



Sustainable Golf Development

Public Facilities Guidelines

More than a game



Photo Credit: Matt Ginella (photographed Rich Lerner, Mike Clancy with Elle (daughter) and Owen (son))

Contents

Foreword	4	Facing Challenges	17
The Opportunity	5	What Can A Golf Course Do?	17
Key Challenges	7	Health & Wellbeing	17
Golf - What Is It?	7	Social Cohesion	18
The Challenges Faced	7	Sustainable Growth	19
The Public Golf Facility	9	Flood Alleviation	20
Ownership	9	Air Quality	22
Design And Construction	11	Soil Pollution	22
Maintenance And Operations	11	Loss Of Habitat	22
Multi-Functional	13	Energy Demand	24
Further Examples	14	Waste Management	24
		Conclusion	26
		Golf Development Industry	28
		About GEO Foundation	30
		GEO Certified®	31
		Technical References	32
		Scale Of A Golf Course	32
		Costings	34
		Glossary Of Terms	35
		Further Reading	37
		Acknowledgements	39

Foreword

We are seeing greater public awareness of health, fitness and well-being particularly amongst younger people, who are looking to increase their participation in sport. Golf is evolving to become more relevant and connected to this movement, and an increasing number of golf facilities are addressing social and environmental issues in a positive way.

This document provides guidance and best practice examples, aimed at decision makers and consultees considering the impact of a proposed golf development or of changes to an existing facility. The document sets out the social and environmental benefits associated with responsibly designed and managed golf facilities, and practical means of ensuring their sustainable delivery, refurbishment and long-term operation.

Over the past 10 years, there have been numerous course closures, reducing the number of much-needed sports and leisure amenities for our urban and peri-urban areas in productive, open and accessible green spaces.

Today's society presents a growing health and well-being challenge as populations rise, especially in the urban areas in which 66% of us will live

by 2050¹. Sports provide organized physical activity and reduce health risks and their costs, specifically for chronic health issues such as heart disease, diabetes, obesity and dementia².

Sustainable golf in particular has the potential both to improve the quality of life for its players and to contribute to the health of the natural landscape. As a land-based outdoor sport, it provides players with fresh air, contact with nature and open space, social connection and both a physical and mental challenge.

Through golf, a city's open spaces can be retained; natural habitats can be

created and conserved; waterways can be cleaned; air pollution can be reduced; and society's need for cohesion, recreation and overall well-being can be met.

The right infrastructure and actions are needed to create the environment in which people will be able to play sport safely, responsibly, affordably and sustainably, long into the future.

GEO Foundation 2019



1: <https://esa.un.org/unpd/wup> | 2: Warburton DE, Nicol CW, Bredin SS. Health benefits of physical activity: the evidence. Canada Medical Association Journal. 2006;174:801-9

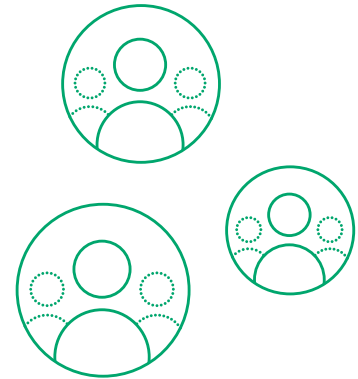
The Opportunity

The space and time for sport in modern life is becoming increasingly hard to create, with rising pressure on urban land resources and on people's time. There is a need to make more intensive use of space and to expand opportunities in our urban areas, so that space can be made more productive and be beneficial for as many people as possible.

As our cities grow and become more densely populated, the recreational areas and facilities within them come under scrutiny to provide greater value for the inhabitants. Golf is a sport that can contribute more value to more people. Every public golf facility can and should aspire to be accessible, profitable, connected and healthy.

Central and local government, sports associations, local groups and community leaders have a shared interest in and responsibility for engaging communities and protecting the future quality of life in our cities. The sustainable development and provision of sports facilities in our cities is an opportunity to create a focal point for renewed community activity and better social cohesion.

21st century policy and planning require a comprehensive view of both the space and the time issues faced by modern society. More robust and resilient cities must be planned that are better able to adapt and cope with changing needs. Open-space networks of green infrastructure³ are the lifeblood of a city. Protecting, connecting and strengthening them helps to future-proof cities. Golf facilities can be a valuable contributor to a city's green infrastructure.



“Europe's cities need more than ever to be sustainable and should offer the kind of quality of life and opportunity that make people want to live in them and make businesses want to invest.”

Janez Potočnik
European Commissioner for
Environment, European Commission



GEO
Foundation
Sustainability in and through golf

Established to engage credibly and visibly in the modern sustainability movement. Fostering nature; doing more to conserve resources; and creating more value for communities – strengthening golf's image and long-term vitality.

3. <http://ec.europa.eu/environment/nature/ecosystems/illustrations.htm>



**running
biking
dog walking
picnics
music
concerts... and golf**

Key Challenges

Golf - what is it?

What can public golf facilities do to contribute more? There is no such thing as a typical golf facility. As they range in size from 1 hectare to 400 hectares (~2 acres to 1,000 acres) and in the number of holes from 3 to 72 or more, it is a difficult thing to define.

What these facilities have in common is that they allow golf to be played outdoors across land and by people of all ages. Beyond that, there is significant flexibility in what constitutes a golf facility. The technical guidance at the end of this document provides some examples of the various permutations and requirements of a golf facility.

The challenges faced

This publication sets out examples of the challenges that face public bodies and local communities, where golf facilities

can contribute to the solutions.

These include:

- Flooding and drought
- Water quality and security
- Loss of habitats
- Protection of open space
- Air and soil pollution
- Health care and well-being
- Sustainable growth
- Social cohesion⁴
- Quality of life
- Increased energy demand
- Waste management

Some, if not all, of these issues are key considerations for public decision makers and consultees, when considering the futures of our urban and peri-urban areas.

There is also the overarching commitment to the Paris Agreement⁵, signed by 195 countries in 2016. The agreement sets out the action plan to address climate change by scaling up the efforts of cities, sub-national authorities, civil society and the private sector to reduce emissions, build resilience and promote greater cooperation.

“We are the first generation that can end poverty, and the last one that can take steps to avoid the worst impacts of climate change. With the adoption of a new development agenda, sustainable development goals and climate change agreement. We can set the world on course for a better future.

Ban Ki-moon,
UN Secretary-General



Winter Park Golf Course, Orlando, Florida, USA

Re-designed by: Keith Rhebb and Riley Johns

Owner: City of Winter Park
28°36'14"N 81°20'53"W

Built in the 1900s, Winter Park, was recently redesigned and rejuvenated to provide a course that is easier to maintain and more profitable. The site, crossed by several roads, comfortably accommodates a 2,480yd Par 35 layout. Affordable construction was delivered ahead of schedule, with green fees of less than \$20, even cheaper for locals. Designed to be affordable, playable and fun, the course is very popular with the local community, young and old, with 45,000 rounds played in 2018.



- \$1.2 million budget and one bulldozer
- Less than 6 months to build and open
- 'Community Putting Course' also built in the budget
- Hickory clubs for rent
- Doubled annual revenue and increased local land values

Photo Credit: Winter Park Golf Course

Public, accessible, fun

2x the fauna diversity

1st public golf facility in Brazil

33 Ha. restored native habitat



Photo Credit: ECP Environmental Solutions | Rio Olympic Golf Course Outdoor Education



The Public Golf Facility

Canal Shores, Chicago, Illinois, United States

Owner: City of Evanston and Village of Wilmette

Designed: Tom Bendelow / Todd Sloan

42°03'47"N 87°41'10"W

In 2012, after a period of reinvigoration and reorganization, Canal Shores started an action plan process with grants from the USGA/ASGCA Site Evaluation Program and the Illinois Department of Natural Resources. The 82 acre (~33 hectares) site has multiple uses and aims to benefit as many stakeholders as possible. In 2018, the course is thriving with new players, users and environmental restoration awards. Canal Shores is operated by a not-for-profit local golf association.



Photo Credit: Canal Shores

- Incorporates running, biking, dog walking, picnic areas, music events
- Restoration of habitats and new tree management program
- Partnerships with volunteer community groups, local school and university

The challenges of rising costs, increased regulation and changing weather patterns are some of the macro influences on public golf courses. These factors, combined with a general decrease in participation in golf⁶, shifting work-life balances and increased expectations, have meant that some public facilities are under pressure to re-imagine their product and their businesses. The public good and the accessible ethos of these facilities create an opportunity to deliver on government policy and targets, joining funded initiatives that could not be accessed by private facilities.

By considering those things that every facility has direct influence over, decision makers will be able to identify several opportunities to lever positive change. These opportunities can be simple maintenance changes

or more complex changes in ownership, business model, the way the course is designed, built and arranged – right down to how it is maintained and operated for its customers.

Ownership

Public golf facilities can come in all shapes and sizes. They also take many organizational forms, from ownership by large multinational corporations to being run by local not-for-profit community groups, such as golf clubs and trusts.

