000	1988	60,519
Georgia Tech	Bobby Dodd Stadium at Historic Grant Field			X	X	X		1988	46,000
Houston	Astrodome				X		67,000,000	1988	62,439
Indiana	Memorial Stadium				X		657,000	1988	52,324

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
North Carolina	Kenan Memorial Stadium				X		7,100,000	1988	52,000
Ole Miss	Vaught-Hemingway Stadium				X		3,750,000	1988	41,000
Oregon	Autzen Stadium				X		2,300,000	1988	41,698
Oregon	Autzen Stadium				X		1,000,000	1988	41,698
Virginia	Scott Stadium	X			X	X	3,000,000	1988	40,000
Arizona	Arizona Stadium				X		6,300,000	1989	51,955
Bowling Green	Doyt Perry Stadium				X		45,000	1989	30,599
Colorado	Folsom Field	X					545,000	1989	52,005
Houston	Astrodome				X			1989	62,439
Illinois	Memorial Stadium			X			613,000	1989	70,904
Iowa	Kinnick Stadium				X		1,000,000	1989	70,397
Kansas State	Wagner Field at KSU Stadium				X		2,000,000	1989	42,000
Louisiana Tech	Joe Aillet Stadium				X		500,000	1989	30,600
Ohio State	Ohio Stadium		X				1,000,000	1989	85,200
Southern Methodist	Ownby Stadium				X		1,500,000	1989	23,613
Southern Mississippi	M.M. Roberts Stadium				X			1989	33,000
Syracuse	Carrier Dome Stadium				X			1989	49,262
Utah	Rice Stadium				X			1989	32,500
Washington	Husky Stadium				X		3,700,000	1989	72,500

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Western Michigan	Waldo Stadium				X			1989	30,200
Baylor	Floyd Casey Stadium			X	X	X	8,000,000	1990	49,000
Clemson	Memorial Stadium	X					600,000	1990	78,000
Duke	Wade Wallace Stadium				X		250,000	1990	33,941
Florida	Ben Hill Griffin Stadium at Florida Field				X		506,000	1990	72,000
Iowa	Kinnick Stadium				X			1990	70,220
Kansas	Memorial Stadium				X		800,000	1990	50,250
Northern Illinois	Huskie Stadium				X		650,000	1990	30,998
Ohio State	Ohio Stadium				X		2,800,000	1990	91,700
Ohio State	Ohio Stadium				X		483,411	1990	91,700
Ole Miss	Vaught-Hemingway Stadium				X		1,250,000	1990	41,000
Oregon State	Parker Stadium				X		1,700,000	1990	35,362
Purdue	Ross-Ade Stadium				X		1,000,000	1990	67,332
Temple	Veterans Stadium				X			1990	65,356
Toledo	Glass Bowl				X		18,500,000	1990	26,248
Washington	Husky Stadium			X	X	X	1,500,000	1990	72,500

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Washington State	Martin Stadium				X		817,000	1990	37,600
Wisconsin	Camp Randall Stadium				X		800,000	1990	76,129
Air Force	Falcon Stadium				X			1991	41,600
Akron	Rubber Bowl				X		100,000	1991	31,000
Alabama	Bryant-Denny Stadium				X		500,000	1991	71,123
Arizona	Arizona Stadium				X		2,800,000	1991	56,167
Colorado	Folsom Field				X		14,000,000	1991	51,748
East Carolina	Ficklen Stadium	X					1,600,000	1991	35,000
Eastern Michigan	Rynearson Stadium				X		13,000,000	1991	30,200
Florida	Ben Hill Griffin Stadium at Florida Field				X		17,000,000	1991	83,000
Georgia	Sanford Stadium				X		3,700,000	1991	85,434
Kansas State	Wagner Field at KSU Stadium				X		800,000	1991	42,000
Maryland	Byrd Stadium				X		3,400,000	1991	48,055
Michigan	Michigan Stadium				X		2,250,000	1991	102,501
Michigan State	Spartan Stadium				X			1991	76,000
Mississippi State	Scott Field				X		1,400,000	1991	40,656

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Missouri	Faurot Field at Memorial Stadium			X				1991	62,023
Oregon State	Parker Stadium				X		4,000,000	1991	35,362
Penn State	Beaver Stadium	X			X	X	12,100,000	1991	93,967
Texas Christian	Amon G. Carter Stadium	X			X	X		1991	44,008
Tulsa	Skelly Stadium				X		500,000	1991	40,235
Virginia Tech	Lane Stadium/Worsham Field				X			1991	52,500
Arizona State	Sun Devil Stadium				X		2,000,000	1992	71,706
Army	Michie Stadium				X			1992	41,684
Bowling Green	Doyt Perry Stadium				X			1992	30,599
Cincinnati	Nippert Stadium				X		10,100,000	1992	35,000
Florida State	Doak Campbell Stadium				X		100,000,000	1992	77,500
Fresno State	Bulldog Stadium/Jim Sweeney Field				X		6,800,000	1992	41,031
Georgia Tech	Bobby Dodd Stadium at Historic Grant Field				X			1992	46,000
Illinois	Memorial Stadium			X	X	X	18,000,000	1992	70,904

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Miami	Orange Bowl				X		21,000,000	1992	74,712
Navy	Navy/Marine Corp Memorial Stadium				X		800,000	1992	34,000
Navy	Navy/Marine Corp Memorial Stadium	X			X	X	3,000,000	1992	34,000
Nebraska	Memorial Stadium				X		1,200,000	1992	73,531
New Mexico State	Aggie Memorial Stadium				X			1992	30,343
Ohio	Peden Stadium				X		5,300,000	1992	19,000
Southern California	LA Memorial Coliseum				X		15,000,000	1992	92,516
Texas A&M	Kyle Field			X				1992	70,016
Texas Christian	Amon G. Carter Stadium				X			1992	44,008
UCLA	Rose Bowl				X		11,500,000	1992	88,565
Washington	Husky Stadium			X	X	X		1992	72,500
Air Force	Falcon Stadium				X			1993	42,100
Alabama-Birmingham	Legion Field				X			1993	83,091
Colorado	Folsom Field				X		880,000	1993	51,748
Duke	Wade Wallace Stadium				X		2,400,000	1993	33,941
Kansas State	Wagner Field at KSU Stadium				X		3,300,000	1993	43,000

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Michigan	Michigan Stadium				X		3,753,965	1993	102,501
New Mexico	University Stadium				X		8,000,000	1993	31,670
Northern Illinois	Huskie Stadium				X			1993	30,998
Oregon State	Parker Stadium				X			1993	35,362
Tulsa	Skelly Stadium				X		1,000,000	1993	40,235
UCLA	Rose Bowl				X		2,000,000	1993	88,565
Air Force	Falcon Stadium				X			1994	52,237
Akron	Rubber Bowl	X		X		X	750,000	1994	31,000
Arkansas	Razorback Stadium				X		30,000,000	1994	50,019
Boston College	Alumni Stadium				X		25,000,000	1994	44,500
East Carolina	Dowdy-Ficklen Stadium				X		1,000,000	1994	35,000
Georgia	Sanford Stadium				X		6,000,000	1994	86,117
Illinois	Memorial Stadium				X		863,835	1994	69,249
Iowa State	Jack Trice Stadium				X		750,000	1994	46,000
LSU	Tiger Stadium	X			X	X	59,000,000	1994	80,000
Maryland	Byrd Stadium				X		48,000,000	1994	54,000
Miami	Orange Bowl				X		18,000,000	1994	72,319
Michigan State	Spartan Stadium				X		4,400,000	1994	72,027

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Nebraska	Memorial Stadium				X		620,000	1994	72,700
Northwestern	Dyche Stadium				X		800,000	1994	49,256
Oklahoma	Oklahoma Memorial Stadium				X		392,368	1994	75,004
Rutgers	Rutgers Stadium			X			28,000,000	1994	41,000
Southern California	LA Memorial Coliseum	X		X	X	X	93,000,000	1994	92,516
Stanford	Stanford Stadium			X	X	X	5,400,000	1994	85,500
Tennessee	Shields-Watkins Field at Neyland Stadium				X		450,000	1994	91,902
Virginia	Scott Stadium				X		2,900,000	1994	40,000
Virginia Tech	Lane Stadium/Worsham Field				X			1994	50,000
West Virginia	Mountaineer Field				X		20,000,000	1994	63,500
Alabama-Birmingham	Legion Field				X		1,000,000	1995	71,594
California	Memorial Field				X		1,500,00	1995	80,000
Colorado	Folsom Field				X		2,600,000	1995	51,808
Georgia Tech	Bobby Dodd Stadium at Historic Grant Field				X		1,000,000	1995	46,000
Iowa	Kinnick Stadium				X		3,000,000	1995	70,220

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Missouri	Faurot Field at Memorial Stadium				X		2,700,000	1995	68,174
Nevada	Current Mackay Stadium				X		15,000,000	1995	26,000
North Texas	Fouts Field				X		1,000,000	1995	30,500
Northern Illinois	Huskie Stadium				1		4,000,000	1995	31,000
Northern Illinois	Huskie Stadium				X		4,000,000	1995	31,000
Oklahoma	Oklahoma Memorial Stadium				X		750,000	1995	75,004
Oregon State	Parker Stadium				X			1995	35,362
Pittsburgh	Pitt Stadium	X		X	X	X	19,400,000	1995	56,400
South Carolina	Williams-Brice Stadium				X		9,900,000	1995	72,400
Southern California	LA Memorial Coliseum				X		6,000,000	1995	92,516
Syracuse	Carrier Dome Stadium				X		100,000	1995	49,262
Temple	Veterans Stadium				X		6,000,000	1995	65,356
Utah	Rice Stadium				X		800,000	1995	32,500
Virginia	Scott Stadium				X		25,000,000	1995	44,000
Washington	Husky Stadium				X			1995	72,500
Western Michigan	Waldo Stadium				X		2,600,000	1995	30,200

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Air Force	Falcon Stadium				X			1996	52,237
Central Michigan	Kelly/Shorts Stadium				X		550,000	1996	30,255
East Carolina	Dowdy-Ficklen Stadium				X		14,100,000	1996	40,000
Kent State	Dix Stadium				X		558,000	1996	30,520
Miami of Ohio	Yager Stadium			X			350,000	1996	30,012
Nevada-Las Vegas	Sam Boyd Stadium				X		500,000	1996	32,000
Northwestern	Dyche Stadium				X		28,000,000	1996	48,187
Notre Dame	Notre Dame Stadium				X		700,000	1996	59,075
Oregon State	Parker Stadium			X	X	X	6,200,000	1996	35,362
Rice	Rice Stadium				X			1996	70,000
South Carolina	Williams-Brice Stadium				X		1,860,000	1996	72,400
Syracuse	Carrier Dome Stadium				X		12,000,000	1996	49,262
Tennessee	Shields-Watkins Field at Neyland Stadium				X		11,500,000	1996	102,544
Texas	Memorial Stadium				X		4,050,000	1996	77,809
Texas A&M	Kyle Field				X		2,500,000	1996	70,016
Texas Christian	Amon G. Carter Stadium				X		11,000,000	1996	44,008
Tulane	Louisiana Superdome				X		22,800,000	1996	73,208

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Utah	Rice Stadium				X		400,000	1996	32,500
Virginia Tech	Lane Stadium/Worsham Field			X			220,000	1996	50,000
Air Force	Falcon Stadium				X		788,000	1997	52,237
Arizona	Arizona Stadium				X		500,000	1997	57,803
Ball State	Ball State Stadium				X		15,000,000	1997	21,581
Baylor	Floyd Casey Stadium				X		800,000	1997	49,000
Boise State	Bronco Stadium 2			X	X	X	9,350,000	1997	30,000
Brigham Young	Cougar Stadium	X			X	X		1997	65,000
Duke	Wade Wallace Stadium	X			X	X	750,000	1997	33,941
East Carolina	Dowdy-Ficklen Stadium				X		13,200,000	1997	43,000
Iowa	Kinnick Stadium			X			364,000	1997	70,220
Iowa State	Jack Trice Stadium				X		14,000,000	1997	46,000
Kansas	Memorial Stadium				X		400,000	1997	50,250
Kent State	Dix Stadium				X		1,300,000	1997	30,520
Kentucky	Commonwealth Stadium				X		600,000	1997	57,800
Mississippi State	Scott Field				X		2,200,000	1997	40,656
Missouri	Faurot Field at Memorial Stadium				X		12,000,000	1997	68,174

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
North Carolina	Kenan Memorial Stadium				X		50,000,000	1997	60,000
Northwestern	Ryan Field				X		20,000,000	1997	48,187
Notre Dame	Notre Dame Stadium				X		50,000,000	1997	80,795
Oklahoma	Oklahoma Memorial Stadium				X		5,575,000	1997	75,004
Ole Miss	Vaught-Hemingway Stadium				X		2,000,000	1997	41,000
Pittsburgh	Pitt Stadium				X		1,000,000	1997	56,400
Purdue	Ross-Ade Stadium				X		3,000,000	1997	66,295
San Diego State	QUALCOMM Stadium				X		78,000,000	1997	71,500
South Carolina	Williams-Brice Stadium				X		13,500,000	1997	80,250
Syracuse	Carrier Dome Stadium				X			1997	49,262
UCLA	Rose Bowl				X		21,500,000	1997	88,565
Utah State	Romney Stadium				X		5,300,000	1997	25,000
Alabama	Bryant-Denny Stadium				X		15,000,000	1998	83,818
Boston College	Alumni Stadium	X					2,000,000	1998	44,500
Bowling Green	Doyt Perry Stadium		X		X	X	2,000,000	1998	30,599
Central Michigan	Kelly/Shorts Stadium				X		28,000,000	1998	30,255

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Duke	Wade Wallace Stadium				X			1998	33,941
Florida	Ben Hill Griffin Stadium at Florida Field				X		5,000,000	1998	83,000
Indiana	Memorial Stadium				X			1998	52,324
Kansas State	Wagner Field at KSU Stadium				X		12,800,000	1998	50,300
Kent State	Dix Stadium				X			1998	30,250
Michigan	Michigan Stadium				X		13,900,000	1998	107,501
Michigan State	Spartan Stadium				X		3,200,000	1998	72,027
Oklahoma	Oklahoma Memorial Stadium				X		3,000,000	1998	72,765
Ole Miss	Vaught-Hemingway Stadium				X		10,700,000	1998	50,000
Oregon	Autzen Stadium				X		4,000,000	1998	41,698
Penn State	Beaver Stadium	X					16,000,000	1998	93,967
San Jose State	Spartan Stadium				X		1,100,000	1998	30,456
Southern Mississippi	M.M. Roberts Stadium			X	X	X	1,300,000	1998	33,000
Texas	Darrell K. Royal-Texas Memorial Stadium				X		90,000,000	1998	83,000
Utah	Rice-Eccles Stadium				X		50,000,000	1998	45,634

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Vanderbilt	Vanderbilt Stadium				X		800,000	1998	40,550
Virginia Tech	Lane Stadium/Worsham Field	X		X		X	1,900,000	1998	50,000
Wake Forest	Groves Stadium				X		8,000,000	1998	31,500
Western Michigan	Waldo Stadium				X		8,200,000	1998	30,200
Baylor	Floyd Casey Stadium				X		9,000,000	1999	49,000
Buffalo	UB Stadium				X		2,500,000	1999	31,000
California	Memorial Field				X		1,100,000	1999	80,000
Colorado	Folsom Field				X		1,200,000	1999	51,655
Colorado	Folsom Field				X		3,600,000	1999	51,655
East Carolina	Dowdy-Ficklen Stadium				X		7,000,000	1999	43,000
Eastern Michigan	Rynearson Stadium				X		750,000	1999	30,200
Houston	John O'Quinn Field at Robertson Stadium				X		6,000,000	1999	32,000
Kansas	Memorial Stadium	X		X	X	X	26,000,000	1999	50,250
Kentucky	Commonwealth Stadium				X		2,700,000	1999	67,606
Kentucky	Commonwealth Stadium				X		27,600,000	1999	67,606
Memphis	Liberty Bowl Memorial Stadium				X		3,000,000	1999	62,921

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Mississippi State	Scott Field				X		1,400,000	1999	40,656
Nebraska	Memorial Stadium			X	X	X	36,000,000	1999	74,056
Nevada-Las Vegas	Sam Boyd Stadium				X		18,000,000	1999	25,000
Oklahoma	Oklahoma Memorial Stadium				X		7,500,000	1999	72,765
Oregon State	Reser Stadium				X			1999	35,362
Oregon State	Reser Stadium				X		1,200,000	1999	35,362
Texas	Darrell K. Royal-Texas Memorial Stadium			X	X	X	3,200,000	1999	83,000
Texas A&M	Kyle Field				X		32,900,000	1999	82,600
Toledo	Glass Bowl				X		500,000	1999	26,248
Utah State	Romney Stadium				X			1999	25,000
Vanderbilt	Vanderbilt Stadium				X		1,000,000	1999	41,448
Virginia Tech	Lane Stadium/Worsham Field				X		500,000	1999	53,130
Wisconsin	Camp Randall Stadium				X		800,000	1999	76,129
Arkansas	Razorback Stadium				X		110,000,000	2000	72,000
Auburn	Jordan Hare Stadium				X		12,000,000	2000	85,214
Cincinnati	Nippert Stadium				X		2,300,000	2000	35,000
Georgia	Sanford Stadium				X		12,000,000	2000	86,520

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Kansas	Memorial Stadium				X		330,000	2000	53,071
LSU	Tiger Stadium				X		50,000,000	2000	91,600
Marshall	Joan C. Edwards Stadium				X		2,500,000	2000	38,019
Mississippi State	Davis Wade Stadium at Scott Field				X		11,700,000	2000	45,286
Missouri	Faurot Field at Memorial Stadium			X	X	X	13,100,000	2000	68,349
Nebraska	Memorial Stadium				X		4,900,000	2000	73,918
Nevada	Current Mackay Stadium				X		950,000	2000	26,000
North Carolina State	Carter-Finley Stadium				X		26,000,000	2000	51,500
Northern Illinois	Huskie Stadium				X		2,100,000	2000	30,998
Syracuse	Carrier Dome Stadium				X		14,000,000	2000	49,262
Tennessee	Shields-Watkins Field at Neyland Stadium				X		18,900,000	2000	104,079
Texas Tech	Jones SBC Stadium				X		30,000,000	2000	47,000
Tulsa	Skelly Stadium				X			2000	40,235
Virginia	Scott Stadium				X		86,000,000	2000	61,500
Virginia Tech	Lane Stadium/Worsham Field				X		3,000,000	2000	55,070

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Washington	Husky Stadium				X		1,000,000	2000	72,500
Washington State	Martin Stadium				X		1,813,000	2000	37,600
Arkansas	Donald W. Reynolds Razorback Stadium				X		20,000,000	2001	72,000
Arkansas State	Indian Stadium				X		1,000,000	2001	30,708
Army	Michie Stadium				X		800,000	2001	41,684
Baylor	Floyd Casey Stadium			X	X	X	2,000,000	2001	49,000
Bowling Green	Doyt Perry Stadium				X		1,096,310	2001	30,599
Cincinnati	Nippert Stadium				X		425,000	2001	35,000
Florida State	Doak Campbell Stadium				X		107,000,000	2001	80,000
Georgia Tech	Bobby Dodd Stadium at Historic Grant Field				X		70,000,000	2001	55,000
Illinois	Memorial Stadium				X		525,000	2001	62,870
Mississippi State	Davis Wade Stadium at Scott Field				X		18,300,000	2001	55,082
Nebraska	Memorial Stadium				X		1,393,085	2001	73,918
New Mexico	University Stadium				X		4,800,000	2001	37,370

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Northern Illinois	Huskie Stadium				X		1,300,000	2001	30,998
Northwestern	Ryan Field				X			2001	48,187
Ohio	Peden Stadium			X	X	X	2,800,000	2001	24,000
Ohio State	Ohio Stadium	X			X	X	194,000,000	2001	96,000
Oregon	Autzen Stadium				X		1,350,000	2001	41,698
Penn State	Beaver Stadium				X		93,000,000	2001	107,282
Temple	Veterans Stadium				X		1,800,000	2001	65,356
Texas A&M	Kyle Field	X					8,000,000	2001	82,600
Texas-El Paso	Sunbowl Stadium			X	X	X	11,000,000	2001	51,500
Utah State	Romney Stadium				X			2001	25,513
Virginia	Scott Stadium				X		10,000,000	2001	61,500
Virginia Tech	Lane Stadium/Worsham Field			X			1,366,500	2001	55,070
West Virginia	Mountaineer Field				X		2,000,000	2001	63,500
Western Michigan	Waldo Stadium				X		780,000	2001	30,200
Wyoming	War Memorial Stadium				X		9,400,000	2001	33,500
Air Force	Falcon Stadium				X		500,000	2002	52,237
Arizona State	Sun Devil Stadium				X		19,100,000	2002	71,706
Arkansas State	Indian Stadium				X		15,900,000	2002	30,406

