



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

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by

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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 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 1,500 to 2,000 golf courses. However, that laissez-faire attitude will lead to an unmanaged outcome and the root causes for the industry’s chronic condition will persist if it is not diagnosed correctly 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 has eventually translated into having a large number of golf courses that do 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 this 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 is 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.²

While that scruffy golf course paled in comparison to the original course 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 the 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 appears to have been little concern among many of the golf course real estate developers for environmental issues as evidenced by the type of golf courses that have been 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 has 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 these courses are too expensive to play. Additionally, many of these golf courses are too difficult to play for the average golfers and the time

² Photograph courtesy of *Golf Illustrated*: www.la84foundation.org/SportsLibrary/GolfIllustrated/1923/gi191c.pdf.

to play a round of golf has increased significantly reducing the ability for the average golfer to have the time to play 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 how 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, average not professional 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 to redevelop the existing courses. These problems have developed over the course of 100 years so they 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 can be or 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 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 to make this commitment to sustainability.

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. There has been a decline in the number of golf courses built as well as 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 (non-real estate related) 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 financing 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.³ 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 Baby Boomer generation (born between 1946 and 1964) who were expected to play more frequently as they aged and bought 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

³ 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 *after* the developer had fully funded the project that included the purchase of the land and the construction of both the golf course and clubhouse.

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 escalated as follows:

	<u>1960s</u>	<u>1970s</u>	<u>1980s</u>	<u>1990s</u>
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

The golf courses built in the 1990s were very expensive compared to the previous three decades. This has led to increased maintenance costs and very expensive fees to play for the average golfers. Further, many of these golf courses are too difficult and challenging for the average golfer to enjoy (Hueber, 2009b).

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 has remained at a constant 12%; however, they do not play 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, the number of golf courses that are experiencing financial difficulty.

Estimates of the number of golfers vary significantly 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 has 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 1, 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.

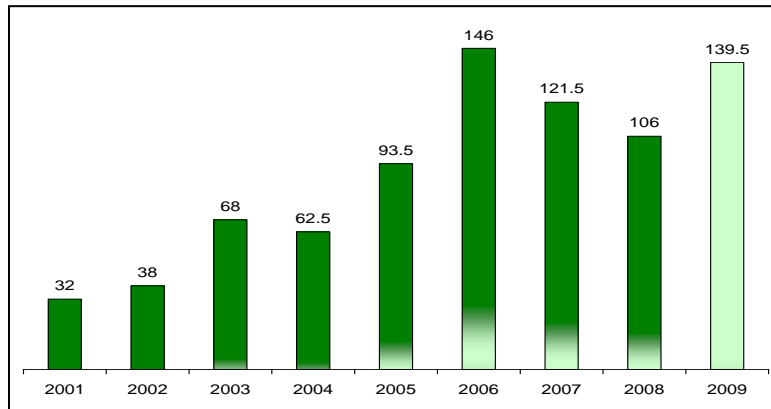


Figure 1: "Golf Facility Closures" (18-hole equivalents), Source: NGF 2009.

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, 2009).

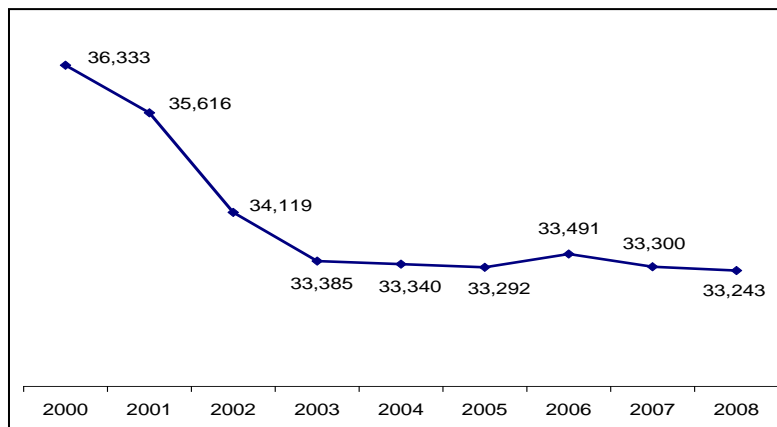


Figure 2. "Golf Rounds per 18-hole Equivalent," Source: NGF 2009.

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 marketplace 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 bound by location. It is difficult to determine what closures in what locations would bring the demand and supply for golf into 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 by Napton and Laingen (2008), “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 have 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. 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 site 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 the 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 typically part of a real estate housing 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 to accommodate 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 that was used for to build courses 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 what is found today. Without golf carts, the walk between the green and the next tee was shorter and more convenient. It is not unusual today for golf courses 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% being public courses. Golf's first boom in the US was followed by a dramatic bust due to the Great Depression and WWII. Over the course of 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 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, as well as television and charismatic players such as Arnold Palmer, Gary Player 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 1920's 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 residential development along the edge of the golf courses. 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 allowing 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 residential 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 consumers, would have a major impact on the demand for golf as they aged, retired and decided to play golf in 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 number. 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 study 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 golfers (NGF et al, 1987-2005). It was theorized that if the Baby Boomers behaved as their predecessors in retirement and played golf as frequently, there would not be enough golf courses (supply) to meet the anticipated demand. Golf's third boom was driven by the expectation that as they aged, the Baby Boomers would play more often because they would have the time, money and inclination to play more golf. ⁴

At this time, the NGF gathered the golf industry for what were called "Golf Summits" and presented this new research that promised a much more optimistic outlook for the game. The NGF then linked up with the renowned strategists at McKinsey and Company and together they developed 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 1990 to 2000 in order for the golf industry to meet the

⁴ 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.

anticipated demand for golf. The 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. The promotional strategy worked.

