A well-trained workforce is critical to completing transportation construction projects throughout the United States, such as this bridge under construction in Louisiana, and to maintaining the transportation system.

Help Wanted

By Clark Martin, FHWA Center for Transportation Workforce Development

Alexandra Dudley, FHWA Center for Transportation Workforce Development

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The transportation industry is leading the effort to recruit and train workers to fill a growing number of jobs. The future of transportation depends on these endeavors.

The transportation system in the United States is a cornerstone of the country’s economic growth and prosperity. The system facilitates travel for work, school, and other everyday needs for mobility. The efficiency of the transportation system is dependent on the skills, knowledge, and abilities of the workforce that develops, delivers, and manages its many operations. However, today’s transportation workforce is facing several challenges, including difficulty in filling job openings.

The retirement of workers from the “baby boom” generation, an increase in competition from other industries, and new technologies that are driving the need for enhanced skill sets are among the primary factors driving the critical need for new skilled workers. A highly skilled workforce is necessary to address the rapidly evolving areas of automation, information technology, autonomous vehicle

Continue on page 6
As the year draws to a close, it is good to look back and reflect on what has occurred and to make plans for the future. The LTAP has been very busy this year, with many accomplishments, including:

- 129 Workshops, with:
  - 47 different Workshops offered
  - 11 new Workshops implemented
  - 2 Workshops given again after years off
  - 2,219 Students attended Workshops
- Co-Hosted the 4th Annual NH Salt Symposium, with 183 attendees
- Provided technical assistance to many Municipalities.

We also assisted the NH Public Works Association, NH Public Works Mutual Aid, and the NH State Transportation Innovation Council in their Board meetings and events.

For the future, we intend to keep holding Workshops, hosting events and providing technical assistance to those who request it. However, the LTAP is Grant-funded and our current Grant is ending at the end of this year. We have proposed a new Grant and are hopeful it will be signed by the time you read this letter.

So that you are aware, under the proposed Grant the staff positions for the LTAP are being reclassified and will undergo a hiring process. Therefore, the LTAP may be quiet for a while this winter, but the plan is to have everything up and running for the Spring Session starting in late March!

I am thankful for the opportunity to serve as the LTAP Director for the past three years and as the Training Coordinator for almost three years prior. I offer my best wishes to all the wonderful people I have met during this time, and for the continued success of the LTAP.

Happy Holidays!

Sincerely

Amy Begnoche
LTAP Director
Technology Transfer Center

UNH Technology Transfer Center Road Business
Why it is that DPW plow operators are expected to operate for indefinite periods of time? I completely understand the need to provide safe roads for travel, but it almost seems like an oxymoron. Safe roads, free and clear of snow and ice but clogged with exhausted plow drivers. Hmm, let’s ponder that a while.

According to the Federal Motor Carriers Guidelines a commercial truck driver can only drive for up to 11 hours out of a 14 hour period of on-duty time. Even then this can only be done after a total of 10 hours of off-duty time. So 10 hours off + 14 hours on-duty, and we get a full 24 hour period, of which only 11 of them can be used for drive time. (Reference the FMCSA 49 CFR 395.3)

Now comes the driver of a government vehicle, (local government includes plow operators) or those who are removing snow and ice (Reference FMCSA 49 CFR 383.3) states in part, … “A driver, employed by an eligible unit of local government, operating a commercial motor vehicle within the boundaries of that unit for the purpose of removing snow or ice from a roadway by plowing, sanding, or salting” is exempt from the FMCSA guideline mentioned above.

Great, this makes it legal for plow drivers to plow an indefinite amount of time. The real questions are, is it safe or smart?? As drivers become more tired they become less safe. Having driven a plow for 20 years I have experienced this first hand. After enough hours pass a driver might see LGM’s in front of them (LGM = little green men) in the road. Then the LGM’s start to dance on the plow and maybe even sit in the passenger seat telling us how to do our job.

According to the National Highway Traffic Safety Administration 100,000 crashes are the direct result of driver fatigue each year. This leads to 1,550 deaths each year, 71,000 injuries and $12.5 billion in monetary losses. Police data collection has to rely on information that is shared on an accident report form as there is no test to determine drowsiness like a breathalyzer.

Who is at risk for drowsy driving? Young people, men and adults with children. Adult men ages 18-29 are much more likely to drive drowsy than other age groups. Adults with children are more likely to drive with sleep deprivation than those without children, and shift workers are more likely to be fatigued than those who work a regular shift.

Ok maybe this is not all that news worthy, but it helps to make a point. What is my point you ask? My point is: What are we doing about it? In almost every snow and ice class I teach I hear drivers say “we can’t go home” or “we can sleep in the truck for an hour”.

"We have to keep plowing until the storm stops."
Butch Says (Pearl of Wisdom)

If you treat your employees as if they were where they ought to be, you help them to become what they are capable of being.

“Leaders become great not because of their power, but because of their ability to empower.”
~ John Maxwell

First steps toward safe and sustainable snowfighting

By Wilfrid Nixon, Vice President, Science and the Environment, Salt Institute, Naples Florida
Published: APWA’s Reporter November 2017, Vol. 84, No. 11

The question arose a few weeks ago—if an agency is currently doing winter maintenance “the old fashioned way” (which in this case meant plowing only after the snow had started to settle on the road, and using a 50-50 salt-sand mix), what would be the first steps that the agency should take to change their current operations to become safe and sustainable snowfighters? It is a really good question, because while it is easy to talk about where an agency should be in terms of their operations, it is not quite as easy for an agency to move from their current position to where they want to be.

As the old saying goes, “the longest journey begins with a single step.” And so I would suggest that the first step an agency should take would be to calibrate your spreader equipment. There are a number of great reasons for doing this.

First, you cannot manage your winter maintenance operations if you do not measure what you are doing in those operations. Knowing how much material you are putting out per lane mile is a pretty basic bit of information, and you may be surprised by how much you are putting out differs from what you think you are putting out. One agency in Wisconsin attended the APWA Winter Maintenance Supervisor Certificate training in Green Bay in Fall 2016 and they decided to do the calibration when they got back from the training. They discovered that their units were way out of calibration and they estimate that calibrating their units saved them about $70,000 in materials last winter. So the second reason to start with calibration is that it could save you a chunk of change!

