



America's Top 100 Private Sector Transportation Design & Construction Professionals of the 20th Century

Building a Better America

Supplement to Transportation Builder Magazine

ABOUT ARTBA



Founded in 1902, the American Road & Transportation Builders Association (ARTBA) advocates strong federal investment in transportation infrastructure. On behalf of its members and in the public interest, ARTBA aggressively and progressively promotes development of safe and efficient transportation systems. Complementing its vital leadership role in this area, the association also provides regulatory advocacy and services and benefits designed to help its member firms and agencies operate more efficiently.

ARTBA's more than 5,000 members hail from all 50 states. They include representatives from all of the U.S. transportation construction industry's business sectors, both public and private. Today, the U.S. transportation construction industry that ARTBA represents generates more than \$200 billion in annual economic activity and sustains 2.5 million American jobs.

In just the past five years, ARTBA has won more than 20 national awards for its government relations and communications programs in support of its mission.

For more information, visit the association's website at www.artba.org.

ABOUT THE ARTBA-TDF

The ARTBA Transportation Development Foundation (ARTBA-TDF) was established in 1985 as a 501(c)3 tax-exempt entity to support research, education and public awareness. The Foundation supports an array of initiatives, including educational scholarships, awards programs, a national exhibition on transportation and a facility dedicated to improving safety in roadway construction zones. ARTBA-TDF activities include:

- *Highway Worker Memorial Scholarship Program*
- *National Work Zone Safety Information Clearinghouse*
- *Roadway Work Zone Safety Awareness Awards Program*
- *Smithsonian's "America on the Move" Exhibition*
- *Safety, Training & Education Programs*
- *Young Executive Development Program*
- *PRIDE Awards*
- *Globe Awards*
- *Special Economic Research & Reports*

Corporate and personal contributions to support ARTBA-TDF programs and activities may be tax-deductible. The Foundation's Federal Tax Identification Number is 52-6283894.

Gifts to support ARTBA-TDF projects and programs may be sent to: ARTBA-TDF, The ARTBA Building, 1010 Massachusetts Avenue, N.W., Washington, D.C. 20001.

**For further information, contact
Foundation Executive Director Brad Sant at 202-289-4434.**



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ARTBA-TDF CHAIRMAN'S MESSAGE



David R. Kraemer
Edward Kraemer & Sons, Inc.
Plain, Wis.

Transportation Construction Industry Titans

When Michigan public official Horatio Earle created the American Road & Transportation Builders Association (ARTBA) in 1902 to advocate construction of a federally-supported interstate highway network, the nation was still largely dependent on railroads for transporting people and products.

America's roads were primitive by today's standards. Less than 10 percent of the two million miles of rural road had a surface other than dirt—often only gravel, shells or sand. Horse-drawn wagons slogging through muddy trails provided the primary means of local travel. Automobiles were in their infancy and airports were still something for the future. The transportation challenges facing policymakers and the public were daunting.

Fast forward 100 years. Today, the U.S. has the most complex, sophisticated, safest and efficient transportation network in the world. It includes: 3.9 million miles of roads and highways; 5,400 public airports; 200,000 miles of freight and passenger railroad track; 5,800 miles of urban mass transit track with more than 2,300 stations; and 3,600 waterport terminals.

Building such a vast infrastructure system didn't just happen. It was a Herculean task—the result of a successful partnership between federal, state and local governments—and the private sector—to serve the public interest.

One of the goals of ARTBA's 2002-03 "Centennial Celebration Program" was to draw public attention to the enormous social, economic and mobility contributions made by the men and women of our industry. "America's Top 100 Private Sector Transportation Design & Construction Professionals of the 20th Century" is their story. It also serves as the companion piece to "America's Top Transportation Projects and Public Officials of the 20th Century," which the ARTBA Transportation Development Foundation (ARTBA-TDF) published in 2002.

The talented—and often daring—individuals featured in this "Top 100" publication were selected from nominations received in response to a survey conducted by the ARTBA-TDF. Of course, no list is completely inclusive, but few would argue about the merits and accomplishments of those selected. Collectively, these "transportation construction industry titans" helped build an infrastructure network that created an unprecedented freedom of mobility and unmatched quality of life, spawned the growth of the hotel and motel, fast food restaurant, convenient store, tourism and other industries and made this country an economic and military superpower.

There are a host of new transportation challenges facing America in the 21st century. But one thing is certain: the skill, ingenuity and innovation of the next generation of transportation construction industry leaders will blaze a path and meet those challenges just as their predecessors did during the past 100 years!

Enjoy this read!

A handwritten signature in cursive script that reads "David R. Kraemer".

A SPECIAL THANKS

The ARTBA-TDF thanks the following companies for their support of “America’s Top 100 Private Sector Transportation Design & Construction Professionals of the 20th Century.”

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Murray Rowe

Virginia Road & Transportation Builders Association

Vulcan Materials Company

Williams Brothers Construction Company

Wisconsin Transportation Builders Association

Zachry Construction Corporation

A team of ARTBA staff members worked on this special ARTBA-TDF publication, led by: Matt Jeanneret, vice president of communications; Carrie Halpern, manager of publications; Sara Dix, chapter services coordinator and communications specialist; Karen Evans, program/research assistant; and The Expressways Publishing Project’s Tom Kuennen. Design and layout by Carrie Halpern. Copyright © 2004 ARTBA.

■ America's Top 100 Private Sector Transportation Design

VINCENT P. AHEARN, SR. (1896-1967)



Vince Ahearn served as the top executive of the National Sand and Gravel Association (NSGA), known today as the National Stone, Sand and Gravel Association. Ahearn also led the National Ready Mixed Concrete Association and National Industrial Sand Association, which were originally divisions of the NSGA.

In the government relations arena, he worked with Presidents Roosevelt and Truman on labor relations and wage and price controls; with President Eisenhower on creation of the Interstate Highway System bill and Highway Trust Fund; on early environmental mitigation strategies with the Army Corps of Engineers and on the original Airport Improvement Trust Fund legislation.

Ahearn negotiated the “material man” exemption from the Davis Bacon Act prevailing wage requirements for the construction materials industries. He played a pivotal role in extending the percentage depletion allowance to construction aggregates and industrial sand—the tax benefit permits the industry to recognize the “depreciation” or depletion of the natural resource on their annual returns. Ahearn retired in 1966.

JAMES ALBRITTON (1964-)



James Albritton made highway shoulders and medians safer for all drivers as the inventor of the revolutionary Trinity Attenuating Crash Cushion (TRACC) and the MPS-350 truck-mounted crash attenuator—two highly successful products marketed by Trinity Industries, Inc. TRACCs are low-cost, fully redirective cushions that protect motorists from impacting the end of concrete barriers and other structures. The MPS-350 protects the public from slow-moving or stationary highway service vehicles in roadway work zones.

Albritton is currently president of Exodyne Technologies, Inc., a small engineering firm in Fort Worth, Texas, that specializes in highway safety product design. His background in advanced materials, fracture mechanics and low-cost manufacturing has led to important advances in affordable protection for the driving public.

■ America's Top 100 Private Sector Transportation Design

MICHAEL BAKER, JR. (1912-1977)

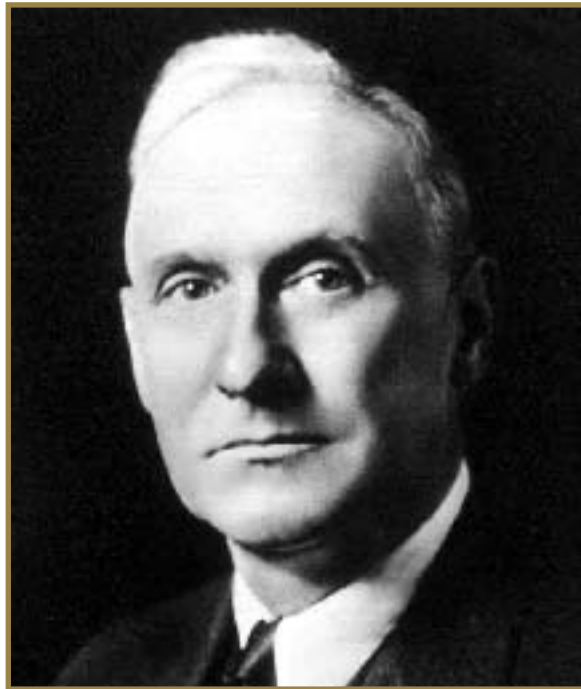


Michael Baker, Jr., graduated from Pennsylvania State University in 1936 at the head of his class. After working at various engineering jobs, he started his own engineering firm in 1940—Michael Baker, Jr., Inc. Today, the firm is one of the largest consulting engineering organizations in the world. For Baker, it was always about “excellence, integrity and resourcefulness.”

Under Baker’s leadership, the firm attained early national recognition as a national and international surveying engineering design firm through completion of many military-related engineering contracts. The firm later was involved in a variety of civil projects in the United States and elsewhere, including: the 135-mile Khmer-American Friendship Highway in Cambodia (1956), the \$7.7 billion Trans-Alaska Pipeline (1977), the 876-ft.-high New River Gorge Bridge in West Virginia and the Midfield Terminal Complex and airfield improvements at Pittsburgh International Airport (1992).

The company is actively involved in the reconstruction efforts in Iraq and Afghanistan and works closely with the Department of Homeland Security.

HARRY H. BARBER (1878-1948)



Harry H. Barber co-founded the Barber-Greene Company in the wake of the nation's first Federal-Aid Road Act in 1916. In the next decade, Barber developed some of his most significant innovations, including material handling machines such as bucket loaders, vertical boom ditchers and belt conveyors. In 1931, he invented what is considered the first functional bituminous concrete paver or the "traveling plant." He is considered an innovator of the continuous-mix asphalt plant, which later lead to the modern drum-mix asphalt plants.

During his distinguished career, he was awarded a total of 70 patents for his inventions in construction and material handling equipment.

■ America's Top 100 Private Sector Transportation Design

GEORGE S. BARTLETT (1858-1945)



George S. Bartlett is regarded as the greatest single influence on the use of concrete roads. During his distinguished career, he was lauded by his contemporaries in the concrete and highway industry for his energetic and innovative promotion of concrete roads. In 1909, Bartlett established experimental stretches of concrete, working with the Board of Road Commissioners of Wayne County, Mich., and the University Portland Cement Company. He continued to advocate for the use of Portland Cement concrete from the time of the first Federal-Aid Road Act in 1916 through World War II. Known as “The Apostle of Concrete,” Bartlett summed up his career by noting that he had probably sold more concrete than any living man.

His memory is preserved with the distinguished George S. Bartlett Award. Co-sponsored by ARTBA, the American Association of State Highway and Transportation Officials and the Transportation Research Board of the National Academies, the Bartlett Award is conferred annually on an individual selected for “outstanding contributions to highway progress.”

WARREN A. BECHTEL (1872-1933)



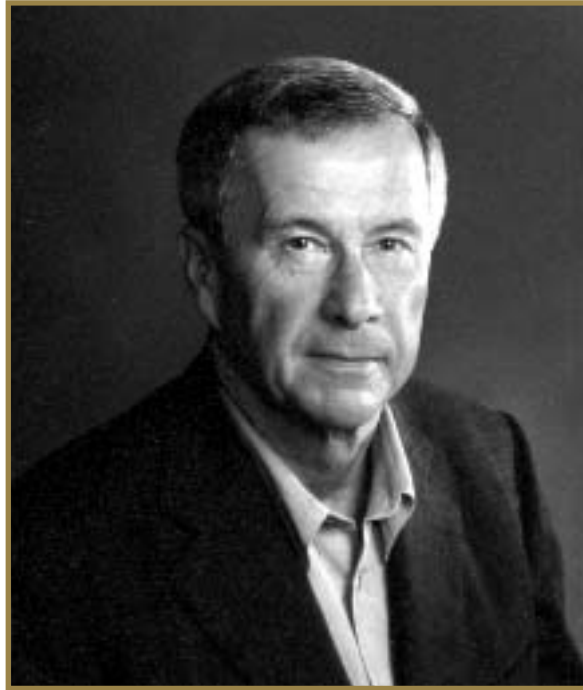
Warren A. Bechtel performed his first construction work in 1898, grading railroad beds with a mule-drawn scraper in Oklahoma Territory. By 1906, Bechtel was contracting on railroad jobs up and down the Pacific coast of the United States. The W.A. Bechtel Co., was soon building roads, tunnels, bridges and dams. Customers responded to Bechtel's work ethic and the business prospered. Bechtel put it succinctly: "When you can't trust a man's word, you can't trust his signature."

To get the work done efficiently, he learned to rely on the most modern methods available—a Bechtel tradition that continues to this day. Early on, Bechtel mastered the steam shovel, and he and his sons pioneered such applications as dump trucks and tractors right on the job site.

In 1931, he helped put together one of the industry's first large-scale joint ventures—the Six Companies consortium that built Hoover Dam. His son, Stephen, took over as president when Bechtel passed away in 1933 and led the business to become the engineering and construction powerhouse it is today.

■ America's Top 100 Private Sector Transportation Design

NED W. BECHTHOLD (1937-)



In 1959, Ned W. Bechthold joined Payne & Dolan, Inc., of Waukesha, Wis., and since then he's guided the growth and performance of this major Midwestern contractor while promoting quality and innovation in asphalt paving nationwide.

Bechthold was an early adopter of the reclamation and recycling of asphalt and concrete pavement. In 1980, he pioneered the concept of internal, continuous asphalt paving and product improvement, hiring a full-time quality control manager. Following a public-private sector fact-finding mission to Europe, Bechthold's firm was the first in the United States to test Stone Matrix Asphalt and was among the first to place the new "Superpave" mixes in Wisconsin.

Payne & Dolan's Hot Mix Asphalt plants have received both national and state environmental awards, and since 1991 the firm has employed a full-time environmental expert who keeps environmental concerns at the forefront.

DR. LOUIS BERGER (1914-1996)



“Doc” Berger founded The Louis Berger Group, Inc., in 1953, and built it into one of the world’s leading engineering, economics and environmental planning and design firms, employing over 4,000 people in more than 70 countries. He graduated from Tufts University in 1936 with a B.S. in civil engineering. In 1940, he received his M.S. in soils and geology from the Massachusetts Institute of Technology. In 1948, he accepted an appointment as a member of the engineering faculty at Pennsylvania State University. Berger received his doctorate in 1951 from Northwestern University. In 1953, a year after leaving his professorship for the consulting world, Berger received his first major domestic assignment: the design of a major portion of the Northeast Extension of the Pennsylvania Turnpike, the nation’s first super-highway.

Continuing Berger’s vision, The Louis Berger Group, Inc., headquartered in East Orange, N.J., has been involved in the planning, design and construction management of more than 100,000 miles of highway, 2,000 miles of railroad, 3,000 bridges, 100 airfields, seaports, dams, water supply systems and numerous environmental mitigation and cultural preservation projects throughout the United States and in more than 140 countries worldwide.

■ America's Top 100 Private Sector Transportation Design

C.L. "LEO" BEST (1878-1951)

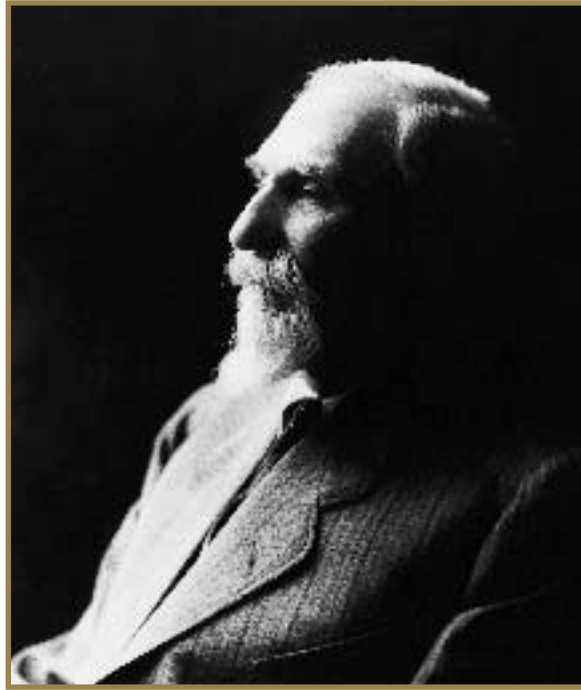


C.L. "Leo" Best, son of the agricultural equipment pioneer Daniel Best, founded his own company in 1910 under the name C.L. Best Gas Traction Co. By 1913, he had developed his own version of the track-type tractor, which he registered under the "Tracklayer" trademark. His tractors were seen in various construction and agricultural applications. In October 1920, he changed his company's name to the C.L. Best Tractor Co., to make it more indicative of the nature of his business.