In that sense, flexibility in ownership and business model can lead to opportunities to redefine a facility's purpose and goals. Inspiration can be taken from partnership or sponsorship models to deliver more value than a simple sports pitch. There are examples, such as Canal Shores in Chicago, Illinois, USA, The Preserve at Bandon Dunes, Bandon, Oregon, USA and others, which demonstrate the benefits to the local community and environment.

'The Wild Rivers Coast Alliance (WRCA) is funded through net proceeds of Bandon Preserve, 1 of 5 courses at Bandon Dunes Golf Resort. WRCA funds community projects on the south coast of Oregon that are committed to triple-bottom-line results (conservation, community, and economy) and prioritize approaches that blend innovative ecological initiatives while driving economic opportunity. To learn more about the WRCA, visit www.wildriverscoastalliance.com.'

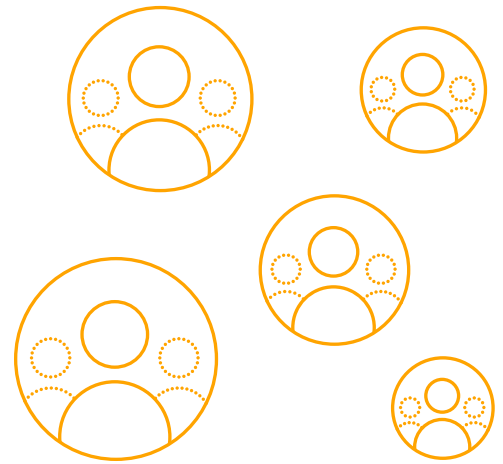
Jim Seeley
Wild Rivers Coast Alliance





'Now, more than ever, the pressures of climate change, diminishing natural resources and tighter regulations are leading to golf facilities having to rethink the way they do business. Golf facilities that act now and show greater resilience and resourcefulness are the ones most likely to be best placed in the years ahead.'

Steve Isaac,
Director - Sustainability
The R&A



The Himlayas, St Andrews, Scotland

Designed: Old Tom Morris (1867)

56°20'42"N 02°48'23"W

A putting-only golf course located 10 minutes from the town centre of St Andrews. Laid out over 1 hectare (~2.5 acres) of grass are 27 holes of putting, known as The Himalayas for the course's undulating terrain and shared with The St Andrews Ladies' Putting Club since 1867. It attracts thousands of visitors between March and October every year to play, some for the first time. The putting course is one of the most popular visitor attractions in the region.



Photo Credit: GEO Foundation

- 1 hectare contiguous putting surface
- All levels of player can play
- £3 for adults & £1 for children
- 10 minutes walk from the town centre

Sticks for Kids Program

Golf Course Builders Association of America Foundation

A junior golf outreach program for young people aged 5 to 18. It provides facilities with clubs, bags, teaching and marketing materials, and instructors to host learning events. Participants learn lessons about integrity and sportsmanship, safety, and respect for themselves and others. The program's mission is to provide as many children as possible with golf clubs and the chance to play the game. It provides a safe and welcoming environment for young people of all backgrounds to experience the game for the first time.



Photo Credit: LPGA / SticksforKids

- Clubs, bags, teaching and resources to start the game
- Aimed at 5 to 18 year olds
- Safe secure and professionally supported

The Public Golf Facility

Design and Construction

An investment in a sports facility is a serious undertaking for any public body. Scrutiny of public spending has never been higher, meaning that work to renovate or create new facilities needs to be done efficiently and effectively.

It is the responsibility of public bodies to ensure work is done responsibly and transparently. It is important to know that spending more money does not necessarily equal a better golf facility. Creativity and resourcefulness in design and construction can have significant positive impacts on a project's budget and the long-term maintenance costs of the facility.

Site selection, soil and water quality, terrain, existing and previous land uses, local knowledge, resource availability and existing infrastructure are just some of the key considerations that will have an impact on cost

when looking at a new golf project's construction. The design stage is also a good time to shape the kind of facility that should be created, connecting with the local community through organized community engagement events and activities.

Maintenance and Operations

Close consideration should be given to the long-term maintenance and operation of a golf facility. Minimizing resource use and long-term costs is essential to reduce the pressure to generate significant amounts of revenue. Early decisions should be made about the expectations of the course's owner, the end users and the market position the facility will occupy relative to courses around it.

The level of course presentation has a direct and significant bearing on

'Too many people feel that they are not heard. This fuels resentment, at different levels. ...This has to change, and the role of cities in that change is central. Our recognition of the importance of the European city has grown and continues to grow, built around the concept of listening. Allowing, and nurturing creative decisions through proposals from local communities is critical.'

Karmenu Vella
European Commissioner for Environment
European Commission

long-term costs. Learn the local golf market and understand its expectations before deciding on the level of course presentation the facility should aspire to – this can save a lot of time and money later on. Golf courses that are interesting to play but have lower-quality playing surfaces can be more appealing to golfers than a bland course that is immaculately presented. When budgets are tight, focusing on priorities such as green surfaces can be critical to sustaining interest and generating repeat play.

Consider the efficiency of the overall arrangement of the site, whether a new construction or a renovation. Where items such as the maintenance compound, clubhouse, entrance roads, pathways and any fences or boundaries are located can have an impact on ease of maintenance and the operations budget of a golf facility, in terms of staff numbers, fuel use and logistics.



'Affordability is no excuse for bland and uninteresting golf. Great golf course design does not cost more and is an important hook to attract and retain golfers of all skill and experience levels. When done right, the same maintenance and management practices that keep golf affordable also positively impact playing characteristics and the environment. Interesting, fun design at an entry-level price point needs to be the model for public golf near urban centers, where so many are first exposed to the game.'

Mike McCartin, Golf Architect
McCartin Golf Design

Photo Credit: The schoolhouse nine golf course

\$64.9 million of subsidies for Florida municipal courses to stay open

USA TODAY Network-Florida Investigation, 2018.

'What municipal golf needs is forward thinking facilities. Rather than looking at what the town down the street, they should create their own unique facility that fits their specific needs. For some it's a standard 18 hole course, for others it's a nine hole facility or short course, for others it might just be a spectacular practice facility. Thinking outside the box is imperative for community courses and in many ways these types of facilities offer less risk to the taxpayer.'

Andy Johnson,
Expert Golf Writer and Critic
Chicago, USA

Goat Hill Park, Oceanside, California, USA

Designed: Ludwig Keehn

Owner: City of Oceanside

33°11'50"N 117°21'34"W

Redesigned as a short 18-hole golf course in the 1990s, Goat Hill Park fell on hard times in the early 2000s. In 2014, a local community group crowdfunded capital to take over the lease from the city and set about renovating the course. Today, the community-led course has a new irrigation system from recycled water, a thriving and diverse membership and a socially minded Caddie Academy for children of low-income families, linked to academic achievement and commitment.



Photo Credit: Goat Hill Park

- Active Caddies Academy providing jobs and opportunity for locals
- Active and diverse membership of players of all ages
- No dress code, music on course and community events hub

Bartlett Hills Golf Course, Bartlett, Illinois, USA

Re-designed by: Bob Lohmann, ASGCA, Lohmann Golf Designs

Owner: Bartlett Hills Community

41°59'40"N 88°11'44"W

A community-owned public golf course, set in 143 acres (~57 hectares) of parkland in the suburbs, west of downtown Chicago. The renovation began in 1985 and is an example of successful long-term planning. Carried out in 9 phases over 17 yrs and overseen by the same manager, now retired, Bob Gavelek, the work was paced to match revenue generation, rather than funded by debt. Now the course is able to host PGA regional events, weddings, community gatherings and junior golf.



Photo Credit: Bartlett Hills Golf Course

- Community owned facility since 1978
- Juniors can play 18 holes for free after 5pm
- Hosts local PGA regional and Junior tournaments

The Public Golf Facility

Rockwind Community Links, New Mexico, United States

Redesigned: Andy Staples ASGCA, Staples Golf Design

Owner: City of Hobbs

32°46'18"N 103°12'05"W

Before its renovation, Rockwind struggled with low participation rates, increasing maintenance costs and lack of revenue. Today, it is an asset to the community and has almost doubled its revenues. Rockwind focused on creating opportunities for all its residents, not only golfers, implementing a pathway system around the course for the community's enjoyment, introducing an auxiliary space for local events and weddings, and opening its restaurant and other facilities to the entire community.



Photo Credit: Andy Staples, ASGCA

- Annual rounds played increased from 17,000 to 27,000.
- 5 tees play from 7,100 to 4,200yds.
- Embraces existing landscape terrain

Multi-functional

As in any business, having a diverse base of customers is highly beneficial. Golf courses can serve more than just golfers. Non-golfing activities can generate revenue and help sustain the financial health of the overall facility. Golf facilities can be public meeting rooms,

other sports pitches for frisbee, football, tennis and so on, or the host for community events and other night-time entertainment – all these things are possible for a golf facility, and are ways to generate additional income, increasing profitability and the productivity of valuable city land.

2,487
municipal golf
facilities in the
WEARE GOLF U.S.

