"Code Blue" for U.S. Golf Course Real Estate Development: "Code Green" for Sustainable Golf Course Redevelopment

Prepared for the *Journal of Sustainable Real Estate*

by

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Revised May 2010

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Preamble: The Crisis

The U.S. golf course real estate development business is in the emergency room and hoping that the current crisis in the golf industry is just a severe case of economic indigestion instead of painful contractions that are symptomatic of a painful paradigm shift in the supply of golf courses and demand for the game. Suddenly, there is a voice over the intercom and someone calls "Code Blue." Unfortunately, the prognosis for the health and vitality of golf's built environment is not good. Some industry pundits wistfully believe that golf's health crisis is no more than a temporary imbalance between supply and demand, and that it will heal naturally once the game sheds some 1,500 to 2,000 golf courses. However, that laissez-faire attitude leads to an unmanaged outcome and the root causes for the industry's chronic condition will persist if it is not diagnosed and left untreated.

The history of the golf industry's built environment in the 20th century has reflected the changing face of the game in terms of the number, type and kind of golf courses built, as well as the demographic profile of those playing the game. The historical analysis of the industry's built environment provides some insight as to how the game and business of golf has responded to the various socio-economic forces that have redirected and reshaped the game. Most recently, the game has taken a turn for the worse, which was directly related to the golf course development boom period in the 1990s when 60% of the golf courses built were tied to real estate development. The influential role that real estate developers played in this regard is of particular note, because too many golf courses were built, too much was spent on developing them and, as a result, many of these golf courses are not financially viable enterprises. Also, these golf courses were often too difficult, too expensive and took too long to play, which eventually translated into having a large number of golf courses that did not meet the needs of the golf industry's ultimate consumers… average golfers.

The reason for this Code Blue alert is to challenge the conventional wisdom that everything will be back to normal once the economy turns around and the golf industry loses 10% to 15% of its golf course inventory. But, it is clear that the underlying reasons for the current crisis are more complicated than that naïve scenario portrays. Can the golf industry be sustained at the prognosticated lower level, if it continues to ignore the needs of its customers? And, more importantly, can the golf industry be sustainable, if its product and services (golf courses) are not sustainable? Most of the golf courses built during the 1990s are not environmentally sensitive, economically viable and socially sustainable. This paper is a "Code Green" call to resuscitate the golf industry by fostering the redevelopment of its built environment into sustainable golf courses.

I. Introduction

There is some argument among golf historians as to the origins of golf in the U.S. Some claim that golf was first played in Charleston, South Carolina and/or Savannah, Georgia; however, there is only anecdotal evidence of golf being played at either of those locations. The consensus among golf

historians was that the game was first played in 1888 by the infamous "Apple Tree Gang" in Yonkers, New York, on a three-hole golf course, dubbed "St. Andrews" after the famous original in Scotland (Wind, 1975).

The first photograph of golf being played by the "Apple Tree Gang" at the St. Andrews Club was taken by S. Hedding Fitch in 1888 at the corner of Broadway and Shonnard Place, Yonkers, N. Y.[1]

While that scruffy golf course paled in comparison to the original where golf was born centuries before, no one would have dreamed that the American version of golf played on this crudely converted apple orchard would foreshadow the coming of something much bigger and more far reaching than anyone could have imagined. From this modest beginning, golf would grow from about 1,000 golf courses and guesstimated 125,000 golfers in 1900 to over 16,000 golf courses and nearly 30 million golfers by the end of the 20th century (Hueber, 2009a).

The history of golf's built environment during the 20th century has reflected the changing face of the game in terms of type of golf courses built and the demographic profile of those who played the game. What may surprise many outside observers is that golf has evolved from being a game played predominately by the upper class at private clubs to a game that is played predominately by the middle class at public golf courses in 2000. However, the democratization of the game, in terms of the number and type of golf courses built has occurred without regard for the environmental, economic or social consequences. It is understandable that the golf industry would be oblivious to these issues during the golf course construction boom periods of the 1920s and 1960s, because society was not cognizant of the ecological issues; however, during the golf course construction boom period of the 1990s, there

[1] Photograph courtesy of *Golf Illustrated*: www.la84foundation.org/SportsLibrary/GolfIllustrated/1923/gi191c.pdf.

appeared to be little concern among golf course real estate developers for environmental issues as evidenced by the type of golf courses built.

Unfortunately, most of the golf courses built during the most recent boom period in golf course construction were not sustainable, and how it was done turned out to be hazardous to the health and economic vitality of the golf industry. The golf courses were not environmentally sensitive, economically viable or socially responsible. Too many golf courses were built and more often than not they were built in the wrong places. Too much money was spent on building the courses and the maintenance of these golf courses is also expensive, so now they are too expensive to play. Additionally, many of these golf courses were too difficult to play for the average golfers and the time to play a round of golf has increased significantly reducing the ability for the average golfer to have the time to dedicate to playing the game.

This paper examines how and why that occurred, defines what a sustainable golf course can be and contrasts the prototype sustainable golf course concept with what has been built over the past 100 years. The objective of this research is to present new insights as to the socio-economic factors that have adversely impacted the game, and to encourage discourse and advocate sustainable solutions for the industry. This analysis and the recommendations are presented in five parts. First, we take a look at "Where We Are." This situational analysis briefly profiles and examines the golf industry's current condition, which gives rise to the question of whether or not the golf industry is sustainable on its current course. Second, we investigate "How We Got There" to better understand the principal causes for the current crisis situation, which begs the question of how the golf industry can be sustained if golf's products/services (golf courses) are not sustainable.

Third, we define what sustainability means for the golf industry and make the case for sustainable golf course redevelopment, how it can be good for the bottom line of the golf course business and it can foster the health and vitality of the golf industry. Fourth, we make the case for sustainable golf courses and explain how these golf courses can be environmentally sensitive, economically viable and socially responsible, as well as better meet the needs of the ultimate consumers… the average golfers.

The resuscitation of the golf industry is entirely dependent upon the redevelopment of golf's unsustainable built environment into sustainable golf courses, which is more easily said than done. It will be a long-term and incremental process. These problems developed over the course of 100 years, so these problems will not be solved overnight. In the fifth section of this paper, we have borrowed

ideas from the U.S. Green Building Council (USGBC) and the Rocky Mountain Institute. We have noted how the USGBC has appeared to have successfully fostered the notion of "Green Buildings" using its LEED certification program that has started a trend with large scale developers, investors and lenders focusing on renovated or new buildings that are "Green". Second, we took a page out of the Rocky Mountain Institute handbook. Early on, they successfully instigated a change in the mentality of the automobile industry when they developed the "Hyper Car." In the conclusions of this paper we suggest that the golf industry's version of for these visionary industry transformations would be conceptually similar, and hopefully, educate and inspire golf course sustainability for not only the right reasons of protecting our limited resources for generations to come but also because it makes business sense.

II. Where We Are

According to the National Golf Foundation (NGF) statistics, the golf industry peaked in the year 2000, in terms of the total number of golf courses, golfers and golf rounds played. By the turn of the century, the boom in golf course construction that occurred during the 1990s turned into a bust with declines in the number of golf courses built, as well as the beginnings of a downward trend in the number of golfers and golf rounds played (NGF, 2008a). This downturn in golf course development was principally driven by adverse economic conditions, as well as an array of other factors that were either overlooked or not understood by the golf industry. This analysis identifies the major forces driving the paradigm shift still underway in the supply of golf facilities and the demand for golf (Barker, 1992).

The 2000 peak in golf course construction was first stymied by the "Tech Stock" tumble and falling stock prices on NASDAQ. Real estate development lending for the construction of new golf course real estate projects became increasingly difficult to secure. As the value of existing golf courses declined, it became more difficult for the real estate developers to dispose of their golf course properties once they sold most of the surrounding residential real estate. Lenders were cautious about providing funds for the acquisition of those golf courses to prospective purchasers. It had been common practice for developers to subsidize the golf course operations, because their primary interest was in selling the real estate surrounding the golf course and not in profitably operating a golf course. Seemingly overnight, these golf courses were becoming liabilities rather than assets, particularly, when the number of interested buyers was decreasing. In some cases, the golf club members were asked to acquire the nonperforming asset but they refused so the developer was obliged to continue funding the deficit operation.

Funding for the construction of new golf courses projects was almost non-existent in the 1990s, except for a few boutique lenders, such as Textron Financial, who would eventually leave the business of financing new golf course projects. Funding could be secured for the financing for the purchase of an existing golf course, even one that was only a marginally profitable operation depending upon the financial capability of the borrower to repay the loan. However, funding for a new golf course was not available, due to the uncertainty of the golf course projects' completion, regardless of the borrower's financial capability.[2] The next shoe to drop that impacted golf course development financing was the 9/11 attack, and the subsequent Recession that continues to endure today.