In May 1925, the C.L. Best Tractor Co., merged with The Holt Manufacturing Company to form the Caterpillar Tractor Co. Best was elected chairman of the new company and retained that position until his death in 1951.

From 1912-1935, he was granted 27 patents. One of the most popular machines he designed and produced was the gasoline-powered Best 60, which eventually became part of the original Caterpillar Tractor Co., product line and in 1931 was used as the chassis for Caterpillar's first diesel tractor, the Diesel Sixty.

DANIEL BEST (1842-1923)



Californian Daniel Best was a pioneer in agricultural equipment and was the founder of Daniel Best Agricultural Works in 1886. This became the Best Manufacturing Company in 1893, as he was producing tractors and engines in addition to his agricultural machinery.

He is credited with some of the early development of the horse-powered combined harvester and the steam-powered combined harvester. His steam traction engines and gasoline engines also garnered a lot of attention and were found in a wide variety of applications. He was also one of the first manufacturers to build a horseless carriage (automobile) on the Pacific coast.

In 1908, his firm, the Best Manufacturing Company, was sold to Benjamin Holt. During his lifetime, he was granted 41 patents on a wide variety of inventions, including grain cleaners, a washing machine, harvesters and engines.

■ America's Top 100 Private Sector Transportation Design

ETHEL A. BIRCHLAND



Ethel A. Birchland, the first woman to lead a national construction association, served as the American Road Builders Association (ARBA) secretary—today's president and CEO position—from 1924-29. She began her service at ARBA in 1913 as an assistant to ARBA's top executive, E.L. Powers. She helped lead the industry during the growth of a national roadbuilding program following several Federal-Aid Road Acts in the 1920s.

Under her leadership, the association created seven ARBA divisions, experienced great growth in the annual "Road Show" equipment exposition—known today as CON-EXPO-CON/AGG—and moved the ARBA headquarters from New York City to Washington, D.C.

HENRY M. BRINCKERHOFF (1868-1949)



Henry M. Brinckerhoff is perhaps best known as the co-inventor of the third rail, demonstrated in 1893 at the Columbian Exposition in Chicago. His invention, the patent of which was assigned to his then-employer, General Electric, for \$25, was to revolutionize urban transit in the coming decades. In 1906, he joined William Barclay Parsons in the firm that now bears their names—Parsons Brinckerhoff—one of the oldest continuously operating engineering firms in the United States.

Brinckerhoff is also recognized for his innovative work in the development of early street railways and subways. He served as consulting engineer to the Board of Street Railway Commissioners of the City of Detroit; chief engineer of the Chicago Subway Commission; consulting engineer for the Cleveland Rapid Transit Commission; transportation consultant for the Philadelphia Rapid Transit Company; and member of the Cincinnati Transit and Internal Bus and Tractor Commission. As the capstone of his career, he designed the network of roads at the 1939 World's Fair in New York City.

■ America's Top 100 Private Sector Transportation Design

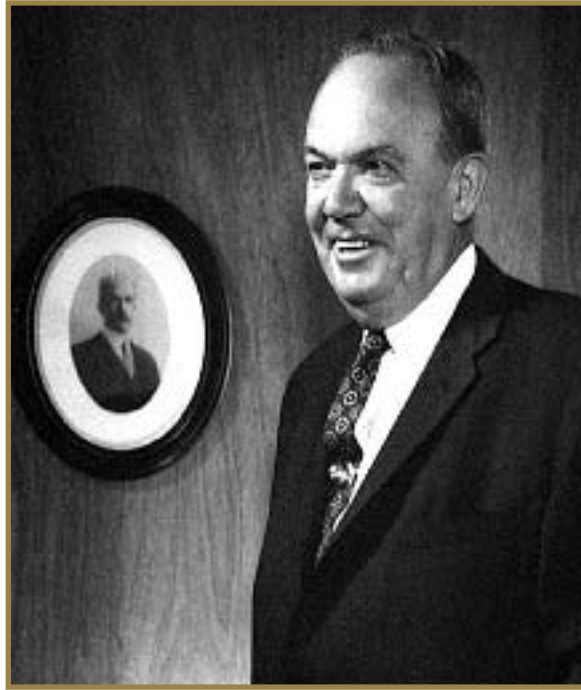
J. DON BROCK, PH.D. (1938-)



In 1965, J. Don Brock received his first patent for a high-speed carpet dryer and sold the patent to build interest in his father's asphalt heating company. Today, his firm holds approximately 200 U.S. and foreign patents on construction machinery and Brock holds between 90 and 100 U.S. patents himself.

Brock quickly became one of the asphalt paving industry's leading authorities. He now serves as chairman of the board, president and CEO of Tennessee-based Astec Industries, Inc., which he founded in 1972. The company manufactures asphalt mixing plants and recycling equipment, mobile asphalt paving equipment, heat transfer equipment and aggregate processing equipment. Under his leadership, the firm has grown into a family of 14 companies located throughout the United States and Canada.

EDWARD W. BULLARD (1899-1963)

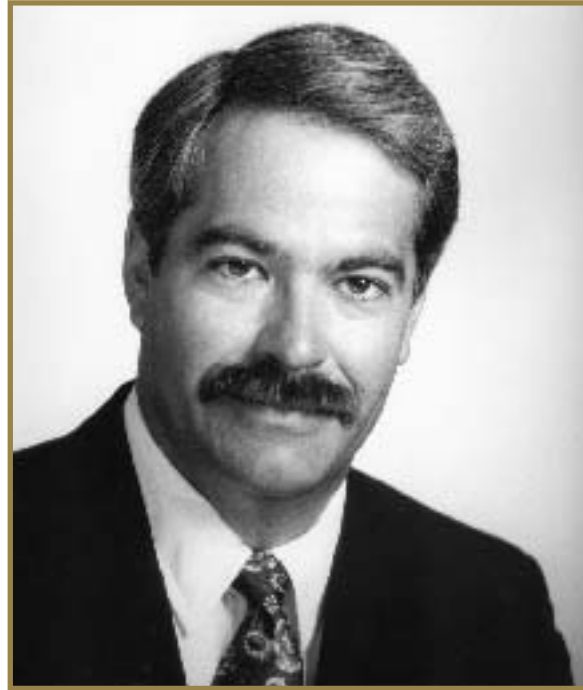


Edward Dickinson Bullard founded the E.D. Bullard Co., Inc., in 1898 in San Francisco, Calif., where the firm manufactured equipment for miners in western states. Two decades later, Bullard's son, Edward W. Bullard, returned from World War I and applied his experience with Doughboy army helmets in designing protective headgear for miners, and soon after, for the construction industry.

E.W. Bullard's original 1919 "Hard-Boiled Hat" was manufactured out of steamed canvas, glue and black paint and included a suspension device. It was considered the first "hard hat," which revolutionized construction and mine worker safety. During construction of the Golden Gate Bridge, Bullard adapted his hats for bridge workers and his engineers designed an original supplied air respirator for workers responsible for blasting the steelwork prior to the application of the bridge's orange paint. E.D. Bullard Co., Inc., remains a family-owned business and continues to produce innovative products for construction and public safety from its headquarters in Cynthiana, Ky.

■ America's Top 100 Private Sector Transportation Design

WILLIAM R. CAPE (1950-2002)

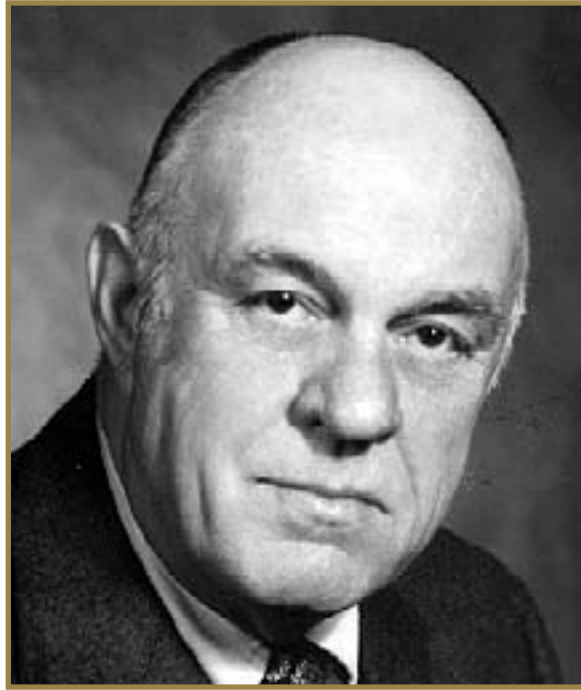


As president of James Cape & Sons Company of Racine, Wis., Bill Cape was a leader and an innovator in the construction of Portland Cement concrete pavements. In 1982, he oversaw the first project in Wisconsin using fly ash. In 1983, he also oversaw the nation's first use of epoxy-coated steel in continuous reinforced concrete pavement and reclaimed recycled concrete pavement as coarse aggregate in new concrete. In 1986, he was the first in the United States to adopt the dowel bar inserter.

Cape sat on the board of directors of the Wisconsin Concrete Paving Association, the American Concrete Pavement Association and the Transportation Development Association. He was also a member of the Wisconsin Transportation Builders Association and the Transportation Research Board of the National Academies.

Cape toured the world giving speeches on various concrete topics, such as: ride quality of concrete pavements, concrete patching and repair, and cost-effectiveness and compatibility of cementitious materials. He held a number of patents, one on a system to change concrete paver widths without having to disassemble the concrete paving machine. He also held a patent for a highly portable high-volume concrete mixing plant.

JAMES A. CAYWOOD (1923-2000)



James A. Caywood graduated from the University of Kentucky in 1944 with a B.S. in civil engineering. After a brief career with the railroad industry, Caywood joined DeLeuw, Cather and Company.

When the firm was awarded the contract as general engineering consultant for design of the Washington, D.C., Metro, Caywood served as project manager. He also served as project director on the Northeast Corridor Improvement Project. For his efforts, Caywood was inducted into the American Public Transportation Association “Hall of Fame.”

He became president and CEO of DeLeuw, Cather in 1978. Under his direction, the company managed the design and construction of highway, railway and rapid transit systems around the world.

He was elected ARTBA chairman in 1982 and served as ARTBA treasurer from 1988-91. Caywood was a professional engineer in all 50 states, D.C., and Puerto Rico.

■ America's Top 100 Private Sector Transportation Design

WILLIAM E. CLARKSON, SR. (1925-)



Bill Clarkson became president of Clarkson Construction Company in 1955, representing the fourth generation to run this family-owned firm. His tenure coincided with the birth of the Interstate Era (1956), and Clarkson became a key player in the development of the Interstate Highway System.

The firm played an instrumental role in the construction of Interstate highways I-70, I-29, I-35, I-435, I-470 and I-635—and many other primary and secondary roads—in the central United States. Under Clarkson's leadership, the firm expanded into concrete and asphalt paving, production of aggregates, diversified drainage work and structural concrete. He remains a leader in the Kansas and Missouri construction industries and has served as a board member of regional and national construction associations.

HOLLY CORNELL (1914-1997)



In 1946, Holly Cornell co-founded CH2M with Oregon State University (OSU) classmates Jim Howland and Burke Hayes, and their engineering professor, Fred Merryfield. In 1971, the company merged with Clair A. Hill & Associates, forming CH2M HILL. Cornell opened and managed the Seattle office and later served as president and chairman.

Among his many accomplishments, Cornell helped guide the firm into the transportation business where, today, CH2M HILL is ranked number eight by *Engineering News-Record*. In 1969, he was instrumental in starting a model bridge contest at OSU for high school students, which is still held annually. He was recognized with OSU's Distinguished Service Award in 1986.

■ America's Top 100 Private Sector Transportation Design

ROY W. CRUM (1885-1951)



Roy Crum will be remembered for his 23 years of service as director of the Highway Research Board (HRB), located in Washington, D.C., and known today as the Transportation Research Board of the National Academies.

Crum earned his B.S. degree in civil engineering at Iowa State University. From 1907 until 1919, Crum taught at Iowa State and also served as a structural engineer with the Iowa Engineering Experiment Station. From 1919 to 1928, he was engineer of materials and tests for the Iowa State Highway Commission.

His tenure at HRB was marked by vigorous growth in new programs and research initiatives and attendance at annual meetings where peer-reviewed research was presented. In 1948, HRB established its highest award for outstanding achievement in transportation research and it was redesignated the Roy W. Crum Distinguished Service Award in 1952.

ROBERT B. DAUGHERTY (1922-)



In 1946, Robert B. Daugherty purchased a small agricultural manufacturing firm and transformed it into one of the world's most successful and respected companies. While Valmont Industries' early focus was on producing a new center-pivot irrigation system to help farmers grow crops while conserving water, Daugherty also sought to produce a product that met a critical transportation infrastructure need—lighting poles. He utilized innovative technology to produce seamless welded poles at a very competitive price—thus providing greater aesthetics and reducing overall costs for roadway illumination and traffic controls.

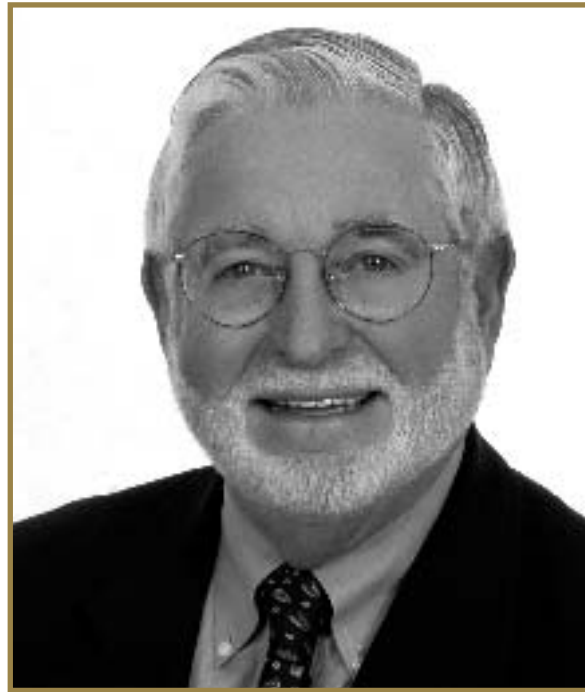
By producing a wide variety of pole designs running from decorative lighting poles for neighborhood streets to highmast lighting poles for the Interstate Highway System, roadway engineers can now design systems to match different lighting needs. Under Daugherty's leadership, Valmont has become the world's leader in producing poles to help safely light our highways, streets and neighborhoods.

Valmont expanded its product offerings to include other transportation infrastructure products to support traffic management and intelligent transportation systems. Valmont is the leading supplier of traffic signal poles, camera poles and sign structures, which are helping make our nation's transportation network safer and more efficient and providing motorists a better driving experience.

Today, Daugherty's legacy continues. As the only publicly traded manufacturer of transportation infrastructure products, Valmont carries on Daugherty's vision to help make the nation's roadways safer and quality of life better.

■ America's Top 100 Private Sector Transportation Design

ARTHUR M. DINITZ (1933-)



Roadway safety devices developed by Art Dinitz have saved lives and changed America's roadsides forever. In 1968, Dinitz, founder of Transpo Industries, Inc., realized the need for products that would enhance the safety of the traveling public.