Millions of dollars were invested into the development of new golf courses as well other facets of the golf industry, which culminated 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 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 3 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.

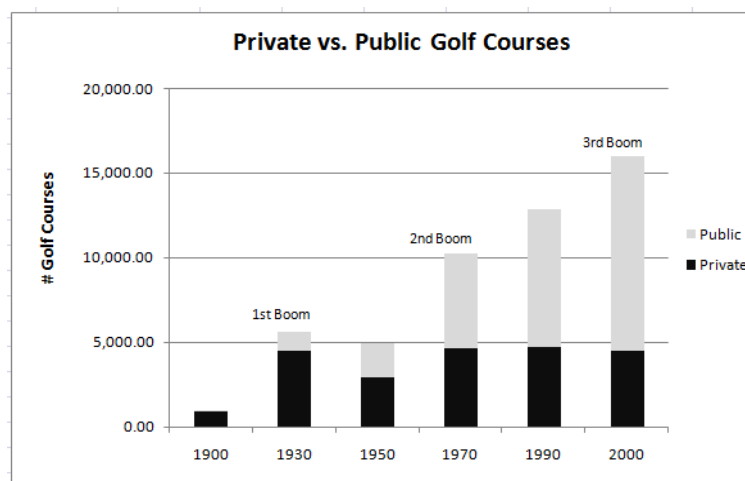


Figure 3: "U.S. Golf Course Development Boom and Bust Cycles 1900-2000," Source: David Hueber (2009).

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. These golf course architects 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 during the late 1980's and throughout the 1990's that encouraged the mentality that golf courses needed to be lengthened to counter how far the professional golfers could hit the golf ball. The most recent example of how technology has enabled today's golf professionals to overpower a golf course was at the 2010 PGA Championship. At Whistling Straights' 598-yard long, par-five fifth hole, PGA Tour professional, Bubba Watson, hit a driver and a 56-degree sand wedge on the 598-yard par five fifth hole to putt for an eagle. Non-golfers can't appreciate this, but golfers know that something was awry. An average golfer could hit his best tee shot and best three-wood second shot and still have 160 yards left to reach the green on his third shot. The disparity between the pros and the amateurs has been accentuated with these technological improvements. Amateurs are forced to play the same game on a golf course that has been designed to challenge pros with the latest and most expensive equipment.

Unfortunately, average golfers, who comprise the vast majority of those who pay to play the game, are unable to take advantage of these technological advances; so, golfers in these most recent times are confronted with golf courses that are too long and too difficult 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. The result of technology's impact on golf is that it has undermined the integrity of the game and golf's fields of play.

In summary, 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 belonged to by the elite society.

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 dominant role in fostering the development of golf courses that turned out to not meet the needs of the golf industry's ultimate customers but were focused on the professional golfer with more sophisticated equipment. Now, the golf industry has inherited a large inventory of golf courses that are 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, have replaced the golf course as featured attractions in this new residential community. 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 are all located nearby. This is also significant because the master developer of Nocatee, the PARC Group has developed many of Northeast Florida's finest golf course 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.⁵ 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 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 creating and maintain good 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 will have significant long-term business ramifications. Many of the golf courses are not economically viable and are either going out of business or just barely staying alive and hoping things will get better once the economy improves. Consequently, what the golf industry has inherited are golf courses that have too much debt, are too expensive to maintain and are not economically viable enterprises. Compounding this problem is that these golf courses are not affordable or fun for the average golfer and they take 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

⁵ The source for this information was the Nocatee Ponte Vedra, Florida website: www.nocatee.com

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 CO₂ levels and the potential impact of climate change; the 1997 Kyoto Protocol, whereby industrialized nations agreed to reduce CO₂ levels to an overall reduction of 5.2%, which recently has received worldwide commitments at 2009 UN Framework Convention in Copenhagen to reduce CO₂ 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) Environment, which is concerned about the preservation and conservation of the natural resources; 2) Economy, which is focused upon the environmental benefits and quantification of costs; and, 3) Social Equity, 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 4: 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 from 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 values and ultimately return on investment. 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). The green building features have been translated into higher occupancy and rental rates as tenants are willing to pay more for 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 net present value 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 more cost effective from an increased productivity standpoint and well worth the additional cost of adding the green features (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 their non-green holdings and are now investing only in green buildings/assets, because they believe these investments will have a greater return and there is less risk of the property becoming obsolete. In addition, like other companies, RREEF contends 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 the business community’s 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, it is now possible to 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 5 defines the three principles of golf course sustainability:

Three Principles of Golf Course Sustainability:

1. Environment - Sustainable golf courses 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 5: “Three Principles of Golf Courses Sustainability,” Source: David Hueber (2010).