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Baylor	Floyd Casey Stadium				X			2002	49,000
Boise State	Bronco Stadium 2			X	X	X	750,000	2002	30,000
Bowling Green	Doyt Perry Stadium			X				2002	30,599
Central Florida	Florida Citrus Bowl Stadium	X			X	X	3,100,000	2002	65,438
Duke	Wade Wallace Stadium				X		22,000,000	2002	33,941
Idaho	Kibbie Dome			X			10,000,000	2002	16,000
Illinois	Memorial Stadium				X		11,500,000	2002	62,870
Iowa State	Jack Trice Stadium				X		500,000	2002	46,000
Kansas State	Wagner Field at KSU Stadium				X		800,000	2002	50,300
Kent State	Dix Stadium			X	X	X	3,000,000	2002	30,250
Ohio	Peden Stadium				X		732,000	2002	24,000
Oklahoma	Gaylord Family-Oklahoma Memorial Stadium				X		12,000,000	2002	82,112
Ole Miss	Vaught-Hemingway Stadium			X	X	X	25,000,000	2002	60,580
Oregon	Autzen Stadium				X		90,000,000	2002	54,000
Southern Mississippi	M.M. Roberts Stadium				X			2002	33,000
Texas	Darrell K. Royal-Texas Memorial Stadium			X			750,000	2002	83,000

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Texas Christian	Amon G. Carter Stadium				X		7,500,000	2002	44,008
Tulane	Louisiana Superdome				X		400,000	2002	73,208
Utah	Rice-Eccles Stadium				X			2002	45,017
Virginia Tech	Lane Stadium/Worsham Field				X		37,000,000	2002	65,115
West Virginia	Mountaineer Field				X		476,000	2002	63,500
Akron	Rubber Bowl			X			403,000	2003	31,000
Army	Michie Stadium				X		7,000,000	2003	41,684
Brigham Young	LaVell Edwards Stadium				X		2,500,000	2003	64,045
California	Memorial Stadium				X		975,000	2003	80,000
Colorado	Folsom Field				X		43,800,000	2003	53,613
Florida	Ben Hill Griffin Stadium at Florida Field				X		50,000,000	2003	88,548
Florida State	Doak Campbell Stadium				X			2003	82,000
Georgia	Sanford Stadium				X		25,000,000	2003	92,058
Hawaii	Aloha Stadium				X		1,300,000	2003	50,000
Indiana	Memorial Stadium				X		1,100,000	2003	52,180
Indiana	Memorial Stadium				X		3,500,000	2003	52,180
Miami of Ohio	Yager Stadium			X			665,000	2003	30,012

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Michigan	Michigan Stadium				X		620,000	2003	107,501
Michigan State	Spartan Stadium				X		2,000,000	2003	72,027
Minnesota	Hubert H Humphery Metrodome				X		715,157	2003	64,172
Missouri	Faurot Field at Memorial Stadium				X		525,000	2003	68,349
Nevada	Current Mackay Stadium				X			2003	26,000
Nevada-Las Vegas	Sam Boyd Stadium				X		800,000	2003	36,318
North Carolina	Kenan Memorial Stadium				X		2,000,000	2003	60,000
North Carolina State	Carter-Finley Stadium			X	X	X	39,000,000	2003	51,500
North Texas	Fouts Field				X		1,000,000	2003	30,500
Ohio	Peden Stadium				X			2003	24,000
Oklahoma	Gaylord Family-Oklahoma Memorial Stadium			X	X	X	75,000,000	2003	81,207
Ole Miss	Vaught-Hemingway Stadium				X		750,000	2003	60,580
Purdue	Ross-Ade Stadium				X		70,000,000	2003	62,500
Syracuse	Carrier Dome Stadium				X		1,500,000	2003	49,262
Texas A&M	Kyle Field				X		27,000,000	2003	82,600

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Texas Tech	Jones SBC Stadium				X		84,900,000	2003	55,000
Troy	Movie Gallery Veterans Stadium				X		18,000,000	2003	30,000
Tulsa	Skelly Stadium				X			2003	40,235
Utah	Rice-Eccles Stadium				X		1,600,000	2003	45,017
Vanderbilt	Vanderbilt Stadium				X			2003	39,773
West Virginia	Mountaineer Field at Milan Puskar Stadium				X		20,000,000	2003	63,500
Western Michigan	Waldo Stadium				X		25,200,000	2003	30,200
Wisconsin	Camp Randall Stadium				X		430,000	2003	76,129
Air Force	Falcon Stadium				X			2004	46,692
Army	Michie Stadium				X		40,000,000	2004	41,684
Auburn	Jordan Hare Stadium				X		24,000,000	2004	87,451
Baylor	Floyd Casey Stadium				X		800,000	2004	49,000
Boston College	Alumni Stadium				X			2004	44,500
Bowling Green	Doyt Perry Stadium				X		4,000,000	2004	24,000
Central Michigan	Kelly/Shorts Stadium				X		550,000	2004	30,255

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Florida	Ben Hill Griffin Stadium at Florida Field				X		2,000,000	2004	88,548
Georgia	Sanford Stadium				X		8,000,000	2004	92,746
Maryland	Byrd Stadium				X		10,000,000	2004	54,000
Memphis	Liberty Bowl Memorial Stadium	X					1,800,000	2004	62,338
Miami of Ohio	Yager Stadium			X			1,000,000	2004	30,012
Minnesota	Hubert H Humphery Metrodome				X		20,000,000	2004	64,172
Navy	Navy/Marine Corp Memorial Stadium	X			X	X	40,000,000	2004	34,000
Nebraska	Memorial Stadium	X					1,300,000	2004	73,918
Nevada	Mackay Stadium				X		6,500,000	2004	26,000
New Mexico	University Stadium				X		2,000,000	2004	38,634
New Mexico State	Aggie Memorial Stadium				X		6,000,000	2004	30,545
Ohio	Peden Stadium				X		236,000	2004	24,000
Oklahoma	Gaylord Family-Oklahoma Memorial Stadium				X		9,000,000	2004	82,112
Oklahoma State	Boone Pickens Stadium				X		74,000,000	2004	47,800
Rutgers	Rutgers Stadium				X		600,000	2004	41,000
Southern Mississippi	M.M. Roberts Stadium				X		1,100,000	2004	33,000

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Utah State	Romney Stadium				X		757,000	2004	25,513
West Virginia	Mountaineer Field at Milan Puskar Stadium				X		13,000,000	2004	63,500
Wyoming	Jonah Field at War Memorial Stadium				X		10,000,000	2004	33,500
Alabama-Birmingham	Legion Field				X		600,000	2005	71,594
Ball State	Ball State Stadium				X		1,200,000	2005	21,581
Boston College	Alumni Stadium				X		27,000,000	2005	44,500
Buffalo	UB Stadium				X			2005	29,013
Central Michigan	Kelly/Shorts Stadium				X		650,000	2005	30,255
Cincinnati	Nippert Stadium				X		3,500,000	2005	35,000
Clemson	Memorial Stadium				X		32,000,000	2005	80,301
Colorado State	Hughes Stadium				X		15,200,000	2005	34,400
Eastern Michigan	Rynearson Stadium				X			2005	30,200
Fresno State	Bulldog Stadium/Jim Sweeney Field				X			2005	41,031
Georgia	Sanford Stadium				X		6,000,000	2005	92,746
Kent State	Dix Stadium				X			2005	29,287
Marshall	Joan C. Edwards Stadium				X		855,000	2005	38,019
Memphis	Liberty Bowl Memorial Stadium				X		931,700	2005	62,338

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Miami of Ohio	Yager Stadium			X			8,500,000	2005	24,286
Michigan State	Spartan Stadium				X		64,000,000	2005	75,005
Nebraska	Memorial Stadium				X		800,000	2005	73,918
New Mexico State	Aggie Memorial Stadium				X		300,000	2005	30,545
North Carolina State	Carter-Finley Stadium				X		17,300,000	2005	51,500
North Texas	Fouts Field				X		665,000	2005	30,500
Oregon State	Reser Stadium				X		32,000,000	2005	43,000
South Carolina	Williams-Brice Stadium	X			X	X	3,000,000	2005	80,250
Syracuse	Carrier Dome Stadium				X		5,000,000	2005	49,262
Texas	Darrell K. Royal-Texas Memorial Stadium				X		15,000,000	2005	83,000
Virginia Tech	Lane Stadium/Worsham Field				X		52,500,000	2005	66,233
Wake Forest	Groves Stadium	X		X		X	1,500,000	2005	31,500
Wisconsin	Camp Randall Stadium				X		109,500,000	2005	80,321
Wyoming	Jonah Field at War Memorial Stadium				X		1,000,000	2005	33,500
Air Force	Falcon Stadium				X		750,000	2006	46,692

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Alabama	Bryant-Denny Stadium				X		47,000,000	2006	92,137
Alabama-Birmingham	Legion Field				X			2006	71,594
Arkansas State	Indian Stadium				X			2006	30,406
Arkansas State	Indian Stadium				X		500,000	2006	30,406
Houston	John O'Quinn Field at Robertson Stadium				X		1,700,000	2006	32,000
Iowa	Kinnick Stadium				X		86,800,000	2006	70,585
Kansas State	Bill Snyder Family Football Stadium				X		13,000,000	2006	52,200
Kent State	Dix Stadium				X		14,500,000	2006	29,287
Louisiana Tech	Joe Aillet Stadium				X		950,000	2006	30,600
LSU	Tiger Stadium	X			X	X	60,000,000	2006	92,400
Middle Tennessee State	Horace Jones/Johnny "Red" Floyd Stadium				X		800,000	2006	30,788
Missouri	Faurot Field at Memorial Stadium				X			2006	68,349
Nebraska	Memorial Stadium				X		3,200,000	2006	73,918
Nevada	Current Mackay Stadium				X			2006	29,993

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
New Mexico State	Aggie Memorial Stadium				X		2,200,000	2006	30,545
Oklahoma State	Boone Pickens Stadium				X		108,000,000	2006	43,500
Oregon State	Reser Stadium				X		3,200,000	2006	43,300
Purdue	Ross-Ade Stadium				X		500,000	2006	62,500
Rice	Rice Stadium			X	X	X	6,000,000	2006	47,000
Tennessee	Shields-Watkins Field at Neyland Stadium				X		26,000,000	2006	102,038
Texas	Darrell K. Royal-Texas Memorial Stadium				X		8,000,000	2006	85,123
Texas A&M	Kyle Field				X			2006	82,600
Texas Christian	Amon G. Carter Stadium				X		100,000	2006	44,008
Texas Tech	Jones AT&T Stadium				X		2,000,000	2006	55,000
Texas-El Paso	Sunbowl Stadium				X		300,000	2006	51,500
Wake Forest	Groves Stadium				X		900,000	2006	31,500
Western Michigan	Waldo Stadium				X		700,000	2006	30,200
Auburn	Jordan Hare Stadium				X		2,900,000	2007	87,451
Ball State	Scheumann Stadium				X		13,500,000	2007	21,581
Bowling Green	Doyt Perry Stadium				X		11,200,000	2007	24,000

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Central Michigan	Kelly/Shorts Stadium				X		2,100,000	2007	30,255
Hawaii	Aloha Stadium	X					12,400,000	2007	50,000
Kansas State	Bill Snyder Family Football Stadium				X		2,600,000	2007	50,000
Kent State	Dix Stadium				X		2,000,000	2007	29,287
Louisiana Monroe	Malone Stadium				X		850,000	2007	30,427
Memphis	Liberty Bowl Memorial Stadium			X	X	X	1,000,000	2007	61,008
Michigan	Michigan Stadium				X		750,000	2007	106,201
Middle Tennessee State	Horace Jones/Johnny "Red" Floyd Stadium				X			2007	30,788
Navy	Navy/Marine Corp Memorial Stadium				X		250,000	2007	34,000
New Mexico State	Aggie Memorial Stadium				X		1,500,000	2007	30,545
North Carolina	Kenan Memorial Stadium				X		70,000,000	2007	63,230
North Texas	Fouts Field	X			X	X	106,000	2007	30,500
Northern Illinois	Huskie Stadium				X		16,000,000	2007	30,998
Oregon State	Reser Stadium				X		17,000,000	2007	43,300
Purdue	Ross-Ade Stadium				X		1,700,000	2007	62,500
Southern Mississippi	M.M. Roberts Stadium				X		31,800,000	2007	36,000

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Southern Mississippi	M.M. Roberts Stadium				X		650,000	2007	36,000
Tulsa	H.A. Chapman Stadium				X		1,500,000	2007	35,524
Utah	Rice-Eccles Stadium				X		500,000	2007	45,017
Utah	Rice-Eccles Stadium				X		400,000	2007	45,017
Wake Forest	BB&T Field (Renamed)				X		48,000,000	2007	31,500
West Virginia	Mountaineer Field at Milan Puskar Stadium				X		3,000,000	2007	60,180
Boise State	Bronco Stadium 2			X	X	X	35,900,000	2008	32,000
Florida	Ben Hill Griffin Stadium at Florida Field				X		28,000,000	2008	88,548
Florida State	Doak Campbell Stadium				X		950,000	2008	82,300
Hawaii	Aloha Stadium				X		25,800,000	2008	50,000
Idaho	Kibbie Dome			X	X	X	10,000,000	2008	16,000
Illinois	Memorial Stadium				X		121,000,000	2008	60,670
Indiana	Memorial Stadium				X		410,000	2008	49,225
Iowa State	Jack Trice Stadium				X		19,500,000	2008	55,000
Kansas	Memorial Stadium				X		34,000,000	2008	53,071
Kent State	Dix Stadium				X		4,000,000	2008	20,500

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Louisiana-Lafayette	Cajun Field (The Swamp)		X				46,000	2008	31,000
Mississippi State	Davis Wade Stadium at Scott Field				X		6,100,000	2008	55,082
Ole Miss	Vaught-Hemingway Stadium				X		6,000,000	2008	60,580
Oregon	Autzen Stadium				X			2008	54,000
Rice	Rice Stadium			X			1,000,000	2008	47,000
Rutgers	Rutgers Stadium				X		35,000,000	2008	41,968
South Carolina	Williams-Brice Stadium				X		2,200,000	2008	80,250
Southern California	LA Memorial Coliseum				X		1,000,000	2008	93,607
Tennessee	Shields-Watkins Field at Neyland Stadium				X		27,400,000	2008	100,011
Texas	Darrell K. Royal-Texas Memorial Stadium				X		179,000,000	2008	94,113
Texas Christian	Amon G. Carter Stadium				X		13,000,000	2008	44,358
Toledo	Glass Bowl				X		800,000	2008	26,248
Tulsa	H.A. Chapman Stadium				X		7,810,000	2008	35,524
Utah State	Romney Stadium				X		11,000,000	2008	25,513
Vanderbilt	Vanderbilt Stadium	X			X	X	12,000,000	2008	39,773

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Virginia Tech	Lane Stadium/Worsham Field				X			2008	66,233
Washington State	Martin Stadium				X		26,000,000	2008	35,117
West Virginia	Mountaineer Field at Milan Puskar Stadium				X		5,000,000	2008	60,180
Boise State	Bronco Stadium 2				X		750,000	2009	33,500
Central Michigan	Kelly/Shorts Stadium				X		636,035	2009	30,255
Duke	Wade Wallace Stadium				X		5,000,000	2009	33,941
Florida	Ben Hill Griffin Stadium at Florida Field				X		5,600,000	2009	88,548
Georgia Tech	Bobby Dodd Stadium at Historic Grant Field				X		4,500,000	2009	55,000
Hawaii	Aloha Stadium				X		4,000,000	2009	50,000
Idaho	Kibbie Dome			X	X	X	2,000,000	2009	16,000
Indiana	Memorial Stadium				X		25,000,000	2009	52,692
Iowa	Kinnick Stadium				X		2,050,000	2009	70,585
Iowa State	Jack Trice Stadium				X		11,500,000	2009	55,000
Kansas	Memorial Stadium				X		800,000	2009	53,071
Louisiana Tech	Joe Aillet Stadium				X		2,000,000	2009	30,600

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Maryland	Byrd Stadium				X		50,800,000	2009	54,000
Memphis	Liberty Bowl Memorial Stadium				X		4,900,000	2009	61,008
Missouri	Faurot Field at Memorial Stadium				X		5,000,000	2009	71,004
Nebraska	Memorial Stadium				X		1,350,000	2009	73,918
North Carolina State	Carter-Finley Stadium			X	X	X	10,000,000	2009	57,583
Northern Illinois	Huskie Stadium				X		500,000	2009	30,998
Notre Dame	Notre Dame Stadium				X		1,000,000	2009	80,795
Ohio	Peden Stadium				X			2009	24,000
Oklahoma	Gaylord Family-Oklahoma Memorial Stadium				X		15,000,000	2009	82,112
Oklahoma State	Boone Pickens Stadium				X		286,000,000	2009	60,218
Ole Miss	Vaught-Hemingway Stadium				X		500,000	2009	60,580
Rutgers	Rutgers Stadium				X		67,000,000	2009	52,454
San Jose State	Spartan Stadium				X		1,300,000	2009	30,456
South Carolina	Williams-Brice Stadium	X			X	X	2,560,000	2009	80,250
South Florida	Raymond James Stadium			X			750,000	2009	65,857

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Texas	Darrell K. Royal-Texas Memorial Stadium				X		27,000,000	2009	100,119
Texas-El Paso	Sunbowl Stadium				X		500,000	2009	51,500
Tulane	Louisiana Superdome				X		360,000	2009	73,208
Utah	Rice-Eccles Stadium			X			800,000	2009	45,017
Vanderbilt	Vanderbilt Stadium	X			X	X	12,000,000	2009	39,773
Virginia	Scott Stadium				X		2,400,000	2009	61,500
Washington State	Martin Stadium				X		13,500,000	2009	35,117
Alabama	Bryant-Denny Stadium				X		65,000,000	2010	101,821
Alabama-Birmingham	Legion Field				X		500,000	2010	71,594
Baylor	Floyd Casey Stadium				X			2010	49,000
Boise State	Bronco Stadium 2			X			817,000	2010	33,500
Boston College	Alumni Stadium				X			2010	44,500
Brigham Young	LaVell Edwards Stadium				X		1,000,000	2010	63,725
East Carolina	Dowdy-Ficklen Stadium				X		20,000,000	2010	50,000
Florida State	Doak Campbell Stadium			X				2010	82,300

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Georgia	Sanford Stadium				X		8,800,000	2010	92,746
Hawaii	Aloha Stadium				X		71,000,000	2010	50,000
Idaho	Kibbie Dome			X	X	X	11,000,000	2010	16,000
Indiana	Memorial Stadium				X		3,000,000	2010	52,692
Louisville	Papa John's Cardinal Stadium				X		72,000,000	2010	55,000
Marshall	Joan C. Edwards Stadium				X		3,000,000	2010	38,019
Memphis	Liberty Bowl Memorial Stadium				X		15,700,000	2010	61,008
Miami of Ohio	Yager Stadium			X				2010	24,286
Michigan	Michigan Stadium				X		226,000,000	2010	107,601
Navy	Navy/Marine Corp Memorial Stadium				X		18,000,000	2010	34,000
Nevada	Current Mackay Stadium				X		1,100,000	2010	29,993
Oregon	Autzen Stadium				X		1,800,000	2010	54,000
South Carolina	Williams-Brice Stadium				X		3,700,000	2010	80,250
Tennessee	Shields-Watkins Field at Neyland Stadium				X		83,000,000	2010	102,455
Texas Christian	Amon G. Carter Stadium				X		105,000,000	2010	44,358
Texas Tech	Jones AT&T Stadium				X		25,000,000	2010	60,454