And that brings us to the third reason—calibration does not cost a great deal to do. It does take some time (probably two people for one hour for each truck) but you do not have to buy any special equipment to do it; all it really takes is to decide that you should do it. And the fourth reason is that calibration is an “easy win.” Most likely you will end up saving material if you calibrate your trucks (none of us on the Winter Maintenance Subcommittee have ever heard of an agency that did calibration and discovered they were under-applying!) and the fact that you have tried something new and been successful is a great way to begin that journey.

So if calibration is your first step, what should be your second step? Of course, every agency is going to begin from a slightly different place, and face somewhat different obstacles to change, so I am going to suggest two directions you might go for step two. That way you can choose whichever one seems better to you!

I think your second step should be either taking a really close look at your cutting edges, or starting the process of measuring pavement temperature and using those...
Safe and sustainable snowfighting

measurements in your operations. I will explain in turn why I think these two are important.

First, those cutting edges—they are really where “the rubber meets the road” and not having the right tool on the bottom of your plow will mean that your plow is not performing as well as it should be. That matters a whole lot, because the way we remove snow and ice from the road is with that plow. If it is not operating at peak performance, then your operations are going to be a long way from being optimal. In particular, if you are still using steel blades (no matter how hardened the steel may be) then you are not getting the best out of your plows.

I learned the hard way, back when I was doing field testing on snowplows many years ago, that changing a cutting edge out is one of the less pleasant tasks you can do. It may just have been me, but the snow from the plow and the cutting edge seemed to find the back of my neck with unremitting regularity and excellent aim. My temper got frayed and the more frayed it got the less success at changing out the blade I had. All in all it was one of those “learning experiences” that tend to scar the psyche! Having to change out blades mid-way through a storm will likely be even less fun, and of course, if your truck is getting its cutting edges changed, it is not out on the road plowing snow.

There are plenty of cutting edges on the market today that will provide much better performance than a steel blade. Not only will they clear the road surface better, they will cause less vibration on the truck (and thus cause less wear and tear on both the truck and the truck driver—vibrations in particular are known to be a key cause of operator fatigue and a tired plow operator is not a safe operator) and they will last significantly longer than a steel blade. Of course they will cost more than a steel blade, but consider this. Even if a new-type blade costs ten times more than your regular steel blade, if it lasts twenty times as long (and some blades have shown at least that much performance improvement) then it is a real bargain. So, if you have not changed the type of blade you are using in your operations for some years now, I would strongly suggest you take a look and see what is out there to improve your operations.

What about pavement temperature? Well, the temperature of the pavement determines whether or not the snow or ice will stick to the pavement. It therefore should determine what material and how much material you put down on the pavement. The colder the pavement, the more material you will need to prevent the snow and ice from bonding to it (depending also on other factors like the type of precipitation, the cycle time of your plow trucks and the level of traffic on the road). If the pavement gets too cold (below about 15°F) then salt takes so long to go into solution that it is often operationally ineffective; in those circumstances you either need to “boost” the salt somehow, or stop applying it.

Once you start to measure pavement temperature then you can build your operations around that data. You can set an application rate based on what you expect the range of pavement temperature to be during the storm (and since you have calibrated your spreaders, you will have some confidence that you are actually applying the amount of material you should be!). Of course, if you do that (setting the application rate) you also need to check that your operators actually apply that amount of material. But, agencies that have undertaken this change in their operations have found that they can reduce their salt usage by up to 50%. That is important because, of course, those pavement temperature sensors cost money. However, if they can help you reduce your material costs by 50% then it seems likely that the benefits will far outweigh the costs.

So, there are three things you might consider doing if you wish to bring about change in your winter maintenance operations. The benefits you see by doing these three things (and many agencies are already doing all three) will of course vary depending on your starting point, but again, the longest journey begins with a single step. These three will likely help you get those first steps taken!

Wilfrid Nixon can be reached at (239) 231-3305 or wilf@saltinstitute.org.

Call for SUPPORT!

You may have heard that Fairfax, VT town employee of more than 30 years, D. J. Leach, 61, was a part of the cleanup effort across VT, following the violent wind storm that knocked down trees and power poles in many communities. While Leach was cutting and removing trees, somehow, one snapped and hit him.

The New England Chapter of APWA is asking Public Works Departments all over the region to send him get well cards and thoughts of encouragement.


His mailing address is:
D. J. Leach
273 Fletcher Road,
Fairfax, VT 05454
Continued from cover page

Help Wanted

technologies, intelligent transportation systems, environmental stewardship, facility and system design, and an expanding global economy.

In August 2015, the U.S. Departments of Transportation, Education, and Labor released a joint report titled Strengthening Skills Training and Career Pathways Across the Transportation Industry. The report analyzes future job needs in the transportation industry. According to the report, the transportation industry will need to hire 4.6 million workers from 2012 to 2022—the equivalent of 1.2 times the size of the current workforce. Of those 4.6 million workers, 417,000 jobs are projected to be related to industry growth and 4.2 million are related to separations, which includes retirements, occupational transfers, and other exits from the industry.

In addition to hiring, the industry must ensure that the new hires are well-trained and prepared to deliver the Nation’s transportation system.

The Demographic Cliff

In 2014, approximately 53 percent of transportation workers were over the age of 45 years. As the majority of the transportation workforce nears full retirement age, further workforce challenges emerge. Baby boomers (those born between 1946 and 1964) have already begun leaving the workforce. By 2024, they will be between the ages of 60 and 78.

Not only is the retirement of the baby boomer generation already leading to a significant number of job openings, but it also will mean loss of valuable knowledge and experience. As baby boomers retire, younger workers need to fill their jobs. However, not enough workers are completing the training and educational programs required to fill these positions, posing a challenge for the transportation industry. Without a sufficient number of skilled workers, the industry will have difficulty designing, constructing, and maintaining an efficient, effective, and safe transportation system.

Through 2022, projected annual job openings are approximately 68 percent greater than the number of individuals who are completing transportation-related education and training programs each year. This disparity highlights the gap that the transportation industry needs to address to meet anticipated industry demand. Without effective action, the industry will continue to experience a shortage of qualified workers with the skills necessary to fill the projected job vacancies.

