TRANSPORTATION TODAY™

YOUR WISCONSIN TRANSPORTATION CONNECTION

SPRING 2014

→ HIGHWAY → RAILROAD → AVIATION → MARITIME → PERSONAL/RECREATIONAL → PUBLIC TRANSIT

A New Spin on Tradition

By Alex Bondar, Franklin High School.

Franklin High School Automotive Technology is a program that was started 40 years ago by Gary Press, who is in his final year of teaching at FHS. Mr. Press turned the program over to John Jewell after setting the framework for the program. Mr. Jewell grew the program into a very strong program that won competitions, and had many students move on to a career in the automotive industry. Unfortunately Mr. Jewell passed away unexpectedly last year from cancer. He was a legend in Franklin, and it was tough on the students and, a big adjustment for them.

I have a 4 year program here at FHS. I have a Small Engine Theory and Repair class that is open to students in any grade, where the students will learn the theory behind the internal combustion engine, and will completely disassemble and reassemble the engine and put back to running order. Another class that is open to all grade levels is Energy & Green Technology. In Energy & Green Technology my students learn about different energy sources, hydraulic and pneumatic systems, simple machines, and green energy. I want to have a lot of hands on activities for this class and am working on acquiring solar panels, wind generators, and other equipment so I can go more in depth with the green technology since that is so popular right now. The previous two classes are prerequisites to get into my Automotive Technology I class. This class is open to sophomores through seniors, and in this class we will cover; brakes, suspension, tires, electrical, and general vehicle repairs. The final class in the progression

at FHS is Automotive Technology II. This class is open to juniors and seniors who have completed Automotive Technology I. In this class we cover the engine, and drivetrain. This class also gets a lot of hands on repair work on their own, and

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Milwaukee's Streetcar . . . Then and Now

Photo Courtesy of Wisconsin Historical Society

The future of Milwaukee's transportation system is taking shape, and it includes The Milwaukee Streetcar network that provides a modern way for people to connect with their jobs, their homes, and their entertainment destinations.

Streetcars do more than simply improve mobility. By promoting development, raising property values, attracting businesses, and helping to define our contemporary city, Streetcars benefit everyone. Streetcars add vitality to an urban setting, increasing commerce and activity around every one of the fixed stations and stops.

Modern streetcars resemble light rail vehicles. But, like old-fashioned streetcars, they typically run on rails laid in streets, draw power from overhead wires and operate in traffic. Milwaukee's streetcars would run every 10 minutes weekdays, and every 15 minutes in late-night, early-morning and weekend hours, from the lower east side to the downtown Amtrak-Greyhound station.

An accessible and convenient Streetcar provides connections to our array of transportation choices. Pedestrians, bus riders, train travelers, automobile drivers, and bicyclists can choose the Streetcar as a link to their destinations.

Visitors will see Milwaukee as an even more attractive city when

Renderings courtesy City of Milwaukee.

they use the Streetcar. The routes will be easy to navigate, downtown destinations will be convenient to reach, and riders will appreciate the high-quality ride that new Streetcars deliver.

The route would come within a quarter-mile of every downtown hotel room, about 90% of occupied downtown office and retail space and 77% of downtown housing and parking lots.

Annual ridership is projected at 588,880 by 2015 with the basic route or 1.2 million with the extensions.

With the extensions, the project

Continued on Page 4

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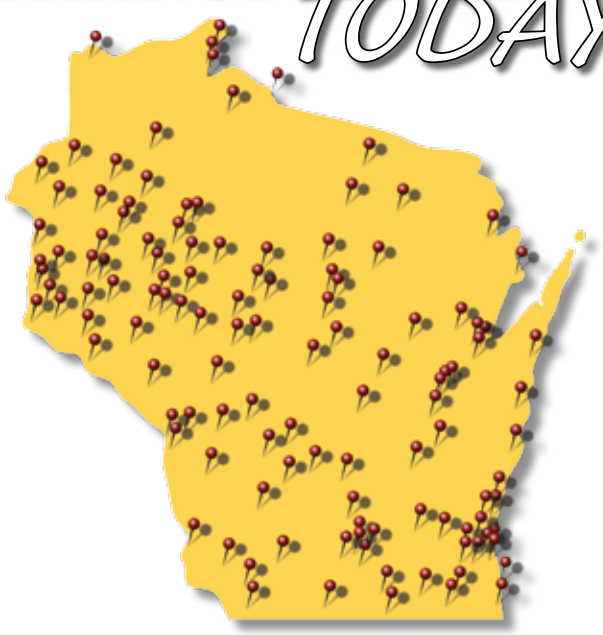


More than 70,000 readers across the state!

American Road & Transportation Builders Association

Student Transporation Construction Industry Video Contest

There has been a lot of talk about transportation and infrastructure lately, ranging from debates in high school to debates in Congress. The American Road and Transportation Builders Association (ARTBA) would like to know what you think. Now in its second year, the Transportation Video Contest has just opened, and students of all ages are encouraged to apply!

The top two student videos (one winner in each category), as selected by ARTBA, will each be awarded a $500 cash prize. The winners, along with other submitted videos, may be shown at the ARTBA National Convention. Entrants may work in teams, but only ONE prize is awarded per video. Submitted videos may also be featured on the ARTBA website, screened on YouTube, and/or other promotional venues.

Entrants should create an original two (2) to four (4) minute video examining any aspect of transportation in the United States. Some suggested topics include:

- U.S. Transportation Infrastructure 101
- How infrastructure is built and paid for
- What are the costs and financing needs of transportation infrastructure
- What are the impacts of congestion and changing travel demands
- What are the "man on the street" impressions of the industry versus reality
- Recent transportation and urban design/development patterns

ARTBA is looking for creativity, so stretch the bounds of your imagination! Entrants must submit a video in one of two categories based on their school attendance through August of 2013:

Category One: Entrants are in elementary, middle of high school. This includes high school students who graduated in 2013 but may be planning to continue their studies at a post-secondary institution. Teachers/directors of elementary, middle, or high school students are eligible to participate with their class/program; however, the video must primarily be the work of the students.

Category Two: Entrants are currently enrolled in a post-secondary, college or graduate school program.

Entries will be judged on creativity, technical merit, adherence to contest requirements, and on how well they manage to convey the themes of the topic. These are clearly subjective categories and will be treated as such. The final awards will be selected based solely on the judges' consensus.

Direct any questions to Lital Shair at lshair@artba.org. More details about this contest can be found at the website below.

Deadline: Video Submission Deadline: August 1, 2014

Website: www.artba.org/video-contest

WTBA
WISCONSIN TRANSPORTATION BUILDERS ASSOCIATION
SPONSORED BY WISCONSIN TRANSPORTATION BUILDERS ASSOCIATION,
SUPPORTING WISCONSIN'S ECONOMY ONE ROAD AT A TIME
www.wtba.org

Milwaukee's Streetcar Continued from Page 1

Renderings courtesy City of Milwaukee.

would create 625 construction jobs and 455 jobs at suppliers, plus 35 operating jobs.

Streetcars are quiet, clean, and efficient. Their popularity and value have been demonstrated in other cities. Streetcars create new opportunities and generate activity in the cities they serve.

The Early Years

It all began with the construction of a street railway system in Milwaukee in 1858. In the following year, the Common Council granted the city's first horse drawn street railroad franchise to the River & Lake Shore City Railway Company. A single track was constructed on N. Water Street from Erie Street to E. Juneau Avenue. On May 30, 1860, a proud city of 45,000 cheered as the first streetcar was pulled over a dirt road by four sturdy horses. It symbolized a remarkable step forward for the city. Fare was 5 cents and the operator received 15 cents per hour.

Thirty years later, on April 3, 1890, the mass transit system in Milwaukee was revolutionized when the first electric car operated on Wells Street. It was not until January 29, 1896, that The Milwaukee Electric Railway & Light Company (TMER&L) was founded. Synonymous with the "Golden Age" of the electric street railway, the company was created primarily as a transportation company, but it also handled electrical utilities.

Early Years information from www.ride-mcts.com/about-us/history

San Francisco's historic streetcars

San Francisco's historic streetcars (sometimes called trolleys or trams) and the world-famous cable cars form a "steel triangle" of rails that bring riders to such destinations as Fisherman's Wharf, Union Square, the Castro district, Chinatown, Nob Hill, Jackson Square, North Beach, Telegraph Hill, and Coit Tower.

Read more at the website below.

Website: www.streetcar.org/museums-in-motion/

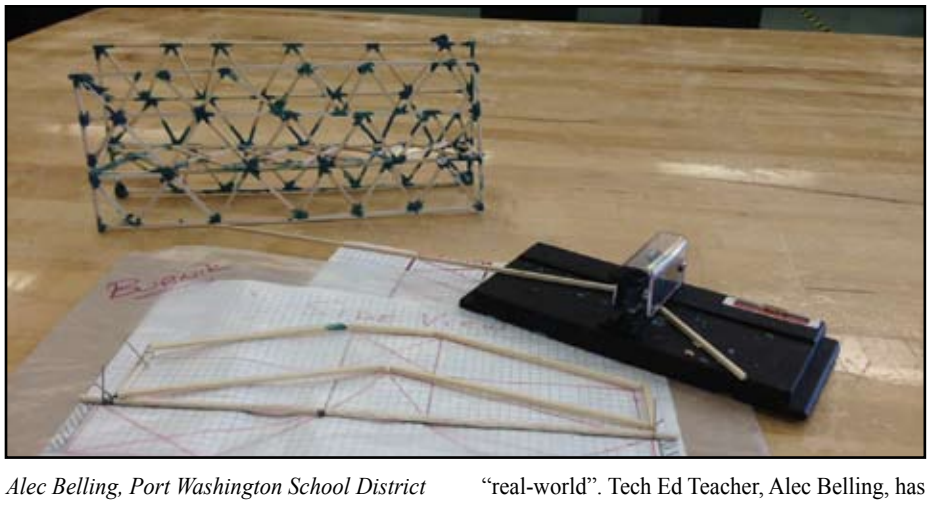
Historic Photos of the New York City Subway

Here, more than a century after the opening of the system's first underground line (long after elevated sections of the Interborough Rapid Transit, or IRT, system had been introduced), LIFE.com pays tribute to the Big Apple's vast, serpentine, almost incomprehensibly complex subway system; the army of men and women who, improbably, keep it up and running; and the intrepid souls who, every day, several times a day, in all kinds of weather, run down those well-worn steps — even though you know you're not supposed to run!