CommonGround, Colorado, United States

Designed: Tom Doak, Renaissance Golf Design Inc

Owner: Colorado Golf Association

39°43'01"N 104°52'05"W

Less than 7 miles (~11 km) from downtown Denver, This public facility serves as a fun and accessible course for all players. There is an 18 hole course and a 9 hole short course, partially funded by a \$175,000 USGA grant, with holes from 70 to 150 yds. The course is home to the Colorado Golf Association and its flagship outreach program, the 'Solich Caddie & Leadership Academy', which introduces 8th and 9th graders to caddying, leadership development and community service.



Photo Credit: Joe Jenkins

- Located in an urban community close to central Denver.
- Walkable, playable and fun design
- Home of the Colorado Golf Association and its Solich Caddie & Leadership Academy
- Served as co-host of 2012 U.S. Amateur and 2019 U.S. Mid-Amateur

Further Examples

Below is a selection of further examples of golf courses located in a diverse range of climates. These are all golf facilities and groups that have made efforts to conserve and enhance nature, think creatively to improve resource efficiency and connect the golf course to their local communities and environments.

'Stewardship of the environment is a cornerstone of good golf course architecture. Now, more than ever, golf course architects, like all designers working in open green space, must demonstrate the benefits to the local environment, society and economy – delivering long-term value for future generations. Well-designed public courses can play an important role in providing accessible and affordable golf facilities and attracting more people to the game.'



Ross McMurray, President
European Institute of Golf Course Architects

Los Robles Greens Golf Course, California, United States

Redesigned by: Jason Straka ASGCA, Fry/Straka Global Course Design, LLC
Managed by: Arcis Golf, LLC

Owner: City of Thousand Oaks

34°10'28"N 118°52'42"W

Los Robles Greens public golf course was redesigned with the purpose of creating a profitable, environmentally beneficial and socially valued golf course. In the process, water consumption was reduced by 25% by replacing 31 acres (~12.5 hectares) of turf with native landscape. Drought-tolerant native grasses were planted along fairways and bunkers, and low-growing native shrubs were planted along the tees and in other out-of-play areas. Additionally, recycled mulch and leaf litter from city collections were used as a base in non-turf areas.



- Removed 31 acres of turf
- Planted approx. 55,000 native and drought resistant plants
- Created a program to recycle the city's green waste

Fife Golf Trust (FGT), Scotland

Manages 7 public golf courses in Fife, Scotland

All 7 golf courses managed by FGT use the OnCourse® sustainability web app to track and deliver their golf operations against the local authority's objectives and targets for sustainable management, biodiversity, waste, climate change, pollution and social cohesion. The organization's proactive approach has meant increased biodiversity in grassland management and greater community value through partnering with 4 local schools for education projects.



- All 7 public courses GEO Certified® for sustainability activities
- High quality playing surfaces
- Led by board of directors including golf expertise.



OnCourse®



Fife Golf Trust

Migros Golfparks, Switzerland

8 locations from pitch & putt to 18-holes

Owner: MIGROS Supermarkets

Migros has built 8 different public golf facilities in the last 20 years, devoted to developing golf courses with the motto 'Golf for everyone'. They offer the chance to learn, and have introduced the game to over 20,000 school children since 2005. They maintain over 180 hectares (~445 acres) of ecologically valuable landscape, with the goal of promoting multi-functional recreation areas. With over 433,000 rounds played in 2014, this social and economic success story is growing the game of golf in Switzerland.



- 8 public golf facilities
- 180 hectares of ecologically rich landscapes
- 433,000 rounds in 2014
- over 20,000 school children played since 2005

Photo Credit: David Bily, EIGCA

Maleny Golf Club, Queensland, Australia

Designed by: Graham Papworth SAGCA, GNP Golf Designs Pty. Ltd.

Owner: Course Membership

26°45'31"S 152°51'55"E

Maleny has transformed a neglected agricultural site into a community asset, which also caters to local tourism. It is based on sound ecological guidelines – 9 holes were built by local volunteers. In a phased approach, the club then built 3 holes, with 6 in construction (2019). Course improvements have been done with the support of local government funding, and a new maintenance facility contributes to safer and efficient working, saving time and money in the long term.



- \$450,000 from the Sunshine Coast Council
- \$100,000 from the Queensland Government
- Phased approach spreading capital requirements

Photo Credit: Graham Papworth, SAGCA

Wychwood Park, Cheshire, England

Designed by: Hawtree Ltd (Ken Moodie EIGCA)

Owner: Course Membership

53°03'15"N 2°23'32"W

Wychwood Park showed a creative and fully integrated nature-based approach to drainage of a golf site. The 180-hectare (~445-acre) site contains a Site of Special Scientific Interest and a Special Area of Conservation that was in poor condition prior to the development and associated management plans. Proposals incorporated extensive water management provisions, including a flood attenuation design, wetlands, lakes, ditches and raised walkways to preserve the sensitive habitat.



- Nature based solutions to drainage.
- Significant increase in wetland area across the site

Photo Credit: Ken Moodie, EIGCA



'Golf facilities should build on existing initiatives promoting inclusivity and encourage increased participation, by developing environments and price structures that are welcoming to all ... Facilities should make every effort to promote equality and diversity, and make golf accessible and environmentally sustainable. Facilities should consider being multi-functional (having facilities in addition to golf, e.g., gym, walking routes or child care) and having diversity of golf facilities.'

2018 International Consensus Statement on Golf & Health to guide action by people, policymakers & the golf industry



'Public golf courses are most often the heart of the community, playing a key role in securing the recreational enjoyment of the citizens while providing an environmental asset that is suitable for many land uses. If fun and sustainable public golf courses are thriving, then the future of the game looks much brighter indeed.'



Bruce Charlton, ASGCA
President of The ASGCA Foundation

Sweetens Cove, Chattanooga, Tennessee, United States

Designed: King-Collins Golf Course Design

Owner: Private Individual

35°02'59"N 85°43'19"W

Once a struggling 9-hole country club located less than 30 minutes from downtown Chattanooga, Sweetens Cove is now an award-winning 9-hole public golf course, and the number 1 public golf course in Tennessee for 2016, 2017 and 2018. The focus is on fun and playable golf that encourages players to come back. Widely understood to be the most fun and inventive course to have opened in recent times, the accolades illustrate that great 9-hole golf is popular and can be built for less than \$1 million.



- Less than 30mins from downtown Chattanooga
- Built for less than \$1 million USD
- \$25 to play
- Play a round in less than 90 mins.

Photo Credit: Sweetens Cove

Golf & Health Project

Research by: University of Edinburgh | Sponsored by: World Golf Foundation

Launched in 2016, the project assessed the relationship between golf and health. Over 300 studies were reviewed and it was found that there was an association between golf and physical health benefits, including improved cardiovascular, respiratory and metabolic profiles and improved wellness. The study concluded that 'policymakers can be encouraged to support more people to play golf, due to associated improved physical and mental wellbeing'. More information at golfandhealth.org



- 11,000 to 17,000 steps per round
- Less likely to suffer from diabetes, CVD, cancer, hipfractures, dementia
- Shows improved cardio and respiratory function in older adults

Photo Credit: The R&A

Facing Challenges

What can a golf course do?

A number of social and environmental pressures affect our cities today. The examples in this publication show that golf land can relieve some of those pressures. Flexibility and opportunity are locked in to the open spaces where golf is played.

The sport is experiencing a shift in player expectations, a changing demographic of its players, shrinking budgets and slow growth in the numbers of players. With more courses closing than opening⁷, there is a loss of

diversity in the type of golf facilities available to players, limiting choice and opportunity to play the sport. The situation provides an opportunity to rethink our public golf courses and the role they can play in wider society.

Health & Wellbeing

There is a growing evidence base that links golf participation with expected overall health and well-being benefits. Walking, muscular activity and social interactions are three of the contributing factors to improving players' physical and mental health.

**5 years
longer life
expectancy
for golfers**

'Golf - a game of life and death. Reduced mortality in Swedish golf players', 2008

*Golf's **physical health** benefits contribute \$32.7 million (AUD) per year due to the prevention of ischaemic heart disease, type 2 diabetes, stroke, colorectal cancer and breast cancer.*

*Golf's **mental health** benefits contribute \$1.1 million (AUD) per year due to the prevention of anxiety and depression and thought to give a 25% reduction in risk of anxiety and depression.*

The Community Impact of Golf in Victoria, Australia. April 2016



USGA-ASGCA Site Evaluation Program

Program Established: 2015

The program provides pro bono consulting services from ASGCA members and USGA agronomists to evaluate golf facilities, offering guidance to improve the playability of the courses and enhance the efficiency of their maintenance practices. Golf facilities are invited to apply for the support and are provided with up-to-date research and a comprehensive knowledge base to inform recommendations for the facility managers. More information at asgcafoundation.org



- Free expert advice for your course and maintenance plan
- Site visit by industry experts
- Tailored to suit facility's goals and business plan.

7: The 2016 U.S. Golf Economy Report. TEconomy Partners LLC, 2016.

Facing Challenges

Social Cohesion

On the pathway to balanced socio-economic development, the issue of social cohesion plays a significant role. We know that reduced disparities between social groups lead to positive impacts on productivity, public trust, mental health, well-

being and improved social relationships⁸.