The highway sector has its own set of workforce challenges. U.S. travelers rely on U.S. highways. The National Highway System has more than 4 million miles (6.4 million kilometers) and slightly more than 144,000 bridges. To better understand the highway construction industry’s workforce challenges, the Associated General Contractors of America (AGC) conducts an annual survey of its member companies. The 2016 survey, which received more than 1,400 responses, showed that construction firms throughout the country are struggling to fill open positions and hire a sufficient number of qualified workers to meet their needs. Difficulty filling positions directly impacts firms’ ability to deliver projects on time and potentially delays repairs needed on the transportation system.

## Contractor Job Openings by Position Type

<table>
<thead>
<tr>
<th>Position</th>
<th>Percent of Firms Struggling to Fill Openings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carpenters</td>
<td>60</td>
</tr>
<tr>
<td>Electricians</td>
<td>53</td>
</tr>
<tr>
<td>Concrete Workers</td>
<td>49</td>
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<tr>
<td>Laborers</td>
<td>44</td>
</tr>
<tr>
<td>Equipment Operators</td>
<td>43</td>
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<tr>
<td>Cement Masons</td>
<td>42</td>
</tr>
<tr>
<td>Iron Workers</td>
<td>40</td>
</tr>
<tr>
<td>Truck Drivers</td>
<td>36</td>
</tr>
</tbody>
</table>

Source: Associated General Contractors of America, 2016 Workforce Survey

“Putting new workforce development measures in place will make it easier for construction firms to keep pace with growing public- and private-sector demand,” says Stephen E. Sandherr, chief executive officer of AGC.

Focused Efforts

To avert a potential crisis, the Federal Highway Administration is working in conjunction with other public agencies and private companies and organizations to attract, educate, train, and retain a qualified highway construction workforce. Many government agencies, local organizations, and employers have formed partnerships, developed training and educational programs, and filled job openings. Continued collaboration and leveraging of resources will be necessary to meet future demands for skilled labor.

Through its Center for Transportation Workforce Development, FHWA is bringing together key partners to develop and implement a focused effort: the Highway Construction Workforce Pilot. This pilot program is a joint effort with the American Association of State Highway and Transportation Officials (AASHTO), Associated General Contractors of America, American Road & Transportation Builders Association (ARTBA), U.S. Department of Labor’s (DOL) Employment and Training Administration, State and local workforce development boards, and other local labor and workforce development organizations. The effort aims to identify, train, and place individuals in high-need highway construction jobs in 12 pilot locations throughout the country. The pilot program will support on-the-job training criteria in highway construction occupations and will explore how to more effectively link

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Research Confirms Low-Binder Asphalt Pavement Mixtures Prone to Cracking

By Jerry Geib, Technical Liaison, Minnesota DOT
Farideh Amiri, Project Coordinator, Minnesota DOT
Eshan Dave, Principal Investigator, University of New Hampshire


What Was the Need?

Introduced in 1993, Superpave has successfully helped transportation agencies in northern regions design asphalt pavements that are less susceptible to thermal cracking. When tested, Superpave-compliant designs were found to resist both rutting and thermal cracking.

Gradation-based design approaches have also allowed for the use of coarse-graded, low asphalt binder mixtures. These mix designs establish a maximum aggregate size and reduce the range of usable gradations. Such coarse-graded designs meet MnDOT specifications because the maximum aggregate size falls within the acceptable gradation range. However, the reduced fine aggregate content made possible by the use of coarse aggregates leads to a mix that, while still within specifications, offers less surface area to be coated by the asphalt binder and can encourage unwelcome permeability in the field. To win low-bid competitions, contractors have embraced these low-binder, coarse-graded designs to reduce binder and aggregate costs.

Transportation engineers noticed that these pavements seemed to “gray out” or lose their dark color more quickly than previous asphalt designs. These pavements also seemed to grow somewhat more brittle and were less able to rebound from loading. Such asphalts are thought to be prone to quicker failure than mixes with finer aggregate and more binder. Road designers typically attribute thermal cracking and potholing in low-binder asphalt to the increased permeability that leads to water incursion and freeze-thaw damage.

What Was Our Goal?

The goal of this project was to determine how well low-binder asphalt pavements perform and whether current designs make sense in terms of cost–benefit and durability. Researchers would identify any relationship between reduced bitumen use and potential for cracking, and would suggest changes to specifications for coarse-graded asphalt pavement mixtures to prevent such cracking issues.

What Did We Do?

Researchers worked with MnDOT to identify 10 pavement locations in Minnesota that used 13 coarse-graded, low-binder asphalt mix designs. Investigators extracted data on cracking, roughness and other factors for these sites from MnDOT’s pavement management system. The research team then visited the sites and inspected the pavements.

Researchers developed a coring plan, and field samples were cored for volumetric analysis to determine the binder, aggregate, air void level and other properties of each mixture. They also tested permeability and dynamic modulus, and conducted fracture energy testing to determine cracking resistance.

Investigators used performance modeling to analyze the test results of pavement properties and project pavement durability. They then compared the projected performance to actual field performance. From this assessment, they drew recommendations for modifying specifications for MnDOT low-binder, coarse-graded asphalt mixtures.

What Did We Learn?

This study suggests MnDOT should reduce its use of coarse-graded asphalt mixtures, but the findings did not provide sufficient data to justify prohibiting the use of coarse-graded, low-binder asphalt designs.

Low-binder mixtures were prone to thermal and transverse cracking. Their high permeability left them vulnerable to premature moisture and freeze-thaw damage. Field and laboratory testing and modeling demonstrated that coarser mixtures produce excessive cracking in a short period of time. Thin overlays...
Among our public works and LTAP community are members who have retired or will be retiring this year. We'd like to thank them for their service and commitment to the transportation industry. Congratulations on closing this chapter and starting a whole new one. Best wishes for this new chapter to be full of adventures and filled with all things good.

Charles Goodspeed

When Charlie Goodspeed enters a room, his energy and excitement for the work he does is palpable. He sees the possibilities in a project or in a student with limitless potential. Ideas bubble from him constantly and enthusiastically, with never-ending passion about each one, regardless of its magnitude. And his long list of accomplishments, and those of his students, back his pioneering mind and endless appetite for finding and creating workable solutions to problems that others would walk away from. He is a true visionary.

Because of his belief that every puzzle has a remedy, and every problem has a solution, he is able to find and offer his students real life challenges and timely problem solving opportunities. Together they have had many “firsts” throughout his active and established career.

Let’s take a quick look at some of those remarkable “firsts”. Approximately 20 years ago, the Bristol, NH Bridge project designed the 1st High Performance Concrete exposed deck bridge in New Hampshire.