With respect to these three principles of golf course sustainability, most of the industry attention has focused on the environment leg of the sustainability stool. Unfortunately, the other two legs, the economy 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, it reveals what needs to be addressed in order to encourage sustainable golf course development.

1. Environment

Audubon International - Ronald Dodson founded Audubon International (AI) and introduced the Audubon Cooperative Sanctuary Program for golf course (ACSP-Golf) certification in the early 1990s; the AI “Signature” program was designed for golf properties in the planning and design stages of development. Now with new golf course development stymied for the foreseeable future, the AI focus has shifted toward golf courses undergoing renovations/redevelopment, which has led to the creation of the AI “Classic” certification program. However, this is a more difficult segment to penetrate as reported by Dr. Kevin Fletcher, AI Executive Director, when he admitted that “only a handful of courses per year enroll in the Classic program.”

The appeal of the Audubon Signature program for developers was that it helped them in securing their CUP (building permits). Environmentally speaking, many of the developers’ motives were probably less than entirely altruistic; and,

one of the authors of this paper must admit to being one of those developers who sought AI's support in contending with the project's deontological environmental adversaries who fought its approval. The appeal for the AI Classic program is for the true believers, which brings forward the need to educate those responsible for golf course operations regarding the environmental, economic and social reasons for running a sustainable golf course. However, by focusing on golf courses that are planning renovations, the prospective market for the Classic program participants is still very limited. This is not intended as a criticism of AI, because they have done a tremendous job in stirring the environmental consciousness of the golf industry. The ACSP-Golf programs now have over 2,100 golf course members, which is quite an accomplishment. Rather, this critique is on the self-imposed limitations of focusing only on new golf course construction and renovations. The point here is that there are a large number of golf courses that are environmentally unsustainable and are not planning to renovate. These golf facilities need to be encouraged to do what they can to make their golf courses "Green," as well as to make their businesses economically viable and socially sustainable.

Dodson is also the author of Sustainable Golf Courses: A Guide to Environmental Stewardship, which is the definitive work on golf course sustainability to date. As inferred by the title, the focus is on "environmental stewardship," and not on all aspects of golf course sustainability, which is also the case for the ACSP-Golf certification program for golf courses. AI works closely with the Golf Course Superintendents Association of America (GCSAA) and the USGA on these ecological concerns.

GCSAA - In February 2003 the GCSAA founded the Environmental Institute of Golf (EIG). Initially, their research has quantified the baseline data on the nature and scope of the U.S. golf courses' environmental and economic impact, as well as examining maintenance practices and other qualitative research. 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 GCSAA has also conducted a number of joint research projects with the NGF in the past regarding national and regional golf course maintenance costs by golf course type.

Universities - University turfgrass 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 Turfgrass Information File (TGIF), which will provide on-line access to these collections and the turfgrass database. There are a number of major universities on the leading edge of turfgrass 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 bentgrass 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, as exemplified by renowned Clemson University professor, Dr. Bert McCarty, in his seminal book, Best Golf Course Management Practices. The author and 27 acclaimed contributors offer a compendium of their experience and expertise in areas ranging from the latest environmental science to new products and maintenance techniques used in implementing those best golf course management practices.

USGA - The USGA has been a longtime financial supporter of turfgrass research, particularly in how to construct golf greens, tees and bunkers, as well as how to maintain healthy golf course turfgrass 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 turfgrass matters have come to know as the "USGA Green Section Record." The USGA also financially supports AI, GCSAA and university research.

At the 2010 U.S. Open at Pebble Beach, it was clear that the USGA is redirecting the Green Section toward a greater emphasis on golf course sustainability. In his television interview, USGA President Jim Hyler inferred that the USGA would be taking a more visible role in fostering sustainable golf course maintenance practices. At this year's U.S. Open, Pebble Beach has become the new exemplar for course set-up and prep. It was not necessary as it has been in the past at other U.S. Open venues, for the USGA to toughen up the course with narrow fairways, high roughs, firm and fast greens. This time the USGA "walked the talk" and went against the grain in describing the motley looking greens as not being pretty, but being fair, challenging and playable. At one point in the golf telecast, USGA Executive, David Fay, responded on air to a question about some "top players'" criticism of the Pebble Beach's greens. In response, Fay stated without naming names that, "You're entitled to your own opinions, but not necessarily your own facts. Fact: The greens are excellent. They're in the best condition we've ever had for a U.S. Open here." Fay then noted that only two players had used the word "awful" stating that the "World No. 2 [Phil Mickelson] said he putted 'awful,' and the World No. 1 [Tiger Woods] said the greens are 'awful.'"

It also helped that Pebble Beach was built in 1919, with an architectural design that allowed golfers to bounce their ball along the ground, because that is how golf was played back then. The approaches to the greens invited an alternative way to play the hole instead of flying the ball to the green; and, using an analogy with football, this style of play could be described as a "ground game" as opposed to an "air or passing game" that is the type of play needed for the modern

“target” golf course architecture. Unfortunately, many of the modern golf courses have hazards fronting the greens that require golfers to fly the ball onto the green and stop it on a dime, which is beyond the capability of most average golfers. Simply changing the maintenance practices as was inferred by the President of the USGA is certainly not the cure-all for all of the golf industry’s problems, particularly as many of the real estate development golf courses were built much later.

