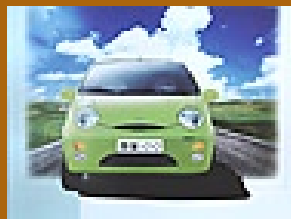


UMTRI

RESEARCH REVIEW

• UNIVERSITY OF MICHIGAN TRANSPORTATION RESEARCH INSTITUTE • OCTOBER–DECEMBER 2005 • VOLUME 36, NUMBER 4 •



on page 1:

China's Automotive Future



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Picturing China's Automotive Future

Some content in this article comes from the *Associated Press*.

China's rapidly expanding automotive industry holds enormous potential, but it will likely be ten to twenty years before Chinese automakers can compete globally in vehicle design, manufacturing, and sales. These are the findings of a recent study by the IBM Institute for Business Value and UMTRI.

The joint study is based on interviews with 20 Chinese industry leaders, including manufacturers, suppliers, government officials, auto dealers, and academic experts. The report, "Inside China: The Chinese View Their Automotive Future," was coauthored by Linda Ban, global industrial and automotive leader for IBM; Bruce Belzowski, assistant research scientist in UMTRI's Automotive Analysis Division (formerly OSAT, see article on page 6); Stefan Gumbrich, managing consultant for IBM; and Jimin Zhao, research investigator at the University of Michigan School of Natural Resources and Environment.

China produced 2.34 million vehicles in 2004¹, up from 220,000 in 1993, with exports accounting for 3 percent of production. Study respondents are optimistic about the development of China's automotive industry, but see significant gaps

and challenges for both domestic and foreign automotive companies. "There is a lot of uncertainty in the Chinese market," says Belzowski. "At the same time, there's a real sense of euphoria and excitement when you talk to people about what the future will bring."

Industry Challenges

The car industry in China has boomed in the last few years. The



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China's automotive market has huge growth potential. Just 24 of every 1,000 people own a car, compared to 120 globally and 750 in the United States.

effects of this exponential growth are now catching up with Chinese manufacturers, dealers, suppliers, consumers, and government, as well as foreign firms seeking market share in China. Study results pinpoint

several serious challenges affecting the Chinese auto industry, including defaults on auto loans, uncertain relationships with joint venture partners, higher demand for oil, higher pollution levels, and severe traffic problems in cities.

The Chinese government must determine how to manage the auto economy without harming its domestic manufacturers and suppliers or its environment. Ban says that the Chinese government hoped to get expertise quickly by requiring Chinese auto companies to own more than 50 percent of any joint venture. However, that technology transfer hasn't happened, in part because foreign automakers are concerned about intellectual property rights. "The domestic Chinese still feel the core technology is in the hands of foreign automakers," she says.

China also has a long way to go in developing the sales process. The

continued...

¹ The U.S. produced 17 million vehicles in the same year.

country restricted the number of auto loans in 2003 after a huge number of defaults, and needs to establish credit bureaus and solid repossession laws. China also has cumbersome laws for selling used cars and has taxes that can make used cars as expensive as new ones.

Infrastructure issues could also restrict the growth of the industry. For example, access to gas may be a problem; China has 85,000 gas stations, mostly in urban areas, compared with 170,000 in the United States. Parking is also a major issue in big cities such as Shanghai where most parking spaces are on the street, which adds to congestion. The Chinese government, while rapidly building roads, must implement strategies for controlling air pollution and importing fuel oil for its growing vehicle population.

Still, Chinese manufacturers and suppliers (both government-supported and independently owned) realize the need to build research and development capabilities, and they are taking steps to close the gap with their world-class competitors. They recognize this need because their joint-venture partners aim to eventually become independent of their Chinese partners.

Based on price competition, the Chinese auto market has begun to consolidate. However, the number of manufacturers surviving into the future may well be determined by the actions of the Chinese government, for example how it will regulate car loans or exit from its role supporting Chinese manufacturers. How the industry will look in the future—both near-term and long-term—hinges on how these challenges are addressed. Such decisions will impact China's future market structure, joint-venture relationships, and its automotive infrastructure, air quality, and oil supply.