The Rollinsford, NH Bridge project, nearly 15 years ago, was the 1st bridge with FRP carbon fiber reinforcement as the only reinforcement used.

In 2005, the Mill Street Bridge in Epping, NH. Post-tensioning tests were used in the lab to come up with this Accelerated Bridge Construction. The bridge was installed in 8 days and won the National PCI Design Award for Best All-Precast Solution Bridge with Spans between 65-135 feet. The Gilford Bridge project in Gilford, NH: This design will utilize a technique that the team initiated: leveling and lifting screws for slab handling and placement and the use of polymer for joint seal testing.

The Bunker Creek bridge project in Durham, NH which is earmarked for a 2019 construction date, is in the research and development stages.

Bridges aren’t the only structures he produces. He has overseen the Senior Project designs and constructions for several buildings including the Masonic Hall in Norway, ME, the Epping, NH Safety Complex, and several private homes.

In 1999, the 1st hyperbolic parabolic corrugated metal roof in the world was used in a student research project for the Town of Newmarket’s (NH) salt shed which was erected in 1 day.

Charlie’s ground breaking creativity doesn’t end with physical structures. He has worked with students to prepare a definition for HPC-15. Together they invented and design tested the retroreflectometer. He has worked with PhD student projects like NH online Parcel Mapping and has pulled in many grants for programs like the most recent Statewide Asset Data Exchange System (SADES), The Hydroacoustic Project, and the New Hampshire Technology Transfer Center with its LTAP grant, for which he served as the Principle Investigator and founder for 31 years.

What trade associations, foundations, etc. are you affiliated with? He has likely made contributions to them, but his “rap sheet” is too long to list!

Public service also comes in the form of active and eager participation in his community. He sits on Epping’s Harvey-Mitchell Memorial Library Board of Trustees, for which one of his students designed and presented an expansion proposal. He also sits on the Epping Zoning Board of Adjustments and is a Board member for the Leddy Center for Performing Arts.

With no signs of letting up or slowing down, Charlie will continue to fight the good fight for his community, for advancement in technology in his retirement. He is relentless with desire to share his knowledge and engage his students in productive and revolutionary ways, which has only allowed him to continue to grow and explore as an engineer and person.

Charlie,
Your passion, insight, and enthusiasm will be missed!

I’ve learned that people will forget what you said, people will forget what you did, but people will never forget how you made them feel.

~Maya Angelou
Help Wanted

Proper construction techniques, such as the girder setting shown here, require specialized skill sets for the transportation workforce.

qualified applicants with workforce opportunities in highway construction. AASHTO, AGC, ARTBA, DOL, and FHWA established the Highway Construction Workforce Pilot and are working together as the National Partners Group.

“We know there are a lot of people out there who would excel in these jobs, but finding those individuals has been a challenge,” says Brian Deery, senior director in AGC’s Highway & Transportation Division. “Our partners on the [workforce development] side can help us with that. The pilot program shows a lot of promise to change the way we address workforce development in the highway construction industry.”

The partners have selected six cities (Atlanta, GA; Dallas, TX; Denver, CO; Los Angeles, CA; Pittsburgh, PA; and St. Louis, MO) and six States (Alabama, Arizona, Connecticut, Idaho, Rhode Island, and South Dakota) to participate in the pilot. The locations were chosen based on consideration of several factors, including workforce data, a mix of cities and States, union and nonunion operations, State or local association member organization, and established relationships with State or local workforce development boards.

“The highway infrastructure is critical to our way of life, and there are a lot of good jobs in the highway industry,” says Byron Zuidema, deputy assistant secretary for the DOL Employment and Training Administration. “Partnering with the industry to make better use of the publicly funded workforce development system will help job seekers receive the skills and training they need to get placed in those jobs.”

How does the pilot program work? At the local level, contractors identify the high-need job occupations they are struggling to fill. Workforce development boards (WDBs) and other local labor organizations identify available training programs and resources, as well as potential participants. Through the pilot program, individuals learn a skill or build on existing skills to begin or enhance a career in the transportation industry, and employers have a larger, more qualified hiring pool to fill their open jobs and complete projects.

Some pathways to highway construction careers are direct referrals of qualified applicants, WDB-provided skills upgrading or training leading to unsubsidized employment, on-the-job training opportunities, apprenticeship programs, and Job Corps or other youth-development programs. There may also be incumbent worker training or other customized training for current workers, and pathways to help workers progress further in their careers.

“By connecting industry and DOL resources, and making the pilot project a local effort, the partners can positively impact workforce development in each location,” says Tony Furst, FHWA’s chief innovation officer and director of the FHWA Office of Innovative Program Delivery. Furst also leads the Highway Construction Workforce Pilot for FHWA. “Through these con-

Workforce Initiatives by the Department of Labor

To address anticipated workforce challenges facing the Nation as a whole, the U.S. Department of Labor (DOL) has funded several initiatives.

**American Apprenticeship Grants.** To streamline the efforts of employers, organized labor groups, nonprofits, local governments, and educational institutions, in 2015 the White House, through DOL, awarded $175 million in grants to 46 public-private partnerships. The grantees are expected to train and hire at least 34,000 apprentices in high-growth and high-tech industries over 5 years.

**America’s Promise Job-Driven Training Grants.** In November 2016, DOL announced $111 million in America’s Promise grants to 23 regional workforce partnerships in 28 States to connect more than 21,000 Americans to education and in-demand jobs.

**Trade Adjustment Assistance Community College and Career Training Grant Program.** In partnership with the U.S. Department of Education, DOL is helping adults acquire the skills, degrees, and credentials required for high-wage and high-skill employment while also meeting employers’ needs. These multiyear grants provide community colleges and other institutions of higher education with funding to expand and improve education and career training programs that can be completed in 2 years or less, are suited for workers who are eligible for training under the TAA [Trade Adjustment Assistance] for Workers program, and prepare participants for employment in high-wage and high-skill occupations.
Nancy Mayville

Nancy Mayville retired May 31, 2017 after a 38+ year career as a civil engineer at New Hampshire Department of Transportation. She has been involved with the Technology Transfer Center (T2) since the late 1980’s, first as an instructor, then as a member of the Advisory Board.

