

VIRGINIA'S GOLF ECONOMY, 2005



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Prepared for:

**The Virginia
Golf Council**



Prepared by:



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I. STUDY OVERVIEW

Golf is more than an enjoyable pastime—it is a key industry contributing to the vitality of Virginia's economy. In 2005, Virginia's golf industry generated approximately \$3.1 billion of direct, indirect and induced economic output, \$948.4 million of income and 40,189 jobs. The size of Virginia's direct golf economy was approximately \$1.6 billion in 2005. Golf brings visitors to the state, drives new construction and residential development, generates retail sales, and creates demand for a myriad of goods and services through the operation of the golf facilities themselves.

Although many golf-related economic studies have been conducted at the state level, there has been no comprehensive, standardized framework employed in these studies. This makes it difficult to monitor industry growth over time in a specific state, or to make comparisons of the size of the golf economy and its impact across states. This report describes and analyzes Virginia's golf industry cluster, including the revenues and economic impact generated by the industry. The report represents significant investment in developing a consistent and comparable state-level economic impact framework by GOLF 20/20, SRI International, and the Virginia Golf Council¹, as well as the estimation of the golf industry's 2005 economic impact in the State of Virginia.

There are many potential uses for such an analysis:

- Defining the wide range of core and enabled industries associated with the game of golf;
- Clearly articulating, for policymakers, the employment and revenue-generating contributions of the golf industry to the state economy;
- Building credibility and recognition of the golf industry as a significant business sector and a driver of economic activity in the state; and
- Creating an economic context to understand the benefits generated by the golf industry through its use of land and water resources. Specifically, this report puts the Virginia golf industry's water usage into context vis-à-vis other large water users in the state and highlights the economic returns on this water use.

II. ANALYTICAL FRAMEWORK

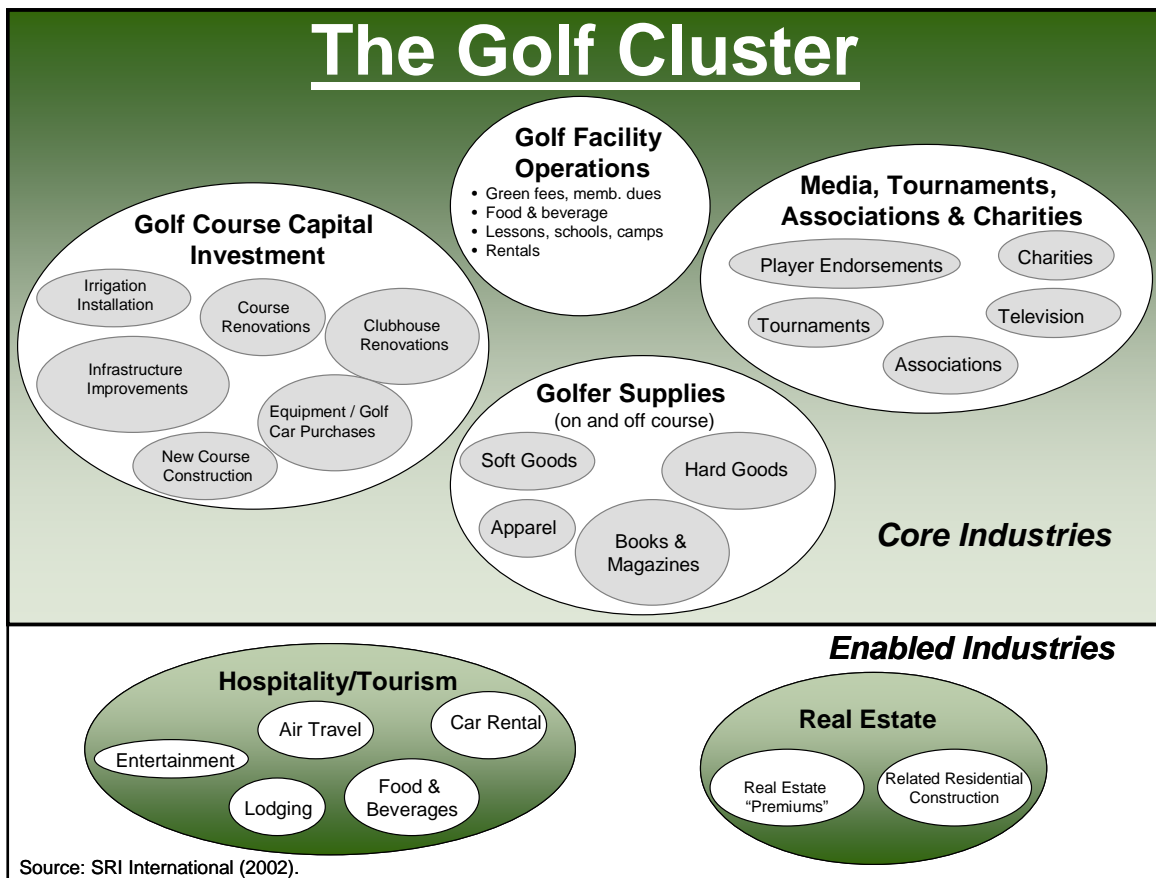
The goal of this study was to develop a replicable framework that provides: (1) rigorous, credible estimates of the size of key golf-related industries that will feed into a state-level golf economic impact assessment and (2) comparability of golf economic impact assessments across states. Current economic studies of the golf industry in different states emphasize different factors and outcomes. For example, one may focus largely on the turf industry, while another might examine the impact of sports and recreation-related tourism more broadly. Ideally, one would want to include all the key activities and industries that are enabled by and benefit from the game of golf.

¹ The Virginia Golf Council is a statewide alliance of representatives from the Virginia State Golf Association (VSGA), the Virginia Golf Course Superintendents Association (VGCSA), the Middle Atlantic Section of the Professional Golfers' Association (MAPGA), the Virginia Turfgrass Council (VTC), the Virginia Chapter of the Club Managers Association of America (CMAA-VA), and related golf organizations.

To meet this goal, SRI has developed a standardized, economic impact framework that can be employed to measure a comprehensive set of golf-driven industry components. This state-level framework draws on the conceptual model of the golf economy developed in SRI's 2000 national-level *The Golf Economy Report*.

A. Golf Industry Cluster Definition

In order to arrive at economic impact, one must first estimate the size of the golf economy in the state. This entails mapping out where the golf industry begins and ends, and then estimating the size of each of these industry segments. We divide the golf industry cluster into two main categories: (1) core industries and (2) enabled industries (see figure). The golf industry cluster begins with the golf facilities themselves and with those other core industries that produce goods and services used to operate facilities and to play the game: golf equipment and apparel manufacturers, golf course architects, turf maintenance providers, and club management services. The game of golf further enables a number of other industries, such as golf-related tourism and real estate development.



We detail these industry segments and estimate their size in the following section. Having defined the core and enabled golf industries, it is possible to estimate the size of each industry segment and to total them for an overall estimate of the size of the golf economy. Multipliers can then be applied to calculate the ripple effects of these economic activities in terms of: (1) impact on total

state economic output and (2) impact on total state employment. However, this process is complicated by the fact that, while most of these industries produce golf-related goods and services, the firms themselves may not limit their activities exclusively to the golf industry. For example, Nike produces golf shoes, but also running, tennis, basketball, and other shoes. Therefore, in general, our approach is to include only those firms and sales that are directly attributable to the game of golf. In so doing, we use a number of different estimation techniques to ensure that our final estimates are reasonable and robust.

Moreover, additional data challenges and location factors make estimation more difficult at the state level than the national level. For example, many of the major golf equipment manufacturers have headquarters and production facilities in just a few states. Similarly, several of the major golf association headquarters are located in Florida. The presence of such firms, associations, or a number of well-known courses will change the size of golf's economic impact in the state considerably. Therefore, one should consider the size of the golf economy and the game's economic impact in the state in relation to the size of the overall economy and other major industries in that state.

B. Data Sources

SRI developed a coherent, replicable framework for measuring the state golf economy based on a broad set of existing sources and data. Although there have been several state-level impact studies conducted in the past, by numerous golf constituencies, few have used a similar methodology, resulting in very different estimates depending on the golf economy elements included. A great deal of data are collected on the golf economy by many organizations on a regular basis. For example, government agencies, national golf associations, and national associations in the enabled industries collect data on different industry elements periodically—annually, every few years, or every five years. In addition, these data are based on a relatively consistent set of inputs by large numbers of constituents. Therefore, the principal challenges involve acquiring the data, inflating or deflating the estimates for the proper target year, and then combining them to represent the entire golf economy in the target year. The core and enabled industry indicators and data sources we have identified are presented below.

