Federal Transportation Authorization Bill: What It Is And How It Affects You

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In 2003 Congress debates the new Transportation bill, which comes up for reauthorization every six years. Called T3 by some, the Transportation bill is the law that governs the management of federal transportation policy and the disbursement of federal funds to federal agencies, states, tribes, and municipalities. The bill reflects the long-term goals of Congress for our nation's roads, railways, ferries, and mass transit facilities.

Reauthorization is both an opportunity and a liability for tribal nations. For example, parts of the current Transportation Equity Act for the 21st Century (TEA21) that are beneficial to tribal roads programs could see reduced funding, or a reduction in program scope. On the other hand, pro-tribal Congressional delegates may succeed in passing transportation law that is beneficial to Tribes.

Since spring of this year, major transportation industry organizations, such as NAPA, ARTBA, and AASHTO, have been developing drafts of language for the transportation bill for review by the US Department of Transportation (USDOT). In addition to submitting copies of their preferred language to the USDOT, lobbyists for the various organizations also visit key congressional committee members such as the House Committee on Transportation and Infrastructure. A list of the members on the various committees can be found at the following Web site: <www.fhwa.dot.gov/reauthorization/links.htm>.

Reauthorization Resources
<www.istea.org>
<www.ncai.org>
<www.fhwa.dot.gov/reauthorization>
<www.fhwa.dot.gov/reauthorization/links.htm>

Who represents the transportation interests of Indian Country?
The National Congress of American Indians (NCAI) has established a Reauthorization Task Force that has solicited and compiled Reauthorization position papers and resolutions from across the country. The Inter Tribal Council of Arizona (ITCA), the United Southern and Eastern Tribes (USET), tribes of the Great Plains and Rocky Mountain region, the Navaho Nation, as well as northwestern tribes and Alaska have all contributed.

The NCAI Reauthorization Task Force has developed a summary of key points and has met with Neal McCaleb, BIA Assistant Secretary for Indian Affairs, Samuel Reid, USDOT Deputy Assistant Secretary for Governmental Affairs, and various members of congress.

Below are the core principles that guided the tribal proposal:

Adequately Fund the Tribal Transportation Program
The task forces sees adequate funding as an increase in Federal Highway funding for the Tribal Transportation Program (formerly IRR Program) from $275 million in FY2003 to not less than $500 million in FY2004, with stepped increases to $1 billion by FY2008.

Adequately Fund Tribal Maintenance Needs
An elimination of gross underfunding of Tribal Transportation Program maintenance needs would have the Department of Interior (DOI) Road Maintenance increase funding to $127 million annually and establish supplemental transportation maintenance funding from the Highway Trust Fund of $70 million annually.

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St. Croix Chippewa Indians
St. Regis Band of Mohawk Indians
Tonawanda Band of Seneca Indians
Tunica-Biloxi Indians of Louisiana
Tuscarora Nation of Indians
Unkecheene Nation
Upper Sioux Community
Wampanoag Tribe of Gay Head Aquinnah
White Earth Band of Chippewa Indians

Editor’s Corner

A New Editor and a New Pathways

I would like to introduce myself as your new editor for the new Pathways. With this issue, Pathways has some format changes that I think you’ll find useful.

As before, our page one article has important information for the tribal transportation community, which for this issue is an article on the Federal Transportation Authorization Bill. Page three directs you to some useful information resources available through our office. Page four will highlight technologies and practices being used in the transportation industry. In this issue we highlight automated machine control, a technology that uses GIS tools to make heavy equipment operation more efficient.

On pages six and seven, we’ll announce training, conferences, and events happening in our region. We have several equipment training sessions scheduled this spring, as well as several important conferences/meetings. As always, if you are interested in having particular training in your area, just let us know and we’ll set it up.

Don’t forget, Pathways is a publication for you, and I encourage you to give us some input on what you’d like to see here. Better yet, if you have an article you’d like to submit or a story that you’d like us to tell, let us know. You don’t have to write the article: We are perfectly happy to hear from you about something you find important, and we’ll write the article.