Since 2006, she held the position of Municipal Highways Engineer in the Bureau of Planning and Community Assistance overseeing the state and federal programs that provide funding to municipalities for local transportation projects. Prior to that she was a Project Manager in the Project Development Division and a resident engineer in the Bureau of Construction. She graduated from UNH in 1976 with a degree in civil engineering.

Nancy recently shared with us that, as an engineer, she finds working with municipalities on their transportation projects to be the most interesting and fulfilling part of her career. She enjoyed working with the many great people in the public works world including municipal staff, elected officials, and the many consultants who assist them.

Nancy describes herself as semi-retired since she is working part-time until a replacement is named. She is planning to spend more time at the family camp on Lake Winnipesaukee, traveling, quilting, gardening, and reading. She also plans to complete the courses needed to be a Master Road Scholar.

Steve Gray

"Steve was Assistant District Engineer in District 2 when I started working for the Department in 1988. Steve’s passion for Highway Maintenance rubbed off on me when I spent time in District 2 as a trainee. Ten years later, I too became the Assistant Engineer in the same District. Steve has always been one of my mentors and I consider him a friend."

– Doug King, District Engineer, NHDOT

Steve began instructing for the LTAP Grant with the UNH T2 Center in 1996. That first workshop was Cold Mix Asphalt. Since then, he has staked claim to 63 workshops. From Project Planning to Pavement Preservation workshops, he’s covered a wide range of topics.

In 2013, his vast expertise was called upon in the creation and institutionalization of the Culvert Maintainer Certification Training, covering the basics of the new NH culvert legislation, which went into effect in 2013 in partnership with the NH Department of Environmental Services. He single handedly trained every certified individual in the state (over 600 of you!).

Steve also dabbles in lecturing on the transportation history of New Hampshire so keep your eyes open for local presentations of things like the history of snowplowing.

Brian Barden

This article is reprinted with the permission from The Dublin Advocate, where it originally appeared in the December 2017 issue.

Brian Barden, Dublin’s Road Agent for nearly 30 years, will be retiring on December 31. His amazing service to the Town will continue, however, as he marks 50 years as a volunteer fireman.

Brian grew up in Keene and graduated from Keene High School in 1960, the last class to attend the school on Washington Street. After serving in the U.S. Army in Vietnam for 14 months, he returned to the area and got a job plowing snow for the Town of Dublin and later at Arthur Whitcomb in Keene.

In 1967 he met Jean, who was attending Keene State College, and they married in 1968. Brian and Jean moved to Dublin, and Brian began work at Worcester’s Garage in the center of town. While at Worcester’s, Brian was recruited by Selectman John McKenna to be Road Agent in February of 1988. He’s been plowing and grading Dublin’s 42 miles of roads ever since – through torrential summer downpours, ice storms, and blizzards – and every road condition in between.

Dublin’s roads are evenly divided: 21 miles of dirt roads; 21 miles of paved ones, which amount to 84 “lane miles.” Over the years, Brian has figured out how often to do the grading and ditching, and where he and his crew of three work on a given day depends on where the need is. He is accustomed to receiving calls about road emergencies late at night and on weekends. In winter there can be occasional 30-hour shifts; he’s good at “cat naps,” he says.

Over the years, Brian and his crew have not only maintained Dublin’s roads but also tackled big projects, such as the culvert and bridge reconstruction on Pierce Road a few years ago. Not having to hire outside contractors for these projects has saved the Town thousands of dollars.

Brian says he will miss his job and his crew (Mike Howe, David Stone and Roger Trempe) but is looking forward to a more relaxed pace and to having more time to work on his collection of five antique cars. Traveling to “T-Tours” with his beautifully restored Model T Ford is a pastime both he and Jean enjoy, and they have made many friends among fellow antique car enthusiasts.
How can we achieve a real rest period for our drivers? Some towns and cities have bunk rooms where drivers can truly sleep in a bed. Others allow them to go home for rest. The problem with that is who is plowing if the drivers are sleeping? Sometimes no one or only a skeleton crew. I think it’s time that we seriously consider shift workers for snow and ice operations.

Some compelling arguments against that are “our mayor or selectmen will not allow that”. My response to that is “Why?” Answer, money. Yes, it will cost more to have additional crews hired for winter ops, but it would be much more expensive to pay a lawsuit caused by drowsy driving. As snow fighters we are committed to safety, but we often overlook our own.

I’m not sure how to bring about this much needed change, and I’m sure that some will feel that it is not needed. For those of you who feel this is important I would welcome your comments. You can reach me at mdsmith@umass.edu.
Help Wanted

Connections, the industry workforce needs will be more effectively and efficiently addressed, and individuals will have the opportunity to start or to build a career for themselves.”

Partnering Makes It Possible

Through the Highway Construction Workforce Pilot, FHWA intends to establish effective working relationships between highway construction interests and the workforce system to identify and advance successful workforce development practices and procedures that cities and States throughout the United States can replicate. The National Partners Group will provide direction and oversight of the pilot project, and a National Operations Group will assist coordination with the city and State working groups that will manage program operations in each pilot location.

Jim Tymon, chief operations officer for AASHTO, represents the association in the National Partners Group. “AASHTO and our State DOT member organizations are excited to work with FHWA and the leading highway contractor organizations, AGC and ARTBA, and their member companies on this critical issue,” he says. “AASHTO and State DOTs clearly recognize the importance of a capable highway construction workforce to the timely and efficient delivery of highway projects. We believe the Highway Construction Workforce Pilot will set a new, better defined approach to workforce development in our business, and AASHTO is committed to the program.”

During the course of the project, the National Operations Group will develop a “playbook” that will include specific project plans, best practices, and challenges to aid other locations in their workforce development programs. The objective is for the pilot project to serve as the foundation to institutionalize relationships in workforce development in the highway construction industry.

“We have highway projects in every State and just about every local area of the country,” says Rich Juliano, senior vice president of strategic initiatives and managing director of the contractors division at ARTBA, who represents the association on the pilot project. “The city/State pilot location approach will be a good opportunity to adjust our efforts to the specific circumstances in each area. We expect to learn a lot from the pilot project that can be applied to workforce development in support of other highway projects throughout the United States.”

