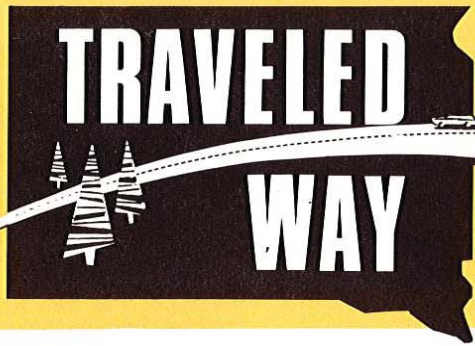


*the*



Congratulations to Cody Lorenz from the Office of Bridge Design for his winning design celebrating 100 years of the South Dakota Department of Transportation.

The 2017 issues of Connecting the DOT's will feature elements from past newsletters and include photos from state archives and submitted by employees or the public.

**Chapter 359 (H. B. 312) Creating the State Highway Department**

AN ACT Entitled, An Act to Repeal Chapter 233 of the Session Laws of South Dakota for the Year 1913, Relating to State Highway Commission; to Provide for State and Federal Aid in the Construction of Roads; to Create a State Highway Department, Define its Duties, Provide Penalties for Violation, and Procedure in the Establishment and Construction of Roads and Bridges.

Approved March 2, 1917

## Project Delivery Update

by Peggy Laurenz, Project Delivery

We continue to work on the improvements to project delivery and the project scheduling process. The last few months have been focused on revising the base network schedules in Primavera to better reflect current business practices. This has involved a lot of work from the scheduling team and also from many other DOT employees who provided input and helped to develop the new networks. In early February, we will begin using all new base network schedules to set schedules for projects.

The changes made to the base network schedules are in relation to the shift to the 8 year STIP, changes in business practices and ensuring proper work flow. A few of those changes include the following. Activity

durations were reviewed to ensure that the needed time was assigned. Relationships between predecessor and successor activities were reviewed to ensure that the right things were happening at the right time. Activities and steps were reviewed to ensure that the right work is included as well as the steps/tasks that fall within that activity are identified based on the project improvement type and scope. We have also been looking at previously unused parts of Primavera such as budgeted labor unit hours as part of implementing resource allocation features.

Starting in February, we will begin a process of applying the new base network schedules to all active projects managed in Primavera. Generally, this will involve moving



*Photo from the S.D. State Archives of the grading portion of a project to Onida, S.D. date unknown*

all existing data in each active project/PCN into one of the new base network schedules. After the data is transferred and reviewed, we will recalculate the schedule to determine project status towards meeting the planned completion date. If projects are behind schedule, we will work with the overall project team to determine steps to bring the project back on track.

We anticipate this being a lengthy and challenging process. Staff will begin working first on FY2024 projects and move forward in the STIP while also selecting some projects from 2018 or 2019 that need work on the schedule now. We will be communicating regularly with Primavera

users as to which projects are being worked on and any specific information they need during the review process. Going forward, we have identified multiple reschedule or review points in the life of a project.

The result of this effort is all of our projects will have accurate schedules that reflect current business practices and will be regularly updated so we can use the software to accurately determine project status. With the accurate status we will be able to provide analysis of projects and resources and have access to data that will assist the DOT to better predict project related needs into the future.



*Photo from the S.D. State Archives of the grading portion of a project to Onida, S.D. date unknown*

## 2016 Region Winter Meeting

by Rick Gordon, Operations Support

The statewide Region Winter Meeting was held in Pierre on Dec. 7-8, 2016. This meeting is an opportunity for the field engineering staff from across the state, along with central office staff, to get together and discuss current construction related topics in a face-to-face group setting.

It was well attended by staff from across

to most of them were provided ahead of time. The question and answer format, along with the subsequent discussions that are held, are one method utilized on an annual basis to continuously look for ways to improve the services we provide.

**Mitch Nachtigall** with the SDNG outlined methods an organization can use to improve its

steps to follow, as well as for identifying potential efficiencies and areas of improvement. The topic of innovation was also stressed and how important it is to allow employees the opportunity to communicate their ideas.

**Jared Pfaff**, project engineer, and **Greg Aalberg**, engineering supervisor, from the Sioux Falls area office talked about the current I-29 / I-229 Interchange project that is utilizing “Next Generation Concrete”. They have noticed improvement in smoothness as well as a great reduction in traffic noise so far. There are homes nearby and the intent was to reduce vehicle noise without constructing a sound barrier wall. Other innovative products were also used such as a radar device that detected changes in traffic volumes. The system would send pertinent information to message boards that were placed in advanced of the work zones, warning motorists of delays and to use alternate routes. This same type of traffic warning system has been used at the Sturgis Rally the past two years.

**Dave Huft**, Research program manager, gave an update on numerous projects that the Research office is actively working on. If you would like to be involved with research projects in an effort to improve our processes, feel free to contact Dave at 605.773.3358.

**Craig Smith**, Mitchell region engineer, provided an update on AGC / DOT work group topics and post construction surveys. Contractor staff was asked to rate the DOT's service on their projects and the goal is to have 85% or more of them rated as “Satisfied” or “Extremely Satisfied”. Regarding the *Project Scheduling work group*, training on Microsoft Project scheduling software is being pursued.

**Ryan Johnson**, specifications engineer, gave an overview of numerous recent Operations Support policy updates that have been made to better align them with language used in the 2015 Spec Book. Progress will continue toward updating old policies, and eliminating others when warranted.