His first product, a water-filled energy-absorbing bumper, was successfully installed on over 4,000 New York City taxicabs. In a continuing search for innovative products, Transpo introduced and marketed crash cushions, omni-directional breakaway systems for sign supports and light poles, Jet Blast and Perimeter Security Fencing for airports and the safety-oriented Rail Road Crossing system. The company was an early developer of polymer concrete materials for rapid rehabilitation and preservation of bridges, roadways, tunnels and airports.

He has been a leader at the national level in promoting the development and use of new materials and technologies in the transportation industry. In 2002, Dinitz was a recipient of ARTBA's John "Jake" Landen Memorial Highway Safety Award, recognizing outstanding contributions to highway safety.

WILLIAM PHELPS ENO (1858-1945)



William Phelps Eno rightly deserves credit for now-routine innovations such as the first codified traffic regulations and rules for driving, traffic guidance with pavement markings and signs, driver hand signals and the promotion of driver licensing and vehicle safety inspection, speed limits and proper law enforcement.

In 1899, Eno devoted himself full-time to developing the emerging science of traffic control. In 1903, he developed the first city traffic code in the world for New York City and the first automobile-era traffic plans for New York City, London and Paris. His traffic plans were used by the Allied armies in both World Wars.

In 1921, he created the Eno Foundation for Highway Traffic Control. In 1926, he published the landmark book, *Fundamentals of Highway Traffic Regulation*. Today, the Eno Transportation Foundation continues his transportation research work in a variety of modes.

■ America's Top 100 Private Sector Transportation Design

EUGENE C. FIGG, JR. (1936-2002)



Gene Figg made significant contributions to the transportation construction industry, resulting in a major impact on how bridges were built throughout America. He was an early advocate and staunch supporter of concrete segmental bridges across the United States. He was recognized for development of cost-competitive bridge technology, along with creating bridge designs that were unique and provided pleasing aesthetics. Under his leadership, the firm he founded created numerous bridge landmarks and icons for owners across America, while providing cost-saving and durable bridges.

Figg furthered the industry through the creation of some of the nation's most recognized bridges and set records for span length and "first-of-a-kind" bridges. Three of these bridges received the "Presidential Award" through the National Endowment for the Arts: the Sunshine Skyway Bridge over Tampa Bay, Fla.; the Linn Cove Viaduct around Grandfather Mountain, N.C.; and the Natchez Trace Parkway Arches near Nashville, Tenn. He was the central figure in the formation of the American Segmental Bridge Institute and was selected for many honors in the engineering profession, including the American Society of Civil Engineers OPAL Award for Design.

JOHN FITCH (1917-)

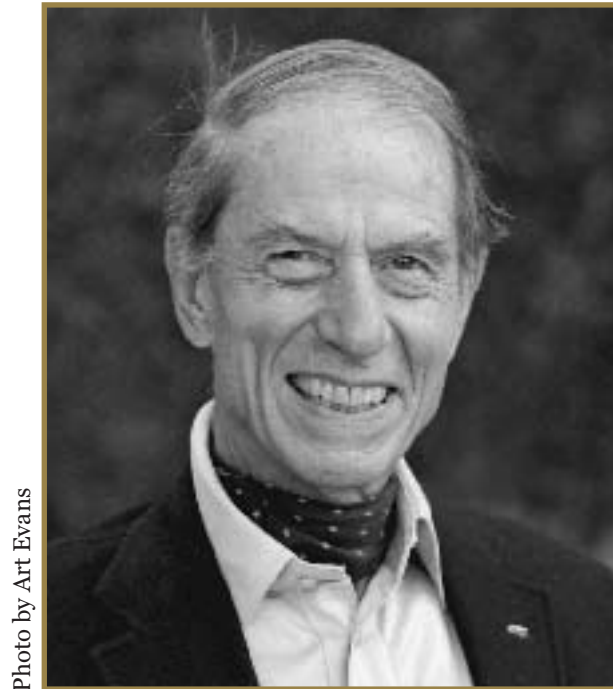


Photo by Art Evans

For 18 years during the 1950s-60s, John Fitch enjoyed a world-class auto racing career on the Mercedes Benz team, among others. During the latter part of his racing career, he entered the field of highway safety by designing, developing and successfully testing the “Fitch Barrier”—a yellow sand-filled crash cushion commonly seen in front of bridge abutments and other potential roadside hazards. The barrel-shaped design is considered one of the most cost-effective crash attenuators ever invented. It has been used in all 50 states since 1968 and is credited with saving thousands of lives.

Fitch-developed “displaceable guardrail” and “compression barriers” are also being used to improve safety on racetracks and roadways that have higher accident and fatality rates. In 1998, Fitch received the Kenneth Stonex Award from the Transportation Research Board of the National Academies for his lifelong contributions to safety relating to the roadside, the vehicle and the driver.

■ America's Top 100 Private Sector Transportation Design

HENRY MORRISON FLAGLER (1830-1913)



Henry Morrison Flagler joined John D. Rockefeller and Samuel Andrews in 1870 to establish Standard Oil, which would quickly become the nation's largest refiner. On an 1878 trip to Florida, Flagler soon recognized the state's potential to attract out-of-state visitors, and in 1885 began construction of a major hotel in Saint Augustine. Realizing the need for a sound transportation system to support his hotel ventures, Flagler purchased the first railroad in what would eventually become the Florida East Coast Railway.

Flagler's hotels, resorts and real estate developments spurred his involvement with railroads. The railroads were extended to West Palm Beach, Biscayne Bay and Key West. More than probably anyone else, Flagler was responsible for making Florida the tourist destination that it is today and his aggressive railroad construction made it possible.

S.W. FLESHEIM (1889-1979)

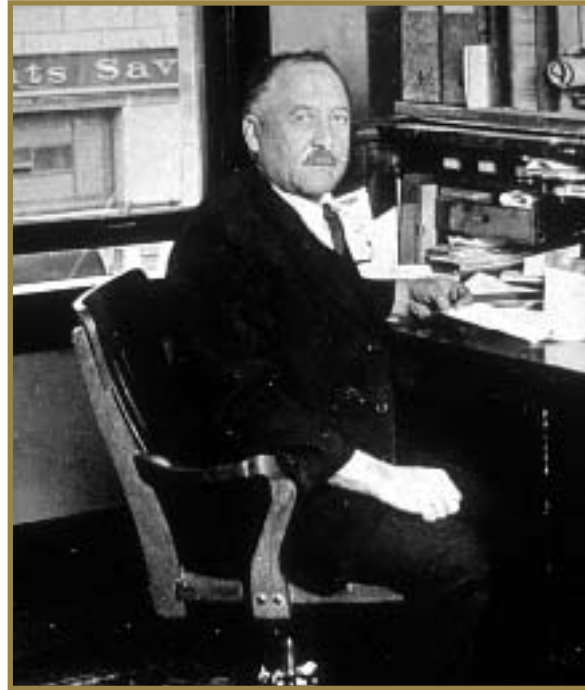


In 1909, S.W. Flesheim founded Master Builders, Inc., and launched an entire new industry in the development, manufacture and marketing of products to improve the performance of concrete in all construction applications. Initially focused on products that enhanced the strength and durability of concrete floors in industrial applications, in 1927, Master Builders developed a water-repellent admixture, Omicron, for concrete, mortar and cement stucco. Five years later, the firm rolled out the first water-reducing admixture, Pozzolith, and introduced the air-entraining admixture, Micro-Air, regarded as the most important advance in concrete technology since the water/cement ratio principle was established in 1918.

Over the next six decades, Master Builders, Inc., continued to pioneer and introduce advanced admixture technologies, including set-accelerating and set-retarding admixtures; advanced high-range and mid-range water-reducing admixtures; Pozzutec 20—the first admixture to facilitate concrete placement in freezing temperatures; organic corrosion-inhibiting admixtures; and hydration control technologies. These new products encouraged innovative uses and new applications of concrete in ready-mix, pre-cast, manufactured concrete products and underground construction markets and provided advances in road construction and general construction.

■ America's Top 100 Private Sector Transportation Design

JOHN SIMON FLUOR (1867-1944)



Fluor Corporation is one of the world's largest, publicly-owned engineering, procurement, construction and maintenance services companies, with more than 30,000 employees and a network of offices in over 25 countries across six continents.

John Simon "Si" Fluor, a Swiss immigrant carpenter who learned engineering in the military, was the epitome of a self-made man. In 1888, when he was 21 years old, he emigrated from Switzerland and joined his older brothers in Oshkosh, Wis. In 1890, with an investment of \$100, they began a construction company. In 1912, Si moved to Orange County, Calif., where he founded Fluor Construction Company, a general construction business.

Today, Fluor is a \$9 billion corporation, serving clients across a wide variety of industries including: chemicals and petrochemicals, commercial and institutional, government projects, life sciences, manufacturing, microelectronics, mining, oil and gas, operations and maintenance, power, telecommunications and transportation infrastructure.

ARTHUR J. FOX, JR. (1923-)



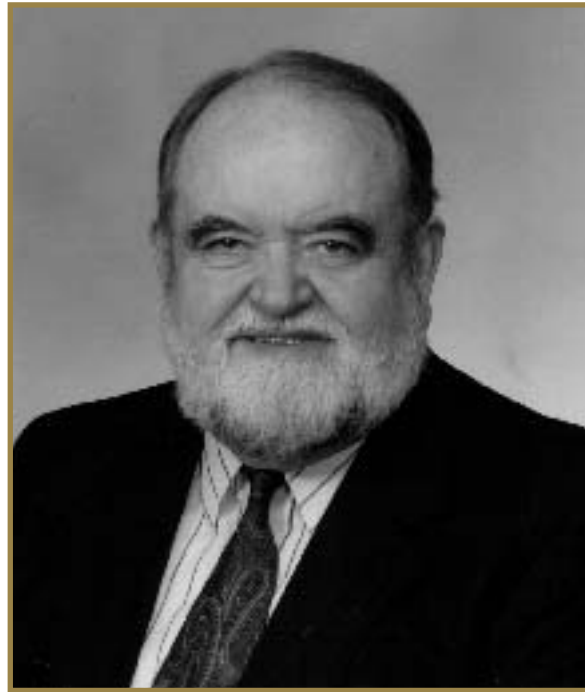
Art Fox was the editor-in-chief of the construction industry's leading publication—*Engineering News-Record* (ENR)—during four of the most exciting decades in U.S. transportation history, including the advent of the Interstate Era, the postwar development of airports and passenger aviation and the revival of light rail.

With an undergraduate degree in civil engineering, Fox joined ENR's staff in 1948 as an assistant editor. His magazine articles and editorials were invaluable to the industry and helped frame the debate during congressional deliberations of several transportation funding laws.

Fox served as president of the American Society of Civil Engineers in 1975-76. Today, Fox is an ENR editor emeritus and has remained active in the industry—serving as managing director of what became the Construction Industry Round Table, a Washington-based organization of 100 CEOs of leading U.S. design and construction firms.

■ America's Top 100 Private Sector Transportation Design

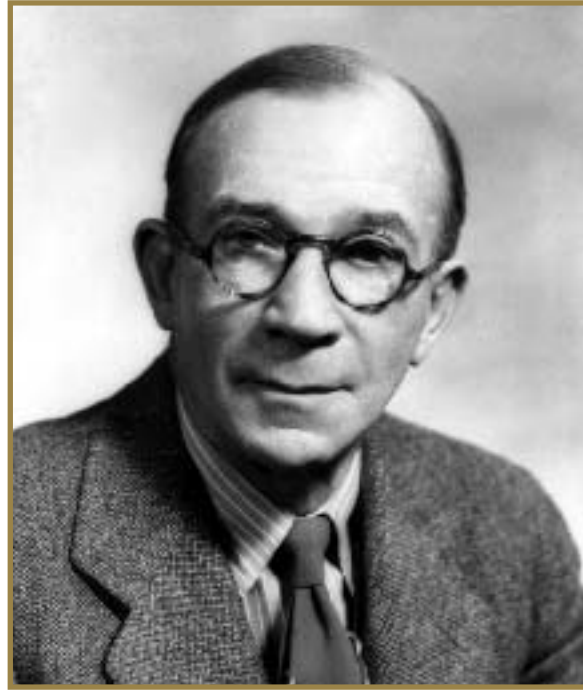
FRANCIS B. FRANCOIS (1934-)



Iowa-born Frank Francois, executive director of the American Association of State Highway and Transportation Officials from 1980-1999, continues to be a transportation advocate well after his retirement. He helped transition state departments of highways to departments of transportation. He built bridges and coalitions among other industry groups and made sure the collective concerns of state transportation departments were recognized by legislators and staff on Capitol Hill.

Francois also helped lay the foundation for the growth of intelligent highway systems and new technologies and worked to promote development of a truly intermodal transportation network.

FARLEY GANNETT (1880-1958)



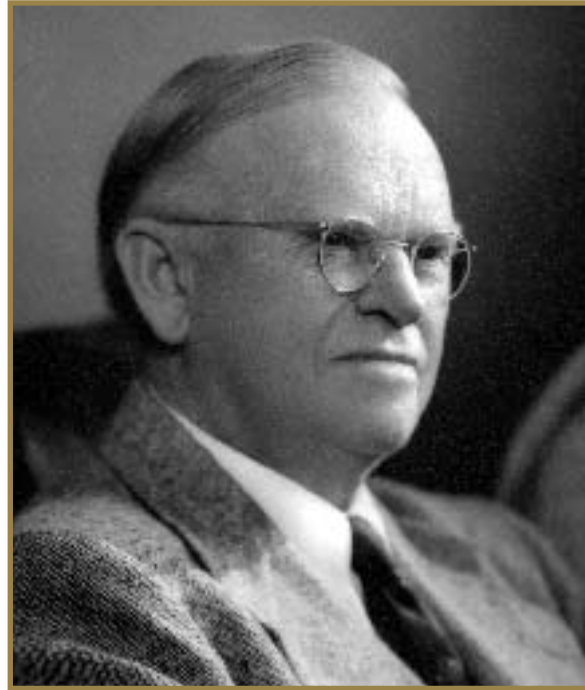
Farley Gannett, founder of one the world's leading engineering firms, was born in Washington, D.C., in 1880 and graduated from M.I.T. (Cambridge) with a B.S. in sanitary engineering in 1902. Gannett's engineering firm started business in 1915, and in 1916, Samuel W. Fleming, Jr., joined to form Gannett, Seeyle & Fleming.

Since its first engineering assignment in 1915, Gannett Fleming has grown into an international consulting engineering and planning firm. Today, Gannett Fleming employs more than 1,900 highly qualified, dedicated individuals who continue the tradition of excellence.

The firm has completed thousands of assignments in all 50 states and 51 countries. Its strategically located offices provide consulting engineering, planning and construction management services in every geographical area.

■ America's Top 100 Private Sector Transportation Design

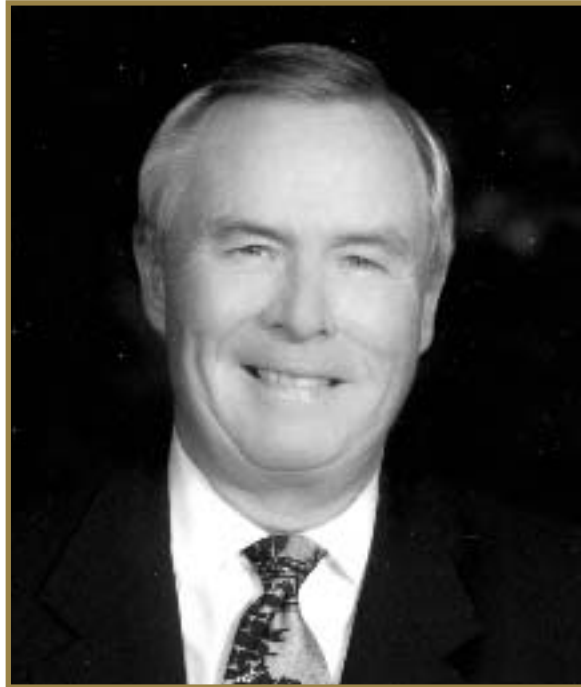
HALBERT POWERS GILLETTE (1869-1958)



Halbert Powers Gillette was an accomplished engineer and engineering writer and is best known as the founder of the predecessors of today's *Roads & Bridges* magazine and its owner, Scranton Gillette Communications, Inc.