While the residential real estate market continued to soar through 2006, the financing for golf course real estate development was diminishing as reflected in the downturn of golf course openings (NGF, 1979-2009a). Obviously, there was excess supply relative to demand, which jeopardized the economic feasibility of those projects. Too many golf courses were built in the 1990s and they were often built where they were not needed. Typically, too much was spent on building these high-end golf courses that were intended to appeal to the huge Baby Boomer generation (born between 1946 and 1964), who were expected to play more frequently as the aged and buy the premium priced golf course lots in the master planned community developments. While it is difficult to put an exact number on the increasing cost of golf course construction over the years, because the range of costs vary markedly by region and the type of golf courses built, Tom Fazio (2000), one of the games preeminent golf course architects reports that the estimate cost per hole and total construction costs from 1960 to 1990 were as follows:

	1960s	**1970s**	**1980s**	**1990s**
Cost per Hole	$10,000-$20,000	$30,000-$60,000	$70,000-$200,000	$200,000-$400,000
Cost per Course	$190,000-$380,000	$540,000-$1.08m	$2.0m-$4.0m	$3.8m-$7.6m

What was built in the 1990s was very expensive golf courses compared to the previous three decades, which led to many of these golf courses being more expensive to maintain and too costly for the average golfers. Further, many of these golf courses were too difficult and challenging for the average golfer to enjoy (Hueber, 2009).

[2] In 2001, the only funding for a golf course that the author could secure for the development of Angeles National Golf Club (a Nicklaus Design high-end public golf course) was a $10 million "Take Out" loan from Textron Financial, which was provided in stages only after the developer had fully funded the project that included the purchase of the land, the construction of the golf course and clubhouse.

Lastly, the huge Baby Boomer population segment who was expected to have a major impact on the demand for golf, did not behave as expected. According to the NGF, the percentage of the Baby Boomers that played golf remained the same at 12%; however, they did not play golf as frequently as the previous generation that had a lower participation rate of 8% but played more often. (NGF, 2008b). Anecdotally, it is postulated that the increasing cost of playing golf was an important factor in the decline of demand, especially, since research from the Sporting Goods Manufacturers' Association (SGMA, 2009a and 2009b) confirms that other recreational activities such as walking, jogging, swimming, etc. are enjoying increased participation, presumably, because they cost less. If the price is too high, golfers will play less often (Lynch, 2007).

Situational Analysis

According to a proprietary NGF 2010 research report, "Golf Business Update," the golf industry has experienced a significant decline since 2000 in all of the key barometers of the golf industry's economic health and vitality, which are as follows: the number of golfers; the number of golf rounds; and, the net increase (decrease) in golf courses (openings versus closings). Related to this latter point is another measure, which is the number of golf courses that are experiencing financial difficulty.

Estimates of the number of golfers vary depending upon the definition of a golfer, so a relative measure of the number of golfers is the best directional indicator. While the percentage of the Baby Boomer population segment that played golf remained the same, NGF research revealed that the percentage of the overall population that played golf declined over the past 20 years. In 1990, the percentage of the population that played golf was 12.1%, by 2000 it was 11.1% and by 2008 it was down to 10.2%. During the first nine years of the 2000 to 2010 decade, rounds played were down 5.7% or nearly 30 million, from 518.4 million rounds played in 2001, to 489.1 million rounds played in 2008 (NGF, 2010).

The golf industry is in the midst of a major crisis in the economic viability of its built environment. NGF research reports there have been over 800 golf course closures since 2000. As detailed in Figure I, it is evident that golf facility closures have increased significantly since 2000, ranging from a low of 32 in 2001 to a high of 146 in 2006. From 2006 through 2009 a total of 510 courses closed or an average of 128 per year.

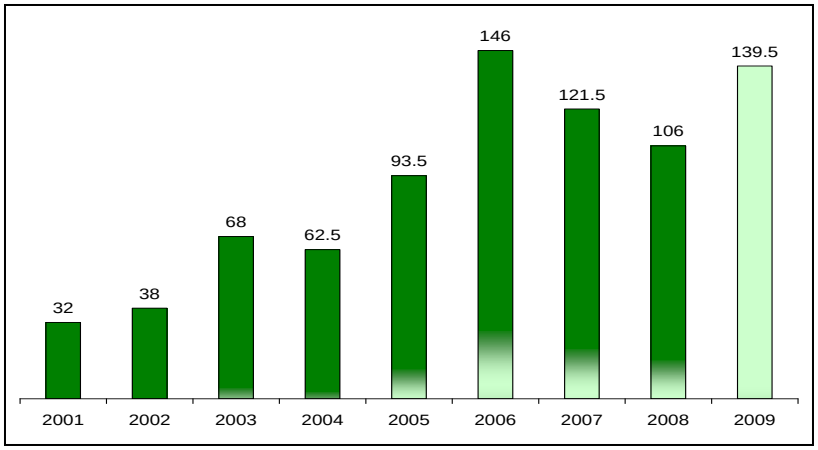

Figure 1: "Golf Facility Closures" (18-hole equivalents), Source: NGF 2009.

In addition, the "Net Growth" (number of golf course openings versus closings) in the number of golf courses has been negative over the past four years, a trend that has not occurred since the Great Depression (NGF, 2008a).

During the 1990s, the supply of golf courses increased 20.6%, and the demand for golf, or rounds played, increased by 14.8%. During the first nine years of 2000, there has been an unhealthy imbalance between supply and demand. The impact of having excess supply and less demand since 2000 can be translated into a lower average number of golf rounds on a per golf course basis. According to the NGF, the number of rounds played per 18-hole equivalent golf course has decreased by 9% from 36,333 in 2001, to 33,243 in 2008 as detailed in Figure 2, (NGF, 2010).

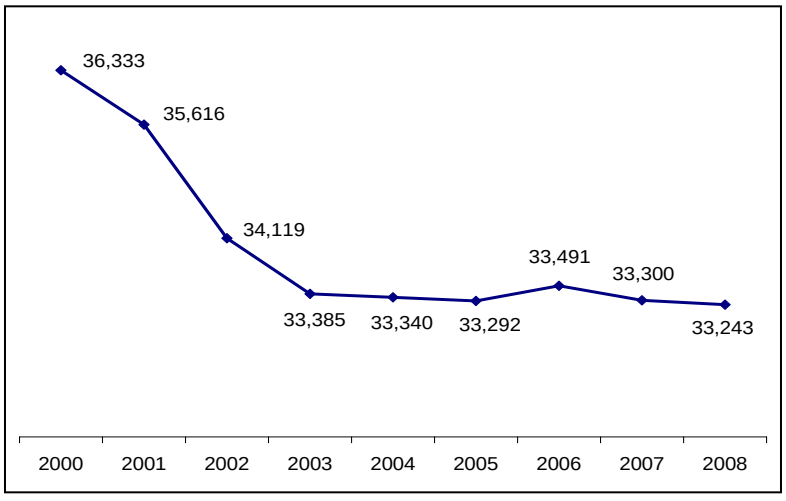

Figure 2. "Golf Rounds per 18-hole Equivalent," Source: NGF 2009.

Pellucid, an independent golf research company explains in its January 2010 newsletter, "Outside the Ropes," that 2009 golf course revenues on a per round basis were down 5% from $12.83 to $12.22 *per round*, which was interpreted as being due to price discounting in 2009 by the golf course operators to preserve their respective market share of the number of golf rounds. Also, the NGF surveyed 330 operators of private golf courses and 1,750 operators of public golf courses and reported that 15% of both types of golf courses said that they were having financial difficulty. Memberships at those "at-risk" private clubs were down nearly 30% and rounds played were down 22% (NGF, 2008c and 2009).

Some optimists in the golf industry believe that this problem will fix itself over time, and the market-place will naturally adjust for this imbalance in supply and demand. However, this is an unmanaged outcome with unknown consequences, particularly, if the problems plaguing the golf business are more substantive than just having too many golf courses and too few rounds of play. As a matter of fact, in an interview with Dr. Joe Beditz, president and CEO of the NGF, he speculated that "the problem of oversupply will fix itself once the industry loses some 1,500 to 2,000 golf courses." Theoretically, having fewer golf courses and maintaining the same number of golf rounds played on a national basis would provide more business for the remaining golf courses; however, there is no guarantee that this cure will work as the golf courses are location specific and the golfers are also for the most part bound by location. It is difficult to determine what closures in what locations would bring the demand and supply in to balance. In addition, the root causes for this downturn other than the obvious supply and demand considerations have not been identified and addressed. In other words, that market adjustment may not be the cure for the maladies plaguing the golf industry. It is clear that the U.S. inventory of golf courses is not economically sustainable in its current form, and cannot be sustainable until these issues are fully understood, diagnosed and addressed.

III. How We Got There

The literature review regarding the history of golf's built environment during the 20th century uncovers many of the causes that have led to the golf industry's current crisis situation. This historical perspective provides insight as to why the paradigm shift in supply (golf courses) and demand (golf rounds) has occurred throughout the 20th century, as well as why and what is happening today. There has been a great deal written about the history of the game, its leading players and famous golf course designers. Most of the academic research has been published by the *Geographic Review*, such as Adams' and Rooney's 1985 paper, "Evolution of American Golf Facilities;" and, more recently, the research published

in 2008 by Napton and Laingen, "Expansion of Golf Courses in the United States." These authors delineated the growth of golf along social and economic time frames without any in depth analysis as to why the paradigm shifts in supply and demand occurred; they primarily observed that there was a change in the number and type of golf courses built, and somewhat after making those observations, they categorized those who played the game along those same socio-economic guidelines.

This current study defines the development of the golf industry in terms of its built environment, and delves more deeply into the questions of how and why each golf course construction boom and bust occurred in order to explain and better understand the current downward spiral in golf course development and golfer demand.