State Golf Economy Indicators and Data Sources		
Indicator	Primary source	Cross-validation source
Golf Facility Operations		
# of golf course facilities by type	2002 Economic Census	2006 PGA Facility Operations Survey (2005 data); state task force
Avg. revenues by type of facility	2002 Economic Census	2006 PGA Facility Operations Survey (2005 data); state task force
# of rounds by facility type	2006 PGA Compensation Survey (2005 data)	National Golf Foundation
Avg. revenues by round type	2006 PGA Compensation Survey (2005 data)	National Golf Foundation
Golf Course Capital Investments		
Avg. capital investment by type of facility	National Golf Foundation	State task force; interviews with golf course builders in state

State Golf Economy Indicators and Data Sources		
Indicator	Primary source	Cross-validation source
Number of golf courses under construction in current year	National Golf Foundation (2005 data)	Golf Course Builders Association of America; state task force
Avg. cost of construction per new course	Golf Course Builders Association of America	State task force; interviews with golf course builders in state
Golfer Supplies		
Golf equipment	National Sporting Goods Association (2005 data)	2006 PGA Compensation Survey (2005 data); 2006 PGA Facility Operations Survey (2006 data)
Golf apparel	National Sporting Goods Association (2004 data)	2006 PGA Compensation Survey (2005 data, gross sales by facility type); 2006 PGA Facility Operations Survey (2006 data)
Golf media	Magazine Publishers of America for golf magazine sales; Amazon and Barnes & Noble for top golf book sales	<i>Bowker Annual of Library and Book Trade Information</i> (2006)
Major Tournaments		
# of major tournaments held in state	State task force	Major golf associations
Visitor attendance at tournaments, tournament revenues	Major golf associations	State task force or state associations
Associations & Charities		
# of major state-level golf associations	State counterparts of national golf associations	State task force
Annual revenues/budgets	State golf associations	State task force
# of employees	State golf associations	State task force
Revenues raised through golf-related charities	Sampling of golf professionals to identify # of tournaments and average amount raised	National Golf Foundation
Real Estate		
# of residential golf courses under construction	National Golf Foundation; real estate/development agencies	Interviews with state level golf course architects and real estate developers
# of lots per course	Interviews with golf course architects and real estate developers	Golf Course Builders Association of America, National Golf Course Owners, National Association of Home Builders
Avg. construction costs per home and real estate premium	Interviews with golf course architects and real estate developers	Golf Course Builders Association of America, National Golf Course Owners, National Association of Home Builders
Hospitality/Tourism		
# of golf travelers or # of golf-related trips to the state	Travel Industry Association (TIA) of America	State department of tourism/recent surveys/studies (Virginia Tourism Corporation)
Avg. spending per traveler or per trip	Travel Industry Association (TIA) of America	State department of tourism/recent surveys/studies (Virginia Tourism Corporation); National Golf Foundation

III. SIZE OF VIRGINIA'S GOLF ECONOMY

SRI estimates the total size of Virginia's golf economy in 2005 was approximately \$1.6 billion. This estimate is comprised of \$834.6 million in core industries and an additional \$756.5 million in enabled industries, as illustrated in the table below.

Size of Virginia's Golf Economy in 2005 by Segment (\$ million)	
Core Industries	
Golf Facility Operations	\$707.5
Golf Course Construction and Capital Investment	\$69.8
Golfer Supplies (retail margin)	\$42.0
Major Golf Tournaments and Associations	\$15.3
Total Core Industries	\$834.6
Enabled Industries	
Real Estate	\$427.4
Hospitality/Tourism	\$329.1
Total Enabled Industries	\$756.5
TOTAL GOLF ECONOMY	\$1,591.1

A. Core Industries

Golf Facility Operations

At the center of any golf economy lies the golf facilities—the largest component in terms of revenues. The revenue that flows through a golf facility comes primarily from greens fees, membership fees, golf cart rentals, and associated spending on food and beverages. This revenue, in turn, supports a host of supply sectors, including golf equipment vendors, food and beverage providers, turfgrass industries, and irrigation equipment and services. Virginia's 334 golf courses, 43 stand-alone ranges and other learning facilities, and 42 miniature golf facilities generated \$707.5 million of revenues in 2005.

Virginia Golf Facility Revenues in 2005 (\$ millions)	
Golf Facilities	\$681.9
Practice, Ranges & Alternative Facilities	\$25.6
TOTAL¹	\$707.5

Note: ¹ Golf facility revenues exclude on-course merchandise sales, which are included in the Golfer Supplies industry segment.

This is a sizeable industry, but even more significant when compared to other popular revenue-generating sports. For example, all of Virginia's spectator sports combined—football, baseball, soccer, auto racing and horse racetracks—produced revenues of \$377.6 million in 2002, or \$406.3 million in 2005 inflation-adjusted dollars, less than 60 percent of Virginia's golf industry. Virginia's amusement parks and water parks generated 2002 revenues of \$238.4 million, or \$256.5 million in 2005 inflation-adjusted dollars.²

² U.S. Census Bureau (2005). *Virginia: 2002, 2002 Economic Census, Arts, Entertainment & Recreation Geographic Series*, May 2005.

Golf Course Capital Investments

Golf facilities generate economic impacts beyond operational revenues through investments to upgrade and maintain facilities and infrastructure, and through the construction and expansion of courses. These investments create employment in the construction and maintenance industries and often involve the purchase of significant amounts of equipment and supplies from companies within the state. SRI's estimate of Virginia's golf course capital investment is divided into two segments: (1) capital investment at existing facilities and (2) new course construction. Virginia's golf establishments made \$69.8 million worth of capital investments in 2005: \$45.6 million at existing facilities, and \$24.2 million for the construction of new courses.

Virginia Golf Course Construction and Capital Investment in 2005 (\$ millions)	
Golf Course Capital Investment¹	\$45.6
New Course Construction	\$24.2
TOTAL	\$69.8

Note: ¹ Only the New Course Construction category is included in the economic impact analysis, because it represents new economic output or activity. Golf course capital investment is typically financed through golf facility revenues, so including both Golf Course Capital Investment and Golf Facility Operations in economic impact analysis would result in double-counting.

Golfer Supplies

In 2005, Virginia golfers spent significant sums on golf balls, clubs, accessories, apparel, golf instructional books and DVDs, and magazines like *Golf Digest* and *Golf Magazine*. The economic value that accrues to a state comes from both the production of these goods, as well as retail sales of such items. While Virginia is not a major manufacturer of golf equipment, apparel or media (books, magazines, videos/DVDs), on-course and off-course sales of these items are sizeable.³ The margin that Virginia retailers and golf facilities made on the sale of golfer supplies totaled \$42.0 million in 2005.⁴

Virginia Retailers' Net Revenues on Consumer Purchases of Golfer Supplies in 2005 (\$ millions)	
Golf Equipment (retail margin)	\$31.0
Golf Apparel (retail margin)	\$10.2
Golf Media (retail margin)	\$0.8
TOTAL	\$42.0

Note: This includes on-course and off-course purchases of golf equipment, apparel and media.

³ According to the National Sporting Goods Association (NSGA), the percentage of golf equipment and apparel purchased off-course at golf specialty stores, sporting goods stores, discount stores, etc., ranged from 63.1 percent for golf shoes to 80.4 percent for golf bags.

⁴ The retail margin is the net revenue accruing to retailers after covering the cost of purchasing the golf equipment, apparel or media from the wholesaler or producer. In 2005, the Census Bureau estimated the retail margin for sporting goods retailers to be 38 percent.

State Golf Associations, Tournaments and Charities

Associations

A myriad of associations support the game of golf in Virginia. Some of the largest include the state chapters of national golf organizations: the Virginia State Golf Association, the Middle Atlantic Section of the Professional Golfers' Association of America (regional chapter of the PGA of America which includes Maryland, Virginia and Washington, DC, headquartered in Virginia), the Virginia Golf Course Superintendents Association (regional chapter of the GCSAA), the Virginia Chapter of the Club Managers Association of America, and the Virginia Turfgrass Council. Our estimate of Virginia golf association revenues was \$4.5 million in 2005.

Major Tournaments

Virginia hosts at least four major golf tournaments each year. These include two PGA TOUR Nationwide events, one LPGA tournament, and the PGA TOUR Presidents Cup, which has been held in Virginia every four years.