Golf properties have the ability to act as multi-functional facilities. Golf facilities across the globe are already opening up opportunities to diversify

the uses made of golf courses. In the examples highlighted on these pages, local community groups are using golf facilities to hold nature-watching activities and to become outdoor learning centres for local education groups – providing safe places for children in deprived areas to socialize and spend time.

San Bartolo Project, Peru

Designed by: Augustin Piza EIGCA, Piza Golf Design

Owner: City of San Bartolo

12°22'53"S 76°46'58"W

The primary focus of the San Bartolo project led by the Peruvian Golf Federation is on the safety and well-being of the poorer children in its community, using golf to build their confidence and discipline. Run by community workers, the facility rewards children who have attended local schools with access to the golf course, teaching and safe social spaces to interact. The golf course makes use of a derelict piece of land that is unsuitable for most other uses.



Photo Credit: Federacion Peruana de Golf

- Use of poor and degraded land of low value.
- Incentive for children to go to school, be safe and improve discipline through golf
- A secure facility run by community workers to provide new opportunities for work and fun.

Olympic Golf Course, Brazil

Designed by: Gil Hanse ASGCA, Hanse Golf Design

Owner: City of Rio de Janeiro

31°17'10"N 120°42'02"E

Two years after the Olympics, the promise of environmental education, accessible public golf and the development of the game is being delivered. The Olympic golf course has forged partnerships with local schools and environmental groups, teaching the next generation about their local flora and fauna – how to protect and value it. They provide free lessons twice a week for all comers, showing what can be done through a resourceful approach and strong local collaboration.



Photo Credit: ECP Environmental Solutions

- Free access golf lessons for all
- Environmental school groups hosted
- Greater awareness of valuable flora and fauna for residents
- Safe and secure place to share time together



⁸ OECD (2011). Perspectives on Global Development 2012: Social Cohesion in a Shifting World: Executive Summary.

Jamor Sports Complex, Lisbon, Portugal

Designed by: José Lencastre

Owner: National Government

38°42'47"N 09°15'18"W

Opened in 2013 and located approximately 15 minutes from Lisbon centre, the Jamor course is owned by the Portuguese state and is part of the Jamor Sports Complex. The course is a partnership between the Portuguese Institute of Sport and Youth and the Portuguese Golf Federation. With the inauguration of the 9-hole golf course, Jamor turned golf into a more accessible sport for the general public and young people. Jamor's facilities are available to players of all levels.



- 15 mins drive from Lisbon
- Partnership of Sports' Institute and Golf Federation
- Centre of Excellence for the sport in Portugal

Photo Credit: Alexandra Betâmio de Almeida

Sustainable Growth

City parks and sports facilities are tools to deliver healthy cities, promoting a good quality of life by protecting open green space and balancing land uses. As a sport, golf is unique both in its scale and its shape. Unlike 'fixed pitch' sports, such as tennis or

rugby, golf's playing field is flexible and amorphous. A golf course of 9 holes, 18 holes or any number of holes is possible, and importantly a course is scalable to 'fit' the size and shape of the land available.⁹

Once a city's land is open space or public land, then that helps protect that land use and the decision-making process is able to change it. This was seen in the case of Goat Hill Park, Oceanside, California, USA – now a profitable golf course that helped bring a local community together.

Motala Golf Club, Motala, Sweden

Designed: Nils Sköld and Jan Sederholm

Owner: Private owner

58°30'29"N 15°02'35"E

Located less than 5 kilometres (~3 miles) from the centre of Motala, the Golf Club's 27-hole facility partnered with a local primary school, Spetsa AB at Linköpings University and the Scandinavian Turf and Environment Foundation. The partnership delivers an outdoor teaching facility and identifies the most suitable areas to host such groups for other courses. A training course for teachers was carried out in 2017, and the children visited their new classroom at the golf course in spring 2018.



- Partnership between school, university and research institute.
- Created outdoor classrooms for schools on golf course land
- Training more teachers to expand the initiative

Learning experiences can be improved if the teaching takes place in outdoor environments. Using golf courses as outdoor classrooms is important at a time when more people live in urban landscapes and areas suitable for outdoor activities are becoming scarce.

Sterf

Maria Strandberg,
Director of R & D, STERF

9: See Technical Appendices for details of what fits into what land

Facing Challenges

Flood alleviation

Open space land is valuable in our cities, never more so than where urban areas interact with a city's waterways. Flooding incidences have grown globally by 22% in the last 10 years. The impact this has on house prices, insurance and damages claims is clear.

Between 1998 and 2009, Europe suffered over 213 major damaging floods, including the catastrophic floods along the Danube and Elbe rivers in summer 2002. Severe floods in 2005 further reinforced the need for concerted action. Between 1998 and 2009, floods in Europe have caused some 1126 deaths, the displacement of about half a million people and at least €52 billion in insured economic losses
European Environment Agency. 2011

The open space of golf properties, such as the one illustrated at The Preserve at Oak

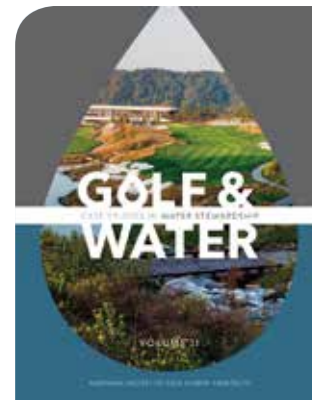
Meadows in Addison Illinois, USA (see below), represents an opportunity to rethink watershed management in urban and peri-urban situations. With the regrading and reshaping of golf courses, these spaces can be made to hold greater quantities of storm water and reduce overall flood risk for the area's residents.

This work does not need to be to the detriment of the quality of the golf offering and, in the case study below, the newly reopened golf facility has received international awards and seen an increase in the revenue generated, turning a liability for the local authority into a profitable asset.

Looking at a whole-watershed approach to

water management can reduce the severity and frequency of flood events. Examples (opposite) illustrate stormwater retention, flood risk and water security in times of drought.

Topics such as natural capital accounting and flood-warning systems are extremely relevant to this work, with financial instruments available to address such topics.



The Golf and Water publications detail more than a dozen examples where ASGCA members and others from the golf industry have had a positive impact on water management.

ASGCA, 2016.



The Preserve at Oak Meadows, Addison, Illinois, USA

Designed by: Greg Martin ASGCA. Martin Design Partnership Ltd

Owner: The Forest Preserve District of Dupage County, Illinois

A public golf course owned by The Forest Preserve District. Built in the 1920s and renovated in 2017. A waterway ran through the golf course, which periodically flooded damaging property. Through the creative problem solving of the design team, the golf property has now been redesigned to absorb flood water, allowing the controlled flooding of 20 million additional gallons of water. In the process, 35 acres (~14 hectares) of wetlands and 40 acres (~16 hectares) of prairie ground were created.



Photo Credit: The Preserve at Oak Meadows

- 20 million more gallons of stormwater attenuated
- 35 acres of wetlands, reed beds and riparian habitats
- 40 acres of new prairie habitat

Broken Sound Golf Club, Boca Raton, Florida, USA

Original Design: Joe Lee (1978) | Redesigned by: Gene Bates (2004)

Owner: Private Owner

29°23'49"N 80°08'15"W

Located in CBD of Boca Raton, near to busy interstate freeways and dense urban development, the 115-acre (~46-hectare) golf property is home to all kinds of local wildlife, from bees to alligators. Beyond nature, the waste management works even harder. Originally, waste removal was costing the club \$120,000 per year, then, through recycling of dry waste and bio waste in an onsite compost machine, they saved \$70,000 per year and generated their own mulch and fertilizer.



Photo Credit: UK Environment Agency

- Located in CBD of Boca Raton, FL
- Saved \$70,000 per year in good waste management practices
- Reduced fertilizer by 40% and pesticides by 60% through better turfgrass management practices.
- Micro-generates electricity with small wind turbines.
- 22 bee hives making 1,500 gallons of honey per year
- 75% increase in wildlife populations over five years.

Skipton Golf Club, Yorkshire, England

Redesigned by: David Jones

Owner: Course Membership

35°11'18"N 79°28'07"W

Completed in 2018, the reconfigured 18-hole course provided 17 hectares (~42 acres) for a new flood-control dam that would protect the nearby village of 15,000 from a one-in-1000-year flood event. The 14-metre-high grass embankment was designed as part of the 17th green area. The £14 million cost of the works were met by the national Environment Agency, with support from other national and local councils and environmental agencies such as district councils and regional water boards.



Photo Credit: UK Environment Agency

- Dam holds 433,000m³ of floodwater
- 2 holes removed and 18 holes re-configured
- Compensated by national Environment Agency

Ole Miss Golf Course, Oxford, Mississippi, USA

Redesigned by: Nathan Crace, ASGCA

Owner: University of Mississippi

34°23'24"N 89°31'51"W

Owned by University of Mississippi, the renovation switched the course to a recaptured water source, replacing the previously used local boreholes. The 3.85 acre (~1.5 hectare) reservoir provides water security for the course and reduces abstraction levels from the aquifer. It was found that the golf course and local airport drained over 100 acres (~40 hectares) through a culvert, none of which was retained. With new drains and reshaping of the course, 7-8 million gallons of water were saved per year.