**Greg Fuller**, director of Operations, talked about making project decisions in the field.



*Photo of an old V-plow and wing mounted on a loader. date taken unknown, came from Wayne Cramer's old files.*

the state. Information was presented to the group from DOT, BHR Benefits, DENR and by a speaker from the S.D. National Guard (SDNG) who spoke on the topic of “continuous improvement”.

Questions were solicited from both the field and central offices before the meeting, and answers

processes. These include mapping processes to not only identify ways to improve them, but also to show someone else how to do your job if you are gone. It is important to involve those who are actually doing the work when mapping a process. They can provide valuable input for detailing which

## ***The Project Final is Not Completed Until the Paperwork is Done***

*by Rod Gall, Yankton area engineer*

As most project engineers sit at their desks this time of year trying to get a handle of all the projects they completed last summer, maybe a thought should arise. If I would have done this when the project was going on, I wouldn't be searching for the information now. This seems to be the thought process for most project engineers across the state. For many years, our work culture has dictated that we work on projects in the summer and when winter comes, sit at the desk and start the paperwork, checking bid items and quantities and making sure that we have all our certifications and other needed paperwork.

Although this has gotten us by in the past, maybe it is time to look for a better way. During this past year, I was on a statewide operations action plan group tasked with improving the finaling process. We started by looking at the flow chart that was created a few years ago with the purpose of helping project engineers go through the finaling procedure. We added some best practices and some time lines to get certain things completed.

Also, we looked at how to increase efficiency with getting the paperwork and certs from the contractors back to us. Finally, we needed to determine a way to assess how much time these steps were taking. Using information from the CMP system, we were able to calculate how long it took from the accepted completion date to the time it was sent to Pierre for review.

For an example of how this can be implemented, let's look at my office. In the Yankton Area, about 5 years ago, we decided to start measuring (by days) the time from when the project engineer declared the project complete until the day the final was sent in to Pierre for review. At this point, even though the final is not fully complete, the project engineer has at least done their part. Next, the operations finals engineer must go through their process before it is sent to FWHA to be approved before the final payment is made and the contractor can get his money. We used a spreadsheet to track each project and project engineer with the number of days it took for the final to be completed.

This has given our office a measure that we keep track of and use to see if we are improving. Of course, we acknowledge there are lots of variables for each engineer from year to year. Some may have smaller projects like chip seals and crack seal jobs which can be finalized in a very short time, while others may have had only one complex urban job with hundreds of bid items which takes a lot longer. These factors are all taken into account for when we compare years and calculate progress.

The thing that we would like to really improve on is the culture of when we start and complete finals. Like I said earlier, it has always been winter when we get started on finaling projects, but why not do them during the project or even immediately after the project is completed? We recognize that sometimes it is not possible, but by finalizing smaller projects such as chip seal, crack seal, small box culverts, and other small projects, especially in the spring or summer, this frees up valuable time in the winter to accomplish other important tasks. Another benefit of

completing the finals right away is that any issues that arise are dealt with while the project is still fresh. Also, communications with the contractors are easier when discussing final quantities, allowing them to check quantities and also getting certifications to us before they are off the job. As you can see, by doing these things early, we can be more efficient and use our time more wisely. In addition, the tracking system we use will give us a concrete way to show us how we are improving our final times. Our culture of doing finaling only in the winter can change if we just try. Letting finals go on for years should not be accepted. With MST, CMP, and doing everything on computers, it should not be difficult to get finals done quicker and more accurately so contractors can get their final payments and get on to the next project.

Yes, project finals are not finished until the paperwork is completed but let's not sit on the pot until things start to stink before we begin the final process.

## Winter Meeting continued

The importance of first fully understanding the problem and why it needs to be solved, was stressed during the discussion. Once the problem is defined, it is important to know who will be affected by the decision and if there is a deadline to meet. The technical experts that are often relied on when gathering information are a valuable resource, but they are available to provide guidance. The ultimate decisions come from the field offices, because they are administering the project contracts. Once a decision is made, ensure it is communicated to all affected parties in a timely manner.

**Peggy Laurenz**, Project Delivery office, talked about the Primavera software and project delivery. A goal in project delivery is to let 80% of projects by Oct. 1, of each year - and this is normally met. Another goal is to let 75% of projects by March 1 of each year; however, this goal is usually not met. It is important to update start and end dates in Primavera for all activities, such as preliminary surveys, as this helps keep projects on schedule. Also, accurate coding in TKS

of time spent working on preliminary activities allows Primavera to develop realistic durations for project scheduling purposes.

**Brian Raecke**, chief Road Design engineer, gave a presentation on the new Bluebeam software



*Photo from the S.D. State Archives of the grading portion of a project to Onida, S.D. date unknown*

that is being used for plan reviews. The software uses cloud technology in a secure application. Users are able to see other reviewers' comments being made in real time, and comments are automatically saved. The software also allows outside agencies to provide comments concurrently. Online video training on the software will be provided in the near future.

**Hadly Eisenbeisz**, bridge construction

engineer, **Darin Hodges**, concrete engineer, and **Rick Rowen**, bituminous engineer, all gave informative presentations on their latest respective topics and how they affect field staff during project construction. Hadly talked about new

DOT does the acceptance profiling. Rick presented numerous topics such as the new specification updates and that the gyratory compactor will be used for Class D, E, G, HR, and Composite mix designs. He also noted that 1% below 94% compaction on asphalt pavements results in a 10% reduction in pavement life.

