Golf Course Maintenance and the ADA

Maintaining a golf course for golfers with disabilities.

BY PATRICK J. GROSS

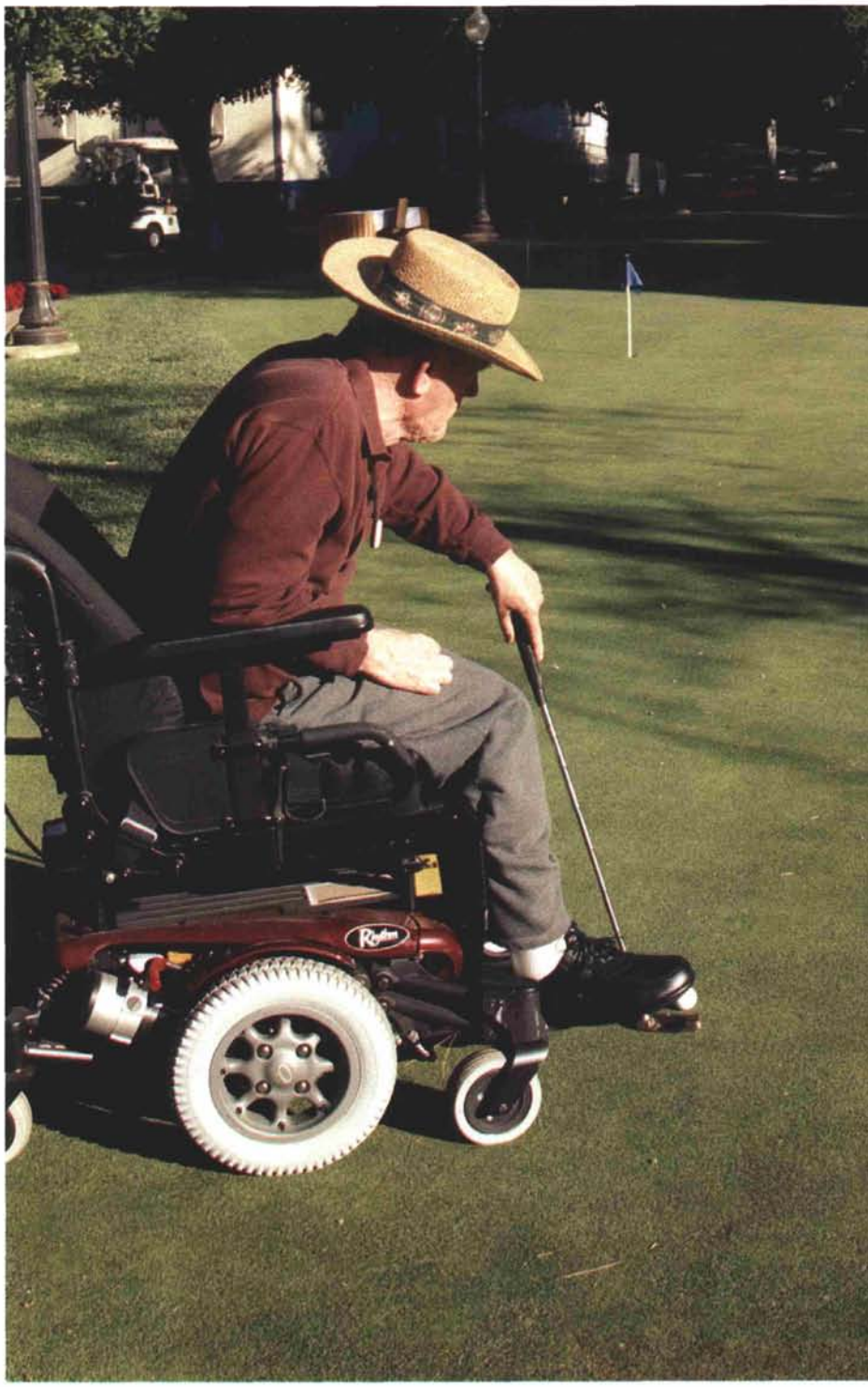
Golfers come in all shapes, sizes, and abilities, or disabilities, as the case may be, and they have at least one thing in common — they are all golfers. It is estimated that 4 to 5 million disabled Americans either play golf or are interested in learning the game. Since the Americans with Disabilities Act (ADA) was signed into law in 1990, many barriers have been removed to allow people with disabilities to access public buildings, transportation, and recreational activities, including golf.