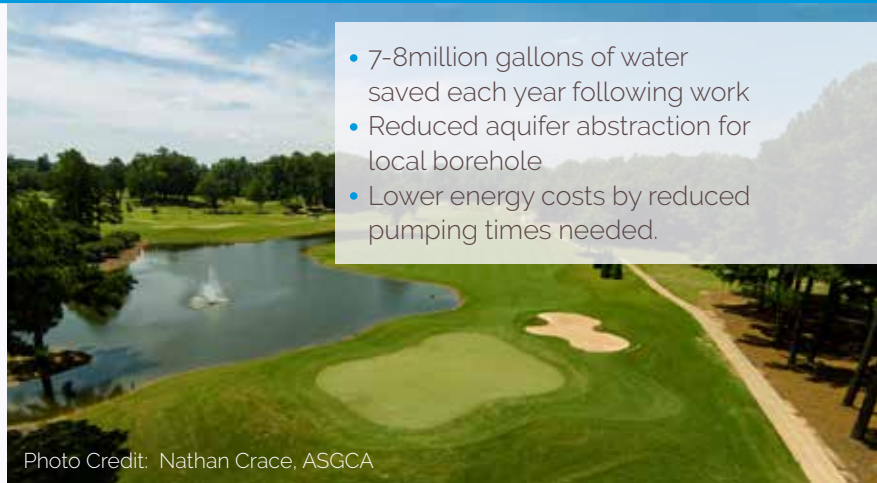


Photo Credit: Nathan Crace, ASGCA

- 7-8million gallons of water saved each year following work
- Reduced aquifer abstraction for local borehole
- Lower energy costs by reduced pumping times needed.

Facing Challenges

Air Quality

Levels of air quality in our cities and homes are declining. Around 7 million deaths per year globally can be attributed to air pollution. As many as 80% of our cities exceed the World Health Organization's guidelines for safe air, and it is an issue that particularly affects the most vulnerable in society¹⁰.

There are multiple solutions that need to be engaged, including energy supplies, transport and industrial activity. Our parks and open spaces can help in the reduction of pollutant dispersion in the air. This needs an open space of tens to hundreds of square metres to be effective, which is where golf courses can contribute.

An average 18 hole golf course may extend to 50 hectares (~125 acres) with about half of that available for mixed woodland, hedges and rough planting. Areas that scale can contribute to reducing air pollutants and reducing the overall ambient temperatures in cities.

Soil Pollution

As industrial land uses move out of cities, they leave behind legacies of soil contaminants in the ground. This ground is often difficult to convert safely for agricultural use or into productive housing. Worse, it can pollute waterways through seepage.

Landfills are a common example of post-industrial land that are difficult to convert and risky to develop. Softer developments such as golf courses can be a positive and cost-effective future land use. This model is well tested in golf development, and there are many examples such as the Skyway Golf Course, Jersey City, New Jersey, USA, that have benefited from landfill closure and created wildlife and recreation havens where the city once buried its waste.

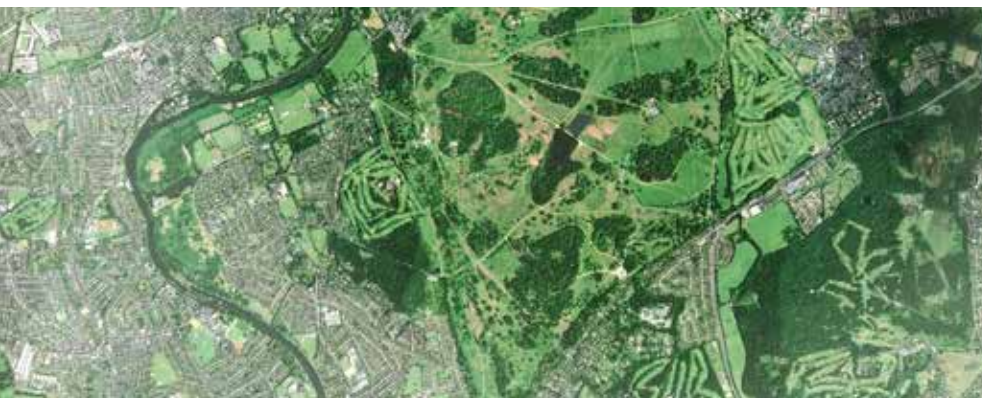
Quarries are another example of a post-industrial landscape that can be converted to golf plus other land uses with

relative ease. The example of The Quarry Golf Course, San Antonio, Texas, USA shows how the City of San Antonio turned a former quarry site into a golf course and successful mixed-use development in a now popular part of the city.

Loss of Habitat

Possibly the greatest threat to the world's species, increasing urbanization and large in-migration into cities are big drivers in the conversion and fragmentation of natural habitats into urban and agricultural lands. With cities and particularly suburban areas set to grow, the protection of habitats in these areas is an important consideration.

Golf courses should be seen as land uses that have the potential to increase biodiversity levels and the amount of habitat available. Introducing native and diverse habitats into the golf course can also be a way of reducing costs and resource use. Changes can be simple, such as less mowing or turning unnecessary turf areas back to native habitat. Done well, this



**7-24%
fewer
particulates in
the air near trees**

Planting Healthy Air, The Nature Conservancy, 2016.

10. Breathe Life 2030: <http://breathelife2030.org> (WHO; UNEP; CCAC)

work can also improve the aesthetics of the course, creating a genuine and authentic course that players are more likely to come back to and play again. habitat. This work, done well, can also improve to aesthetics of the course, creating a genuine and authentic course that players are more likely to come back and play again.

85% of species on IUCN's Red List are there because of habitat loss

wwf.panda.org

Baylands Golf Links, Palo Alto, California, USA

Designed: Willaim F Bell | Re-designed: Forrest Richardson, ASGCA

Owner: City of Palo Alto

37°27'13"N 122°06'57"W

Occupying low-lying land close to Palo Alto airport, the land used represented low-value property for the city. The city wanted to improve the asset for use by a wider audience and use the open space to help reduce the increasing flood risk. The new design saw increased native vegetation and habitats introduced, as well as a reduction in water use and an increase in flood-water capacity. With 4 sets of tees and 3 combo layouts, the course offers something for all levels of golfer.



Photo Credit: Dave Sansom

- Removal of non native plantings to be replaced with 300 native trees
- 500 protected native oak trees
- 55 acres of native wetland habitat
- 40% less turfgrass
- 35% less potable water use
- 74 acres of marshland habitat that doubles as flood protection
- Shared property with Baylands Athletic Center

Chambers Bay, Washington, United States

Designed by: Bruce Charlton, ASGCA. Robert Trent Jones II

Owner: Pierce County

47°12'02"N 122°34'16"W

Chambers Bay is a celebrated example of a public golf development on a former brownfield site, well integrated into a wider mixed-use master plan. Situated on the urban fringe of Tacoma with a bay flanking the golf course, the situation provides a backdrop to a dramatic golf course that made significant use of materials found on site and provided a productive use for land that had limited suitability for other uses.



Photo Credit: Skyway Golf Course

- Hosted 2015 U.S. Open and 2010 U.S. Amateur.
- Converted brownfield land back into productive use.

Facing Challenges

Energy demand

Overconsumption, poor infrastructure and unexplored renewable energy options contribute to a worsening energy situation in our urban areas. Oil, gas and coal are the main sources of energy in the world. De-carbonizing our energy economy is the next step in meeting global climate change goals using renewable energy, and in places legislation is being brought in to deliver the change.

Public golf facilities can look at energy supply as a way of contributing towards national or regional targets and improving the profitability of their operations. Actions facilities can take include switching to renewable energy suppliers; using hybrid or electric vehicles; installing micro-renewables such as wind or solar; and

using low-wattage electrical fittings. These actions can result in measurable business savings, and there are numerous government grant schemes available globally to help small to medium-sized businesses implement change.

Waste Management

Recycling of household waste has now become commonplace in many parts, with targets of 50% of household waste to be recycled by 2020 in Europe¹¹.

Around 40% of municipal waste is made up of 'bio-waste'. This is waste that can be recycled through composting. Research in Europe shows that less than 5% of it is recycled in this way¹². Difficulties in collection methods and space

availability mean that composting is not always possible.

Public golf facilities can be seen as a land resource and possible location for community composting sites, where green garden waste can be stored and processed either to be used in the maintenance of municipal courses and parks to reduce costs or to be sold locally to gardens and allotments. Broken Sound Golf Club in Boca Raton, Florida, USA was able to recycle 500,000 lbs of food and 1,200,000 lbs of garden waste in one year, saving the club \$45,000 that year in municipal waste disposal rates alone.

'We bury 1.2 million tons of food waste in landfills every year at a cost of nearly \$80 per ton. That waste can be used as fertilizer or converted to energy at a much lower price. That's good for the environment and for taxpayers.'