Industry Potential

China also has huge growth potential. Just 24 of every 1,000 people own a car, compared with 120 globally and 750 in the United States. The report predicts that China's auto market could be larger than that of the U.S. by 2015. China's production capacity is expected to grow rapidly and could surpass Germany as soon as 2008, but it won't catch Japan's 10 million units of productive capacity until some time in the next decade.

Future Market Structure

The Chinese market is on track to become one of the largest automotive markets in the world. Interviewees had many viewpoints on the status of the current and future market, but they agreed on several key points:

- **Growth will be steady, not exponential.** Steady growth of the Chinese car industry allows more time for Chinese domestic manufacturers and suppliers to catch up technologically with foreign manufacturers and suppliers.
- **Export plans are underway.** The Chinese plan to export more vehicles and components, but opinions on the timing and destinations differ. However, emerging markets, rather than developed ones, are a primary export focus.
- **The Chinese consumer must be better understood.** Companies that cater to the Chinese consumer, understand local preferences, and leverage this knowledge across the vehicle design and sales processes will be in a much better position to retain a "customer for life." A full complement of services (e.g., used vehicle sales, service, and financing) will

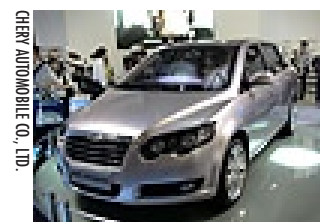
help establish a strong competitive advantage.

- **The government plays a large role in China's future market.** Over the past twenty years, the Chinese government has determined the joint-venture relationships among Chinese and foreign manufacturers, and thus shaped the structure of the auto industry. Today, it manages the growth of the market through restrictive vehicle financing. As the government's banking reforms progress and vehicle financing becomes available, significant opportunities for growth in auto sales seem likely.

Future Industry Structure

The Chinese automotive industry is undergoing many of the same challenges that other more mature markets have passed through, but at a much faster pace and with some interesting twists:

- **Conflicts abound in joint ventures.** Joint ventures have developed productive business relationships, with the exception of research and product development, but success has fallen short of expectations. Foreign manufacturers and suppliers, wary of creating their next competitor, must find ways of developing the trust needed in a joint-venture relationship or risk alienating themselves from the Chinese local or central governments.



- **Mergers and acquisitions are replacing joint ventures as a way to acquire industry and technological skills from outside of China.** Manufacturers are establishing relationships with foreign engineering-services firms and global suppliers to develop new products, enhance their skill sets, and develop their own intellectual property.

- **Consolidation is coming.** Mergers and acquisitions should continue within the Chinese auto industry for the next five to ten years and beyond, though it's unclear which companies will merge, be acquired, or be divested. Government deregulation and national and local policy setting remain key factors.

- **Competitiveness will increase.** Although many manufacturers are protected by local governments, their competitiveness could be challenged by foreign manufacturers and some of the Chinese joint-venture partners as they begin to develop their own brands.

- **Intellectual-property ownership remains controversial.** Intellectual-property violations by domestic Chinese manufacturers and suppliers make it increasingly difficult to partner with foreign firms and to make Chinese products accepted in the global marketplace. As Chinese manufacturers and suppliers develop their own intellectual capital, they will likely take steps to protect it.

- **Quality is critical to success.** Quality is key to the long-term viability of Chinese domestic manufacturers and an absolute requirement if Chinese companies anticipate exporting their products. Chinese manufacturers must raise quality to the level of their global competitors, or they will not be able to compete.

The researchers expect the Chinese automotive industry to remain a dynamic force, not only in China, but also in the global auto industry.

To view the report, see <http://hdl.handle.net/2027.42/13909>. **RR**



UMTRI Launches Doctoral Studies Program

The University of Michigan (U-M) Office of the Vice President for Research, in cooperation with UMTRI, has launched the Doctoral Studies Program to support dissertation research at UMTRI in transportation-related disciplines with collaborating faculty from UMTRI and U-M schools and colleges.

The purpose of the program is to increase the opportunity for doctoral students to conduct their dissertation research in UMTRI's diverse and dynamic research environment. The \$1 million program will also increase research collaborations between UMTRI faculty and faculty throughout the University as well as stimulate new research and funding initiatives.

UMTRI's research faculty members have expertise and experience conducting multidisciplinary transportation research involving engineering (mechanical, bioengineering, industrial and operations, and civil), human factors, economics, behavioral science, public health, psychology, sociology, human development, statistics, and education. Their research projects provide a rich research training opportunity for doctoral students.