Many of the provisions of the ADA have already been adopted and are commonplace in the United States. Although the compliance requirements for buildings and other public areas are straightforward, it has taken several years to develop workable standards for various recreational facilities such as golf courses, and still there are issues to be resolved.

Since the law was passed, course owners, professional staff, and superintendents have been apprehensive about how to implement some of the proposed standards. Will they be required to remodel the course? How much will it cost to make the necessary changes? Will they be forced to let wheelchairs and other types of mobility devices drive across greens and potentially cause damage? Will disabled golfers slow the pace of play? The perceived problems and adjustments are not as overwhelming as they may seem. Addressing a few key areas can make your course more playable and enjoyable for all golfers.

ELEMENTS OF THE ADA THAT PERTAIN TO GOLF COURSES

The ADA Accessibility Guidelines (ADAAG) address buildings, golf courses, and other



Since the Americans with Disabilities Act was signed into law in 1990, some superintendents and course owners have been apprehensive about how to implement the proposed standards. The perceived problems and adjustments are not as overwhelming as they may seem, and addressing a few key areas can make the course more playable and enjoyable for all golfers.

Curbs and other man-made barriers that are often installed along paths may need to be modified to comply with the ADA accessibility guidelines. Openings at least 60" wide are recommended for curbs to allow access to the driving range, teeing grounds, and at 75-yard intervals along fairways.

recreational facilities. These guidelines were developed to make the game of golf accessible to as many golfers as possible and not detract from the fundamental challenge and nature of the game. The following is a brief summary of the proposed guidelines:

1. Accessible Routes: Continuous, unobstructed pathways of at least 48" in width must be available to connect all areas within the boundaries of the entire golf facility, including:

- Bag drop area.
- Parking lot.
- Clubhouse and pro shop.
- Practice facilities.
- Golf course (tees, fairways, greens, and routes between golf holes).
- Course toilet facilities.
- Amenities (snack bar, halfway house).
- Weather shelters.

In most cases, an accessible route will be some form of path.

2. Alternative Golf Cart Passage: The ADAAG recognizes that it may be impractical to provide an accessible route (48" wide path) through all areas of the golf course due to the unpredictable nature of golf ball flight and the fact that altering slopes or the architecture of the course could diminish the challenge of the game. In such instances, an alternative golf cart passage can be substituted for an accessible route. This is simply an area that can be used by golf carts to gain access to certain areas and does not need to have a prepared surface. As an example, alternative golf cart passages would be a recommended route over a turf area to access greens, fairways, and teeing grounds.

3. Practice Facilities: Driving ranges and practice facilities must have an accessible route or golf cart passage (48" wide) that is connected to accessible teeing stations. At least one teeing station or a minimum of 5% of the total number of stations, whichever is greater, must be accessible and provide space for a golf cart to enter and exit.

4. Teeing Grounds: Access must be provided from the path to at least one teeing ground on each hole. If one or two teeing grounds are provided for a hole, only the forward teeing ground must be accessible. For holes with three or more teeing grounds, two of the teeing grounds must be accesible. The guidelines state that existing courses do not have to provide access to the forward teeing ground if terrain makes compliance infeasible.

5. Course Barriers: Curbs and other man-made barriers are often installed along paths to restrict golf carts from entering at specific points. Where such barriers exist, openings at least 60" wide must be provided at intervals not to exceed 75 yards.

6. Greens: Putting surfaces to be built or renovated must provide at least one accessible

route. The guidelines recognize that limiting the architecture and slope of the greens to the proposed guideline of 1:20 would be too restrictive and unfairly take away from the fundamental nature of the game. There is reasonable flexibility in this regard, and the guidelines simply state that there must be at least one accessible route for golf cart passage.

7. Bunkers: Bunkers have been a particularly difficult issue to tackle because modifying the hazards to make them ADA accessible would change the challenge and character of the golf course. For this reason, there have been no proposed guidelines or design requirements applied to bunkers. From a playability standpoint, the USGA published *A Modification of The Rules of Golf for Golfers with Disabilities* that outlines procedures for retrieving a ball from a bunker, and dropping and playing the next shot from outside the bunker (see Rule 28 — Ball Unplayable). With good design, it is possible to construct bunkers with an accessible route; however, such design guidelines are not mandated at this time.

For more detailed information, obtain a copy of *Accessible Golf Courses — A Summary of Accessibility Guidelines for Recreational Facilities,* available from the United States Access Board (www.access-board.gov).