In addition to the role of real estate developers in building overly difficult golf courses to sell real estate, there have been other causal factors and unintended consequences that have led to the existence of a large number of golf courses in the US that are not environmentally, economically and socially sustainable. One such factor is the USGA’s resistance to reining in the technological advances in golf equipment which has indirectly contributed to modern golf courses being made longer and more difficult to play in order to compensate for golf balls going farther and straighter. Instinctively, golfers and those in the golf business know that this is a big problem for the future of the game. Golf is in a crisis situation and it is not going to get better by itself. To quote, Jerry Tarde, Editor in Chief of *Golf Digest* magazine, in some personal correspondence the week prior to the 2010 U.S. Open at Pebble Beach, “The golf industry has its own gulf oil spill.” So, the golf industry must ask itself, how can it fix the “golf” spill? There is no need to point fingers. All of the stakeholders need to step up and do what they can to fix the problem. The first step is to reach a consensus as to what the problems are. Unfortunately, the leadership of the golf industry is not generally cognizant that the golf industry is in the midst of a paradigm shift in the supply and demand for the game. Golfers are not playing as often and non-golfers are not playing at all because playing golf is perceived to be too expensive, too difficult and takes too long to play. We know that the golf industry cannot be sustainable if its product/services (golf courses) are not sustainable.

2. 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 current downturn in the golf industry. The priority for the industry should be to fix what is broken; that is, to stabilize the net loss in the number of golf courses, as well as, 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 these costs are often the highest expense category for golf courses. This will result in a change in what American golf courses look like and how they will play. Golf course operators will not be able to spend as much as they have in the past to maintain to the perfectly manicured and pristine look.

American golf courses will begin to look more like the golf courses in Scotland as brown becomes the new color for grass, except for the fairways, greens and tees. US golf courses will no longer be “wall-to-wall green” vistas that were designed to help sell the real estate (Wyman et al, 2010). 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 growing concern for the preservation and conservation for finite natural resources will encourage a change in golf course maintenance practices to reduce the use of water for irrigation, to better provide for biodiversity and wildlife habitat, as well as to minimize the use of fertilizers, pesticides and herbicides.

These new limitations will impose new standards and best practices for golf course operations and will impact how the courses are maintained, the nature of the game and how the golf will be played in the future. In actuality, the vast majority of golfers will likely prefer the firmer playing conditions characteristic of sustainable golf course maintenance, because the golf courses will be a fairer challenge relative to their skill levels and more fun for them to play. For example, most golfers are not able to hit a golf shot high enough to land softly on some golf greens found on many courses developed in the last 20 years, and especially those built during the development boom of the 1990s. 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 some 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 carry 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 brown 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 more suitable for all golfers to play and that will be less costly to maintain.” The golf course architects, in cooperation with the golf course owners, operators and golf course superintendents will need to return to some of the more traditional golf course design features that are an appropriate challenge for average golfers and that can be maintained more economically. Furthermore, golf needs to redefine its image as a game and business that is ethically committed to 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, steeply sloped and deep sand bunkers, high thick roughs, lush greens and fairways that are lavishly maintained and manicured. All of these physical attributes are unrealistic given the business climate and today’s environmentally conscious society. At this point in time, golfers are somewhat ignorant of these concerns, so part of the strategy for reinvigorating the golf industry is to change the hearts and minds of the average golfers so they understand that sustainable golf courses will be less costly and more fun to play.

3. 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 really matter as 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 the likelihood of an increase in new 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.

V. Making the Case for Sustainable Golf Courses

Sustainable golf courses require less water, less chemicals and less intensive maintenance. Sustainable golf courses also cost less to maintain, so it will 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.

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 make sure the industry understands what it means for a golf course to be sustainable. Second, the industry leaders need to understand how sustainability 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 both the game as well as society. Golf course owners are likely to also get on the band wagon, particularly if they can see how it makes business sense to be more environmentally responsible.

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 of sustainability for the golf industry has not been articulated and communicated. Historically, golf course developers and owners have paid attention only to the economic issues. They have begrudgingly responded to environmental concerns only after they have been raised by the local environmentalists that are opposing development in a given 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 has been viewed as an impediment in the process of obtaining a CUP and nothing else.

Revitalizing the Game and the Business

Legendary writer and visionary in business management theory, Dr. Peter Drucker, stated in his seminal book, The Practice of Management, that “the purpose of a business is to create customers.” Inadvertently, the opposite has

occurred in the golf business with the proliferation of unsustainable golf courses built during the golf course real estate development boom of the 1990s. The leadership of the golf industry needs to first understand what has occurred; second, it needs to assess the current state of the game; and, third, it needs to evaluate the product that is being offered and whether or not it meets the needs and wants of its customers... average golfers. 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 three the top three major barriers for existing golfers not playing more often as well as why non-golfers do not play the game as follows:

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, 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 an image of being a game for the upper class, however, the game is now played predominately by the middle class. The rules of the business game changed with the explosive growth of golf courses tied to residential real estate development in the 1990's. The developers believed that grandiose golf courses that were famous for their difficulty sold real estate at higher prices. These golf courses cost more to build and to maintain which resulted in higher membership dues/ greens fees. By 2000, and with the economy souring, a new paradigm that was unfolding revealed a disjunction between price and demand for the game. The target market of aging Baby Boomers, who were expected to play more often, did not behave as expected.