In 2005, two Nationwide Tour events were held in Virginia: the Virginia Beach Open held at the Traditional Players Club of Virginia Beach and the Henrico County Open held at the Dominion Club in Richmond. The Michelob Ultra Open at Kingsmill, sponsored by Anheuser Busch, is a premier LPGA tournament held at the Kingsmill Resort and Spa in Williamsburg. The Presidents Cup is an official PGA TOUR event, and it showcases the year's top 12 PGA TOUR money winners and top 12 international players. The tournament was held at the Robert Trent Jones Golf Club in Lake Manassas in 2005 with former Presidents Clinton and Bush in attendance. These four tournaments generated approximately \$10.7 million in 2005.

Virginia's Major Golf Tournaments & State Golf Association Revenues in 2005 (\$ millions)	
Major tournaments	\$10.7
Associations	\$4.5
TOTAL	\$15.3

Charities

Virginia's golf industry sponsors tournaments for a variety of national charities ranging from Special Olympics to the Muscular Dystrophy Foundation. However, the industry's largest impact is at the local level in the provision of on-going financial support to charitable and service-oriented organizations in the community: fire departments, emergency medical services, police departments, Toys for Tots, hospitals, and other community services that rely heavily on private support. Golf courses and golf professionals are happy to serve as access points for annual fundraising by local service organizations.

A 2005 survey of Virginia PGA professionals found that charitable giving linked to Virginia golf courses ranged from \$5,600 to \$1 million per course, per year, with an average of \$183,000 and

a median of \$60,000.⁵ These are significant amounts of money generated by local golf communities to support local causes. Statewide, charitable monies raised by Virginia golf tournaments in 2005 totaled approximately \$20 million. Charitable giving is not included in economic impact estimation because it is a direct transfer of income. Nevertheless, it is an important contribution of the industry to the state.

B. Enabled Industries

Real Estate

Real estate developers use amenities to attract new home buyers, and golf is a key amenity in both rural and urban areas of the state. A number of new golf communities were under construction in 2005 offering a mix of single family homes, townhomes and condominiums. New residential developments are under construction at existing courses (e.g., Homestead Preserve at the Homestead Resort), expanded courses (e.g., Williamsburg National Golf Course), and new courses (e.g., Blue Ridge Shadows in Front Royal, northern Virginia, or Ashley Plantation in Daleville, near Roanoke). This new golf-related real estate construction generated \$341.0 million in 2005. Furthermore, in 2005 there were approximately 128 golf communities in Virginia, and we estimate the “golf” premium associated with the sale of real estate in these developments to be \$86.4 million. The premium is the additional amount a buyer is willing to pay for a home or property located on a golf course or within a golf community.

Virginia Golf Real Estate Revenues in 2005 (\$ millions)	
Golf-Related Residential Construction	\$341.0
Realized Golf Premium	\$86.4
TOTAL	\$427.4

Note: The sale of existing homes is considered a transfer of assets rather than new economic output, so the golf premium that is realized in the sale of an existing home is not included in the economic impact analysis.

Hospitality/Tourism

Golf has enjoyed increasing popularity, whether it is the primary motivation for a trip or is connected to other recreational time spent with friends and family, or business colleagues. Golf enthusiasts flock to tournaments, such as the 20,000-plus visitors who attended the 2005 PGA TOUR President’s Cup at the Robert Trent Jones Golf Club, or Virginia’s annual LPGA and Nationwide Tours. Similarly, people also travel to play famous golf courses (e.g., the Homestead, the Golden Horseshoe, etc.) or to try out new or yet unexplored regional golf courses. A 2004 Virginia Tourism Corporation Visitor Study found 1.551 million golf-related person trips were taken within or to Virginia. Traveler expenditures on food, lodging, transportation and other entertainment while on these trips totaled \$321.0 million in 2004, or \$329.1 million in inflation-adjusted 2005 dollars.

⁵ The average is higher than the median because there are a large number of courses that raise considerable annual sums (\$300,000 plus) at charitable tournaments throughout the year.

Virginia's Golf-Related Travel Expenditures in 2005 (\$ millions)	
Total (2004\$)	\$321.0
Inflation-adjusted Total (2005\$)	\$329.1
TOTAL	\$329.1

Note: This figure assumes a similar level of golf-related travelers and expenditures in 2005 as in 2004 and only adjusts for price level changes between 2004 and 2005.

IV. GOLF'S ECONOMIC IMPACT IN VIRGINIA

Golf's impact on the Virginia economy includes both the direct effects of economic activity in golf-related industries (i.e., the core and enabled industries), as well as the indirect and induced (or multiplier) effects that ripple through the state economy. Therefore, in 2005, the \$1.591 billion golf economy generated an additional \$1.629 billion in indirect and induced economic impacts for the State of Virginia. The total impact of the golf economy was an estimated \$3.089 billion.

Golf's Impact on Virginia's Economic Output in 2005 (\$ million)			
Industry	Direct Impact	Indirect/Induced Impact	Total Impact
Golf Facility Operations	\$707.5	\$742.450	\$1,449.950
Golf Course Construction and Capital Investment			
Golf Course Capital Investment¹	\$45.6	*	*
New Course Construction	\$24.2	\$31.421	\$55.621
Golfer Supplies (retail)	\$42.0	\$46.070	\$88.070
Major Golf Tournaments and Associations			
Associations	\$4.5	\$5.989	\$10.489
Tournaments	\$10.7	\$11.654	\$22.354
Golf Real Estate			
Golf-Related Residential Construction	\$341.0	\$442.754	\$783.754
Golf Premium²	\$86.4	*	*
Hospitality/Tourism	\$329.1	\$348.574	\$678.474
TOTAL	\$1,591.1	\$1,628.912	\$3,088.713

Notes: ¹ Only the New Course Construction category is included in the economic impact analysis, because it represents new economic output or activity. Golf course capital investment is typically financed through golf facility revenues, so including both Golf Course Capital Investment and Golf Facility Operations in economic impact analysis would result in double-counting. ² Similarly, the sale of existing homes is considered a transfer of assets rather than new economic output, so the golf premium that is realized in the sale of an existing home is not included in the economic impact analysis. Source: Multiplier values for each Virginia industry sector were obtained from the Bureau of Economic Analysis RIMS II program.

The golf economy also generates significant jobs and earnings for Virginia residents. Based on the economic output of the core and enabled golf industries, SRI calculated the total number of jobs, both direct and indirect, that are generated by golf, as well as the earnings of those workers. As shown below, the golf economy generated a total impact of 40,189 jobs throughout the Virginia economy in 2005, with total earnings of \$948.4 million. These total (direct plus multiplier) impacts include both the employment and earnings of those employed in golf-related industries, as well as the employment and earnings generated in other sectors of the economy through subsequent purchases of goods and services by golf industry employees.

Golf's Impact on Virginia Employment and Earnings in 2005		
Industry	Total Employment Impact	Total Earnings Impact
Golf Facility Operations	22,301	\$460,299,500
Golf Course Construction and Capital Investment		
Golf Course Capital Investment¹	*	*
New Course Construction	473	\$16,603,620
Golfer Supplies (retail)	982	\$25,704,000
Major Golf Tournaments and Associations		
Associations	100	\$3,088,800
Tournaments	363	\$8,221,880
Golf Real Estate		
Golf-Related Residential Construction	6,669	\$233,960,100
Golf Premium²	*	*
Hospitality/Tourism	9,301	\$200,514,045
TOTAL	40,189	\$948,391,945

Notes: ¹ Only the New Course Construction category is included in the economic impact analysis, because it represents new economic output or activity. Golf course capital investment is typically financed through golf facility revenues, so including both Golf Course Capital Investment and Golf Facility Operations in economic impact analysis would result in double-counting. ² Similarly, the sale of existing homes is considered a transfer of assets rather than new economic output, so the golf premium that is realized in the sale of an existing home is not included in the economic impact analysis. Source: Multiplier values for each Virginia industry sector were obtained from the Bureau of Economic Analysis RIMS II program.

V. ENVIRONMENTAL IMPACT: WATER USAGE BY VIRGINIA'S GOLF INDUSTRY

Virginia has abundant water resources relative to other states—for example, average annual rainfall in Virginia is 43 inches compared to 17 inches in Colorado. Moreover, the state's humid climate helps stem evaporation unlike the arid climates of many Western states. Nevertheless, freshwater supplies in some parts of Virginia are sometimes insufficient to meet the local water demands of growing populations and expanding economies, especially in peak summer months.

