Golf Course Traffic Control:

Maximizing Revenue While Protecting the Turf

By Steve Batten

Since the commercial production of the first golf car, the Arthritis Special in 1947, the science of reducing turfgrass wear stress and soil compaction has been a priority with every golf course superintendent.

Prior to golf cars, similar traffic concerns were caused by pull carts, caddies and golfers as they played "follow the leader" from tees to greens. The golf car only enlarged the problem of sportsman trampling sportsturf.

After all, it is the responsibility of all golf personnel to encourage more golf traffic to generate greater revenue. The superintendent shares this goal by promoting denser turf in intense traffic areas.

Many golf clubs are now requiring the rental of a golf car by each player. The revenue produced from renting golf cars has enabled golf clubs to maintain a steady source of income that has promoted our own turfgrass industry.

Golf cars have been a main focus of turf wear stress because of their increasing numbers and inadequate limitations to their use. In 1982, an estimated industry-wide revenue potential close to $1 billion a year was proposed for the 670,000 golf cars then in existence. The average nationwide number of golf cars was then 52.2 for 18 holes according to a survey by a major golf industry association. Since then, the trend to improve golf car fleet efficiency has increased this number. The National Golf Foundation and the Professional Golf Association are cooperatively compiling the results of a new status report on golf cars on the golf course.

On the positive side, golf cars have promoted the game of golf by enabling elderly players and those with medical considerations to enjoy the sport in more convenience and comfort. However, of the present 17.5 million golfers in the United States, the highest percent of those using golf cars is in the age group between 30-39 years. Common sense would predict an increase in the next 20 years of future elderly players in the age group over 59

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Quarter-circles at the end of cart paths disperse golf cars exiting from the path and help reduce concentration of wear.

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using golf cars. The fact that there will be a greater total number of players of all ages will increase the need for efficient traffic control.

Meeting this demand, the golf course superintendent will rely on his ingenuity and versatility typical of his profession to produce many tricks of the trade to reduce the wear stress caused by golf traffic. The basis of many of these traffic control techniques were pioneered in this country.

Much of the solution to car wear stress can be found in the design of the golf car. Research in more efficient power plants, better weight ratios, and tire standards has been continuous since the later 1950's.

Tire size and inflation are important considerations to reduce turfgrass wear. During the early 1960s the University of Georgia at Tifton in cooperation with Goodyear Tire Company and The Toro Company conducted a series of studies to determine the effects of tire size and inflation on turf wear. At the same time, the effects of tire size on cool season turfgrasses were being evaluated at Ohio State University. From both studies, the 9.50 width tire became the standard that has a great influence on golf cars built today.

Presently, four-wheel golf cars are gaining popularity over three wheel models because of a smoother ride. However, the three wheel golf car causes less loss of turfgrass leaf canopy and has a sharper turning radius due to its tricycle wheel pattern. Since three wheel golf cars often cost less, they present an ideal purchase situation for public golf courses with limited budgets or where turfgrass wear is a primary consideration.

The design of golf cart paths has evolved into design characteristics similar to proper highway and road construction. Cart paths are now typically eight feet in width to allow for mobility of both golf cars and maintenance equipment in all types of terrain. Some basic patterns include a collection of theories to provide gentle curves through non-playing areas. This reduces unfair and unnatural playing conditions and does not interrupt the pastoral beauty associated with a course.

Concrete cart paths, as opposed to asphalt, stone, or organic substance, should always be considered since its nominal cost will provide a more permanent and wear tolerant surface. A heavily brushed-finish surface is imperative to provide traction for both cars and golfers.

The cart path areas that receive the greatest concentration of wear are at the ends of the paths where the pavement meets the turf. These areas are referred to as stubbouts. Encouraging players in cars to scatter their traffic patterns will prevent permanent turf damage and tire ruts in the soil along the edges of paths. Flairing the end of the pavement or curving the path back toward the rough provides a wide radius for players to choose a point of entrance and exit. Wear on short concrete paths can be reduced by making the last concrete section into a quarter-circle. This rounded cart path end has proven very successful on several desert golf courses in Arizona.

Traffic buttons on the edge of a cart path remind golf car drivers to stay on the path as they would stay in a highway lane.

Many methods have been tried to reduce compaction at cart path ends and tire ruts. These include the removal of native soil and replacing it with sandy soil that resists compaction. Changing the soil in a small area at stubbouts can be disastrous because the sandy soil will move more readily and cause greater rutting and instability of the car.

A better solution is to raise the existing soil level to be the same as the pavement. This small soil ramp greatly reduces severity of the ruts or tire tracking.

Barriers also serve to distribute wear. A barrier can be any device that changes the flow of traffic. Most barriers on a golf course should be temporary objects, such

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as ropes, posts, or just timbers layed across the ground. The object is to divert traffic from an area while it recovers. Ropes and other barriers more than a few inches off the ground can cause damage to golf cars or injury to players when they are placed at the end of cart paths. At these points, small signs are commonly used to direct traffic away from the ends of the path.