**Jill Kruger** and **Kari Senger** from BHR updated the group on the latest health plan changes, and provided valuable information on the benefits within the new plan. Some good questions were answered regarding the different types of savings and spending accounts that are now offered to employees.

**Laura Newman** from DENR and **Tom Lehmkuhl** (DOT Environmental Engineer) provided information on current environmental topics and how they will relate to administering construction projects in the field.

**Thank you** to everyone who gave presentations, provided questions and answers, as well as helped set up and take down equipment for the meeting!

specifications for bridge deck concrete and steel structures, and how bridge falsework now needs written certification from a registered PE (Professional Engineer) that it was built according to the approved shop plans. Darin discussed a change in the IRI (International Roughness Index) PCCP (Portland Concrete Cement Pavement) Smoothness provision that allows the contractor to grind concrete pavement before

## **Senate Bill 1 impact: state system**

*by Julie Bolding, management analyst*

### **6-cent gas and motor vehicle excise tax increases put \$73 million more in State Highway Fund**

The 2015 gas and motor vehicle excise tax increases provided \$73 million in additional revenue for the State Highway System in state fiscal year 2016, close to the \$68.5 million estimated when the increases were approved in 2015, Secretary Darin Bergquist told legislators in January.

The six-cent gas tax increase added \$43 million to State Highway Fund revenues. The motor vehicle excise tax increase from three to four percent produced \$30 million in additional revenue in fiscal year 2016.

2016 was the first full year of the extra revenues. The increases took effect April 1, 2015, three months before the end of state fiscal year 2015, so the increases are contrasted with 2014 revenues. Gas tax and motor vehicle excise tax revenues make up more than three-quarters of State Highway Fund revenues, which totaled \$315 million in 2016.

These state funds are used for winter and other maintenance activities and equipment, and to match federal construction and preservation funding. Under the 2015 law, \$7 million from increased revenues from increased license plate fees will be used to fund the newly created Local Bridge Improvement Grant (BIG) Fund intended to fund much needed repairs to structures off the state highway system. In addition, the South Dakota Transportation Commission committed an additional \$2 million in state highway funds to the newly created program. Once the previously programmed federally funded local bridge projects are complete, the Transportation Commission has committed an additional \$6 million in state highway funds for the BIG program.

### ***Department meets pavement and bridge condition goals***

In his departmental update to the House and Senate transportation committees, Bergquist also told legislators that 84 percent of State Highway System pavements are in good condition or better, above the current target of 80 percent. Ninety-six percent of bridges are in fair or better condition, above the current target of 95 percent.

Under the same 2015 state law authorizing the increases, the state Department of Transportation is required to report overall pavement and bridge conditions to the House and Senate transportation committees by the fourth Tuesday in January of each legislative session.

The Fixing America's Surface Transportation (FAST) Act, the five-year federal highway bill passed in Dec. 2015, provided five percent more funding, or about \$13 million, in federal fiscal year 2016, and was projected to increase two percent a year through federal 2020.

However, Congress hasn't approved a budget for federal 2017, only a continuing resolution, so South Dakota and other states are receiving the lesser 2016 amount. Bergquist expects Congress will make up the difference when it passes a federal budget sometime before the continuing resolution expires in April.

The department is encouraging South Dakota's congressional delegation to work to include rural infrastructure needs in any infrastructure legislation considered by the new Congress, but current discussion involves private investment and borrowing for megaprojects or tolling projects that wouldn't apply to South Dakota. He doesn't expect any action regarding infrastructure in 2017.

At both the House and Senate transportation committee hearings, Bergquist said State Highway System pavement conditions are trending slowly downward.

"We talked about at the time of Senate Bill 1's consideration how much would be needed to maintain our pavements in the same condition that they are today each year. That identified figure was \$140 million a year. Out of Senate Bill 1, we anticipated about \$70 million a year and accepted the fact that the condition of our pavements was going to decline with that level of investment.

"Part of the thought behind that was that the additional revenue greatly flattened out the speed of that decline, and if you look in the next five years, we're at or going to be really close to our goal of 80

## ***Evolution of SDDOT's Learning Management***

*by Ann Campbell, Training and Development coordinator*

Training has always been a key to our organization success given the technical nature of our work. In FY2014, SDDOT began the work of developing a formalized and centralized SDDOT Training Program to enhance our training effort. Developing, engaging, and empowering our supervisors to provide a high quality workforce was one of the main strategic objectives identified in the strategic planning process for the department. This will enable g our workforce to engage in the training they need to be proficient and efficient at their jobs as training directly impacts the quality of our services, processes, and products.

Our biggest challenge has been prioritizing and coordinating the resources to ensure department wide alignment is achieved and all staff has access to quality training. Since there is limited time throughout the year to attend training, it can become a challenge to prioritize the individual training courses as not every training class can be offered. When we first began the work of organizing the resources, training requirements, and prioritizing offerings, it quickly became clear that we needed a formal process to manage training requests coming from employees across the department.

In response to the need, a formal training process was created. This process included the Training Oversight Board (TOB) whose purpose is to provide oversight, strategy, and prioritization to the training related activities within the department. The TOB is comprised of department leadership- DOT secretary, deputy secretary, division directors, a region engineer representative and a pogram manager representative. This group's responsibility is to ensure training

initiatives are aligned with strategic objectives, acts upon recommendations made by the Standing Training Groups (STGs) and supports the prioritization of training development.