Water is an important input for the Virginia golf industry, as it is in many other industries—manufacturing, agriculture, power generation and services (e.g., hotels and restaurants). While it is true that an individual golf course uses significant quantities of water from mid-May to mid-September, the scale of water use by Virginia's golf industry (which encompasses 334 golf courses) on a statewide basis is significantly less than that used by other industries.

Virginia golf courses:

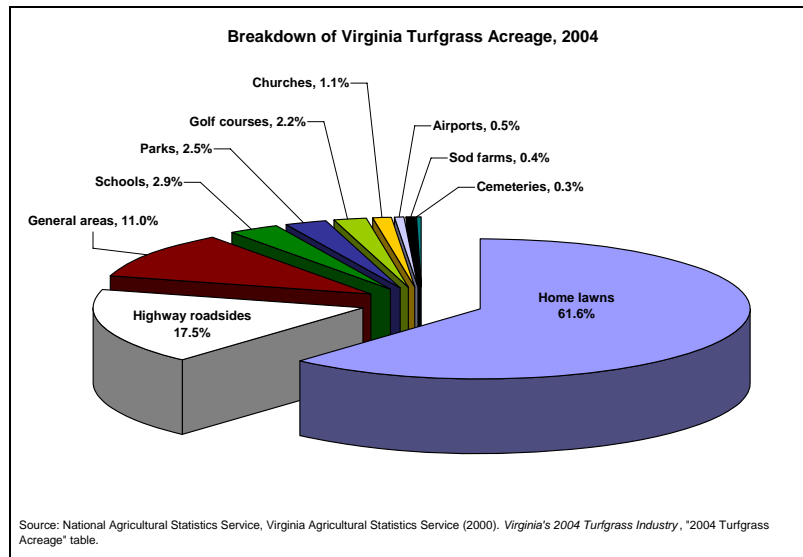
- account for only 2.2 percent of the total turfgrass acreage in the state;⁶
- consume approximately four-tenths of one percent (0.4%) of the water used in the state;⁷

⁶ National Agricultural Statistics Service, Virginia Agricultural Statistics Service (2000). *Virginia's Turfgrass Industry*.

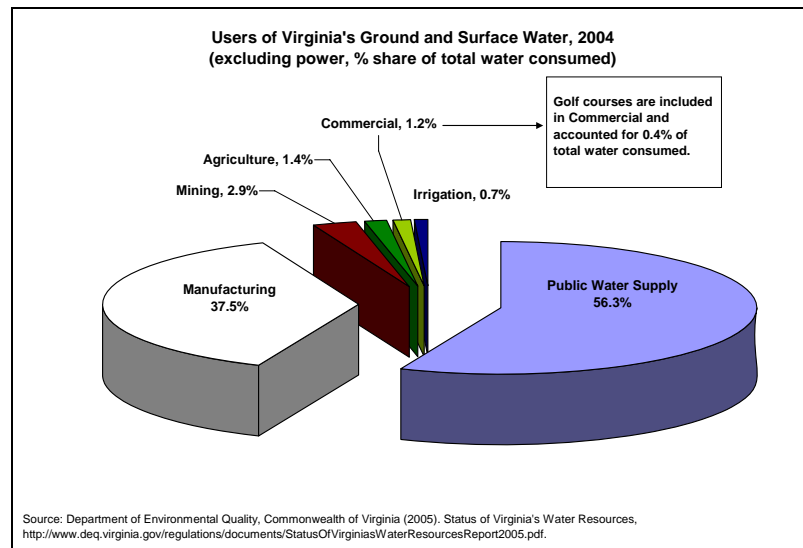
⁷ Department of Environmental Quality, Commonwealth of Virginia (2005). *Annual Status of Virginia's Water Resources*, <http://www.deq.virginia.gov/regulations/documents/StatusOfVirginiasWaterResourcesReport2005.pdf> and Virginia Tech Turfgrass Research Center data.

- actively collaborate with other stakeholders to find solutions to the state's population-driven water challenges (e.g., participating in both the Governor's Drought Taskforce as well as current Water Reclamation and Recycling Regulation roundtable discussions);
- generate much higher economic returns from their per acre water use;
- employ golf course superintendents that are well-educated in land and water conservation issues, water-saving technologies, and efficient turf management; and
- support turfgrass research and improvements in efficient water use and integrated pest management (IPM) strategies.

Virginia golf courses account for only 2.2 percent of total turfgrass acreage in the state.



Virginia golf courses account for four-tenths of one percent (0.4%) of the ground and surface water consumed in the state.



Virginia golf courses generate higher economic returns from per acre water use (examples presented below).

Virginia Water Usage and Economic Returns Comparisons	
Average water usage	
Golf course	4,170 gallons/acre/day
Home lawn	3,879 gallons/acre/day
Grapes	3,879 gallons/acre/day
Corn, grain	2,521 gallons/acre/day
Magnitude of irrigated acreage	
Home lawns	1,048,000 acres
Corn, grain	330,000 acres
Golf courses	36,900 acres
Grapes	1,900 acres
Revenues per acre	
Golf courses	\$18,480/acre
Grapes	\$2,453/acre
Home lawn (supplies and service)	\$1,687/acre
Corn, grain	\$189/acre

Sources: Home lawn and golf course irrigated acreage data and home lawn maintenance revenues data from the Virginia Agricultural Statistics Service (2005), *Virginia's 2004 Turfgrass Industry*. Crop acreage and revenues data from the Virginia Department of Agriculture and Consumer Services (2006), <http://www.vdacs.virginia.gov/agfacts/rankings.shtml>. Water usage data calculated from Virginia Tech Extension Services evapotranspiration (ET) data. Golf course revenue data calculated by SRI.

Note: Revenues for crops and home lawn maintenance are presented in 2005 inflation-adjusted dollars (converted from 2003 and 2004 revenue figures, respectively).

The golf industry actively participates in finding solutions to the state's population-driven water challenges.

A Virginia Golf Course Superintendents Association representative sat on the technical advisory committee that helped formulate the State's 2003 Drought Assessment and Response Plan. This plan put forward responsible irrigation regulations (e.g., irrigation of fairways, tees and greens at the minimum rate necessary between 9pm and 10am) while maintaining viable courses. The Virginia golf industry is also playing an active and supporting role in the State's Water Reclamation and Recycling Regulation roundtable discussions.

The industry employs golf course superintendents that are well-educated in water and land conservation issues, water-saving technologies and efficient turf management.

The majority of Virginians living in single family homes likely have watered their lawns during the summer. However, it is less likely that the majority of homeowners know the type of grass they have, the water requirements of this grass during summer months, and the amount of water actually used when the sprinkler is turned on. By contrast, efficient turf management is an integral part of a golf course superintendent's job and training. Surveys indicate that superintendents choose the profession largely for two reasons: a passion for golf, and a desire to be outdoors or work with nature. Many of Virginia's golf course superintendents have a sincere respect for the land and take their environmental stewardship seriously.

Another leading golf association focusing on issues of golf and the environment is the GCSAA and its non-profit research foundation, the Environmental Institute for Golf. The Institute delivers programs and services—information collection, research, education and outreach—that communicate to golf course superintendents the best practices in environmental stewardship and management on the golf course. The Institute recently launched a multi-year, national environmental study to collect data on water use and conservation on the golf course. The results will be used to help golf course superintendents evaluate and improve environmental performance on the golf course.

At the state level, Virginia Tech⁸ has undertaken significant turfgrass research to maximize water conservation, to identify the best performing grasses for Virginia regions and climates, and to help those involved in turfgrass maintenance more effectively manage the timing and use of fertilizers and herbicides. For example, a recent study by Ervin, et al. (2006), found that fertilizer application amounts should be reduced when using recycled water for Bentgrass and Bermudagrass irrigation.⁹ Such research has been funded by the Virginia Turfgrass Council (VTC) and is disseminated via the *Annual Digest of Turfgrass Research in Virginia*. The VTC's membership includes many state golf associations and companies providing inputs to the golf industry, and the organization has funded over \$300,000 of scholarships and research over the past 10 years. In addition to turfgrass research, the VTC has worked with the Virginia Department of Conservation and Recreation and Virginia Tech to develop nutrient management guidelines and a certification program for urban areas.