Golf's built environment has had three "boom" periods of sustained and accelerated growth in the number of golf courses constructed that peaked in 1930, 1970 and 2000. Each boom period was unique in the socio-economic factors that propelled the growth in the golf course industry during each respective boom period. Each boom was followed by a "bust" that is defined simply as a prolonged downturn in the number of golf courses built. The socio-economic factors that instigated the boom and bust cycles were unique and reflected a paradigm shift in the drivers of growth, the number and type of golf courses built as well as the demographic profile of those who were expected to be playing the game as reflected in the mix of private versus public golf courses (Hueber, 2009a and 2009b).

Golf's First Boom – The Roaring 20's

The first boom period of sustained growth in the number of golf facilities occurred during the "Roaring 20's," and peaked in 1930 just after the Stock Market Crash in 1929. Between 1923 and 1929, approximately 600 golf courses were opened each year (Adams et al, 1985). By 1930, there were 5,600 golf courses and an estimated 1.1 to 1.5 million golfers. Nearly 80% of the golf courses were private clubs. Golf was a game for the upper class and played predominately at private clubs. This image as being a game for the rich would forever brand golf as an elitists' game. Amateur sports in general, and golf specifically, was the bastion of the upper class, which explains why Francis Ouimet's 1913 U.S. Open win was more than just a "David and Goliath" victory over golf's greatest players of the time. Ouimet was 20-years old and the first amateur to win the U.S. Open at The Country Club, in Brookline, Massachusetts, where he once caddied. It was a remarkable story of class envy, struggle and intrigue as told by Frost (2002) in, The Greatest Game Ever Played: Harry Vardon, Francis Ouimet, and the Birth of Modern Golf.

Golf, at this time, was in its "Great Gatsby" period with extravagant private country clubs that reflected their members' "Conspicuous Consumption" (Veblen, 1998). These exclusive private clubs were often ostentatious expressions of their memberships' wealth. The clubhouses were grandiose, overdone and destined to become "White Elephants" when the economic prosperity of the Roaring 20's came to a screaming halt with the Great Depression and then WWII (Hueber, 2009b).

The private golf courses that were built during this era reflected the golf course construction technology and techniques of that era, as well as the limitations of the golf equipment used by golfers to play the game. Because earthmoving was difficult with horse drawn and/or rudimentary mechanized equipment, the sites that were selected for a golf course tended to be the type of property that required less earthmoving. Donald Ross (1872-1948) was the foremost golf course architect and is credited for designing over 600 golf courses, including such notable courses as Pinehurst No. 2, Oak Hill, Seminole and Oakland Hills (Cornish et al, 1992). The original designs for these courses and other golf course designs were ingenious in their simplicity and practical in their construction techniques given the parameters and limitations of building golf courses in those days.

The golf equipment that was being used by the golfers set the standards for the length of the golf holes (par 3, par 4 and par 5 holes). Since golfers didn't hit the golf ball as far using hickory golf shafts and golf balls of the day, the golf course architects designed holes that were shorter in length by today's standards. This was significant because as golf equipment technology improved, golfers were able to hit the golf ball farther; so, it became necessary to lengthen the golf holes to preserve the score of par as being standard of golfing excellence. In fact, new golf equipment technology could outmode the fields of play. For example, the golf ball used in the 1890s, the "Gutta Percha Ball" (basically a solid rubber ball), was completely outmoded with the introduction of to Coburn Haskell ball around 1900 (rubber core, with tension wound rubber bands over a rubber core and a balata cover). Average golfers could hit their drives 20 yards farther with the Haskell ball. So, the first few hundred golf courses built before and just after the turn of the century were scaled for play of the "Guttie." The golf courses that were built during the golf course construction boom in the 1920s needed to be longer, so that they would be better suited for the new golf balls that went farther (Graffis, 1975).

The country clubs built just prior to and during the Roaring 20's were not a part of real estate development, as was the case in the latter half of the 20th century. The private golf courses that were built were what are known today as "core" golf courses meaning that the golf holes were adjacent to one another, without needing more acreage that currently accommodates housing along the fairways

(Muirhead, 1994). In the 1920s, a private golf club had a much smaller footprint, including making room for the clubhouse. The entire facility usually occupied less than one hundred acres, which is about half the acreage used for the modern courses built since the 1960's (Golf Course Superintendents Association of America (GCSAA) et al, 2007a).

The golf course footprint is much larger today for a number of reasons. First, the golf courses of the 1920s did not have driving ranges that currently require about 10 to 15 acres. The length of the golf holes were shorter, because the golfers did not hit the golf ball as far, and the "buffer zones" or the distance between the adjacent holes was considerably less than are found today. And, without golf carts, the walk between the green and the next tee was shorter and more convenient. It is not unusual today for golf course real estate developments to have a quarter of a mile or more to travel by golf cart from one green to the next tee. It was inconceivable in the 1920s to have golf holes meander through a housing development in order to maximize golf course lot frontage.

At the 1930 peak of the "Roaring 20's" boom, the NGF estimates that there were approximately 5,600 golf courses, of which 4,400 were private clubs and 1,100 were open to the public. This translates into about 80% of the golf courses being private golf clubs and 20% were public courses. Unfortunately, golf's first boom was followed by a bust due to the Great Depression and WWII. Over the course of the next 20 years, the golf industry was given a devastating blow. The number of golf courses between 1930 and 1950 dropped by about 700 golf courses from approximately 5,600 to 4,900 (NGF, 1979-2009a). Importantly, the mix in the number of private versus public golf courses during this time went from a private to public golf course ratio of 80/20 in 1930, to 60/40 in 1950. Private golf courses were hit the hardest by these catastrophic events, because many of the private clubs were compelled to either close their doors or open them to the public in order to meet their operating expenses (Hueber, 2010).

Golf's Second Boom – The Emergence of the Middle Class

Golf's second Boom started slowly after WWII, and accelerated in the 1960s with an average of 380 golf courses opened per year during that decade. By 1970, the NGF reported that the number of golf courses had more than doubled from 4,900 in 1950 to 10,200 golf courses and there were an estimated 12.5 million golfers. The growth in the number of golf courses and golfers was driven by the growing post WWII economy and the emergence of the middle class who increasingly had the time, money and inclination to spend more on recreational activities, such as golf. Golf was also popularized in the 1950's

and 1960s by a golfing president, Dwight Eisenhower, television and charismatic players such as Arnold Palmer, Gary Player, Chi Chi Rodriguez and Jack Nicklaus.

Aside from the 3,800 golf courses that were built during the 1960s, the majority of golf courses built were open to the public, changing the ratio of private versus public golf courses from 60/40 in 1950, to 50/50 by 1960, to 45/55 by 1970. The democratization of the game, in terms of the type of golf courses being built and the economic class that predominantly played the game was changing dramatically from being a game played predominantly by the upper class to a game played predominately by the middle class.

The leading architect of this time, Robert Trent Jones, Sr., (1906-2000) was generally recognized by his peers as "the father of modern day golf course design." He is credited with designing approximately 600 golf courses around the world. His work featured many strategic design elements including expansive multiple teeing areas, large greens, the extensive use of fairway and greenside bunkers, etc. The golf courses that were built between 1950 and 1970 were typically longer than the golf courses constructed during the 1920s' golf boom in order to accommodate the technological advancements in golf equipment used by golfers, such as improved golf balls and golf clubs with steel shafts, as well as to provide more acreage for golf course related real estate development. The 1960s was also a hallmark in golf course development because real estate developers discovered that golf courses could be an amenity that enhanced lot sales values and increased sales turnover. So, the amount of acreage needed for the golf course development nearly doubled to an average of 150 acres in the 1960's in order for real estate developers to maximize their premium priced golf course frontage lots. Henceforth, new golf course development was tied more closely to the fortunes of the real estate industry.

With the Recession of the 1970's, coupled with the high interest rates and inflation, the real estate business and the golf industry both had the economic wind knocked out of their sails. Consequently, golf course development slowed dramatically from averaging 380 new golf courses per year in the 1960s, to 150 per year in the latter part of the 1970s, to about 100 per year by the mid-1980s. At this point, many in the golf business felt that golf might be a mature industry with little headroom for growth.

Golf's Third Boom – The Baby Boomers

Golf's third boom occurred in the 1990s and peaked in the year 2000 as golf industry averaged 400 golf course openings per year throughout the decade, and culminated with over 16,000 operating golf

courses in the United States and nearly 30 million golfers by the year 2000. This golf course development boom differed from the first boom that originated with the upper class; and, it differed from the second boom that was fueled by the economic emergence of the middle class. Golf's third boom was driven by the expectation that the huge "Baby Boomer" population segment (born between 1946 and 1964), some 80+ million strong, would have a major impact on the demand for golf as they aged, retired and picked up the sport during their "golden years".

In the late 1970s and early 1980s, golf did not seem to fit the active life style of the Baby Boomer generation, which did not bode very well for golf's future prospects. Golf was perceived to be a game played by overweight, middle-aged white guys in double-knit plaid pants. Tennis was hot and golf was not very cool. According to the SGMA, tennis had an estimated 35+ million participants, and golf had less than half of that. Golf seemed to be a dying industry. It had an image of being an expensive game for the elite, even though there was abundant evidence to the contrary that it was a game played predominantly by the middle class.