Michael Bloomberg
New York Mayor

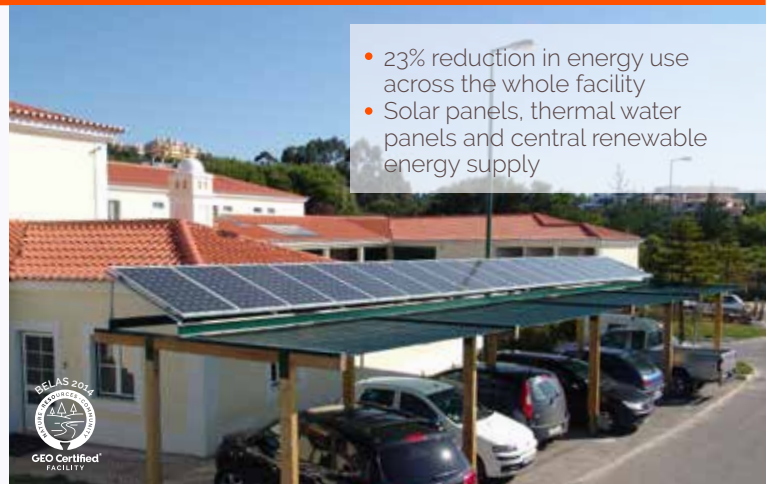
Belas Clube De Campo, Belas, Portugal

Designed by: William Roquemore

Owner: Private owner

38°48'29"N 9°16'26"W

In the northern suburbs of Lisbon, the 18-hole course has been making significant strides in reducing energy consumption since 2007. By tracking energy consumption from 2007, it now has over 10 years of data. Using this data, the club implemented a wide range of energy-saving measures and has seen energy consumption fall year on year since 2010. Using renewable national grid energy supply, on-site solar panels, thermal water panels for showers and new hybrid vehicles has delivered a 23% reduction in energy consumption.



- 23% reduction in energy use across the whole facility
- Solar panels, thermal water panels and central renewable energy supply

11. European Commission. Landfill Directive 1999/31/EC. | 12. Eurostat 2011 data.

Skyway Golf Course, Jersey City, New Jersey, USA

Redesigned: Roy Case and Jeff Grossman

Owner: Hudson County

40°43'58"N 74°05'31"W

Opened in 2015 as the first public golf course in Hudson County, the 9-hole course project initiated by the Hudson County Improvement Authority on a former landfill site now hosts 35 acres (~14 hectares) of wetlands and 10 tidal pools and uses recycled water to irrigate the turf. The capping of the site used 1.2 million cubic yards (~900,000 m³) of fill, which had previously been flat. Once capped, the course took 15 months to build and open. The course costs between \$20 and \$36 to play.



Photo Credit: Skyway Golf Course

- Less than 16-month to build the course and open
- 35 acres of wetlands
- 10 tidal pool and a recycled water and irrigation system
- Play for less than \$36

*By 2020, municipalities' biodegradable waste going to landfill must be reduced to 35% (by weight) of 1995 levels ...
14 member states are on track to miss this target*



European Commission.
Landfill Directive 1999/31/EC.



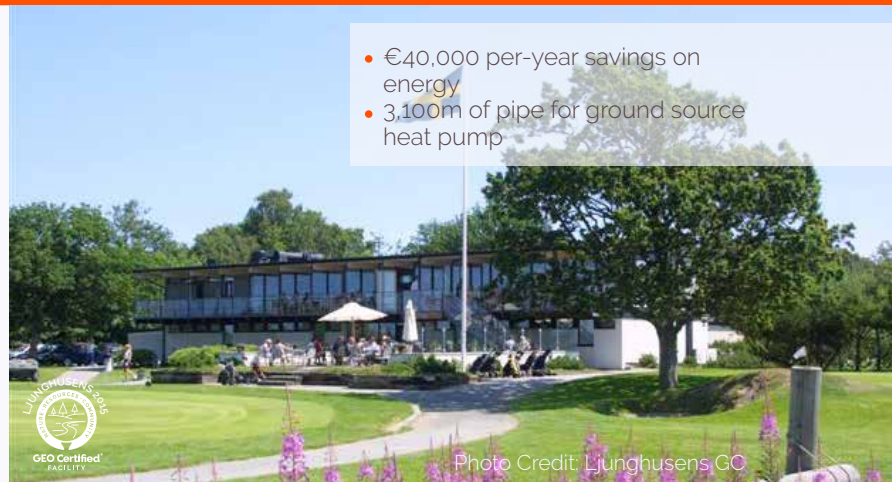
Ljunghusens Golf Club, Sweden

Designed by: Douglas Brasier

Owner: Private Owner

55°23'25"N 12°54'25"E

When Ljunghusens Golf Club renovated its clubhouse, sustainability was an important consideration. This led to passive design solutions and a focus on renewable energy. Although the clubhouse doubled in size, the club reduced its electricity and fuel bills, thanks to the instalment of a large-scale ground source heat pump with pipes beneath the semi-rough. The club is on track to pay back the investment within 4 years.



- €40,000 per-year savings on energy
- 3,100m of pipe for ground source heat pump



Photo Credit: Ljunghusens GC

Conclusion

Some, if not all, of the issues covered in this document will be applicable for public decision makers and consultees when considering the future of the open spaces in our urban and peri-urban areas.

The series of examples included here are being generated by golf facilities making short- and long-term changes to better address the issues facing our wider society as well as making their businesses more productive and profitable. Golf and its green open space should be viewed as an asset, not a liability, when reviewing the balance sheets of our cities.

Through careful planning and a good understanding of the options, well-designed, constructed and maintained fields of play can provide communities with the

opportunity to gain access to outdoor recreation, open space, nature and social connection.

Simultaneously, these open spaces can help public decision makers deliver more effectively on their economic, social and environmental targets and aspirations for their jurisdictions.

Each individual facility will have its own set of circumstances that will need to be considered before embarking on any proposed alterations. People may think 'this doesn't work here'. What is set out in this document reinforces the importance of reviewing the situation with the full knowledge of its potential.

Golf facilities, as increasingly rare open spaces in our urban and peri-urban areas, offer a valuable asset that can help cities and towns solve issues of water management, habitat creation, pollution control, improved health and quality of life, social cohesion and sustainable urban growth. Golf facilities can provide for a number of diverse uses, shaped to address local environmental, social and economic needs.

'When we refer to "Municipal Golf," what we're really talking about is Community Golf. These facilities are the backbone for bringing so many new players to the game. When Municipal leadership can begin to look at their golf facilities differently, opportunities to provide a better overall experience, as well as higher ROIs for their community, will occur much more frequently.'

Andy Staples, ASGCA
Staples Golf Design

The Quarry Golf Course, San Antonio, Texas, USA

Designed: Keith Foster

Owner: City of San Antonio

29°29'49"N 98°28'36"W

Some 10 years after it closed, a former limestone cement quarry just 5 miles (~8 km) north of downtown San Antonio was revitalized and converted into the 18-hole Quarry golf course. The abandoned quarry landscape lends itself to dramatic golf features, with 100-foot-high rock faces. The course is open to all and can be played for less than \$40 per round. The course made use of elevated walls for its clubhouse and a successful public restaurant with expansive views.



- Former limestone quarry converted into 18 hole golf course, clubhouse and mixed use development area
- Public golf course played for less than \$40 per round

Photo Credit: Skyway Golf Course

Kevin Duggan Academy, Luton, England

Designed: Ken Moodie, EIGCA.

Owner: City of Luton

51°51'53"N 00°25'05"W

Based at the 18-hole Stockwood Park public course, this 9-hole short golf course (or pitch and putt) was built for a charity representing disadvantaged children. Created in partnership with the local authority, the charity paid for the construction of the course in exchange for 50% use, while the local authority provided the land and maintenance. The course has holes from 50 to 100 yards in length, to encourage new players to develop their skills. It is supported by the Ryder Cup European Development Trust



Photo Credit: Ken Moodie, EIGCA

- Built in partnership between charity and local authority
- 9 hole short course
- Free for disadvantaged children of the Kevin Duggan Charity
- Supported by Ryder Cup Development Trust
- Built for £150,000 (2004)

The Refuge, Flowood, Mississippi, USA

Re-designed: Nathan Crace, ASGCA (2018) | Original Design: Roy Case (1998)

Owner: City of Flowood

32°18'57"N 90°05'43"W

Redesigned to be a profitable and efficient partner for a new resort hotel, the renovation of The Refuge involved the removal of invasive tree species to open playing corridors – improving ecology, water quality and playing surfaces. The work included new greens, bunkers and irrigation, as well as 3 new holes and the American Society of Golf Course Architects Foundation's and U.S. Kids Golf Foundation's Longleaf Tee System to suit players of all abilities, with sets of tees from 4,500 to 7,045 yards.



LONGLEAF TEE SYSTEM



- Longleaf Teeing System for players of all abilities
- Removal of invasive tree species
- Easier to maintain and play
- Created a quicker 9 hole loop for players by creating 3 new holes

Kristianstads Golf Club, Åhus, Sweden

Designed by: Douglas Braiser and Tommy Nordström

Owner: Private company

55°55'25"N 14°16'28"E

Founded in 1924 on the edge of Åhus in the south of Sweden, the Kristianstads golf club works with the local biosphere office to provide outdoor leisure activities besides golf. Management practices have changed to promote biodiversity, and new paths have been created to extend pedestrian networks. Local wildlife interest groups gather on the property regularly to watch and record the flora and fauna – promoting social connectivity and improved health and well-being.