General Research Continued

Turfgrass Water Conservation through Crop Coefficients and Biostimulants

Virginia Tech Researchers Erik H. Ervin, Ph.D., Zhang, Ph.D., and AJ LaRanche, Masters Candidate, Turfgrass Physiology (Department of Crop Soil and Environmental Sciences)

Sponsors: Virginia Agricultural Council and Virginia Turfgrass Foundation, Weather station donated by: Virginia Golf Course Superintendents Association, Old Dominion Golf Course Superintendents Association, Smith Turf and Irrigation, and Turf Equipment and Supply.

Rationale for research
Virginia's population has increased 14% within the last ten years, resulting in insufficient water for landscape irrigation in drought years. While Virginia is not currently suffering from drought conditions, population increases the place higher demands on natural resources. In times of drought, landscape irrigation is among the first water uses to be governmentally restricted. This turf species, creeping bentgrass and tall fescue, was selected for this study because fairways and home lawns cover the largest turf areas in Virginia. Utilizing crop coefficients allows turf managers and homeowners to use less irrigation while maintaining acceptable turf quality. Some turf managers include organic growth supplements, also called biostimulants, in their maintenance programs in an attempt to increase turfgrass drought resistance. Most of these biostimulants contain seaweed extract and/or humic acid as base ingredients, such as the products utilized in this study. Claylon betaine (CLB), the other biostimulant used in this study, is a naturally occurring plant amino acid derivative. Upon drought stress, levels increase to serve as an osmoprotectant, which allows plants cells to adapt to the drought conditions. Foliar application of CLB is thought to increase the likelihood of greater drought tolerance. The objective of this study is to determine water conserving crop coefficients for creeping bentgrass fairways and tall fescue home lawns in the Mid-Atlantic region. Additionally, this research aims to quantitatively determine to what extent irrigation requirements can be reduced by the foliar application of seaweed (SWR), a humic acid (HA), glutathione betaine (GLB), a byproduct of sugar beet processing, or a seaweed and iron commercial biostimulant (BC-2), while maintaining turf health.

Methods
Research was conducted in 2003 and 2004 at the Turfgrass Research Center in Blacksburg, VA on creeping bentgrass and a tall fescue species blend were maintained at fairway and home-lawns mowing heights, respectively. The plots were treated monthly with SWR (3 g/1000 ft²) + HA (15 g/1000 ft²), CLB (1 oz./1000 ft²), seaweed and iron (BC-2) biostimulant (4 oz./1000 ft²) or placebo-water control. Weather data were downloaded from the on-site weather station and then entered into a computer program to determine evapotranspiration (ET) demand. Plots were hand-watered upon incidence of minor wilt of the 100% ET control plots. Upon onset of rain, the plots were covered with a rainnet (after a minimum confounding irrigation application).

Results
The 2003 wet weather and irrigation scheduling approach did not allow for the turfgrass to undergo drought stress; therefore no measurable differences were detected concerning irrigation requirements. Although biostimulant response is typically only present during stress, some differences were found between creeping bentgrass treatments. Harvested plots had quality and leaf rolling ratings equal to that of the control plots, but higher than SWR+HA treated plots. Total root length and surface area were largest for the CLB treatments. In 2004, differences between irrigation treatments were present. Overall turfgrass quality was maintained at an 80% ET level, but a fall below acceptable levels for the 50% and 50% ET plots. Bentgrass average canopy temperature was lowest for the 100% and 80% ET plots. Seaweed humic acid (SWH) and seaweed peroxidase (LPC) antioxidant activity was highest in the bentgrass 80% ET scenarios. Fairway creeping bentgrass irrigation could be reduced by 15% while not sacrificing turf health. All follow-up plots rated above the minimum quality of 8 (based on a 1 to 9 scale, where 1 is dead turf and 9 is very healthy turf), and no physiological measurements showed any differences between irrigation level or biostimulant treatment during both years.

Significance to the industry
During a moderate summer like 2003 and 2004, tall fescue can safely be irrigated with 30% less water. However, a deep root system might allow turf to survive when irrigated below 50% ET. ET

Date	Creeping Bentgrass Quality			Biostimulant Activity		
	SWR	CLB	BC-2	SWR	CLB	BC-2
08/07	8.5	8.5	8.5	0.15	0.15	0.15
08/17	8.5	8.5	8.5	0.15	0.15	0.15
08/27	8.5	8.5	8.5	0.15	0.15	0.15
09/07	8.5	8.5	8.5	0.15	0.15	0.15
09/17	8.5	8.5	8.5	0.15	0.15	0.15

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⁸ Virginia Tech's formal name is the Virginia Polytechnic Institute and State University.
⁹ Ervin, et al. (2006), "Recycled Water for Irrigation of Bentgrass and Bermudagrass in Norfolk," *Virginia Turfgrass Journal*, January/February 2006, p.22.

VI. DETAILED METHODOLOGY & DATA SOURCES

A key challenge in this study was to identify reliable state-level data sources and to develop methodologies for measuring the size of industry components for which cross-state estimates do not exist in straightforward metrics, e.g., golf real estate and off-course purchases of golf apparel and equipment. This section describes each of the core and enabled industries included in the golf economy and SRI's approach to measuring each of these segments.

A. Golf Facility Operations

Golf course facilities lie at the heart of the golf industry cluster. This is one of the best studied and surveyed segments of the golf economy. Revenues for this segment include annual membership fees, daily fees, and cart rental fees; purchases of golf apparel and equipment in pro shops; golf lessons; tournament entry fees; consumption of food and beverages; etc.

Number of golf course facilities. Many golf associations track the number of golf facilities in a state: the National Golf Foundation (NGF), the PGA of America, and state counterparts of the USGA, among others. The U.S. Census Bureau also surveys golf course facilities as business establishments in its Economic Census every five years. However, these organizations' calculations of the total numbers and type of golf course facilities in each state are not always consistent due to: (1) disagreement over whether to count the number of facilities or the number of 18-hole equivalent courses, (2) annual facility or course closures and openings, and (3) inconsistency in the classification of courses, especially resorts.

For example, in some surveys, golf facilities are allowed to self-classify themselves. In others, the surveying organization classifies the facility based on certain criteria. This can mean the difference between a small number of resorts (e.g., a figure that includes only those golf facilities that offer five-star lodging) or a much larger number of resorts (e.g., three or four-star hotels with conference services located near a daily fee golf course). Similarly, a resort with two 18-hole golf courses could be counted as two golf facilities or as one depending on the reporting organization. Fortunately, the variances caused by these data collection issues are very small, and thus do not materially impact the overall analysis. The table below presents slightly differing estimates for the number of golf course facilities in Virginia in 2005 or the latest available year.

Estimates of Virginia Golf Facilities from Various Sources, 2002-2005				
	2002 NGF (# of facilities) ¹	2005 NGF (# of 18-hole equivalent courses) ²	2005 PGA (# of facilities) ³	2002 Census (# of facilities minus resorts & municipal) ⁴
PRIVATE	128	127.0	124	255
PUBLIC	198	202.0	181	
Daily fee/ semi-private		164.5	136	
Municipal		37.5	45	(PGA: 45)
Military				
University				
RESORT			29	(PGA: 29)
TOTAL	326	329.0	334	255 (329 w/PGA)

Sources: ¹ National Golf Foundation (2005). "18-Hole Equivalent U.S. Course Supply—December 31, 2005," *Golf Industry Report*, First Quarter 2006, vol. 6, p.10.

² NGF (2003). "Golf Facilities in the U.S. (as of December 31, 2002)," *2003 Golf Business Almanac*, p.6.

³ Professional Golfers' Association of America (2005). *Compensation Survey*, June 2005.

⁴ U.S. Census Bureau, *2002 Economic Census*.

After thorough analysis of different golf course facility lists and numbers in collaboration with the Virginia golf task force, SRI used PGA's state-level facility data as the basis for state golf economy assessments. In the preceding table, the total numbers of Virginia golf course facilities are very similar despite differences in year (which generally means closures of some courses and openings of others) and categories for which data were collected (more detail about facility type from certain sources in some years). Note that for the Census data, one needs to add PGA resort and municipal numbers to the Census total to arrive at a comparable total estimate (329 facilities).

Furthermore, the PGA collects state-level data on the number of driving ranges, golf schools and indoor golf centers—all of which should be included to capture a comprehensive analysis of a state's golf economy—in addition to providing detail on the number of golf facilities by type (private, daily fee, resort, municipal, etc.). PGA has indicated that it will be collecting revenue data by type of facility for all 50 states on an annual basis through Performance Trak (an online entry system).