Small work groups or STGs were developed to oversee the training development and current training resources for assigned disciplines. Initially there were eight groups, but subsequently these groups were consolidated down to five groups. The remaining three groups have a focused target audience according to the content area they are responsible for and they meet when the need presents itself. The STG's are: Construction and Materials, Design, Planning, MOST and Skills Development. The consolidated subgroups are Survey, Structures and Asset Management.

The department has a vast amount of training resources available to staff. We are one of four states that participate in the Transportation Learning Network (TLN). During each training season there are approximately 50-60 courses offered by TLN through the video conference sites. The department also hosts in-house training delivered by content experts on specific topics, such as ADA, ArcGIS, and maintenance management. Our in-house trainer Todd Hanson, has the ability to develop approximately 5-6 new online learning modules per year. We currently have 17 contract courses that will be offered during the spring of 2017 for various target audiences. In addition, we have access to several soft skills trainings and online learning through the Bureau of Human Resources, training from vendors when we purchase new equipment, numerous webinars and eLearning via the AASHTO learning management system, and NHI

*Continued on page 11*

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## ***State Systems continued***

percent in five years. Why is five years important? Because that's also when that federal highway bill will expire.

“So, at that time, once we get an idea of what the new federal highway bill will be, a chance to re-evaluate our conditions and our projections and determine again where we're at, where we believe we may go

and whether any additional adjustments need to be made. Certainly, for the next five years relative to our goal, we're in a very good position and condition,” he said.

The situation with state-owned bridge conditions is similar, he said.

## **Senate Bill 1 impact: local systems**

*by Julie Bolding, Management Analyst*

### **License plate fee and wheel tax increases provide \$26.3 million in new money for local roads and bridges**

License plate and wheel tax revenues for local roads and bridges grew by \$26.3 million in state fiscal year 2016, the South Dakota House and Senate transportation committees were told in January.

License plate fees, as motor vehicle registration fees are commonly called, increased 20 percent in 2015, raising \$22.5 million more in 2016, the first full year the increase was in effect, than in 2014, Secretary Bergquist said. The increases were part of Senate Bill 1, passed during the 2015 legislative session and effective April 1, 2015.

Counties were allowed to increase wheel taxes from \$4 to \$5 per wheel, and on up to 12 instead of four wheels, raising an additional \$3.8 million.

Sixteen counties enacted a new wheel tax after Senate Bill 1 was approved, making for 58 counties levying wheel taxes. Eighteen counties with wheel taxes increased them.

Counties can use their license plate and wheel tax revenues to maintain and construct county roads and bridges, but the money raised locally is small compared to needs on local systems, especially in rural counties with low numbers of residents. The state supplements those amounts with \$54 million in federal and state funding channeled through the state Department of Transportation in numerous ways, which Bergquist outlined.

A percentage of the state's federal Surface Transportation Program funding, currently \$27 million, is allocated by formula to counties and Class I cities to be used on roads eligible for federal aid. In the past, local entities could accumulate their annual portions until the amount was large enough to fund a project.

In 2016, the funds in these savings accounts were distributed with state highway funds to the respective local governments. Now the locals' annual federal funding will be swapped for state funding each year. State funds can be expended without the need to meet costly federal-aid requirements, allowing local

governments to make the most of those dollars. In return, the state uses their federal funding on the state system.

Before Senate Bill 1, local governments also received a portion of the state's federal bridge funding. Two million dollars of the \$8 million allocated for local bridges paid for biennial inspections of all bridges on local public roads. The remaining \$6 million was allocated on a first-come, first-served basis to local bridge projects. The \$6 million continues to be used to whittle down a pre-existing backlog of those local bridge projects.

When local bridge projects already in the STIP are completed, \$6 million in state highway funds will go into the new Local Bridge Improvement Grant (BIG) fund, which gets \$7 million of the additional motor vehicle registration revenue, and an additional \$2 million from the State Highway Fund. In total, the BIG fund will ultimately receive \$15 million annually to allocate for local bridge repair and replacement.

In order to qualify for BIG grants, a county must have a wheel tax and transportation plan. Grants only pay part of costs for preliminary engineering, repair and construction. Counties must pay some of the expense of each project given a grant.

Finally, \$2 million more of State Highway Fund money was added by the Transportation Commission to the \$2 million in economic development grants provided annually to local governments for industrial park roads and roads to new agribusinesses, and to counties and cities with less than 5,000 people to improve important community streets.

The first BIG fund grants totaling \$9 million were made in February and April 2016. Out of 99 grant requests, 40 grants were made for preliminary bridge engineering costs, 14 for repair and five for replacement. One hundred and nine applications have been received for the \$9 million available in 2017.

"While this is certainly a very good program in helping address that backlog of need on the local



## Mentoring Corner

by Alison Sfreddo

### Sharpening Your Problem Solving Skills

#### Upcoming Events:

Mentoring Program Registration Opens – March 24, 2017

Watch for an email from Secretary Bergquist in late March

Challenges and changes are a part of everyday life – both personally and professionally. Instead of watching them mount or negatively affect the bottom line, the best way to overcome them is to acknowledge the challenge at hand, develop a strategy to solve it and ensure it is not repeated. Although this may seem to be easier said than done, with a thoughtful approach to planning, a problem can be solved with minimal impact. The most effective leaders and problem solvers have developed strategies that they put into practice when overcoming every day challenges and organizational obstacles. The following are some of the basic steps for sound problem solving:

**Assess how the challenge or obstacle affects the big picture and key stakeholders.** It is much easier to see a problem from the perspective of how it affects you individually, but quite another to view how it effects the entire group or organization. This will be critical when determining the solution.