In a similar manner, a 4 × 4 inch timber can be used to force golf cars to exit before they reach the end of the cart path. These temporary barriers layed across the path are not only highly mobile, but they cause little damage to the golf cars in the event of a collision.

If vertical posts are needed to prevent entry onto a protected area, they should be parallel and not perpendicular to the flow of traffic. An effective short vertical post barrier can be made from short sections of fence posts or painted timbers. They can be anchored with steel spikes (6 to 10 inches long) inserted in the bottom of the post. The spikes should be long enough to insure rigidity when placed into the soil.

Ropes should always be avoided as barriers on a golf course whenever possible. Ropes require daily attention to realign and tighten, a costly consideration from a labor standpoint. They are, however, customary for any ground under repair or around excavations, irrigation repairs, or reseeding.

The best height above ground at which to set ropes for high visibility has always been debatable. A rope set too low (12-24 inches) encourages golfers to step over and trip. The best height for marking ropes is 30-36 inches.

Golf cart paths have created another turf wear problem beside the areas at the end of paths. Golfers, whose minds are generally more on the location of their ball than how they are driving, constantly venture off paths causing wear on the turf adjacent to paths and parking areas next to tees and greens.

An idea gaining popularity is the use of small buttons placed 30 inches apart on the edge of paths and parking areas. These traffic control buttons are similar to the reflector buttons used to distinguish lanes on highways. They can be purchased commercially or made of anything from formed concrete to plastic. Any person who drives an automobile is familiar with these buttons and they provide a polite reminder to keep the wheels of golf vehicles on the pavement. One area where buttons are especially useful is the parking area at the first tee where order is perhaps most important. If the golf car driver starts the round under control, he is more likely to continue this care on the rest of the course.

Scatter block on a cart path helps distribute golf car traffic wear and can be easily moved to a new location upon need.

Buttons relate to a tendency people have to follow lines, just as they follow each other. A white line painted in front of the apron of each green will guide golf cars away from the green site. Lines are effective becasue they do not detract from the playability of the course. On private golf clubs, members are encouraged to keep their vehicles behind the lines near greens.

The first lines used for this purpose were made from chalk, but paint has since taken its place. Painted lines need to be repainted every two to three weeks in a new location during peak golf playing periods. In South Florida, a few golf clubs are now using highly visible plastic rope layed across the ground in place of painted lines. These ropes can be relocated more frequently than painted lines.

A recent development to reduce wear on turf has been the use of protective turf mats and subsurface cellular devices (blocks or grids). The mats, made of perforated rubber or plastic or geotextile fabric, distribute the load of the turf vehicle. The advantage of the geotextile is it allows the turf underneath to breath and receive some sunlight. The blocks or grids are buried in the soil and the cells are filled with soil and seeded. Both subsurface devices and geotextile also permit normal drainage of rain and irrigation water.

Currently, there is very little university research information about use of these devices in this country but they are found on a growing number of courses each year. In Japan, superintendents at several courses are trying a thick perforated plastic mat. The mat, approximately 1/2-inch thick with 3/4-inch holes, is pinned on top of the zoysiagrass and the turf is allowed to grow through it. Reduced traffic wear has been reported after the mat stabilizes and the turf matures.

Another interesting idea being utilized in Japan is the are incorporation of rubber walk paths into the asphalt cart paths. A two foot wide path made of rubber chips plasticized with a urethane resin is placed flush with the asphalt surface parallel to the cart path. The surface, like a rubberized track, is wear-resistant and provides a comfortable walking surface.

Cultural practices can also play a major role in managing turf wear and compaction. Any practice that stimulates deep roots, a dense leaf canopy, tillering or growth of stolons and rhizomes will provide extra protection from wear and improve the ability of the turf to recover.

Of course, little can help heavily trafficked turf if basic maintenance procedures are not followed. Aerification is extremely important along with regular application of fertilizer with high rate of potassium to stengthen turfgrass plants. Traffic areas should be mowed higher than other turf areas and soil should drain well to promote deep root development.

Another factor that affects the ability of turf to resist wear is plant maturity. As turf matures, it tillers, or in the case of warm season grasses, produces a dense underground rhizome system. An example of this is the fall overseeding of perennial ryegrass on bermudagrass. In early fall, the ryegrass is allowed to grow higher than normal until it tillers and matures.

Changing putting green cups and tee marker placements has become a daily practice by tradition to reduce wear patterns on tees and greens. However, these changes also alter the point of entrance and exit on these areas which distributes the traffic concentration on the areas surrounding greens and tees.

The success of any traffic control technique depends on the cooperation of the golf players to scatter their traffic patterns. However, it is the golf course superintendent's responsibility to grow more grass than golfers and their cars can wear out. ▶

Editor's note: Steve Batten is agronomist for Golfturf, Inc., a Jack Nicklaus company in North Palm Beach, FL, which has designed and consulted more than 30 golf clubs around the world.