THE IMPACT OF MOBILITY DEVICES ON TURF

Once the ADA was enacted, superintendents had many concerns about the various assistive devices that could be operated on greens and other sensitive turf areas without restriction, as well as everyday golf cart traffic. Typical concerns included:

- Indentations created by crutches, thin-tire wheelchairs, and single-rider golf carts that could impact playing conditions and ball roll, especially on greens.
- Soil compaction.
- Tearing and scuffing of the turf on greens from making sharp turns and abrupt stops with mobility devices.
- Wear and tear on older greens.
- The potential for significant damage when golf carts and other adaptive equipment are operated under very wet conditions.

The concerns about traffic and turf damage are not unique to mobility devices and can occur with any type of traffic that is applied to turf. There are several references to turf damage caused by traffic in the scientific literature. Beard (1973) mentions that vehicular and foot traffic can cause damage to turfgrasses and contribute to soil compaction. The mechanism of this injury is due to a combination of factors, including pressure, abrasion, scuffing, and tearing. Burton and Lance (1966) reported that more wear damage occurred on turf from vehicles with narrow, high-pressure tires, sharp turns, and repeated passes over a specific area. Carrow and Johnson (1989) evaluated two golf cart types and various tire designs and the impact on the amount of wear damage caused to Tifway bermudagrass. They concluded that the most important factors influencing the amount of damage were moderately sharp turns and the number of repeated passes over the turf.

The research that is most pertinent to this topic was conducted by Murphy and Gentilucci at Rutgers University in 1995 and 1996. Their study focused on developing quantitative tests to assess the surface characteristics of putting greens and quantifying the disruption to the playing surfaces when various types of assistive devices were used. The study was conducted on both sand-based greens and amended native soil greens at 11 golf courses in New Jersey. These courses represented a range of conditions, including soil moisture content, soil texture, depth of mat layer, and turfgrass species. The forms of traffic evaluated are summarized in Table 1.

Table 1
Traffic Source and Tire Characteristics Applied to Putting Greens — Murphy and Gentilucci, Rutgers University, 1997.

Traffic Source	Diameter	Width	Tire Type
Heel Sneaker		8 cm / 3.1"	
Heel Golf Shoe		7.5 cm / 2.9"	
Rigid-Tire Wheelchair	61 cm / 24"	2.5 cm / 1"	Rigid rubber
Quickie GPS Wheelchair	61 cm / 24"	3.5 cm / 1.4"	Pneumatic
Golf Express Single Rider	33 cm / 13"	16.5 cm / 6.5"	Pneumatic
Lone Rider Single Rider	33 cm / 13"	12.7 cm / 5"	Pneumatic

Although all forms of traffic caused some deflection in ball roll, the results were not as dramatic as anticipated. The following is a brief summary of some of the findings from the study:

- As expected, the worst-case scenario of using a narrow, rigid-tire wheelchair (what most would consider a standard wheelchair) on greens with high soil moisture content caused the greatest depth of depression; however, the average depth of depression was relatively shallow at 1.8 mm (0.07 inch). The 3.5 cm wide pneumatic tires caused even less of a depression at an average of 1.2 mm (0.04 inch).
- The maturity of the mat layer in the top 0-5 cm (0-2 inches) had an impact on the ability of a green to bear traffic and rebound from wheel rutting. Interestingly, the study found that new sand greens with a relatively immature mat layer were more susceptible to rutting when compared to older, modified native soil greens with a mature mat layer.
- Firmer surfaces resulted in less surface impact, especially on sand greens.
- Researchers measured the amount of rebound that occurred on the turf 30 minutes after the traffic was applied. The rebound effect was greater on the older modified native soil greens with a higher organic matter content and greater soil strength. Based on discussions with the researchers, they commented that it was difficult to identify the wheel ruts 30 minutes after the traffic due to the relatively shallow depressions initially made by the wheelchairs and the rapid rebound of the turf.
- Unfortunately, the two models of single-rider golf carts were not available for the duration of the study. Based on the limited amount of data collected, the wider tires of the single-rider golf carts did not cause significant surface depressions.
- The various devices were not tested under excessively wet conditions. The researchers felt that further research should be performed under a wider range of conditions.