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Tulane	Louisiana Superdome				X		193,000,000	2010	73,208
Tulsa	H.A. Chapman Stadium			X	X	X	22,000,000	2010	35,524
Vanderbilt	Vanderbilt Stadium	X			X	X	8,000,000	2010	39,773
Wake Forest	BB&T Field				X		1,500,000	2010	31,500
Wyoming	Jonah Field at War Memorial Stadium	X			X	X	26,500,000	2010	29,181
Connecticut	Rentschler Field			X			1,000,000	2011	38,066
Fresno State	Bulldog Stadium/Jim Sweeney Field				X		1,200,000	2011	41,031
Georgia	Sanford Stadium				X		1,400,000	2011	92,746
Hawaii	Hawaiian Airlines Field at Aloha Stadium				X		2,000,000	2011	50,000
Hawaii	Hawaiian Airlines Field at Aloha Stadium				X		2,000,000	2011	50,000
Idaho	Kibbie Dome				X		7,000,000	2011	16,000
Iowa State	Jack Trice Stadium				X		4,000,000	2011	55,000
Kentucky	Commonwealth Stadium				X		6,250,000	2011	67,606
Louisiana Monroe	Malone Stadium				X		1,400,000	2011	30,427
Louisiana Tech	Joe Aillet Stadium				X			2011	30,600

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Michigan State	Spartan Stadium			X			253,000	2011	75,005
Missouri	Faurot Field at Memorial Stadium	X		X	X	X	45,550,000	2011	71,004
North Carolina	Kenan Memorial Stadium				X		7,500,000	2011	63,230
Penn State	Beaver Stadium				X		10,000,000	2011	106,572
Rutgers	High Point Solutions Stadium				X		650,000	2011	52,454
San Diego State	Snapdragon Stadium				X		9,100,000	2011	61,000
San Jose State	Spartan Stadium				X		1,000,000	2011	30,456
South Carolina	Williams-Brice Stadium				X		500,000	2011	80,250
Southern Methodist	Gerald Ford				X		3,000,000	2011	32,000
Syracuse	Carrier Dome Stadium				X		30,000,000	2011	49,262
Texas Christian	Amon G. Carter Stadium				X		59,000,000	2011	44,358
Texas Tech	Jones AT&T Stadium				X			2011	60,454
Tulane	Louisiana Superdome				X		1,600,000	2011	73,208
UCLA	Rose Bowl				X		152,000,000	2011	91,136
Wyoming	Jonah Field at War Memorial Stadium				X		1,316,998	2011	29,181

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Arkansas State	Liberty Bank Stadium				X		5,000,000	2012	30,406
Ball State	Scheumann Stadium				X		639,000	2012	22,500
Boise State	Bronco Stadium 2				X		3,100,000	2012	37,000
Boston College	Alumni Stadium	X			X	X		2012	44,500
Brigham Young	LaVell Edwards Stadium	X			X	X		2012	63,470
California	Memorial Stadium			X	X	X	321,000,000	2012	63,186
Clemson	Memorial Stadium				X		3,800,000	2012	81,500
Colorado	Folsom Field				X		6,500,000	2012	53,613
Florida	Ben Hill Griffin Stadium at Florida Field				X		5,600,000	2012	88,548
Florida International	Alfonso Field at FIU Stadium				X		31,000,000	2012	20,000
Hawaii	Hawaiian Airlines Field at Aloha Stadium			X			190,000	2012	50,000
Illinois	Memorial Stadium				X		1,000,000	2012	60,670
LSU	Tiger Stadium	X					856,000	2012	92,542
Maryland	Byrd Stadium				X		500,000	2012	54,000
Memphis	Liberty Bowl Memorial Stadium	X		X	X	X	12,000,000	2012	59,308

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Middle Tennessee State	Horace Jones/Johnny "Red" Floyd Stadium				X		1,000,000	2012	30,788
New Mexico	University Stadium				X		1,500,000	2012	39,224
Ohio State	Ohio Stadium				X		7,000,000	2012	102,329
Oregon State	Reser Stadium				X			2012	45,674
San Jose State	Spartan Stadium				X		15,000,000	2012	30,456
South Alabama	Ladd-Peebles Stadium				X		10,000,000	2012	40,646
South Carolina	Williams-Brice Stadium				X		6,500,000	2012	80,250
Southern California	LA Memorial Coliseum				X		100,000,000	2012	93,607
Southern Mississippi	M.M. Roberts Stadium			X	X	X	980,000	2012	36,000
Texas State	Bobcat Stadium				X		33,000,000	2012	30,000
Toledo	Glass Bowl				X		1,100,000	2012	26,248
Troy	Larry Blakeney Field at Veterans Memorial Stadium				X		850,000	2012	30,000
Utah	Rice-Eccles Stadium				X			2012	45,017
Utah State	Romney Stadium				X			2012	25,513
Vanderbilt	Vanderbilt Stadium	X			X	X	18,000,000	2012	40,550

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Virginia Tech	Lane Stadium/Worsham Field				X			2012	66,233
Washington State	Martin Stadium				X		80,000,000	2012	32,740
Arizona	Arizona Stadium				X		85,700,000	2013	57,800
Idaho	Kibbie Dome				X		1,150,000	2013	16,000
Illinois	Memorial Stadium				X		6,700,000	2013	60,670
Iowa	Kinnick Stadium				X		8,000,000	2013	70,585
Kansas State	Bill Snyder Family Football Stadium				X		90,000,000	2013	50,000
Louisiana-Lafayette	Cajun Field (The Swamp)			X	X	X	57,526,725	2013	65,000
Marshall	Joan C. Edwards Stadium				X		2,000,000	2013	38,227
Mississippi State	Davis Wade Stadium at Scott Field				X		80,000,000	2013	61,337
Nebraska	Memorial Stadium				X		63,500,000	2013	81,067
Nevada	Current Mackay Stadium				X		6,000,000	2013	29,993
Northern Illinois	Huskie Stadium				X		3,400,000	2013	30,998
Oregon	Autzen Stadium				X		5,000,000	2013	54,000
South Carolina	Williams-Brice Stadium				X		30,500,000	2013	80,250
Southern Methodist	Gerald Ford				X			2013	32,000

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Texas Tech	Jones AT&T Stadium				X		16,000,000	2013	60,454
Virginia Tech	Lane Stadium/Worsham Field				X		3,000,000	2013	66,233
Wisconsin	Camp Randall Stadium				X		74,000,000	2013	80,321
Wyoming	Jonah Field at War Memorial Stadium				X		500,000	2013	29,181
Alabama	Bryant-Denny Stadium				X		2,500,000	2014	101,821
Boston College	Alumni Stadium				X			2014	44,500
Buffalo	UB Stadium				X		1,000,000	2014	29,013
Eastern Michigan	Rynearson Stadium				X		1,000,000	2014	30,200
Iowa State	Jack Trice Stadium				X		60,000,000	2014	61,500
Kansas	Memorial Stadium				X		500,000	2014	53,071
LSU	Tiger Stadium				X		70,000,000	2014	102,321
Marshall	Joan C. Edwards Stadium				X		750,000	2014	38,227
Massachusetts	Warren P. McGuirk Alumni Stadium				X		20,000,000	2014	17,000
Michigan State	Spartan Stadium				X		49,327,337	2014	75,005

(Table 8.8 continued)

School	Stadium	Preserve	Restore	Reconstruct	Rehab	Combo	Nominal Cost ($)	Facility Change	Capacity
Middle Tennessee State	Horace Jones/Johnny "Red" Floyd Stadium				X		1,400,000	2014	30,788
Missouri	Faurot Field at Memorial Stadium				X		1,500,000	2014	71,004
Nebraska	Memorial Stadium				X		12,300,000	2014	81,607
Nevada-Las Vegas	Sam Boyd Stadium				X		400,000	2014	36,318
New Mexico State	Aggie Memorial Stadium				X		1,300,000	2014	30,545
Northwestern	Ryan Field				X		2,000,000	2014	48,187
Notre Dame	Notre Dame Stadium				X		750,000	2014	80,795
Oregon State	Reser Stadium				X			2014	45,674
Purdue	Ross-Ade Stadium				X			2014	62,500
Rice	Rice Stadium			X				2014	47,000
Texas A&M	Kyle Field				X		300,000	2014	82,589
Washington State	Martin Stadium				X		1,438,200	2014	32,740
Western Michigan	Waldo Stadium				X		1,350,000	2014	30,200
Wyoming	Jonah Field at War Memorial Stadium				X		10,200,000	2014	29,181

Table 8.9 Stage Five (1985-2014) Renovations- Parking, Suites and Club Seats

School	Stadium	Facility Change	Parking	Suites	Club Seats
Arkansas	Razorback Stadium	1985		36	0
Florida State	Doak Campbell Stadium	1985	4,500	15	0
Georgia Tech	Grant Field	1985		14	0
Hawaii	Aloha Stadium	1985	8,000	1	0
Indiana	Memorial Stadium	1985	12,000	0	0
Iowa	Kinnick Stadium	1985	3,500	0	0
LSU	Tiger Stadium	1985	2,400	2	750
Purdue	Ross-Ade Stadium	1985	2,787	0	0
San Jose State	Spartan Stadium	1985	4,500	13	0
Stanford	Stanford Stadium	1985	10,000	0	0
Temple	Veterans Stadium	1985	16,000	89	48
Texas Christian	Amon G. Carter Stadium	1985	4,000	0	0
Virginia	Scott Stadium	1985	5,000	1	132
West Virginia	Mountaineer Field	1985	5,000	0	0
Bowling Green	Doyt Perry Stadium	1986	1,200	0	0
Central Michigan	Kelly/Shorts Stadium	1986	2,200	0	0
Memphis	Liberty Bowl Memorial Stadium	1986	7,000	40	0
Tennessee	Shields-Watkins Field at Neyland Stadium	1986	10,750	0	0
Texas	Memorial Stadium	1986	500	64	0
Auburn	Jordan Hare Stadium	1987		71	0
Minnesota	Hubert H Humphery Metrodome	1987	500	113	0
Oklahoma State	Lewis Field	1987		0	300
Oregon State	Parker Stadium	1987		0	1,500
Pittsburgh	Pitt Stadium	1987	14,000	0	0
Tennessee	Shields-Watkins Field at Neyland Stadium	1987	10,750	42	0
Texas A&M	Kyle Field	1987	3,550	48	0
Air Force	Falcon Stadium	1988	11,400	0	0

(Table 8.9 continued)

School	Stadium	Facility Change	Parking	Suites	Club Seats
Alabama	Bryant-Denny Stadium	1988	10,000	0	0
Arizona State	Sun Devil Stadium	1988	3,500	68	1,677
Boston College	Alumni Stadium	1988		30	0
East Carolina	Ficklen Stadium	1988	2,500	0	0
Houston	Astrodome	1988	24,000	119	100
North Carolina	Kenan Memorial Stadium	1988	3,500	1	0
Ole Miss	Vaught-Hemingway Stadium	1988		1	700
Oregon	Autzen Stadium	1988	8,400	12	381
Arizona	Arizona Stadium	1989		24	319
Colorado	Folsom Field	1989	5,000	0	0
Kansas State	Wagner Field at KSU Stadium	1989	5,000	0	0
Louisiana Tech	Joe Aillet Stadium	1989		0	200
Southern Methodist	Ownby Stadium	1989	7,500	0	0
Southern Mississippi	M.M. Roberts Stadium	1989	5,000	0	0
Syracuse	Carrier Dome Stadium	1989	8,000	41	0
Utah	Rice Stadium	1989		0	400
Baylor	Floyd Casey Stadium	1990	2,715	0	0
Clemson	Memorial Stadium	1990	19,500	0	0
Duke	Wade Wallace Stadium	1990	2,000	0	0
Florida	Ben Hill Griffin Stadium at Florida Field	1990	20,000	0	0
Northern Illinois	Huskie Stadium	1990	2,200	0	0
Ohio State	Ohio Stadium	1990	26,000	0	0
Toledo	Glass Bowl	1990	8,900	45	300
Washington State	Martin Stadium	1990	3,743	0	0
Wisconsin	Camp Randall Stadium	1990	4,000	0	0
Air Force	Falcon Stadium	1991	11,400	9	0

(Table 8.9 continued)

School	Stadium	Facility Change	Parking	Suites	Club Seats
Akron	Rubber Bowl	1991	1,200	0	0
Arizona	Arizona Stadium	1991	23,200	24	319
Eastern Michigan	Rynearson Stadium	1991		0	340
Florida	Ben Hill Griffin Stadium at Florida Field	1991	20,000	18	1,991
Georgia	Sanford Stadium	1991	14,000	30	3,656
Maryland	Byrd Stadium	1991		0	300
Penn State	Beaver Stadium	1991	25,000	0	0
Tulsa	Skelly Stadium	1991	2,500	0	0
Bowling Green	Doyt Perry Stadium	1992	1,200	1	106
Cincinnati	Nippert Stadium	1992	5,000	2	0
Fresno State	Bulldog Stadium/Jim Sweeney Field	1992	4,200	22	3,240
Georgia Tech	Bobby Dodd Stadium at Historic Grant Field	1992		32	0
Miami	Orange Bowl	1992	4,500	0	0
Nebraska	Memorial Stadium	1992	2,000	0	0
New Mexico State	Aggie Memorial Stadium	1992	5,000	0	0
Southern California	LA Memorial Coliseum	1992	19,000	0	0
UCLA	Rose Bowl	1992	20,000	0	1,200
Alabama-Birmingham	Legion Field	1993	4,000	2	860
Kansas State	Wagner Field at KSU Stadium	1993	5,000	26	0
New Mexico	University Stadium	1993	4,000	0	0
Northern Illinois	Huskie Stadium	1993	2,200	0	2122
Oregon State	Parker Stadium	1993		12	1,500
Boston College	Alumni Stadium	1994		54	0
Georgia	Sanford Stadium	1994	14,000	50	6,720
Michigan State	Spartan Stadium	1994	500	0	0
Rutgers	Rutgers Stadium	1994	3,000	0	0

(Table 8.9 continued)

School	Stadium	Facility Change	Parking	Suites	Club Seats
West Virginia	Mountaineer Field	1994	5,000	12	0
California	Memorial Field	1995	10,000	0	0
Colorado	Folsom Field	1995	5,000	41	1,961
Georgia Tech	Bobby Dodd Stadium at Historic Grant Field	1995		50	0
Iowa	Kinnick Stadium	1995	3,500	18	0
Nevada	Current Mackay Stadium	1995	3,000	60	0
North Texas	Fouts Field	1995	1,400	0	0
Oklahoma	Oklahoma Memorial Stadium	1995		9	0
South Carolina	Williams-Brice Stadium	1995	4500	16	0
Western Michigan	Waldo Stadium	1995		0	325
Nevada-Las Vegas	Sam Boyd Stadium	1996	16,000	0	0
Northwestern	Dyche Stadium	1996	1400	0	0
Rice	Rice Stadium	1996	7,700	0	0
Tulane	Louisiana Superdome	1996	5,000	137	14,077
Virginia Tech	Lane Stadium/Worsham Field	1996	8,000	0	0
Ball State	Ball State Stadium	1997	1,200	0	0
Brigham Young	Cougar Stadium	1997	2,000	1	200
Iowa State	Jack Trice Stadium	1997		20	0
Kansas	Memorial Stadium	1997		36	0
Kentucky	Commonwealth Stadium	1997	10,000	0	0
North Carolina	Kenan Memorial Stadium	1997	3,500	8	1,000
Notre Dame	Notre Dame Stadium	1997	10,000	0	3,028
Ole Miss	Vaught-Hemingway Stadium	1997		50	700
San Diego State	QUALCOMM Stadium	1997	18,500	113	7,600
South Carolina	Williams-Brice Stadium	1997	4,500	19	1,600
Alabama	Bryant-Denny Stadium	1998	20,000	85	0
Central Michigan	Kelly/Shorts Stadium	1998	2,200	9	358

(Table 8.9 continued)

School	Stadium	Facility Change	Parking	Suites	Club Seats
Kansas State	Wagner Field at KSU Stadium	1998	5,000	31	0
Texas	Darrell K. Royal-Texas Memorial Stadium	1998		116	0
Utah	Rice-Eccles Stadium	1998	4,500	25	461
Vanderbilt	Vanderbilt Stadium	1998		15	332
Wake Forest	Groves Stadium	1998	9,899	0	0
Western Michigan	Waldo Stadium	1998		10	325
Baylor	Floyd Casey Stadium	1999	2,715	37	0
Buffalo	UB Stadium	1999	3,500	12	0
Houston	John O'Quinn Field at Robertson Stadium	1999	2,148	32	0
Kansas	Memorial Stadium	1999	13,700	36	0
Kentucky	Commonwealth Stadium	1999	10,000	40	0
Nebraska	Memorial Stadium	1999	2,000	42	1,500
Nevada-Las Vegas	Sam Boyd Stadium	1999	16,000	16	488
Texas A&M	Kyle Field	1999	3,550	72	1,900
Utah State	Romney Stadium	1999	6,000	0	0
Arkansas	Razorback Stadium	2000	10,000	70	7,170
Auburn	Jordan Hare Stadium	2000	1,650	79	0
LSU	Tiger Stadium	2000	2,400	72	750
Marshall	Joan C. Edwards Stadium	2000	1,100	20	0
Mississippi State	Davis Wade Stadium at Scott Field	2000		50	1,700
Missouri	Faurot Field at Memorial Stadium	2000		35	1,265
Nebraska	Memorial Stadium	2000	2,000	42	2,119
North Carolina State	Carter-Finley Stadium	2000	8,000	0	0
Tennessee	Shields-Watkins Field at Neyland Stadium	2000	10,750	120	0
Texas Tech	Jones SBC Stadium	2000	3,000	24	500
Arkansas	Donald W. Reynolds Razorback Stadium	2001	10,000	132	8,950
Arkansas State	Indian Stadium	2001	4,000	0	0

(Table 8.9 continued)

School	Stadium	Facility Change	Parking	Suites	Club Seats
Florida State	Doak Campbell Stadium	2001	4,500	70	0
Georgia Tech	Bobby Dodd Stadium at Historic Grant Field	2001	15,000	74	2,200
Northwestern	Ryan Field	2001	1,400	0	300
Ohio	Peden Stadium	2001		0	2,000
Ohio State	Ohio Stadium	2001	26,000	81	2,500
Penn State	Beaver Stadium	2001	25,000	60	4,000
Texas-El Paso	Sunbowl Stadium	2001	7,900	0	0
Virginia	Scott Stadium	2001	9,000	44	360
Wyoming	War Memorial Stadium	2001	4,159	0	0
Arkansas State	Indian Stadium	2002	4,000	8	170
Central Florida	Florida Citrus Bowl Stadium	2002	3,830	30	0
Idaho	Kibbie Dome	2002	1,700	0	0
Oklahoma	Gaylord Family-Oklahoma Memorial Stadium	2002		27	2,500
Ole Miss	Vaught-Hemingway Stadium	2002	6,000	50	700
Oregon	Autzen Stadium	2002	8,400	44	3,200
Virginia Tech	Lane Stadium/Worsham Field	2002	8,000	15	2,361
Brigham Young	LaVell Edwards Stadium	2003	2,000	42	1,836
Florida	Ben Hill Griffin Stadium at Florida Field	2003	20,000	56	2,900
Florida State	Doak Campbell Stadium	2003	4,500	89	0
Georgia	Sanford Stadium	2003	16,000	77	7,136
Michigan State	Spartan Stadium	2003	500	24	800
Missouri	Faurot Field at Memorial Stadium	2003	3,000	35	1,265
North Carolina State	Carter-Finley Stadium	2003	8,000	51	955
Purdue	Ross-Ade Stadium	2003	2,787	34	200
Troy	Movie Gallery Veterans Stadium	2003	600	27	1,000
Auburn	Jordan Hare Stadium	2004	1,650	79	2,975
Memphis	Liberty Bowl Memorial Stadium	2004	8,000	40	0

(Table 8.9 continued)

School	Stadium	Facility Change	Parking	Suites	Club Seats
Navy	Navy/Marine Corp Memorial Stadium	2004	4,400	18	140
New Mexico	University Stadium	2004	4,000	4	400
New Mexico State	Aggie Memorial Stadium	2004	5,000	4	0
West Virginia	Mountaineer Field at Milan Puskar Stadium	2004	5,000	30	648
Clemson	Memorial Stadium	2005	20,075	108	0
Colorado State	Hughes Stadium	2005	4,500	12	428
Oregon State	Reser Stadium	2005	5,000	22	1,500
Virginia Tech	Lane Stadium/Worsham Field	2005	8,000	41	4,180
Wisconsin	Camp Randall Stadium	2005	4,000	72	337
Alabama	Bryant-Denny Stadium	2006	20,000	123	1,859
Houston	John O'Quinn Field at Robertson Stadium	2006	4,888	32	0
Iowa	Kinnick Stadium	2006	3,500	47	1,297
Kansas State	Bill Snyder Family Football Stadium	2006	5,000	53	2,126
Kent State	Dix Stadium	2006	2,200	4	100
LSU	Tiger Stadium	2006	2,400	72	3,200
Middle Tennessee State	Horace Jones/Johnny "Red" Floyd Stadium	2006	1,000	28	557
Nevada	Current Mackay Stadium	2006	6,000	60	0
Oklahoma State	Boone Pickens Stadium	2006		56	4,400
Oregon State	Reser Stadium	2006	5,000	22	3,600
Rice	Rice Stadium	2006	30,000	0	200
Tennessee	Shields-Watkins Field at Neyland Stadium	2006	10,750	120	425
Texas-El Paso	Sunbowl Stadium	2006	7,900	1	390
Louisiana Monroe	Malone Stadium	2007	1,100	20	300
North Carolina	Kenan Memorial Stadium	2007	3,500	28	3,660
Southern Mississippi	M.M. Roberts Stadium	2007	5,000	34	800