2. Golf Is Too Difficult - The design, construction and maintenance of a golf course will impact the cost of playing the game as well as impact the golfers' enjoyment in playing the game. Unfortunately, many of the recently developed golf courses were designed to be famous for their difficulty. Designers were hired with this in mind and they created golf courses that are too difficult for the average golfers... the ultimate consumer for this product. 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. But, sometimes this system fails miserably. A skiing analogy is useful in making this point. Imagine every skier is required to buy a \$150 lift ticket and is only allowed to use the black diamond run; but, according to their ability, age or sex, they are allowed to start farther down the hill although the moguls and difficulty of the run is

constant for the whole hill. This does not make sense for skiing and it should not make any more sense for golf. However, this is what the golf course developers of courses in the 1980's and 1990's vintage are offering its customers. In addition, golf courses can be made more challenging if fairway corridors are narrower and 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. So, simple maintenance of the course can change the difficulty of the course. Furthermore, water usage can impact the playing conditions of a course. The average golfer is looking for more distance with the additional bounce and roll which is possible if fairways are not soggy from overwatering. Just a simple change in golf course maintenance practices can make a course more fun to play for most golfers. In some cases, the golf holes on more difficult golf courses will require redesign. This could include moving or eliminating the hazards fronting the greens, or changing the contours, dimensions and/or shape of the greens to make them more receptive to the approach shots made by the average golfers.

3. Golf Takes Too Long to Play - While the cost 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. It is not just the time that it takes 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 activities. Some of these issues can be mitigated, some cannot. A number of remedies have been offered over the years to reduce the time commitment, including promoting the play of nine-holes versus 18-holes. Nothing seems to have taken hold and has been embraced by either the golf course operators or the golfers. The latest generation of longer and lusher golf courses also increases the time it takes to play the game. Average golfers are prone to lose their golf balls in the thick and tall rough; it takes time to look for their balls; and, if they can find them, it can be quite difficult to extricate a decent shot from where the ball lies in the deep and heavy rough.

The distance between the putting green and the next tee in the newer courses is often much longer than the traditional courses due to desire for the real estate developer to maximize the number of premium priced golf course frontage lots. To keep the speed of play up, these courses often require the use of golf carts. Therefore, it is impossible for golfers to combine golfing with legitimate exercise. In addition, the cost of the game increases because the golf cart is mandatory. One of the biggest fallacies is that it takes longer to play a golf course walking than it does riding in a golf cart. It certainly depends on the course layout, but when the course is "walkable," it can be faster to walk as the golfer does not have to return to the paved golf cart path. The time that it takes a foursome to play a round of golf is an important variable for the golf course operator and the financial health of a golf course. The difference between a four and five hour round of golf could translate into eight additional rounds of golf per hour, which over the course of eight hours of tee times equals 64 more rounds. The rationale for this argument is that if golfers can play a round of golf in four instead of five hours, there will be enough time for two more foursomes per hour to play during daylight hours. That could translate into \$3,000 to \$5,000 of revenue for a typical 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 as well as societies' expectations. In many ways, what is being suggested is for golf to return to its roots, to the traditional values and appeal of the game before golf courses mutated into being primarily an amenity for selling real estate in master planned communities. The challenge will be how to preserve the traditions of the game by reestablishing golf course design standards and maintenance best practices that are more in keeping with the golfing experience that most golfers prefer. This idea of "making old new again" is embodied in the concept of sustainable golf course development and would enhance the essence of the game and lead toward golf becoming a sustainable industry.

VI. Fostering the Development of Sustainable Golf Courses

It is unequivocally evident that a paradigm shift is underway in the supply and demand for the game of golf; furthermore, the golf industry has a large inventory of golf courses that are not sustainable and that are not meeting the needs of its primary customers, average golfers. With the downturn in new golf course development, the focus should be on the redevelopment of the current inventory of unsustainable golf courses. But, ask a golfer or golf course operator what a sustainable golf course is, and in today's climate they would have a tough time in coming up with a good answer. At this point, there is no general understanding among golfers or golf course operators as to what a sustainable golf course is and what it would mean for the golfers' enjoyment of the game. In addition, there is no understanding of what it could mean for the economic well being of the golf course business. What is being recommended is that the golf industry embraces a challenge similar to what it did 25 years ago, when the golf industry appeared to be a mature and possibly a dying industry. Back then, the golf industry redefined itself as a growth industry with the "*Course a Day*" promotional initiative. The challenge today is quite different, but it will take the same commitment of all of the participants in the golf course industry to move in the same direction toward redevelopment of the existing golf courses so that they are sustainable.

Means to the End

It is recommended that golf industry foster the development of a sustainable golf course certification program that addresses the environmental issues, as well as the critical economic and societal concerns. The principle vehicle to accomplish this would be the creation of World Golf Foundation (WGF) sponsored "Green Golf Course" certification program for sustainable golf courses, which would mirror what the U.S. Green Building Council (USGBC) did with its Leadership in Energy and Environmental Design (LEED) certification program. The USGBC's LEED program is credited for the transformation of commercial real estate development into a healthy and economically viable "Green" industry. In less than 10 years, the USGBC successfully fostered the development of "Green Buildings" using its LEED certification standards and practices ratings system. It started a movement whereby many large scale developers, investors and

lenders are now more interested in renovated or new buildings that are “Green.” Green buildings are the new standard of excellence because they provide a better ROI, they are better for the environment, save money/energy and, most importantly, they are preferred by those who live and work in those Green buildings.