Website: life.time.com/history/new-york-city-subway-photos-from-the-1940s-1950s-and-1960s

Bridging the Classroom and Real Life

Port Washington Middle School Students Simulate the Real World



Alec Belling, Port Washington School District

Eighth grade students at Thomas Jefferson Middle School in Port Washington, WI get to do some pretty cool things in their Technology and Engineering class. Students do several hands-on projects that focus on relevant designs from the "real-world". Tech Ed Teacher, Alec Belling, has been teaching middle school for the Port Washington-Saukville School District for 6 years.

Last semester students designed their own bridges constructed out of balsa wood. Students were able to use a simulation program called West Point Bridge Design to first learn about bridge designs that are used in the real world. The program allows students to pick from a list of current bridge construction methods and design their bridge. As the students draw and adjust their bridge a construction list is created that details each member of their bridge. Students can test the bridge and simulate what happens when a truck passes over. If their bridge fails, students can go back and adjust the size and/or material of the member. As they make their corrections they are also competing against each other to design the most cost-effective bridge. The program keeps a budget and changes the cost of the bridge project as they modify their designs.

Upon completion of the computer simulation, when students have a design that is cost-effective and passes the "truck test", they print out their designs and use them to layout their balsa wood. Students all get the same amount of balsa wood; the only difference from student to student is their design. They lay out their balsa and construct models of their designs. The models are loaded, one at a time, into the bridge tester and each bridge is tested until it fails. Students are now able to see how many pounds of force their designs were able to hold, as well as where their designs failed. Students have figured out the mass of the bridges prior to testing, so they can see how efficient their design is. "What I like most about this project is that the students are all basing their models off of real world designs," says Alec Belling, "They get to see the bridges perform and then I connect their designs and the test results with the math and science they are using in the other classes."

www.pwssd.k12.wi.us

The St. Croix Crossing Project: Constructing the Bridge Pier Foundations

A completed column rises just above the water, while the column to its left continues to be constructed inside the dry cofferdam.

The St. Croix River Valley will experience a transformation over the next three years with construction of the new St. Croix Crossing. The $369.5 million bridge will connect St. Joseph, Wisconsin, and Oak Park Heights, Minnesota, and replaces the Stillwater Lift bridge.

The main spans are an extradosed bridge — a hybrid of a concrete box girder and cable-stayed bridge. It is the second of its kind in the nation. The first is in Connecticut.

The bridge is scheduled to open to traffic in 2016 and includes five piers in the river. The pier foundations are now complete, but not without the support of calculated design and engineering.

Constructing the Pier Foundations—Everything Below Water

The contractor followed a series of steps to create the pier foundations that today rise about 16 feet above the water's surface.

Step 1: Construction crews floated in a pre-fabricated concrete deck that served as a work platform, as well as a guide for placing the casings that are nine-feet in diameter, hollow and made of steel.

Step 2: The casings, or caissons, were placed into the muck and bedrock beneath the river bottom. Altogether, crews installed 40 caissons that range from 90 to 120 feet long. Before reaching the bedrock, the casings were drilled through up to:

- 25 ft. of water
- 87 ft. of muck
- 2 ft. of sand and gravel
- 2 ft. of soft sandstone

Even then, crews drilled about 25 feet further into the bedrock to anchor each casing. The muck, mud and rock were removed using large drill bits—up to 7.5 feet in diameter. The equivalent of about 2,500 dump truck loads of material was dredged up from the construction of the five piers. Next, the casings were filled with reinforcement bar and concrete to create solid foundations for the new bridge.

Step 3: At this point, the work area must be dry. To remove the water, crews installed a box-like structure on top of the pre-fabricated deck—called a cofferdam—then lowered the cofferdam to the river bottom.

Step 4: A 3.5 to 4-feet thick layer of concrete was added to seal the sunken deck around the casings. The seal ensured water did not flow into the cofferdam. Then crews pumped out the remaining water.

Step 5: Working within the dry cofferdam, crews constructed a reinforced concrete footing on top of the concrete seal. There are 10 footings total—two at each of the five piers—that give each pier added strength and stability. From here, crews added a column. Two columns at each pier location will eventually anchor the bridge's cable stays. Together, the five piers will support 400,000 tons of weight.

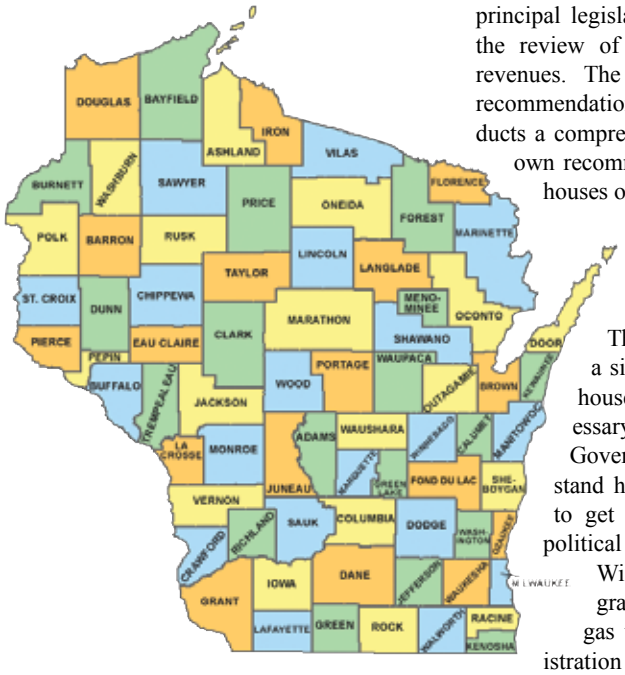
Step 6: Lastly, the cofferdam was removed, letting the river water surround the new pier foundation.

Completing the pier foundations is a major milestone, and there are many more to come. Crews will spend 2014 to 2016 building all parts of the bridge above water, known as the superstructure. Continue to follow the project at www.mndot.gov/stcroixcrossing/.

This article is Part 1 of a 4-part series. Part 2 will appear in the Fall issue of Transportation Today WI

A design view of the new St. Croix Crossing looking into the Wisconsin river bluff.

State Funding for County Transportation Programs



The state of Wisconsin's Segregated Transportation Fund plays a big role in supporting local transportation. It is the reason that the Wisconsin Counties Association (WCA) works so hard to ensure that there is adequate funding for county-related programs in the Segregated Transportation Fund. Some of the transportation programs range from funding that assists local governments in construction, road improvement projects, maintenance investment and Mass Transit Operating Aids. The budget process dictates the level of funding counties will receive for their transportation programs.

Within the Legislature, the Joint Committee on Finance is a statutory, 16-member standing committee. Eight members are appointed from each house. The Committee's primary responsibility is to serve as the principal legislative committee charged with the review of all state appropriations and revenues. The Committee reviews budget recommendations made by the Governor, conducts a comprehensive review and adopts its own recommendations forwarded to both houses of the legislature.

At the end of the process the Governor has yet another crack at making changes to the budget by issuing vetoes. The budget document requires a simple majority to pass in each house. A two-thirds vote is necessary to override a veto by the Governor. It is importation to understand how the budget process works to get an idea of how Wisconsin's political leaders make decisions about Wisconsin's transportation programs. Primarily, funding from gas tax revenues and vehicle registration fees supports the different programs funded with revenue from the Segregated Transportation Fund. Funding is determined on a biennial basis by the Wisconsin State Legislature and Governor.

The Local Road Improvement Program (LRIP) was established in 1991 (Wis. Stats. 86.31) The purpose of the program is to assist local units of government in improving seriously deteriorating town roads (towns), municipal streets (cities & villages) and county highways (counties). Local units of government are reimbursed by the state for improvement projects up to a maximum of 50 percent of the total project cost.

Applicable LRIP projects are locally let and then reimbursed by the Wisconsin Department of Transportation (WisDOT) upon completion. Only projects on existing county trunk highways, city and village streets, and town roads are eligible for LRIP funding. All projects must have a projected design life of at least ten years and the same project cannot be submitted more than once in a ten-year period.

The General Transportation Aids (GTA) program provides local units of government with a partial reimbursement of costs. The reimbursement of funds from the state is used to offset county and municipal costs for local road maintenance, improvement projects, traffic, and police costs. The GTA program is the second largest program in the Wisconsin Department of Transportation budget. Under this program, 1,922 local units of government receive quarterly payments.

There are two ways local units of government are reimbursed under the GTA program. The level of funding given to a local unit of government may be determined by the road mileage under its jurisdiction. Under such a circumstance a rate per mile payment may apply. The amount a municipality may receive in rate per mile payments is based on the number of centerline miles of roadway and the "per mile rate" established by the Legislature. Counties are not eligible for the rate per mile payment.

Counties receive a "share of costs" percentage that floats from year to year based on the costs reported and whatever funding remains in the GTA appropriation after rate-per-mile entitlements are subtracted. No community-receiving share of costs payments may receive revenue in excess of 115 percent of the prior year's payment. Counties must also, as a minimum cushion, receive at least 90 percent of the prior year's payment.

County highway departments, under contract with the state, perform the majority of State Trunk Highway Maintenance activities. WisDOT sets statewide maintenance policies, work priorities and oversees all state highway maintenance through WisDOT regional offices. County highway departments perform routine maintenance activities. The aforementioned arrangement (between the state and counties) has existed since 1932. Some of the activities conducted by counties on behalf of the state include:

- Roadway surface, base, and shoulder repair
- Minor bridge repair
- Emergency repairs and accident cleanup
- Drainage, culvert maintenance, erosion control measures, repair of guard rail and safety features
- Repair of damaged traffic signs and other roadway features
- Mowing, weed control, brush and tree removal

Counties provide most general maintenance activities and are reimbursed for state maintenance work based upon county labor costs, county machinery costs and materials supplied by the county.

The state of Wisconsin subsidizes local transit programs through a statutory appropriation to Mass Transit Operating Aids. Wisconsin's local mass transit systems offer an alternative means of transportation that have a significant positive impact on the state's economy, including job access, time-saving benefits to travelers and transportation cost savings to businesses.

There are many transportation-related programs that are important to counties. Hopefully this column has given you some background on how are state government supports local transportation and on the importance of advocacy done by the Wisconsin Counties Association.

Faces of Wisconsin Counties Association

WISCONSIN COUNTIES ASSOCIATION

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Madison, WI 53703
Phone: 608-663-7188
Toll Free: 1-866-404-2700
www.wicounties.org

Grants

"Living in a Material World" Teacher Grants

The goal of the ASM Education Foundation is to increase awareness of, and interest in, the often overlooked science of materials. Metals, semiconductors, ceramics, and polymers are the foundation of a range of modern electronic, mechanical, and thermal systems. Through the network of chapters that exist throughout the United States, ASM members work with local teachers to learn about and integrate materials-based concepts into their course curriculum. Excite your students about the many careers available in materials science. Learn how to develop innovative and fun classroom projects as you explore "Everything Material."