In 1985, Dr. John Rooney, a renowned geographer from Oklahoma State University, was engaged by the NGF to conduct a nationwide study on golf participation. The result revealed what demographics had higher golf participation, as well as a correlation between the percentage of the population that played golf and the number of public golf courses per capita (Adams et al, 1985). This research coupled with consumer and demographic research conducted by the NGF with Market Facts, Inc., revealed that golf could be at the threshold of a significant increase in demand based upon the fact that the Baby Boomer population segment had a high percentage of individuals that played golf (NGF et al, 1987-2004). It was theorized that if the Baby Boomers behaved as their predecessors in retirement and played as frequently, there would not be enough golf courses (supply) to meet the anticipated Baby Boomer demand. Golf's third boom was driven by the expectation that the Baby Boomers were likely to play more often as they grew older, because they would have the time, money and inclination to play more golf. [3]

The NGF gathered the golf industry for what was called "Golf Summits," and presented this new research that promised a more optimistic outlook for the game. The NGF then linked up with the renowned McKinsey and Company, and put together a "Strategic Plan for the Growth of the Game." The centerpiece for that plan was a clarion call to build "*A Course a Day*" from 1988 to 2000 so that the

[3] At this time, one of the authors of this paper, Dave Hueber was the NGF President and CEO. This is a first-hand analysis of what transpired during this time period.

industry could meet the anticipated demand for golf. This slogan of "*A Course a Day*" was featured in PGA Tour television public service announcements (PSAs) and caught fire with the media (NGF et al, 1987). This led to the new perception in the business community that there was a great opportunity for profitable investments to be made in the golf industry in the 1990s. The promotional strategy worked.

Millions of dollars were invested into building golf courses as well other facets of the industry, which consummated in launching the third boom in golf's growth in the 20th century. Many sectors in the golf industry benefited from increased business including Callaway, Aldila, Adams, American Golf, etc. Many companies were successful on Wall Street finding investors to financially fuel their growth. Professional golf also benefited as tournament purses and television ratings grew dramatically and advertising revenues for both the electronic and print media soared.

It was a significant achievement to makeover an entire industry's perception of itself in the 1980's as being a mature industry and possibly even a dying business, to becoming a growth industry. The golf development industry did average to build more than a golf course a day during that period, with nearly 400 new course openings per year from 1990-2000. However, the impact of this growth was more far reaching than just increasing the number of golf courses and golfers. The democratization of the game was seemingly a fete accompli, as golf once being considered an exclusive game for the elite with nearly 80% of the golf courses being private clubs, was now a game for the middle class with 72% of the golf courses being open to the public. This represented a complete turnabout from where golf started at the beginning of the century (see Figure 4 below). By the year 2000, the golf industry had over 16,000 golf courses with nearly 30 million golfers playing an estimated 520 million rounds of golf each year.

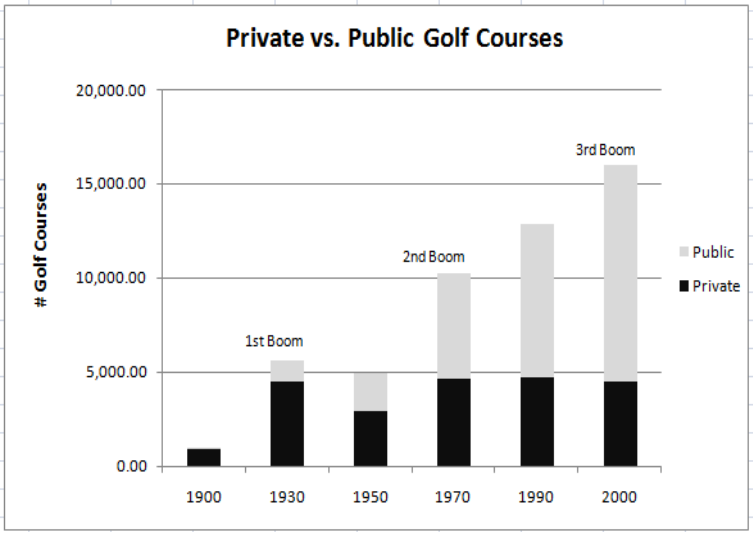

Figure 4: "U.S. Golf Course Development Boom and Bust Cycles 1900-2000," Source: David Hueber (2009).

The Marriage and Divorce of Golf and Real Estate Development

The marriage between real estate and golf course development was first consummated during the second boom period during the 1960s when it was estimated by NGF researchers that about a quarter of the 380 golf courses built each year were a part of a real estate development. That percentage changed significantly during the 1990 boom period when according to the same NGF sources, approximately 60% of the 400 golf courses opened each year during the 1990s were associated with real estate development. This significant increase in the number of golf related "master planned community developments" signaled the greater role that real estate developers would play in determining the number and type of golf courses that would be built during the 1990s golf course development boom.

During the 1990s, when the U.S. economy was growing and the golf industry was booming, the seeming symbiotic relationship between golf course and real estate development appeared to be a marriage made in heaven. Real estate developers believed that golf courses were a great amenity in selling real estate. "Big Name" golf course architects were hired to design golf courses that were famous for their difficulty, because real estate developers believed that these types of golf courses enabled them to sell real estate at higher prices and with greater sales velocity (Muirhead, 1994). The "big three" golf course designers during this time were Pete Dye, Tom Fazio and Jack Nicklaus; however, they were at the mercy of the golf course real estate developers who had the final say regarding the type of golf courses that they wanted them to design. The master plan community developers wanted each golf course to be harder than the next, because the conventional wisdom among real estate developers, as well as the prevailing business literature of that time, supported the notion that famous golf courses drove premium real estate sales.

This real estate marketing strategy was heralded in ULI articles such as: "The Changing Economies of Golf" and "Golf's Real Estate Value" (McElyear, et al, 1987 & 1991). Perhaps the best example of the golf industry's embrace of this marriage between golf and real estate was depicted in the ULI publication, Golf Course Development and Real Estate, in which Muirhead states "Lots and houses in a golf course community bring higher premiums than comparable lots and houses in a non-golf community." And, further, he said that "Historically, private golf course have created the highest premiums. Regardless of whether it is a private or daily fee operations, premiums for real estate are

related directly to the quality of the golf courses as consumers perceive it" (Muirhead et al, 1994, page 22).

Since real estate developers considered the golf courses to be an amenity that increased real estate values and increased sales turnover, it made business sense to subsidize the operating costs of the golf course in order to maximize the sales prices of the lots within the community. But, the real estate developers' primary interest was in selling real estate and not in operating the golf course as a going concern so most had an exit plan to dispose of the golf course once they sold the real estate. The problem with this business model was many of the golf courses were not economically viable so the golf industry was left with a large inventory (supply) of golf courses that did not meet the golfing needs of the industry's ultimate consumers as they were too difficult and expensive for the average golfer to play. Ron Whitten, the golf course architecture critic for *Golf Digest* was particularly harsh in his criticism of the modern era "championship quality" golf courses that were designed to be centerpieces for real estate developments, and that were created at "…the insistence by some owners on having the meanest, toughest, hardest golf course in all the land" (Whitten, 2007, page 4).

United States Golf Association

Aside from the real estate developers' desire to have more difficult and longer golf courses because it made business sense to be able to sell more real estate, there were other factors that promulgated the construction of more challenging golf courses during the 1990s. A major contributing factor that instigated the perceived need for longer golf courses was the United States Golf Association (USGA), who as the rule making body of the game, had unwittingly allowed advancements in golf equipment technology that necessitated more land for the course. In the end, this inaction would unintentionally undermine the integrity of the game and playability of golf courses.

The technological advances in golf equipment resulted in the general perception that golf courses needed to be lengthened and made more challenging to accommodate the additional length that the professional golfers could hit the golf ball. The USGA allowed these technological improvements in golf equipment during the late 1980's and throughout the 1990s, which indirectly may have encouraged the real estate developers to build longer and more difficult golf courses. Unfortunately, average golfers, who comprise the vast majority of those who pay to play the game, were unable to take advantage of these technological advances; so, golfers were confronted with golf courses that were too long and difficult for them to play. According to the USGA handicapping service, the average handicap for golfers

has not improved. NGF/Synovate research findings report similar findings from their national survey panel. In other words, golfers are just as bad as they always were. With the increased land needed to accommodate the longer real estate related golf courses, these golf courses were also more expensive to build, and as a result, they were also more expensive to operate and maintain. As Mulvihill succinctly stated, "…developers were building golf courses that were too expensive, too difficult and too frustrating to play" (Mulvihill, 2001).

An analogy that might explain this problem to non-golfers would be to imagine the impact on Major League Baseball (MLB) if they had permitted the use of "hot" baseballs and metal bats. Second basemen would be breaking Babe Ruth's homerun record and baseball stadiums would need to be either enlarged or they would become obsolete. Unfortunately, what happened in the golf industry is that the golf courses were lengthened and made more difficult to accommodate the professionals who could take advantage of the latest technology; however, the average golfer could not take advantage of that same technology and were then faced with the prospect of playing golf courses that were too long, too difficult and too expensive.

Summary Analysis

Each boom period contributed about a third of the 16,000 golf courses open for play by the year 2000. The first boom built golf courses that were essentially an amenity for the private club. Unfortunately, this image created a first impression of the golf industry as being a game for the rich. To this day it has still stigmatized golf's image in the US. However, it should be noted that those private golf courses had a smaller environmental footprint, and obviously those clubs that were able to survive until today were economically viable. However, the extent of their actual environmental impact (positively or negatively) is not actually known. The proclivity for these private clubs to have highly manicured turf conditions has fostered an image of the golf industry as being environmentally and socially aloof.