He worked as an assistant engineer for New York State, then as a private contractor, until 1902. He worked for *Engineering News* magazine until founding the Gillette Publishing Company in 1905. By that time, he had published a list of reference works in road and heavy construction, including *Economics of Road Construction* (1901), *Earthwork and its Cost* (1903), *Handbook of Rock Excavation* (1904) and *Handbook of Cost Data* (1905). Later works included *Roads & Streets*, *Engineering & Contracting*, *Water Works* and *Municipal and County Engineering* magazines. Today, the fourth generation of the Gillette family continues to publish *Roads & Bridges* as well as a variety of other civil engineering and industry trade journals in suburban Chicago.

GARY L. GODBERSEN (1939-)



As one of the leaders in the equipment manufacturing industry, Gary Godbersen has been at the forefront of international transportation issues since the early 1970s. A co-founder, president and CEO of Iowa-based GOMACO Corporation since 1965, he and his company have been largely responsible for the development of concrete paving and support equipment used in the construction of many of the world's roadways, canals and airports in the last quarter century.

Godbersen was elected 1986 ARTBA chairman and was the 1993 "ARTBA Award" recipient. He also served on the board of directors of the American Concrete Pavement Association and the International Road Federation. He was 1982 chairman of the Construction Industry Manufacturers Association—now known as the Association of Equipment Manufacturers (AEM)—and served as CONEXPO-CON/AGG general chairman from 1986-1996.

Godbersen earned a B.S. degree in business administration and construction engineering from Iowa State University in 1962. His published works include such topical issues as slipform concrete technology and concrete solutions to highway safety.

■ America's Top 100 Private Sector Transportation Design

HAROLD GODBERSEN (1916-1986)



In 1938, Harold Godbersen opened his first construction firm in Ida Grove, Iowa. Later that same year, he founded his second—Godbersen-Smith Construction Company. With a solid foundation in the construction field, Harold Godbersen partnered with his son Gary Godbersen and founded GOMACO Corporation in 1965.

Godbersen developed a double oscillating screed finisher, and by the early 1960s those machines were built and rented to Iowa contractors for concrete bridge deck finishing. In 1967, GOMACO developed a cone drum or cylinder finisher for wider bridge decks. Other innovative products followed, including a fine grade trimmer, a curb and gutter trimmer/slipformer and the three-track GT-6300 (Commander III) slipform paver.

WILLIAM B. GREENE (1886-1982)



William B. Greene played a major role in obtaining acceptance among contractors and public agencies for the inventive products of his partner, Harry Barber, with whom he founded the Barber-Greene Company.

With the stimulus of the Federal-Aid Road Act in 1916, Barber-Greene developed bucket loaders, vertical boom ditchers and belt conveyors. Greene was responsible for the organizational, sales and promotional success of the Barber-Greene Company and worked hard to sell its products, including the industry's first practical asphalt paver.

He was an active leader in national and international industry associations and continued in active management and industry involvement until 1966, when he retired as chairman of the company's board of directors.

■ America's Top 100 Private Sector Transportation Design

PATRICK J. HANRATTY (1931-)



Dr. Patrick J. Hanratty is widely known as the “Father of CADD/CAM” for his pioneering contributions to the field of computer-aided design and drafting (CADD), manufacturing (CAM) and engineering (CAE).

These contributions began in 1957 with PRONTO, the first commercial numerical-control programming system. At General Motors Research Laboratories in the 1960s, Hanratty was a co-designer of Design Automated by Computer (DAC), the first production interactive graphics manufacturing system.

In 1971, Hanratty founded Manufacturing and Consulting Services, Inc., (MCS) of Scottsdale, Ariz.—now a leading worldwide supplier of 3-D mechanical CADD/CAM/CAE software systems. Industry analysts have estimated that 70 percent of all the 3-D mechanical CADD/CAM systems available today trace their roots back to MCS’s original code.

DANIEL J. HANSON, SR. (1929-)



Dan Hanson guided ARTBA and the roadbuilding industry through the turbulent 1970s and 1980s and set the stage for the association and the transportation construction industry in the post-interstate years of the 1990s. Having served as a public works official in St. Louis County, Mo., and the District of Columbia, Hanson joined ARTBA in 1968 and became president in January 1973. Under Hanson's leadership, the industry enjoyed higher spending levels. He also guided the industry response in the 1970s to attacks on transportation projects that emerged with the birth of the professional environmental groups.

Under Hanson, ARTBA helped develop the 1973 and 1976 surface transportation bills. Hanson championed the first federal gas tax increase in 23 years in 1982. In 1986, Hanson helped bring national attention to Congress' failure to pass a highway bill. When Congress finally passed authorizing legislation early in 1987, President Reagan vetoed the bill, and Hanson helped galvanize industry grassroots action that led to a one-vote override. In 1988, Hanson was named president emeritus of ARTBA. He retired in 1991.

■ America's Top 100 Private Sector Transportation Design

SHORTRIDGE HARDESTY (1884-1956)



Shortridge Hardesty, a partner in Waddell & Hardesty and Hardesty & Hanover, was a leading bridge designer. He became the firm's sole owner upon J.A.L. Waddell's death in 1938 and in 1945 formed the partnership of Hardesty & Hanover. Under Hardesty's leadership, the company expanded its services throughout the United States, designing such famed long-span fixed bridges as the Goethals and Outerbridge cantilever bridges—major crossings in the metro New York City highway network.

Hardesty also designed the Cooper River Bridge in Charleston, S.C., a milestone in cantilever bridge design, and the landmark Rainbow Bridge at Niagara Falls—the longest fixed arch bridge in the world in 1941. Movable bridges were his specialty and he designed the majority of vertical lift bridges in the New York City metro area. He is also the designer of many of the city's bascule bridges.

The Trylon and Perisphere, now icons of modernity, were the theme and the center of the 1939 New York City World's Fair. Hardesty designed these monumental structures, a gleaming sphere 180 feet in diameter and spiraling tower 615 feet high.

FREDERIC R. HARRIS (1875-1945)



Rear Admiral Frederic R. Harris retired from the U.S. Navy in 1927 and founded Frederic R. Harris, Inc., a company that began as an international Marine engineering firm and would later build a reputation for creative and innovative solutions to complex civil and structural engineering problems. It became one of the foundations of today's DMJM+HARRIS, a leader in transportation infrastructure.

Throughout his career, the "Admiral" earned a reputation for innovative thinking, such as devising the breakthrough method of building a dry dock by using floating caissons. He later obtained a patent for the idea, after it was used as the solution for collapsing dry docks in Pearl Harbor. His firm designed and patented a number of pioneering techniques for constructing marine facilities. The firm also designed the first large scale People-Mover System in the United States and developed state-of-the-art computer models for analyzing the stability of dams and elevated structures.

In the late 1960s, Frederic R. Harris, Inc., expanded its scope of work to include projects in the energy, highways and bridges, mass transit, ports and harbors, aviation, environmental and water resources markets. In October 2000, the firm joined with Daniel, Mann, Johnson & Mendenhall Infrastructure and Holmes and Narver Infrastructure, to create DMJM+HARRIS. Today, as part of AECOM Technology Corporation, DMJM+HARRIS has a portfolio of many high-profile transportation projects.

■ America's Top 100 Private Sector Transportation Design

SHELDON G. HAYES, SR. (1895-1985)



The collapse of the old American Asphalt Paving Association in 1932 left U.S. asphalt contractors without a unified voice, until Sheldon G. Hayes, Sr., became the driving force behind the founding in 1955 of the National Bituminous Concrete Association. In 1965, it was renamed the National Asphalt Pavement Association (NAPA).

Hayes, president of Cadillac Asphalt Company in Detroit, Mich., was the association's first president and guided it through its early years. Hayes also laid the country's first rapid curing cutback asphalt pavement in Michigan City, Ind., and bought the first five asphalt plants made by the Barber-Greene Company.

Today, NAPA provides industry leadership on technical, operational, environmental and educational issues. Its highest award for achievement in construction of an asphalt pavement is the Sheldon G. Hayes Award.

WILLIAM RANDOLPH HEARST, JR. (1908-1993)



As momentum gained for a national interstate highway program, Hearst Newspapers chairman William Randolph Hearst, Jr.—son of the newspaper magnate—generated tremendous publicity for America’s road needs. In 1952, aware that inadequate roads would slow the economy, Hearst reassigned a managing editor of *The Detroit Times* to exclusively cover the need for better roads for all Hearst papers.

In following years—under Hearst’s personal direction—the giant newspaper chain ran an aggressive campaign for better roads. Between October 1952 and the end of 1955, the Hearst papers printed nearly three million lines on the highway problem, enough to fill 1,229 full newspaper pages.

For his efforts at influencing public opinion, Hearst was honored with the 1955 George S. Bartlett Award, the most distinguished award bestowed by the highway community each year.

■ America's Top 100 Private Sector Transportation Design

JOHN NICHOLAS HELTZEL (1882-1952)



John Nicholas Heltzel, founder of the Heltzel Steel Form & Iron Co., pioneered the first practical steel form system for building concrete roads, leading the way to revolutionary changes in paving methods and labor-saving machinery.

Popularly called the “Heltzel Hanging System,” his invention was the first of 101 patents he would receive during his lifetime. When slip-forming began to take hold in the road paving industry in the 1960s, his company—the Heltzel Steel Form & Iron Co.—became the premier manufacturer of road forms and road paving machines.

He pioneered new technologies in concrete road paving machines that have helped the industry reduce construction costs and extend road life. He also developed the first practical mobile batch plant, which has remained essentially unchanged.

HARRY HELTZER (1911-)



Harry Heltzer began his career as an abrasives engineer at Minnesota Mining and Manufacturing Company (3M). In 1937, at the request of Minnesota state highway engineers, Heltzer and a group of colleagues undertook research to develop material that would increase visibility of traffic signs and pavement markings beyond the existing reflector buttons.

In 1939, the team created the first fully reflective vertical sheeting utilizing glass bead optics. This innovation has been applied to traffic control devices around the world, making roadways safer for millions of motorists and pedestrians.

Over the years, reflective technology has evolved and become the industry standard. Its impact on the safety of anyone near a roadway continues to be profound. Heltzer went on to become chairman and CEO of 3M.

■ America's Top 100 Private Sector Transportation Design

SANFORD H. HIGH (1907-1983)



During his lifetime, Sanford H. High was a builder of trustworthy relationships and an innovative risk taker. He pioneered the welded bridge concept, saving time and money for cash-strapped highway departments during the Great Depression. In the 1920s, many engineers were skeptical about welding's reliability, but High was convinced that highway bridges presented a new frontier for welding instead of riveting. His tenacity paid off during a 1933 experimental welded bridge project in York County, Pa.

High Welding Company grew in number of workers and job complexity. In the late 1950s, automated welding equipment was adopted, revolutionizing heavy girder construction and leading the movement to faster, lower-cost submerged arc welding. Today, High Steel Structures, Inc., is the largest fabricator of steel bridge superstructures in the United States, having completed more than 6,000 bridges in the past 25 years.

BUCKNER HINKLE, SR. (1914-1999)



Buckner Hinkle founded Hinkle Contracting Company in 1942, building it into a major paving contractor. He was active on state and national levels of the transportation construction industry, serving as founding member of The Road Information Program and chairman of the Kentucky Association of Highway Contractors.

Hinkle was instrumental in building the Bert Combs Mountain Parkway, the Bluegrass Parkway, the Western Kentucky Parkway and sections of I-64 and I-75. Today, Hinkle Contracting Corporation owns and operates 10 quarries and 15 bituminous hot-mix plants in Kentucky and Tennessee.

In 1985, he received the “ARTBA Award”—the association’s highest honor—in recognition of his contributions to the betterment of transportation in America. In 1991, he was elected to the Kentucky Transportation Hall of Fame.

■ America's Top 100 Private Sector Transportation Design

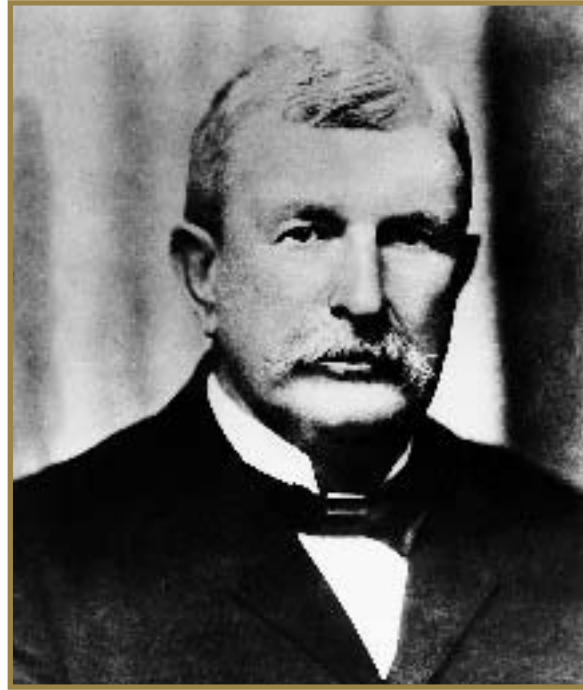
ROBERT E. HIRSCHMAN (1919-)



Bob Hirschman has made a permanent stamp on our nation's highway infrastructure. Now chairman of a holding company of road building firms, he helped shepherd the highway industry through the lull in road building after World War II and through the tumult in highway construction following the passage of the 1956 Interstate Highway System law.

During this critical period, he served as a director and later president (1965-66) of the Associated Pennsylvania Constructors; as a director, executive and president (1967) of the American Concrete Pavement Association; and as a director and adviser of the Maryland Highway Contractors Association. He was elected 1984-85 ARTBA chairman. He's been honored as "Man of the Year" by the American Society of Highway Engineers and has served Pennsylvania Department of Transportation year after year as a private sector adviser. He spent 12 years as the ARTBA co-chairman on the Joint Committee of the American Association of State Highway & Transportation Officials, the Associated General Contractors of America and ARTBA. He was the recipient of the 2002 "ARTBA Award"—the association's highest honor—in recognition of his leadership and contributions to the transportation construction industry in Pennsylvania and nationally for more than 30 years.

BENJAMIN HOLT (1849-1920)



Benjamin Holt was the founder of The Holt Manufacturing Company, one of the predecessors of Caterpillar Inc. Holt adapted steam tractors for use in agriculture and had great success with combined harvesters.

Holt utilized existing crawler technology to create a commercially successful steam-powered track-type tractor in 1904. His first gasoline-powered tractor was rolled out in 1906. In 1910, Holt registered the name “Caterpillar” as a trademark with the U.S. Patent Office and this trademark has remained the sole property of Caterpillar Inc. Between 1889 and 1920, 47 patents were registered in his name, and he received another 140 in collaboration with other engineers at his company.

He did not live to see the merger of his business with the C.L. Best Tractor Co. Nonetheless, he saw his factories produce over 10,000 Holt crawlers used by the Allies in World War I and at thousands of construction sites around the world.

■ America's Top 100 Private Sector Transportation Design

FRANK G. HOUGH (1890-1965)



Frank G. Hough was largely responsible for the development of the first fully integrated rubber-tired wheel loader—the indispensable workhorse of the aggregates, asphalt and concrete industry.

His HS Payloader, introduced in 1939, revolutionized speed, maneuverability and fast cycle times. He formed a new company under his own name in 1933. His firm produced a long line of innovations, which have defined the modern wheel loader, including the four-wheel drive, torque conversion and the hydrostatic transmission—all of which were essentially unchallenged for 15 years after the introduction of the HS. In 1952, he sold his company to International Harvester, later acquired by Komatsu-Dresser Company.