MICROSOFT OFFICE ONLINE MEDIA

Deadlines for applications to be submitted are March 15 and June 15 each year. The first award winners will be announced in June and October 2006.

For more information on UMTRI's Doctoral Studies Program, see www.research.umich.edu/funding/um_sources/DSP-UMTRI.html or contact Dr. Jean Shope, UMTRI research professor, at jshope@umich.edu.

Hybrids Are Becoming Mainstream

Hybrid gasoline-electric vehicles are rapidly becoming mainstream choices for American consumers, say researchers at UMTRI and HybridCars.com.

"The first buyers were motivated by the novelty of the technology, but today's shoppers are more interested in tangible benefits, such as saving fuel, reducing emissions or reducing dependence on oil," says Walter McManus, head of UMTRI's Automotive Analysis Division (*formerly OSAT*; see related story on page 6).

McManus and colleague Brad Berman, editor of website HybridCars.com, surveyed more than 1,500 visitors to HybridCars.com from December 2004 to March 2005 to learn about consumer attitudes and views of hybrid vehicles. More than a third of the respondents said they own a hybrid and most of the rest said they were in the market for one. In an interview on the television program

Autoline Detroit, McManus said that there is a potential in the United States to sell a million hybrids and 1.5 million advanced diesel-engine vehicles by the year 2012.

The survey found that while owners of hybrids were less likely than other recent buyers of new vehicles to have owned a sport-utility vehicle or pickup truck in the past five years, nearly 40 percent of the survey's "hybrid shoppers" have owned an SUV and about 25 percent have owned a truck.

"The first wave of hybrid owners, who were satisfied with smaller vehicle options, are being joined by consumers wanting to keep their SUVs or large sedans—and not get stung by rising gas prices," Berman says. "Hybrids have quickly shifted from a feel-good ideological purchase to a bottom-line, cost-conscious decision. Hybrids cars are clearly going mainstream."

According to the survey, saving money on gas and cutting down on air pollution were the top two reasons for owning a hybrid (this was true for both owners and shoppers of hybrids). Reducing dependency on foreign oil and emitting less climate-changing carbon dioxide were other main reasons for owning a hybrid (for both groups). However, owners of hybrids were far more likely than shoppers to say they liked the design and technology of hybrid vehicles.

The new and anticipated hybrid SUVs—Ford Escape, Lexus RX 400h, Toyota Highlander—also are attracting more mainstream customers, the researchers say. "These new hybrids are rapidly rising on the hybrid shopping list, although the smaller Toyota Prius remains at the top," McManus says. "Trust in the brand, technology, fuel economy, design, styling and performance are what motivated current owners to buy the specific model they did. And the Prius scores well on all these dimensions."

Toyota's New Prius was the highest-rated hybrid. Other leading models include the Honda Accord, Honda Civic, Honda Insight, Ford Escape and Toyota Prius Classic. Today's shoppers look for hybrid models with high fuel economy, value for the price, a trusted brand name and good performance, McManus and Berman say.

The survey also included a detailed assessment of quality as perceived by owners, including likes and dislikes, whether the owner would recommend the model to a friend or plans to buy another hybrid in the future, and five-point ratings in six categories: mechanical, body and interior, features and accessories, performance, creature comforts, and style.

Fear of higher maintenance costs was the most frequently cited dislike, a fact that has taken on greater urgency for manufacturers since the National Highway Transportation Safety Administration is investigating complaints by some Prius drivers that the car stalls at highway speeds, the researchers say.

You can watch McManus' interview on *Autoline Detroit* at www.theautolink.com/autoline/watch.php?stream=932 or read his blog on hybrids at www.hybridcars.com/blogs/brain. For a related story, see "NCEP Supports Tax Credit Based on OSAT Study" in volume 35, number 4 of *UMTRI Research Review*, www.umtri.umich.edu/library/pdf/rr35_4.pdf. **RR**



PHOTOS THIS PAGE: HYBRIDCARS.COM AND UNIVERSITY OF MICHIGAN NEWS SERVICE

Walter McManus Heads UMTRI's Automotive Analysis Division (Formerly OSAT)

Walter McManus, an expert on alternative drive powertrains and automotive forecasting, joined UMTRI in spring, 2005, as the division head of UMTRI's Automotive Analysis Division (formerly OSAT; see sidebar article). McManus is the former executive director of global forecasting for J.D. Power and Associates and also worked at General Motors for nearly a decade. While at J.D. Power and General Motors, he conducted research on new automotive technologies and their impact on society and the environment, the market potential of hybrids and diesel-powered vehicles, and automotive product and brand portfolio strategies.