The second boom in golf course development built public golf courses to meet the recreational needs of the burgeoning middle class. However, the environmental footprint for these new golf courses nearly doubled in order to maximize golf course lot frontage for the accompanying real estate development. Notably, this all occurred during a time of America's environmental awakening that started with Rachel Carson's Silent Spring, which alerted everyone to the dangers of DDT. Golf courses used DDT extensively and golf courses soon became the poster child for environmental legislation that followed in the 1970s until today.

The third boom in golf course development was intended to meet the anticipated demand from the Baby Boomers that were entering the prime of their working lives or were on the verge of retiring. This era cemented the marriage of golf course development and residential real estate development. Since 60% of the golf courses built in the 1990s were real estate related, the real estate developers played a dominate role in fostering the development of golf courses that did not meet the needs of the golf industry's ultimate customers and the golf industry inherited a large inventory of golf courses that were not economically viable.

The marriage of golf and real estate development has ended in a divorce, and the chances of reconciliation are unlikely given the irreconcilable differences. That is not to say that there will not be golf course real estate development projects in the future, but it is safe to say that there will not be as many golf courses being built as the primary amenity and feature attraction for selling lots in a master planned community. There are a number of current and planned real estate projects that have either deemphasized the golf course as the main attraction, or do not have a golf course as is the case in the Nocatee, a mixed use (Development of Regional Impact) 13,323 acre development near Jacksonville, Florida. Instead, nature preserves, trails, parks, water views, schools, shopping, community centers, even a water park, etc., have replaced the golf course as featured attractions. Keep in mind that this new master plan community is located in what is known as the "golf capital of the world" with the PGA Tour national headquarters, the World Golf Foundation and Hall of Fame, the TPC and world famous Sawgrass Country Club all located nearby. This is also significant because the master developer of Nocatee, the PARC Group has developed many of Northeast Florida's finest country club communities including: Pablo Creek Reserve, Reedy Branch Plantation and Marsh Creek Country Club. The PARC Group was also recognized by the Florida Homebuilders Association in 2008 for their environmental efforts in Nocatee and won awards for Best Green Community of the Year and the Best Master Planned Community of the Year, so the decision for these very sophisticated developers to not have a golf course may be indicative of the direction for future golf course real estate development.[4]

David Wyman, a professor at Clemson University and authority on golf course real estate development contends that in today's marketplace, water views are the preferred locations for real estate buyers (Wyman, 2009). His analysis concludes that there is a higher premium paid for water views over golf

[4] The source for this information was the Nocatee Ponte Vedra, Florida website: www.nocatee.com

course views, and in an interview with David Wyman he added that it costs far less to create and maintain water views versus the same expense in having golf course views (Wyman et al, 2010).

So, what the golf industry has received in the final divorce settlement between golf and real estate development is a failed golf course real estate development model with little hope for any reconciliation between the parties. More importantly, the offspring golf courses from this union are not meeting the needs of the golf industry's ultimate consumers, which have significant long-term business ramifications. Many of the golf courses are not economically viable, going out of business, or just barely getting by and hoping things will get better when the economy improves. Consequently, what the golf industry inherited were golf courses that had too much debt, were too expensive to maintain and were not economically viable enterprises. Compounding this problem was that these golf courses were not affordable or fun for the average golfer and they took too long to play. Unknowingly, the golf industry has created a monster.

It is evident that the majority of the industry's golf courses, particularly the ones that were built during the construction boom of the 1990s are not environmentally, economically and socially sustainable. Therefore, the golf industry now has a large inventory of golf courses that are unsustainable, which calls into question the conundrum of whether or not an industry can be sustainable, if its products/services (golf courses) are unsustainable. Therefore, in order for the golf industry to be sustainable, it needs to foster the transformation of its inventory of unsustainable golf courses into sustainable golf courses.

IV. Sustainable Development

"Sustainable Development" is a concept that has evolved as society has become increasingly aware of mankind's adverse environmental impact, as well as coming to grips with the understanding that the planet has limited natural resources and carrying capacity. America's environmental awakening started with Rachel Carson's Silent Spring, which alerted everyone to the dangers of DDT and the unintended consequences of technology (Carson, 1962). Ian McHarg then challenged the prevailing notion of mankind's presumed divine right to dominate and despoil the natural environment in his seminal work, Design with Nature, where he redefined man's role and responsibility in preserving nature for future generations (McHarg, 1969). He pioneered the concept of ecological planning and set forth the basic concepts that were later developed into Geographic Information Systems (GIS), which is now commonly used tool in land planning and making informed decisions regarding the environmental trade-offs

involved in resolving competing ideas for land use. Both he and Carson were ahead of their time, because this was a time when there was little awareness of these environmental concerns.

It wasn't until the early 1970's that most people could plainly see the aftermath of mankind's environmental irresponsibility with catastrophic events such as: acid rain in the northeastern industrial states; Cleveland's Cuyahoga River catching fire and burning for five days; Lake Erie's near death from industrial pollution; and, the American Bald Eagle nearly becoming extinct from DDT exposure (Audubon International, 2007). These and other incidents led to greater public awareness and precipitated events such as Earth Day in 1970, and the beginnings of an environmental movement that led to the establishment of Federal and State environmental laws to mitigate ecological damage. Most of the new statutory requirements and new regulations were focused on the industrial pollution, with the Environmental Protection Agency (EPA) and big business quickly developing an adversarial relationship. Unfortunately, that adversarial relationship was exacerbated by the EPA's occasional nonsensical rulings that created a widening rift with the private sector, which used those decisions as foils to question the environmental and economic merits of those rulings (Findley, 1992).

In 1987, Gro Harlem Brundtland, the former Norwegian prime minister authored "Our Common Future," which defined sustainable development as "development which meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987). With the Brundtland Commission's report, the international community coalesced around this concept and took steps to embrace the concept of sustainable development with a series of scheduled conferences and initiatives such as: the 1992 Earth Summit in Rio de Janeiro, which focused on global environmental issues; Agenda 21, which focused on establishing priorities for a global environmental plan; the UN International Panel on Climate Change (IPCC), which was created to monitor CO_2 levels and the potential impact of climate change; the 1997 Kyoto Protocol, whereby industrialized nations agreed to reduce CO_2 levels to an overall reduction of 5.2%, which recently has received worldwide commitments at 2009 UN Framework Convention in Copenhagen to reduce CO_2 emissions by 2020 (Porter et al, 2000).

Sustainable development is clearly based upon attaining specific environmental objectives. However, there has been some disagreement among its proponents as to how this can be best achieved. Dresner (2009) draws a distinction between sustainability and sustainable development with the former being more concerned with the environment and the latter being more concerned about development. This leads to the concepts of strong versus weak sustainability, which Pierce defines as strong sustainability

that mandates what he describes as non-declining "Natural Capital," versus weak sustainability that is more broadly defined as non-declining "Total Capital." The distinction being that the deontological proponents of strong sustainability believe that there can be no substitution for the loss of natural capital; and, the teleological advocates of weak sustainability believe that there can be "human-made" capital to substitute for the loss of some natural capital (Pierce et al, 2000).

Therefore, the definition of sustainable development falls into the philosophical camp of those who believe that sustainable development can responsively preserve, protect and replenish the natural resources that it uses and provide the same for future generations. Ironically, there is a philosophical rift within the environmental movement, whereby some ardent environmentalist reject the idea of "sustainable development" as being conceptually oxymoronic , because natural resources cannot be replenished by man-made substitutes. Consequently, there is no point of compromise with the proponents of strong sustainability. There will always be a philosophical point of contention between the ardent environmentalists and real estate developers; because there is nothing that a developer can offer that will appease the fundamental core principles of strong sustainability.

So, the starting point in understanding sustainable development is based upon the premise of weak sustainability and the notion of Total Capital. This is also the premise for the Brundtland Report, which by definition, must provide for having man-made substitution for the loss of natural capital.

Sustainable development must address three key principles: 1) Environmental, which is concerned about the preservation and conservation of the natural resources; 2) Economic, which is focused upon the environmental benefits and quantification of costs; and, 3) Social, which addresses the social equity in the economic impact of real estate development. Each of these dimensions of sustainability interacts and supports the achievement of the others, and has been likened to the three legs that support a stool. All three legs must be addressed or the stool will topple.

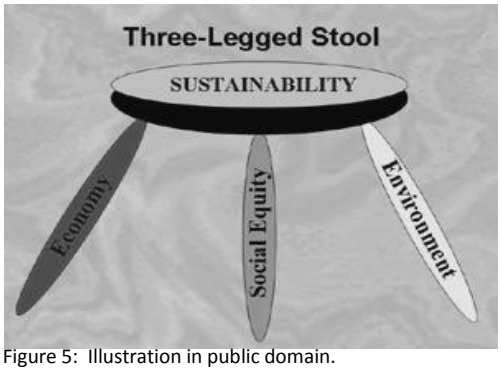

Figure 5: Illustration in public domain.

Perhaps the preeminent proponent of weak sustainability is the Urban Land Institute. They define sustainable development in the following way: "Sustainable implies forever, perpetuity, constant rebirth and renewal, an inexhaustible system. Development connotes change, growth, expansion, production, movement. Both words speak of time, evolutionary processes, and constructive adaptation. But each word modifies the other. Development, to be sustainable, must somehow incorporate renewal that ensures the continuity of matter, resources, populations, cultures. Sustainability, to incorporate development, must allow change and adaptation to the new conditions. Today, the two ideas together speak of balancing economic and social forces against the environmental imperatives of resource conservation and renewal for the world of tomorrow" (Porter et al, 2005, page 1.).