Average revenues per facility. To calculate total revenues accruing to this golf industry segment, it is also necessary to know the average revenues per facility. Here again, the challenge is that average facility revenues will vary significantly depending on: (1) the number of holes (e.g., a 9-hole course versus a 27-hole course) and (2) the type of facility—whether a golf course facility is private, daily fee, resort, municipal, etc.

The U.S. Census Bureau collects revenue data for golf course facilities as part of its Economic Census of all U.S. establishments every five years. Whereas facility surveys conducted by private sector organizations are often based on low response rates (less than 30 percent), all establishments are required by law to respond to the Census Bureau survey.

However, the Census Bureau data has several limitations. First, some types of facilities are not included in the survey: (1) resort facilities, (2) many municipal and military facilities, (3) driving ranges, and (4) golf course facilities without payroll. Nevertheless, the latest 2002 Economic Census contains revenue, payroll, and employment data on 12,261 golf facilities broken down by state. This provides a robust estimate of average facility revenues in a state in 2002.

To supplement the Census data, SRI drew on PGA state-level revenue data which include categories for which Census data are not available—resorts, municipal courses, and military courses—in addition to providing a validity check on the Census's traditional facility data. NGF does not provide state-level facility data—only information for nine multi-state regions.

Estimates of Virginia Average Revenue per Facility Data From Different Sources, 2002-2005			
	Census (2002\$)	PGA (2005)	NGF (2005)
Private facility	\$2,045,863	\$2,836,065	\$1,808,660- \$5,345,100
Daily fee facility	\$1,186,776	\$1,403,769	\$1,088,260- \$1,976,690
Resort facility		\$996,859	X
Municipal/military/university facility		\$2,453,808	X
Driving range		Not yet released	\$251,638
Miniature golf	\$314,452	X	X

2005 Golf Facility Operations Revenues		
Facility type	Calculation	Estimate
Private facilities	Average revenue ¹	\$2,836,065
	Number of facilities	124
	Total revenue [1]	\$351,672,058
Daily fee facilities	Average revenue ¹	\$1,403,769
	Number of facilities	136
	Total revenue [2]	\$190,912,644
Municipal/military/university facilities	Average revenue ¹	\$2,453,808
	Number of facilities	45
	Total revenue [4]	\$110,421,360
Resort facilities	Average revenue ¹	\$996,859
	Number of facilities	29
	Total revenue [3]	\$28,908,911
Driving ranges	Average revenue	\$251,638
	Number of facilities	43
	Total revenue² [5]	\$11,411,611
Miniature golf facilities	Average revenue	\$314,452
	Number of facilities	42
	Total revenue² [6]	\$14,211,719
TOTAL	Sum [1] to [6]	\$707,538,303

Note: ¹Golf facility average revenues exclude on-course merchandise sales, which are included in the Golfer Supplies industry segment. ²Adjusted for inflation into 2005 dollars using the appropriate GDP deflator. Sources: Golf facilities average revenue data are from the PGA of America (2006), Compensation Study. Driving range average revenue data from the Golf Range Association of America (GRAA) & NGF (2003), Profile of Golf Practice Facility Operations. Miniature golf facilities average revenue data are from the 2002 Economic Census.

B. Golf Course Capital Investment

Golf facilities generate economic impacts beyond operational revenues through investments to upgrade and maintain facilities and infrastructure, and through the construction and expansion of courses. These investments create employment in the construction and maintenance industries and often involve the purchase of significant amounts of equipment and supplies from companies within the state. SRI's estimate of Virginia's golf course capital investment is divided into two segments: (1) capital investment at existing facilities and (2) new course construction. Together, Virginia's golf establishments made \$69.8 million worth of capital investments in 2005, \$45.6 million at existing facilities and \$24.2 for the construction of new courses.

Virginia Golf Course Construction and Capital Investment in 2005 (\$ millions)	
Golf Course Capital Investment ¹	\$45.6
New Course Construction	\$24.2
TOTAL	\$69.8

Note: ¹ Only the New Course Construction category is included in the economic impact analysis, because it represents new economic output or activity. Golf course capital investment is typically financed through golf facility revenues, so including both Golf Course Capital Investment and Golf Facility Operations in economic impact analysis would result in double-counting.

Investment at existing courses. The NGF's *2006 Operating and Financial Performance Profile* presents estimates of capital expenditures at: (1) public facilities by fee level (mid-range and premium) and divided into two regions (Sunbelt and Frostbelt); and (2) private facilities by size (those with revenues of less than \$3 million and those with revenues above \$3 million). Using these average golf course capital investments, we approximate the average facility investments in Virginia using the known distribution and type characteristics of facilities in the state. (See preceding section on number of facilities for sources.) These imply that each of Virginia's 334 golf courses invested an average of approximately \$136,590 in 2005, for a total capital investment of \$45.6 million.

New course construction. The NGF's *Golf Facilities in the U.S.* series is the only national source for estimates of the number of new golf courses under construction in each state. For example, NGF estimated that six new 18-hole equivalent golf courses opened in Virginia in 2005 and that 15.5 were under construction.

An estimate for the average investment for each new golf course in Virginia is derived from the Golf Course Builders Association of America's *2006 Guide to Estimating Cost for Golf Course Construction*. This database of golf course construction costs is based on a survey of golf course builders around the country, and is divided into four construction regions. Using an average of regions one and two (Coastal Lowlands and High Piedmont) which roughly equates with the distribution of golf courses in Virginia and the average ("normal") costs for each of the various construction categories (see box below), we estimate the average investment required to build a new golf course in Virginia is \$4.7 million.

To Build a Golf Course: Required Investments	
Mobilization	Greens Construction
Layout and Staking	Tees
Erosion Control	Bunkers
Clearing	Bridges
Selective Clearing	Bulkheading
Topsoil	Cart Paths
Excavation	Fine Grading
Rough Shaping	Seeding and/or Grassing
Drainage	
Irrigation	

This investment, however, is not entirely expended over one year but is rather disbursed over several years. Assuming the average course takes approximately three years to complete, we estimate the 15.5 courses under construction in 2005 invest an average of \$1.5 million each, for a total of \$24 million.

C. Golfer Supplies

Golfers' annual purchases of golf equipment (both hard and soft goods), golf apparel, and golf-related books and magazines, are sizeable. Many of these goods are purchased at golf facility pro shops. However, a significant portion of golf equipment and apparel purchases take place off the course in sporting goods stores, golf specialty shops, discount stores, warehouse clubs, online, and so forth.

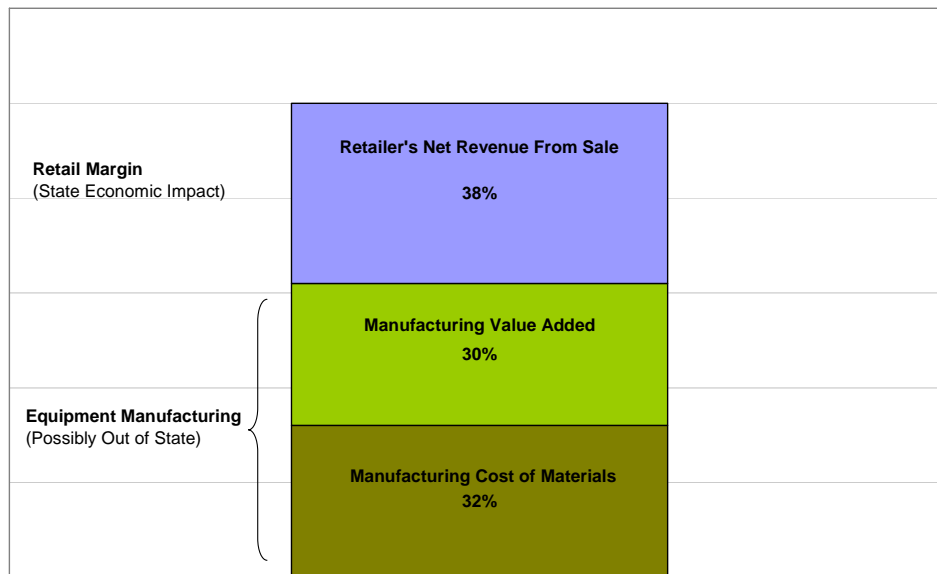
Golf equipment and apparel. The economic value created by golfer supplies consists of two components: production and the retail sales margin. On the manufacturing, or production side, the economic impact created by the manufacture of golf equipment or apparel is attributable to the state in which the golf club or golf bag is manufactured. On the retail side, the economic impact is derived from the margin the retailer makes from the sale of the golf club, i.e., the net revenues accruing to retailers after covering the cost of purchasing the golf equipment or apparel from the wholesaler/producer. SRI will use manufacturers' net revenues data for those states where golf equipment and apparel manufacturers are located. For example, Callaway Golf, which produces Big Bertha, Odyssey, Ben Hogan and TopFlite brands, manufactures golf clubs in its Carlsbad, California facility, and golf balls in its Massachusetts and New York facilities. We will work with the state golf task forces to identify major golf equipment manufacturers in each state.