**Take stock of all viewpoints and eliminate biases.** When soliciting suggestions on how to solve a problem, be sure that everyone's voice is heard and respected. Preconceived notions or perceptions can

cloud or dismiss what could actually be a very good idea.

**Reach out to others for ideas.** Many times when faced with a tough problem, people tend to solicit feedback and ideas from their inner circle alone. This could be unproductive in the workplace as many problems are organizational and would benefit from the ideas of the collective group – especially when decision making affects everyone.

**Be willing to make adjustments as needed.** Solving a problem is a process and should always include evaluating whether the solution is working or not. Oftentimes there are a number of issues or nuances that were not first considered. Effective problem solving saves room for further adjustments.

*Reprinted with permission from The Training Connection Newsletter*



*This fleet of dump trucks was upfitted by Drake Equipment for the State of South Dakota Transportation Dept. in the 1960s. (origin unknown)*

## Local Systems continued

structure side of the things, one of the concerning things, maybe, as we move forward, if you look at the types of grants that were given in the last year, 40 of the 59 went for preliminary engineering. This is the design and the hydraulics and that type of thing that goes into getting a bridge ready to be reconstructed.

“So as those projects that have gotten preliminary engineering grants and have gotten started, the number of grants [applications] and the number of bridges that are going to be ready for construction is going to grow in future years. We're already getting way more

applications than can be funded under the program. I think that amount of need is going to grow instead of get smaller in coming years,” he said.

Local governments also receive federal funding through the state agency for signing, safety projects, planning, research and certain community-oriented special projects. Altogether, \$54 million in federal and state funding goes through the SDDOT to help local governments with their roads and bridges in addition to revenues raised locally.

## Local Government Assistance

*by Laurie Schultz, Administration program manager*

Change is the act of making or becoming different. In the last two years there have been a large number of changes in the Office of Local Government Assistance (LGA). We have eliminated programs, added programs, and revised programs. Thanks to staff members who are resilient, creative, and out-of-the-box thinkers, these changes are being incorporated into daily work schedules.

The eliminated programs included the federal-aid Surface Transportation Program (STP) projects previously completed on behalf of the counties and Class I cities. These projects were previously instigated by the local governments through an annual submission of resolutions requesting projects be added to the STIP. Their federal allocations were banked by the DOT until adequate funds were available for their projects. Project plans were developed by consulting firms, under the direction of DOT staff; were let to bids by the DOT; and the construction management and oversight was done by the DOT.

These entities now receive state cash annually instead of having their federal fund allocations banked with the DOT. The exception to this is the City of Sioux Falls, at their request. Many of the city's federal-aid projects align with or cross into state projects requiring federal oversight and environmental coordination. The other exception to this is when a local government requests a State Infrastructure Bank (SIB) loan.

The federal aid Bridge Program is being phased out over the next several years. This program has been funded at a \$7.8 million level for a number of years. Funding for local bridge inspections comes off the top of this allocation, leaving approximately \$5.9 Million available for bridges. No additional projects were added to this program starting in 2015 and it is expected that by 2020 they will all be let to bids.

The primary reason for most of the changes is the desire to put less restrictions and bureaucracy on the local governments. When they receive state highway funds, they are free to expend these funds wherever their highway and bridge needs exist, not just on federal-aid routes. There is also the elimination of Federal Highway oversight and special conditions placed on those projects such as wage rates and Buy-America requirements. Projects let to bids locally are normally cheaper than those let to bids by the DOT, and local contractors have a greater ability to bid on

these projects.

Another reason for a number of the changes in LGA is due to Senate Bill 1, passed in 2015. This created the Bridge Improvement Grant (BIG) program. It also required the counties have a department-approved "5 Year Highway and Bridge Improvement Plan". The LGA staff had to write Administrative Rules, create procedures, guidelines, forms and checklists to oversee these two new programs. So far we have completed one round of grant awards.

The grant program was funded by the legislators at \$7 Million per year from license plate fees. The DOT added an additional \$2 million for a total of \$9 million available each year. In 2019, the DOT will add another \$6 million in state funds to bring the program total to \$15 million each year.

The first round of BIG applications included 100 applications from 7 cities and 30 counties. The grant requests totaled \$17.3 million. There were 59 grants awarded for preliminary engineering, preservation work, and replacement projects.

The second round of applications was due January 2. We received 112 applications from 9 cities and 38 counties. The grant requests total \$21.4 million. The applications need to be reviewed and ranked by staff members prior to consideration and approval by the Transportation Commission at the April 27 meeting.

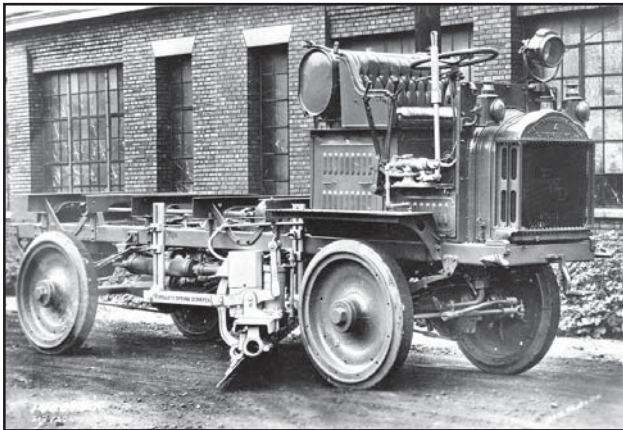
When the STP program was eliminated and the BIG program was created, there was natural anxiety among the staff members on what their new roles and responsibilities would be, or if they would have a job in the future. In addition, County Highway and Bridge Improvement Plans were never required before, so decisions had to be made on how restrictive or lenient we would need to be. Decisions also had to be made on how much oversight was needed for the BIG projects, and how much authority the department needed to retain. There were pros and cons to each decision that had to be made, and approved.