Grants of $500 are awarded and applications are due May 25, 2014.

Website: www.asminternational.org/web/guest/foundation/teachers/teacher-grants-k12

Discovery Research K–12 (DRK–12)

Sponsored by The National Science Foundation

The Discovery Research K–12 program (DRK-12) seeks to significantly enhance the learning and teaching of science, technology, engineering and mathematics (STEM) by prekindergarten through grade 12 students and teachers, through research and development of innovative resources, models and tools. The intent of the program is to catalyze new approaches to STEM learning, develop students' 21st century STEM skills, and provide multiple pathways and resources in a variety of learning environments to study the learning process itself.

Exploratory projects of up to $450,000 with duration of up to three years are awarded; Full Design and Development projects of up to $3,000,000 with duration of up to four years are awarded; and Conference/Workshop/Synthesis projects of up to $100,000 for duration of up to two years are awarded.

Deadline: Full proposals are due October 16, 2014.

Website: www.nsf.gov/funding/pgm_summ.jsp?pims_id=500047&org=NSF&sel_org=NSF&from=fund

Alternative Fuel Foundation Grants

The Alternative Fuel Foundation is heavily committed to developing and strengthening green education programs throughout the northeast, while also helping to promote the use and study of alternative fuels. There is a preference for funding requests that promote the awareness and use of alternative fuels or promote the concept of sustainability. Projects that encourage parent involvement and build stronger community spirit will be favored.

Awards range from $250 to $500.

Online applications are accepted on an ongoing basis.

Website: www.alternativefuelfoundation.org/grant_application.html

Shell Grants

Grant requests related to education must focus on Shell's funding priorities. These include increasing interest in technical careers among students, and professional development in science and mathematics for educators. Funding is provided to support programs in kindergarten through grade 12 that are designed to boost students' mathematics and science skills. Shell also funds projects at vocational and technical schools where chemical and refinery operators and technicians are trained.

Grant applications are accepted year-round, with a limit of one grant application per organization per fiscal year (September to August).

Website: www.shell.us/environment-society/grant.html

Resources

Aquatic Invaders Attack Pack

The Aquatic Invaders Attack Pack is a rucksack filled with preserved specimens and materials about Great Lakes aquatic invasive species. Wisconsin residents can check one out for free through Wisconsin's Water Library.

Website: seagrant.wisc.edu/attackpack

Free Curriculum for Teen Driver Safety

Toyota and Discovery Education are offering Toyota Teen Driver, a free online resource for educators, students, and parents that promotes responsible driving for teens. In addition to parent-focused resources, the website offers a digital curriculum that includes lesson plans, activities, and discussion starters for students in grades 9-12. Through these resources, educators can help inform students about the dangers of distracted driving, enable them to drive safely, and encourage their friends to do the same.

Website: toyotateendriver.discoveryeducation.com

Competitions

Video Contest — Help save lives and WIN!

The first year after a teen gets their license will be one of the most dangerous years of their life. (Source: National Safety Council) We believe that you have the power to inspire others and make a difference.

If your friends were going to watch ONE video that made them think twice about making bad decisions behind the wheel, what would that video be? This is what we're asking YOU to create.

REGISTER — You have until March 13, 2014 to submit – but get started now!

BE CREATIVE! Create your 60-90 second video anyway you like. Work by yourself or with up to three friends.

SUBMIT your video as a YouTube link.

Check out the Video Entry Checklist and the Contest Rules to make sure it qualifies to win.

Check out the Prizes!

- 1st Place: $15,000 and the chance to work with a Discovery film crew to reshoot your video into a TV-ready PSA!
- 2nd Place: $10,000 and a behind-the-scenes trip for two to a Discovery Channel Velocity show!
- 3rd Place: $7,500

Website: www.toyotateendriver.com/teens/video-challenge

Morris 4x4 Center and Omix-ADA 2013 Jeep Giveaway

Enter one time per week through March 31, 2014 to win a modified Jeep Wrangler. This car sweepstakes is open to legal residents of the USA who are of legal driving age in their state of residence.

Website: www.jeep4x4center.com/jeep-wrangler-giveaway/

Engineering For You Video Contest

The National Academy of Engineering (NAE) is celebrating its 50th anniversary by holding a contest, looking for the answer to the question: what will engineering create in the next 50 years? The academy believes that engineering creations serve the welfare of humanity and the needs of society. Over the past 50 years, engineering achievements include helping land astronauts on the moon, creating the Internet, and decoding the human genome.

The contest is asking everyone to get creative and create a one- to two-minute video that shows how engineering has served the welfare of humanity and the needs of society over the past 50 years, how it will continue to do so in the next 50, and how it inspires each applicant.

There are two grants awarded: the Best Video Overall will be awarded $25,000, and the People's Choice Award video will be awarded $5,000.

Deadline: Video submissions are due March 31, 2014.

Email: E4Uvideocontest@nae.edu

Website: www.nae.edu/e4u/

Google Science Fair

The Google Science Fair is an online science competition open to teenaged students from around the globe. In 2014, the Google Science Fair will accept entries in 14 languages. Students aged 13 to 18 are challenged to submit their ideas and projects that could change the world. Entrants may submit projects in any one of the following categories: Computer Science and Mathematics, Earth and Environmental Sciences, Behavioral and Social Sciences, Flora and Fauna, Energy and Space, Inventions and Innovation, Physics, Biology, Chemistry, Food Science, and Electricity and Electronics.

Ninety regional finalists will be chosen from all the entries. Fifteen of those regional finalists will be selected to go to Google's headquarters for a chance to compete to become a Finalist Winner (three total) in their age category: 13 to 14, 15 to 16, 17 to 18. One of the three Finalists Winners will be selected as the Grand Prize Winner.

In addition to awarding a Grand Prize Package, the Finalist Prizes, and Age category winners, the Google Science Fair competition includes several other awards.

More information about all awards can be found at www.googlesciencefair.com/en/competition/prizes.

Deadline: Entries are due May 12, 2014.

Website: www.googlesciencefair.com/en/competition

Gary Dickinson Award for Teaching Excellence

The Gary Dickinson Award for Teaching Excellence recognizes an outstanding middle school teacher or a team of teachers who have made creative and exemplary use of the A World In Motion (AWIM) program to further develop students' understanding and experience in mathematics, science, and engineering. This award was funded by the SAE Detroit Section to commemorate the life of industry leader, Gary Dickinson, and is intended to foster math and science education for middle school students.

The award consists of a framed certificate and an honorarium of $2,000, divided equally between the teacher and the middle school where the program was implemented.

Application Deadline: October 30, 2014

Website: awards.sae.org/dickinson/

Reevaluating an Automotive Program

Purple Knight Automotive

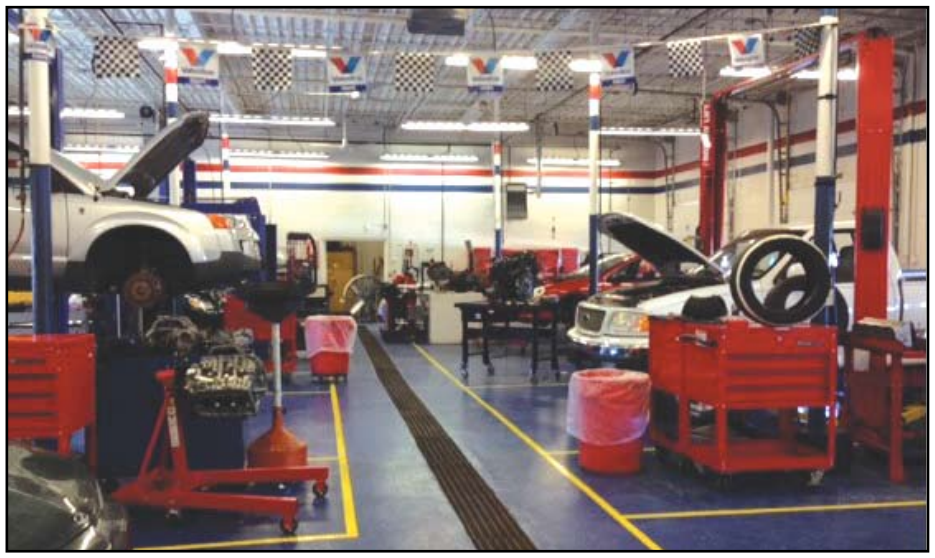
The Beloit School District and Beloit Memorial High Schools Career and Technical Education programming is in a state of redevelopment. Each area is getting an in depth look at what we are doing well and what we need to improve upon. It is important to the School District of Beloit that we are providing students with learning opportunities that are current with today's industry standards. This means that what we have done in the past may not be the best practice for today. Our Automotive program is one of these areas that we believe must be enhanced to meet the needs of our students and there future employers.

Like many of our programs in the Beloit School District we have developed advisory committees. The automotive advisory committee has input on what students should be introduced to as well as what skills or knowledge base is expected from students when they leave our automotive program. Their guidance drives the direction of the program.

Another crucial element to any automotive program is the instructor. The Beloit School District is fortunate to have a talented and passionate instructor in Mr. Aaron Troxell. Aaron has an Associate Degree of Applied Science in Automotive Mechanics, a Bachelor of Science Degree in Technology Education. Along with Aaron's educational credentials he also has completed industry certifications.

As we continue on our path of redevelopment our connection with Blackhawk Technical College is also vital. Articulation agreements are in place so students can earn credit while still in high school. The school also has the AYES (automotive youth educational system) in place. Not only is it a benefit to the student, but it is also a benefit for the employer to be able to train someone for entry-level employment.

Our Purple Knight Automotive facility is also pursuing recertification from a national organization. This provides justification for our students and employers that the education that we are providing is of high quality.



The Purple Knight Automotive program is located at the Eclipse Center in Beloit Wisconsin. We have eight vehicle bays and five lifts (one of which is an alignment rack) that offer students a chance to work in an actual facility that was previously a professional automotive shop. We also have equipment that is representative of today's industry standards and are working with our advisory committee members to determine what other necessary equipment would benefit our program.

The Beloit School District is passionate about Career and Technical Education. We believe it is time to take our programs and our students to the next level. This is what being "Beloit Proud" is all about!