MAINTENANCE CONSIDERATIONS

Traffic from Assistive Devices: We know from research and practical experience that all forms of traffic have the potential to cause damage to turf. The amount and intensity of damage is due to a combination of several factors:

- The health of the turf and strength of the surface mat layer.
- Moisture content of the soil, especially at the surface.
- Intensity of the applied force (psi).
- Shearing and abrasion from sharp turns or the rapid starting and stopping of a vehicle.
- Repeated traffic over a confined area.

Practices for managing wear damage are the same, regardless of the source of traffic. These practices include: dispersing traffic over a wider area; increasing the traffic tolerance of the turf with proper mowing, fertility, and irrigation practices; and applying corrective maintenance procedures such as core aeration, topdressing, and drainage improvement. A strong, resilient turf will be able to withstand various forms of traffic, including maintenance vehicles, regular foot traffic, and assistive devices. Based on the study by Murphy and Gentilucci, as well as interviews with superintendents at courses where these assistive devices have been used, the potential for damage from assistive devices is negligible in most situations. First, the overall amount of traffic from such devices is very limited since golfers with disabilities covered by the ADA are only a small part of the overall golfing population. Second, the technology of the new assistive devices and single-rider golf carts has improved since the Rutgers study in 1997. The majority of these vehicles have wide pneumatic tires that spread the weight over a wider surface area, and the controls allow the vehicle to start and stop smoothly without skidding. Third, the footprint and psi of these vehicles is generally less than most turf equipment routinely used on greens and other turf areas, including triplex mowers, aerators, and topdressers.

Soil Moisture and the Potential for Turf Damage: Any traffic over wet, saturated turf will cause some form of damage. The superintendents who were interviewed for this article universally agreed that keeping the turf on the dry side minimized or eliminated any potential damage from golf carts and assistive devices in addition to improving the overall playing quality of the course. Of course, there will be times when heavy rainfall will create saturated conditions and the use of any type of vehicle (maintenance equipment, golf carts, and assistive devices) should be suspended until the soil is adequately dry to support such traffic.

Accessible Routes: Where curbs exist along paths, it will be necessary to provide a 60"

wide opening at intervals not to exceed 75 feet. Wherever possible, it is ideal to place these openings where there is full sunlight exposure so that the turf will have a good opportunity for healthy growth and recovery from wear. Where traffic is confined to a limited area, it may be necessary to spot treat on a more frequent schedule with extra aeration and fertilizer applications.

Bunkers: Playability and access to bunkers is largely a matter of architecture. Providing a wide, relatively flat entrance to a bunker will make it easier for people using assistive devices to enter and exit the hazard. Firmer sand conditions are preferred for traction and to allow vehicles to travel over the sand without becoming embedded.

Superintendents interviewed for this article indicated that they have not made any changes to their normal maintenance programs to allow the use of mobility devices on their courses. In general, any programs that contribute to a strong, healthy, resilient turf surface and better playing quality will benefit all golfers, including those with disabilities.

Research at Rutgers University confirmed that the worst-case scenario of using a narrow, rigid-tire wheelchair on greens with high soil moisture content caused the greatest depth of depression on the turf; however, the depth of depression was relatively shallow at 1.8 mm (0.7 inch). The maturity of the mat layer in the top 0-2 inches had an impact on the ability of a green to bear traffic and rebound from wheel rutting. New sand greens with an immature mat layer were more prone to rutting when compared to older, modified native-soil greens with a mature mat layer.

SUGGESTIONS FOR DEVELOPING YOUR OWN PROGRAM

Although it is difficult to set a definitive policy until the final guidelines are adopted by the Department of Justice, it is a good idea to address the issue of accessibility proactively. You may wish to consider the following suggestions as part of your programs to operate and maintain a golf course that is accessible to golfers with disabilities:

- Analyze your course for accessibility and compliance with the proposed guidelines. An excellent reference for completing this exercise is *The National Alliance for Accessible Golf: Toolkit for Golf Course Owners and Operators*, available at www.accessgolf.org and the USGA Resource

Center for Individuals with Disabilities at http://resourcecenter.usga.org.

- Become educated about the ADA Accessibility Guidelines for Golf Courses and learn more about how to meet the needs of golfers with disabilities. Be open-minded and accommodating with regard to the use of adaptive devices. Research and experience indicate that these devices cause little or no damage to turf when properly operated.
- Mark areas of the course that are too wet and any other areas where mobility devices may have problems navigating. Be sure to relay this information to the starter and course marshals so they can inform golfers of any hazardous conditions.
- Test and evaluate various mobility devices at your course to see what impact they have on turf conditions. Better yet, test one yourself and possibly play a round of golf in a single-rider golf cart or other type of mobility device.