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Pathways is published quarterly by the Tribal Technical Assistance Program, in the Michigan Tech Transportation Institute at Michigan Technological University. The Tribal Technical Assistance Program is part of a nationwide effort jointly financed by the Federal Highway Administration (FHWA) and the Bureau of Indian Affairs (BIA). It intends to relay the latest technology and information on tribal roads and bridges, tourism, recreational travel, and related economic development to tribal transportation and planning personnel. TTAP’s regional tribes are those in the Minneapolis and Eastern BIA Regions. Contact the TTAP office for a free Pathways subscription, or to submit articles and suggestions.

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Michigan Technological University is an equal opportunity educational institution/equal opportunity employer.
Pathways is printed on recycled paper (15% post-consumer waste, 50% total) with soy-based ink.
New in the TTAP Library

**American Indian Law in a Nutshell**
A succinct 336 page legal reference covering federal Indian Law and the governmental policies underlying it.

**Gravel Roads Maintenance and Design Manual**
A comprehensive manual addressing gravel road maintenance and design for planners, designers, and machine operators.

**Great Lakes Better Backroads Guidebook - Clean Water By Design**
A guidebook with practical and cost-effective methods for designing and maintaining non-paved backroads in the Great Lakes region.

**American Indian Sovereignty and the US Supreme Court: The Masking of Justice**
"A relentless in depth examination of the manner in which the Supreme Court dealt with Indian cases in the last half of the nineteenth century and early part of this century." - Vine Deloria Jr.

**Innovative Approaches to Transportation - A Guidebook**
The USDA Forest Service guidebook provides strategies for state, local, federal, and tribal cooperation for transportation planning.

**USDA Forest Service Road Planning & Maintenance Videos**
1 Forest Roads & the Environment
2 Reading the Traveled Way
3 Reading Beyond the Traveled Way
4 Smoothing and Reshaping the Traveled Way
5 Maintaining the Ditch and Surface Cross Drains
Today, if you’re building a road, using 3-D machine guidance and machine control technology will take anywhere between 15 and 30% out of the cost of your earthmoving and preparation phases,” Mark Nichols told Roads & Bridges. “It eliminates the need to go out and put stakes in the ground, so you can significantly reduce your survey costs associated with the project.”

Nichols is the general manager of a brand new joint venture between Caterpillar Inc., Peoria, Ill., and Trimble Navigation Ltd., Dayton, Ohio, aimed at developing new and better machine control technologies tailored to fit Cat construction equipment. Before the joint venture was announced on March 15, Nichols was the division vice president for machine control and fleet management at Trimble’s Engineering and Construction Division. The joint venture is called Caterpillar Trimble Control Technologies LLC and is based in Dayton.

Until now automatic machine control systems have been aftermarket products that could be attached in about a day. Now the goal is to have the ability to ship the motor grader, dozer, scraper or excavator with the positioning and machine control system installed.

The operator in a motor grader equipped with a machine control system can sit in the cab and look at the jobsite on a graphic display. The contours of the site plan have already been programmed into the machine’s computer directly from the engineering drawings. The display tells the operator exactly where he is on the jobsite, how his blade is oriented and where dirt needs to be cut or filled.

The latest generation of machine control technologies has been around for only about three years. They use either a robotic total station or a GPS receiver to calculate the position and orientation of the machine in three dimensions. With the computer linked to the hydraulic valves on the machine, the system can change the orientation of the blade as the operator drives to get a flat surface or a crown on a roadbed or to cut a side slope or a complicated superelevation or vertical curve.

“With one of these systems on board, the operator can tell anywhere on the site how much fill material is needed,” commented Nichols, “so he can direct the driver of a truck, for example, more closely to where the material needs to be dumped, and therefore he has less distance to travel to push and spread that material. That increases his efficiency again.”

The improved productivity can lead to a quick return on investment and better profitability.

“You’ve got companies now that before would have a hard time investing $20,000 into a motor grader system, now are investing into a three-dimensional system at $100,000 and realizing the payback much quicker and are purchasing second and third systems much sooner,” Murray Lodge, national sales manager for equipment automation at Topcon Positioning Systems Inc., Pleasanton, Calif., told Road & Bridges.