Yes, change has impacted LGA programs, and they are now different. But the overall function and responsibility of providing training, information, and project coordination for our local government partners has not changed. LGA staff members are still the advocates and supporters of local governments in South Dakota. Because of their personal resilience, they have weathered the change.

## Learning Management continued

specialized trainings.

In 2017 the Training Program will begin the work of implementing a Learning Management System to help manage the department's training resources and training requirements. Over the past few years, we have researched how other DOT's managed their training programs and the accompanying Learning Management Systems. In 2015, a DOT work-group released a Request for Information (RFI) for Learning Management System providers. Three companies were evaluated and interviewed. This gave us a better understanding of the capabilities of an LMS. In 2016, the work-group (expanded) released a Request for Proposals (RFP) for an LMS. Eight companies provide proposals and these were evaluated according to criteria outlined by SDCL 5-18D-18. The work group then narrowed its focus to the top three candidates. After careful consideration, criteria ratings, interviews, reference checks and demonstrations, the group selected Cornerstone OnDemand. Cornerstone



*Possibly an old road grader. Photo from State Archives, date unknown.*

OnDemand, Inc. is a cloud-based learning and talent management solutions provider headquartered in Santa Monica, California, and has been in business since 1999. Cornerstone OnDemand is a leader in their industry and proven experts at learning management.

Over the next six months, we will work with Cornerstone OnDemand on the configuration and implementation of their LMS product for SDDOT. Our goal for the new SDDOT LMS is to accomplish the following in the next six months:

- **Deliver targeted employee training**
- **Improve training development & delivery**
- **Increase employee engagement with collaborative learning**
- **Create relevant, social learning programs that are accessible anytime, anywhere**
- **Inspire a culture of continuous learning and development**

Automate the administration and oversight of employee compliance training

A special thank you goes out to LMS RFI/RFP work group members:

Jan Talley - Finance Accounting Manager  
 Jess Powell - Safety Coordinator  
 Joe Feller - Materials & Surfacing Engineer  
 Mark Peterson - Aberdeen Region Ops. Engineer  
 Brad Norrid - Winner Project Engineer Supervisor  
 Todd Hanson - DOT Trainer  
 Keith Johnson - Pierre Area HM Supervisor  
 Kristi Sandal - Communications Manager  
 Amanda Olson - Training Assistant  
 Doug Sherman - Winner Area Engineer  
 Julie Bolding (constructed RFP) -Mgmt. Analyst

## Longevity

Brooke White	15	Sioux Falls
Jeff Brosz	30	Transportation Inv. Mgmt.
Kim Zerr	10	Transportation Inv. Mgmt.
Steven Schneider	10	Sioux Falls Area
Karla Engle	15	Legal Counsel
Robert Clouser	15	Huron Area
Stephen Crane	25	Aberdeen Region
Neil Filler	10	Mobridge Area
Debra Nielsen	40	Brookings

## ***TRAC: Float like a Butterfly, Sting Like a Bee***

*by Naomi Fossen, Rapid City region design engineer*

### *TRAC – Kadoka High School & MagLev Module*

“What is Newton’s First Law? Newton’s Second Law?” If you’re like most, you may have to consult Google for a quick refresher. The senior class at Kadoka High School learned all about Newton’s Laws of Motion in December through the TRAC (TRansportation and Civil Engineering) Program.

You’ve probably heard a lot about the TRAC program over the past year and read several articles on the topic in past newsletters. TRAC consists of seven education modules taught in high school classrooms that not only align with current teaching standards, but are also geared towards providing students hands-on activities to motivate them to consider careers in engineering and science. TRAC Teacher Training was held in June 2016, which provided teachers, such as Julie Hermann from Kadoka, in-depth training in all seven modules. Ms. Hermann chose the MagLev (magnetic levitation) module for her senior class because of the design phase and competition component.

To kick off the MagLev module, Harry Johnston (Rapid City area project engineer) and Naomi Fossen (Rapid City region design engineer) spoke to the class about their background and what they do on a day-to-day basis with the DOT. Harry and Naomi touched on the future need for engineers, different specialties within civil engineering and the life of a DOT project from design to construction. The students were also refreshed on the physics behind the MagLev module including Newton’s Laws of Motion, velocity,

acceleration and roadway characteristics.

A great example of how these components play into a real world application is the High Friction Surface Treatment (HFST) work recently completed in the Black Hills. Harry was the project engineer during construction of the HFST; he provided great insight and knowledge into the construction aspect and also shared a video of the actual application process. Naomi has designed HFST projects and was able to share the importance of roadway safety treatments such as proper speed limits signs and surface treatments near sharp curves. “The students were surprised and amazed about the design process of roads and bridges. They didn’t realize the depths that go into designing roads; speed limits, curvatures or other design factors. Students specifically mentioned the “sandpaper” road design (i.e. HFST) for the curves near Deadwood. They really enjoyed seeing pictures and hearing about the construction side of engineering,” added Ms. Hermann.