For more information please contact:
Ryan Rewey
Career and Technical Education Director
School District of Beloit
rrewey@sdb.k12.wi.us
1.608.361.3206

beloitschools.org/desk/ryan-rewey-cte

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Franklin High School Automotive Continued from Page 1

school vehicles. Once all of those classes are completed my students have an opportunity to do an automotive internship for half of the school day where they will actually go out into the industry and work. My students also have the option to take classes at a local technical college in the automotive area their senior year. Another class I teach is called Consumer Auto & Home Maintenance, and this is meant for students who have not taken automotive or construction classes. It goes over how to buy homes and vehicles, as well as basic repairs for both.

I obtained my mechanical background at a young age from my father who has been a diesel technician for 35 years. I have been able to see how much the automotive industry has changed in recent history though talking with my father. The use of computers in vehicles has greatly affected the industry and he has had to constantly to push himself so stay current with his information. Vehicles need to keep evolving to keep up with fuel economy standards, EPA standards, and standards from the customer. The use of computers and electronics has improved the economy of the vehicle, however, it has made them more difficult to work on. There is less space under the hood, and some things that you may think are major issues on a vehicle may just be a simple wiring problem. I currently have 3 OTC Genesis Scan Tools that we use in the classes to pinpoint problems.

To say that I am excited for the future of this program is an understatement. One of my goals is to give my students more real world, hands on experience for my advanced classes. This is being done through the purchase, and donation of vehicles for my program. With these vehicles the students are able to learn problem solving skills, proper diagnosis of issues, working in a team, and quality repair work. My students and I are also currently building an engine test stand so when my advanced class is done rebuilding an engine they will actually be able to see and hear it run.

With the support of Franklin Public Schools, I have been working over the past few months to get new lifts installed in the shop to meet industry standards. Everything is now starting to take shape and next year we should have 3 new Rotary lifts including two, 2-post frame contact lifts, and one 4-post alignment rack. Future plans are to become certified by a national auto organization but it will be a long process to get there.

In the mean time I will be preparing my students for their futures by giving them real world experiences to work on their problem solving, diagnosis of problems, teamwork, and repair skills through my classes, and my schools Youth Apprenticeship program. If you have any questions, comments, or helpful hints, please contact me at (414)817-5510 or email me at alexander.bondar@franklin.k12.wi.us

www.franklin.k12.wi.us

Grafton High School Builds Auto Tech Leaders

With a population of around only 12,000 people, Grafton sits smack dab in the middle of Wisconsin's 2nd smallest county. What takes place in the automotive program at the high school is nothing short of astonishing. Grafton High School has the record for the most top finishes in national automotive competitions. In the last 25 years, Grafton's "Auto Hawks" have been to 35 national automotive competitions, posting 24 national top ten finishes, 5 of those being national championships!

Carl Hader has been the Auto Shop Teacher there for 35 years and can say with certainty that it's been no easy task to establish or to maintain national-caliber program integrity, but it has been great for our students, our graduates, our community and our school district. Through open enrollment, we attract students from all of the high schools in our county to Grafton. Career training is first and foremost in their minds when they enter here and they always get more than they expected.

Just last May Grafton High School passed a critical inspection for NATEF accreditation of the program. Few people know that there is a five year improvement cycle focused on curriculum content, hours of instruction, instructor credentials, and physical facility if you are going to remain NATEF certified. Our school has been there every step of the way, committed to maintaining that benchmark. We are now the most-credentialed high school automotive program in Wisconsin, at what's known as the NATEF Automotive Service Technology or AST level.

People Always Ask . . .

People always ask: "What is the secret to your success"?

There are many formulas and paradigms for success and not one that doesn't require tenacity in leadership. Should you coach competitors like you teach students or teach students like you coach competitors?

After state or national-level success with one or two students you begin to ask:

"Why isn't the whole class this successful?"

"What's keeping every student that I teach from reaching this level?"

If I could narrow it down to ten bullet points it might look like this.

- Place importance on achieving standards and building the skill set of every student.
- Prove to students the importance of integrating science, technology, engineering and math with the specific automotive standards, this approach creates an enhanced course content.
- Design hands-on activities to give students as many chances to succeed as possible.
- Use cognitive as well as hands-on assessments.
- Illustrate every concept that is taught and make those illustrations readily available to students.
- Begin every course with the end in mind using clear course goals and a clear explanation of how to get to a level of excellence.
- Steer students back on track if they drift in their perseverance during a semester.
- Finish strong with comprehensive assessments – final exams for everyone that prove-out the depth of their knowledge and their skills.
- Since one size does not fit all, at regular intervals along the way, consciously reassess and make necessary changes to ensure that content is compatible with student abilities.
- Plan early, adjust often, debrief after every semester, maybe after every unit, with an ultimate goal of continuous improvement.

Bottom Line: Treat every hour of class as if it is the most important hour of the day for the student.

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Evolution of the Spartan Power Center

Jim Sainsbury,
Automotive Instructor,
Madison Memorial High School

Most car people know that the automobile is constantly undergoing change, evolving with technological improvements. I don't go back as far as the innovation of the electric starting motor, but I do remember automotive technicians (mechanics back in those days) being upset that drum brakes were being phased out of the front wheels of the newer cars. How about the elimination of breaker points and the locking out of idle mixture adjustment screws in the mid '70s, remember those evolutions? Automotive Education, of course, has tried to keep up with these changes, and the Madison Metropolitan School District has tried to keep pace.

A big starting point for Madison Memorial was the addition of an Applied Technology Building in the early 70s, which created a 32x53 automotive lab, which I call the Spartan Power Center. Later an even larger automotive lab was added to Madison La Follette High School. In those days, each instructor in Madison taught a curriculum that each saw fit. Some common units of study were taught, but each school did their own thing. All four high schools each offered courses in automotive studies (and still do), but East High and West High had become land locked, so their facilities were somewhat limited.

Another evolution occurred in the mid '90s when Wisconsin started developing youth apprenticeship programs. Dane County School to Career Consortium was developed and led by Diane Kraus. An Automotive Youth Apprenticeship was created through a group effort. Through different national certifications it brought the standards of what should be taught in an automotive program to the Dane

The next step in the evolution is MMSD moving into the Youth Apprenticeship Program on its own, being run by former Automotive Instructor and now MMSD Career and Technical Education Director, Miles Tokiem. Memorial has recertified, and with Instructor Julia Sherwood, La Follette is in the process of becoming certified through a national automotive organization. This will give MMSD Automotive students an East side and a West side location and will take their related Automotive Youth Apprenticeship courses in one of these two schools.

A big factor in this evolutionary process has been the training of instructors through a state automobile association. Other workshops and seminars throughout the year have also helped keep us up to date with the changing technology of the automobile.

Our courses are lab based with only a small amount of "sit and get" lecture instruction. Each

course still has units of study, but each unit has a set of lab activities that relate to that unit. Each pair of students rotate through this set of activities. Some of these activities involve on-line learning stations. We utilize an online textbook with worksheets, matching practice and e-flash cards. Students access this information from a computer located in each work area. These can be accomplished on shop cars, student cars, and when appropriate, staff "customer" cars.

We are fortunate enough space and tools to have seven work bays, plus other work stations. We have some classes with 24 students, so we generally have 12 groups rotating through 12 stations.

Through the support of the school district, dedication of the educators, great program opportunities and others the Automotive Program at the Spartan Power Center is creating the opportunity for the students to be prepared for today's automotive industry!

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Oshkosh School District is Busy Building a Strong Apprenticeship Program

Automotive Instructor Mark Boushele and one of his students

After years of lagging behind other districts, the Youth Apprenticeship program in Oshkosh is getting a push from the school district and chamber of commerce to offer high school students work experience in a variety of careers.

The Oshkosh Area School District hasn't historically had a strong apprenticeship program, because the curriculum wasn't developed enough to meet their requirements or there weren't employers to sponsor them.

Still, businesses in Oshkosh have consistently been involved in employing students through cooperative education programs, or co-ops,

Tania Kilpatrick, CESA 6 career and technical education coordinator, said YA is an important opportunity for students to test drive a career.

"When you're looking at a workforce, economics, building the pipeline of future employees," she said. "Any opportunity that you can give kids options for education I think is important."

Two apprenticeships were recently secured with Bergstrom Automotive.

Hands-on learning

Marc Stanga, a senior at Oshkosh West, is an apprentice at a local dealership in Oshkosh. He works for a few hours each day after school and on Saturdays, where he's learning alongside a mentor to become a GM-certified auto technician.

So far the 17-year-old has learned how to do oil and headlight changes, check fluids and more.

"It's teaching me the basics of being an auto mechanic," Stanga said, adding the mentor has been a key part to what he's learning.

"My whole life I've wanted to be an auto mechanic," he said. He thinks the youth apprenticeship will be a big help to getting a job in the future and hopes to receive a scholarship from the program as well.

Stanga said he's loving his apprenticeship because it's really hands on.

"It's like a paid internship," he said. "You really can see if you really like to do what you were planning on doing."

Stanga is also working on live cars in a lab at West for the curriculum part of his apprenticeship.

Apprenticeships have benefits for both students and employers.

Students gain a valuable, real-world connections between the curriculum and work. There's no bad internship experience because of the skills one learns during it, Mosher and Patti Andresen-Shew, Oshkosh Chamber of Commerce education and workforce coordinator, said.

A long-term investment

The State Department of Workforce Development said 85 percent of YA students are offered jobs at the end of apprenticeships, which can be more effective than finding workers through recruiters or advertising. Employers have said it also inspires current employees to be even better workers.

"We like to hire locally and have had great success hiring people early in their work life, who can then learn and become a part of our culture and grow with our company over the course of their career," Tim Bergstrom, President and COO of Bergstrom Automotive, said in a statement.

"The Chamber and our local school system have come together to provide us with a unique opportunity to find just this type of candidate to become a potential long-term team member," Bergstrom said.

www.oshkosh.k12.wi.us

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Shawano Community High School — Technology Education Department

Jeremy Hodkiewicz, Automotive
Joshua Ericson, Graphics
Jason Eggert, Metal Fab
Greg Brown, Bldg Trades

It has been a very exciting year at Shawano Community High School. This summer the technology and agriculture education departments received an addition to its facilities. Through a strong partnership with our school board, administration, and local business leaders we were able to add an additional 9500 square feet of space to be able to provide more opportunities for our students at Shawano High School.

At a time when spending tax payer dollars is not a very popular thing to do, it was a breath of fresh air to work with a school board that was willing to invest in our students. Through this support our students will continue to grow and gain valuable skills that can be used in their future careers and everyday life.