A review of the literature focused on sustainability in the golf industry reveals there are significant gaps on this subject. While sustainability has become a ubiquitous term in society today, it is not in the lexicon of the professionals in the golf industry. Therefore, it has been necessary to go outside of the golf industry to better understand what the benefits and costs could be creating golf courses that could be labeled as sustainable. A literature review of how the real estate industry has addressed these issues has provided insight and some good examples of how the concept of sustainable development can be applied to the golf industry. "Sustainability is not a destination, but a journey. By making a strong corporate commitment to sustainable design and operations, many developers are beginning to walk the talk in an open way" (Yudelson, 2006, page 41). He makes the case that "green" development, or what he calls "High Performance Green Buildings" are not only good for the environment, but good for the bottom line as well.

Green buildings cost more to build, but those higher costs can be offset to some degree by lower operating costs, as well as higher property valuations and returns. The principle measure for green building performance is the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) "Green Building Rating System," which is a third-party certification program that has created generally accepted standards for the design, construction and operation of high performance green buildings. A recent study on office buildings confirmed that there are cost savings and greater returns obtained by owners of "green" office buildings adhering to LEED standards (Dermisi, 2009). These green building features translated into higher occupancy and rental rates as tenants value green features such as natural lighting, better ventilation and air quality, no VOCs and more efficient use of energy and water. Unfortunately, limited research has examined the impact of a green building on tenant productivity. Miller contends that green or healthy buildings reduce sick time

and therefore increase productivity, citing an earlier study (Kats, 2003) that quantifies the NPV benefit as being in the range of $37 to $55 per square foot. He found that even using very conservative estimates, that green buildings are cost effective from an increased productivity standpoint and well worth the additional cost of a green building. (Miller et al, 2009).

In an interview with Elaine Worzala, Director of the Pennell Center for Real Estate Development, she stated that green building investments are an emerging megatrend in commercial real estate development and investment, because it is a way for companies to merge their business interests with their values of being socially responsible corporate citizens. Major commercial real estate property owners, such as RREEF, are gradually ridding themselves of non-green assets and are now primarily interested in green buildings/assets, because there is a greater return and less of a chance of obsolescence. In addition, they contend it is the right thing to do (Worzala, 2010). Esty et al (1987) describes this as the "Green Wave" of corporate change and indicative of their acceptance of their social responsibilities.

Sustainable Golf Course Development

Armed with the understanding of "Where We Are" as an industry, "How We Got There" and what "Sustainable Development" means, we can now define what a sustainable golf course is. This definition must embrace the principles of sustainability, in the context of being environmentally, economically and socially responsible. Figure 6 defines the three principles of golf course sustainability:

Three Principles of Golf Course Sustainability:

1. Environment - Sustainable golf course strive to be one with nature and cause no lasting environmental harm, which includes taking no more from nature than what is needed and that can be replenished, and by fostering biodiversity and supporting wildlife habitat with golf course maintenance "best practices" that minimize the use of irrigation, fertilizers, pesticides and other chemicals.

2. Economic - Sustainable golf courses are economically viable enterprises that meet the needs of its customers and provide a golfing experience that is affordable and enjoyable for the average golfer.

3. Social - Sustainable golf courses contribute to the social well being of a community by preserving and protecting environmentally sensitive green spaces, generating economic activity, and providing recreational amenities that enhance the quality of life in a community.

Figure 6: "Three Principles of Golf Courses Sustainability," Source: David Hueber (2010).

Sustainable golf courses should require less water, less chemicals and less intensive maintenance. Sustainable golf courses should also cost less to maintain, so it should be less expensive to operate and lower the cost of green fees. Sustainable golf courses should be more fun for most golfers to play, because the average golfer can hit his/her golf ball along the ground, somewhat more like the game is played in Scotland or how most golf courses in the U.S. played before real estate developers started building heavily watered "wall-to-wall" green vistas to sell real estate. Lastly, sustainable golf courses are more socially responsible in only using natural resources that can be replaced and/or replenished. Sustainable golf courses enhance the quality of life and well-being of a community, by preserving nature for future generations. It makes business sense for the golf industry to foster the development of sustainable golf courses and to become a sustainable industry.

With respect to these principles of golf course sustainability, to date most of the industry attention has focused on the environmental leg of the sustainability stool. Unfortunately, the other two legs, the economic and social equity concerns have been ignored or overlooked. To follow is a brief summary of what has been done so far, but more importantly, what needs to be addressed in order to encourage sustainable golf course development.

Environment

Dodson (2005) has written the definitive work on golf course sustainability to date and focuses primarily on the ecological aspects of golf course sustainability. He lauds the turf grass and related ecological research that has been undertaken by the Environmental Institute for Golf (EIG), the Audubon International (AI) and the USGA, which have been supported by the Golf Course Superintendents Association of America (GCSAA), and principally funded by the USGA. The bulk of research in this area focuses on cultivating and creating the best growing conditions for turf grass. In recent years, this emphasis has shifted from turf grass research toward the environmental issues. In February 2003 the GCSAA started the EIG. Initially, their work focused on developing qualitative research examining maintenance practices and quantifying the baseline data on the nature and scope of the U.S. golf courses' environmental impact.

Currently, the GCSAA is conducting a comprehensive five-part study through the EIG that surveys golf course superintendents and focuses on several critically important environmental subject areas: 1) the physical characteristics of golf courses; 2) water use and conservation; 3) nutrient use; 4) pesticide use; and, 5) energy use. The latter two studies are yet to be completed. The Audubon International Cooperative Sanctuary Program for Golf Courses is similar in concept to the USGBC's LEED certification program, but with a greater focus on the ecological concerns versus the cost and benefits of sustainable golf courses (Audubon International, 2007). The AI golf course certification program, with over 2,100 certified member golf courses, has led to the development of case studies and other research regarding the value of taking voluntary environmental action in the form of cost savings, new revenue, image enhancement, etc.

The USGA has been a longtime financial supporter of turf grass research, particularly in how to construct golf greens and to maintain healthy golf course turf grass conditions. Since 1921, the USGA Green Section has recorded and published information regarding the maintenance and upkeep of golf courses. In May 1963, the USGA started publishing what golf course superintendents and those concerned about turf grass matters have come to know as the "USGA Green Section Record." Some 200 issues later, this publication continues to provide the game of golf with pertinent information and unique perspective on the maintenance and management of golf courses.

Lastly, university turf grass research has played an important role in conducting, compiling and disseminating research and technological breakthroughs. Michigan State University has functioned as the clearinghouse for this scientific and academic research since the 1960s. With the support of the USGA, the MSU library is creating the Turf grass Information File (TGIF), which will provide on-line access to these collections and the turf grass database. There are a number of major universities on the leading edge of turf grass research, including Clemson University which is undertaking studies such as, the best cultivation and maintenance practices for Zoysiagrass, and genetic research on new strains of bent grass that better tolerate salinity and difficult growing conditions.

While the amount of research work underway is impressive, the most significant innovations will come in better understanding how to optimize these technological breakthroughs with best golf course maintenance practices that will lead to lowering golf course maintenance costs, reducing adverse environmental impacts, reducing the amount of irrigation water used, reducing nutrient and pesticide use, and ultimately, enhancing the playing experience for golfers. In other words, research will advance

the cause of sustainable golf course development, but the biggest advancements will come as a result of the development of best practices in the maintenance and operation of golf courses.

Economic

It is evident from this analysis that a paradigm shift in the supply and demand for golf is underway. Given that there will be a limited number of new golf course real estate development projects built in the future, the primary task for the golf industry should be to focus on encouraging the redevelopment of its unsustainable built environment into sustainable golf courses. This could be the key to slowing the downturn in the golf industry. The priority should be to fix what is broken and stabilize the net loss in the number of golf courses, and the decline in the number of golfers and rounds played.

The real estate developers' business model for developing difficult and expensive golf courses required a financial subsidy that is no longer available in today's economic environment. It is likely that there will be increasing pressure on golf courses to cut costs, particularly, golf course maintenance costs because this is the highest expense category for all golf courses. There will be a change in what American golf courses will look like and how they will play, because golf courses cannot afford to spend as much as has been spent in the past to maintain the previous high standard of golf course maintenance.

This change is inevitable and American golf courses will begin to look more like the golf courses in Scotland. Brown will become the new color for grass, except for the greens and tees. Golf courses in the U.S. will no longer be "wall-to-wall green" vistas that are there to create views that have helped to sell the real estate (Wyman et al, 2010). Furthermore, in the last few years there has been a major shift in environmental and societal concerns that are focused on conservation, particularly for water issues. This will prompt a change in golf course maintenance practices due to the millions of gallons of water needed each day for irrigation at many golf courses, as well as the use of fertilizers, pesticides and herbicides.

These new limitations impose new standards and best practices for golf course operations and will impact how the courses are maintained, and how the game the game will be played in the future. Amateur golfers will likely prefer the firmer playing conditions characteristic of sustainable golf course maintenance, particularly where fairways are shortened. Most golfers are not able to hit the high shots currently needed to get on many of the greens found on the courses developed in the last 20 years.

Average golfers tend to hit the ball lower and rely upon the bounce and roll of the ball to reach the greens. Some golf courses will need to make changes in the design of their courses to make them more playable for their customers. Usually, this will mean creating approaches to the greens that do not require the average golfer to hit his/her shot over a hazard and have it stop on the green.