ERNEST E. HOWARD (1880-1953)



Ernest E. Howard joined Waddell & Hedrick in 1901, where he learned the art of bridge design from J.A.L. Waddell and later, John Lyle Harrington. He was a founding principal of Ash-Howard-Needles in 1928 and the renowned Howard Needles Tammen & Bergendoff (now known as HNTB) in Kansas City and New York City in 1940.

He was senior partner when HNTB designed the New Jersey Turnpike and hundreds of other surface transportation and aviation planning and design projects throughout the United States. In 1950, he was named president of the American Society of Civil Engineers and over the course of his career guided HNTB through two world wars and the Great Depression.

■ America's Top 100 Private Sector Transportation Design

ROBERT A. HUBBARD (1932-1999)



Robert A. “Bud” Hubbard was an engineering graduate of the Virginia Military Institute. He received his Yale University Bureau of Highway Traffic certificate in 1955 studying under Wilbur S. Smith. After working the early years of his career with the Virginia Department of Highways, Smith brought Hubbard into his renowned firm in 1960. Throughout the 1960s and 1970s, Hubbard directed major transportation projects throughout the United States and around the world. He became an officer of Wilbur Smith Associates in 1970 with responsibilities for the technical management of the firm’s operating divisions and regions worldwide. In 1982, Hubbard was named president, and CEO and chairman in 1986. He led the initiative to transform Wilbur Smith Associates into an independent employee-owned stock ownership company, wholly owned by the firm’s employees.

A fellow at the Institute of Transportation Engineers and the American Society of Civil Engineers, Hubbard made significant contributions to the advancement of the transportation engineering profession. He was an active member of ARTBA and the Transportation Research Board of the National Academies, and he held leadership positions in many professional associations, including chairman of the International Road Federation.

CHARLES LINCOLN IRELAND (1861-1942)



In 1916, Charles Lincoln Ireland, a banker from Ohio, purchased Birmingham Slag Company—an Alabama-based, family-owned construction materials company founded in 1909—and sent his three sons to manage the new business.

Ireland kept Birmingham Slag profitable until 1932, when the Great Depression overtook the nation. Under his leadership, Birmingham Slag rebounded in 1939 when it became the major supplier to Tennessee Valley Authority projects.

The firm benefited from defense projects through World War II and after, exploding in growth with the Interstate Highway program. In 1956, the firm became a public company, was renamed Vulcan Materials Company and had access to capital markets that helped it grow and prosper. By 2000, when Vulcan acquired CalMat, Inc., and Tarmac America's aggregates properties, the nation's leading aggregates producer was also a top producer of hot-mix asphalt and ready-mixed concrete.

■ America's Top 100 Private Sector Transportation Design

JAMES W. JOHNSON (1900-1982)



In the 1920s and 1930s, Portland Cement concrete pavements were built right on dirt grade from concrete placed in temporary forms that were set up by hand. For the needs of the era, this process served well until the 1930s, when truck loadings began to incur pumping of base. Road bases were redesigned, but concrete placed in formwork continued to dominate construction.

This changed in 1946, when Iowa engineers and partners James W. Johnson and Bert Myers, revolutionized the industry by conceiving the slipform concrete paver, attached to a mixer truck that pulled it forward. The first slipformed roadway appeared three years later in Iowa. In 1955, Quad City Construction Company improved this design, with a self-propelled, track-mounted slipform paver. With the advent of the Interstate Highway program in 1956, equipment makers began marketing high-volume slipform pavers that could pave up to four lanes wide.

THOMAS L. JOHNSON, SR. (1938-)



Thomas L. Johnson, Sr., has been a transportation construction industry leader in Texas and nationally for more than 30 years as executive vice president of the Associated General Contractors (AGC) of Texas. He first joined the association in 1967. He has been an important private sector partner as the Texas Department of Transportation (DOT)—with an annual construction program exceeding \$3 billion—has worked to provide efficient and effective transportation systems throughout the state. The success of the Texas DOT in meeting staggering user demand owes much to the AGC of Texas and Johnson’s leadership.

A rancher and landowner, he speaks fluent Spanish. Johnson has served as an officer in the U.S. Army and holds a bachelor’s degree in business administration from Texas A&M University.

■ America's Top 100 Private Sector Transportation Design

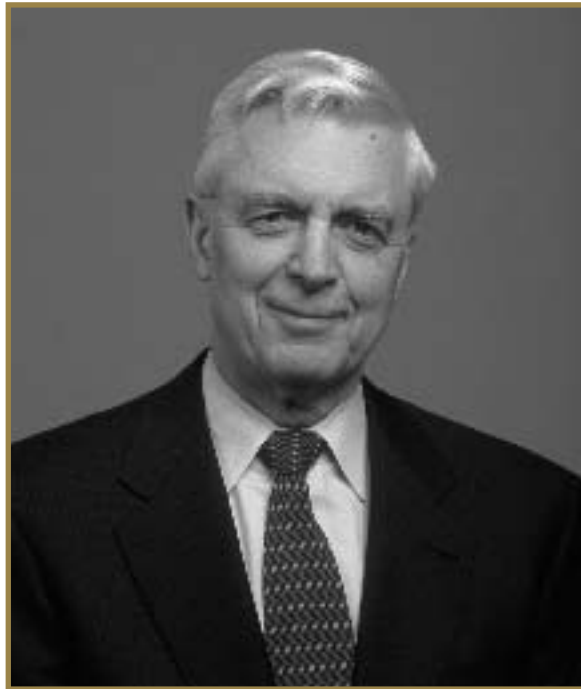
PETER KIEWIT (1900-1979)



Peter Kiewit is best known for transforming a small Omaha, Neb., construction company—Peter Kiewit Sons', Inc.—into one of North America's largest and most respected contractors. In 1931, at the age of 30, Kiewit became president of the company. To stay afloat during the Great Depression, he shifted the firm's emphasis to the heavy/highway market. Transportation work rapidly became the largest portion of Kiewit's business and remains so to this day.

After World War II, the company built the first section of the Santa Ana Freeway, predecessor to today's system of limited access highways. Under Kiewit's leadership, the firm built more lane miles of the original Interstate Highway System than any other contractor, prompting *Forbes* magazine to call him the "Colossus of Roads."

JAMES L. LAMMIE (1931-)



James L. Lammie, former CEO and president of Parsons Brinckerhoff (PB), played a significant role in transit development throughout the United States. His projects have included Atlanta's Metropolitan Atlanta Rapid Transit Authority (MARTA), Pittsburgh's light rail system, San Francisco's Bay Area Rapid Transit (BART), the Los Angeles Metro Blue and Red lines, Boston's Central Artery/Tunnel project and the Southeastern Pennsylvania Transportation Authority's (SEPTA) Philadelphia Elevated rapid transit line.

Lammie served as president and CEO of Parsons Brinckerhoff Quade & Douglas, Inc.—the U.S. transportation engineering arm of PB—from 1982 to 1990. He headed the entire PB organization from 1990 to 1996. During his tenure, PB doubled in size and became global in reach, with nearly 5,000 employees in more than 150 offices throughout the world.

Before joining PB, Lammie, a West Point graduate, had a 21-year career in the U.S. Army Corps of Engineers. He commanded a construction company in Korea, a combat battalion in Vietnam and had headquarters assignments in Germany and the Pentagon.

■ America's Top 100 Private Sector Transportation Design

JOHN C. LANFORD (1930-)



Jack Lanford, president & CEO of Adams Construction Co., has played a prominent role in the passage of major transportation funding bills and has worked tirelessly for decades to promote transportation development. After holding leadership positions with the Virginia Road & Transportation Builders Association, he became involved at the national level with ARTBA in the 1970s. He was appointed as the ARTBA co-chair to the Joint Committee of the American Association of State Highway & Transportation Officials, Associated General Contractors of America and ARTBA. He held this post for five years. He has served as a member of the Joint Committee, which seeks common ground on issues of concern to both the industry's public and private sectors, for over 20 years.

As 1991 ARTBA chairman, he played a key role in the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA), which provided a record level of \$151 billion in federal highway and transit investment over six years. Lanford's leadership in ISTEA's passage was recognized by his peers in 1992, when he was honored with the "ARTBA Award," the association's highest accolade.

He has also helped publicize highway needs by serving as chairman of The Road Information Program.

STAN F. LANFORD, JR. (1933-)



Stan Lanford, president of Lanford Brothers Co., Inc., has been a prominent transportation construction industry leader for more than 20 years. A member of the Virginia Road & Transportation Builders Association's board of directors since 1982, he rose to lead the state association as treasurer (1986), vice president (1987) and president (1988).

In 1988, Lanford was elected to the ARTBA board of directors. In 1990, he helped develop the industry's first business insurance program for transportation contractors with CNA Insurance, now one of the top five association-endorsed insurance programs in the United States. In the 1990s, Lanford became an industry spokesman on the highway/transit program reauthorization, testifying on behalf of ARTBA before Congress.

In 1999, he was elected ARTBA chairman. He created the ARTBA TEA-21 Reauthorization Task Force, which was charged with developing the association's legislative goals for the reauthorization of the nation's highway and transit programs. As ARTBA chairman, he and his brother, Jack, provided significant financial support to establish the "Highway Worker Memorial Scholarship Program," which provides post-high school education financial assistance for children of highway workers killed in the line of duty. Today, this first-of-its-kind scholarship is supported by industry executives, firms and unions nationwide.

■ America's Top 100 Private Sector Transportation Design

R.G. LETOURNEAU (1888-1964)



R.G. LeTourneau pioneered the process of constructing machines entirely by welding rather than with rivets and along the way made welding a universally accepted industrial process. He is credited with owning more than 300 patents. From his early factory in California to later in Peoria, Ill., near the Caterpillar Tractor Company, he designed, built and sold many of the country's scrapers-earthmovers.

LeTourneau also developed "Tournacranes," the "Walking Dredge" and the Jib Crane. During World War II, his company developed most of the earth-moving equipment used by the Allies to build their critical roads and airstrips during the war. "With his countless innovations, his leadership and his pioneering spirit, he was truly a man of vision who helped change earthmoving methods all over the world," said the Association of Equipment Manufacturers.

HARRY W. LOCHNER, SR. (1906-2000)



Harry W. Lochner integrated today's limited-access highways into the urban and rural environment. As a transportation planner for Cook County, Ill., and later chairman of H.W. Lochner, Inc., in Chicago, Ill., he developed and improved transportation planning techniques, including land use projection, travel demand forecasting and origin-destination studies. He perfected the development of expressway system plans to serve America's post World War II cities and urban areas. During the 1930s and 1940s, he developed urban expressway design concepts. In 1942, he was an innovator of the spiral highway ramp—in which a wide-radius ramp tightens as speed decreases—making high-speed exits safer. He later pioneered innovative geometric concepts in freeway design to preserve and enhance the natural environment, long before the nation's consciousness recognized these needs.

Lochner developed the original expressway plans for over 30 major U.S. cities. His 1944 Louisville, Ky., plan was the first expressway plan in an American city that integrated limited access highways into the urban environment. Lochner's 1972 environmental plan integrated south Florida's Alligator Alley (I-75) into the Everglades, including the first use of wildlife underpasses and pioneering hydrologic features to protect the unique sheetflow of surface water vital to the Everglades.

Today, the firm that bears his name has since grown to nearly 400 employees in 19 offices nationwide.

■ America's Top 100 Private Sector Transportation Design

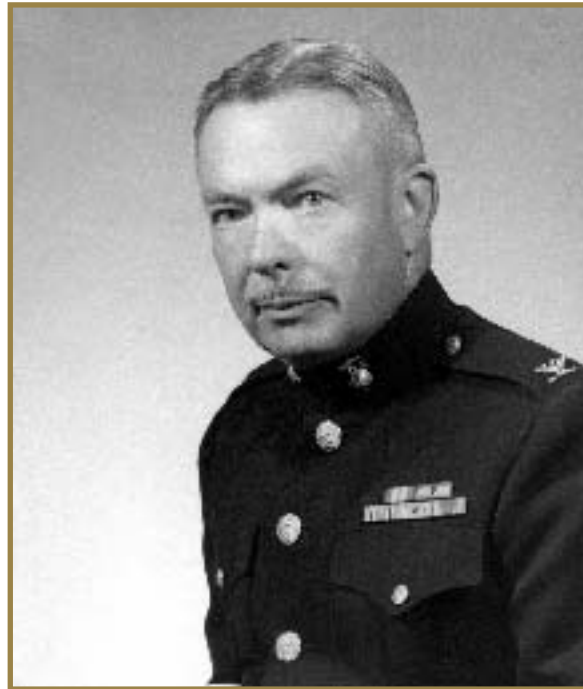
ANSTON MARSTON, PH.D. (1864-1949)



At the fifth annual meeting of the American Association of State Highway Officials in 1919, renowned engineer and educator Anston Marston presented a paper that touched off the drive to establish what is now known as the Transportation Research Board of the National Academies. Marston served as its first chairman in 1920-21.

Marston has been called the “catalyst for modern highway construction and research.” He served as the first dean of engineering of Iowa State University (ISU) from 1904 until 1932, during which time he firmly established ISU’s leadership in highway research, including investigations of soil structure interaction for buried conduit. He was responsible for the design and construction of the first free-standing water tower west of the Mississippi, an engineering marvel that still stands today, less than 100 feet from ISU’s Marston Hall.

ROBERT S. MAYO (1900-1988)



Mayo Tunnel & Mine Equipment—later renamed Elgood-Mayo Corp.—was started in 1937 by Robert S. Mayo to provide specialized civil engineering services to the heavy construction industry. Mayo's primary business came from the design and supply of structural underground construction equipment. This equipment included shields, air locks, mucking devices, mine cars and forming gear.

Mayo based his equipment designs on experience gained in projects such as the Holland Tunnel, the Delaware River Aqueduct and the Chicago sewer tunnels. Later projects involving Mayo's firm included San Francisco's Bay Area Rapid Transit (BART) and Washington's Metro system. Today, the firm is a subsidiary of Gannett Fleming, but Mayo's work lives on in contemporary tunneling equipment.

■ America's Top 100 Private Sector Transportation Design

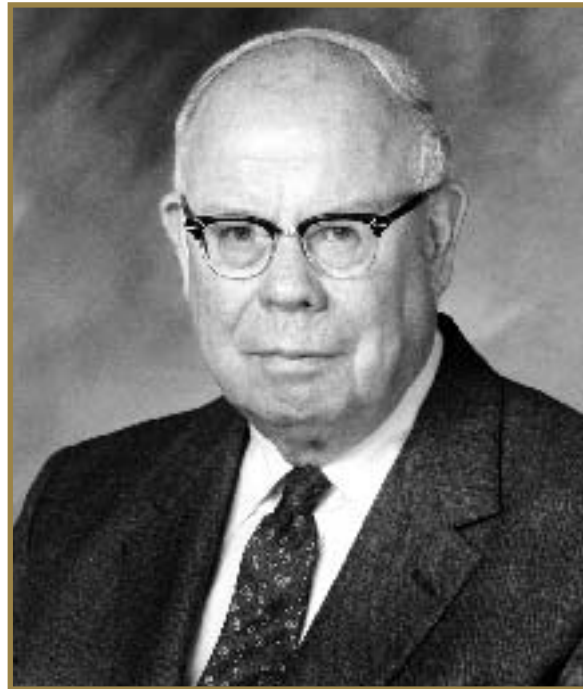
W.N. MCMURRY (1923-)



Neil McMurry was the number one contractor in the construction of highways throughout Wyoming in the Interstate Era, from 1950 to 1980. Today, he remains one of Wyoming's leading businessmen and contractors. His firm, Rissler McMurry Company, has been the state's largest highway contractor for nearly six decades. Currently, the company does approximately \$55 million in construction annually.

McMurry changed the company name to McMurry Ready Mix in 2002. He was lauded by Wyoming governments in 2003 when he and his business partners kicked in \$2.7 million to build a 2.2-mile, \$3.7 million road extension for the Casper Area Economic Development Alliance, to provide access to a 500-acre industrial park being developed by the partners.