(Table 8.9 continued)

School	Stadium	Facility Change	Parking	Suites	Club Seats
Wake Forest	BB&T Field	2007	9,899	27	656
West Virginia	Mountaineer Field at Milan Puskar Stadium	2007	5,000	34	648
Boise State	Bronco Stadium 2	2008		35	680
Illinois	Memorial Stadium	2008		42	1,400
Iowa State	Jack Trice Stadium	2008	4,000	43	542
Kansas	Memorial Stadium	2008	13,700	39	3,000
Louisiana-Lafayette	Cajun Field (The Swamp)	2008	3,000	22	0
Rutgers	Rutgers Stadium	2008	3,000	0	968
Tennessee	Shields-Watkins Field at Neyland Stadium	2008	10,750	120	850
Texas	Darrell K. Royal-Texas Memorial Stadium	2008		116	2,100
Texas Christian	Amon G. Carter Stadium	2008	4,000	6	250
Indiana	Memorial Stadium	2009	12,000	9	300
Iowa	Kinnick Stadium	2009	4,300	47	1,380
Maryland	Byrd Stadium	2009		0	3,300
Oklahoma State	Boone Pickens Stadium	2009		111	4,000
South Florida	Raymond James Stadium	2009	10,000	195	12,332
Virginia	Scott Stadium	2009	9,000	56	360
Washington State	Martin Stadium	2009	3,743	21	1,266
Alabama	Bryant-Denny Stadium	2010	20,000	159	3,907
Louisville	Papa John's Cardinal Stadium	2010	8,125	63	5,725
Michigan	Michigan Stadium	2010		83	3,200
Navy	Navy/Marine Corp Memorial Stadium	2010	4,400	26	140
Texas Christian	Amon G. Carter Stadium	2010	3,200	24	2,500
Texas Tech	Jones AT&T Stadium	2010	3,000	89	500
Tulsa	H.A. Chapman Stadium	2010	2,500	22	400
Wake Forest	BB&T Field	2010	9,899	30	660
Wyoming	Jonah Field at War Memorial Stadium	2010	4,159	12	256

(Table 8.9 continued)

School	Stadium	Facility Change	Parking	Suites	Club Seats
Connecticut	Rentschler Field	2011	10,600	38	635
Idaho	Kibbie Dome	2011	1,700	9	232
Southern Methodist	Gerald Ford	2011	3,500	24	560
Texas Christian	Amon G. Carter Stadium	2011	3,200	30	2,500
Texas Tech	Jones AT&T Stadium	2011	4,500	89	544
UCLA	Rose Bowl	2011	20,000	102	1,200
Wyoming	Jonah Field at War Memorial Stadium	2011	4,800	12	256
Ball State	Scheumann Stadium	2012	1,200	25	184
Boise State	Bronco Stadium 2	2012	3,400	35	680
California	Memorial Stadium	2012	10,000	1	2,700
Clemson	Memorial Stadium	2012	20,375	108	0
Florida International	Alfonso Field at FIU Stadium	2012	4,000	18	1,500
Maryland	Byrd Stadium	2012		64	3,300
Memphis	Liberty Bowl Memorial Stadium	2012	8,000	40	1,500
Ohio State	Ohio Stadium	2012	26,000	81	2,625
Oregon State	Reser Stadium	2012	5,000	52	3,600
South Alabama	Ladd-Peebles Stadium	2012		11	120
Texas State	Bobcat Stadium	2012	8,000	15	450
Washington State	Martin Stadium	2012	8,185	63	1,266
Arizona	Arizona Stadium	2013	23,200	24	5,000
Kansas State	Bill Snyder Family Football Stadium	2013	5,000	71	2,800
Louisiana-Lafayette	Cajun Field (The Swamp)	2013	3,000	37	1,200
Marshall	Joan C. Edwards Stadium	2013	1,100	24	0
Mississippi State	Davis Wade Stadium at Scott Field	2013		72	3,091
Nebraska	Memorial Stadium	2013	2,000	51	2,119
Southern Methodist	Gerald Ford	2013	3,500	31	793

(Table 8.9 continued)

School	Stadium	Facility Change	Parking	Suites	Club Seats
LSU	Tiger Stadium	2014	2,400	132	4,700
Massachusetts	Warren P. McGuirk Alumni Stadium	2014	5,000	2	0

Table 8.10 Stage Five (1985-2014) Renovations- Restrooms and/or Concession Stands

School	Stadium	Facility Change	Restrooms	Concession Stands
Florida State	Doak Campbell Stadium	1985		36
Hawaii	Aloha Stadium	1985	36	23
Iowa	Kinnick Stadium	1985	25	19
Louisiana Tech	Joe Aillet Stadium	1985	8	12
LSU	Tiger Stadium	1985	48	23
Purdue	Ross-Ade Stadium	1985	16	14
San Jose State	Spartan Stadium	1985	13	6
Stanford	Stanford Stadium	1985	19	10
Temple	Veterans Stadium	1985		64
Texas Christian	Amon G. Carter Stadium	1985	12	6
Virginia	Scott Stadium	1985	52	8
Bowling Green	Doyt Perry Stadium	1986	8	8
Central Michigan	Kelly/Shorts Stadium	1986	12	7
Memphis	Liberty Bowl Memorial Stadium	1986	10	19
Auburn	Jordan Hare Stadium	1987	35	22
Kansas	Memorial Stadium	1987	8	12
LSU	Tiger Stadium	1987	50	23
Pittsburgh	Pitt Stadium	1987		14
Air Force	Falcon Stadium	1988	6	6
Alabama	Bryant-Denny Stadium	1988	68	37

(Table 8.10 continued)

School	Stadium	Facility Change	Restrooms	Concession Stands
Arizona State	Sun Devil Stadium	1988	60	
Boston College	Alumni Stadium	1988	10	12
East Carolina	Ficklen Stadium	1988	8	13
Houston	Astrodome	1988		42
North Carolina	Kenan Memorial Stadium	1988	4	6
Oregon	Autzen Stadium	1988	12	20
Ohio State	Ohio Stadium	1989		80
Southern Methodist	Ownby Stadium	1989		3
Syracuse	Carrier Dome Stadium	1989	14	52
Utah	Rice Stadium	1989	30	16
Western Michigan	Waldo Stadium	1989	6	3
Baylor	Floyd Casey Stadium	1990	11	8
Toledo	Glass Bowl	1990	20	4
Washington State	Martin Stadium	1990	25	11
Akron	Rubber Bowl	1991	10	6
Arizona	Arizona Stadium	1991	10	14
Colorado	Folsom Field	1991	18	44
Eastern Michigan	Rynearson Stadium	1991	6	4
Maryland	Byrd Stadium	1991	30	20
Penn State	Beaver Stadium	1991	25	20
Tulsa	Skelly Stadium	1991	8	10
Cincinnati	Nippert Stadium	1992	2	2
Fresno State	Bulldog Stadium/Jim Sweeney Field	1992	9	9
Miami	Orange Bowl	1992	56	
New Mexico State	Aggie Memorial Stadium	1992	4	4
Southern California	LA Memorial Coliseum	1992	11	12
UCLA	Rose Bowl	1992	40	15
New Mexico	University Stadium	1993	10	8

(Table 8.10 continued)

School	Stadium	Facility Change	Restrooms	Concession Stands
Boston College	Alumni Stadium	1994	18	18
Iowa State	Jack Trice Stadium	1994	20	37
Northwestern	Dyche Stadium	1994	13	4
Rutgers	Rutgers Stadium	1994	10	8
Tennessee	Shields-Watkins Field at Neyland Stadium	1994	55	60
California	Memorial Field	1995	9	13
Nevada	Current Mackay Stadium	1995	10	4
North Texas	Fouts Field	1995	6	4
Northern Illinois	Huskie Stadium	1995	14	4
Western Michigan	Waldo Stadium	1995	6	4
Air Force	Falcon Stadium	1996	12	13
East Carolina	Dowdy-Ficklen Stadium	1996	16	13
Kent State	Dix Stadium	1996	8	4
Miami of Ohio	Yager Stadium	1996	4	4
Nevada-Las Vegas	Sam Boyd Stadium	1996	13	18
Northwestern	Dyche Stadium	1996	24	10
Rice	Rice Stadium	1996	34	13
Tulane	Louisiana Superdome	1996	95	68
Ball State	Ball State Stadium	1997	6	4
North Carolina	Kenan Memorial Stadium	1997	16	7
Notre Dame	Notre Dame Stadium	1997	54	79
San Diego State	QUALCOMM Stadium	1997	96	52
Alabama	Bryant-Denny Stadium	1998	70	41
Florida	Ben Hill Griffin Stadium at Florida Field	1998	26	12
Michigan State	Spartan Stadium	1998	16	43
Penn State	Beaver Stadium	1998	25	24

(Table 8.10 continued)

School	Stadium	Facility Change	Restrooms	Concession Stands
Utah	Rice-Eccles Stadium	1998		30
Vanderbilt	Vanderbilt Stadium	1998	10	7
Wake Forest	Groves Stadium	1998	18	11
Buffalo	UB Stadium	1999	10	12
Kansas	Memorial Stadium	1999	18	12
Nebraska	Memorial Stadium	1999	75	44
Utah State	Romney Stadium	1999	6	4
Arkansas	Razorback Stadium	2000	40	21
Georgia	Sanford Stadium	2000	60	
LSU	Tiger Stadium	2000	54	43
Marshall	Joan C. Edwards Stadium	2000	16	14
North Carolina State	Carter-Finley Stadium	2000	16	17
Texas Tech	Jones SBC Stadium	2000	46	42
Virginia	Scott Stadium	2000	52	25
Virginia Tech	Lane Stadium/Worsham Field	2000		16
Arkansas State	Indian Stadium	2001	16	6
Georgia Tech	Bobby Dodd Stadium at Historic Grant Field	2001	34	30
Mississippi State	Davis Wade Stadium at Scott Field	2001		14
Northwestern	Ryan Field	2001	24	15
Ohio	Peden Stadium	2001	12	13
Penn State	Beaver Stadium	2001	58	
Texas A&M	Kyle Field	2001	84	23
Texas-El Paso	Sunbowl Stadium	2001	12	18
Virginia	Scott Stadium	2001	74	37
Virginia Tech	Lane Stadium/Worsham Field	2001	75	16
Central Florida	Florida Citrus Bowl Stadium	2002	55	27

(Table 8.10 continued)

School	Stadium	Facility Change	Restrooms	Concession Stands
Duke	Wade Wallace Stadium	2002	9	9
Idaho	Kibbie Dome	2002	8	4
Oklahoma	Gaylord Family-Oklahoma Memorial Stadium	2002	19	28
Oregon	Autzen Stadium	2002	12	26
Brigham Young	LaVell Edwards Stadium	2003	34	
Georgia	Sanford Stadium	2003	60	24
Hawaii	Aloha Stadium	2003	36	75
Indiana	Memorial Stadium	2003	16	22
Purdue	Ross-Ade Stadium	2003	16	22
Troy	Movie Gallery Veterans Stadium	2003	6	5
Cincinnati	Nippert Stadium	2005	4	4
Clemson	Memorial Stadium	2005	75	84
Colorado State	Hughes Stadium	2005	43	23
Memphis	Liberty Bowl Memorial Stadium	2005	10	21
Alabama	Bryant-Denny Stadium	2006	76	45
Houston	John O'Quinn Field at Robertson Stadium	2006	6	8
Iowa	Kinnick Stadium	2006	32	25
Kansas State	Bill Snyder Family Football Stadium	2006	17	16
LSU	Tiger Stadium	2006	56	55
Middle Tennessee State	Horace Jones/Johnny "Red" Floyd Stadium	2006	12	7
Auburn	Jordan Hare Stadium	2007	35	50
Ball State	Scheumann Stadium	2007	6	8
Kansas State	Bill Snyder Family Football Stadium	2007	20	16
Louisiana Monroe	Malone Stadium	2007	8	4
Memphis	Liberty Bowl Memorial Stadium	2007	13	21

(Table 8.10 continued)

School	Stadium	Facility Change	Restrooms	Concession Stands
Michigan	Michigan Stadium	2007	18	21
North Carolina	Kenan Memorial Stadium	2007	20	7
Northern Illinois	Huskie Stadium	2007	14	10
Purdue	Ross-Ade Stadium	2007	20	24
Southern Mississippi	M.M. Roberts Stadium	2007	19	18
West Virginia	Mountaineer Field at Milan Puskar Stadium	2007	24	35
Florida State	Doak Campbell Stadium	2008	42	36
Illinois	Memorial Stadium	2008	29	39
Kent State	Dix Stadium	2008	8	6
Louisiana-Lafayette	Cajun Field (The Swamp)	2008	12	16
Ole Miss	Vaught-Hemingway Stadium	2008	54	29
Texas	Darrell K. Royal-Texas Memorial Stadium	2008	43	33
Texas Christian	Amon G. Carter Stadium	2008	16	19
West Virginia	Mountaineer Field at Milan Puskar Stadium	2008	24	35
Missouri	Faurot Field at Memorial Stadium	2009	20	20
Oklahoma State	Boone Pickens Stadium	2009	42	37
Rutgers	Rutgers Stadium	2009	26	33
South Carolina	Williams-Brice Stadium	2009	31	28
South Florida	Raymond James Stadium	2009	88	42
Virginia	Scott Stadium	2009	74	54
Alabama	Bryant-Denny Stadium	2010	82	49
Georgia	Sanford Stadium	2010	62	28
Louisville	Papa John's Cardinal Stadium	2010	46	36
Michigan	Michigan Stadium	2010	22	25
Connecticut	Rentschler Field	2011	9	17

(Table 8.10 continued)

School	Stadium	Facility Change	Restrooms	Concession Stands
Fresno State	Bulldog Stadium/Jim Sweeney Field	2011	20	10
South Carolina	Williams-Brice Stadium	2011	32	28
Southern Methodist	Gerald Ford	2011	25	25
Texas Christian	Amon G. Carter Stadium	2011	16	38
UCLA	Rose Bowl	2011	40	30
California	Memorial Stadium	2012	18	19
Florida	Ben Hill Griffin Stadium at Florida Field	2012	27	34
Florida International	Alfonso Field at FIU Stadium	2012	10	4
Maryland	Byrd Stadium	2012	41	23
Oregon State	Reser Stadium	2012	31	23
South Alabama	Ladd-Peebles Stadium	2012	10	6
Texas State	Bobcat Stadium	2012	9	8
Vanderbilt	Vanderbilt Stadium	2012	11	12
Louisiana-Lafayette	Cajun Field (The Swamp)	2013	16	42
Mississippi State	Davis Wade Stadium at Scott Field	2013	39	18
LSU	Tiger Stadium	2014	63	56
Massachusetts	Warren P. McGuirk Alumni Stadium	2014	4	3
Missouri	Faurot Field at Memorial Stadium	2014	20	22

schools (Dosh, 2013). This meant that the conference became the most important piece of the social system. Interpersonal communication between schools and the conference headquarters became integral to the success or failure of the conference. Members of the same conference often copied the renovations of other members of the conference, presenting once again the power of the social system. Two excellent examples of the copying of renovations were found at Alabama and LSU, who both renovated their south end zones with extremely similar developments, and in the PAC-12, where three schools all chose to tear down and rebuild their venues within eight years of each other as previously discussed.

The social system of the NCAA was still important amongst FBS schools, as universities used virtual geography to learn about peer institutions across the country and the ongoing renovations at each institution. Renovations in Stage Five were very much tied to the relative social system the university was a part of, based on conference alignment. Schools that were part of the current Power 5 (i.e., ACC, Big 10, Big 12, PAC-12, and SEC) tended to develop similar renovation projects as other member institutions of those conferences. Schools that were not a part of the Power 5 also tended to renovate similarly. Meaning that renovations occurring at Central Michigan (Mid American Conference) were likely to be similar to those occurring at Nevada (Mountain West), while renovations occurring at Purdue (Big Ten) were likely to be similar to those occurring at Oregon State (PAC-12). The reasons for this were significantly related to the relative financial positions of the institutions (Power 5 institutions gained significantly more revenue from their television contracts than non-Power 5 schools). One important note to the social system, it was not only college athletic directors or coaches involved in these discussions. University presidents also met constantly to discuss conference issues, and

issues that developed within Division I. Furthermore, the NCAA continued to be important for the university presidents, as the convention and other events brought them together.

Communication Channels

Mass media was heavily invested in the success of college football following the NCAA v. Board of Regents decision in 1984. For the first time, pretty much every FBS program had access to some sort of broadcast television for their games, especially as the Stage progressed into the 2000s. Television was a very rich mass media communication source, as it provided both a live picture and sound of what was on going at the venue (Rogers, 2003). Cable television in particular provided dozens of broadcasts each week of games from conferences around the country. Following the advent of the Internet and the ability to stream live video, virtually every FBS game played each week was televised. Many were only available via live stream on the Internet, but this still allowed others to view the event as it happened and to learn about new innovations. If a school wanted to learn about an innovation at another conference school, it could find the broadcast of a game from the stadium and learn some details about the innovation.

Interestingly, during Stage Five, the improvement of the stadium became a spectacle in itself. Universities began to place live webcams where interested spectators could go watch the progress of the stadium development (“Campus Crossroads Project,” 2016; “Redevelopment of Kyle,” 2016). Universities usually provided detailed renderings of what the new facility would look like, and even computer animated videos of a virtual tour of the new spaces (Tiger Athletic Foundation, 2012; “Vanier Family Football,” 2016). Associated engineering and architectural firms (i.e., Brassfield & Gorrie, HKS, HOK, Populous, etc.) also produced websites and brochures about the coming renovations to promote their involvement in the project (Brassfield & Gorrie, 2015; HKS, 2016; HOK, 2016; Populous, 2016b). Populous even went further than

many other firms, as it described exactly what innovations it brought to the development project, and how those innovations improved the facility (Populous, 2016b). The Internet provided interested organizations with a new and different way to communicate with perspective clients, through the usage of the Internet and other new technologies. No longer did a possible donor have to examine drawings and envision what the site might be, they now could watch a virtual video of the new space. These tools were commonly used by groups like Louisiana State University’s Tiger Athletic Foundation, and Architects like Populous and HOK to convert interest into sales.

Another important development in Stage Five was the significant growth of interest in stadium development. Stage Five is the first stage where significant space is dedicated in newspapers to the development of stadiums. It is important to note that the Internet also allows for the increase in coverage, as no longer was the newspaper limited in size by what it could afford to print in the paper. Due to the Internet and the development of newspaper websites, and even online only news coverage sites, larger amounts of information was available to the interested consumer. Cable networks such as ESPN and Fox Sports added Internet sites to cover important sporting events, and the development of facilities for sports leagues and teams at all levels. The coverage of the development of college and professional football facilities allowed for other universities to learn through mass media about the new innovations that were developed and placed into practice in Stage Five.

Many architectural, engineering, and other related firms (e.g., HOK, HKS, Populous, etc.) placed information online about projects they were involved in including stadiums. Interested university leaders or influential alumni could go onto these sites and learn almost anything they wanted about the project. Often these sites included renderings and other

information that previously was unavailable to outside parties without a direct contact to the university or who did not proscribe to journals like *American Architect*, *Engineering News-Record* and *The Athletic Journal* amongst others. The Internet, and mass media communication in general radically improved the rapid spread of innovations. It is important to note that because of mass media and the ease of information transfer through both television and the Internet that for the first time, geography played a very minor role in the diffusion of innovations. Since schools could learn about innovations at other institutions anywhere in the country through television and the Internet, they were no longer limited by geography and being able to visit the venue in person.