The addition to the building has allowed the automotive program to grow. We now have the space to have a rebuild area set up at all times for the freshman level small gas engine classes and for engine projects for the advanced automotive students. No longer are we scrambling to find storage space for disassembled projects and we always have the space to pull in at least five cars.

Some very important donations have been made to the auto program in order to help us grow and provide students with more opportunities. Over the past few years we have received through the generous donations of over 40 small engines from major companies. A motor cycle company donated 15 engines and transmissions, and another company a diesel engine. These donations are a very important part to building and maintaining a strong automotive program.

We are in the process of becoming Maintenance and Light Repair (MLR) national automotive certified. This fits our program very well and there will not need to be any significant changes to the program. Most of the pieces are in place and the goal is to have a national automotive organization come and complete the evaluation early next school year. We currently have an agreement with a local college for students to earn two credits for Automotive Service Fundamentals. Becoming certified will open up the door for additional transcription agreements with them. These are all very positive benefits for our students.

All these events keep our students very busy all year long and Shawano High is committed to continue to provide its students with as many career exploration possibilities as possible and give them the tools to be successful after they graduate. We have had some of our graduates become very successful and we have no doubt that the improved facilities will help us to encourage more of our graduates follow a successful career path.

schs.shawanoschools.com

Black Ice = Danger

Black ice is almost invisible to the naked eye and is frequently mistaken for a wet or newly paved road. Black ice can form even when it's not raining or snowing. Melting snow that runs across the road or condensation from overnight dew can freeze forming a thin layer of ice that creates one of the slickest road conditions known to man.

It is because black ice can form so quickly and is so camouflaged on the road that Occupational Safety and Health Administration officials call it one of the deadliest of all winter driving hazards.

Here's what to watch out for:

- Pavement that looks dark, wet or like new asphalt.
- Low-lying areas that may have standing water or run off from nearby melting snow banks or puddles.
- Bridges and Underpasses.
- Any road areas which are shaded from the sun.
- Any time the temperature is below 40 degrees F.
- Vehicles that have slid off the road under any of the above conditions.

Here are some braking tips should you find yourself on black ice:

1) Braking without anti-lock brakes: Use the heel-and-toe method. Keep your heel on the floor and use your toes to press the brake pedal firmly just short of locking up the wheels. If the wheels lock, release the pressure on the pedal, and press again in the same way. Repeat this until you come to a full stop.

2) Braking with anti-lock brakes: Apply the brakes. Do not remove your foot from the brake pedal or pump the brakes. The ABS should keep the brakes from locking while allowing you to steer as you continue to slow the vehicle down.

In both cases, if your vehicle begins to skid, remember to steer in the direction of the skid. You may also find it advantageous to put your transmission in neutral while trying to stop on black ice.

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Don't Just Be a Passenger

Kevin W. McMullen, P.E.
President, Wisconsin Concrete Pavement Association

Don't just be a passenger in that car, take a good look at the road in front of you. There are a lot of things built into that road that make your drive safer, smoother and interrupted less by construction. Let's look at a few examples of what the highway engineers and construction companies are doing for you. This article is assuming that you are driving on one of the newly reconstructed sections of our interstate highways in Wisconsin or perhaps State Trunk Highway 29 across the state or the new United States Highway 10 from Appleton to Marshfield.

First, take a good look at the surface that the tires are riding on. You will notice grooves in it. This is called longitudinal tining. Its purpose is to prevent hydroplaning of tires in wet weather. Hydroplaning occurs during a storm when there is a thin film of water on the surface and when the vehicle starts to brake the tire can actually lift off the roadway surface due to the water. This results in the vehicle losing control and an accident. The longitudinal tining is a groove in the pavement that allows the water to escape under the tire before it hydroplanes. The Wisconsin Department of Transportation is a pioneer in the design of this surface texture. Together with Marquette University they researched how to tine the surface and at the same time keep tire noise down to a minimum. We got national attention in the 1990s because it eliminated the loud tire "whine" that had been constructed with the tining in the transverse direction for decades.

Second, you will notice that there are saw cut joints across the pavement every 15 feet. They are hard to see when the car is going 55 or 65 miles per hour, but take note to look for them when you are at a lower speed. Our Wisconsin climate is such that no matter what we do with the range of temperatures from the high in the summer to the low in the winter, the pavement will crack due to temperature induced stresses. Then, you have to add the heavy trucks that use our roads and it compounds the situation. These saw cuts are the highway engineer's way of telling the pavement where to crack. We build in a weak spot to force the crack. Then, beneath the surface there is a series of 1.5 inch steel bars at each saw cut that do not allow differential settlement of the individual concrete slabs. This assures a long lasting smooth riding pavement.

Third, take a look at the outside shoulder. You will notice that in all cases that the pavement extends 2-3 feet past the white edge pavement marking line. This is another great safety feature. Our pavements deflect downward every time a truck goes over them. If there is also water in the pavement this will pump the fine particles of the road base out of it and the edge will drop in time.

A tire dropping off the edge or coming back up a vertical edge can fool a driver and they can lose control of the vehicle. Moving the edge of the pavement out two feet minimizes the number of vehicles that may hit the edge.

Fourth, you should take a closer look at the paint marking on the pavement. The yellow line on the left, the dashed white lines in the center and the white lines on the right are recessed 1/8 to 3/16ths of an inch. Recessing extends the life of the pavement markings. The snow plows can no longer scrape them off the surface. It also keeps the reflectivity of the glass beads in these paints and thermoplastics as bright as possible for a longer period of time. Every driver loves to know where the road is as far ahead as possible.

Finally, you will notice that the amount of rumble strips has increased dramatically on all types of roadways. Rumble strips are 4-inch grooves milled into the pavement to give a driver audible and tactile warning that they are leaving the pavement or their assigned lane. All divided roadways will have rumble strips on the outside of the road to alert the driver they are leaving the roadway. New in Wisconsin in 2012 are several segments of two lane undivided roadways that the rumble strip was installed in the center of the roadway. This warns the driver that they are crossing the center line and prevents a head on collision.

I can go on forever about all of the work we do into building safety, smoothness and long life into our roadways in Wisconsin. The highway industry wants you to know we are doing everything we can to assure that you and your family will be traveling as safe as possible.

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The Fastest – Trains and Aircraft

TRAINS

Just how fast would the Hyperloop transportation system envisioned by entrepreneur Elon Musk have to be? Try more than twice as fast as the fastest commercial train in the world.

Musk believes the Hyperloop, with giant vacuum-like tubes and an air-bearing suspension system, could ferry riders from Los Angeles to San Francisco in 35 minutes.

That's a roughly 350-mile trip, meaning the futuristic capsules would be zipping along at almost 700 mph -- faster than most commercial airliners and slightly less than the speed of sound.

He envisions the tube itself being built above ground, roughly following California's Interstate 5 highway. Sealed capsules carrying 28 passengers each would leave from stations in Los Angeles and San Francisco up to every 30 seconds during peak hours.

While the Hyperloop exists only in theory at this point, there are some incredibly fast trains in operation. Here are five of the speediest forms of rail transportation:

Shanghai Maglev Train, China ▶

The Shanghai Maglev ("magnetic levitation") train connects Shanghai Pudong International Airport with the Shanghai metro system.

It has been recorded at a top speed of 311 mph and its top operating speed is 268 mph, making it the world's fastest commercial train.

It cost $1.2 billion to build and took on its first passengers in 2003.

China Railways CRH380A, China

Running on a more traditional track, the CRH380A has topped out at 302 mph, maxes out commercially at 236 mph and routinely runs at 217 mph.

There are currently four models of the train serving different railroad lines in China.

Transrapid TR-09, Germany

Another "mag-lev" train, this one ran on a monorail at a top speed of 279 mph. It was the world's fastest train at the time, running from the Munich airport, but was eventually canceled by the German government in 2008 due to escalating costs.

Shinkansen Train, Japan

Japan's famed bullet train, the Shinkansen, is nicknamed "The Duck-Billed Platypus" because of the duck-like shape of its nose. Japan's high-speed rail network includes more than 1,400 miles of track, where the bullet trains top out at about 275 mph.

TGV Réseau, France

In service since 1992, France's high-speed train generally runs at about 199 mph, with a maximum speed of 236 mph.

From CNN

Read more at www.cnn.com/2013/08/12/tech/innovation/hyperloop-fastest-trains/index.html

AIRCRAFT

The fastest aircraft have been developed by designers primarily through the use of more powerful engines and the reduction of drag through aerodynamic engineering. When aircraft engineers discovered the "area rule", it was possible to develop the fastest aircraft. "Area rule" is the contouring of an aircraft fuselage to have the lowest possible transonic wave drag. It results in a narrowing of the fuselage where it joins with the wings. Engine technology has continued to improve for the fastest aircraft. The power of jet engines was boosted with the advent of afterburners. Originally the fastest aircraft primarily used aluminum and magnesium in their construction. Today's fastest aircraft incorporate magnesium alloys and specially formulated steel along with carbon and graphite composite materials. The fastest aircraft need a better way to control them than the mechanical linkages of older aircraft. Today's fastest aircraft use computers and fly-by-wire controls. Electronics, rather than linkages, control the fastest aircraft.

Here is a sampling of some of the fastest recorded aircraft:

NASA Space Transportation System Vehicle 17,500 mph

The fastest airplane in the world. The STS, more commonly known as the Space Shuttle, achieved its maximum speed upon leaving earth orbit. Its final landing was on 7/18/2011.

X43A Scramjet

7,500 mph — It is the world's fastest air breathing engine vehicle and is pilotless. The record was set on 11/16/2004 when the X-43A was launched by a booster rocket at 40,000 feet from a B-52. At an altitude of 110,000 feet it reached top speed for about 11 seconds, officially Mach 10.

Boeing X-51

3,400 mph or Mach 5.1 (not a record) — On May 1, 2013 the U.S.A.F. announced that they had successfully launched a Boeing X-51 from under the wing of a B-52 when it reached an altitude of about 50,000 feet. The Boeing X-51 was attached to a rocket that accelerated to about Mach 4.5. Then, under its own power, the 25 foot long pilotless vehicle continuted to accelerate to Mach 5.1 over 230 miles for about 5 minutes before ending up in the ocean. The purpose of such a test is to determine the possibility of using so called "waverider" type vehicles that mix air from the atmosphere with on board jet fuel, as weapons for the military. The advantage of such a vehicle is that it should be able to travel faster and be lighter than rocket powered vehicles. At this time, controlling such vehicles so that they will be practical is in the development stage.