HAROLD L. MICHAEL (1920-1999)



Harold L. Michael was an internationally-recognized, long-time faculty member at Purdue University, where he headed the School of Civil Engineering from 1978 until his retirement in 1991. His impact on engineering students worldwide was profound. A leading highway researcher, he was survey director in the early 1950s for the State Highway Department of Indiana and was in charge of the traffic and economics section of the Joint Highway Research project at Purdue. In 1975, he was inducted into the National Academy of Engineering.

Michael was the 1981 recipient of ARTBA's S. S. Steinberg Award, which recognized his outstanding contributions to transportation education. In 1978, he was honored with the Transportation Research Board of the National Academies' Roy W. Crum Distinguished Service Award. In 1982, he received the George S. Bartlett Award—co-sponsored by the American Association of State Highway & Transportation Officials, Associated General Contractors of America and ARTBA. Purdue's Harold L. Michael Traffic Operations Laboratory is named in his honor.

■ America's Top 100 Private Sector Transportation Design

HENRY L. MICHEL (1924-2001)



Henry L. Michel, former president and chairman of Parsons Brinckerhoff Inc. (PB), forged a five-decade career as a civil engineer and manager that earned him an international reputation as a leader and innovator.

Under his leadership, PB developed into one of the most dominant transportation engineering firms in the world. Michel directed the firm's engineering services on some of the most significant transportation projects of the 20th century, including the expansion of Atlanta's Metropolitan Atlanta Rapid Transit Authority (MARTA); the first Metro line in Caracas, Venezuela; and the rapid transit system of Taipei, Taiwan.

Michel served as chairman of the International Road Federation from 1989 to 1992 and was a founding member of the Civil Engineering Research Foundation, serving as its chairman from 1989 to 1996.

FRANK P. MOOLIN (1934-1982)

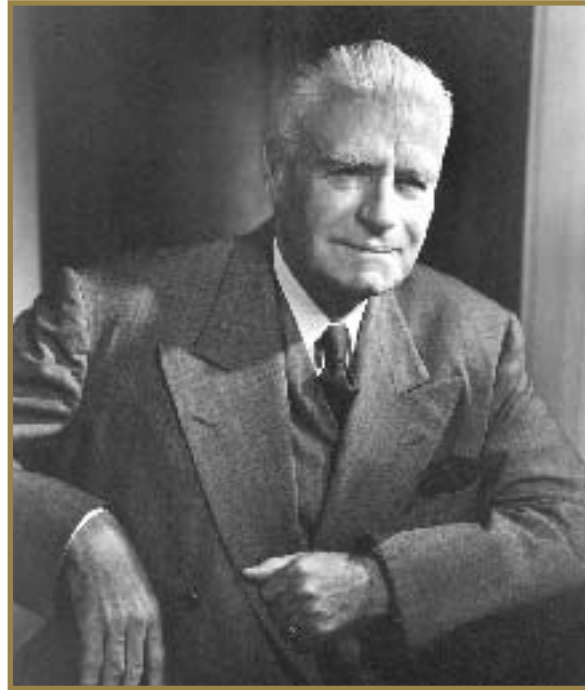


Frank P. Moolin was the senior engineer responsible for overseeing the design and construction of the Trans-Alaska Pipeline System (TAPS). Moolin helped manage a 28,000-man workforce that completed the project in 38 months.

The 800-mile TAPS is an engineering wonder, an essential element of the state's economy and a major supplier (20 percent) of domestic-sourced energy to the United States. The Alyeska Pipeline Service Company was established in 1970 and charged with designing, constructing, operating and maintaining TAPS. At the time, the pipeline was the largest privately financed construction project ever attempted, and it cost over \$8 billion to build in 1975-77.

■ America's Top 100 Private Sector Transportation Design

HARRY W. MORRISON (1885-1971)



In 1912, at the age of 24, Harry W. Morrison teamed up with Morris Hans Knudsen to found Morrison-Knudsen Company (MK) in Boise, Idaho. The new company's assets were six teams of horses and \$600 in cash.

By the 1950s, MK was the largest heavy civil construction company in the world. Morrison pioneered the joint venture concept that brought several contractors together for large and complicated projects. This concept was first successfully employed on the Hoover Dam and the San Francisco Bay Bridge projects in the 1930s. MK is now one of the heritage companies that comprise Boise-based Washington Group International.

JEAN MULLER (1925-)



Photo by Julie V. Clark

Throughout the world, the name Jean Muller is associated with the design of outstanding bridges and structures. An engineer by training, he is best known for his collaboration with Eugene Figg in Figg & Muller Engineers, Inc., with whom he introduced pre-cast segmental construction with match-cast joints in the United States. Famous U.S. structures on which he has collaborated include the Sunshine Skyway Bridge in Florida and the Linn Cove Viaduct in North Carolina.

In 1986, he returned to France to start Jean Muller International. The firm quickly became involved in the design and construction supervision of cable stay bridges, suspension bridges, arches, bowstrings, composite structures and traditional bridges. Muller has left his mark on over seven million square yards of bridge deck throughout the world.

■ America's Top 100 Private Sector Transportation Design

ENOCH NEEDLES (1888-1972)



Colonel Enoch Ray Needles' legacy still lives on at HNTB (formerly Howard Needles Tammen & Bergendoff), where he was a founding partner whose tenure spanned three and a half decades, ending in 1962.

Needles spearheaded the post-war development of turnpikes throughout Maine, Massachusetts, New Jersey, Ohio, Kentucky, West Virginia, Florida, Texas, Kansas and Colorado. His unwavering dedication to revenue bond projects and alternative financing of toll roads prior to the Interstate Era helped revolutionize the way major highways were planned and constructed in the United States.

Needles also worked on behalf of the industry through various national professional associations. In 1946, he was elected president of the American Institute of Consulting Engineers. He was elected chairman of the American Society of Civil Engineers in 1955, served as ARTBA chairman from 1949 to 1951 and was president of the Engineers Joint Council from 1958 to 1959.

CLARKSON H. OGLESBY (1908-1992)



Clarkson H. Oglesby enjoyed a celebrated career in both highway engineering and construction engineering and management. From 1950 to 1988, he was active in the Highway Research Board (HRB), serving on a number of committees. His book, *Highway Engineering* (1954), has been a major text and reference book for nearly a half century.

Oglesby worked for the Arizona Highway Department and as chief engineer for a construction company. In 1943, he returned to his alma mater, Stanford University, as a faculty member of its civil engineering department.

■ America's Top 100 Private Sector Transportation Design

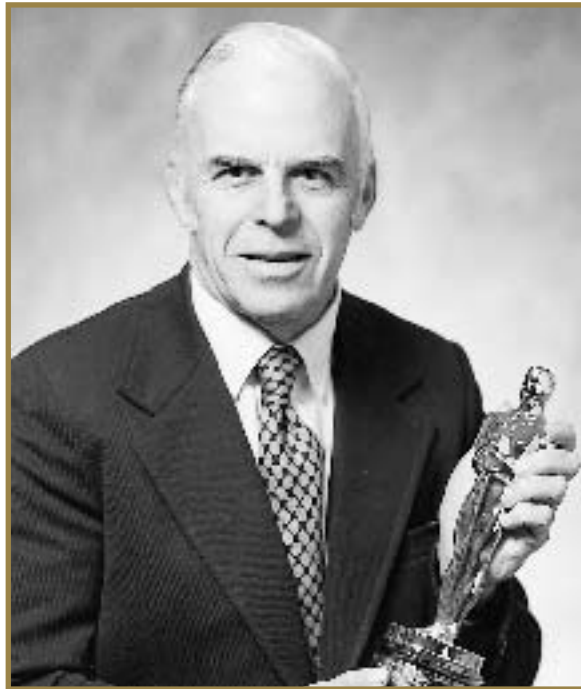
THOMAS PALAZZI (1916-)



In the 1930s, Thomas Palazzi joined his father and brother to form Frank Palazzi and Sons Construction Company in Connecticut. The firm's early projects included the Merritt Parkway, the Wilbur Cross Parkway and the Groton submarine base. The company was an early leader in superhighway construction, beginning with work on the F.E. Everett Turnpike. It built much of I-89, I-93 and I-91 and has been honored by the American Institute of Steel Construction, the Federal Highway Administration and the American Society of Civil Engineers for its construction of road and bridge projects.

Palazzi has been active in transportation associations, including ARTBA and the Associated General Contractors of America. He has been a long-standing transportation investment advocate, testifying before Congress in 1954 about the need for an Interstate Highway System.

PHILIP V. PALMQUIST (1914-2002)

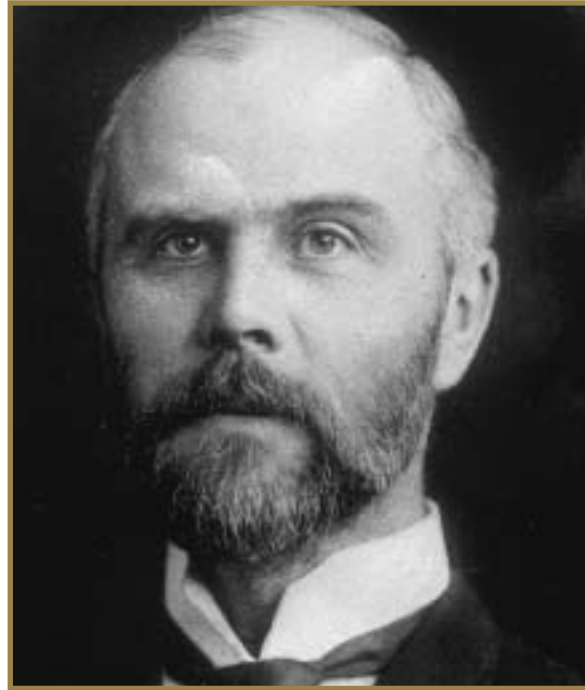


Roads are safer today, and no doubt thousands of lives have been saved, due to the work of Philip V. Palmquist. Along with his colleague Harry Heltzer and others, Palmquist worked to invent reflective sheeting, an innovation applied to traffic control devices around the world. Palmquist served as a research chemist at Minnesota Mining and Manufacturing Company (3M) and later was technical director of the Reflective Products division and Special Enterprises unit.

Beginning in 1937, both Palmquist and Heltzer spent countless hours testing concepts and in 1939 erected the first fully reflective sign in Minnesota. In the 1940s, Palmquist made a huge product improvement breakthrough—transparent film applied to the surface that protected the optics and improved performance in inclement conditions. Later developments included improved optics and sheeting components that would enhance brightness and angular performance. A prolific inventor, Palmquist also invented “High Gain Sheetting” used to create more realistic motion picture backgrounds, for which he was awarded an Oscar for technological achievement.

■ America's Top 100 Private Sector Transportation Design

WILLIAM BARCLAY PARSONS (1859-1932)



William Barclay Parsons was a great authority on urban mass transit, canals and railroads. In 1885, he founded Parsons Brinckerhoff, one of the oldest continuously operating engineering firms in the United States, which today has approximately 9,000 employees in over 150 offices worldwide.

Parsons oversaw the design and construction of New York City's first subway, which opened in 1904. He designed the route and proposed electricity as the power source. He pioneered the large-scale use of cut-and-cover construction and oversaw the design and construction of the Steinway Tunnel as part of New York's rapid transit system. Parsons also directed the design and construction of the Cape Cod Canal in Massachusetts and served on a board that advised President Theodore Roosevelt on the Panama Canal. In the late 1890s, he charted the course of a railroad in China. He was the author of several books, including *Engineers and Engineering in the Renaissance* and *An American Engineer in China*.

W. DENNEY PATE (1956-)

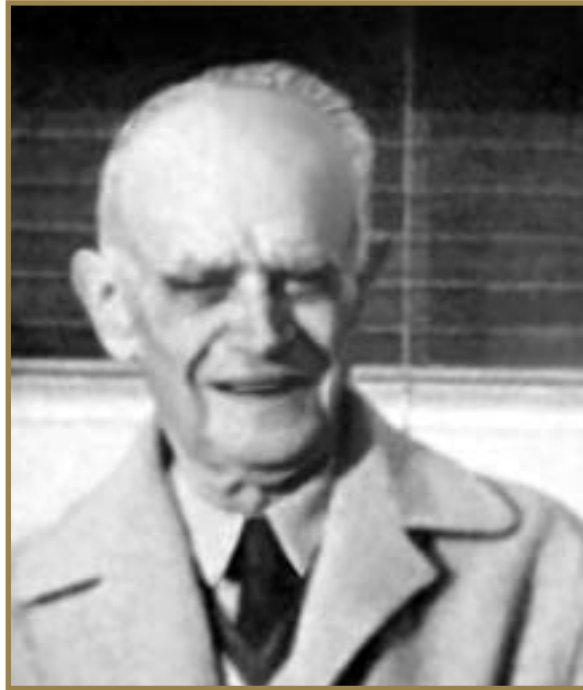


Denney Pate is a senior vice president/principal bridge engineer at Figg Bridge Engineers and has played a critical role in pioneering new technology for the design of cable-stayed and long span bridges. In 1980, he began work on the design of the Sunshine Skyway Bridge in Florida and spent nearly six years from design through construction on this award-winning bridge. His creativity and technical expertise have helped improve the bridge industry with innovations in concrete and cable-stayed system technologies.

These technological innovations assisted in the creation of cost-efficient, durable, beautiful bridges that are landmarks for communities across America, such as Varina-Enon Bridge near Richmond, Va.; the Chesapeake & Delaware Canal Bridge near St. Georges, Del.; the I-280 Maumee River Bridge in Toledo, Ohio; and the Leonard P. Zakim Bunker Hill Bridge in Boston, Mass. Pate also serves as a member of the Cable Stayed Bridge Committee of the Post-Tensioning Institute, the Federal Highway Administration Virtual Bridge Committee and the American Segmental Bridge Institute.

■ America's Top 100 Private Sector Transportation Design

ALDEN F. PERRIN (1887-1965)



Alden F. Perrin was founder and publisher of *Better Roads* magazine from its first issue in October 1931 through August 1964, when he retired.

Under his direction, *Better Roads*—which serves highway contractors and engineers and state, county and municipal highway engineers and officials—became a highly sought after information source on federal, state and local transportation and construction issues. The magazine grew rapidly when the Interstate Highway System was launched under President Eisenhower in 1956. William O. Dannhausen became publisher of *Better Roads* in 1964 upon Perrin's retirement. In 2000, the magazine was sold to James Informational Media, Inc.

ALAN E. PISARSKI (1937-)

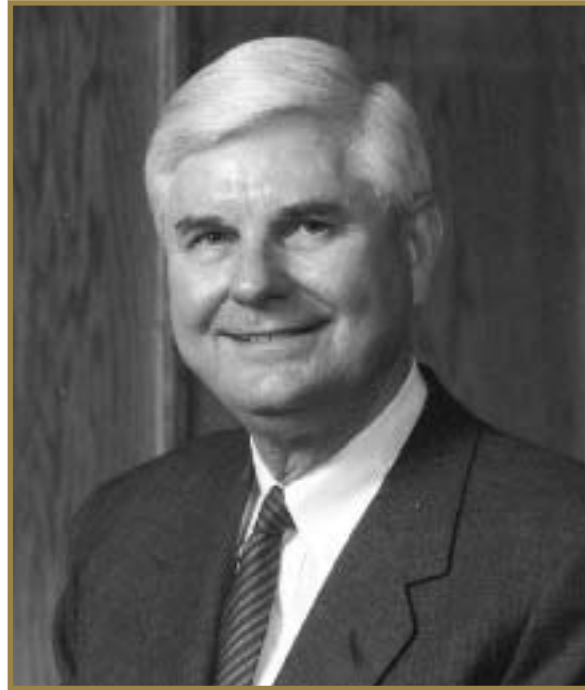


For almost 40 years, Alan Pisarski has been involved in national transportation policy from vantage points at the original Tri-State Transportation Commission in New York and the Metropolitan Washington Council of Governments, in the Office of the Secretary at the U.S. Department of Transportation (U.S. DOT) and in a personal consulting capacity. He has measured the transportation activities of America from the metropolitan, state, national and international levels. During his time at U.S. DOT, he organized the major travel surveys of the nation and designed and managed the transportation statistical system, which is still in use today.