Interpersonal communication also shifted greatly due to the development of the Internet and online communication technology. Interpersonal communication at the start of Stage Five was limited to telephone calls, direct conversation in person or letters back and forth through the mail. Following the development of the Internet, email became a common form of interpersonal communication (Partridge, 2008). By the mid-2000s, video conferences that streamed video of both parties to each other were in common use (Romano, 2013). This allowed for two people on the opposite sides of the country to be able to see each other and share information quickly and easily via video. Companies also developed technology that allowed for the sharing of information such as charts, drawings, architectural plans and a wide variety of other materials directly through video conference (Romano, 2013). For the first time, the receiver could go through with the sender the documents viewing them at the same time via remote technology. The video conference lowered the cost of knowledge transfer significantly, as no longer was flights or other travel necessary in order to gather all necessary information about a particular project or event (Dearing, 2009; Rollett, 2012).

From an innovation diffusion perspective, the radical changes in the requirements for high quality interpersonal communication (i.e., the removal of the distance issue) increased the quality of information being shared across further distances. The increased quality of information shared led to quicker adoption and diffusion of an innovation. The increased quality also removed the importance of geographic location. Through the Internet, and especially through video conferencing and other similar technologies, traditional geography no longer is a limiting factor to the diffusion of innovations. The biggest limiting factor is access, and in the U.S. basically every Division I-FBS program has access to high quality Internet, if for no other reason to broadcast games online. The ability to share information over the Internet has allowed for the quick diffusion of new stadium innovations. Innovations were commonly adopted within a year of each other by schools in several different geographic areas. Both mass media and interpersonal communication improved significantly in Stage Five, increasing the diffusion of innovations across the whole social system.

Time and Geography

Based off the studies of Stages One through Three, the expectation was diffusion occurred slowly and was clustered in geographic patterns, supporting the arguments made by Hagerstrand (1952, 1953) of a neighborhood effect. Starting with the diffusion of artificial turf in Stage Four, the neighborhood effect begins to dissipate, and physical geography begins to appear to be less limiting than in previous stages. Virtual geography begins to replace physical geography as far as impacting knowledge transfer. Remote viewers from thousands of miles away can now connect directly with the source of the innovation, either through mass media communication via television or the Internet, or through the usage of interpersonal communications technologies such as the video conference to share information (Seifried, 2011).

For the first time, clustering occurs due to the relationships one has with the social system, instead of traditional physical geography. However, schools that were part of the same region tended to renovate their stadiums similarly. As an example, schools in the SEC tended to add large numbers of luxury spaces, especially during the late 1990s and early 2000s. Several schools in the Big Ten moved back to grass fields between 1988 and 1999. Three schools in the PAC-12 decided to gut their stadiums either through completely destroying the previous venue and rebuilding or through removing most of the previous venue and rebuilding.

The time an innovation takes to move from innovator to laggard significantly decreases during Stage Five. One prime example of this is the adoption of the new generation of rubber-filled artificial turf. The first universities (or innovators) begin to install the new version of turf in 1997-1999. By 2001, the new surface reached the early majority stage with over 16% of FBS universities adopting the surface, and by 2005, the late majority stage of innovation adopters was reached with over 50% of Division I-FBS having adopted a version of the new rubber-filled turf.

Another area where the impact of the social system on the time an innovation takes to diffuse is in the development of video board technology. Video boards first begin to appear in two locations, the Deep South where significant investment in football was occurring amongst SEC schools in particular, and in the Midwest, near where a significant amount of professional sport facilities adopt video boards in the 1980s and 1990s. As a school adopts a video board, other conference members are pressured to adopt similar structures and usually did so within a couple of years. As the technology improves, schools were forced to update the boards to keep up with the technology. HD video forces almost every school in FBS to renovate their video boards within the last five to seven years of the study. The new technology forces universities to either renovate and adopt or fall behind other institutions and lose their place relative to peer

institutions in the social system. The early adoption of video boards is one of the few areas where traditional spatial geography impacted some of the early development. By the last few years of the study, the top ten largest video boards are in Texas (2), Arkansas, California, Florida, Arizona, Mississippi, Oklahoma, Michigan and Ohio and in the biggest stadiums (Aschoff, 2014). Interestingly, though social systems matter once again, as all of the top ten video boards are part of the BCS conferences (ACC, Big Ten, Big 12 and PAC-12). Much like the adoption of turf, the HD video board moves through the adopter categories from innovator to late majority adopter within six years. The rate of adoption in Stage Five is incredibly quick, and communication channels and social system play a vital role in the increased rate of adoption.

Virtual geography also is responsible for the increasing speed of innovation. No longer does an athletic director or other opinion leader have to wait for days for a package to come with the plans of a stadium from across the country. Those plans can be sent via email instantaneously to any interested athletic director in the country. If an opinion leader wants a tour of a specific new facility, it can be done via video conference. If more detail is needed, the opinion leader can use technology to set up meetings with the architects and or engineers to go over specifics of the project. Knowledge transfer that used to take days, now only takes a few seconds or hours depending on what is necessary for the opinion leader to learn the necessary pieces of the project. This radically increases the speed of diffusion of innovations, and removes the traditional limitations and clustering found in Stages One through Three related to geography.

Chapter Nine: Conclusion

The current work attempts to explain the development of the college football facility from the beginning of the game until the current day. These venues varied greatly in shape, size and amenities, based on age of venue, geographic location and a variety of other variables. The work was broken into an ideal-type in an attempt to illustrate the similarities and differences found amongst venues in each stage. The current work was broken into five distinct stages of college football stadium evolution.

Stage One involved the original development of venues where football could be played. The first places where games were held in the late 1860s and early 1870s were either in parks or on common grounds found on campus. These first facilities used available space and lacked any continuity of rules between institutions or even from year to year. As Stage One develops, schools begin to go to venues off campus and collect admissions fees to support the sport on the college campus. Following significant success playing away from campus, universities constructed temporary facilities on campus. The temporary facilities were developed to allow the university and their school football associations to increase profits. Games played at neutral sites required the paying of rent to venues, significantly cutting into the profits. Moving on campus removed rental costs, increasing revenue from contests. Harvard became the first football team to play on campus in 1874 at Jarvis Field (Lewis, 1965).

Early on-campus venues lacked bleachers, and were used for baseball, football, track and field and any other event that needed a large open space. The spaces were enclosed so that admission fees were collected to pay for the costs of the sport. Over time, these venues developed bleachers that were moveable depending on the sport being played that day. The bleachers rarely sat more than 1,000, simply due to the challenges of moving them for multiple

sports, and the associated costs (Smith, 2005). Schools in the Northeast (e.g., Harvard, Yale, Princeton, Rutgers, and Penn) were the first to build on campus venues. Schools in the Midwest and on the West Coast, developed on campus facilities in the 1890s. The venues in the Northeast continued to advance as football became the dominant sport. Harvard, Yale and Princeton all built new temporary venues that placed football as the primary focus in the 1890s. These product innovations allowed for the spectator to have a place to sit inside the venue, a significant improvement over venues that required the spectator to stand. Averages for the size, capacity, and cost of Stage One venues can be found in Table 9.1 and 9.2.

The development of the Stage One temporary football focused facility directly tied to the development of a standardized set of rules. Early games involved the captains meeting before the contest to agree on a set of rules. By 1876, the Intercollegiate Football Association (ICFA) was developed as part of what should be considered process innovation to set rules for Harvard, Yale, and Princeton, along with any school wishing to play those institutions. The IFCA developed rules for field size, allowing for bleachers to be built on the edge of the field, as the size was standard for a season or more (Lewis, 1965). This also allowed for clear separation of players from spectators, a necessity due to the roughness of football. By the end of Stage One, college footballs rules were largely decided (with the notable exception of the forward pass) allowing for the temporary football venue to grow in size. It is also important to note that the temporary nature of Stage One facilities made them very expensive to maintain Ingrassia, 2012; Lewis, 1965). Wood, the primary material used to construct the venues, easily broke, burned and was damaged by storms. The maintenance costs were very high, encouraging universities by the end of Stage One to try to find a material that was more durable than wood, while still being

affordable to the university (Ingrassia, 2012). Few renovations occur in Stage One, and the ones that do occur are almost exclusively simple rehabilitation efforts.

Stage Two started with the construction of Harvard Stadium in 1903. The facility was constructed of reinforced concrete and steel, a significantly more durable and flexible product than the wooden structures of Stage One (Smith, 2005). The $320,000 structure was constructed with financing raised from previous gate receipts and alumni donations (Blanton, 2014). The 23,000-seat structure was constructed in a horseshoe or u-shape, with columns and other decorative pieces built into the structure. Syracuse followed Harvard by building a u-shaped reinforced concrete and steel structure in 1907. The two structures shared a many similarities but one important difference remained; Archbold Stadium was partially constructed into the side of a hill, lowering the amount of materials and subsequent cost needed to support the structure ("Archbold Aids Syracuse," 1905). Yale and Princeton followed in 1914, with Princeton building a u-shaped structure like Harvard and Syracuse and Yale building the first bowl-shaped structure, continuing the development of the reinforced concrete and steel stadium.

By using the ground to support the structure, Yale was able to build a larger structure at a relatively lower cost. After the completion of the Yale Bowl, WWI interrupts the building of college stadiums. Following the war, several institutions (e.g., California, Illinois, Kansas, Stanford, etc.) built either u-shaped or bowl shaped memorial stadiums following the designs put forward by Harvard and Yale. The first double-decked horseshoe reinforced concrete and steel stadium was built at The Ohio State University (Ingrassia, 2012). During Stage Two, the South first began to become involved in modern stadium construction. Southern projects typically were much smaller than those in the Northeast or Midwest, but were constructed of concrete and steel.

The development of Southern stadiums was important to the future development of stadiums, as the Southern stadium would be among the first to renovate the stadium to increase the size. Stage Two stadiums were the first to experience significant renovations. A total of 108 renovations occurred during Stage Two, with 102 rehabilitation projects, four combination renovations, one preservation and one restoration. As was common throughout the five-stage ideal-type, rehabilitation efforts dominated the renovations of Stage Two.

While the reinforced concrete stadium brought significant change to the stadium, some features of the stadium stayed the same. Spectator amenities were non-existent. The stadium lacked restrooms and concession stands at almost all venues during Stage Two. Space for the press was extremely limited or non-existent in Stage Two. Lastly, the stadium seating was often either directly on the reinforced concrete or on wooden boards attached to the concrete, which provided little comfort for the spectator. The average Stage Two new construction also required significant donations from the alumni for construction. Many university or university athletic associations took out bonds to pay for the construction of the venue, counting on gate receipts and donations from alumni to finish paying for the construction of the venue. Average cost for Stage Two venues (new construction and renovation) are found in Tables 9.1 and 9.2 along with capacities and acreage sizes of the venues.

Stage Three (1930-1945) brought college football to the Great Depression, and the ramifications for stadiums was the movement to new funding sources for venue construction. Stage Three was where the first significant renovations of the stadium occurred. Many of these

Table 9.1

Stage Averages- New Construction

Stage	Capacity	Cost ($)	Parking	Surface Area	Luxury	Club	Disabled Seats	Restrooms	Concessions
One	5,700	6,144	X	5.84	X	X	X	X	X
Two	19,812	361,711	X	7.96	X	X	X	X	X
Three	17,570	223,966	X	12.17	X	X	X	X	X
Four	38,326	12,278,277	7,489	13.09	X	X	X	12.44	13.85
Five	43,008	150,593,643	9,135	26.55	42.21	2,079	720.69	29.92	38.06

Table 9.2

Stage Averages- Renovations

Stage	Capacity	Cost ($)	Parking	Surface Area	Luxury	Club	Disabled Seats	Restrooms	Concessions
One	N/A	N/A	N/A	N/A	X	X	X	X	X
Two	16,988	129,966	X	8.42	X	X	X	X	X
Three	29,934	216,986	X	7.77	X	X	X	X	X
Four	51,182	1,416,333	6,843	10.75	X	X	X	17.09	14.25
Five	53,529	13,477,537	6,835	11.36	25.61	855	366	24.68	21.39

Table 9.3

Stage Innovations

Stage	Years	Innovations
One	1869-1902	Enclosure, Wooden Bleachers
Two	1903-1929	Reinforced Concrete and Steel, Press Areas, Parking
Three	1930-1945	Radio, Press Box, Lights, Restrooms, Concessions, Electronic Scoreboards
Four	1946-1984	Television, Large Scoreboards, Artificial Turf, President's Box
Five	1985-2014	Luxury Suites, Video Boards, Complete Reconstructions

renovations were funded on some level by public works projects through the state and federal government. As part of the New Deal, Franklin Roosevelt created the PWA and the WPA to provide jobs to the millions of people who were out of work because of the economic decline that occurred during the Great Depression (Taylor, 2008). The PWA and/or the WPA were part of 17 college stadium new construction or renovation projects in Stage Three, focused on schools primarily in the South and along the West Coast. The WPA projects were focused on employing workers, not providing expensive improvements to the venue. Projects usually involved materials available close to the venue, and used almost exclusively manual labor to complete the project. Several schools benefited significantly from WPA projects (e.g., Arkansas, LSU, Washington, etc.). The WPA changed the process by which stadiums were constructed during Stage Three, moving funding from the university or alumni groups to the federal government. The universities lacked the ability to fund significant construction, requiring a shift in the process of funding a new venue or renovation.

Stage Three also brought some new amenities to the stadium. For the first time, some college venues had restrooms (n = 12) and concession stands (n = 14). While this was a small

amount of the renovations and eleven new constructions found in Stage Three, it was a significant step forward for the spectator. Stage Three was also where lights were first brought into the stadium so schools could play at night. Lights were a great example of the limits of the types of renovations that were possible in Stage Three. Lights were installed at twelve venues. Another common addition to the Stage Three venue was the electric scoreboard. The scoreboard provided the spectator with pertinent information about the game (e.g., time, distance to the first down, down), while also serving as a crowd control device (Seifried & Pastore, 2009). Each of these was an important new product, which improved the spectator experience. Lights allowed the spectator to attend the game at night, after working during the day. The scoreboard improved the knowledge of the spectator about the game inside the stadium. Restrooms and concession stands also provided added benefits to the spectators as product innovations. Significant renovations occurred in Stage Three with 89 of the 112 total projects a renovation. Of the renovations, 85 were rehabilitation projects and two were reconstructions along with two combination projects. Public works projects funded 17 of the renovations. Once again as in Stage Two, rehabilitation efforts were the most common form of renovation. The reason for rehabilitation efforts being the most common was that rehabilitation projects improved the stadium to the standards of the current era, increasing the value of the project for the university.

One last innovation that impacted the development of the Stage Three venue was the development of radio as a commercial revenue source for college sports (Smith, 2001). The development of radio required significant changes to the venue. A separate space was needed for the press, primarily the radio broadcast group, in order to provide the best radio broadcast of the game. The needs of the radio led to the development of the press box, as a separate space just for the press (Oriard, 2001). The press box further supported a separate space inside the box

separated from the rest of the press to support the equipment needed for radio broadcasts. The stadium was also wired with telephone lines to support radio broadcasts from the venue through long distance telephone calls (Smith, 2001). Lastly, the venue was wired to support microphone placements around the stadium, near the field and close to the band in order to pick up desired sound such as contact or the fight song as the band played it. The stadium in Stage Three was moving toward being more supportive of commercial endeavors and the press. Average cost, venue capacity and size are found in Tables 9.1 and 9.2 for new constructions and renovations, respectively.

While significant improvements in spectator amenities occurred at some Stage Three venues, it is important to note that most still had little to no restroom or concession stands available for the spectator. Seating was still on wooden boards or the reinforced cement itself. Lights allowed spectators at universities that had them to attend the game at night, but most universities in Stage Three lacked lights. Probably the most important innovation for the spectator was the radio, as for the first time the spectator did not have to go to the stadium or to the local newspaper to keep up with what was going on inside the stadium. The interested fan could listen to the game at home on a radio in the comfort of their own living room. Radio allowed for people who had never attended a college football game to learn about the sport and increased the interest of fans in teams that were within the signal area that their radio could pick up. Interestingly, several universities benefited from relationships with strong signal radio stations and developed fans hundreds of miles away from the university.

The Stage Four (1946-1984) venues started to develop following the end of WWII. The university underwent several changes during and right after WWII. During the war, many universities were used as training centers by the military with football as a primary training tool

(Seifried & Katz, 2011). Hundreds of thousands of troops that fought during WWII were directly exposed to the sport and how the sport was played (Seifried & Katz, 2015). Many were actively involved in the sport and played on military teams during and after the war (Seifried & Katz, 2011, 2015). Games involving military teams also received significant coverage both in the U.S. and abroad on military bases around the world through both the newspaper and radio. College football benefited significantly from the increased interest in the game during the war, as those who became interested in the military game during the war, became interested in the college game after the war. In essence, Stage Four venues had to find space for the thousands of new students enrolling on college campuses as part of the GI Bill, which provided funding for university war veterans (Salaga, 2015).

The Stage Four venue underwent significant changes due to the growing enrollments (particularly in the South), along with the development of several new technological innovations (Seifried, in press; Smith, 2001). The stadium needed to develop space for the new mass media communications device that began to dominate Stage Four, the television. Television required booths and extra wiring much like radio did before. Television also required the development of spaces for camera equipment and production equipment, along with all the wiring to support the new gear. Television was a new product, which required the stadium to adjust to fit its demands. The stadium, especially those stadiums with popular college football teams, underwent renovations to support the new medium. Press boxes were enlarged to support television and cameral wells were carved into seating areas in the stadium. Once the NCAA controlled television rights starting in 1951, smaller universities began to provide temporary spaces in the stadium for television broadcasts. Overall, universities wanted to be on television because it meant increased revenue.

Other improvements occurred to the venue in Stage Four and largely followed professional stadium construction of the era (Seifried, 2005). For instance, the next wave of innovations started with the development of the Astrodome in 1964. The inability to grow grass inside a dome required the development of a surface that did not need light in order to survive and support playing baseball and football (Seifried, 2005). Universities adopted Astroturf and other forms of artificial turf during Stage Four as universities added more sports to their athletic programs. Specifically, 52 schools adopted artificial surface during Stage Four. Another innovation that stemmed from the Astrodome was the development of luxury spaces inside the stadium (Seifried, 2005). Colleges did not add significant luxury spaces until Stage Five, but a few schools (n = 8) added President's boxes to their venues and found them valuable. The President's box was reserved for the university president, other important university dignitaries, the opponent's president and important donors. The President's box served as a place where the university leadership could interact with donors and other important members of society in hopes of soliciting donations or support for university projects.

One last important innovation that occurred during Stage Four was the development of the large electric scoreboard. Again, the Astrodome was a venue that included a large scoreboard. Large scoreboards allowed the teams to share information about the game, along with providing spaces for advertising. The new scoreboards engaged the fans, often including fireworks and loud sounds, increasing the spectacle of the event through the usage of the board (Jares, 1965; Seifried, 2005). Stage Four venues added 27 of these modern boards to their venues, at a cost of as little as $125,000 to as much as several million dollars, depending on size and scope of the project. Each of these innovations were new product innovations, improving the spectator experience in the case of the scoreboard. Stage Four brought 364 total renovations,

with 311 rehabilitation projects, 34 combination projects, ten reconstruction projects, eight preservation projects and one restoration project. The primary areas rehabilitated during Stage Four were the field, with the addition of Astroturf and the expansion of the overall venue's capacity. The growth of the capacity of the Stage Four venue was significant, and rehabilitation projects were the primary reasons for this growth. For the first time, several preservation projects were conducted during Stage Four, due to the aging superstructure of the stadium.

Other spectator amenities continued to become more and more common during Stage Four. Most venues had several restroom and concession locations by the end of the Stage. The restroom and concession stand became an industry standard during the period covered by Stage Four (Seifried, 2005). Other developments included wider concourses inside the stadium, and venues with unobstructed seats (Sullivan, 1987).

One last important amenity to note was the importance of parking during Stage Four, as over 80% of the population had at least one automobile by the end of the Stage. Universities developed an average 6,875 parking spots for spectators in Stage Four. Parking was a new product aimed at improving the spectator experience, while also increasing revenues for the university. The averages for parking in different stages are found in Table One. The college venue did not necessarily have a significant amount of extra space near the venue, but as more and more students commuted to college campuses, universities developed parking spaces for those students (Kim & Rury, 2011). The commuter spaces worked well for college football contests, as universities rarely had Saturday classes, allowing those spaces to be used for football games, and often to be sold as a revenue booster.

While significant improvements occurred in Stage Four venues, it is important to note that these venues were still not as significantly advanced as professional venues built during the

era. Most stadiums had restrooms and concession spaces, but not enough to support the fans in attendance. Similarly, parking was a problem on college campuses, and something that universities would continue to be challenged with going further. Lastly, the stadiums on college campuses around the country were aging. Many of the stadiums still in use on college campuses were built during Stage Two, and were closing in on being 60 or more years old. The aging venue required athletic departments and the university to invest significant financial capital into preservation efforts to maintain the structures. As the stadium aged, the cost of maintenance increased. Tables 9.1 and 9.2 includes averages for new constructions and renovations of cost and capacity, along with average number of restrooms, concessions, parking spaces and costs for the Stage Four venue.