Lockheed Blackbird (Pictured Above)

The fastest jet — 2,193 mph on 7/28/76 — The SR-71 first flew in December of 1964 and was deployed in March of 1968. It was retired in 1998. In 1976 it set the current world speed record for a jet aircraft.

Ye-155

The fastest jet plane — fighter aircraft — 2,170 mph, unofficial speed record, observed on 11/12/71. The Ye-155 prototype for the MiG-25 set numerous records. The MiG-25 was produced for both interception and recon. Its recommended top speed is limited to keep its engines from wearing out prematurely, but its top speed has been observed in emergency situations.

See more at Aviation Trivia — hwww.aviationtrivia.info/Aviation-Trivia.php

John Long Middle School STEM Challenge Propels Learning

The "market for jobs is changing." We need to "build a different kind of graduate." Headlines such as these are in the business sections of newspapers weekly. They all have one thread in common — 21st century skills. We hear all about them in media, in our schools, in industry. What does it all mean? Collaboration. Cooperation. Design and Purpose. Problem Solving. These are just some of the concepts learned through the 1st Annual STEM Challenge. This year, the concept of learning was the focal point of our building wide fund raiser.

In an effort to bring a new team-based learning opportunity to ALL at John Long Middle School, we held our FIRST ever design challenge. As part of our building-wide learning about STEM (Science-Tech-Engineering-Math), design thinking, and problem solving, we presented a challenge for individuals and teams (up to 3 members). The students had to design and build a boat and race it against others in their class and school! This race was unique in that each team had to solicit sponsorships for the race and for their team. We were able to raise $4000 for our Parent Group to grant to classrooms for innovation and creative teaching and learning.

The entire event was sponsored by larger business contributions from Grafton businesses:

Presenting Sponsor JLMS STEM Boat Challenge:

- Port Washington State Bank
- Grafton Education Foundation

Boat Race Track Sponsor:

- Waukesha Metals

JLMS STEM Support Supper:

- Kohler Credit Union

JLMS STEM Challenge Boat Supplier:

- LaBudde Group and RAM Tool

STEM Challenge Signage Provider:

- Digital Edge

The students had a blast during design week in December. They used prototyping, computer aided design (CAD) and other applications with their netbooks. After completing their designs they had to work on their engines, wiring, and placement. Over winter break the completed boats were taken home to put on the finishing touches and make them look amazing. We followed up the break with test runs in the track that helped us to make adjustments, trouble-shoot, and enhance the design for an improved craft. 8th grade student Gretchen Geiser was wondering if "an alumni race next year so that she can come back and compete again!"

This event was a wonderful showcase of learning for both students and staff. Many staff found themselves learning along with students in a flexible, real time learning environment. Students and staff had fun, worked together and capped off their learning about engineering, design, and science with a race on January 17 in the JLMS Gymnasium. The potential for this event and for flexible teaching and learning are fast becoming part of the learning experience at John Long Middle School. We hope you will attend this wonderful event next year!

Winners of the JLMS STEM Challenge 2014:

6th Grade Race: *DaPhish* — Connor Guysky, Nik Biliskov, Isaiah Mielke

7th Grade Race: *Double H Boat* — Kaia Hansen, Cambryn Klaus

8th Grade Race: *Tropical Beast* — Hannah Wendorf, Olivia Forshee

Best Staff Design: *The Bat Girls* — 6th Grade Team

Ugliest Boat Design: *SS Versace* — Matthew Fischer, Matthew Likins, Connor Ramsey

Best Overall Design: *Sparkling Tye-Dye* — Jenna Grandinetti, Gretchen Geiser, Katie Lamb

Most Attractive Design: *SS Winter* — Tiana Cannizarro, Grace DeStefano

Slowest Boat: *The Sweatshirts* — Logan Hahm, Audrey Schaut, Carley Olsen

jlms.grafton.k12.wi.us

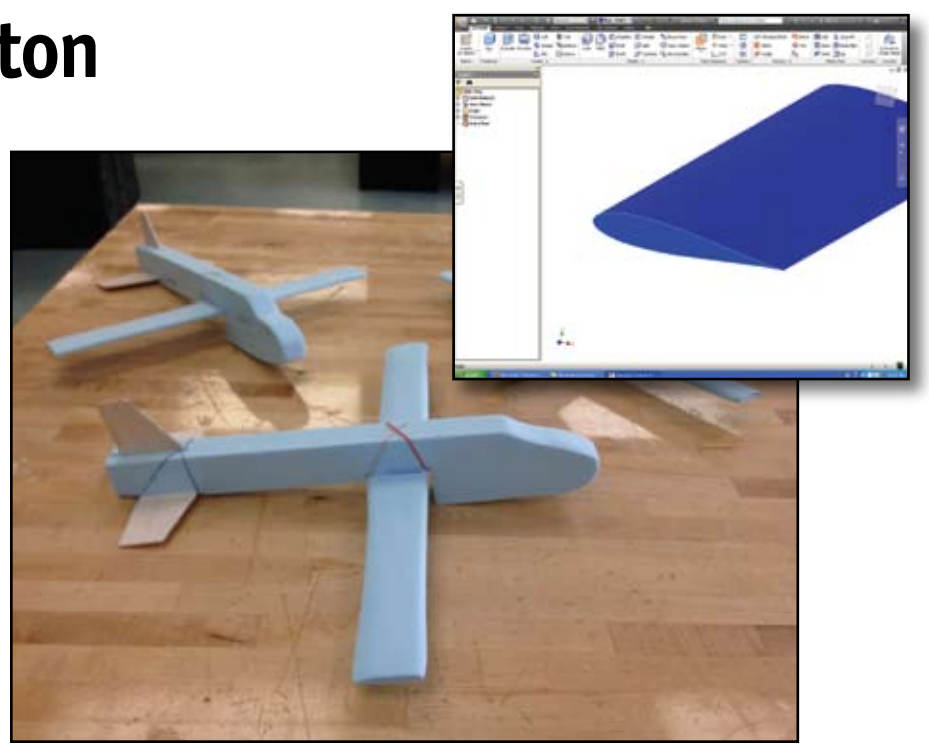
Flight Design at Port Washington

Alec Belling, Port Washington School District

The students do something very challenging and cool when they get into their flight and space unit. They use a website designed by NASA that allows students to change an airfoil (wing) and see how lift is generated. Students can change the camber, thickness, and angle of attack and see how the lift generated changes in their designs. They again, get to see the math and science behind their design. After they finish their NASA simulations, they can export the coordinates of their airfoil designs and import them into Autodesk Inventor, a 3D modeling program, to create a 3D model of their airfoil.

Using foam, the students trace their airfoil designs on to the wings of their gliders. After a couple of days of work, they have a fully assembled foam glider. The students all have gliders that perform well because their wings are shaped, based on the airfoil designs they have already tested in the simulation. Students are starting to see that simulating and testing their designs prior to construction is an effective step in the engineering and design process. In the end, they have a model that is proven to work based on the simulation and the students can truly see the math and science working behind their designs. "In the past, the students always liked completing projects like this however; a student's focus was always on making the objects and not really putting much time or effort into the design itself. Now, with the simulations, the designing is just as much fun as the building and testing phases, the students are enjoying the entire engineering and design process, instead of just one part," says Alec Belling.

www.pwssd.k12.wi.us



5 Ways to Ace a Job Interview

You've probably heard your parents talk about the importance of making a good first impression on a job interview (their "dress for success" talk may sound like a lecture, but in this case parents are right).

Here are 5 strategies to help you ace your job interview:

Dress the part.

Even if the job you're applying for involves wearing a uniform or working behind the scenes, the way you dress for an interview tells your potential employer that you take the job seriously. If you're a guy, wear a nice pair of pants and a shirt (a tie usually isn't necessary for a summer job, although it doesn't hurt to wear one!). Sneakers, sandals, shorts, t-shirts, sweatshirts, and jeans don't make good interview attire. The same goes for girls — wear something simple and avoid short skirts or skimpy tops.

Appear confident.

Look your potential employer in the eye, shake his or her hand, and remember another parental mantra: good manners. Of course, appearing confident is easiest when you know what you're talking about, and that brings us to the next point.

Be prepared.

Find out what you can about the position or company in advance and show your knowledge during the interview. Researching the company shows the interviewer that you're smart and eager to learn. Doing your research also lets you learn what inspires you about the company so you can share your enthusiasm with the interviewer.

If you can, find out more about the position itself. Looking on the company's website or talking to someone who has worked there allows you to think in advance about which skills you have that fit well with the job.

Answer (and ask!) questions.

You'll no doubt be asked typical interview questions, such as why you're interested in the position, what types of skills you offer, and the hours you're available to work. Prepare your answers before the interview.

Don't be afraid to ask questions. Questions don't make you look stupid. Asking good questions shows the interviewer you're thoughtful and that you're not afraid to interact with other people — a particularly good interview strategy if the position involves dealing with people, such as sales. If you can, practice being interviewed by an adult in business. When the real time comes, you'll be more prepared and comfortable.

Follow up.

Send the interviewer a brief email or letter thanking him or her for spending time with you. Say how interested you are in the position. This is a particularly good strategy if you're

interviewing for an internship or office position. Your future employer will be impressed by your determination.

Parents or older siblings can offer good advice about job hunting and interviewing. So don't hesitate to ask for help on everything from putting together your résumé to choosing an interview outfit. Chances are, you'll be interviewing with and working for people their age anyway so a little insight can't hurt.

A job or internship should be about learning as well as making money. Try to find something that can help guide you toward your long-term goals. For example, if you want to study veterinary science in college, finding a job in a vet's office or animal shelter, or even a pet store, may be better choices for you than working in a restaurant.

As jobs become harder to find, you may have to take whatever's available — and that's OK. Learning to readjust goals and priorities is another important life skill. Just try to find some aspect of the work that you love and can learn from.

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Retooling for the Future

Whether you've been out of the job market for two months or twenty years, going back to work can be scary. Giving yourself time and making the proper preparations are the keys to successfully navigating your way back. Take the time to figure out what you really want, update your skills and be willing to wait for the position that's right for you.

Before you start job-hunting

Take Stock of You — Don't just dive back in by answering ads and sending out résumés. People who have been out of the workforce have a unique opportunity to reflect on who they are and what they want and need out of a job. Ask yourself these key questions:

- What do I need in a job? This is critical to your return. Is it money? Flexible hours? The need to do something interesting or fulfilling? Be honest, so you don't settle for a job that doesn't address the reasons why you returned.
- What do I want in a job? You may be going back to work because you need the money, but what is it that will make you look forward to going to work every morning? A job that challenges you mentally? The chance to meet and work with the general public? A job outdoors? The chance to travel? Don't be afraid to let yourself dream a little. Explore all of the possibilities.