Photo Credit: Kristianstads Golf Club

- Home for local wildlife group
- Greater levels of biodiversity
- Information board to raise awareness of valuable habitats and species
- Increased physical activity

Golf Development Industry

Golf development is an interdependent industry including developers, architects, builders, superintendents and suppliers, working closely together to deliver the next generation of golf courses. Their contributions to this publication are much appreciated and bring to life the subject of sustainable golf development through case studies and insights into their work and achievements.

American Society of Golf Course Architects (ASGCA)

Established in 1947 by fourteen founding fathers, the mission of the ASGCA is much the same today as when those original members outlined the articles of incorporation:

- Foster the game of golf, its growth and advancement.
- Foster professionalism of ASGCA members through education, promotion and fellowship of the world's leading golf course architects.
- Support design excellence by creating golf courses that are technically, strategically and aesthetically excellent while meeting the economic, environmental and other needs of golf course owners, developers and communities.
- Expand the opportunities of ASGCA members to better serve their clients and the game of golf.

The ASGCA are proud to have participated in the creation of the guidelines. We believe this tool can help promote sustainable golf course development, and help the golf industry continue to raise its profile as an entity dedicated to good stewardship of the environment.



Society of Australian Golf Course Architects (SAGCA)

The SAGCA was formed in 1989 with the purpose of creating a society of fellow professionals with the intent of meeting regularly to exchange ideas and experiences, encourage the highest standard of golf course design and construction, and further advance the status of their golf course architecture.

SAGCA aims to encourage the advancement of the game by highlighting its health benefits, the opportunities for social interaction and the importance of golf courses as green open spaces – especially in cities.



European Institute of Golf Course Architects (EIGCA)

The EIGCA represents Europe's most qualified golf course architects. Members of the EIGCA have shown through their skill, experience and training that they are able to design and oversee the construction of golf courses to the highest standards. The EIGCA believes golf course sustainability and stewardship of the environment to be the cornerstones of golf course architecture. Golf courses can have a positive impact on the environment and the ways in which golf course architects design courses reflect the importance of environmental sustainability in golf course development.

These guidelines and associated tools, including the EIGCA's sustainable education programme 'Raising the Standard of Sustainable Golf Course Development' are important in demonstrating that golf courses can be developed in ways good for all concerned. The EIGCA is proud of our input assisting GEO Foundation, which dates back more than a decade, and look forward to further close collaboration with all of the team there in the coming years.

Golf Course Builders Association of America (GCBA)

The GCBA is a non-profit trade association of the world's foremost golf course builders and leading suppliers to the golf course construction industry. Founded in the early 1970s, its members represent all segments of the golf course construction industry.

The GCBA enjoyed providing guidance through the creation of the guidelines, and thank GEO for providing these tools to promote sustainable golf course development and maintenance across the globe.



Photo Credit: Aidan Bradley, Askernish Golf Club

About GEO Foundation

Since 2006, the GEO Foundation (GEO) has worked to support sustainability in and through golf, building on a history of social and environmental value which is at the root of the game.

GEO is the only international non-profit dedicated entirely to providing a credible and accessible system of **sustainability standards, support programmes, recognition, and capacity building** for golf courses, developments, government ministries, NGOs and local community groups.

Sustainable thinking carries direct benefits, ranging from cost-effective facility operations, to the more compelling and successful planning and building of golf courses, and ultimately to helping to **future-proof our open spaces**, which are increasingly under pressure from other land uses, hard development, water scarcity and regulation.

Sport can play a significant role in achieving sustainable growth, as it inspires extraordinary levels of attention from its followers. Many sports are acting on this opportunity, starting initiatives to make their operations more

sustainable, and then becoming advocates of sustainability to fans and the public.

As a central component of golf's efforts, GEO manages and assures an innovative support platform, **OnCourse®**, which provides customized project services and streamlined sustainability reporting to development teams and golf courses. It offers strategic project and facility planning, identification of key issues, team coordination and credible representation of the associated environmental and social value to governments, investors and other stakeholders.

OnCourse® follows golf's **three sustainability themes** – nature, resources and community – to practically apply the three pillars of sustainability to each situation. The objective is to tackle the broad and complex subject of sustainability by guiding **real-world decisions and taking practical actions** that make a difference.



Nature



Resources



Community

OnCourse®

Developments | Tournaments | Facilities



GEO Certified® Tournament



GEO Certified® Facility



GEO Certified® Development

'Golfs needs to get more active and communicate even more strongly about their "greening" efforts and mitigation so that people grasp the game's commitment and value. You have all the ingredients ready to take action.'



Dr. Hoballah, former Senior Director
United Nations Environment Program

'As a multi-billion dollar global industry, it is time golf took deliberate collective steps to be a leader in sustainability. The programs set up by GEO for golf are world-leading and we would like to see golf fully committed.'



Richard Holland,
Director at WWF International

GEO Certified® and International Social And Environmental Labelling Alliance

ISEAL Alliance

GEO also delivers a modern certification for golf, assuring credibility by continually meeting rigorous qualifications for full membership of the ISEAL Alliance. ISEAL is the global leader in defining and communicating good practice in sustainability standards, helping to drive sustainability systems towards credibility and effectiveness. The ISEAL Credibility Principles are the result of global multi-stakeholder collaboration and define the essentials needed to bring about positive social or environmental impact.



- GEO is a full member of the ISEAL Alliance



“

We believe that, done well golf courses provide multiple positive benefits to local environments and wider communities. Those benefits are complex and often interconnected but provide the opportunity to enhance quality of life and enrich landscapes and ecosystems.

Jonathan Smith
Executive Director,
GEO Foundation

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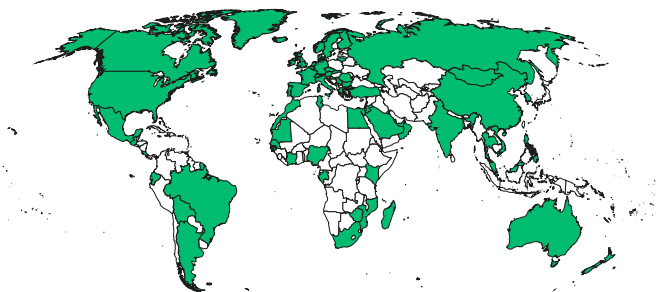
Voluntary Sustainability Standards for Golf

These standards have been developed through open consultation with the public and an international-expert working group, with years of real-world testing across the globe. They inform the delivery of sustainable golf facilities, developments and tournaments – **accessible, adaptable and affordable for all.**

Visit sustainable.golf for more information and support



Photo Credit:
Royal Ostend GC



OnCourse® reach today

GEO Certified®

The international mark of credible sustainability in golf. Recognized by ISEAL, the global body for credibility and assurance in sustainability systems. After completing OnCourse® a facility, development or tournament can apply for this **international distinction.**



Technical References

Scale of a Golf Course

The diagrams below illustrate examples of the possibilities for golf within sites of different sizes. There are no definitive guidelines on the size of a golf facility as it depends on numerous factors, including shape, slope, adjacent land use and existing natural features, and can range from hundreds of hectares to less than one, depending on the number of holes and the types of activities being offered.

The facts and figures below are a broad indication as to what may be possible on a given site. These are not to be used for site selection purposes. Reference to the International Voluntary Sustainable Standard for Golf Developments at [sustainablegolf](https://www.sustainablegolf.org/) can be made to assist in project planning.



50,000m² / 540,000 sq.ft

On a site this size, the illustration shows a 3 hole par 3 layout and a large short-game practice area, with clubhouse and maintenance facility with car parking.

Facts & Figures

Total length = approx. 475-525 yards.

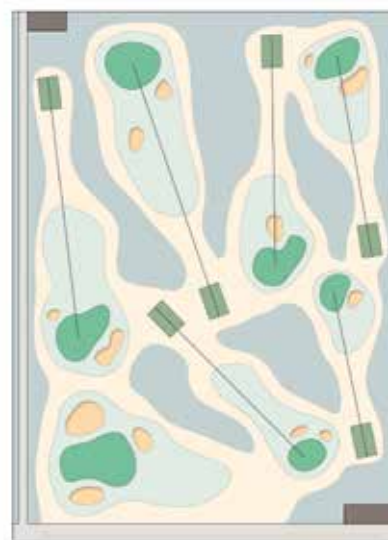
Practice area = 120 yards x 60 yards (20,000 sq.ft green shown)

Other Facilities:

Clubhouse = 600m² / 6,500 sq.ft

Maintenance = 450m² / 5,000 sq.ft

Car Park = 40 - 50 spaces



125,000m² / 1,350,000 sq.ft

On a site this size, the illustration shows a 6 hole par 3 layout and a large short-game practice area, with clubhouse, maintenance facility and car parking.