The concerns about traffic and turf damage are not unique to mobility devices and can occur with any type of traffic that is applied to turf, including utility vehicles and tractors typically used for maintenance.

- Be prepared to provide information and training, if necessary, for single-rider carts. Golfers who rent a single-rider cart at Haggin Oaks Golf Course in Sacramento, California, for the first time are given a five-minute training session on the three-hole practice area. Having a system or a procedure in place makes it easier for the customer and the staff.
- Consider making a map of accessible routes and alternate cart passageways for your course. The map also could provide information about accessible tees, bunkers that may be difficult to access, and areas of the course to be avoided. Golfers with disabilities are not risk takers — they want to enjoy their round of golf without getting stranded or causing damage to the course. A map or information card will help them accomplish that goal and enhance their golfing experience.
- There will be times when the course is too wet for maintenance equipment, golf carts, and mobility devices. It is important to be clear and reasonable with your explanation as to why golf carts or adaptive devices cannot be used on a given day. In general, if mowers and turf maintenance vehicles can be used on the course, it is reasonable to allow mobility devices as an accommodation to golfers with disabilities covered under the ADA. This can be a controversial topic and there are likely to be protests from other golfers who wish to use golf carts. While each case will involve a judgment call, it is important to remind other golfers that providing access is a matter of complying with the law.
- Consider a two-flag system for designating golf carts that have unrestricted access and others that simply need permission to drive closer to greens and tees. For example, a red flag can be

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used to designate golfers with disabilities covered under the ADA and a blue flag for other golfers with mobility impairments that allows them to drive closer, but not onto greens and tees.

- Continue to implement sound agronomic programs to grow strong, healthy, resilient turf. This will provide the best possible playing conditions for all golfers, including those with disabilities.

CONCLUSION

Allowing vehicles other than turf maintenance equipment on golf greens and any other sensitive areas can be nerve-wracking for superintendents. There is a fear that all the hard work and effort put into producing an ideal surface can be destroyed in an instant with various mobility devices. Sam Samuelson at Haggin Oaks Golf Course is one superintendent whose attitude has changed as a result of seeing adaptive golf carts in action. "The biggest thing for me was getting over the fear. Once I saw one of those carts drive across one of my greens, I quickly realized it was no more damaging than the triplex putting green mower I use every day. Those carts can go anywhere they want, as far as I'm concerned." His comments were echoed by other superintendents who have personal experience with the use of different mobility devices on their courses.

The Rutgers study was very encouraging for turf managers, considering the fact that under the worst-case scenario, there were relatively minor surface impacts caused by the wheelchairs and single-rider golf carts. Hopefully, more research in this area can be done to evaluate the impact of such devices under a wider range of conditions. Concerns about wear injury (scuffing and tearing) and damage to putting surfaces can be minimized with proper operation of the devices and good course etiquette. Since the time of the Rutgers study, there have been many improvements in design and technology to make the various mobility devices even more user-friendly and turf-friendly.

Mark areas of the golf course that are too wet and any other areas where mobility devices may have problems navigating.

The positive news is that the potential turf damage caused by various adaptive devices is negligible, and there should be very little concern on the part of golf course superintendents as long as common sense and good turf management programs are applied. While the provisions of the ADA were focused on removing barriers for people with specific disabilities, all golfers will benefit by making courses more accessible, playable, and easier to maintain. The USGA, through its Grants and Fellowship Program and other activities, has been very involved in growing the game and sharing the many positive aspects of golf with all segments of our society, including golfers with disabilities. There are many resources available through the USGA Center for Individuals with Disabilities to help golfers, course operators, and superintendents learn more about this issue. Turf issues are relatively minor compared to the overwhelming positive impact — both physically and psychologically — associated with exposing the game of golf to golfers with disabilities and removing barriers that prevent access to the course. As Sam Samuelson said, "Seeing that smile on the golfer's face made me realize the power of golf. To him it was truly more than just a game."

Single-rider golf carts are becoming more popular for golfers with mobility impairments. The wide pneumatic tires minimize the potential for turf damage in most situations, even on sensitive areas such as tees and greens.

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RESOURCES AND INFORMATION

USGA Resource Center for Individuals with Disabilities: http://resourcecenter.usga.org

National Alliance for Accessible Golf: www.accessgolf.org

National Center on Accessibility: www.ncaonline.org

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