"The Automotive Analysis Division gives UMTRI an important window on the automotive world, and Walter's GM and J.D. Power experience and fine reputation with automakers and suppliers will help UMTRI," says UMTRI director Peter Sweatman. "We need to focus our research on tomorrow's auto industry issues, such as hybrid drivetrains, alternative energy, and vehicle-vehicle and vehicle-highway communication. Walter will continue the UMTRI tradition of providing topical and insightful studies on the state of the auto industry."

McManus, who has doctoral and master's degrees in economics from the University of California, Los Angeles, and a bachelor's degree from Louisiana State University, initiated J.D. Power's research program on the market potential of alternative powertrains. His research showed that the auto industry has underestimated consum-



PHOTOS THIS SPREAD: UMTRI / SHEKHAR ERINGTON

er demand for diesel-powered vehicles.

In addition, McManus created a model to evaluate policy choices to encourage the adoption of hybrids and clean-

diesel vehicles for an industry group of automobile manufacturers, suppliers, the United Auto Workers, and other organizations. Another model he developed is used by manufacturers to study options for hybrid and clean-diesel product portfolios and by the Department of Energy to assess the impact of different policies on overall fuel economy.

Other research he led at J.D. Power included forecasting auto sales in most markets worldwide, Generation Y's future influence on the auto market, the growing importance of Hispanics in the demand for autos, and creating models to forecast sales of telematics and advanced safety features.

His work at General Motors throughout the 1990s focused on developing new product and brand portfolio strategies that are credited for sustaining the company's profitability since that time and for helping to launch some of GM's most successful new models in the last five years.

"Walter is a first-rate econometrician and microeconomist who has published in leading academic journals," says Mustafa Mohatarem, GM's chief economist. "His innovative work on General Motors' economics staff left a powerful and lasting imprint on the way we analyze the industry and market our passenger cars and trucks. His work at J.D. Power has also contributed significantly to our understanding of the business and public policy climate."

As division head, McManus replaces Michael Flynn, who recently retired. Flynn, who had worked at UMTRI since 1988, headed OSAT from 2000 to 2005.

OSAT Changes Its Name to Automotive Analysis Division

UMTRI's Office for the Study of Automotive Transportation (OSAT) has changed its name to the Automotive Analysis Division (AAD). The change reflects the important role the division is playing in UMTRI's strategic development and clarifies UMTRI's growing role in researching the impact of the automotive industry on

the safety and sustainability of transportation. UMTRI director Peter Sweatman says, "Walter McManus, head of the Automotive Analysis Division, is making great strides in strengthening UMTRI's position as the University of Michigan's window on the automotive world."

New Business Administrator



Cathy Seay-Ostrowski joined UMTRI on October 31, 2005, as its new business administrator. She has a strong background in research administration, financial systems, and staff development. Her main responsibilities are management of all administrative functions including budget preparation and monitoring, research administration, facilities administration, and human resources administration.

Seay-Ostrowski's immediate plans include working with UMTRI administrative support staff to develop best practices in human resources, research, and financial administration. This goal is aligned with the growth and development initiatives currently underway at UMTRI, and Seay-Ostrowski hopes to continuously find new and better ways for administration to support development and division activities.

Seay-Ostrowski has worked for the University of Michigan (U-M) for seventeen years, most recently as the lead business administrator for the Department of Atmospheric, Oceanic, and Space Sciences in U-M's College of Engineering. Prior to that, she worked as an administrative manager in U-M's Office of Undergraduate Admissions. Seay-Ostrowski also served as the business administrator for the University's Intelligent Transportation Systems Lab, which collaborated with UMTRI researchers and was codirected by Bob Ervin, then the head of UMTRI's Engineering Research Division¹. Prior to that, she was employed as a teacher, administrative assistant, and secretary.