Take a Skills Inventory — What skills do you possess? Honestly assess what you have to offer and write everything down.

- Evaluate the skills you've already used in the workplace. Are they applicable to the occupation you want to obtain now? Do they need to be updated?
- Translate non-paid experience into paid skills. Have you done volunteer work? Helped a spouse launch a business? Been active in other pursuits?
- Research the marketplace and determine what skills you do need. Now would be a good time to take some classes at a local community college and update your skill level.

Develop a Plan of Action — Once you know what kind of job you want and have brought your skills back up to speed, you're ready to put together a job-hunting strategy. Among the steps you should include in your plan:

- Write Your Résumé — A functional résumé works best for those re-entering the workforce, since it de-emphasizes chronology and focuses attention on skills, abilities and accomplishments. Include any skills you acquired during your time away from the job market.
- Network — Seven out of ten people find their jobs this way, and many of those reentering the workforce find it to be especially effective. Talk to former colleagues, friends and relatives about your goals and the type of job you're interested in.
- Be Assertive — Even if a job opening seems to be out of reach, don't assume that you're automatically locked out. You might be surprised at what a few years of maturity adds to your marketability.

References

Employers will rely heavily on your references, so make certain that you have excellent sources.

- Call your references before naming them. Get back in touch with former co-workers and ask them if they mind being used as a reference now.
- Get in touch with old bosses. Your prospective employer is likely to call them for a reference, so give a quick call first to remind them of your contributions. Even if you were fired, a phone call from you beforehand can't hurt the situation and it might help.

What would you like to do in Transportation?

- Aircraft Pilot
- Airport Operations Crew Member
- Air Traffic Controllers
- Bus Driver
- Captain
- Chauffeur
- Deckhand
- Deck Officer
- Dispatcher
- Distribution Center Manager
- Distribution Director
- Distribution Manager
- Driver/Sales Representative
- Driver/Sales Workers
- Engineer
- Equipment Director
- Estimating Manager
- Expeditor
- Fleet Manager
- Flight Instructor
- Flight Engineer
- Fork Lift Operator
- Helicopter Pilot
- Import/Export Clerk
- Import/Export Manager
- Import/Export Supervisor
- Industrial Tractor Operator
- Inventory Control Analyst
- Inventory Control Clerk
- Inventory Control Manager
- Inventory Control Supervisor
- Locomotive Engineer
- Logistics Analyst
- Logistics Coordinator Jobs
- Logistics Manager
- Logistics Specialist
- Marine Cargo Inspector
- Marine Oiler
- Materials Control Manager
- Materials Handler
- Materials Handling Supervisor
- Materials Planner
- Merchant Mariners
- Motorboat Operator
- Motor Racer
- Operations Manager
- Packaging Engineer
- Pilot
- Production Scheduler
- Public Transportation Inspector
- Rail Car Repairer
- Railroad Brake Operator
- Railroad Conductor
- Railroad Yard Worker
- Rail Yard Engineer
- Refuse and Recyclable Material Collectors
- Sailor
- Scheduler
- Shipping and Receiving Clerk
- Shipping and Receiving Supervisor
- Shuttle Car Operator
- Streetcar Operator
- Subway Operator
- Taxi Driver
- Top Distribution Executive
- Top Inventory Control Executive
- Traffic/Rate Analyst
- Traffic Clerk
- Traffic Director
- Traffic Manager
- Traffic Supervisor
- Train Crew Member
- Transportation Director
- Transportation Manager
- Transportation Planner
- Transportation Supervisor
- Travel Coordinator
- Travel Manager
- Truck Driver Supervisor
- Van Driver
- Yardmaster

Please note: This represents a broad and not conclusive list of careers within the world of transportation

Explore Transportation Careers at

www.transportationtodaywi.com

Find a Transportation Career

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Step 2: Search

- Search for Current DOT Job Announcements.

Website: dot.usajobs.gov/

- Learn More About Grade Levels Before You Search

Website: www.dot.gov/careers/search-dot-positions

Step 3: Apply

- Review your on-line application for accuracy and click Submit.

Website: www.dot.gov/careers/online-application-process

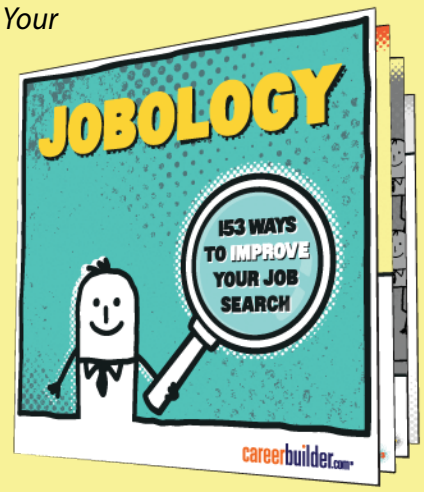
If you have further questions, please contact the DOT Jobs Help Line at: 202-366-1298, or email your applicant inquiries to: transjobs@dot.gov.

JOBOLOGY:

YOUR STEP-BY-STEP GUIDE TO FINDING A JOB

Finding a new job can be many things: exciting, frustrating, eye-opening. One thing it should not be is mysterious.

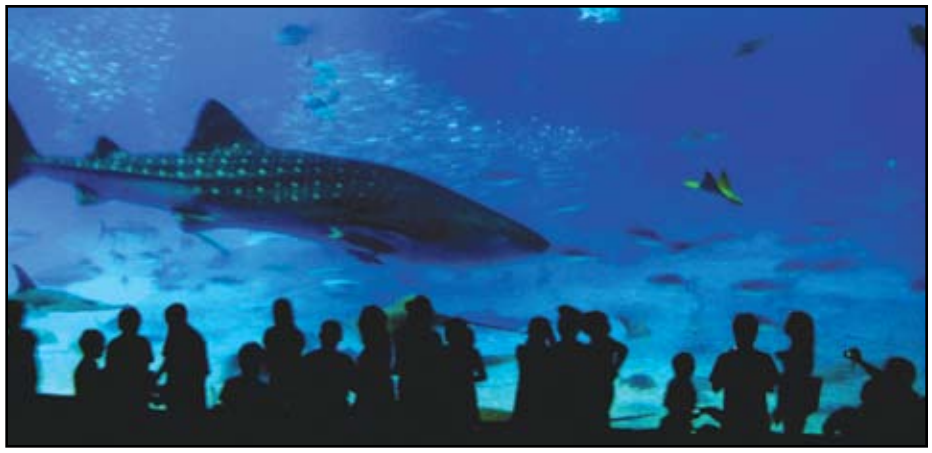
We decided to create a guide to help you along. In *Jobology: 153 Ways to Improve Your Job Search*, we take you from the first moments of your job hunt all the way to the salary negotiations. Whether you wonder how to begin your search, which résumé format to use, or when to send a thank-you note, we have the answer.



Download *Jobology* for free and take the question mark out of your job search.

www.careerbuildercommunications.com

A Whale Shark's Tale



Shippers are relentlessly challenged with minimizing and managing exceptions to avoid costly, untimely delays. But for some shippers, exceptions—even the living, breathing, largest-fish-in-the-world kind—are the norm.

When a major aquarium in Georgia and an international transport company teamed up to move a pair of female whale sharks from a sea pen off the coast of Taipei, Taiwan, to the Atlanta facility in June 2006, they were challenged with executing a transportation itinerary few had undertaken before—from the blue ocean to the blue skies, to the newest and largest aquarium in the world.

The sharks, Alice and Trixie, made it safely to their new home thanks largely to Tim Binder, director of husbandry for the aquarium. Binder is responsible for all animal care operations, as well as coordinating and managing the safe transportation of marine life to the aquarium.

An animal's species and size often dictate the transportation mode the aquarium uses, notes Binder. "We set protocol and standards for the way animals are transported. We have a team with a history and expertise in moving animals," he explains.

To transport smaller animals, the aquarium uses commercial freight forwarders and traditional cargo routes. But some moves require additional dedicated resources and special expertise.

For Alice and Trixie's trip, the aquarium relied on the transport company to meet three primary objectives, says Hatcher: logistics planning; configuring the containers and securing the aircraft needed to transport the whale sharks; and customs clearance.

The transport required two tanks, each weighing 25 tons, including the water and the fish. The interior of the aircraft was also retrofitted to secure custom containers with marine life support systems and an onboard lab that enabled aquarium veterinarians to proactively monitor the status of the whale sharks and check water vitals during transit. The transport also required long takeoffs and landings, and gradual turns while in air, to similarly avoid unnecessary stress on the sharks.

Upon arrival at Atlanta's Hartsfield-Jackson International Airport after 30 hours in flight, Alice and Trixie were transloaded to specially designed trailers for a police escort to the aquarium.

Even the homestretch delivery required additional planning. Binder checked the baseball schedule to make sure there wasn't a conflicting game or traffic issues to contend with while transporting the whale sharks to the aquarium.

In the end, the aquarium proved to be the venue for a honeymoon unlike any other. And in case anyone forgets the efforts and planning that facilitated this union, a replica of the special transportation containers are on display in the aquarium gallery.

Excerpt from an article by *Inbound Logistics*
Read more here: www.inboundlogistics.com/cms/article/how-do-they-ship-that/

Sharks, stingrays avoid Georgia's icy roads

The Associated Press — 1/31/2014

ATLANTA — A rolling tank of sharks and stingrays heeded warnings and fared far better than Atlanta drivers stranded by this week's ice and snow storm.

The specialized truck with life-support systems was scheduled to make a cross-country trek from the Florida Keys to a new aquarium opening next month in Concord, N.C.

Pollyanna Falk of Spark Strategic Ideas said the Sea Life aquarium had planned to introduce the animals at a media event Thursday, but that was postponed due to the ice and snow storm.

She said the delivery company heeded warnings about treacherous road conditions in Georgia Wednesday and the trip was postponed.

Falk doesn't believe the truck made it to Georgia, so it was never stuck in metro Atlanta's epic traffic jam that began Tuesday afternoon and stretched into Wednesday.

"Apparently the truck was still in Florida when he had heard about all the delays in Atlanta so he didn't want to get stuck in the icy conditions," Falk said.

Help Wanted – Airline Pilots and Aviation Mechanics

There is a shortage of qualified airline pilots here in America leading U.S. airlines to accelerate hiring and cut some services.