The USGBC’s LEED certification program was the primary promotional vehicle in that industry’s educational process, because it explained to everyone in the business what “Green” or “High Performance” buildings are, as well as what the environmental, economic and societal benefits are in having “Green” buildings and a sustainable industry. The USGBC successfully conveyed the concept of what being “Green” means via the establishment of the criteria and measurement standards to assess adherence to the principles of sustainability. Without being able to measure adherence to these standards, sustainability cannot be understood, managed and/or promulgated. Therefore, the USGBC’s LEED certification program was the “means to the end” of becoming a sustainable industry.

The means to that end for the golf industry is the creation of a “Green Golf Course” certification program that will educate and promote the greening of the game and business of golf. This certification program would build upon the research from the USGA, the GCSAA, Audubon International, the Environmental Institute of Golf, university turfgrass programs, etc. And, importantly, the development of a WGF certification program needs to involve and draw upon the expertise and professional experience of the GCSAA, the USGA Greens Section Agronomists, the PGA, the PGA Tour, the National Golf Course Owners Association, the American Society of Golf Course Architects, the NGF and the Club Managers Association. It must be an inclusive process for this initiative to succeed.

Since a golf course’s environmental footprint is interdependent with the community that surrounds it, the golf industry’s version of this certification program should be conceptually similar to the new “LEED 2009 for Neighborhood Development Certification Program,” which will make golf’s version of this initiative an outreach program that will involve the surrounding community in meeting the certification program’s criteria. The objective is to educate, promote and inspire cooperation among the residents and the golf course regarding their common interests in having a sustainability community. Most importantly, the golf industry’s version of LEED certification needs to involve the key players in the golf industry regarding the creation of the criteria and measurement means in defining what a sustainable golf course is. The standards for a sustainable golf course certification need to be established and authenticated. It must be an inclusive process for this initiative to succeed. Ultimately, the long-term effectiveness of this program can only be measured in terms of having everyone in the golf industry understand what being a “Green Golf Course” means for both the golfer’s enjoyment of the game and the health and vitality of the golf industry.

And now, with the USGA taking an advocacy role, the leadership of the game can chart a course toward the sustainability of the golf industry. Once the “Green Golf Course” certification program is established and as it becomes better understood, there is an army of foot soldiers ready to fight the battle. The USGA has a staff of professional agronomists, and through its state golf associations, they could attract golfer volunteers that could be educated on golf

course sustainability who could rate golf courses for meeting the “green” standards just as they rate golf courses for handicapping purposes. Attaining the higher standards would mean meeting the criteria for the WGF sponsored certification program. The leadership and roles of the members of the local PGA Sections, the GCSAA Chapters and the Club Manager Association of America (CMAA) will be crucial in the development and implementation of the WGF “Green Golf Course” certification program.

Golf’s “Green Golf Course” Seal of Approval

How this might work would be for golf to have its own version of the “Good Housekeeping Seal of Approval,” which would be a meaningful designation to everyone in golf about what it means to be a sustainable golf course. Golfers would know that a sustainable golf course is environmentally responsible, less expensive and more fun to play. Golf course operators would understand that a sustainable golf course will meet the needs of their customers, is socially responsible and will improve their businesses’ bottom line.

Learning from Other Industries

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 with its “Hypercar” concept. Amory and L. Hunter Lovins, cofounders of 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. They designed 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.

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. The golf industry needs to do the same. The answers to the industry’s problems are there for the taking. While environmental and turfgrass research will provide 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 could be dubbed for now as the “Green Golf Course Seal of Approval.” Golf course maintenance costs and the perceived negative environmental impact of golf courses 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 number of rounds played and revenues per golf course will increase commensurately.

From “Code Blue” to “Code Green”

About 25 years ago, the golf industry appeared to be a mature business and possibly a dying industry. Golf redefined itself as a growth industry based upon research that indicated that there would be increased demand from the Baby Boomer population as they aged and had the time, money and inclination to play more golf. This idea transformed the industry’s image of its future prospects from gloom to boom. The “*Course a Day*” promotional initiative led to unprecedented investment into many sectors of the golf industry. The golf industry grew, and more than a golf course a day was built during the 1990’s.

The golf industry today faces a different but similarly daunting challenge to its future well being. The title of this paper was a “Code Blue” and a call for the leadership of golf to proactively deal with the crisis conditions confronting the health and vitality of the game and golf business. The diagnosis was that any industry cannot be sustainable if its products are not meeting the needs of its customers. This paper is a “Code Green” call to resuscitate the golf industry by fostering the development of sustainable golf courses. The means to that end is the creation and implementation of a “Green Golf Course” certification program that would transform the golf business into a “Green” industry. This will take discipline and work to educate the industry as well as the golfers and the general population. This endeavor is easier said than done, but it is what the golf industry can and should do.