Workforce Development At FHWA

In addition to the Highway Construction Workforce Pilot, FHWA is working on other efforts to develop workforce programs and fill the skills gap. In May 2016, FHWA created the Center for Transportation Workforce Development to emphasize workforce issues in the transportation industry. The center provides national leadership, coordination, and assistance to develop and support workforce initiatives throughout the education continuum of K–12, community colleges, universities, and professional development. The workforce center is one of four program-aligned centers that make up the FHWA Office of Innovative Program Delivery. The other centers are the Center for Accelerating Innovation, the Center for Local Aid Support, and the Center for Innovative Finance Support.

“The Federal Highway Administration will continue to focus leadership on areas most critical to the transportation industry and system,” says FHWA Acting Deputy Administrator Butch Waidelich. “And with the new workforce center, we have an organization that will provide leadership in working with key partners in transportation, education, and other workforce interests to leverage activities and resources to enhance transportation workforce development.”

The center helps to manage the Highway Construction Workforce Pilot and several other workforce development efforts including the FHWA On-the-Job Supportive Services Program, Eisenhower Fellowship Program, National Summer Transportation Institute Program, Garrett A. Morgan Technology and Transportation Education Program Clearinghouse for K–12 programs, and the five Region Transportation Workforce Centers.

“The increasing focus and leadership on workforce development that the FHWA workforce center provides will improve workforce development at all levels,” says Virginia “Ginny” Tsu, director of the Center for Transportation Workforce Development. “Expanding our relationships in workforce development with key partners including DOL through the pilot program, and bringing together the existing FHWA workforce programs pro-

Matthew Cullen, Louisville Paving and Construction

Developing a variety of workforce programs will be necessary to address the skills gap and provide for a well-trained and qualified transportation workforce. This construction crew is preparing the bridge for the deck construction stage.
of 3 inches or less crack more quickly than thick overlays of 4 to 6 inches. Mechanistic-empirical simulations showed that low-binder asphalt mixtures were significantly inferior to higher-binder mixtures in terms of thermal cracking.

Most of the high-cracking mixtures showed low fracture energy in testing, suggesting the value of fracture energy testing and modeling. Disk-shaped compact tension testing showed that higher permeability mixtures correlate reasonably well with lower fracture energy. Eight of the 13 mixtures were more permeable than recommended, and six significantly so. Typical volumetric properties poorly predicted cracking.

To better project pavement performance, researchers recommend that MnDOT maintain volumetric testing-based specifications, but add performance testing-based specifications and testing designs for fracture energy, fracture resistance, modulus and other parameters. For Superpave designs, investigators suggest using a narrower aggregate gradation range, reducing the gradation gap between minimum and maximum aggregates in mixes.

“With coarser mixtures, excessive cracking will occur in a very short time. We recommend that MnDOT adopt performance-testing specifications and conduct mechanical testing like fracture energy, fracture toughness and modulus measurements, which the agency has already started.”

~Eshan Dave
Assistant Professor, University of New Hampshire
Department of Civil and Environmental Engineering

What’s Next?
Although the research validates MnDOT engineers’ anecdotal concerns, the pavements evaluated were mostly overlays, which are known to be susceptible to transverse cracking because of flaws in underlying pavement layers. MnDOT may weigh the results and adjust specifications, but would likely require further study of coarse-graded mixture performance before ruling out its use or identifying situations in which coarse-graded mixtures may be the best option. Additional research could consider the use of nonuniform lift designs for asphalt pavements, varying mixes for each lift in the structure rather than using a single, uniform mix for every layer in the full depth of the pavement.

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“Everyone thinks of changing the world, but no one thinks of changing himself.”

~Leo Tolstoy
On December 13, 2017, NAWIC National President Catherine Schoenenberger and the Acting Assistant Director for OSHA, Loren Sweatt signed the renewal for the alliance with federal OSHA.

The alliance assures that NAWIC and OSHA will work together for the next five years to continue to support women in the construction industry and the issues they face in keeping safe. This includes ongoing monitoring of sanitation issues, ergonomics and issues related to PPE. Additionally, the alliance is studying bullying, harassment and sexism in construction and are in preliminary discussions with NIOSH (the National Institute on Construction Safety & Health) to develop a research model to evaluate, among other items, the relationship between a harassment encounter and subsequent injury or accident. We have also been in discussions with CPWR (the Center for Construction Research and Training) issues surrounding PPE and may be able to join in a grant to develop a white paper or further research in addressing PPE issues throughout the industry.

Joining Catherine for the ceremonial signing were NAWIC members Romina Byrd, Greater Washington DC Chapter and Kathi Dobson, Detroit Chapter and 2017-2018 OSHA-NAWIC Alliance co-chair. Attending from the Department of Labor were Christina Morgan, Alliance Liaison, Outreach Services; Doug Kalinowski, Director of the Directorate of Office of Cooperative and State Programs; Dean McKenzie, Director of OSHA’s Directorate of Construction; Tina Jones, Director of Outreach Services and Alliances; and other support staff from the Directorate of Cooperative and State Programs, including Lolita Oliver, Arlene Williams and Eric Kampert. The alliance meets twice a year in Washington DC with other construction alliances for a roundtable session and periodically by teleconference.

For more information on the alliance or to join the committee, please contact:
Kathi Dobson kdobson@alberici.com or Schelle Wood schelle@dolphinsheetmetal.com

ABOVE: seated – Catherine Schoenenberger, Loren Sweatt
Standing from left to right – Romina Byrd, Tina Jones, Doug Kalinowski, Kathi Dobson, Dean McKenzie, Arlene Williams, Eric Kampert, Chrissy Morgan, Lolita Oliver
The solicitation of STIC Incentive projects is open at the beginning of the Federal fiscal year (October 1st) and closes at the end of the Federal fiscal year (September 30th).

Eligible Projects/Activities:
The requirements for eligibility of a project or activity are as follows:
• The project must have a statewide impact in fostering a culture for innovation or in making an innovation a standard practice.
• The project/activity for which incentive funding is requested must align with TIDP goals.
• The project/activity must be eligible for Federal-aid assistance and adhere to applicable federal requirements.
• The proposed project/activity must be started as soon as practical (preferably within 6 months, but no later than 1 year) after notification of approval for STIC Incentive funding and the funds must be expended within 2 years.

Bill Oldenburg, NH DOT Assistant Director of Project Development
Patrick Bauer, FHWA Division Administrator
Yamilee Volcy, NH FHWA (603) 410-4842 Yamilee.Volcy@dot.gov
For more details and information on the NH STIC council: https://www.nh.gov/dot/programs/stic/index.htm

The NH STIC council is a partnership of public and private transportation industry stakeholders that work together to evaluate innovative products and practices and to lead their incorporation into the next generation of New Hampshire’s transportation network.