The Stage Five (1985-2014) venue experienced significant investment into three important areas of the venue. First, as the cost of college athletics increased, universities realized they needed to increase revenue coming into the athletic department. Through the help of fundraising organizations like LSU's Tiger Athletic Foundation, universities began to invest millions of dollars into luxury spaces for the venue. The development of new ways to fund the venues was a process innovation, and an important one at that. Now, a third party, the fundraising organization was able to raise monies necessary to improve the venue. At least partially due to the new funding sources, Stage Five experienced far more renovations than any other Stage, with 676 renovations. For the first time, a significant variety of renovations were found in Stage Five. Once again rehabilitation projects dominated the renovation efforts, with 570 projects. Other types of renovations were more common, with 67 combination projects, 26 reconstruction projects, eleven preservation projects and two restoration projects. The growth in variety of project types had much to do with the increasing revenues, and the need to maintain

the existing structure. Reconstruction projects allowed the university to reconstruct the existing structure in some way, improving the facility if only in that the replacement structure was new in comparison to anywhere from several years to several decades old. Preservation projects allowed the athletic program to make sure that the facility would continue to exist well into the future, through the replacement of seats, windows, painting, sealing and other similar projects. Rehabilitation projects helped bring many of the facilities within FBS very close to any newly built facility of the Stage, especially as far as improved technology and luxury areas.

One product pursued by the various foundations involved luxury suites. Professional teams generated millions in new revenue from the luxury spaces, and colleges moved in Stage Five to build similar structures in their stadium. The revenue earned from the luxury spaces was significantly higher than those found from traditional seats. For example, the University of Arkansas raised over $4 million from 126 suites leased in Donald W. Reynolds Razorback Stadium (Joyner, 2015). Almost every university in Division I FBS (only five lacked any spaces) built some sort of luxury area, whether it was club seating or individual luxury suites. The average new FBS venue included 42.21 luxury suites and 2,079 club seats, while the average renovated structure included 25.61 luxury suites and 855 club seats. This data is shown in Tables 9.1 and 9.2. The new products were aimed at the wealthy fan, who could afford to pay more for privileged access to the venue. Several universities late in Stage Five actually shrunk the capacity of the stadium and used donor dollars to build luxury spaces in the spaces previously having been reserved for the traditional fan. Average capacities and costs, along with the average number of luxury suites and club seats is found in Tables 9.1 and 9.2 for new constructions and renovations respectively.

Following the NCAA v. Board of Regents (1984) decision, colleges and universities at the FBS regained direct control over television rights from the NCAA. As universities (primarily through their conference memberships) negotiated with television partners to bring television broadcasting to their stadiums, they continued to develop spaces specifically for television inside the venue. The stadium, especially at the highest levels of FBS began to turn into a broadcast studio. Space was set aside for television broadcasting inside the press box, through the development of camera wells all around the stadium, and with space for production vehicles outside the venue. The stadium was also wired for high definition television broadcasting, with hundreds of miles of high level cable spread around the stadium so that the modern television broadcast organization could quickly come in and set up the broadcast (Moseman, 2015).

Another significant addition to the Stage Five venue was the modern video board. Once again borrowed from the professional sports venue, the video board was added to virtually every college stadium in Stage Five (Seifried, 2005). The video board that was first installed in venues in Stage Five allowed for limited advertising and computer graphics to be presented on the board. As the stage progressed, many institutions installed video boards that allowed for replays and even live broadcasting of games through the video board. By the end of Stage Five, the video board technology improved to the point that the game was presented in High Definition on the video board. Furthermore, several angles of key plays were often presented on the video board as well. Throughout the Stage, it is important to note that the video board was an important revenue generator. Advertisements were often built into the support structure of the video board itself. The video board moved from a novelty to an important revenue producer by the end of Stage Five for the modern university. The value of the video board may best be explained by the extreme size of the boards constructed in the mid-2000s and beyond. Texas, Texas A&M, and

others build video boards that were over 4,000-square feet in size (Aschoff, 2014). The video board, by the end of Stage Five, was a significant piece of the modern stadium. It provided the fans with important information (serving the original purpose of the structures) while also providing a significant amount of revenue for the university. For many universities, the video board became a focal point of spectator interest in the Stage Five stadium (Aschoff, 2014).

Another significant change to the modern stadium was the development of seating for those with disabilities. The Americans with Disabilities Act of 1990 (ADA) required stadiums built following the passage of the law to include at least one percent of the seating capacity of the venue to be set aside for those with disabilities. The requirement also included that the one percent of seats set aside be found in all parts of the venue and include all seating types (Section-by-Section, 2010). Most universities provided disability seating, but usually at smaller numbers than the one percent, due to the exception allowed by the law. The average number of disabled seats found in a Stage Five new construction and renovation are found in Tables 9.1 and 9.2.

Other important developments in Stage Five involved the continued improvement to artificial turf. For instance, between 1988 and 1999 at least 24 universities removed artificial turf from the stadium and replaced it with natural grass. As a response to concerns over the safety of the surface, the industry as a whole began to develop new surfaces. Of primary interest to college football stadiums was the development of the in-fill artificial turf, which created a surface with plastic grass like fibers that was then covered with rubber pellets to soften the surface. Later artificial surfaces involved the inclusion of fiber optics to increase the visual attractiveness of the surface for television (Belisle, 2013; Burke, 2006). Other additions, such as restrooms and concession stands were continuously added to the venue to increase the spectator experience.

Tables 9.1 (new construction) and 9.2 (renovation) provide averages for concessions and restrooms in Stage Five venues.

Process versus Product

One common theme that spread across the Five Stage ideal-type was the significant number of product innovations found in each Stage of the ideal-type. Product innovations included the development of bleachers in Stage One, along with the enclosure of the venue to allow for admissions to be collected. The products developed in Stage One helped to fund the continued development of bleachers of increasing size. Stage Two picked up with the development of the reinforced concrete and steel permanent structure, a significant product development that provided the university with a durable venue to generate increasing profits. For the spectator, the permanent venue provided more comfort than the traditional wooden structure, along with views that were improved due to improvements in seat size. The reinforced steel and concrete stadium also drew increased attention to the university as a marvel of modern construction, with capacities often larger than the populations of their host city.

Stage Three promotes process innovations. For instance, public works funding developed several new construction and renovation projects during the stage, funding projects previously funded through alumni donations and admission fees or through state funding sources. Product innovations in Stage Three included lights, allowing for the game to be played in the evening, scoreboards that increased the knowledge of the spectator, along with the development of the press box. Press boxes developed at least in part because of the development of another new product innovation, the radio. The radio allowed spectators to listen to the game at home, without ever leaving the comfort of the house to learn the play-by-play outcome of the game. Each of

these innovations improved the overall experience for the interested spectator, whether in attendance at the game or listening to the game on the radio.

Stage Four presented several important product innovations. As an example, the development of artificial turf provided a durable playing surface for all weather. The modern scoreboard provided the spectator with information about the game along with entertainment in between plays and during breaks in the action. Perhaps most importantly for innovation diffusion, was the development of the television. This product innovation provided a way for the spectator to watch the game from home, viewing exactly what was happening inside the stadium from the comfort of their own living room. The television also allowed universities to learn about new innovations through watching games from other stadiums around the country. Stage Four also presented one process innovation, with the decision of the membership of the NCAA to grant control over television to the NCAA instead of the schools controlling the new innovation. The new process allowed for the revenue earned from television to be split amongst schools that appeared on television. This further encouraged universities to develop space inside the venue for television, a new product innovation. Lastly, television provided significant revenue to universities that appeared on the new medium, allowing for the continued improvement of the modern stadium. It is important to note that more and more universities added restrooms and concessions during Stage Four, another product improvement that continued to provide the spectator with an improved game experience.

Stage Five brought one important process innovation and two significant product innovations to the modern stadium. The major process innovation found in Stage Five was the development of TAF and other university athletic fundraising groups, which provided a new source of revenue to improve the athletic department and the stadium. These fundraising

organizations removed the pressures from the athletic department of trying to find ways to fund stadium improvements. The first product innovation involved the addition of the modern luxury seating areas. These new luxury spaces provided the spectator with a different experience than the common fan. Luxury ticket holders experienced better food options, along with an enclosed space to enjoy the game. Those individuals/businesses who were wealthy enough to afford a suite were able to completely separate themselves from other fans in the stadium, and enjoy the game from the privacy of their own mini-apartment in the venue. A second product innovation during Stage Five involved the development of the modern video board. The video board allowed the spectator to watch video replays of important plays, along with advertisements and other information deemed important by the athletic department. The technology was notably a significant revenue creator for the university athletic department. Sponsors were sought for replays, stats and other information presented on the video board. As the picture quality improved, universities could charge more and more for the right to place ads on the structure housing the video board, along with increased prices for advertisements presented during the game. The video board, along with luxury suites provided the spectator with a significantly improved game experience. Both new product innovations provided the university with significant additional revenues, funding further projects inside the stadium.

Innovation Diffusion

The current project found Rogers' (2003) three key characteristics of innovation diffusion were involved in the development of the college football stadium. The following section will analyze those three concepts (i.e., social system, communication channels, and time) along with geography. The five Stages discussed in the first part will serve as the basis of the discussion of innovation diffusion.

Stage One found the diffusion of innovations was significantly influenced by the weakness of the social system, the challenges of geography and related difficulties of travel and the limited types of communication channels available prior to 1903. The social system that dominates modern college football (the NCAA and conferences) did not exist at the start of the college game. Early football games were played by students on the same campus against one another as a form of campus welcome or hazing. As intercollegiate sport developed (rowing and then baseball before football), typically it only involved the elite eastern institutions near major cities. It makes sense that the same institutions were instrumental in the development of college football and college football stadiums. As an example, Harvard, Yale, and Princeton dominated the development of college football. Other universities that wanted to play those schools copied what those schools were doing. This included stadium development, where most facilities were new constructions. Very few renovations occurred in Stage One, and those that did were additions of bleachers, known as rehabilitations.

Harvard, Yale, and Princeton ran the IFCA and others were expected to follow their rules if they wanted to participate in football games against ICFA members. The IFCA developed rules that move the game toward mass play, downs, and line of scrimmage to gain a certain distance to maintain control of the football. An integral part of the diffusion of college football was the movement of former Harvard, Yale and Princeton players to institutions around the country to teach and coach football. These players spread the Northeastern game of football around the country. The early social system primarily involved players, faculty and alumni of eastern schools.

Travel was a significant challenge during Stage One. Part of the reason for the successful development of intercollegiate sport in the Northeast was the well-developed railroads found in

the region. Interested spectators along with football players from competing institutions could easily travel and watch a game between two universities due to the railroad. One of the reasons for the slow development of the game outside of the Northeast and the Midwest was the lack of significant railroad connections in the most of the rest of the country. Clusters of teams developed in the Northeast and later at Midwest schools. The Western Conference (Big Ten) and several other Midwestern schools picked up the game in the late 1890s, joining the Northeastern schools as the primary institutions playing the game. A limited number of schools in the West and South played college football, but the game lagged significantly behind that developed in the Northeast and Midwest.

Another significant factor of diffusion in Stage One was the communication channels available during the stage. The major types of communication were newspapers for mass media communication and person-to-person, letter writing, and telegraph for interpersonal communication. The challenges of spreading information quickly significantly limited the development of the college game outside of the Northeast and Midwest. Newswires carried accounts of those games around the country. Beyond the newspaper coverage of games, no mass media communications tool was available to spread the sport. The telephone had not yet spread widely so only the telegraph or direct in-person communication was available to spread knowledge about college football. It is through the spread of former eastern players west and south that the diffusion of the college game occurred. Those former players directly communicated the sport and the facility needs to the university where they were hired. Letters between Camp and former players and between former teammates also helped spread college football, slowly from the Northeast to the Midwest and eventually to the West Coast and South.

Due to the limiting factors of geography, communication channels and the weak social system, college football diffused very slowly during Stage One.

Stage Two experienced an increase in the speed of the spread of innovations. The NCAA developed during Stage Two, creating a national organization where leaders from institutions across the country could come together and meet to discuss the challenges of college athletics. The usage of conventions as a base for the spread of information and rich communication was commonly discussed in diffusion literature (Compagni et al., 2015; Greenwood et al., 2002; Rogers, 2003). The development of the NCAA along with conference organizations significantly increased the ease of the diffusion of innovations. Conferences of college football playing institutions began to develop in earnest during Stage Two, further increasing the amount of discussion ongoing between different institutions and therefore the speed of diffusion of innovations. The combination of the development of the NCAA and conferences improved both the overall strength of the social system and communication between college football playing institutions. Communication channels also improved through the continued growth of interest in newspapers across the country in college football. Newspapers far from the Northeast were covering the game, often dedicating several pages to the games involving local teams, along with newswire coverage from across the country. Finally, journals in architecture, engineering and athletics also developed during the period, covering the development of athletic facilities around the country.

Geography was a distinct limiting factor still for diffusion of innovations. Universities were more interconnected than in Stage One, as the railroad had spread further west and south, increasing the amount of cities connected by the railroad. The development of the automobile also increased the ability of people to move from one area to another. The Yale Bowl, along with

other venues began to add limited parking for automobiles. While this helped to remove some of the limits of geography, spatial distance still limited the spread of innovations across the social system. Newspapers and journals were decreasing the impact of spatial geography as well. While the impacts of spatial geography were lessening, they were still a significant factor. Diffusion of an innovation in a particular area occurred relatively quickly due to the neighborhood effect. Reinforced concrete and steel was a primary example of the impact of the neighborhood effect. Clusters developed around the Big Three schools in the Northeast, the Western Conference in the Midwest, California and Stanford on the West Coast and in the South. Clustering was very important to the continued diffusion of innovations, and the clusters that developed in Stage Two would largely continue to evolve moving forward. It is also important to note that the Midwestern cluster built significantly larger venues than those found on the East Coast, while Southern stadiums were much smaller than those built anywhere else in the country. On the West Coast, Stanford and California built large permanent structures, while other venues built in the West Coast cluster were much smaller. Stage Two also experienced the first significant renovations of stadiums. Renovations were clustered much like new constructions, with one important difference. Renovations were far more common in the Midwest, South and West Coast than in the Northeast. Rehabilitation projects as previously discussed were most common, and the majority of these projects occurred in the Midwest and the South.

In Stage Three, the Great Depression had a significant impact on innovation development. Radio developed as a new mass media communications device for innovation diffusion. Radio diffused starting in the Northeast geographic cluster and then spread to the Midwest geographic cluster. Radio allowed for knowledge of the innovation to spread as far as the radio waves reached. Radio impacted the stadium in a variety of ways. First, as universities

were attempting to deal with the significant loss of spectators attending games, radio began to provide profits to the university during Stage Three. The development of radio broadcasts for profit encouraged neighboring universities to attempt to develop relationships with their own commercial radio stations to gain revenue from a contract with the station. Radio also served as a communications channel, sharing information about additions of lights, press areas and renovations of stadiums done by the PWA and WPA. Interestingly, the South and the West were where clusters of construction by the WPA and PWA occurred as part of public works projects of the New Deal. Public works projects allowed a few schools that had not added concrete and steel facilities in Stage Two to build them in Stage Three. Stage Three brought over 80 renovation projects. Rehabilitation projects dominated the era, with the addition of lights, press spaces and capacity increases being the most common rehabilitations done to the Stage Three stadium. Interestingly, most of the renovation projects occurred in the South cluster, with a smaller number occurring on the West Coast and in the Midwest. Few projects occurred in the Northeast cluster, continuing the relative decline of the Northeast facilities in comparison to the rest of the country.

The NCAA continued to strengthen, along with the continued development of conferences around the country. The social system of college football was very strong by the end of Stage Three. All of the top schools in college football were members of a conference and/or members of the NCAA. Information quickly was shared across college football due to radio. Interpersonal communication, whether through person-to-person conversations at events or through usage of another important innovation the telephone, helped the spread of innovations during the stage. One last important innovation was the decision to renovate facilities instead of building new. Many universities made this choice for the first time in Stage Three, whether

through small innovations such as lights, or through much larger innovations with the help of the PWA or WPA. This process innovation was an important change from any previous decisions made by universities. The decision to renovate existing concrete and steel stadiums instead of tearing them down and building new would radically shift the development of the college stadium from that of the professional venues built throughout the U.S. (Seifried, 2005). Due to the increasing speed of knowledge sharing, the time needed for an innovation to diffuse quickened. It is important to note that the Great Depression impacted diffusion in Stage Three, with innovations in the mid-1930s being basically limited to those funded through public works projects.

At the start of Stage Four, television developed as an important mass media communication channel during Stage Five. For the first time, if a university wanted to learn about a new innovation at another institution, all it had to do was find a game being broadcast from the innovator's home stadium. Interestingly, many of the innovations of Stage Four emenated from professional sports and moved into college football. Colleges were quick to limit broadcasts of college football, while professional teams were more willing to experiment with broadcasting of professional games on television. The large scoreboard, Astroturf, and the development of luxury spaces all first occurred in the professional game before spreading to college football. Most of these were part of renovations that were funded during Stage Four. Of the 364 renovation projects, over 300 were rehabilitation projects, additions of seating, turf, scoreboards, press boxes or a combination thereof. The growth of renovations was significant, with more renovations occurring in Stage Four than in the previous three stages combined. Television provided universities with knowledge of new innovations, which were quickly added to other stadiums around the country. Clustering declined during the Stage, especially related to

turf, but some clustering still existed. Many of the renovations continued to occur in the South, where the increasing enrollments forced universities to become creative in finding new funding sources to support the increasingly larger athletic department. Preservation projects were conducted around the country on venues that were constructed several decades earlier.

Geography's impact on diffusion declined in Stage Four, especially related to the spread of artificial turf. The ability of schools to learn about an innovation through television broadcasting removed many of the limitations on diffusion related to geography. Turf spreads across the country in a scattered pattern, unlike any other previous innovation. For the first time, virtual geography or the ability to remotely learn of an innovation played a significant role in the diffusion of an innovation. Due to the decline of physical geography, and the interconnectedness of the social system, diffusion sped up during Stage Four. Turf is a wonderful example of this. The original innovation occurred in 1968, yet, less than four years, later twenty-five schools all across the country had adopted the new innovation. Other innovations were still found in the traditional Northeastern cluster, Midwest cluster, Southern cluster and Western cluster found in previous eras but the rate of diffusion was faster. It is interesting to note that these clusters were growing in size. More and more universities were adopting an innovation during the Stage, with fewer and fewer laggards waiting years to adopt innovations.

The influence of the conference social system presents an important influence over Stage Five. As one member of a conference adopts an innovation, others quickly follow. For instance, as a couple members of the SEC begin to adopt luxury seating options early in Stage Five, others quickly begin to follow suit. Again, the decline in the importance of physical geography continued as the importance of television and the Internet increased. Through television early in Stage Five, and through both television and the Internet later in the Stage, universities quickly

learned about innovations from other universities scattered all over the country. Often dozens of universities all around the country adopted a new innovation within a year or two of each other. This lends credence to the importance of virtual geography, and the increasing ease of communication as significant contributors to the decrease in time for an innovation to spread across the complete social system.

Interestingly, Stage Five also brought a significant increase in the variety of interpersonal communication available to universities. No longer were universities limited to telephone calls and letters to share information interpersonally over great distances. The Internet allowed for the development of email communication along with voice and video conferencing technologies. Two people on opposite sides of the country could experience a very similar experience to personal face-to-face communication without having to travel to meet each other. Furthermore, two opinion leaders did not have to wait days to discuss an important issue. They were able video conference with each other over the Internet, share documents via email or the conference, and quickly learn anything and everything the other was doing in their venue. Communication channels changed significantly in Stage Five, increasing the speed of innovation diffusion due a significant decrease in the barriers to diffusion.