In an interview with Eric Larsen, president of Arnold Palmer Golf Course Design and the 2010 president of the American Society of Golf Course Architects, he said that "Golf course sustainability means a great deal more than having brownish grass. There will be a great need for architects to be innovative in the redesign of these golf courses with the intention of making them easier to play and less costly to maintain." The golf course architects, in cooperation with the golf course owners, operators and golf course superintendents will need to reinvent, rebuild and reconstruct golf courses that can be maintained more economically; and, importantly, so that golf can be perceived as being more environmentally and socially responsible (Hueber, 2009b).

Eventually, golfers will have a different idea of what a well maintained golf course looks like and how it plays. What golfers see on television today and what is being extolled as the standard of excellence for golf course maintenance is counterintuitive to the whole notion of sustainability. What they see and hear on television are praises for double-cut and lightning fast greens, perfectly smooth bunkers, high thick roughs, lush greens and fairways that are lavishly maintained and manicured, etc. All of these physical attributes are unrealistic given the business climate and environmentally conscious society of 2010. At this point in time, golfers are somewhat ignorant of these concerns, so part of the strategy for resurrecting the golf industry is to shift the hearts and minds of the golfers so they understand the benefits from redesigning their courses. In short, sustainable golf courses will actually not be green due to the color of their turf grass, but will instead be green in their quest to be environmentally, economically and socially responsible.

Social Responsibility

Until recently, the golf industry has not been cognizant of its negative image with respect to the environmental movement. Given the history of golf's built environment, it is understandable that the general public does not see the golf industry as being environmentally and socially responsible, because it is perceived by many that golf course operators either selfishly or irresponsibly use limited natural resources and have damaged the environment.

In today's politically charged environmental movement, the golf industry is not viewed in a favorable light. Golf's image as a rich man's game with its gated communities and oases of lavishly maintained green areas are not politically correct and accepted by individuals that are trying to "do their part" in the green movement. While many in the golf industry believe with some justification that golf courses have been unfairly characterized as an environmental villain and a social pariah, it doesn't matter because public perception alone, right or wrong, can be the basis for adverse political action and overreaction to the industry. The golf industry needs to be proactive in dealing with these realities, or it will face the more costly political ramifications of being reactive to societal concerns and an increase in regulations. These proactive efforts need to be louder than words; these actions need to be substantive and penetrating in their scope in redirecting the golf industry toward sustainability and fostering the redevelopment of unsustainable golf courses into sustainable golf courses. It only makes business sense to do so, because sustainable golf courses could address a myriad of maladies afflicting the business today, including the high cost, difficulty and time of playing the game.

V. Making the Case for Sustainable Golf Courses

Three CEO's of major international companies, Charles Holliday, Stephan Schmidheiny and Philip Watts completed a groundbreaking book, Walking the Talk: The Business Case for Sustainable Development. In this book the authors present 67 business cases studies of how major international corporations have embraced sustainable development because it makes business sense and because it is the socially responsible to do. In fact, corporate social and environment responsibility can be good for any businesses' bottom line.

The authors' of "Walking the Talk" described how the sentiment of international business leaders on this subject has evolved over the past decade or so; and, they expressed disappointment that this movement has not taken hold as expected. This was explained as being due to an over emphasis on the environmental issues at the expense of the social justice concerns, which the authors espouse as being equally important in making the business case for sustainable development (Holiday et al, 2002). An Audubon International research paper on "Golf's Green Bottom Line" echoes the same sentiments and explains that smaller businesses, such as golf courses, are "still in relative infancy with respect to managing the natural environment as a business issue" (AI, 2009, page 13). Many advocates of green design are stilted in their conception of sustainability and see it as being synonymous with environmentalism (Kirk, 2006). One of the biggest impediments for the golf industry adopting

sustainability is to first understand what it means for a golf course to be sustainable. Second, it must be understood how this idea applies to the golf course business and how it will benefit the game of golf. Third, all of the stakeholders in the golf industry, in particular, the golfers, must be educated as to the benefits of converting the existing built environment into a sustainable golf course.

Recent research by Limehouse (et al, 2009) concludes that golfers will pay a premium price to play a golf course that presents itself as being environmentally responsible. While this one study is not representative of golfers in general, it is indicative of golfers being receptive to the notion of greater environmental consciousness and responsibility. Golfers need to be convinced that sustainable golf courses are in their best interests, and that it is good for the game and society. Golf course owners are likely to be similarly inclined, particularly if it makes business sense to be more environmentally responsible and will help grow the game.

The application of the sustainability concept to golf courses has been very slow in getting started, in part because the focus has been on the ecological issues and because it just has not been a matter of great concern to the golf industry since the values and benefits for golf have not been articulated and communicated. Historically, the golf course developers and owners have paid only attention to the economic issues. They have begrudgingly responded to environmental concerns only after they have been raised by the local environmentalists opposing development in a community. Consequently, the business value in having sustainable golf course has not been of interest to the golf course real estate developers. The limited amount of work in this area has been focused on the ecological issues, because an Environmental Impact Report (EIR) was required before a developer could secure a Conditional Use Permit (CUP) and start building the golf course. At best, the EIR was no more than an impediment in the process of obtaining a CUP.

Remarketing the Game and the Golf Business

Famous writer and visionary in business management theory, Dr. Peter Drucker, stated that “the purpose of a business is to create customers” (Drucker, 1954). The golf industry has done the opposite and has allowed the transmutation of its product into something that does not meet the needs and wants of its current customers so it needs to transform itself and do what Drucker suggests, create customers for its business. In order to accomplish this, the golf industry needs to assess the current state of the game, evaluate the product that is being offered and determine what the needs and wants are for its target customers, particularly as it relates to creating a sustainable golf course. The first two

points have already been presented and analyzed, so it is now appropriate to take a look at the market research regarding golf's present and prospective customers.

Since 1986, the NGF has conducted annual research panels with Market Facts, Inc., and later with Syncopate, Inc., that have repeatedly identified the top three barriers for existing golfers as well as why non-golfers do not play the game:

1) golf is too expensive;

2) golf is too difficult; and,

3) golf takes too long to play.

To follow is an interpretation of the NGF marketing research from the standpoint of the consumer, which offers an explanation as to why demand for golf has been declining due to these top three barriers to golf participation for both golfers and non-golfers alike:

1) Golf Is Too Expensive

Golf has a history and has maintained an image of being a game for the upper class; however, with the emergence of the middle class as an economic force in the 1950's and 1960's, the democratization of the game has been established. However, the golf course development boom of the 1990's changed the rules of the business game and has clearly impacted the cost of the playing the game. The explosive growth of golf courses tied to residential real estate developments have dominated the new construction that have also resulted in membership dues and greens fees rising. By the turn of the century a new paradigm was unfolding, which revealed a disjunction between price and demand for the game. It became more evident as the economy stumbled and the golf industry seemingly fell on its face.

According to the NGF, the Baby Boomer population segment still maintained a high percentage of individuals that played golf, but these golfers were not playing as often as expected (NGF, 2008b). Research on sports participation from the SGMA revealed that other recreational activities such as walking, jogging, swimming, etc. are enjoying increased participation (SGMA, 2009), presumably, because they cost less than golf. Anecdotally, it seems obvious that golf is simply too expensive compared to other recreational activities, especially, during times of economic duress and uncertainty. If the price is too high, golfers will play less often. If the price is lower, it is logical that golfers will play more often and possibly more individuals will actually decide to play the game.

2) Golf Is Too Difficult - Everyone understands that golf is a difficult game to learn and play; however, developing the skill to play the game to one's capability is a major part of the game's appeal. What is difficult for non-golfers to understand is how playing a game through landscaped parkland could be frustrating and not be fun to play. An analogy in skiing that explains this problem in the golf business is to imagine that most skiers, like most golfers, are of average ability; now imagine that every skier is required to buy a $150 lift ticket and is only allowed to use the very demanding "Black Diamond" run. This is what has happened to the golf industry which has become more apparent during the most recent golf course development boom.

Golfers understand how the design, construction and maintenance of a golf course can affect the enjoyment and cost of playing the game. Golf courses can be made more challenging if the fairway corridors are made narrower and the roughs are mowed at a higher height. Conversely, these same golf courses can be made easier to play if the fairways are wider, the roughs are cut lower. Furthermore, the overall maintenance of golf courses can create playing conditions that enable golfers to hit their ball farther, because the average golfer is looking for more distance with the additional bounce and roll when the fairways are not soggy. For many golf courses, just a change in maintenance practices will address many of these problems of increased difficulty. Unfortunately, many of the golf real estate developers created golf courses that were intended to be famous for their difficulty, and they were successful; however, what they created was simply too difficult for the average golfers. The shape and contours of some greens are so abrupt that the more cost efficient mowing equipment (i.e. triplex/three cutting blades) cannot be used. As a result, the more expensive single mower is used to provide a more precise and lower cut that makes the game more difficult for everyone but the professionals.

Most golf course architects pride themselves on designing golf courses that are fair, but challenging for golfers of all abilities. Given the fact that most golfers are bogey golfers, the golf course architects try to make the golf course a little more user friendly by having multiple tee areas: there are the gold tees for the pros; blue tees for the low handicap amateurs, white tees for the members (average golfer); and, red tees for the ladies. Sometimes, golf courses also have a set of green tees for the "super" seniors. While the colors of the tees may vary from course to course, the accommodation for the length of the golf hole for different categories of golfers is intended to make the golf course play the same for everyone according to their abilities. However, this system fails miserably. Another analogy using skiing is useful. Again, imagine that every skier is required to use the black diamond run, but according to their

ability, age or sex, they are allowed to start farther down the hill. That doesn't make any sense for skiing and it doesn't make any more sense for golf. Still, that is what the golf industry is offering its customers.