The mission of the council is to identify projects, apply for federal funding, develop or evaluate new products and technologies, and to transfer the innovations into the construction projects of the future.

The solicitation of STIC incentive projects is open at the beginning of the Federal fiscal year (October 1st) and closes at the end of the Federal fiscal year (September 30th).

Eligible Projects/Activities:
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Help Wanted

A sharp focus and precise workmanship, such as that demonstrated by these workers installing a girder splice, is critical to maintaining the public trust in delivering the Nation’s highway program.

An Expanded Effort: Region Centers

In 2014, FHWA created five regional transportation workforce centers—collectively known as the National Network for the Transportation Workforce—to establish a network—driven approach to developing and retaining a highly skilled and effective transportation workforce. Although the regional centers do not provide training, they engage organizations and existing programs to establish new strategic partnerships and promote best practices to educators, employers, and those on the transportation career pathway. For more information on the National Network for the Transportation Workforce, see “Connecting the Employment Dots” in the November/December 2015 issue of Public Roads.

“The region workforce centers provide an important network for workforce development that can help identify and facilitate implementation of value-added workforce development programs,” says Glenn McRae, director of the Northeast Region Workforce Center based at the University of Vermont. “We are able to work within and across transportation, education, and training interests for the greater benefit of transportation workforce development. Collectively, the National Network for the Transportation Workforce has already established more than 100 partnerships with transportation and education groups for substantive workforce activities. We will continue to work with FHWA and other key partners to improve workforce development throughout the education continuum.”

FHWA recently awarded the National Network for the Transportation Workforce, a cooperative agreement for the National Transportation Career Pathways Initiative, to research and develop career pathways in the key discipline areas of environment, safety, operations, planning, and engineering. Led by the Southwest Transportation Workforce Center located at the California State University, Long Beach, the program will identify key occupations, as well as gaps between available training, education, and experiential learning programs.

The program will also identify elements necessary to develop a highly skilled workforce in each of the five discipline areas. In collaboration with key stakeholders, the National Network for the Transportation Workforce will develop career pathways at technical schools, community colleges, and universities to help fill the skills gap and train individuals in the key occupations.

The National Network for the Transportation Workforce began work on the Career Pathways Initiative, a 2-year program, in October 2016. The Southwest Region Workforce Center will lead a demonstration project in at least one technical school, community college, and university for the planning discipline. The other region workforce centers will complete their work on competencies, curriculum, experiential learning, and design demonstration projects for the disciplines they are managing.

“We need to better align the transportation workforce demand of private and public sector transportation organizations with the workforce supply efforts of education, training, and workforce development,” says Tom O’Brien, director of the Southwest Transportation Workforce Center. “A lot of work needs to be done, and the National Network for the Transportation Workforce is looking forward to working with key partners across the transportation, education, and workforce communities on the National Transportation Career Pathways Initiative.”

Regional Transportation Workforce Centers

Source: FHWA

continued from page 12
Attracting younger workers to the transportation industry will be crucial to filling job openings over the next 10 years. These workers will help deliver a safe and efficient transportation system, including constructing new infrastructure.

A Present and Growing Need
With the highway industry bracing for shortages of available workers, now is the time for efficient and effective programs focused on recruiting, training, placing, and retaining workers, as well as efforts to better prepare the next generation of workers for transportation jobs.

Positions in the highway industry can lead to promising careers and opportunities for advancement. Although 4-year degrees often are not required for transportation careers, some training and education is necessary to have the skills required for most positions. Current workers and potential new hires in the transportation industry need to have access to and awareness of the available training programs that can help them develop skills to further their careers.

The need will continue to grow as more baby boomers retire and new technologies emerge. The transportation industry must continue to focus on training younger workers and providing them with the necessary knowledge, skills, and experience to deliver a safe, efficient, and effective highway system.

Clark Martin is a program manager for the FHWA Center for Transportation Workforce Development, part of the Office of Innovative Program Delivery. He is a lead manager for FHWA workforce programs and initiatives including the five FHWA-sponsored Region Transportation Workforce Centers, the Highway Construction Workforce Pilot, and the National Transportation Career Pathways Initiative. Martin is a graduate of the University of Maryland with a B.A. in political science.

Alexandra Dudley is a business analyst in the FHWA Center for Transportation Workforce Development. She is very involved with the Highway Construction Workforce Pilot, Region Transportation Workforce Centers, and the National Transportation Career Pathways Initiative. She holds a B.A. in economics and history from William & Mary and an M.S. in commerce from the University of Virginia.

For more information, contact Clark Martin at: 703-235-0547 or clark.martin@dot.gov.

Matthew Cullen, Louisville Paving and Construction

Fill a Public Works Truck

The NE APWA is proud to introduce “Fill a Public Works Truck.” What will your municipality be doing to celebrate? This event is an opportunity to give back to those in need by collecting food and household provisions for your local food bank during Public Works Week. Mark your calendars!

Not only will you be giving back, but this will also help raise awareness of public works and what we do for the community. For more information and further details check http://newengland.apwa.net/PageDetails/13498

May 20–26, 2018
Roads Scholar Program

The Roads Scholar Program establishes educational and training requirements for municipal level highway practitioners, and recognizes those who have successfully completed specified T2 Center workshops. Annually, the T2 Center publishes a directory to acknowledge those who have earned an achievement level among our Roads Scholars.

Since January 1, 2015, there are six levels in the NH Roads Scholar Program, plus an additional “side award.” Each Level has a defined number of contact hours, and Level 2 requires attendance at workshops in specific subject areas. A contact hour is an hour of actual instruction. A typical one day workshop includes 5 hours of instruction in a specific subject area to ensure that training covers a range of subjects essential to local road management. In addition, if Roads Scholar participants earn 20 contact hours in the Safety category, they earn a Safety Champion award.