Facts & Figures

Total length = approx. 1,000-1,250 yards.

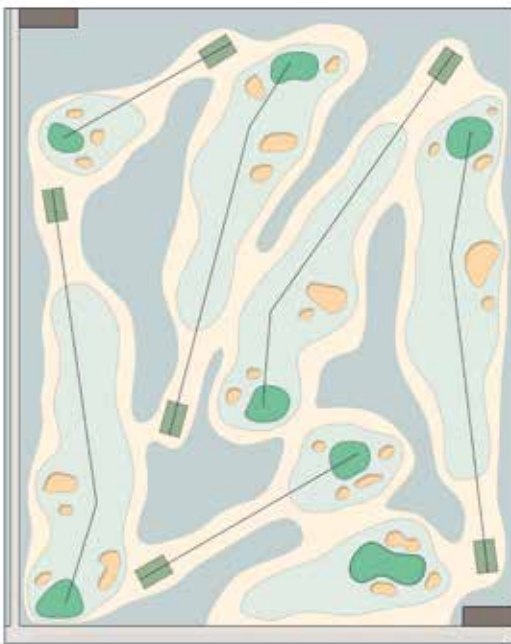
Practice area = 200 yards x 85 yards (20,000 sq.ft green shown)

Other Facilities:

Clubhouse = 600m² / 6,500 sq.ft

Maintenance = 450m² / 5,000 sq.ft

Car Park = 60 - 70 spaces



200,000m² / 2,150,000 sq.ft

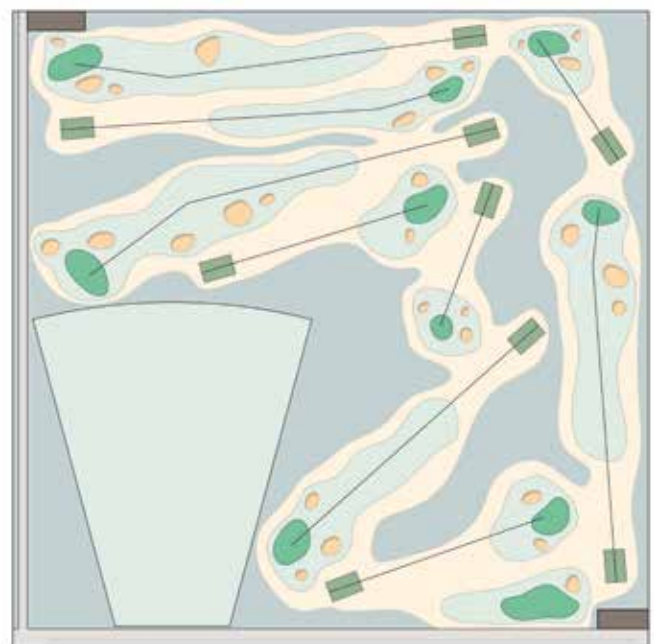
On a site this size, the illustration shows a 6 hole short course and a short-game practice area with clubhouse, maintenance facility and car parking.

Facts & Figures

Total length = approx. 1,650-1,850 yards.
Practice area = 165 yards x 70 yards (15,000 sq.ft green shown)

Other Facilities:

Clubhouse = 600m² / 6,500 sq.ft
Maintenance = 700m² / 7,500 sq.ft
Car Park = 90 - 100 spaces



250,000m² / 2,700,000 sq.ft

On a site this size, the illustration shows a 9 hole short course with full length range and short-game practice area with clubhouse, maintenance facility & car parking.

Facts & Figures

Total length = approx. 2,250-2,500 yards.
Practice area = 120 yards x 45 yards (10,000 sq.ft green shown)

Other Facilities:

Clubhouse = 600m² / 6,500 sq.ft
Maintenance = 700m² / 7,500 sq.ft
Car Park = 110 - 130 spaces

Technical References

Costings

The information below is taken from industry sources to provide a broad indication to the reader about the issue of costs. It is important to note that each situation will be different and, as such, it is advisable to seek expert advice to assist with any budgeting exercise.

Unfortunately, there is no given formula for the **overall cost** of constructing or remodelling a golf course. This figure depends on a number of factors, including those in the excerpt below from 'The Golf Course Development Process' by The American Society of Golf Course Architects (ASGCA).

'What are some of the key aspects in **site selection**?

- Location, location, location
- Terrain which requires minimal earthmoving
- Suitability for an environmentally sensitive approach to golf course development
- Quality soil suitable for excellent turf grass

What are the **primary questions** to address for a specific site?

- Property size and configuration
 - Can a quality golf course routing be achieved within the useable land?
- Suitability to support healthy turf growth through soils proper drainage and water availability
- Ease and availability of utility connections, including those

necessary for a clubhouse and maintenance facility

- Accessibility of the project for construction logistics
- Proximity to population centers and thoroughfares
- Governance, including regulatory restrictions/zoning criteria
- Adjacent land uses/distractions, such as air traffic, noise, etc...'13

Maintenance is another area of key consideration. Below is an excerpt that has been paraphrased from the 'Affordable Golf Facility Development' by The R&A.

'Designs that are reasonably maintenance friendly, made to suit ease of mowing and other practices, will be inherently cheaper to maintain. Intricate bunker design will be labour intensive; up to 25% of maintenance time can be spent managing such complex hazards.

The cost of ongoing maintenance must be factored into budgets to ensure that the facility remains affordable and accessible. The main maintenance costs to consider are:

Labour. Consider where the trained workforce going to come from.

Machinery. There is a lot more to maintaining a golf facility than cutting grass. The range of maintenance tasks required will

determine how much equipment will be needed, but an 18-hole facility can be looking at upwards of £250,000.

Machinery maintenance. Consider an employed mechanic, which would save a lot of machinery down-time compared to having to send machinery away for servicing.

Irrigation (if required). The hardware of a system is not the only cost to consider. There is also the need for maintenance of the system, the cost of pumping and the cost of the water itself.

Materials. A wide range of materials are needed to maintain a golf facility. These include fertilisers, top dressing, bunker sand, wetting agents and pesticides.

Buildings. Staff, machinery, any irrigation hardware and materials will all need suitable housing.

Energy. Petrol, diesel and electricity will all be required to power machinery, any irrigation pumps, lighting in buildings, etc.

Waste management. Much can be done to reduce waste through re-using and recycling programmes but maintaining a golf facility will produce waste materials and some of these will likely have to be uplifted from site, which will incur a business cost.

Generally speaking, the larger the facility and the more intricate its design, the higher the cost of maintenance. This can vary from £1,000's for small-scale facilities to £100,000's for higher end courses.'14

Courtesy of:



13. Excerpt from: ASGCA. 2006. 'The Golf Course Development Process'. 14. Excerpt from: The R&A. 2012. 'Affordable Golf Facility Development'.

Glossary of Terms

Term	Definition
Health and Wellbeing	The absence and prevention of diseases or illnesses and the aspirational state of complete physical, mental and social wellness.
Resilient Cities	An idea pioneered by The Rockefeller Foundation, it refers to cities that adopt strategies to address shock events such as earthquakes, fires, floods, etc. and stresses such as high unemployment, inefficient transport systems, food or water shortages etc., allowing the city to deliver basic functions better in good and bad times.
Green infrastructure	A strategically planned network of high-quality natural and semi-natural areas with other environmental features, which is designed and managed to deliver a wide range of ecosystem services and protect biodiversity in both rural and urban settings.
Future proof	Taking actions and developing methods to ensure a system remains functional and relevant to the demands of tomorrow.
Public Golf Facility	A golf facility that allows access, at a commonly affordable cost, to any member of the public.
The Paris Agreement	An international government agreement within the United Nations Framework Convention on Climate Change, dealing with greenhouse gas -emissions mitigation, adaptation and finance.
Golf Clubs or Trusts	Organizations formed of a number of individuals acting collectively in the best interest of a shared asset, in this case a golf facility.
Course Presentation	The way in which the golf course is managed in terms of the turfgrass conditioning, bunker maintenance, greens speed, firmness and length of the grass amongst other detailed issues. ¹⁵
Fixed Pitch Sports	Sports that are played on a defined size and shape of field, such as tennis, soccer.
Golf's Playing Field	The grounds in which the game is played and/or practiced on.
Watershed Management	The process of implementing land use and water management practices to protect and improve the quality of water and natural resources within a river catchment.
De-carbonizing	Reducing the amount of gaseous carbon compounds released as a result of an activity.
Bio-waste	Any waste material capable of decomposing under anaerobic or aerobic conditions.
Seepage pollution	The slow escape of a liquid or gas through a porous material, causing harmful or poisonous effects.
Par	The number of proposed shots it takes to play a hole i.e. Par 4 sometimes aggregated for a number holes i.e. Par 72

15. For more details, see: The R&A. 2016. 'Course Policy Document Template'.

1 Ha. of turfgrass
£3 to play 18 fun putting holes
10 mins. walk from the middle of town



Photo Credit: GEO Foundation | View across The Himalayas back towards St Andrews





Further Reading

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**More
than a
game**

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Photo Credit: Abby Hopper | Wildflower meadow as part of the course at The Schoolhouse Nine



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