Topcon has its own joint venture with Sauer-Danfoss Inc., Ames, Iowa, announced Feb. 2, 2001. Tim Kramer was with Sauer-Danfoss and became the general manager of the joint venture company, called TSD Integrated Controls. In the announcement, Kramer said the combination of his company’s strong position with equipment manufacturers and Topcon’s innovative positioning technology would “provide a standardized solution to the task of adding automated positioning and machine management control systems to off-highway equipment.”
Sauer-Danfoss makes engineered hydraulic systems and components for use primarily in applications of off-highway mobile equipment.

“By forming a joint venture with them,” said Lodge, “we’re actually able to go into the equipment manufacturers themselves now and provide the full solution so that we can actually install a system at the factory.”

In the first year of the joint venture, TSD Integrated Controls has partnered with more OEMs than all the other laser and machine control companies combined, according to Ray O’Connor, executive vice president of Topcon. The companies include Case Equipment, Caterpillar Paving Products, Cedarapids, CMI, Dynapac, Gomaco, Guntert & Zimmerman, Miller Formless, Power Curbers, Roadtec and Vogele America.

Different technologies for different folks

The operator can use the positioning system as a guide and manually do bulk earthwork, then switch to automatic machine control to do finish grading. With a robotic total station sitting on the site tracking the machine, the 3-D positioning system can achieve an accuracy of 0.03 ft. Using GPS, the machine can reach an accuracy of 0.1 ft.

Setting up a rotating laser at the jobsite and equipping the earthmoving machine with a receiver can get about the same accuracy as a total station, but only on a two-dimensional plane. The laser cannot track the machine up a vertical curve.

Sonic positioning systems have been around for about 15 years and need a reference to follow, such as a curb or string line, to establish an elevation.

The advantage of the total station is its control and precision. The disadvantage is that it requires one total station for every machine to be controlled on the jobsite. With a laser grade system, one laser can provide 2-D grade information to many machines. GPS can provide 3-D information to many machines on the jobsite, but it is not quite as accurate as a total station, which receives a signal from the earthmover, calculates its position and transmits the information back to the machine.

Innovation can thrive in tough times

Contractors are climbing on the electronic bandwagon—or at least the electronic earthmover—and increasing productivity and decreasing job times.

Lodge said the technologically less sophisticated side of Topcon’s business had gone through a little bit of a slowdown recently, but the machine control business was actually up from last year: “Contractors realize they’ve got to figure out a way to be more productive if they’re going to be competitive. And machine control does that for them.”

In fact, Lodge commented that automatic machine control was being written into the specifications for some federal and state highway construction jobs, because the agencies want tighter tolerances on grades and faster job completion times.

Nichols echoed the same thought: “What you see with an emerging technology, particularly one that has a very fast return on investment and a very distinct advantage in reducing the cost of doing earthmoving, what you see is even in times when there is an economic slowdown, that doesn’t necessarily mean that this type of technology slows down. In fact, it can continue to grow and often grows faster, because the astute contractor understands that by having this technology he can win business in a tougher economic environment because he can bid at a lower price and still make money by utilizing this class of technology.”

The following are descriptions of a few of the grade control products applicable to roadbed prep.

3-D grading

The BladePro 3D machine control system from Trimble combines its TerraModel software with position information and the BladePro dual control system to deliver an automated fine grading solution.

The system uses either a GPS receiver or a robotic total station to measure X, Y and Z coordinates and compares the current position to the preloaded digital terrain model of the project. The system automatically moves the blade to the correct cut or fill position, elevation and slope by directly controlling the machine’s hydraulic system.

BladePro 3D is available for dozers, graders, motor scrapers and carry-all scrapers.

Trimble announced the extension of its SiteVision GPS guidance and control product to excavators on March 19 at ConExpo-Con/Agg 2002. The system provides for accurate digging by programming the site design into a computer in the excavator’s cab and using GPS technology to calculate the position of the machine in 3-D on the site.
Advanced 3-D GPS

Topcon’s GPS+ incorporates the company’s Paradigm technology, which uses both GPS and GLONASS satellites to maintain signal lock even under adverse conditions. The result is higher accuracy and faster automatic performance, according to the company. Plus, in-band interference rejection and advanced multipath reduction cleans up the information received.