Interestingly, by Stage Five the Southern cluster stadium was every bit as advanced as any stadium in the country. Due to increasing enrollments and the need to generate revenues to replace those lost to students, southern stadiums were the first to add luxury spaces to the venue (Seifried, 2012, in press). The South definitely caught the Midwest and Western clusters by the end of Stage Five. While clustering for innovation diffusion purposes was very limited during the Stage, it is interesting to note that each cluster found during the ideal-type development appeared to have stadiums that were similar in nature in many ways. Southern stadiums were

growing in size, but the Midwest still had several large venues. Western facilities, while not as large as either the ones in the South or the Midwest, were every bit as technologically advanced as other venues found in the country. It is interesting also that the renovations of the Stage were diverse both in type (though with rehabilitation efforts still dominating) and in location. Many of the early projects of the Stage were in the South, where schools attempted to continue to catch up with the rest of the country. As the Stage progressed, universities in all parts of the country became involved in renovation projects. Luxury seating, video boards, artificial turf and stadium expansions dominated the rehabilitation projects of the Stage. It is interesting that more renovations occurred in Stage Five than the four previous stages combined. The modern college stadium experienced significant investment during the stage in the form of renovations. The impacts of innovation diffusion on the stadium were quite clear by Stage Five, as was the increasing importance of virtual geography. Stadiums that shared no common connection geographically appeared quite similar in the structures inside the venue. The modern stadium, fully invested in the spectator as well as television had developed across Division I FBS by the end of Stage Five.

Future Implications

The five-stage ideal-type discussed in this study allows for some educated comments on the future of college football stadium construction. First of all, universities are dealing with significant challenges related to in-game attendance, especially amongst students. Universities exist primarily to educate students, and so the student is an important part of all facets of university life including the athletic programs. Yet significant attendance declines have occurred in the last few years of Stage Five, leaving universities trying a variety of techniques to garner student attendance (Bovin, 2015; Brantley, 2014). One of the continued pushes of the university

most likely will be to continue to attempt to meet the needs of the modern student. Whether that is through increased technology in the stadium, the development of unique students' spots or the continued growth of promotions for students, the university will continue to work to grow student attendance. The reason for the devotion to student attendance is very simple. Today's students are tomorrow's donors, and universities want to make sure that students come to the game to experience the environment inside the stadium and want to continue to come back long after they are no longer students.

A second area of a future development inside the facility will likely be the continued growth of luxury spaces, most likely at the expense of traditional seating. Several schools already have started to do this, with the schools that rebuilt at the end of Stage Five shrinking total capacities and increasing luxury spaces (Jude, 2013; "Stanford Stadium," 2015; Taylor, 2012). Other university leaders, such as LSU's athletic director Joe Alleva, discussed similar moves (Castiglione, 2015; Rabalais, 2014). The return on investment is much higher on luxury spaces, and, at universities where the demand is higher than the amount available, increasing those spaces makes significant sense.

The last trend that developed at the end of Stage Five that will be worth paying attention to moving forward is the complete or almost complete demolition of the stadium and a new venue developed on the same spot. California, Stanford and Washington all decided to do this during Stage Five (Jude, 2013; "Stanford Stadium," 2015; Taylor, 2013). Texas A&M was in the process of completing a $450 million project of similar proportions during the completion of the current research (Newcomb, 2015). Arizona State University was starting a similar project at Sun Devil Stadium, becoming the fourth PAC-12 school to invest in this new wave of developments (Joseph, 2015). Similar projects are being discussed at other venues around the country, and the

trend may be the next step in facility construction. The challenges of such projects are enormous, as universities either have to close parts of the stadium off, move to another venue to play for a couple seasons, or complete projects in the off seasons. Each option increases the total cost of the construction, which may be a limiting factor to the diffusion of the new innovation in stadium construction.

Future Research Recommendations

The enormous scope of the current project presents several future research opportunities either directly tied to the current project, or as tangents of the data collected for the current project. The first future research goal needs to be the development of a conceptual map of innovation diffusion. Rogers' (2003) Diffusion of Innovation theory has served as a valuable theoretical foundation for the current work. Interestingly, while Rogers (2003) understands that diffusion has a beginning and an end, his and other scholar's research largely ends with the adoption of an innovation by an organization (Compagni et al., 2015; Jalonen, 2012; Redmond, 2003). Research on innovation diffusion largely focuses on the communication channels that encourage early adopters to adopt, due to its interest in the adoption decision itself (Dearing, 2009). The importances of the social system, change agents, geography and other factors have experienced less scrutiny in diffusion research (Dearing, 2009; Greenhalgh et al., 2004; Redmond, 2003).

Kimberly and Evanisko (1981) encouraged scholars to figure out "why and how an innovation – or group of innovations – spread in a population" and further challenged scholars to better understand the reasons that drive rapid diffusion (p. 696). Several researchers have made a call for a conceptual model to understand the process of innovation diffusion (e.g. Damanpour & Schneider, 2006; Greenhalgh et al., 2004; Jalonen, 2012). The current research further supports

the need for a conceptual model to explain the process of innovation diffusion. The current research explores the importance of time, communication channels, geography and the social system on the diffusion of innovations. The project found significant limitations in understanding the true process of diffusion due to a lack of a model to explain the process. One significant future contribution that should be developed from the current project is the development of such a conceptual model in order to better understand and explain the rationale of diffusion and the process by which diffusion occurs. Rogers (2003) spent a significant amount of time discussing the adopter categories and the importance of communication channels, time and the social system in the spread of diffusion to early adopters, but that is where it ends. The current project challenges future researchers to expand the knowledge of the diffusion process through the development of a conceptual model to explain such a process.

A second area of future research available from the current project is the development of quantitative studies on the data collected. A rich collection of quantitative data, previously uncollected by researchers as a whole, is now available. The current study delves into the quantitative side of the data to determin averages and other very limited information. There is no doubt that future research could use the data to develop a significant number of quantitative studies from the data. One such study would be on the novelty effect of stadium renovation. Significant research has occurred examining the impacts of new construction on spectator attendance at professional sporting events (e.g., Coates & Humphreys, 2005; Noll, 1974; Quirk & Fort, 1997). Only one study examined renovations (Feddersen, Maening & Borcherding, 2006). The study found that complete reconstructions tended to have similar novelty effects as new construction projects. Due to the decisions by universities to renovate most stadiums, a significant amount of data was collected explaining the costs and related capacity increases

found as part of the renovation projects. Further, data were collected on the four types of renovations, all of which have been discussed significantly earlier in the document. The collection of this data, combined with other data available from the NCAA (i.e., attendance data) and other sources, presents future researchers with the opportunity to examine the novelty effect of renovations as a whole. The data also allow future researchers with the opportunity to examine whether different types of renovation projects have a larger novelty effect versus other types. The novelty effect of renovations is one of most likely several studies available to researchers due to the significant amount of newly collected data found in current study.

Lastly, the current research allows for scholars to examine the individual stories found at each university in Division I FBS. As Seifried (in press) and Tutka and Seifried (in press) demonstrate, stadium history papers are publishable with special use of theoretical lens such as modernization. The data collected allow for the exploration of many Division I FBS stadiums for unique and interesting stories that would be of interest to both state historical journals along with sport management journals. The current project provides the database to know the dates and costs of stadium changes, allowing for future researchers to build upon the current study through critical examination of archives at universities around the country. The current research has led to visits to over 40 university archives, and the collection of a significant amount of data that could be used to write the stories of several of these venues. Other similar trips by researchers would only increase the knowledge base and the development of individual stadium stories.

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Appendix A: The Historical Ideal-type as a Heuristic Device for Academic Storytelling by Sport Scholars

Abstract

The goal of this research endeavor is to take the previous calls of sport scholars to expand into alternative research approaches (e.g., history, case study, law reviews, philosophy, etc.) and to show how storytelling can be an effective tool through use of a heuristic device. The present analysis attempts to focus on the usage of the historical ideal-type as a heuristic device for academic storytelling so that scholars within sport studies can become more comfortable in possibly other methodological approaches. To support this goal, an example of a sport focused historical ideal-type is reviewed along with ideal-type activity practiced in other disciplines. Finally, the contribution and employment of academic storytelling and historical ideal-types will be promoted as an important tactic to enhance the impact of a scholar's academic findings and overall writing potential.

The Historical Ideal-type as a Heuristic Device for Academic Storytelling by Sport Scholars

Sport studies scholars in kinesiology have repeatedly challenged the field in recent years to reach out and/or consider new and different methodologies or approaches to research (Block & Estes, 2011; Freedson, 2009; Silverman, 2012). As an example, in Sport Management, Amis and Silk (2005), de Wilde and Seifried (2012), de Wilde, Seifried, and Adelman (2010), Doherty (2013), Rudd and Johnson (2010) and Seifried (2010a) all challenged their discipline to embrace interdisciplinary studies and perspectives because of what they perceived to be a narrowing of field. In particularly, they argued methodological preferences (i.e., quantitative and qualitative) have reduced the ability to produce research wholly capable of appreciating context. Thus, they suggested it was necessary to involve history, philosophy, law reviews, and case study, among other interconnected approaches and tactics, to boost the communication ability of the discipline (Amis & Silk, 2005; Doherty, 2013; Rudd & Johnson, 2010; Seifried, 2010a).

Dr. Earle F. Zeigler also notably pushed for the use of interdisciplinary approaches in his research and frequently advocated for history, case studies, legal analysis, and other methods to enhance the communication of findings (de Wilde, Seifried & Adelman, 2010; Doherty, 2013). Multiple recipients of the Dr. Earle F. Zeigler Award at the North American Society for Sport Management (NASSM) have similarly called for the field to follow this recommendation (Chalip, 2006; Danylchuk, 2011; Doherty, 2013; Shilbury, 2012). The quest to embrace alternative methods within sport management is slowly occurring but that reality is far from complete (Amis & Silk, 2005; de Wilde & Seifried, 2012; Doherty, 2013; Seifried, 2010).

The problem for many scholars, like those in sport management and with respect to methodology and interdisciplinary work, is one of comfort and writing (Chalip 2006; Danylchuck, 2011; Doherty, 2013). In particular, interdisciplinary work forces the sport scholar

to not only become comfortable and familiar with a specific scholarly area of study but may prompt the seeking of information on alternative methodologies to enhance their writing (Mahony, 2008). The study of alternative methodological approaches requires the scholar to become comfortable in another system to the point where terms and concepts can be used correctly for their own work (Chalip, 2006; Doherty, 2013). More often than not, this necessitates the scholar to reach out to other scholars writing in that area of study (Doherty, 2013). Notably, developing such relationships allows the researcher to work with others and possibly gain a deeper understanding of the concept(s). In turn, this should lead to improved acquisition of knowledge and the analysis of results for the solving of previously difficult problems and limiting points of view (Buller, 2008; Doherty, 2013).

Highlighted within the shared discussion amongst many sport scholars was how to introduce, relate, and/or explain both the difficult and ordinary in a new and interesting way to fellow researchers and sport professionals (Block & Estes, 2011; Chalip, 2006; Freedson, 2009; Silverman, 2012). In particular, the practical utility of scholarly theory and methods was acknowledged as critical for the improvement of real world practice and deserving of such introductory, relational, and/or explanatory attention (Chalip, 2006; Mahony, 2008; Thibault, 2009). Woven within these works, the concept of storytelling is a major attribute subtly featured; yet many scholars "do not recognize the importance of storytelling to academic success" and the advancement of ideas toward interdisciplinary approaches (Pollock & Bono, 2013, p. 629).

Pollock and Bono (2013) argued the lack of storytelling ability should be a concern because many manuscripts turn into "research reports" where "interesting ideas and finding will be buried under a desert of barren prose, revealed only to those willing to endure the tedious archeological dig necessary to excavate them" (p. 629). Storytelling, as described by Flaherty

(2009), Huff (1999), Sword (2012), and Zinsser (2006), suggests the written word is essential to convey the activities of the world and critical to help influence interest in management behavior. Active scholarly interest in storytelling should further occur because it involves the attaching of 'human faces' and activities to events and episodes capable of assisting in the learning of concepts, about social phenomena, and notable achievements (Flaherty, 2009; Pollock & Bono, 2013).

The goal of this scholarly endeavor is to take the previous calls of sport scholars for expanding their interdisciplinary efforts and to show how storytelling is not just the simple use of emotive language but can be used within the identification and portrayal of human action to help with theorizing and knowledge acquisition. This research effort also focuses on the usage of the historical ideal-type as a heuristic device for storytelling so that sport scholars can become more comfortable in their own research and possibly other alternative methodologies (e.g., case study, historical, philosophy, law review). Lindbekk (1992) and Shiner (1975) suggested ideal-types serve to reduce a variety of overlapping characteristics into one, single-flowing representation of reality. They further described the ideal-type as capable of making order and deriving meaning from human activity (Lindbekk, 1992; Shiner, 1975). More recently, Forsberg (2011) positioned ideal-types as "idealized descriptions of the concrete features of things that help to compare otherwise fuzzy phenomena with each other" and as being helpful "as heuristic aids for studying concrete phenomena" (p. 1199).

Overall, the contribution and employment of academic storytelling and this work's use of the historical ideal-type will be promoted as important tactics to enhance the impact of a scholar's academic findings and overall writing potential. To support this point, a separation between general and academic storytelling is provided to help demonstrate that some storytelling

is capable of translating and developing concepts, explanation, or connecting outcomes and experiences to human and/or organizational behavior. Next, a breakdown of historical versus general or pure ideal-types is provided to show its connectivity to academic storytelling and as capable of generating important results, discussion, and future considerations. Finally, use of the ideal-type is presented by sport and non-sport scholars to convey confidence in the potential utility of the device within academic writing, communication, and conceptualization pursuits.

Literature Review

Explanation of the general 'story', as an approach to research, is frequently discouraged because it is looked at as evolving from a simple narrative or reporting style like that offered by chronicling (Daily & Browning, 2014). The concept of the general 'story' perspective surfaces through narratives best described as simple accounts of events in time and space (Dailey & Browning, 2014). General narratives may "imply causality" and "convey an awareness" (Dailey & Browning, 2014: 23). Taylor and Van Every (2000) further noted general narratives can present an obvious style of reasoning that Ricoeur (2004) and Seifried (2008) argued could display emotional biases. Polster (1987) and Seifried (2008) added such stories are also created and potentially retold to address goals of the storyteller. Thus, the general storyteller makes efforts to use emotional language to guide readers toward a shared perspective (Green & Brock, 2000; Seifried, 2008). Further, general storytellers can use comparisons but also embellishment "to situate" their narrative into a "broader discursive space, or orient the listener" in an attempt to link their story to the reader (Luhman & Boje, 2001, p. 166).

By contrast, complex or academic storytelling is an outcome from research capable of benefitting sport industries, organizations, and individuals. Flaherty (2009) and Sword (2012) described, what this work labels as 'academic storytelling', as a presentation of the information

to relay the activities of the world capable of influencing interest in human and management behavior. Academic storytelling is not the use of emotive language to describe phenomena or events but the identification and portrayal of human action to help with theorizing and knowledge acquisition. Interestingly, such academic narrative-based works has been successfully used as a methodology for organizational studies (e.g., Quinn & Worline, 2008; Rhodes & Brown, 2005), strategic management (e.g., Dunford & Jones, 2000; Sonenshein, 2010), and culture (e.g., Dailey & Browning, 2014; Parada & Viladas, 2010) so that current and future sport scholars should not see those involved with academic storytelling as illegitimate.

Our conception of academic storytelling still supports an Aristotelian start, middle, and finish like narratives in that, "events and happenings are configured into a temporal unity by means of a plot" (Polkinghorne, 1995: 5). Further, we view academic storytelling as involving four key features that Browning and Morris (2012) presented: "1) foreshadow a problem; 2) provide a sequential rendering of actions in the face of complications leading toward resolution; 3) achieve closure; and 4) invite or pronounce moral implications" (p. 32). Moreover, we view academic storytelling as declaring or inferring causality, requiring confirmation of time and space, and promoting the sequence of activities as critical to the developing story. However, we differentiate academic storytelling from the general and narrative comparisons by arguing it is not emotionally charged like Dailey and Browning (2014) and Ricoeur (2004) suggested was typical of narratives and general storytelling due to academic storytelling's lack of reliance on personal memory, meanings, and efforts to influence their recipients.

Alternative methodologies such as case studies, historical research, and legal analysis are regularly discussed within sport but sport management scholars, in particular, use them much less than quantitative or qualitative approaches to explain current or evolving phenomena

occurring in the modern sport industry (de Wilde & Seifried, 2012; Seifried, 2010a). For example, de Wilde and Seifried (2012) found top association journals such as the *Journal of Sport Management* (JSM), *Sport Management Review* (SMR), *Sport Marketing Quarterly* (SMQ), and *European Sport Management Quarterly* (ESMQ) contained very few scholarly articles (*n*=74 of 394) involving case studies, historical research, and legal analysis between 2005 and 2009. While this may be explained through: 1) a lack of interest by sport management scholars; 2) subpar submissions; 3) possible editorial resistance/preferences; 4) a limited number of quality reviewers emerged to encourage more recognition and use of those methods; and 5) their own field specific journals (e.g., *Case Studies in Sport Management, Journal of Legal Aspects of Sport, Journal of Sport History*), it is also likely that many scholars are just not comfortable in those research approaches and how to communicate the results they might produce.

One way sport and sport management scholars can make the study of and acceptance to engage in these alternative methodological approaches more common is through the use of heuristic devices. Heuristic devices allow the researcher to explain phenomena through the means of shared and identifiable or familiar associations but through an academic orientation (Forsberg, 2011; Soliva, 2007). As a tactic within academic storytelling, heuristic devices serve to put a 'face' on concepts or phenomenon. Examples of heuristic devices emerge from a variety of disciplines and in multiple ways to influence the promotion of storytelling. For instance, concepts (Hellawell, 2006) and conceptual models (Reyes & Azuara, 2011) are found in language studies, conceptual maps in engineering education (Ellis, Rudnitsky & Silverstein, 2004), paradigms in business (Alexander, 2007), and causal-comparative associations throughout qualitative research (Siau & Tan, 2005). Interestingly, the ideal-type has also been used in the

past as a visual and verbal heuristic device to explain phenomenon for a variety of disciplines (e.g. Bale, 2001- Sport Geography; Forsberg; 2011- Foreign Policy; Seifried, 2010b- Sport Management; Soliva, 2007- Landscape Studies; Weber, 1959- Management). Highlighted within the ideal-type description below are the contribution of motion and pacing and the human face identified by Pollock and Bono (2013) as critical academic storytelling elements important for the transfer of knowledge.

Defining and Describing the Ideal-type

The ideal-type was the creation of social scientist Max Weber (Kim, 2012). Weber defined the ideal-type as a construct used to gather individual phenomena into a group in order to explain the presence of a collected phenomenon (Kim, 2012; McIntosh, 1977; Rogers, 1969; Weber, 1948). According to Weber (1949), an ideal-type is:

> "Formed by the one-sided accentuation of one or more points of view and by the synthesis of a great many diffuse, discrete, more or less present, and occasionally absent concrete individual phenomena, which are arranged according to those one-sidedly emphasized viewpoints into a unified thought construct" (p. 90).

Shiner (1975) also presented two different classifications of ideal-types (i.e., historical and general/pure). The historical ideal-type requires researchers to locate and examine information on an initially undescribed topic to help create representative features of its evolving face. Burger (1987) further proposed such an ideal-type is generally representative of a specific culture because of the unique historical information created and social actors. The historical ideal-type notably makes use of quantitative data to help build conclusions in addition to important qualitative information (Shiner, 1975). The general or pure ideal-type represents "exaggerations… not bound by considerations of adequacy to the spread of the empirical data but purely by the concern for ideational consistency or investigative fertility" (Shiner, 1975, p. 246). Hempel (1965) added that pure ideal-types "represent extreme places in the range defined

by the given criteria" and that their "typology terminology" is not significant (p. 159). Pure ideal-types only serve to accentuate "certain aspects of a given phenomena" to develop a "general concept of an artificial nature applicable to any historical or cultural terrain" (Shiner, 1975, p. 246). In essence, the general or pure ideal-type cannot represent a specific representation of reality like that offered by the historical ideal-type and can only serve a general storytelling purpose.

The overarching goal of the historical ideal-type is to allow the researcher to gather information on events or ideas that occurred within similar periods of time to create a single representation of an evolving reality many can share through the establishment of unique verbal and/or visual stages (Kim, 2012; Rogers, 1969; Weber, 1948). Rogers (1969) further differentiated the ideal-type from other heuristic devices by suggesting it: 1) is not a hypothesis, which means it is not "verifiable" (p. 57); 2) not reality, but is in fact an abstract collection of occurrences; 3) represents a collection of ideal and not the average of them; and 4) not "a formulation of the concrete traits *common* to a class of concrete things" (p. 58). This abstractness allows for the historical ideal-type to be flexible to any topic's unique characteristics. Moreover, the historical ideal-type combines a wide variety of informational sources and compels the comparison and scrutinizing of information to help shorten the interpretive gap other communication devices might struggle to achieve (Heckman, 1983; Kim, 2012; Von Mises, 1996; Weber 1948).