References:

- Adams, R., and J.R. Rooney, Jr. Evolution of American Golf Facilities. *Geographic Review*, 75(4): 419-438, 1985.
- Audubon International. *Golf’s Green Bottom Line: Uncovering the Hidden Business Value of Environmental Stewardship on Golf Courses*. A Research Project of Audubon International. 2007.
- Audubon International. *Proceedings of the Sustainable Communities Summit, 2008*.
- Audubon International. *Lessons for Eco-Design & Development, 2009*.
- Barker, J. *Paradigms: The Business of Discovering the Future*. New York: Harper Collins, 1992.
- Beditz, J. F., and J. R. Kass. *A Strategic Perspective on the Future of Golf*. National Golf Foundation: Jupiter, FL, 2007.
- Beditz, J. F., and J.R. Kass. *Golf Business Update*. National Golf Foundation: Jupiter, FL, 2010.
- Beditz, J. F., Ph.D., and J.R. Kass. *Golf Industry Report: The Future of Public Golf in America*. National Golf Foundation: Jupiter, FL, 2009.
- Brundtland, G. *Our Common Future*. World Commission on Environment and Development. Oxford, UK: Oxford University Press, 1987.
- Burrough, D. J. *Evolving Greens: Golf Course Development is Experiencing a Major Evolution*. *Urban Land*, Urban Land Institute, Washington DC, 2000.

- Carson, R. *Silent Spring*. Boston: Houghton Mifflin, 1962.
- Cornish, G.S., and R.E. Whitten. *The Architects of Golf*. New York: HarperCollins Publishers, Inc., 1992.
- Cotton, H. *The History of Golf Illustrated*. Philadelphia & New York: J.B. Lippincott Company, 1975.
- Dermisi, S. V. Effect of LEED Ratings and Levels on Office Property Assessed and Market Values. *The Journal of Sustainable Real Estate*: 1:1, 23-47. 2009.
- Dodson, R. G. *Sustainable Golf Courses: A Guide to Environmental Stewardship*. Hoboken, New Jersey: John Wiley & Sons, 2005.
- Dresner, S. *The Principles of Sustainability*. London: Earthscan, 2009.
- Drucker, P. *The Practice of Management*. New York: Harper & Row, 1954.
- Esty, D., C. Winston, and S. Andrew. *Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value and Build a Competitive Advantage*. Washington, DC, 1987.
- Fazio, T., and C. Brown, *Golf Course Designs*. New York, NY: Harry N. Abrams, Inc., 2000.
- Findley, R., and D. Farber. *Environmental Law Handbook*. Minneapolis, MN: West Publishing Company, 1992.
- Fream, R.W. *Planning for Change in the Game*. Urban Land, January, 2002.
- Friedman, T. L. *Hot, Flat, and Crowded - Why We Need a Green Revolution and How it Can Renew America*. New York: Farar, Straus and Giroux, 2008.
- Frost, M. *The Greatest Game Ever Played: Harry Vardon, Francis Ouimet, and the Birth of Modern Golf*. New York: Hyperion Books, 2002.
- Golf Course Superintendents Association of America and Environmental Institute for Golf. *Golf Course Environmental Profile, Property Profile and Environmental Stewardship of Golf Courses, Volume I*. 2007a.
- Golf Course Superintendents Association of America and Environmental Institute for Golf. *Golf Course Environmental Profile, Water Use and Conservation Practices on U.S. Golf Courses, Volume II*. 2007b.
- Golf Course Superintendents Association of America and Environmental Institute for Golf. *Golf Course Environmental Profile, Nutrient Use and Management on U.S. Golf Courses, Volume III*. 2007c.
- Graffis, H. *The PGA: The Official History of the Professional Golfers Association of America*. New York, 1975.
- Hawkins, P., A. Lovins, and H. L. Lovins. *Natural Capitalism: Creating the Next Industrial Revolution*. New York: Back Bay Books, 1999.
- Holliday, C. O., S. Schmidheiny, and P. Watts. *Walking the Talk: The Business Case for Sustainable Development*. San Francisco: Berrett-Koehler Publishers, Inc., 2002.
- Hueber, D. The Greening of the Golf Industry's Built Environment. *PDBE 810: Unpublished Paper*, Clemson University, 2009a.
- Hueber, D. The Role of Real Estate Development in the Paradigm Shift of Golf's Built Environment. *PDBE 801: Unpublished Paper*, Clemson University, 2009b.
- Hueber, D. Making the Business Case for Sustainable Golf Courses. *CRP 870: Unpublished Paper*, Clemson University, 2010.