The most popular activity with the MagLev module is called, “Float like a Butterfly, Sting like a Bee”, a competition in which students design, construct, and race vehicles. “The students designed cars out of Styrofoam and raced them on a magnetic track. The speed of the car on the track depended on the aerodynamic design and placement of the magnets,” described Ms. Hermann. The students applied what they learned about laws of motion, balance, and aerodynamics into the design of their vehicles.



*Finished vehicles designed by each student.*



*Students voting for their favorite vehicle.*

*Continued on page 13*

## TRAC continued

DOT staff from the Rapid City Area (Jason Baker, Naomi Fossen, and Harry Johnston) were present for Race Day in December. They served as unbiased race facilitators and also chose the recipient of “Judge’s Choice” based on the design and performance of the vehicle.



*Setting up the MagLev track.*



*Preparing to race a student's vehicle.*



*Race Day Award Winners*

### Awards for:

- Fastest Car
- People's Choice
- Judge's Choice
- Lightest Car
- Slowest Car

One common goal with the TRAC program is to make science and engineering more interesting to students. Ms. Hermann decided to implement the TRAC program in her classroom this year because she thought it would increase student interest towards college and the engineering field because of the hands-on experience of creating and designing a project car as well as the competition aspect.

“Students thought the project was neat and a nice

change of pace from the regular classroom. They loved the hands-on experience as well as seeing everyone else's designs. I had one student who told another staff member that she never considered the engineering field until she completed this module. She is now considering the engineering field,” Ms. Hermann shared, who is interested in continuing the TRAC program in her classroom and implementing more modules in the future.

# ArcGIS Tips and Tricks

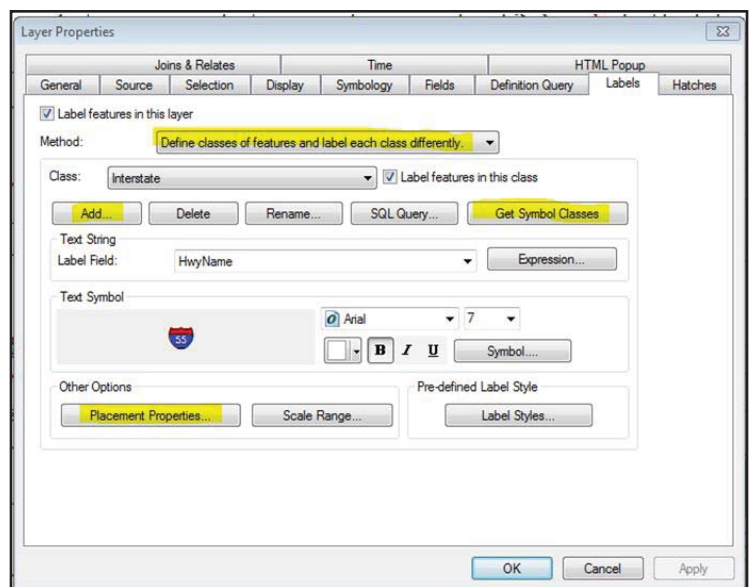
by Kimberly Zerr, Data Inventory

## Advanced Labeling

Labeling adds descriptive text to features on a map based on values from the attribute table. Setting the right properties is sometimes difficult, but there are a couple tricks I like to use when I work with labels; label classes and the Maplex Label Engine.

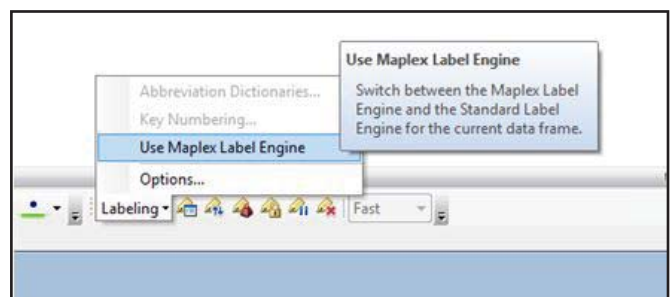
Label classes are found in the Properties dialog box and allow the user to label the same feature in different ways. For example, state highways are one feature with three labels; a label for interstates, US highways, and state highways. Label classes are set by choosing the Method (first highlight in the graphic below) and adding a class in the Labels tab (Add button), or by taking symbol classes created in the Symbology tab (Get Symbol Classes button). The Placement Properties button allows me to set rules for label placement using the selected label engine.

To create a label class using the Add button, I need to create a SQL query to determine which features are in the class. The process is simple: click Add, give the label class a name, and then create a SQL query. Creating a SQL query is just like doing a definition query or selecting by attributes from the attribute table. For example, here is the query for interstates: (HighwayClass = 'IN') and (Direction = 'E' or Direction = 'N'). The direction is added so only one label appears in both directions. If not all of the highways in a label class have a direction (like US Highways), the first part of my query would include a blank for direction: (Direction = ' ' or Direction = 'E' or Direction = 'N'). This labels all highways without a direction as well as all eastbound and northbound routes. If I want the features in my new class to be labeled, I should make sure the box next to the Class dropdown is checked. This lets me choose whether or not all of my classes are labeled. Finally, I set my label field (in this case, the highway name) and make the labels look the way I want by using options in the Text Symbol box and Placement Properties to set automatic placement rules.



Creating labels based on symbol classes is an easier process. If I have a layer that is symbolized based on a field (i.e. highways), I use the Get Symbol Classes button to create label classes identical to the symbol classes. After that, the process for labeling the features, choosing text symbols and placement is the same.