The operator can monitor the GPS+ on a touch screen in the cab. The System Five Control Box displays real-time design elevation and design slope, as well as real-time equipment location, distance to finish grade and actual cross slope. It works for GPS+ LPS (Topcon’s total station 3D machine control system), laser, sonic and cross-slope applications.

Topcon’s 3-D GPS system uses a digital terrain model to show the operator the equipment location on the jobsite, design elevation, design slope, actual blade slope and distance to finish grade.

Other Topcon products automatically control pavers, dozers or excavators. With 3D-GPS Automatic Grade Control, multiple machines can be operated from one base station and make rough grading directly from site plans.

EZ does it

The EZ-Blade Motorgrader System from AGL Construction Lasers & Machine Control Systems, Jacksonville, Ark., features an on-board grade and slope sensing system that provides uniform grade control over the entire job with minimal staking. The system can follow a curb, existing pavement, a string line or a laser reference.

EZ-Blade enables finish grading in one or two passes, according to AGL, instead of three or four and allows finish grading in second or third gear. It has a slope sensor that feeds precise information to the cab and a rotation sensor to ensure proper slope when the blade angle is changed.

EZ-Blade also features a laser receiver that allows the operator to set the reference point wherever the laser beam happens to hit the receiver, rather than needing to align the on-grade area of the receiver with the beam. The receiver will send information to move the blade up or down from that reference point.

Pro control

The Pro Control System is the latest in machine control from Laser Alignment, a Grand Rapids, Mich., division of Leica Geosystems. Laser Alignment makes a variety of construction lasers, pipe lasers and machine control solutions.

The Pro Control System is a proportional machine control system for dozers, scrapers, graders and skid loaders. It can function for manual control, fully automatic control using dual power masts, tilt control and 3-D GPS.

Like a laser shot

Laser Reference Inc., Campbell, Calif., makes a variety of construction lasers for grade checking, form setting, transferring elevations, land leveling, setting drop ceilings and other applications.

The L1-AS Servo Leveled Slope Laser, for instance, is designed for grading and pipeline contractors. It can shoot slopes of 0-9% in increments of 0.01% with an accuracy of 3/32 in. at 100 ft. It has an operating range of 1,000 ft. All the user has to do is set the unit on a tripod, dial in the desired slope and push the power button. The unit will level itself.

Level yourself

The PLP-5H/PLP-50 Automatic Self-Leveling Laser is one of a line of lasers suitable for roadbed prep from Pentax Corp., Englewood, Colo. The waterproof laser will level itself in seconds simply by turning it on. It uses an internal electronic leveling mechanism. The PLP-5H delivers an accuracy of ±10 in. with a measuring radius of 1.65-660 ft. The PLP-50 delivers an accuracy of ±12 in., with a measuring radius of 1.65-330 ft. The diode laser beam can rotate at 300 or 600 rpm.


Equipment Operation & Safety Training

TTAP schedules equipment operation and safety training at locations throughout the Eastern region. The training is open to anyone, but class size is limited, so be sure to plan ahead. If you would like to have training in your area, give us a call.

April 1-3, 2003
Heavy Equipment Training Eastern Cherokee Band, Cherokee, ND

April 8-10, 2003
Heavy Equipment Safety Tunica Biloxi Tribe, Marksville, LA

April 15-17, 2003
Heavy Equipment Safety Onondaga Nation, Nedrow, NY

April 22-24, 2003
Forklift & Heavy Equipment Shakopee Mdewakanton Sioux, Lower Sioux Res., Morton, MN

Conferences and Meetings

These events are sponsored by other organizations of interest to the TTAP community. Call us for more information.

Ninth Conference on the Application of Transportation Planning Methods (TRB)
Baton Rouge, LA
April 6-10, 2003

BIA/Tribal Transportation Meeting (Michigan)
Baraga, MI
April 15-16, 2003

North American Snow Conference
Quebec City, Quebec, Canada
April 27-30, 2003

BIA/Tribal Transportation Meeting (Wisconsin)
Green Bay, WI
April 29-30, 2003

PL93-638 Contracting Workshop
St. Regis Mohawk, Cornwall, Ontario, Canada
May 6-8, 2003
Experience College Life FREE this Summer!