Seay-Ostrowski received a U-M Workplace 2000 Outstanding Leadership Award-Honorable Mention and an M-Pathways² Contributions Award for U-M's College of Engineering. She was recently awarded a slot in the University's Center for the Education of Women's Leadership Series, and will complete this training in May, 2006. She maintains memberships in the University's Research Administrator's Network, the Society of Research Administrators, and the National Council

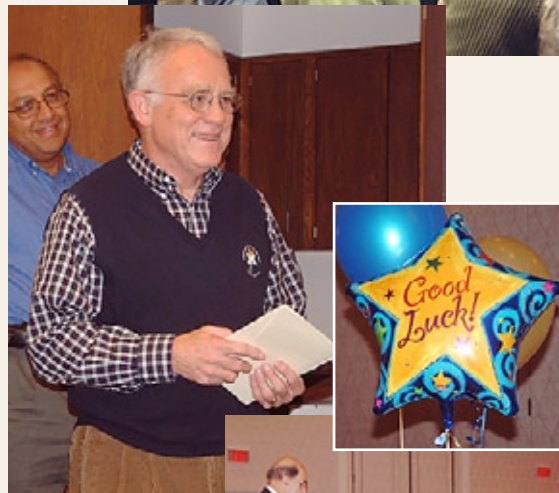
of University Research Administrators. Seay-Ostrowski holds a master's degree in administration with a concentration in human resources management from Central Michigan University, and a bachelor's degree in secondary education from Eastern Michigan University.

Outside of work, Seay-Ostrowski enjoys spending time with her family (husband, Rob, and kids Claire, 16, Chris, 12, and Connor, 4), which often includes attending youth baseball and softball tournaments. **RR**

Assistant Director Retires

Jim Thomson, UMTRI's long-time assistant director, retired in October, 2005. Thomson had worked for UMTRI for 20 years and for the University of Michigan for nearly 40 years.

UMTRI staff members and other well-wishers gathered to bid farewell to Thomson both at a dinner and at an in-house party.



UMTRI NAMES & FACES

¹ Bob Ervin is now retired. For an overview of his career, see "Bob Ervin Wins SAE Award" in volume 36, number 1 of *UMTRI Research Review*, www.umtri.umich.edu/library/pdf/rr36_1.pdf.

² M-Pathways is a University-wide administrative system that allows managing financial, human, and physical resources as well as student information.

Most UMTRI reports are available in full text online. See the website address at the end of the citation. Please contact the UMTRI library at (734) 764-2171 or umtridocs@umich.edu to inquire about the availability of other publications listed here.

Conference Papers

Bingham, C.R.; Shope, J.T. 2005. "Adolescent Predictors of Traffic Crash Patterns from Licensure to Early Young Adulthood. In *Association for the Advancement of Automotive Medicine*. 49th Annual Proceedings. Barrington, Ill.: AAAM, 2005, pp. [245]–259.

The research documented in this paper was sponsored by the National Institutes of Health.

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The research documented in this paper was sponsored by the National Highway Traffic Safety Administration.

Journal Articles

Reed, M.P.; van Roosmalen, L. 2005. "A Pilot Study of a Method for Assessing the Reach Capability of Wheelchair Users for Safety Belt Design." *Applied Ergonomics* Vol. 36, no. 5 (Sept. 2005), pp. 523–528.

The research documented in this article was sponsored by the National Institute of Disability and Rehabilitation Research.

Technical Reports

Flannagan, M.J. 2005. *Rearview Mirror Glare with Varying Vehicle Geometries*. 20 p. Report No. UMTRI-2005-25.

The research documented in this report was sponsored by UMTRI's Industry Affiliation Program for Human Factors in Transportation Safety.

Green, P.E.; Blower, D. 2005. *The Safety Profile of Work-Related Trucks*. 55 p. Report No. UMTRI-2005-21. <http://hdl.handle.net/2027.42/13897>.

The research documented in this report was sponsored by the National Truck Equipment Association.

Sayer, J.R.; Devonshire, J.M.; Flannagan, C.A. 2005. *The Effects of Secondary Tasks on Naturalistic Driving Performance*. Report No. UMTRI-2005-29.