§ Roads Scholar 1 Requires 25 contact hours

Paul Arguin  NHDOT - District 1
Aaron Arsenault  Wendell Rexford & Son
Raymond Beaudoin III  NHDOT - District 5
Amy Begnoche  UNH T2 Center
Kevin Belanger  NHDOT - District 4
Marshall Bennett  NHDOT - District 5
Doug Blain  Dartmouth Hitchcock MC
Joseph Bolduc  NHDOT - District 1
William Boulanger  City of Dover
Eric Brand  P & L Landscaping
Frank Bryson  City of Franklin
Sara Carbonneau  Town of Swanzey
Craig Cashman  NHDOT - District 4
Stephanie Cottrell  UNH T2 Center
Geoff Davis  NHDOT - District 4
Jack DeCormier  Town of Tilton
Thomas Demers  Demers Mowing & Landscape
Gerald DuBreuil  NHDOT - District 2
Scott Dunn  R & D Paving
Diane Durgin  Town of Gilford
Michael Durgin  Durgin & Durgin Landscaping
Peter Elliot  Town of Northwood
Jim Freeman  Knott’s Land Care LLC
James Gates  Knott’s Land Care LLC
Peter George  NHDOT - District 6
Fredrick Gilbert  NHDOT - District 1
Andrew Giragosian  Outdoor Pride, Inc.
Robert Gonyea  Town of Newport

Bruce Gosselin  City of Manchester
Bill Goutier  Town of Sanbornton
Rick Govoni  Gateway Property Mgmt
Mike Grimes  Knott’s Land Care, LLC
Mike Hague  Town of Bow
Richard Hanks  Town of Wolfeboro
Ken Henderson  City of Rochester
Cameron Huntoon  Town of Danbury
Andrew Johnson  City of Laconia
James MacNichol  NHDOT - Bureau of Turnpikes
Brett Martin  Town of Hancock
Jennifer Mates  Town of Exeter
Christopher Mayer  City of Laconia
Barbara McMillian  NH DES
William Mitchell  Eastman Community Association
Richard J. Niolet  Town of Canterbury
Tom Nixon  Town of Derry
Mike Nugent  City of Concord
Brad Osgood  Town of Sunapee
Brandon Ovitt  Town of Winchester
Daniel Pare  NHDOT - District 4
Kristopher Perreault  Town of Bedford
Jim Robbins  City of Lebanon
Craig Sartwell  Town of Newport
Fred Schaefer  City of Concord
Scott Sonia  Town of Carroll
Jerome Spooner  Town of Bedford
Jeff Stillman  Town of Henniker
Shane Stone  City of Claremont
Steve Waterstrat  City of Nashua
Gretchen Young  City of Dover

§ Roads Scholar 2 Requires 50 contact hours in specific subject areas: 5 hours of Environmental, 10 hours of Safety, 5 hours of Supervisory, 20 hours of Technical, 10 additional hours

Dale Bevilacqua  Eastman Community Association
David Briand  Town of Derry
Nick Coursey  Town of Rumney
Roger Dandeneau  NHDOT - District 1
Joseph Gore  Town of Wakefield
Joshua Hamel  Town of Raymond
Jason Hayden  City of Nashua
Jim Hoffman  Town of Pelham
Greg Hogan  Town of Carroll
Archibald Jackson  Town of Bedford
Gary Marshall  Town of Whitefield
George McAllister  NHDOT - District 1
William Rines  NHDOT - District 4
Carl Ruel  NHDOT - District 4

Continued to page 22

UNH Technology Transfer Center Road Business

December 2017
Education is the most powerful weapon which you can use to change the world.

~ Nelson Mandela

ONLINE Resources

Articles


APWA Reporter page 19, "Environmental concerns about chlorides": https://issuu.com/apwa/docs/201710_reporteronline


Downed power line safety: http://www.we-energies.com/outages_safety/reporting/powerlines.htm


Videos

Solar roadways: https://youtu.be/qITA3rnpgzU

Downed power lines: https://youtu.be/fLVzvMTgGDY
Let’s now exercise our frontal lobes (that deal with working memory and attention, among other things) and parietal lobes (visual interpretation). Quick!

1. Count the number of times the number “6” appears below (you may need to scroll down).

2. Then, count the total of both “3”s and “7”s, trying to add the total number of both as you see either (this is, don’t just count all the “3”s, and then the “7”s, but both at the same time).

123446788997467465786587657657
3576573625432657346578436578342
7321885827358274567246873438278
72878682768723682376783768267
2647648823178346432764876774653
743657438581483627868653873465

The most important thing here is not to get the right answer, but to try. This type of exercise has been used by the military to improve attention for decades (now there are more advanced, computer-based, tools, but this keeps being fun).
Word Search
Have fun!

NAME

AFFILIATION

E-MAIL

PHONE

“Changing Seasons”

R A L O H C S F I R I D Q T A U U U M I
M A N A G E M E N T E D H V S A A V F
K P P Y C D S M I T A C A S N C R A L K
S A U G M C C E A O H R V O U G S A I D
A V B L N X Y R N D R S R O S G N W N
F E L K O I E R I J E A V R I G A E O Y
E M I Q R L D C O S E E P S E W C I R X
T E C W E Y A A O S E K T I R T S K T
Y N Y C T L B U E J I A R N O A G N N N
P T C L I G R O A R N V T F C E E O E E
R A O N R C I P H C Q E D I G N I W M M
O S U T E C D E E T R K L A I T N F P P
P A T S M O G R C N Z P N R A Y Z L L O
O L R N E M E T X P I B V E N G A O L
S T E A N P S T C A A J R W N H I K Y E
A Y A S T U X I Y R Q E J Q C K T E E V
L A C S H T N O D L S G R A V E L S E E
N E H E X E A N P E P C H A I N S A W D
K D K T G R L S R O W K E R S X V C
Y C T U A S P W E D I S D A O R Y B Y

Technical Assistance
Local Program
FHWA Proposal
Seasons
Snowflakes
Winter

Asphalt
Brine
Salt Spreaders
Application Rates
Roads Scholar
Flagger
Drainage
TIMS

Pavement
 Preservation
Public Relations
Operations
Tree Workers
Chainsaw
Curve Advisory
Plan Reading

Roadside Mowing
Asset Management
Hard Road
Employee Safety
Who’s The Boss
Gravel Roads
Accelerated

Bridges
Development
Work Force
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Resources

Be the first to complete this word search and send it to T² any of the following ways to win a FREE T² workshop!

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Words can be circled either upward, downward, backward, or diagonally.

UNH Technology Transfer Center Road Business

December 2017
The T2 Center is working to update your resources web page. If you have any suggestions on applicable resources or items you would like to see included, please contact us at t2.center@unh.edu

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(Links, book titles, videos, articles, documents, etc)