The American Indian Workshop (AIW) introduces young (12-15 years old) Native American students to the excitement of a college education through investigation of biology, computers, or mathematics. You can gain confidence and learn to solve problems in science and computer-related activities as well as look at careers, meet role models, develop new skills, gain an awareness of your environment, investigate college life, and celebrate American Indian culture. You will also meet young people from other tribes and have plenty of time to enjoy recreational activities like swimming, movies, and sports.

During the Workshop, you will have an opportunity to:
- Investigate careers.
- Develop an awareness of your environment.
- Learn about college life.
- Meet young people from all over Michigan and the U.S.
- Build your own afternoon schedule with speakers and recreational activities.
- Meet and interact with role models.
- Celebrate American Indian accomplishments.

Students who are selected to attend the program and are residents of the state of Michigan will be awarded a full scholarship (including tuition, meals, housing, and lab fees). Students who are selected to attend the program and are non-Michigan residents must pay a fee of $465. Financial support for out-of-state applicants may be available through schools or tribal governments. This Workshop is supported by Michigan Technological University and the King-Chavez-Parks College Day Initiative.

The session takes place June 15 - 21, 2003. You can receive an application by calling the Michigan Tech University Summer Youth Program office at (906) 487-2219 or by visiting their Web site at <www.edopp.mtu.edu/sap/yp/fall/aiw/default.htm>.

At the Michigan Tech Summer Youth Web site, you can also find information about other programs specialized for particular groups and interests. The Summer Youth Web site is <www.edopp.mtu.edu/sap/yp/fall/>.

Eliminate the Obligation Limitation Deduction

Eliminating the Obligation Limitation exemption for the Tribal Transportation Program would restore former funding.

Ensure Adequate Transportation Planning Resources for Every Indian Tribe

Increasing tribal transportation planning funds from two percent to four percent of total appropriation and establishing a base minimum level of $35,000 for planning activities for each federally recognized tribe would provide adequate planning resources.

Augmenting the Tribal Transportation Program (formerly the IRR program) with an additional $100 million annually from the Federal Transit Administration (FTA) also contributes to planning resources.

Establish Tribal Programs in Every USDOT Modal Administration

To increase inter-agency cooperation, the Task Forces propose to establish Tribal Programs in Every USDOT Modal Administration:
- Tribal Transportation Safety Program ($50 million)
- Tribal Scenic Byways Program

Establish a Self-Determination/ Self-Governance Project in USDOT

A demonstration program allowing Indian tribes to enter into contracts or agreements directly with USDOT pursuant to the P.L. 93-638 would give greater self-determination.

Improve Tribal Partnerships with Federal, State and Local Governments

Government-to-government partnerships could be improved by implementing no-cost changes to Title 23.

Establish a Tribal Transportation Coordinating Committee

A Tribal Transportation Coordinating Committee (formerly known as IRR Coordinating Committee) would improve Federal transportation policy implementation for tribes.

Legislate Regulatory Improvements

Regulatory improvements could help the Federal/Tribal TEA-21 Negotiated Rulemaking Committee reach consensus on impasse issues. These issues included advance funding, Plans, Specifications & Estimates (PS&E) approvals, innovative financing, and Emergency Relief of Federally Owned Roads (ERFO). A new negotiated rulemaking committee must be established to implement the Tribal Transportation Program by both Federal and tribal governments and ensure that regulations facilitate, rather than hinder, sound transportation policies in Indian country.

Contact TTAP for more information about any of these issues or about T3.
P.L. 93-638 Construction Contracting Workshop

Best Western Parkway Inn & Conference Center
Cornwall, Ontario, Canada
May 5-7, 2003

This workshop provides important information on the fundamental law affecting federal/tribal cooperation, The Indian Self-Determination and Education Assistance Act, and is relevant for all tribal decision makers and state/federal officials. The workshop concentrates on the rules and policies of federally-funded construction projects. The rules apply to all construction contracts, not just transportation related projects.

For more information on the workshop and accommodations, contact TTAP by phone at 888-230-0688 or by fax at 906-487-1834.