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Sivak, M.; Schoettle, B.; Reed, M.P.; Flannagan, M.J. 2005. *Influence of the Visibility out of the Vehicle Cabin on Lane-Change Crashes*. Report No. UMTRI-2005-32.

The research documented in this report was sponsored by UMTRI's Industry Affiliation Program for Human Factors in Transportation Safety. 

CONFERENCES & EVENTS

Transportation Planning Applications
 May 6–9, Daytona Beach, Florida
www.lctr.fiu.edu/trb-appconNational

**Canadian Institute of Transportation
 Engineers Annual Conference**
 May 14–17, Banff, Canada
www.citebanff.ca

National Transportation Week
 May 14–20, various locations
www.ntweek.org

Innovations in Travel Modeling
 May 21–23, Austin, Texas
www.trb-forecasting.org

**Northeast Association of State Transportation
 Officials Annual Conference**
 June 4–6, Québec City, Canada
www.nasto2006.mtq.gouv.qc.ca

International Crashworthiness Conference
 June 4–7, Athens, Greece
www.bolton.ac.uk/news/events/icrash2006

**North American
 Travel Monitoring Conference**
 June 4–7, Minneapolis, Minnesota
www.trb.org/conferences/natmec

Rail Transit Conference
 June 11–14, New York, New York
www.apta.com/conferences_calendar/rail

**Ninth International Symposium for
 Heavy Vehicle Weights and Dimensions**
 June 18–22, University Park, Pennsylvania
www.outreach.psu.edu/C&I/9ishvwd

Navigation Europe 2006
 June 19–20, Bristol, England
www.telematicsupdate.com/naveurope2006

RESNA 2006
 June 22–26, Atlanta, Georgia
www.resna.org/Conference/Conference.php

**Conference of
 Minority Transportation Officials**
 July 8–12, Austin, Texas
www.comto.org/Events/2006_Events/annualc.htm

Southern African Transport Conference
 July 10–13, Pretoria, South Africa
www.up.ac.za/academic/civil/satc/SATC2006.pdf

Thirteenth Annual School Bus Expo
 July 22–26, Reno, Nevada
www.stnonline.com/stn/expo

**National Transportation
 Management Conference**
 July 23–28, Park City, Utah
transportation.org/aashto/calendar.nsf

**International Forum on Traffic Records and
 Highway Information Systems**
 July 30–August 3, Palm Desert, California
www.atsip.org 

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Transportation Tidbits

- On October 8, 1866, in the first use of a steam car to attract national attention, brothers Henry and James House transported several people in their House Steamer from Bridgeport to Stratford, Connecticut. The brothers had constructed the House Steamer earlier in the year and after testing the invention in and around Bridgeport for several months, they made the six-mile trip to Stratford to watch a vessel launching.
- The world's oldest licensed driver, Layne Hall of Silver Creek, New York, was born on December 25, 1884. He died with a valid driver's license at age 105 on November 20, 1990.
- The first race of gasoline-powered cars took place on November 4, 1895, between Chicago and Waukegan, Illinois in an event sponsored by the *Chicago Times-Herald*. Although eighty automobiles had entered, only two showed up: a Benz driven by Oscar Bernhard Mueller and a car built by Charles and Frank Duryea of Springfield, Massachusetts. Mueller won the race that day, but the race was rescheduled for Thanksgiving day so more entrants could compete.
- On November 6, 1899, James Ward Packard drove the first completed Packard automobile through the streets of Warren, Ohio. The Model A featured a one-cylinder engine capable of producing 12 hp. Built around the engine was a single-seat buggy with wire wheels, a steering tiller, an automatic spark advance, and a chain drive.
- Great Britain issued its first automobile license plate, number A1, on December 24, 1903. The plate was issued to Frank Russell, the brother of philosopher Bertrand Russell. Starting on January 1, 1904, the Motor Car Act required all vehicles in the U.K. to be registered and to carry license plates.
- On October 1, 1940, America's first toll superhighway, the Pennsylvania Turnpike, opened for service. Inspired by Germany's 100 mph autobahns, the Pennsylvania Turnpike reduced travel time between Pittsburgh and Harrisburg by three hours. The tolls created revenue to cover the turnpike's construction and maintenance costs.

SOURCE: This Day in Automotive History, www.historychannel.com



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