Pisarski is perhaps best known as the author of the *Commuting in America* series published each decade since the 1980s, with *Commuting III* due in late 2004. His work has been reviewed, discussed and quoted in all of the major national newspapers. He has appeared often on major national radio and television network programs, including “Good Morning America,” “The Today Show,” “Nightline” and “20/20.” His writings have been translated into at least eight different languages.

■ America's Top 100 Private Sector Transportation Design

JAMES D. PITCOCK, JR. (1928-)



Doug Pitcock has provided leadership over the past 35 years that has made a lasting impression on the transportation construction industry in the United States and Texas. As owner and CEO of Houston-based Williams Brothers Construction Co., Inc., he heads one of the country's largest highway/heavy construction companies. Williams Brothers has built major bridges over the Mississippi and other major rivers, including the Inter-Coastal Waterway and the Houston Ship Channel.

In 2003, the firm had more than \$1.42 billion of Texas Department of Transportation projects under contract, including a \$262 million interchange in Houston.

E.L. POWERS



E.L. Powers, editor of *Good Roads* magazine in New York City, was one of the first officers of ARTBA's predecessor organization, the American Road Makers (ARM). Powers served as treasurer of ARM in 1907 and as secretary for 17 years. He is recognized as one of the association's "founding fathers"—along with Horatio Earle and James H. MacDonald, ARM's first two presidents.

Powers helped the construction industry respond to the transition of American road transportation from the wagon-and-mud era to the the first Federal-Aid Road Act in 1916. His yearbooks of *Good Roads* in the early 20th century are prized national reference works of those early times.

■ America's Top 100 Private Sector Transportation Design

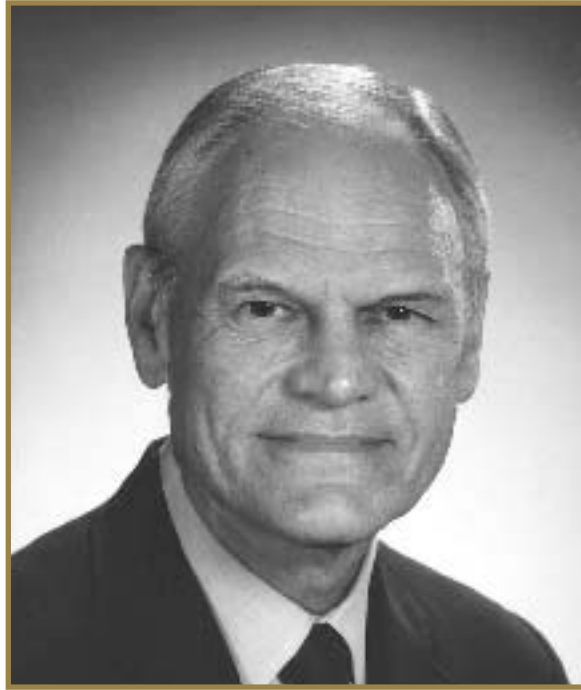
M.E. RINKER, SR. (1904-1996)



During the depression, a finance company took away the only truck Marshall E. “Doc” Rinker, Sr., owned. Unable to sell it, they returned it to him, and from there he transformed his one-truck business into one of America’s largest building materials firms, supplying ready-mixed concrete, concrete block and steel to post-war Florida.

In 1988, he sold his empire, Rinker Materials, with over 50 concrete plants, 15 block plants, 500 trucks and a cement plant, for \$515 million. He used that wealth to establish a philanthropic foundation to support higher education, hospitals and the arts in Florida. The University of Florida’s Rinker School of Building Construction is named in his honor.

RICHARD J. ROBBINS (1933-)



Richard J. Robbins graduated from Michigan Tech in 1956 with a degree in mechanical engineering and went on to develop the tunnel boring machine, which permitted contractors to continuously bore a complete cross section of a tunnel. Robbins is an international leader in tunneling machine technology. Under his leadership from 1958 to 1993, his firm—The Robbins Company—was responsible for new records in tunnel boring technology, from mining applications to the boring of three large tunnels under the English Channel.

Robbins sold his company in 1993, and five years later he established the Robbins Group, which handles research and product development. In his career, he has been granted 11 U.S. and 56 foreign patents and has authored more than 75 publications and papers.

■ America's Top 100 Private Sector Transportation Design

PHILIP E. ROLLHAUS, JR. (1934-2001)



Philip E. Rollhaus, Jr., launched a revolution in passive highway safety products in 1969 when he founded Energy Absorption Systems, Inc., a subsidiary of Quixote Corporation and a leading developer and manufacturer of energy-absorbing highway crash cushions. Energy Absorption's first product was a patented energy-absorbing bumper for vehicles. In an innovative twist, Rollhaus and his associates decided to reformat that technology and developed the first crash cushion to place in front of roadside hazards.

With that decision, the highway crash cushion was born. It is estimated that since 1969, Energy Absorption's crash cushions have saved over 50,000 lives worldwide. They are in use in all 50 states and in over 44 countries.

The legacy of Rollhaus, who passed away in July 2001, lives on in the company he founded and the many transportation products and services offered today by Quixote Corporation. In addition, since 1997, Energy Absorption has sponsored the Philip E. Rollhaus Essay Competition, which offers cash prizes to student writers and their professors for papers treating the subject of highway safety.

MURRAY ASHER ROWE (1932-)



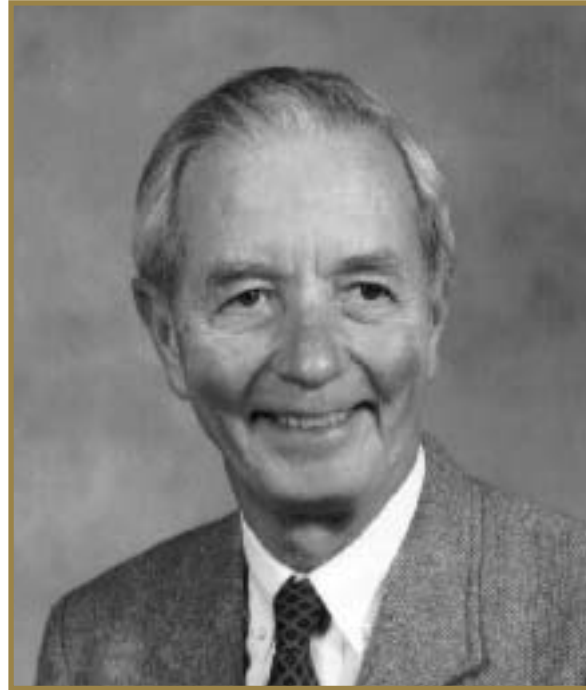
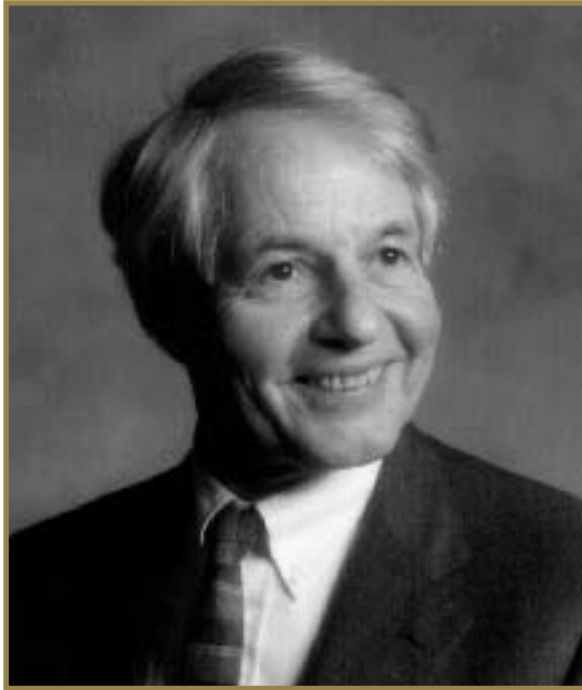
Murray A. Rowe, of Bid-Well Corporation, located in Canton, S.D., developed and marketed a new kind of innovative concrete paving machine that revolutionized concrete bridge deck paving in the Interstate Era.

Bid-Well was launched in 1961 when Rowe teamed up with a fellow South Dakotan, Tex Bidwell, a bridge construction foreman, who had invented a new-design bridge deck paver. Shortly after their association, Bidwell died. Rowe purchased the corporation and continued the effort—proving to state personnel and contractors alike that Bid-Well’s refined, fast, lightweight deck pavers that rode on pipe rails on the outside falsework would meet state specifications and efficiently produce a paved concrete deck surface of superior quality and finish.

The company went international in 1970 after Bid-Well joined CMI Corporation of Oklahoma City. Today, Bid-Well remains in Canton, and the locally manufactured concrete pavers are sold nationally and internationally to pave bridges, roads, airports and canals. Murray Rowe retired in 1999.

■ America's Top 100 Private Sector Transportation Design

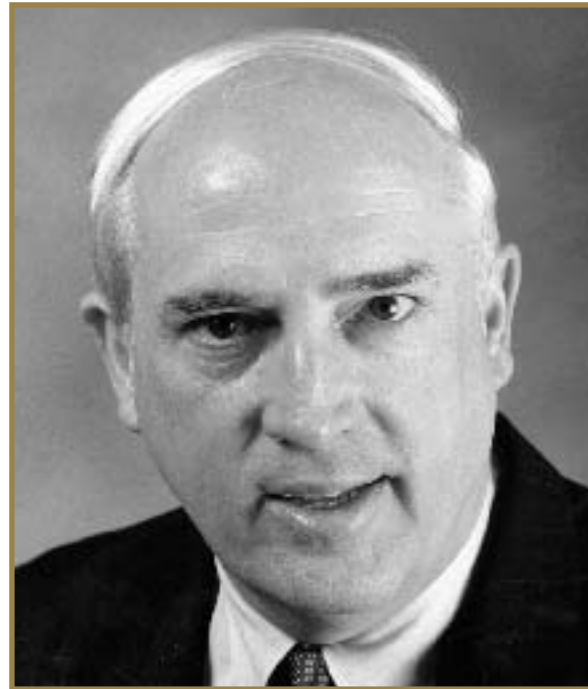
BILL (1921-) & HUGH ROWLAND (1918-1990)



Founders of the Reflexite Corporation in 1963, Bill and Hugh Rowland were innovators and leaders in transportation safety and were responsible for the invention of micro cube corner prism technology used to make reflective materials. This reflective technology is used in hundreds of applications, including temporary road markers, signage, channelizing devices and high visibility safety garments. Their process raised the bar for performance and set the standard for high visibility worldwide.

Under their direction, Reflexite introduced the first reflective roll-up sign back in the early 1980s, a life-saving innovation that improved delineation of highway work zones and made them safer. Hugh died in 1990, but his and Bill's tenacity, entrepreneurial spirit and leadership introduced a standard-setting technology that aids the safety and mobility of motorists and workers on roadways worldwide.

DR. T. PETER RUANE (1945-)



Hailed in 2004 as the “dean of transportation lobbyists” by *Congressional Quarterly*, Dr. T. Peter Ruane has served as ARTBA president and CEO since 1988. Under Ruane’s leadership, ARTBA introduced a variety of new tools to support its core mission, including advocacy advertising, broad-based coalitions, market defense litigation, Internet technologies, cutting-edge economic reports, safety programs and enhanced grassroots lobbying.

He was widely recognized as the transportation construction industry’s principal advocate in the passage of four bills that have provided record levels of federal investment in highway, transit and airport construction programs: 1991’s ISTEA, 1998’s TEA-21, 2000’s AIR-21 and 2003’s “Vision 100—Century of Aviation Reauthorization Act.” He spearheaded ARTBA’s efforts in helping pass the 1995 National Highway System Designation Act. In 2004, Ruane has led the industry charge for another significant boost in federal transportation investment.

In 1999, Ruane was honored with two prestigious national awards for his work on TEA-21, including *Engineering News Record’s* “Top Newsmakers.” He was also the first association executive to ever receive the American Public Works Association’s “Distinguished Service Award” for his “far-reaching positive impact on public works programs or policies through distinguished public service and commitment.”

■ America's Top 100 Private Sector Transportation Design

STEPHEN J. SEGUIRANT (1956-)



Engineer Stephen J. Seguirant is a visionary who blazed the way to today's new standard deep pre-cast, pre-stressed concrete girder sections. His proposal in 1996 prompted the industry, the Federal Highway Administration and the Washington State Department of Transportation jointly to develop new girder sections that would be deeper and span farther than those available at the time. Seguirant took the lead in the public-private effort to develop the new technology. These new girders provide the ability to increase the previous maximum span length of 140 feet to 225 feet. The increased span lengths allow elimination of environmentally sensitive piers located in bodies of water. He is now director of engineering for Concrete Technology Corporation in Tacoma.

JAMES J. SKELLY (1881-1967)



Jim Skelly went from being a railroad gandy dancer (ballast shoveler) in 1902 to own his own road building company, James Skelly, Inc., in just two years. Skelly built Pennsylvania roads, beginning with waterbound macadam bases during the “Good Roads Movement” days, to the first cloverleaf interchange in Pennsylvania. In 1932, he was a founder of the Associated Pennsylvania Constructors (APC) and traveled to other states to help them establish such associations during the drought years of roadbuilding during World War II.

He served as president of APC from 1937-1945. He served as president of ARTBA’s Contractors Division in 1942 and served as 1945-46 ARTBA chairman. In this post, he was able to influence the revival of the national highway program after the war.

■ America's Top 100 Private Sector Transportation Design

WILBUR S. SMITH (1911-1990)



Wilbur S. Smith was a strong advocate for funding the Interstate Highway System and helped generate public support through his studies that demonstrated that the system would pay for itself through economic benefits and transportation sav-

ings. His work on a multimodal traffic plan for the National Capital Planning Commission sparked local decision makers to initiate construction of the Washington Metro System.

In 1952, he established Wilbur Smith Associates as a transportation and traffic engineering consulting practice with offices in New Haven, Conn., and Columbia, S.C. With the beginning of the Interstate Highway System in 1956, the firm added highway and bridge engineering design capabilities and over the years continued to diversify into all facets of transportation and infrastructure engineering, planning and economics.

Smith gave his time to the industry as well, serving as 1977 ARTBA chairman, chairman of the Highway Research Board (now Transportation Research Board of the National Academies), president of the Institute of Transportation Engineers and president and chairman of the Eno Foundation.

Today, the firm has completed more than 30,000 projects around the world, operates in more than 65 offices globally and has served clients in all 50 states and in more than 117 countries on six continents.

DONALD B. STABLER (1908-1997)

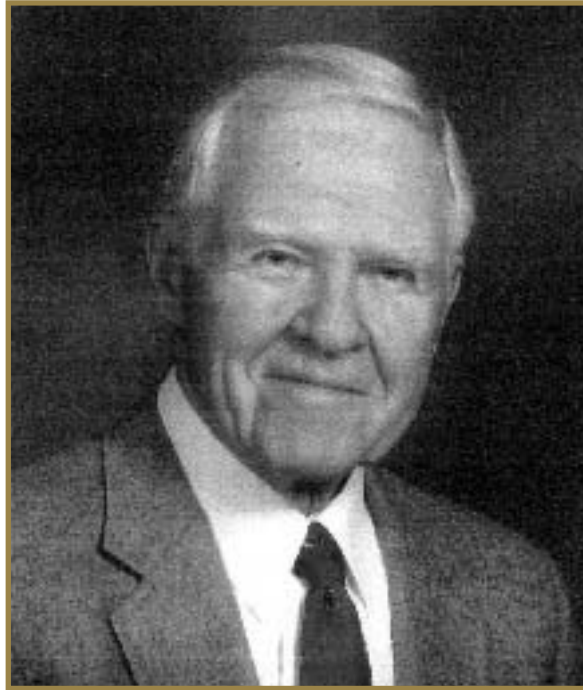


Donald B. Stabler entered the highway construction business in 1940 as a sole proprietorship (Donald B. Stabler Contractor). In 1955, he merged that proprietorship into Stabler Construction Company, laying the foundation for Stabler Companies Inc., which now includes 10 subsidiaries employing more than 1,100 people throughout Pennsylvania and other states.