- Jones, R.T., Jr. *A Challenging Environmental Issue: Use of Wetland in Golf Course Design*. Golf Course Management, July 1989.
- Kaufman, S. Golf Courses/Communities Supply and Demand. *Urban Land*, Urban Land Institute, Washington, DC, 2004.
- Kirk, P.L. Designing the Way to Green: Environmental Design is Now Synonymous with Sustainable, or Green, Design. *Urban Land*, Urban Land Institute, Washington, DC, 2006.
- Laing, J. A Rough Round. Why Golf's Prospects are Dimming. *Barons*, July 2003.
- Limehouse, F., P.C. Melvin, and R.E. McCormick. The Demand for Environment Quality and An Application of Hedonic Pricing in Golf. *Journal of Sports Economics Online First*, 2009.
- Lynch, A. K. *The Golf Business During Recessions: Analysis & Perspective*. Jupiter, FL.: National Golf Foundation, 2007.
- Mazanec, J., and H. Strasser. *A Nonparametric Approach to Perception-Based Market Segmentation*. Berlin: Springer, 2000.
- McCarty, L.B. *Best Golf Course Management Practices*, 3rd edition. New Jersey: Prentice Hall, 2008.
- McHarg, I. L. *Design with Nature*. The Falcon Press, Philadelphia, 1969.
- McElyea, J.R., A.G. Anderson, and G.P. Krekorian. The Changing Economies of Golf. *Urban Land*, Urban Land Institute, Washington, DC, 1987.
- McElyea, J.R., A.G. Anderson, and G.P. Krekorian. Golf's Real Estate Value. *Urban Land*, Urban Land Institute, Washington, DC, 1991.
- Miller, N. G., D. Pogue, Q.D. Gough, and S.M. Davis. Green Buildings and Productivity. *The Journal of Sustainable Real Estate*, 1(1): 65-89, 2009.
- Muirhead, D., and G.L. Rando. *Golf Course Development and Real Estate*. Washington, D.C.: ULI-the Urban Land Institute, 1994.
- Mulvihill, D.A. Golf Course Development in Residential Communities. *Urban Land*, Washington, D.C.: ULI-the Urban Land Institute, 2001.
- Napton, D. E., and C.R. Laingen. Expansion of Golf Courses in the United States. *Geographic Review*, 2008.
- National Golf Foundation and Market Facts, Inc. *Golf Consumer Profile*. Jupiter, FL, 1987-2005.
- National Golf Foundation and McKinsey & Company. *A Strategic Perspective on the Future of Golf*. Jupiter, FL, 1999.
- National Golf Foundation and McKinsey & Company. *Strategic Plan for the Growth of the Game*. Jupiter, FL, 1987.
- National Golf Foundation and Qualitative Decision Center (NY). *A Qualitative Exploration into Ways of Encouraging Growth of the Game of Golf*. Jupiter, FL, 1982.
- National Golf Foundation. *Golf Facilities in the United States – 2009 Edition*. Jupiter, FL, 1979-2009a.
- National Golf Foundation. *Golf Industry Overview – 2008 Edition*. Jupiter, FL, 2008a.
- National Golf Foundation. *Golf Industry Report: NGF's Golf Business Symposium*. Jupiter, FL, 2008b.
- National Golf Foundation. *Golf Participation in the U.S.* Jupiter, FL, 1979-2009b.
- National Golf Foundation. *Golf Course Design and Construction*. Jupiter, FL, 1990.

- National Golf Foundation. *Rounds Played Report*. Jupiter, FL, 1979-2009c.
- National Golf Foundation. *The Future of Private Clubs in America*. Jupiter, FL, 2008c.
- National Golf Foundation. *The Future of Public Golf in America*. Jupiter, FL, 2009.
- National Golf Foundation. *The Spending Report: Sizing the Golf Consumer Marketplace - 2003 Edition*. Jupiter, FL, 2003.
- Nicholls, S., and J.L. Compton. *The Impact of a Golf Course on Residential Property Values*. Journal of Sports Management, 2007.
- Pierce, D., and E. Barbier. *Blueprint for a Sustainable Economy*. London: Earthscan Publications, 2000.
- Porter, D. R. et al., *The Practice of Sustainable Development*. Washington, D.C.: ULI-the Urban Land Institute, 2000.
- Shackelford, G. *The Future of Golf: How Golf Lost Its Way in the 21st Century and How to Get It Back*. Seattle, WA: Revised edition, Sasquatch Books, 2005
- Shmanske, S. *Golfonomics*. Hackensack, NJ: World Scientific Publishing Co. Pte. Ltd., 2004.
- Sporting Goods Manufacturers Association. *Sports Participation in America 2009*. North Palm Beach, FL, 2009a.
- Sporting Goods Manufacturers Association. *2009 Sports and Fitness Participation Report Today!* North Palm Beach, FL, 2009b.
- Turner, C., and M. Frankel. *Energy Performance of LEED for New Construction Buildings*. Washington D.C.: U.S. Green Building Council, Final Report, 2008, March.
- Vitello, P. More Americans Are Giving Up Golf. New York Times, 2008, February.
- Wind, H. *The Story of American Golf: Its Champions and its Championships*. New York: Farrar, Straus and Co., 1975.
- Whitten, R. *The Complete History of the Best New Courses*. Golf Digest, 2007
- Wyman, D. Analysis of Golf Course Communities: Does the Golf Course Really Matter? Unpublished and Pending Dissertation: Aberdeen University, 2009.
- Wyman, D., and S. Sperry. The Million Dollar View: A study of Golf Course, Mountain, and Lake Lots. *The Appraisal Journal*, 128 (2): 159-168, 2010.
- Veblen, T. *The Theory of the Leisure Class*. Prometheus Books, 1998.
- Yudelson, J. *Developing Green Strategies for Success*. NAIOP, Herndon, VA., 2006.