On the retail side, we will estimate total sales of golf apparel and equipment at the state level and then apply the requisite retail margin percentage for economic impact analysis. In our national level study for GOLF 20/20, SRI was able to collect national sales data from a number of sources: (1) the NGF, (2) the National Sporting Goods Association (NSGA), (3) Golf Datatech, and (4) the Census Bureau. Unfortunately, the relatively small sample size for the majority of these surveys do not allow for publication of reliable state-level estimates by these organizations. None of the aforementioned organizations report golf equipment or apparel expenditure data *by state*. However, the NSGA conducts a 100,000-household consumer panel survey each year for its

annual *The Sporting Goods Market* publication. SRI was able to use this data in conjunction with the PGA's total courses data for each state to derive state-level estimates of golf equipment and apparel sales.

For example, in 2005, NSGA reported total U.S. off-course and on-course purchases of golf bags to be \$332.6 million. The NSGA survey found the South Atlantic region accounted for 16.6% of these purchases, or \$55.2 million. Within the South Atlantic region, one can estimate Virginia's share of purchases by creating a rounds- or courses-based weight. Using either approach yields similar weights, since the number of rounds played is highly correlated with the number of 18-hole equivalent courses in a state ($r=0.93$). SRI used the number of 18-hole equivalent courses in each state, as it was easier to verify than estimated number of rounds played. Virginia represents 9.99% of total 18-hole equivalent courses in the South Atlantic, so this weight was applied to the South Atlantic region total (\$55.2 million) to estimate \$5.5 million of golf bag sales in the state of Virginia in 2005. Further, retail margins on final sales suggest that 38%, or \$2.1 million, of total sales was retained in the Virginia economy. (See graphic below.)

Distribution of Economic Value of \$1 of Golf Equipment Sales in State
(Preliminary)



Virginia's On-Course and Off-Course Golf Equipment & Apparel Purchases, 2005		
Category	Calculation	Estimate (\$ million)
Golf club sets	South Atlantic region's sales	\$415.0
	VA's courses-based weight	9.99%
	VA's share of sales [1]	\$41.4
Golf apparel	South Atlantic region's sales	\$268.3
	VA's courses-based weight	9.99%
	VA's share of sales, [2]	\$26.8

Virginia's On-Course and Off-Course Golf Equipment & Apparel Purchases, 2005		
Category	Calculation	Estimate (\$ million)
Golf balls	South Atlantic region's sales	\$184.0
	VA's courses-based weight	9.99%
	VA's share of sales, [3]	\$18.4
Golf clubs	South Atlantic region's sales	\$109.2
	VA's courses-based weight	9.99%
	VA's share of sales, [4]	\$10.9
Golf bags	South Atlantic region's sales	\$55.2
	VA's courses-based weight	9.99%
	VA's share of sales, [5]	\$5.5
Golf shoes	South Atlantic region's sales	\$54.3
	VA's courses-based weight	9.99%
	VA's share of sales, [6]	\$5.4
TOTAL	Sum of [1] to [6]	\$108.5 million
Retail sales margin	Multiply TOTAL by 38%	\$41.2 million

Source: National Sporting Goods Association (2006). *The Sporting Goods Market in 2006*, Mt. Prospect, IL: NSGA and *Sports Clothing Expenditures in 2004*, Mt. Prospect, IL: NSGA.

Golf media. A large number of magazines, books, and videos/DVDs are directed at delivering golf news, instruction, equipment and travel ideas to the golf novice and professional alike. For example, *Golf Digest* and *Golf Magazine* have placed in the Top 100 national magazines with the largest paid circulations in the country for years, ranking 49th and 60th respectively in 2005.

Similar to golf equipment, golf media's economic contribution to the state economy has two components: production and retail sales margin. On the production side, the economic impact created by the publication of magazines or books is attributable to the state in which the magazine or book is published. On the retail side, the economic impact is derived from the margin the retailer makes from the sale of golf media, i.e., the net revenues accruing to retailers after covering the cost of purchasing the media from the wholesalers/producers. For golf magazines, we identified the publications with the largest circulations and the state in which they are published—no major golf magazines were published in Virginia in 2005. We can also calculate a weight to estimate the percentage of book retailers' sales attributable to the sale of golf books and magazines in stores. Golf videos and DVDs are more difficult. In SRI's previous national-level study, we were not able to identify a source with data on the annual sales of golf-specific videos/DVDs. In the case of this current state-level study, this category was also omitted due to the absence of a reliable data source.

On-Course and Off-Course Sales of Golf Books in Virginia, 2005	
Category	Estimate (\$1,000)
Virginia retail book sales¹	\$498,458
Golf books as % of total book sales	0.4%
Total retail golf book sales	\$2,094
Retail sales margin	\$796

Note: ¹ Adjusted for inflation into 2005 dollars using the appropriate GDP deflator.
Sources: Virginia retail book sales data from the 2002 Economic Census. Golf books as a percentage of total book sales derived from the *2006 Bowker Annual of Library & Book Trade Information* and American Booksellers Association data.

Virginia Retailers' Net Revenues on Consumer Purchases of Golfer Supplies in 2005 (\$ millions)	
Golf Equipment (retail margin)	\$31.0
Golf Apparel (retail margin)	\$10.2
Golf Media (retail margin)	\$0.8
TOTAL	\$42.0

Note: This includes on-course and off-course purchases of golf equipment, apparel and media.

D. State Golf Associations, Tournaments & Charities

Associations. Numerous associations support the game of golf in Virginia. Some of the largest include the state chapters of national golf organizations: the Virginia State Golf Association, the Middle Atlantic Section of the Professional Golfers' Association of America (regional chapter of the PGA of America which includes Maryland, Virginia and Washington, DC, headquartered in Virginia), the Virginia Golf Course Superintendents Association (regional chapter of the GCSAA), the Virginia Chapter of the Club Managers Association of America, and the Virginia Turfgrass Council. Our estimate of Virginia golf association revenues was \$4.5 million in 2005.

Major Tournaments. Virginia hosts at least four major golf tournaments each year. These include two PGA TOUR Nationwide events, one LPGA tournament, and the PGA TOUR Presidents Cup, which has been held in Virginia every four years.

In 2005, two Nationwide Tour events were held in Virginia: the Virginia Beach Open held at the Traditional Players Club of Virginia Beach and the Henrico County Open held at the Dominion Club in Richmond. The Michelob Ultra Open at Kingsmill, sponsored by Anheuser Busch, is a premier LPGA tournament held at the Kingsmill Resort and Spa in Williamsburg. The Presidents Cup is an official PGA TOUR event, and it showcases the year's top 12 PGA TOUR money winners and top 12 international players. The tournament was held at the Robert Trent Jones Golf Club in Lake Manassas in 2005 with former Presidents Clinton and Bush in attendance. These four tournaments generated approximately \$10.7 million in 2005.

Virginia's Major Golf Tournaments & State Golf Association Revenues in 2005 (\$ millions)	
Major tournaments	\$10.7
Associations	\$4.5
TOTAL	\$15.3

Charities. Virginia's golf industry sponsors tournaments for a variety of national charities ranging from the Special Olympics to the Muscular Dystrophy Foundation. However, the industry's largest impact is at the local level in the provision of on-going financial support to charitable and service-oriented organizations in the community: fire departments, emergency medical services, police departments, Toys for Tots, hospitals, and other community services that rely heavily on private support. Golf courses and golf professionals are happy to serve as access points for annual fundraising by local service organizations.

A 2005 survey¹⁰ of Virginia PGA professionals found that charitable giving linked to Virginia golf courses ranged from \$5,600 to \$1 million per course, per year, with an average of \$183,000 and a median of \$60,000.¹¹ These are significant amounts of money generated by local golf communities to support local causes. Statewide, charitable monies raised by Virginia golf tournaments in 2005 totaled \$18.8 million. Charitable giving is not included in economic impact estimation because it is a direct transfer of income. Nevertheless, it is an important contribution of the industry to the state.