Label placement is controlled by label engines within ArcMap. There are two labeling engines for dynamic (automatic) labels: the Standard Label Engine (which is the default) and the Maplex Label Engine. The Standard Label Engine provides fast labeling with basic placement rules. The Maplex Label Engine provides advanced rules for controlling the appearance and placement of labels such as how labels are oriented and formatted, how labels are placed in congested areas, and how ArcMap resolves conflicts between labels. The Maplex Engine is activated from the Labeling toolbar.



Do you have questions or comments for the GIS team? Let us know!

## **SDDOT TRAC Program in the news**

*republished with permission from West Region Transportation Workforce Center*

***South Dakota Department of Transportation  
Launches TRAC (Transportation and Civil Engineering) Educational Outreach Program  
Posted on January, 30th 2017***

The American Association of State Highway Transportation Officials (AASHTO) initiated the TRAC™ (Transportation and Civil Engineering) program as a mechanism to provide State Departments of Transportation across the United States with a standards-based educational outreach program designed to integrate hands-on transportation experience into middle and high school STEM classrooms. The program relies on partnerships between transportation professionals and teachers to bolster pre-college students' exposure to transportation careers and their interest in math and science by demonstrating "real world" applications. The AASHTO TRAC program provides eight TRAC modules to participating state departments of transportation and partner schools, which include a variety of hands-on activities, teachers' guides, equipment, software, and supplies. TRAC module topics include: bridge builder; highway development and the environment; highway safety; magnetic levitation; traffic technology; motion and the transportation engineer; roadway design and construction; and city planning. The program also provides training for participating professionals and teachers, and provides guidance to teachers on how to adapt the TRAC resources to their existing curriculum.

The South Dakota Department of Transportation (SDDOT), concerned about the need to fill

transportation positions as an increasing number of professionals reach retirement age, decided to launch a TRAC pilot program in the state in 2015. The pilot program was led by an oversight committee comprised of representatives from SDDOT, the Associated General Contractors, the Engineering Society, and Pierre Riggs High School. The pilot resulted in the implementation of three TRAC modules in physics and environmental science classes at the high school. Based on positive feedback from teachers, professionals, and students participating in the pilot program, the TRAC program will now be expanded to additional school districts in the coming school years.

The AASHTO TRAC™ program provides state DOTs concerned about attracting and recruiting new talent to their agencies with an avenue for partnering with education providers to heighten the awareness of teachers and students about the diverse opportunities in civil engineering and transportation professions and to spark enthusiasm among more young people about pursuing transportation careers.

For more information about the SDDOT TRAC program, visit: <http://trac.sddot.com/program>

The SDDOT website includes a video overview about the program, which provides great perspectives from actual participants.

For more information about AASHTO TRAC™ and RIDES program, visit: <http://trac.transportation.org>  
<http://wrtwc.org/success-stories/2017/south-dakota-department-of-transportation-launches-trac-transportation-and-civil-engineering-educational-outreach-program/>

## **Policy Updates**

"Construction Change Orders," DOT-OS-OC-14.1, has been approved. It only applies to projects let after Sept. 2, 2015.

"Monitoring Contract Time," DOT-OS-OC-16.0, replaces "Monitoring Contract Time," OC-1996-02.

## New Employees

Therkelsen, Thomas	Environmental Scientist II	Pierre	01/03/2017	New Hire
Buscher, Nate	Engineer I	Pierre	01/09/2017	New Hire
Voldseth, Richard	Environmental Scientist III	Pierre	01/09/2017	New Hire
Yija, Mandefrot	Engineer I	Mitchell	01/09/2017	New Hire
Loibl, Albert	Highway Maintenance Worker	Kadoka	01/09/2017	New Hire
Harvey, Andrew	Journey Transportation Tech	Rapid City	01/09/2017	New Hire
Ellis, Hailey	Engineer I	Winner	01/09/2017	New Hire
Ulmer, Cody	Highway Maintenance Worker	Yankton	01/09/2017	New Hire
Hieb, John	Highway Maintenance Worker	Aberdeen	01/09/2017	New Hire

## Babies!



Gwen & Bryan Schwartz are proud to announce the birth of their son, Logan Frederick, on Nov. 26, 2016. Logan weighed in at 6 lbs. 12 oz. and

measured 20 inches long.

Bryan works for Inventory Management in Aberdeen

Jennifer and Adrian Netterberg are proud to announce the birth of their son, Dalton James Netterberg who arrived on Saturday, Jan. 21, at 3:30 a.m., weighing in at 7 lbs .6oz., and 19 inches long. Dalton joins two older brothers Graham and Eli.

Jennifer is an appraiser in the ROW Program in Rapid City.



## Charitable Giving

In November 2016, the offices of Finance and Internals Services/Audit held a Biscuits & Gravy and Walking Taco fundraiser. Along with the dessert of the month - \$1,230.87 was raised to buy presents for several children chosen from the Angel Tree.

The office of Transportation Inventory Management once again held their coat and blanket drive that will be distributed to folks in need in the Pierre/Ft. Pierre area. 123 coats, 43 blankets, a variety of boots, hats, scarves and gloves, plus \$240 for the Holiday Meal Project was collected.

## Wedding Bells!

Nolan Merrill (Pierre native) married Paige Larsen (Emery native) in Rockwall, Texas on Oct. 1, 2016. They live and work in the Rockwall area. They married at the Rockwall Harbor and had their reception at the Hilton Harbor Hotel.

Nolan is the son of Lana Lambert who works in the Project Development office in Pierre.