The shortage flows from both a long-anticipated wave of pilot retirements and recently enacted rules that require an increase in training for new pilots and more rest for existing aviators at passenger airlines.

Under congressional mandate, the Federal Aviation Administration began in August requiring most newly hired pilots to have at least 1,500 hours of prior flight experience, up from the previous minimum of 250 hours. The rule raised the costs and time necessary to train new aviators. An additional FAA rule that took effect last month gave passenger-airline pilots more rest, requiring carriers to hire about 5% more pilots to maintain current service levels.

Meanwhile, thousands of senior pilots at major airlines are hitting the mandatory retirement age of 65 years old because of heavy hiring in the 1980s and relatively thin hiring over the past decade. Those airlines are hiring pilots away from the regional carriers, which in turn are struggling to find new recruits with adequate experience.

Kit Darby, a retired pilot who consults on pilot-hiring trends, said the airline industry neared a pilot shortage in 2000 and again in 2007, but drops in demand after the 2001 terror attacks and the 2008 recession delayed the problem. Now, he said, with demand healthy and airlines expanding, the new rest and training rules "pretty much guarantee a shortage."

From the Wall Street Journal
online.wsj.com/home-page

If there's a bright side to looming pilot and aviation mechanic shortages, it's that young people with a dream to fly or fix airplanes can look to a brighter future in an exciting and challenging field. For some time now, aviation professionals have worried privately that turbulence in the aviation industry – with layoffs, furloughs, wage and benefit cuts affecting wide-swaths of the industry – was going to result in too few men and women choosing to become pilots and mechanics. Combined with a predicted global growth in aviation, the decrease in the numbers of trainees – both civilian and military – is creating what many see as a looming shortage of both pilots and mechanics.

Young people with a passion for aviation can look to that field for their careers. In addition to traditional piloting jobs, the expected growth in drones provides opportunities for a whole new batch of aviation-related jobs that people need to start training for now.

According to Forbes
www.forbes.com/sites/johngoglia/2014/01/04/2014-outlook-for-aviation-careers-brightens-with-looming-pilot-and-mechanic-shortages/

Drone Use on the Rise

A growing number of American students are eager to cash in on expected boom market for drone operators after more unmanned aircraft become legal to fly in U.S. airspace, which could happen in the next few years.

Dozens of schools offer some courses in what's known as UAS (unmanned aircraft systems), which range from drones as big as small planes to 2-foot-wide mini-helicopters.

Drones are best known for their use by the U.S. military, but other markets beckon. Amazon made a splash earlier this month by unveiling an embryonic effort that might someday deliver packages by drone, though the company acknowledged practical use is years away.

The skills needed to fly larger unmanned planes are not unlike those required to fly modern aircraft with computer-based flight controls, professors say. The toughest part of unmanned flying comes with doing it from the ground: You can't feel what's going on.

The Federal Aviation Administration projects some 7,500 commercial drones could

be aloft within five years of getting widespread access to American airspace.

An industry commissioned study last spring predicted more than 70,000 jobs would develop in the first three years after Congress loosens restrictions on U.S. skies.

From CBS News
www.cbsnews.com/

The World of Trucking

We asked a number trucking companies what they are looking for in future employees. Check out their responses!

What types of positions are most needed now and in the future with your company?

Heavy duty equipment repair people (welding, brake, axle, tires, etc). Over the road truck drivers (gone from state of Wisconsin several days, up to a week, home on weekends).

What types of education are the most commonly needed with these positions?

Welding experience, electrical concepts for lights, mechanical skills, CDL certification, H endorsement plus.

Do you offer Internships or Apprenticeships?

Not really. We have trained some mechanics and have taken many people from the truck driving schools of our technical college.

What are the most important skills you are looking for?

Can-do positive attitude, polite, ability to listen and learn.

—Susan

What types of positions are most needed now and in the future with your company?

We are in desperate need of diesel mechanics! We are always looking for safe and reliable truck drivers.

What types of education are the most commonly needed with these positions?

Diesel Mechanics can go to a 9 month program, some are just trained on the job. Drivers can go to driving school, or some have experience from the military or construction related jobs.

Do you offer Internships or Apprenticeships?

We do hire trailer mechanics with some mechanic capability, and then train them as apprentices.

What are the most important skills you are looking for?

Experience driving CDL vehicles, and mechanics with some mechanic capabilities.

What are the most important qualities you are looking for?

Potential hires who are dependable, reliable, and who take feedback well.

—Nancy

What types of positions are most needed now and in the future with your company?

Diesel Technicians and Semi drivers.

What types of education are the most commonly needed with these positions?

High School and Commercial Driver training, (Tech college or independent school) Tech college for Diesel Tech training.

Do you offer Internships or Apprenticeships?

We do not offer Internships or Apprenticeships but have worked with area Tech College to train techs.

What are the most important skills you are looking for?

Ability to analyze what is going on around them and to act rationally with the training they have received through both school and life experience. Drivers / Techs.

What are the most important qualities you are looking for?

Responsibility, Attitude.

—Don

What types of positions are most needed now and in the future with your company?

Over the road drivers and diesel mechanics.

What types of education are the most commonly needed with these positions?

Drivers need a Class A CDL License

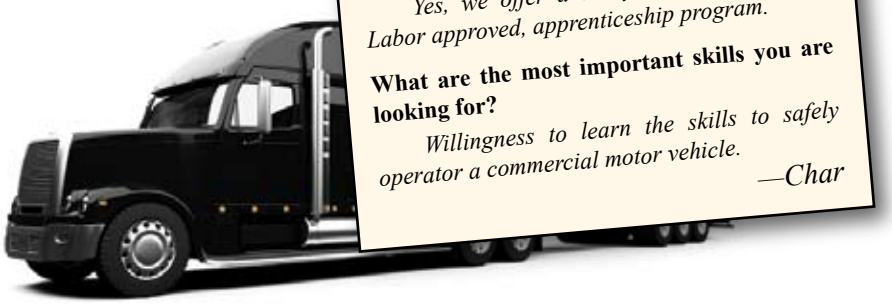
Do you offer Internships or Apprenticeships?

Yes, we offer a two-year, Department of Labor approved, apprenticeship program.

What are the most important skills you are looking for?

Willingness to learn the skills to safely operator a commercial motor vehicle.

—Char



At Marten Transport . . .

One of the cornerstone philosophies at Marten Transport, Ltd. involves providing employees with quality, up-to-date and safe equipment. We believe that our drivers deserve every advantage and we work hard to make sure they have the best possible tools to do their job. Our equipment is constantly updated and meticulously maintained. We utilize the latest temperature control technology and observe regular trade cycles.

We view safety as a priority — and our track record proves it. We've been named Grand Prize Winner for Fleet Safety by the Truckload Carriers Association twice ('02 and '04) in the past four years and placed among the top three in the contest seven of the last eight years.

The Georgia Motor Trucking Association awarded us their Grand Champion Safety Award honors for General Commodities Truckload Division in 2002 and 2004. We also earned top safety distinction from the Wisconsin Motor Carriers Association in 2004.

In addition to our Safety Department, we have a Safety Committee in place. This committee has representation from the Safety Department, Risk Management, Maintenance Department, and a person from each of the outlying Marten terminals. It is a ten member committee that elects a Chairman, Co-Chairman and Secretary yearly, with the Safety Manager as the advisor.

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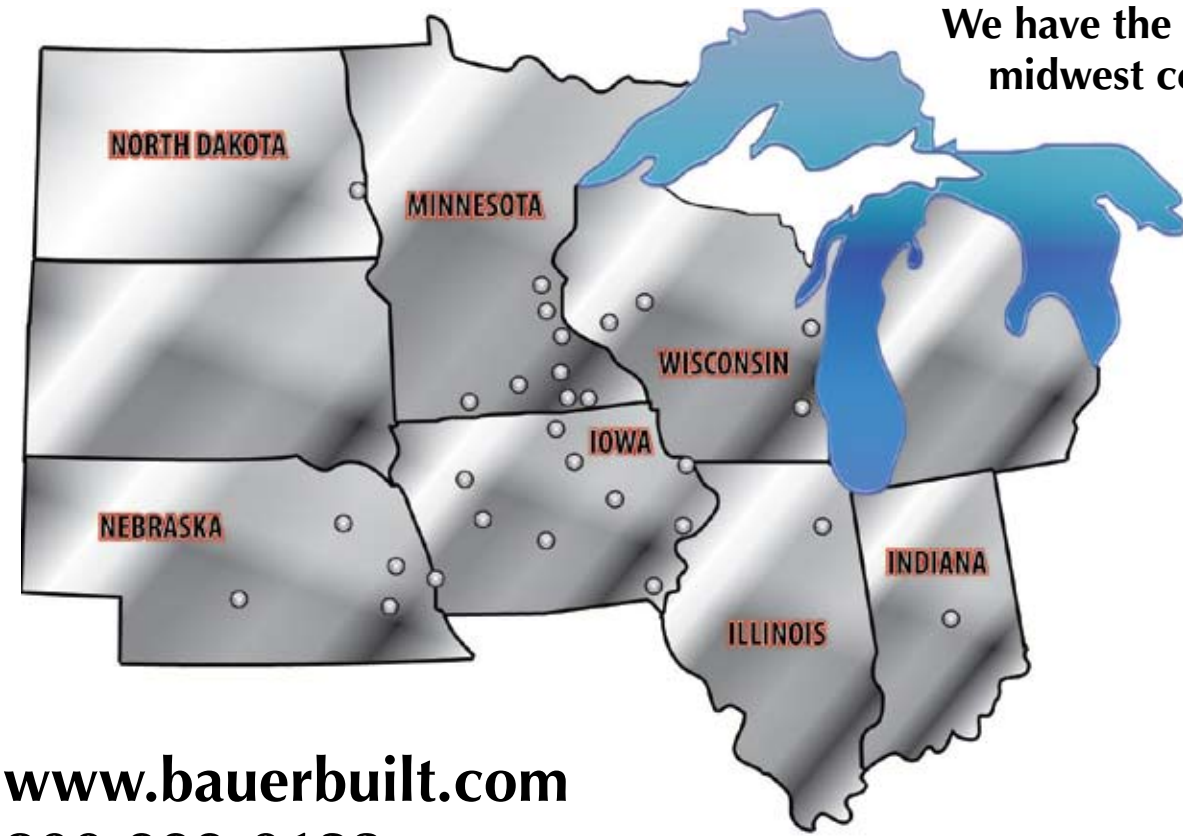

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