Most golf courses outside of the U.S. are not part of a real estate development. This is what differentiates golf as it is played in Scotland, versus the "target golf" that is played in the U.S. Using less irrigation water, fertilizers and chemicals will make the golf courses easier to play because golfers will get more of a roll and more distance on their shots. In many cases, just a change in golf course maintenance practices will facilitate this transition and the change in maintenance is actually more sustainable. In some cases, golf holes on the more difficult golf courses will require design changes as the hazards that have been placed fronting the greens, as well as in the contours and shape of the greens make the course too difficult for the average golfer.

In 2009, the Golf Environment Organization (GEO) unveiled draft guidelines for "Sustainable Golf Development" at the World Forum of Golf Architects in St. Andrews, Scotland. (However, these draft guidelines have not been published.)The American Society of Golf Course Architects (ASGCA) and the European Institute of Golf Course Architects (EIGCA) have applauded the GEO initiative. Their respective presidents, Erik Larsen and David Krause offered a joint statement declaring that "We were all impressed with the GEO's achievements to date and the golf course design industry unanimously agreed to support their Guidelines project," which promises to develop environmental guidelines for the planning, design and construction of golf courses that are "challenging but relevant."[5]

While this all sounds good, it could be a case of too little too late if the focus is on developing sustainable criteria for new golf course development, because so few new golf courses are being developed. With the exclusion of the U.S., the U.K, Japan and most Western European nations, the prospects for golf course development are more promising. Still, the attention should be focused on what needs to be done to foster the redevelopment of existing unsustainable golf courses, which is where most of the golf course architectural design work will be in the foreseeable future.

3) Golf Takes Too Long to Play

While the cost of playing golf and the difficulty of playing the game are obvious impediments to the appeal of the game, the time that it takes to play the game is always noted by golfers and non-golfers alike as a reason why they don't play as often or don't play at all. First, it's not just the time that it takes

[5] "Architects support GEO Guidelines for Sustainable Golf." Golf Inc., www.golfincmagazine.com.

to play the game; it is the four to five hours that it takes away from other activities such as: family, work and other social and recreational activities. Obviously, families can play golf together, but in all likelihood if it is too expensive for one player, it will be extremely costly to have an entire family play.

There are a number of remedies that have been offered over the past 30 or 40 years, for improving the speed of play such as promoting the play of nine-hole game that should theoretically take half the time of the more traditional 18-hole round of golf. Yet, nothing has really been successful or has been embraced by the golf course operators or golfers. The longer and lusher golf courses created over the last twenty years take much longer to play. Golfers lose their golf balls in the thick and tall rough, it takes time to look for them and it is difficult to extricate a decent shot from those heavy lies.

The distance between the green and the next tee is often much longer due to the design requirements of the real estate development that wanted to increase premium priced golf course frontage lots. This often makes the usage of golf cars mandatory, and golfers wanting to get some exercise walking the golf course must pay more to play the game in a golf cart. One of the biggest fallacies is that it takes longer to play a golf course walking than it does riding in a golf cart, which simply is not true for those who are able to walk. In fact, when the golf cart usage is restricted to the cart paths or the roughs, it will take longer to play a round of golf in a golf cart because golfers take more time to go back and forth between the golf cart and their ball, or their co-rider in the golf cart to find their ball, choose the right club and hit their shot. When golfers walk, they go straight to their balls and have pretty much figured out what club to use before they even reach their ball.

The time that it takes a foursome to play a round of golf is also an expensive proposition for the golf course operator. The difference between a four and five hour round translates into 32 rounds of golf per hour, which over the course of eight hours of tee times equals 64 rounds. That could translate into $3,000 to $5,000 of revenue for a public golf course on a busy Saturday in May.

In the final analysis, a sustainable golf course is simply an environmentally sensitive, economically viable and socially responsible enterprise that provides a golfing experience that is affordable and fun, and meets the needs of its customers and the expectations of society.

VI. Fostering the Development of Sustainable Golf Courses

While developing a strategic plan for the development of sustainable golf courses is beyond the scope of this research, there are lessons to be learned from other industries such as what the Rocky Mountain

Institute did to stimulate new thinking and revolutionize the automotive industry. Similarly, there are lessons to be learned in how the USGBC with its LEED certification program fostered the development of "Green Buildings" and initiated revolutionary thinking in how the real estate business could become a sustainable industry.

Amory and L. Hunter Lovins, who cofounded the Rocky Mountain Institute, saw how the landscape of America was transformed with the proliferation of automotive transportation during the 20th century. While the commerce and prosperity associated with automobile drove the U.S. economy, it also took its toll on the planet and polluted the environment to the limits of its carrying capacity. Their solution was a simple idea… to make an automobile that caused less environmental harm. They envisioned a vehicle that was fuel efficient (gas & electric hybrid), ultra-light carbon graphite shell and frame, less drag, created less pollution and systematically took advantage of the latest technology. In 1991, the "Hypercar" concept was unveiled. In order to stimulate development of this concept, their design was not patented and put into the public domain. In 1997, Toyota introduced the Prius hybrid, which started the revolution in automotive transportation and promises to lessen the automotive industry's adverse environmental impact (Hawkins et al, 1999).

The genius of the original "Hypercar" was not in any particular technology. It was in the systematic combination of known technologies into a new form (Friedman, 2008). In his recent best seller, Hot, Flat and Crowded, Friedman quoted Jonathan Rose, a real estate developer specializing in green buildings and communities as saying, "Optimizing individual components can only lead to incremental change; optimizing the system can lead to a transformational ecology."

The golf industry needs to do the same. The answers to golf's problems are there for the taking. While the environmental and turf grass research provides some insight and answers, it is the systematic determination of "best practices" in golf course maintenance and operations that will lead to the creation of golf's version of the "Hypercar" that has been dubbed for now as "Green Golf Courses." Golf course maintenance costs can be reduced. Golf courses can be economically viable. The idea is very simple. If playing golf is more affordable and fun, more people will play the game.

The USGBC has established the criteria for "Green Buildings" for incorporating sustainability in office buildings via its LEED certification program. The establishment of these measurement standards has provided the means to assess adherence to the principles of sustainability. If you cannot measure something, you cannot manage it, which is the essence of the certification program. In April of 2010, the

USGBC has announced the creation of the "LEED for Neighborhood Development Communities," which will have direct applications to golf related master planned communities. Green development is the wave of the future in the real estate industry, and the codification of these standards has prompted a new mentality and way of doing business that is good for the environment and the business bottom line.

In applying these ideas to the golf industry, it is important that golfers develop an appreciation for the golf courses' communion of its business interests with nature. Golfers are the primary constituency in the golf industry; so, they need to understand what a sustainable golf course is and what it would mean for their enjoyment of the game. The Rocky Mountain Institute Hypercar was the vehicle for the ultimate consumer in understanding what an environmentally friendly and fuel efficient automobile was all about. Similarly, the golf industry needs to inspire understanding of what an environmentally friendly, economically viable and socially responsible Green Golf Course is all about.

Regardless of how this is achieved, the golf industry can encourage and institute the concept of sustainable golf courses by promoting the "Green Golf Course " concept, and by establishing a certification program that defines what a sustainable golf course is and fosters sustainable golf course redevelopment as the standard of excellence. What is being described is the transformation of the golf industry that is not unlike what confronted Amory and L. Hunter Lovins at the Rocky Mountain Institute in 1991, and is not unlike what confronted the USGBC when they started the LEED certification program in 2000. With the development of the Hypercar concept, the researchers stimulated some new thinking and a new construct for defining and resolving a myriad of environmental problems associated with the development of the automotive industry. The answers were all there, waiting only for a systematic solution. With the development of the LEED certification program, the USGBC created a mechanism to measure, manage and foster the development of green buildings.

About 25 years ago, the golf industry appeared to be a mature business, possibly a dying industry. Golf redefined itself as a growth industry based upon the anticipated increased demand from the Baby Boomers and transformed the business environment with the *"Course a Day"* promotional initiative. What is being suggested is that golf embrace a similar challenge and start all over again. The golf industry cannot be sustainable if its product/services are not sustainable. The goal is simply to transform the game into being a sustainable industry by fostering the development of sustainable golf courses.

One idea that might prove to be great promotional vehicle for this change is for the World Golf Foundation (WGF) to foster the development of sustainable golf courses by creating an annual national

award that recognizes outstanding "Green Courses" that exemplify the principles of golf course sustainability. The golf industry's version of LEED certification could be one of the criteria for measuring and determining the outstanding sustainable golf courses. Along with this national recognition, there could be a significant cash award to be shared by the management of the golf course(s). This type of prize recognizes and illustrates that it will take a team effort to teach an old dog new tricks in order to promote the idea of a sustainable golf course.

From "Code Blue" to "Code Green"

The title of this paper was a "Code Blue" call for the golf industry to deal with the crisis conditions and challenges confronting the game. The "Code Green" call or sustainable gold course is the cure for what has been ailing the golf industry and it will be beneficial in moving the golf industry toward a more healthy sustainable industry.

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