Stabler was the founding president of The Road Information Program (TRIP) and was nicknamed “Mr. TRIP” in recognition of his support and dedication to the organization’s efforts to promote public awareness of the nation’s transportation needs. He was a past president of the Associated Pennsylvania Constructors and an active member of ARTBA, the American Society of Highway Engineers and the National Asphalt Pavement Association. With his wife, he formed the Donald B. and Dorothy L. Stabler Foundation, which provides financial support and material aid to charitable, religious, scientific and educational organizations.

■ America's Top 100 Private Sector Transportation Design

RICHARD R. STANDER, SR. (1919-)



Dick Stander has spent a lifetime improving U.S. highways. Throughout his career, which spans more than a half century, he has been an inventor and industry pioneer. In World War II, he championed research that led to a new type of floating bridge to accommodate larger and heavier armored vehicles. After the war, he built the Mansfield Asphalt Paving Company into one of Ohio's leading contractors and was an early adopter of automatic paver screeds, pneumatic and vibratory rollers and state-of-the-art asphalt plant production.

He served as the 1978 ARTBA chairman, was director of the Ohio Transportation Research Center and is a past chairman of the National Asphalt Pavement Association and the Ohio Contractors Association. He was also involved in The Road Information Program and the Joint Committee of the American Association of State Highway & Transportation Officials, Associated General Contractors of America and ARTBA. He's a recipient of ARTBA's "Nello L. Teer Jr. Contractors Division Award," the "ARTBA Award" and the CIT Group/Equipment Finance "Rebuilding America Award."

STEPHEN STEPANIAN



Stephen Stepanian of Columbus, Ohio, an Armenian émigré from Turkey, designed a self-discharging, rotating drum that could efficiently transport mixed concrete in 1914. This design led to the first mixer trucks in the 1920s. But, the ready-mixed concrete industry didn't begin to really grow until World War II, when both demand and the availability of stronger trucks and more powerful motors spurred production.

In 1947, he was recognized by the National Ready Mixed Concrete Association as the true inventor, and he served as the association's chairman in 1943-44.

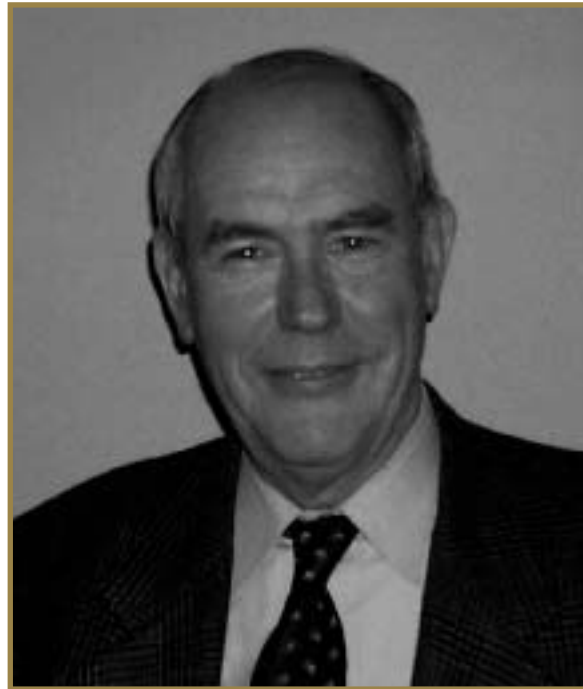
■ America's Top 100 Private Sector Transportation Design

ROBERT STUDEBAKER (1911-1999)



In 1965, Robert Studebaker invented the “Laserplane,” an innovative machine that combined laser technology with a motorized spinning prism for establishing construction and surveying reference elevations. He later developed laser detection equipment that enabled surveying to be done by one person or with automatic control of earth-moving equipment. This technology was a tremendous leap forward and dramatically advanced the swiftness and accuracy of surveying. The majority of equipment in use today employs methodology patented by him. The Laserplane Corporation, which Studebaker founded in 1967, merged with Spectra Precision Group, which was acquired by Trimble in 2000.

IVAN SUTHERLAND (1938-)

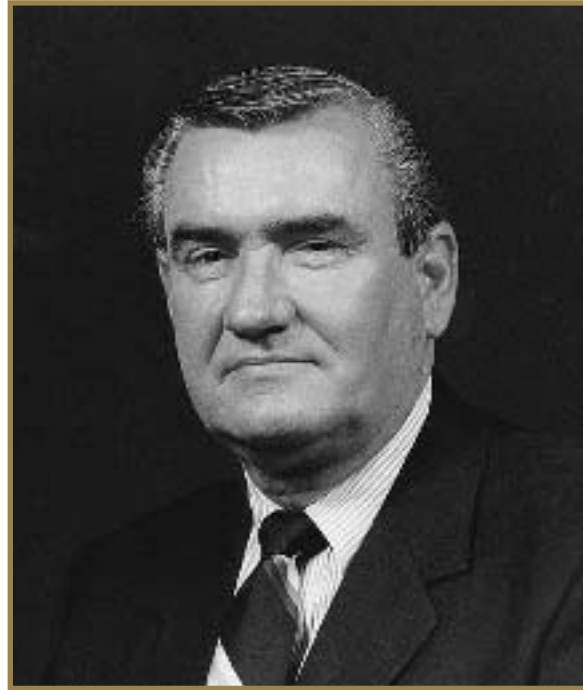


Nebraska-born Ivan Sutherland is an engineer, entrepreneur and professor, and serves as vice president at Sun Microsystems, Inc. He has left a lasting mark on transportation construction as a pioneer of 3-D computer modeling and visual simulations, the basis for today's computer graphics, computer-aided design and drafting (CADD).

In 1963, his Ph.D. thesis, *Sketchpad: A Man-Machine Graphical Communications System*, used a device called a lightpen to create engineering drawings directly on a CRT linked to a massive computer at M.I.T. This was the first Graphical User Interface (GUI)—long before the term was coined. Sutherland managed contractors in research projects that were building modern computer science, including timesharing and artificial intelligence. His subsequent work has pushed forward the limits of computer technology.

■ America's Top 100 Private Sector Transportation Design

WILLIAM SWISHER (1930-)



Bill Swisher is the founder of CMI Corporation—now part of Terex Roadbuilding—which is based in Oklahoma City. During the ramping-up of the Interstate Highway program in the early 1960s, Swisher developed the Autograde machine that would automatically cut final grade for swift-paced highway and airport runway projects, increasing productivity of grading contractors by as much as 500 percent.

Success with the Autograde led to product innovations in paving technology as CMI automated the complete concrete slipform paving process from grading and placement to surface texturing and curing. He served as a long time director and supporter of The Road Information Program and the former Construction Industry Manufacturers Association, known today as the Association of Equipment Manufacturers. He has also been a director of ARTBA and a key player in the International Road Federation.

NELLO L. TEER, JR. (1914-1996)



Nello L. Teer, Jr., son of the accomplished contractor Nello L. Teer, literally grew up in the construction business. After studying business administration and engineering at the University of North Carolina, he joined Nello Teer Company in 1938 as field supervisor and was appointed president in 1952. Teer led his firm through tremendous growth in the Interstate Era and launched its foreign operations.

In addition to his work with the Associated General Contractors of America and the International Road Federation, Teer served as 1959-61 ARTBA chairman. ARTBA's Contractors Division award is named after him and is presented annually to a contractor member who has made outstanding contributions to the division and the transportation construction industry as a whole.

■ America's Top 100 Private Sector Transportation Design

KARL TERZAGHI (1883-1963)

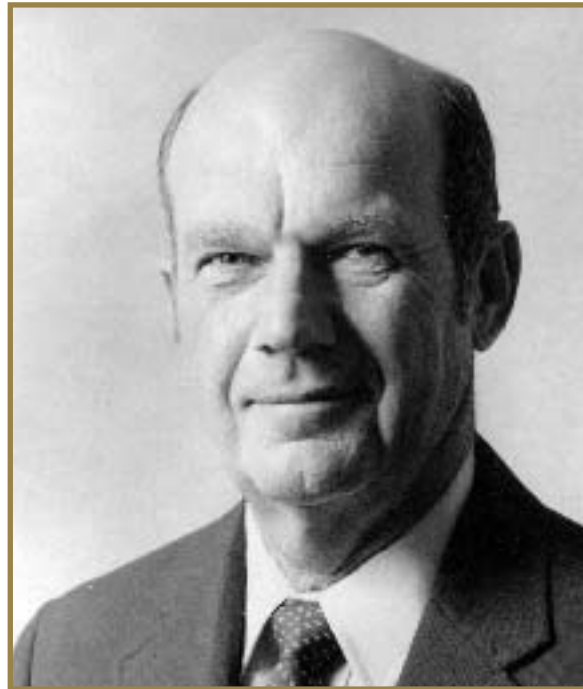
Photo by Richard E. Goodman



Karl Terzaghi was the first to elaborate a comprehensive mechanics of soils and is known as “the Father of Soil Mechanics.” His “effective stress principle” proved to be the unifying discovery that led to fundamental understanding of settlement, strength, permeability and erosion of soils. He also introduced a range of methods and procedures for investigation, analysis, testing, instrumentation and engineering practice that defined much of current Geotechnical Engineering.

Through courses at Harvard, the University of Illinois, and other universities, numerous public lectures, correspondence with engineers and scientists, and a lifelong devotion to publishing both research and practical experiences, Terzaghi disseminated advances in soils engineering that influenced the entire civil engineering world. While teaching at Massachusetts Institute of Technology in the 1920s, he served as soils consultant to the Federal Highway Administration’s forerunner, the Bureau of Public Roads. He developed an apparatus for measuring the consolidation characteristics of soils and the data were used to determine the rate and amount of settlement of highly compressible soils. The Geo-Institute of the American Society of Civil Engineers honors outstanding contributions to knowledge in soil mechanics and earthwork with its “Karl Terzaghi Award” and invites a distinguished engineer to deliver the prestigious Karl Terzaghi Lecture annually.

ROBERT THOMPSON (1932-)



In 1959, former Air Force pilot Bob Thompson risked \$3,500 of his wife's savings to buy a sprayer, a roller and a spreader fashioned from a personally rebuilt old end loader to found Thompson-McCully Co., a Michigan paving company. Bolstered by its dedication to quality paving, the firm grew and benefited from the burgeoning Interstate System and urban growth to the extent that he was able to sell the firm in 1999 for \$461 million.

He made world headlines in 1999 by sharing \$128 million of the proceeds with his employees and began another career as a philanthropist by setting aside another \$100 million to establish the Thompson Foundation—formerly Thompson-McCully Foundation—for charitable giving, which has funded over 1,100 engineering and general scholarships. While his effort to underwrite 15 charter schools for Detroit schoolchildren was declined, in early 2003, he donated \$10 million to expedite demolition of 1,400 abandoned properties in Detroit. He continues his philanthropic work today.

During his career, Thompson has served as a chairman of the National Asphalt Pavement Association and president of the Michigan Road Builders Association, the Michigan Asphalt Pavement Association and the National Center for Asphalt Technology.

■ America's Top 100 Private Sector Transportation Design

CHARLES M. UPHAM



Charles Melville Upham began his career with state road agencies, including the Massachusetts, Delaware and North Carolina Highway Commissions. In 1918, he became a director of the American Road Builders Association (ARBA). In 1929, Upham assumed the administration and management of ARBA as its first full-time business manager and later association president—a post he would hold through his retirement in 1950. As ARBA's top executive, Upham led the association through the crises of the Great Depression and World War II, never failing in the fight for a national Interstate Highway System that would become a reality in 1956.

HENRI VIDAL (1924-)



In 1962, French architect-engineer Henri Vidal experimented with sand and pine needles at a beach and noticed the sand's behavior changed when he mixed in pine needles. It took Vidal five years of research and testing before his theories were ready for their first practical test in the French Alps.

Vidal combined earthworks with tensile reinforcement to create a new and strong composite material. Vidal's thesis documented the performance of Terre Armee—or Reinforced Earth—and the technology was brought to the United States in 1972. Since then, over 30,000 structures—including more than 97 million square feet of facing—has been built by the Reinforced Earth Company. The lower-cost technology utilizing pre-cast panel construction has leveraged highway construction funds and is used extensively in many parts of the United States.

■ America's Top 100 Private Sector Transportation Design

DR. C. MICHAEL WALTON (1941-)



Mike Walton is the Ernest H. Cockrell Centennial Chair in Engineering and professor of civil engineering at the University of Texas at Austin. Walton's research focuses on intelligent transportation systems, transportation policy and systems analysis. He has published more than 200 articles and reports and has presented more than 250 technical lectures, presentations and keynote addresses. He is a member of the National Academy of Engineering, the nation's highest honor for engineering professionals.

He has served in the Office of the Secretary at the U.S. Department of Transportation and the North Carolina State Highway Commission. His more than three decades of policy papers and engineering analyses has earned him numerous awards, including the George S. Bartlett Award—jointly sponsored by the American Association of State Highway & Transportation Officials, the Transportation Research Board of the National Academies and ARTBA. In 2002, he was elected chairman of the board of directors of the Intelligent Transportation Society of America. He is a past chairman of the executive committee of the Transportation Research Board of the National Academies and currently serves as ARTBA First Vice Chairman.

REINHARD WIRTGEN (1941-1997)



Reinhard Wirtgen, founder of Wirtgen GmbH, pioneered asphalt and concrete pavement recycling to the benefit of the world. By 1971, Wirtgen had developed hot asphalt milling technology to remove asphalt pavements. Later, using cutters from the mining industry, Wirtgen modified his hot milling machines into cold milling machines, which worked without pavement preheating and now have become a world standard. In 1989, Wirtgen unveiled machines for cold recycling of road base courses and materials. These machines helped popularize asphalt recycling to the extent that it is far and away the most recycled product in the United States.

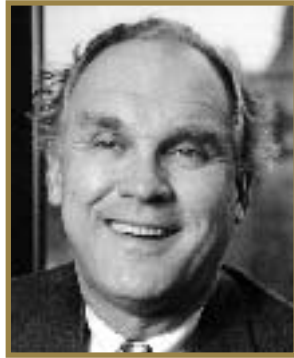
■ America's Top 100 Private Sector Transportation Design

HENRY BARTELL ZACHRY (1901-1984)



H.B. "Pat" Zachry's small company rented mules to move dirt on its first job in 1924. Under his six-decade leadership, the San Antonio, Texas-based H.B. Zachry Co., grew into one of the nation's largest construction firms. Zachry's vision and leadership made a lasting impact on Texas and U.S. transportation. He built highways, bridges, airstrips, dams, power plants and pipelines around the world. Zachry served as president of the Associated General Contractors of America. He was named a distinguished alumnus of Texas A&M, where he also chaired the Board of Regents and the university named its Engineering Center for him in 1972. His firm now is called Zachry Construction Corporation and is a diversified industrial and heavy construction provider.

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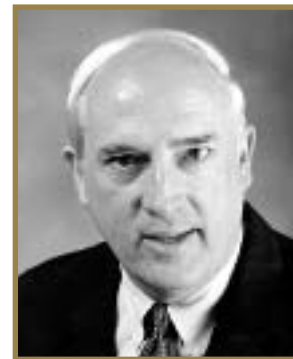
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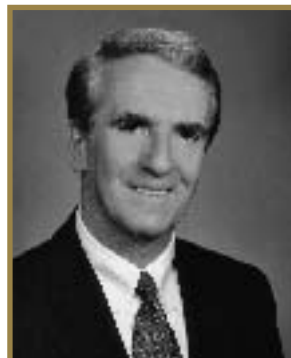
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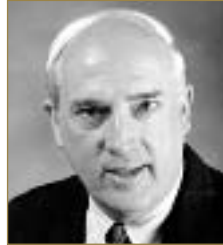
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