E. Real Estate

Real estate developers use amenities to attract new home buyers, and golf is a key amenity in both rural and urban areas of the state. A number of new golf communities were under construction in 2005 offering a mix of single family homes, townhomes and condominiums. New residential developments are under construction at existing courses (e.g., Homestead Preserve at the Homestead Resort), expanded courses (e.g., Williamsburg National Golf Course), and new courses (e.g., Blue Ridge Shadows in Front Royal, northern Virginia, or Ashley Plantation in Daleville, near Roanoke). This new golf-related real estate construction generated \$341.0 million in 2005. Furthermore, in 2005 there were approximately 128 golf communities in Virginia, and we estimate the "golf" premium associated with the sale of real estate in these developments to be \$86.4 million. The premium is the additional amount a buyer is willing to pay for a home or property located on a golf course or within a golf community.

¹⁰ MAPGA Survey of Virginia and Maryland Golf Facilities' Annual Charitable Giving, 2005.

¹¹The average is higher than the median because there are a large number of courses that raise considerable annual sums (\$300,000 plus) at charitable tournaments throughout the year.

Virginia Golf Real Estate Revenues in 2005 (\$ millions)	
Golf-Related Residential Construction	\$341.0
Realized Golf Premium	\$86.4
TOTAL	\$427.4

Note: The sale of existing homes is considered a transfer of assets rather than new economic output, so the golf premium that is realized in the sale of an existing home is not included in the economic impact analysis.

Golf-related residential construction. For this industry segment, SRI worked with Virginia golf course builders and golf real estate developers to arrive at estimates of the average number of homes constructed in Virginia golf communities, the fraction of these homes under construction in a given year, and the average construction costs per type of home (i.e., condominium, townhouse or single family home). Values varied considerably depending on such factors as the location of golf communities within the state, the proportion of condominiums or townhouses versus single family homes, and overall real estate market conditions. In 2005, NGF estimates there were approximately 15.5 Virginia golf courses with active real estate development. From interviews with industry representatives, SRI estimates that, on average, approximately 450 units will be developed on each course at a build-out rate of 20 percent per year. We further assume average construction costs in the state of \$350,000 for single family homes, \$150,000 for townhouses, and \$75,000 for condominiums. Multiplying the total number of each type of unit under construction in a given year times the average construction cost per unit yields a total 2005 golf-related residential construction figure of \$341.0 million.

Realized golf premium. The “golf real estate premium” is the extra value a home owner can expect to receive on the sale of a home located in a golf community that is above and beyond the premium associated with a home’s other features or amenities (e.g., square footage, fixtures, landscaping, etc.). Through industry interviews, SRI arrived at a conservative estimate of this premium of \$25,000 per unit. Multiplying the approximately 128 existing Virginia golf communities by the average number of housing units per golf course, we arrive at a total of 57,600 golf community homes. In 2005, the home turnover rate (percentage of homes sold) was 6 percent. Therefore, the realized golf premium (i.e., the additional money flowing into the economy from the sale of golf real estate) can be found by multiplying the home turnover rate by the total number of golf community homes by the average golf premium per unit. SRI estimates this premium to be \$86.4 million in 2005.

F. Hospitality/Tourism

Golf-related travel has enjoyed increasing popularity, whether as the primary motivation for a trip or in connection to other recreational time spent with family and friends or business colleagues. Although a large and critical golf industry segment, there are no central sources of state-level golf tourism data. To estimate a state’s total golf tourism revenues, one needs data on two key indicators: (1) the annual number of golf-related trips and (2) average spending per trip.

Number of golf-related trips. Many states subscribe to the Travel Industry Association (TIA) of America's TravelScope statistics, which provide annual data on the number of people traveling to or within a state and the average length of their trips. In addition, some states' departments of tourism have sponsored golf tourism studies.

In the case of Virginia, the TIA TravelScope estimated a total of 54.8 million person trips (a trip in which a person travels 50 or more miles to, through or within Virginia) were taken in 2005. The same person can take more than one person trip in a given year. In its Virginia Visitor Study survey, the Virginia Tourism Corporation's (VTC) Research Division found that approximately 2.8 percent of total person trips, or 1.551 million trips were golf related. This seems plausible given PGA's estimate of 8.5 million rounds played in Virginia in 2005—meaning that approximately 17.8 percent of rounds played at Virginia courses were played by non-members or non-locals, i.e., golfers from other parts of Virginia, other states, or other countries. Since Virginia is a Top 10 golf destination state, its share of golf trips seem reasonable compared to the national total.

Average spending per golf trip. For the national *The Golf Economy Report*, SRI used annual domestic travel expenditure data collected through golfer surveys by NGF, and compared this with average spending per trip data collected by the U.S. Bureau of Labor Statistics (BLS). However, neither source provides average spending data by state. For example, NGF's *U.S. Golf Travel Market 2003 Edition* data are based on 1,606 responses to a national survey—too small for extrapolation to the state level.

Moreover, NGF changed its methodology between the publication of its *U.S. Golf Travel Market, 1998 Edition* report (used by SRI in its 2002 *The Golf Economy Report*) and the 2003 edition. The former included data on average spending per trip for Business Golf Travelers, Vacation Golf Travelers, and Golf-Specific Travelers. The 2003 edition surveyed golfers regarding their expenditures on Golf-Specific Travel and compares this to their expenditures on Non-Golf Business Travel and Non-Golf Vacation Travel. Because of the lack of state-level data and the absence of data on golf-related trips (i.e., trips in which the primary motivation is vacation or business but during which travelers played golf) in the latest NGF report, SRI has accordingly revised its approach to estimating golf-related tourism revenues.

SRI obtained average golf trip spending data from the VTC's Virginia Visitor Study which found average spending on a 2003/2004 golf trip in Virginia was \$207. Although this figure seems low compared to other national estimates, this is countered in some ways by the large number of golf trips. In addition, the VTC provides the following reasons for the difference: (1) other studies, such as the 2003 study conducted by NGF, require an overnight stay while the VTC did not require this stipulation; and (2) other studies focus on golf travelers rather than golf trips—a golf traveler may be reporting total spending on all golf trips taken during the year rather than breaking down spending by trip.

Virginia's Golf-Related Travel Expenditures in 2005	
# Golf trips	1,551,574
Average travel \$ per trip	\$207
% attributable to golf	100%
Total (2004\$ millions)	\$321.0 million
Total (2005\$ millions)	\$329.1 million

Note: This figure assumes a similar level of golf-related travelers and expenditures in 2005 as in 2004 and only adjusts for price level changes between 2004 and 2005 using the GDP deflator.

G. Golf's Economic Impact

The impact of golf on a state's economy includes both the direct impact of the sector itself (its core and enabled industries), as well as the indirect and induced (or multiplier) impacts that occur as golf's direct impact creates ripple effects throughout the state economy.







Direct economic impact. The direct economic impact of golf is simply the size of the golf industry cluster within the state economy in terms of revenues. The "state golf economy" can be calculated by adding together the size of each of the core and enabled industries calculated in the sections above:

Direct Impact of the State Golf Economy	
Core Industries	+ Golf Facility Operations
	+ Golf Course Capital Investment
	+ Golfer Supplies
	+ Media, Tournaments, Associations
Enabled Industries	+ Real Estate
	+ Hospitality/Tourism
= Size of State Golf Economy	

Indirect/induced economic impact (multiplier impact). Golf course facilities and the companies that provide goods and services to the golf industry, in turn, purchase goods and services from other companies. These purchases are considered the "indirect" impacts of the golf sector. Furthermore, the employees directly employed by the golf sector will spend much of their incomes in the region, creating more spending and more jobs in the economy. These impacts are considered "induced" impacts. Together, the indirect and induced impacts make up the multiplier impact of the golf economy.

Multiplier values vary from region to region, based on the unique characteristics of the state's or region's economy. Industries with more extensive linkages to other industries within the local economy will have a greater multiplier effect on final economic activity relative to the initial, direct effect. Conversely, economies and industry sectors dependent on a large share of imported

supply will have smaller multiplier effects. For this study, the RIMS II (Regional Input-Output Multipliers), calculated by the U.S. Bureau of Economic Analysis, were used to calculate the multiplier impact of Virginia's golf economy.

Multiplier Impacts on State Economy				
Industry	Direct	Indirect	Induced	TOTAL (\$ million)
Golf Facility Operations				\$1,449.9
Golf Course Capital Investment				\$55.6
Golfer Supplies				\$88.1
Media, Tournaments, Associations				\$32.8
Real Estate				\$783.8
Hospitality/Tourism				\$678.5
TOTAL				\$3,089.7

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