The historical ideal-type also allows for shared crossover traits between stages while simultaneously making emphasized distinctions between them based on the emergence of some significant features (McIntosh, 1977; Rogers, 2012; Seifried, 2010b). Historical ideal-types further provide an opportunity for the diffusion of the original ideas across the area studied while

allowing for new developments to be revealed over a time period (Bale, 2001; Kim, 2012; McIntosh, 1977; Rogers, 1969; Seifried, 2010b). Historical ideal-types are also useful to help project future changes or to make educated guesses about what the future holds (Seifried, 2010b). As an example, Cheung et al. (2006) argued that places and/or activities of social phenomenon are tied to the changes that proceed them and “a rigorous conceptual yardstick must be devised that can delineate in a more precise and unambiguous manner the essential constitution of that phenomenon in question” (p. 160). Thus, “constructing an ideal-type enables us to cut through the complications and vicissitudes” that plagued history through the presentation of “conceptual baseline places” (Cheung et al., 2006, p. 160). Moreover, as Weber (1948) suggested, the attempt to create this “conceptual scaffolding” helps make sense from the “infinite world of sensible experience” by identifying variations in the conceptual core (Cheung, et al., 2006, p. 160).

From the stage approach, historical ideal-types help with academic storytelling through opportunities to establish an appropriate motion and pace for the reading of the paper with respect to the beginning, middle, and an evolving end. Pollock and Bono (2013) described motion as the “action that propels the story forward” (p. 630) while Flaherty (2009) defined pacing as writing that “allows the reader enough time to pause over an idea, absorb it and reflect on it (p. 86). Historical ideal-types help reduce the interpretive gap because they require the reader to stop and contemplate the described phenomenon that is required to be free of cluttered language. Zinsser (2006) argued “Clutter is the disease of American writing [academic with emphasis]…strangling in unnecessary words, circular constructions, pompous frills and meaningless jargon” (p. 6). Arrogance and the demonstration of intellectual superiority are also highlighted as troublesome characteristics of academic work associated with motion and pacing

(Pollock & Bono, 2013; Zinsser, 2006). Historical ideal-types should be recognized as readily able to help reduce the likelihood of arrogance because they prompt varying sentence lengths and promote digestible descriptors to enhance motion and pacing. Furthermore, accompanying visual components help reduce the interpretive gap to elevate historical ideal-types as a useful communication tool.

Next, it should be noted that the subjective nature associated with the study of historical, cultural, and social realities are unique because of the complexities associated with human behavior (Coser, 1977). Researchers of cultural and social phenomenon analyze environments full of detail and decisions made by social actors (Lindbekk, 1992; Von Mises, 1996). Many argued such complexities make use of the ideal-type preferred because it helps create an image of how history happens through a calculated and thoughtful collection of human activity (Coser, 1977; Oakes, 1977; Prandy, 2002; Von Mises, 1996). Swingewood (2000) and Latour (2000) opposed the study of any phenomenon that does not respect the activity of social actors because 'man' always makes history. Attaching a "human face" to events respects the contribution of humans (Pollock & Bono, 2013, p. 629) and the concept of academic storytelling which Flaherty (2009) again recognized as capable of involving emotions and activities from all experiences.

Finally, historical ideal-types help secure valid results from social actors through a fair and balanced approach to understand the environment. Reliability and validity is a central feature displayed by the historical ideal-type. Cheung et al. (2006) identified that such an ideal-type may reduce the affect of the values and orientations of the researcher(s). Shiner (1975) similarly proposed "any attempt to amend them [ideal-types] so as to better fit the data is wrong in principle" because the data or information must complete the story (p. 250). Researchers regularly attempt to responsively derive meaning through the connection of events and human

behavior by requiring themselves to follow procedures that necessitate their activity to take place through unobtrusive and unbiased perspectives (Burger, 1987; Von Mises, 1996). The creation of an historical ideal-type notably allows and promotes intellectual scrutiny to occur because as a product, it necessitates the providing of information regarding its process to show the formulation of the conclusion(s) drawn within the evolving story. Middendorp (1991) argued from this perspective that historical ideal-types are like a theoretical model because they are "systematically built-up" through combining "essential characteristics of a particular construct" (p. 237).

Examples of Ideal-type Use outside Sport

The ideal-type has been used in a variety of ways for political, geographic and governmental history and development studies to help convey confidence in the potential utility of the device as a communication tool. For instance, ideal-types found a home in landscape studies (Soliva, 2007; Soliva & Hunziker, 2009), reviews of welfare (Kvist, 2007), public management (Hernes, 2005), foreign policy studies (Forsberg, 2011) and within studies on authority (Schneider, 2004). To be more specific, Soliva and Hunzinker (2009) used the ideal-type to examine possible land use scenarios within Switzerland. Within, the researchers were able to use the ideal-type to create an academic story of different landscape change scenarios with respect to special stakeholder groups recognized in the study (Soliva & Hunzinker, 2009). Their ideal-type allowed for the synthesis of concrete occurrences with a theoretical creation of possible outcomes regarding development. Soliva (2007) similarly used the ideal-type when discussing land use in the Swiss Alps and utilized it to bring national and local stakeholders together to better understand the unique issues facing rural areas in Switzerland previously misunderstood.

Tsagarousianou (2004) also employed the ideal-type to look at how mobility has effected movement of people from one area to another. Tsagarousianou (2004) focused on populations that had moved away from their homelands yet had never felt at home in their new countries. The lack of comfort immigrants felt in the new countries caused them to create separate communities within their new location as these groups realized returning home seemed unlikely, impossible, and undesirable. Forsberg (2011) also looked at how the European Union used the normative power concept through the creation of the ideal-type from which the normative power produced by the United States was compared. Forsberg (2011) studied the concept of normative power, meaning power over opinions or ideas that the European Union seemed to represent, and commented on other countries, such as the United States, regarding what they lacked.

Finally, ideal-type usage has occurred in the world of management. Weber (1959) stressed the value of the ideal-type in the management setting and highlighted the influence of religious beliefs on past management decisions/behaviors. Again, Weber (1959) is recognized as the starting point for many studies of management thought, especially those that challenge the traditional "Protestant Ethic," common in many studies (Dyck & Schroeder, 2005, p. 707). Weber (1959) established an ideal-type management style focused on individual and company success, not on the greater good. Previously, Weber (1959) argued, Puritan orientations served as driving business activities, where working for the greater good was seen as not only important, but as a semi-requirement. Overall, Weber's ideal-type suggested change occurred which moved practices from the Puritan ideal to a more profit business centered motive.

Following Weber (1959), Dyck and Schroeder (2005) argued for a more moral-centered ideal-type that is less materialistic since the mid-point of the 20th century. The goal of Dyck and Schroder's (2005) scholarly work was to adjust the Weber (1959) ideal-type and create a new

more radical ideal-type secular in nature. This use of the ideal-type suggests it holds value to generate important and interesting discussions about the evolution of our society and where we may be headed in the future. Again, by highlighting trends, the activities of important social actors, and the contribution of environmental cues, this historical ideal-type served as a useful tool to communicate information to others and to help the understanding of social phenomena. Lastly, it should be recognized that historical ideal-types are not just valuable in one discipline, but across several disciplines, which fit perfectly into the interdisciplinary concept pushed by the aforementioned Ziegler Award winners (Chalip, 2006; Doherty, 2013). Thus, the ability to use the ideal-type to bring diverse ideas together into concrete thought is valuable outside of sport and one sport scholars can more readily employ (Gibson, Qi, & Zhang, 2008).

An Example of an Ideal-type within Sport

Booth (2005) also argued the historical ideal-type served to adequately organize thoughts associated with events and was capable of combining significant amounts of primary and secondary sources to generate confidence in research findings and conclusions. Yet, the use of historical ideal-types as a heuristic device is not typical in sport studies despite calls by Booth (2005) which advised constructionist-based research to use it as a tool to help explain the ideas that led to or caused the development of phenomenon. Taking the constructionist approach of intertwining experiences and pieces of information, sport geographer John Bale (2001) established a flexible but distinct four-stage ideal-type in *Sport, Space, and the City* to explain the development of English soccer facility construction. These stages are based on generalizations of the development of sport and society in England. Within, Bale (2001) proposed that each stage intersects with another stage in his model. Seifried (2010b) advanced a similar ideal-type in *The Evolution of Professional Baseball and Football Structures in the*

United States, 1850 to the Present: Toward an Ideal-Type. In that document, Seifried (2010b) featured 'human faces' and/or stories with each stage to help draw interest towards the story of the evolving stadium. Further, he utilized 'human faces' and the historical ideal-type to help create an appropriate motion and pacing for the transference of knowledge in a sport management setting.

Collectively, both Bale (2001) and Seifried (2010b) used the historical ideal-type concept in the same way that many non-sport management scholars used the concept. Their ideal-types were used to explain how the facilities modernized through time, and the stages each went through to get to the modern English Football Ground or American Baseball or Football Facility. Diffusion and modernization were featured as key components to the long-term growth of sport facilities. For example, Bale (1984) previously presented that some sport spread from Great Britain to other places in Europe and around the world and supported the opportunity for use of the historical ideal-type to explain the diffusion of technology, rules, and human sport practices. Building on this concept, his ideal-types were created for the explanation of diffusion of such items across stadiums during a set time period (Bale, 2001; Seifried, 2010b; Weber, 1958).

Bale's (2001) historical ideal-type also provided a conceptual understanding of how modernization impacted sport facility changes over time, through the establishment of different time periods and distinct characteristics within a frame (i.e., stages). In essence, while some stadiums still exist from earlier eras, the facilities modernized within to meet the organizational goals of the management/ownership. Seifried's (2010b) work similarly focused on modernization but also commented on the potential application of extensibility theory toward future stadium construction and the impact of human territoriality theory on stadium design. In essence, Seifried's (2010b) six-stage historical ideal-type helped explain the story of how

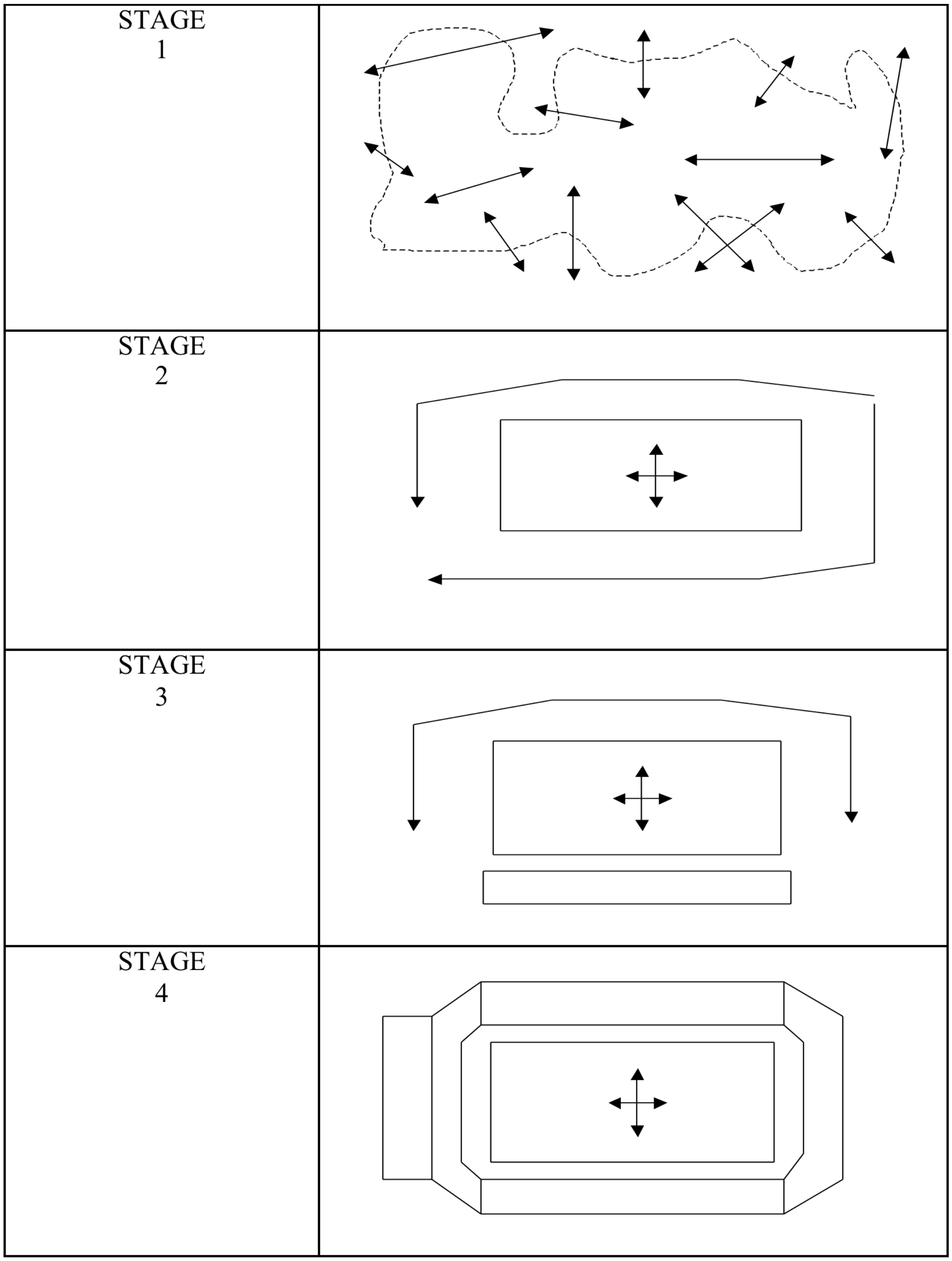

Figure 1.1 Bale's Four Stage Model

American stadiums evolved but embraced other concepts and/or theories to suggest how they may change in the future toward the satiation of stakeholder needs and the encouragement of interaction with the core event. Moreover, both Bale (2001) and Seifried (2010b) notably involved elements of academic storytelling into their ideal-types by: 1) presenting a problem or question to address (e.g., how did the modern stadium evolve?); 2) providing a sequential rendering of stadium changes as an attempt by entrepreneurs and participants to resolve problems or address opportunities made available to them; and 3) offering how the identification and portrayal of human action helped with theorizing and knowledge acquisition related to modernization, human territoriality, and extensibility.

Application and Conclusion

The goal of this work aimed to take the concept of the ideal-type as originally presented by Weber (1948, 1959), and show the historical ideal-type's potential in scholarly work as an academic storytelling device. Effective usage of the historical ideal-type both within sport and outside of sport has shown the value of the concept and particularly its usefulness in alternative research methods. As an example, Bale (2001) and Seifried (2010b) were acknowledged as exemplars of how the historical ideal-type can effectively provide valuable information to the sport academic community and to prompt further work and discussion. Outside of sport, Forsberg (2011), Soliva (2007), and Tsagarousianou (2004) and others showed the value of using the ideal-type as a heuristic device across other disciplines.

The ideal-type as put forward by Weber (1959) works as a heuristic device which allows academics in all fields to strengthen their research through its usage. Because of the historical ideal-type's allowance of overlap between one period or stage's end and another's beginning, the ideal-type becomes a flexible heuristic device which can fit a wide variety of quantitative,

qualitative, legal, or historical data. Again, Bale (2001) and Seifried (2010b) showed that even as facilities change on the surface they might not look so different through use of such information. More specifically, Seifried (2010b) demonstrated respect for the 'human face' by utilizing stories about how entrepreneurs picked their locations, changed the shape of those venues over time, and incorporated new technological advancements along with greater responsiveness for fan preferences to highlight the many differences between those facilities built at the beginning of the 20th century and today. Featured within his report, Seifried (2010b) also used data on acreage sizes, stadium capacity, ballpark dimensions, parking spaces and other categories to quantitatively describe the changing facility shapes while simultaneously using anecdotes and other qualitative-based information. Collectively, Seifried (2010b) used this information to introduce the beginning, present a middle, and provide an open ending to a story about modernization and human territoriality with an ending that explained extensibility and its potential on future stadium construction.

Next, the work presented in this paper suggests that the historical ideal-type maybe useful for the prospective mentoring of student academic storytelling. Again, Pollock and Bono (2013) challenged scholars to become better storytellers and further called on scholars to tell stories better in order to help students, other scholars, and practitioners better understand the concepts presented in research. The goal for future graduate students and scholars should be to move from papers that are basically "research reports" into projects that are able to draw the interest of other scholars through not just the contents of the research, but how the paper itself tells, reveals, and explains research (Pollock & Bono, 2013, p. 629). As sport scholars within a variety of disciplines, academic storytelling is useful to help communicate finding to other scholars, work interdisciplinary with other scholars, and to put a 'human face' on the work presented (Flaherty,

2009; Pollock & Bono, 2013). Generating interest is critical because without interest even the best findings and/or advice might be overlooked. Both Seifried (2010b) and Bale (2001) used several anecdotes and quantitative information to help build interest in an attempt to connect their stories to other audiences.

With respect to the clarity of writing and pacing of documents, historical ideal-types allow for the scholar to develop comfortable motion and pacing. Again, the stage approach presented by the historical ideal-type (i.e., beginning, middle, end) allows the reader to pause and think about information within the flexible but distinct stages. The separation of stages and recognition or emphasis of specific information improves the overall writing style of the document and comprehension by prospective readers. In essence, clutter is removed from the document through the clarity provided by the historical ideal-type, which Zinsser (2006) discussed as a significant problem within American writing. Further, issues with intellectual superiority are more likely to be removed from academic writing because the historical ideal-type works to enhance motion and pacing while removing inaccurate information through its required verbal and visual triangulation process (Pollock & Bono, 2013; Zinsser, 2006).

Finally, the goal of this research effort was to make the usage of the historical ideal-type and academic storytelling a more commonly used practice in sport scholarship. In many ways, by combining the usage of heuristic devices such as the historical ideal-type, the path for future sport scholars to work with other disciplines and possibly through other methodological approaches (i.e., philosophy, case study, legal reviews, etc.) can be made significantly easier. Moving forward, scholars should be willing to step outside of their comfort zone and move into interdisciplinary studies and this work promotes academic storytelling as one option.

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Appendix B: Author Permission

Subject: Fw: Question
Date: Tuesday, April 19, 2016 at 3:08:22 PM Eastern Daylight Time
From: Patrick M Tutka
To: Patrick Tutka

Patrick Tutka
| College of Human Sciences & Education
Coordinator of Events for Professional Education
Adjunct Instructor- School on Kinesiology
Ph.D. Student- Sport Management

From: Patrick M Tutka
Sent: Wednesday, February 17, 2016 11:18 AM
To: authorqueries@tandf.co.uk
Subject: Question

Hello,
My name is Patrick Tutka. I am an author with my adviser Dr. Chad Seifried, of

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DOI: 10.1080/00336297.2014.984735

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| College of Human Sciences & Education
Coordinator of Events for Professional Education
Adjunct Instructor- School on Kinesiology
Ph.D. Student- Sport Management

RE: Question

Author Queries <authorqueries@tandf.co.uk>

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Vita

Patrick M. Tutka was born in 1981 in Royal Oak, Michigan and grew up in Richmond, Michigan. Patrick showed an interest in sports very early in life, as a successful soccer and baseball player, along with a soccer official. Patrick graduated in 1999 from Richmond High School in Richmond, Michigan. Patrick chose to attend Grand Valley State University, in Allendale, Michigan where he majored in Secondary Education-Social Studies. After three years at Grand Valley, Patrick chose to transfer back home and finish up his degree at Wayne State University in Detroit, Michigan. Patrick graduated with his Bachelor's degree in Secondary Education in May of 2006. Following the completion of his education degree, Patrick was hired by Shelby High School in Shelby, North Carolina.

Patrick was a successful teacher and coach at Shelby High School, winning two state championships as an assistant (Boys Basketball and Boys Soccer). Following four years at Shelby, Patrick chose to go to Louisiana State University in Baton Rouge, Louisiana to get a Master's Degree in Sport Management. In the last semester of his Sport Management Master's program, he was offered the opportunity to teach two Sport Management classes as a Graduate Assistant. Following the successful completion of his Master's program Patrick was offered the opportunity to continue at Louisiana State University to earn his Doctorate of Philosophy in Kinesiology with a concentration in Sport Management. Patrick served as a Adjunct Instructor in the Spring of 2012, starting his four year Doctorate in the Fall of 2012. He taught several core Sport Administration courses to undergraduate students at Louisiana State, including, Introduction to Sport Administration, Sport and Society, Sport Law, Sport Administration, Event and Facility Management, and Sport Seminar. Patrick's Doctorate focused on facility history and development, primarily college football stadium history. Patrick is happily married for five years

to his wonderful wife Carrie. He has a strong interest in sports, as a life long fan of Detroit sports teams.