

2015-17 BIENNIAL BUDGET REQUEST

UGPTI - AGENCY 627 | DENVER TOLLIVER, DIRECTOR

NDSU UPPER GREAT PLAINS
TRANSPORTATION INSTITUTE

HB1020

SENATE APPROPRIATIONS COMMITTEE

SENATOR RAY HOLMBERG, CHAIRMAN

MARCH 25, 2015



Agency Overview

The Upper Great Plains Transportation Institute was established at North Dakota State University in 1967 by the North Dakota Legislature to foster a better understanding of transportation's role in the state's economy.

- UGPTI's **research mission** is to conduct applied and advanced research in highway, transit, rail, air, and multimodal transportation to address the critical issues of the state and region and promote safe and efficient freight, passenger, and personal transportation.
- UGPTI's **educational mission** is to educate the transportation workforce of tomorrow through multidisciplinary curricula that focus on transportation economics, management, infrastructure planning, mobility, and supply chain logistics.
- UGPTI's **workforce development mission** is to improve the skills and knowledge of the existing workforce through technical and managerial training and the transfer of research results to practitioners.

UGPTI's multimodal research program provides timely and critical information to the North Dakota Legislature, state agencies, shippers, businesses, counties, townships, cities, and tribal governments. Some of UGPTI's research focus areas are:

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| <ul style="list-style-type: none">▪ Road infrastructure planning▪ Highway and motor carrier safety▪ Small urban and rural transit▪ Urban traffic analysis▪ Transportation information technology | <ul style="list-style-type: none">▪ Agricultural freight and logistics▪ Supply chain planning▪ Railroad transportation▪ Air services planning▪ Transportation security |
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UGPTI coordinates NDSU's multidisciplinary Transportation and Logistics education program and offers extensive training and workforce development through its Transportation Learning Network and Local Technical Assistance Program. UGPTI is the lead institution of the Mountain-Plains Consortium (MPC), a competitively selected university transportation center sponsored by the U.S. Department of Transportation. The consortium includes Colorado State University, South Dakota State University, University of Colorado Denver, University of Denver, University of Utah, Utah State University, and University of Wyoming.

Budget Base

The Upper Great Plains Transportation Institute's 2013-15 base appropriations and changes reflected in engrossed HB 1020 are shown in Table 1. Minus one-time funding for the county road and bridge study (Line 3), UGPTI's 2013-15 base general fund appropriation is \$2,826,824 (Line 4). Including amendments, UGPTI's base general fund appropriation in engrossed HB 1020 is \$3,312,865 (Line 9). UGPTI's total general fund budget in Engrossed HB 1020 of \$4,562,865 (Line 12) includes a one-time appropriation of \$1,250,000 to continue the county road and bridge study (Line 10).

Table 1 Summary of Changes from 2013-15 Budget Base to Engrossed HB 1020: Upper Great Plains Transportation Institute

Line	Item	Amount
1	2013-15 original general fund appropriation	\$4,076,824
2	2013-15 adjusted general fund appropriation	\$4,076,824
<i>Base adjustments:</i>		
3	Less 2013-15 one-time appropriation	(\$1,250,000)
4	2013-15 base general fund appropriation	\$2,826,824
<i>House amendments to base funding:</i>		
5	Cost to continue FY2015 salary & retirement increases	\$28,306
6	Compensation package (3% per year) and health insurance increases	\$157,187
7	UGPTI increase*	\$300,548
8	Subtotal: base funding adjustments	\$486,041
9	General fund base appropriation per engrossed HB 1020	\$3,312,865
<i>Adjustments for one-time funding:</i>		
10	Continuation of road study	\$1,250,000
	Subtotal-one-time funding adjustments	\$1,250,000
11	Total House amendments to general fund	\$1,736,041
12	General fund per engrossed HB 1020	\$4,562,865

*An increase of \$300,548 was included in Engrossed HB 1020 in matching funds for federal grants

2015-17 Budget Requests

As shown in Table 2, an increase of \$4,800,000 in general funds is requested to continue, expand, or initiate five high-priority program areas that offer great benefits to the state. These initiatives were recommended by UGPTI's Advisory Council and have been approved by President Bresciani and the State Board of Higher Education.

HB 1020 provides one-time funding of \$1,250,000 to continue the county road and bridge study: which is one of the three main objectives included in UGPTI's priority budget request of \$2,783,000 to establish an on-going transportation infrastructure and safety program. While one-time funding is appreciated, it does not provide the certainty needed to maintain critical programs. With strong demands for transportation and logistics expertise in the private sector and other areas of the country, it is difficult to attract and retain key personnel at UGPTI. With one-time funding, there is no assurance of continued employment beyond the biennium. Because of this pronounced uncertainty, key personnel may leave UGPTI for more stable positions and take with them the accumulated expertise gained during the past five years.

Table 2: Upper Great Plains Transportation Institute's 2015-17 Requests for New General Fund Appropriation, as Approved by the SBHE

	Amount
Base Funding Initiatives	
Transportation Infrastructure and Safety	\$2,738,000
Energy Logistics and Transportation	\$747,500
Air Services Planning	\$651,500
Transportation & Logistics Workforce Development	\$265,000
Total Requested Base Increase	\$4,402,000
One-Time Funding Initiatives	
Transportation Security	\$398,000
Total Requested Increase	\$4,800,000

1. Transportation Infrastructure and Safety Center

Transportation infrastructure is critical to the prosperity of North Dakota. Record investments are being made in highways, bridges, pipelines, freight terminals, and railways. These assets must be managed to achieve optimal service lives and performance. A continuous effort is needed by UGPTI to assess transportation infrastructure conditions, estimate future investment needs, and recommend maintenance practices.

Continued Road and Bridge Infrastructure Studies. As shown in Table 1, the North Dakota legislature provided \$1.25 million in one-time funding for the 2013-15 biennium so that UGPTI could match federal funds and undertake critical infrastructure studies. With rapidly changing transportation demands from the energy sector, changes in agricultural production, and growth in manufacturing and service industries, a long-term focus on transportation infrastructure is needed. While the one-time funding is greatly appreciated, it does not allow UGPTI to plan for on-going research activities and technical assistance and retain talented researchers in a competitive market. It is difficult to ramp-up for one-time funding, ramp-down again, and respond to time-sensitive requests from the legislature and state and local governments. With the requested funding, UGPTI could continue to forecast road and bridge investment needs while developing management tools for state and local agencies.

Road and Bridge Asset Management. Over time, the focus of the state will shift from reconstructing and rehabilitating roads and bridges to preserving and maintaining them. The requested funds will allow the development of a statewide asset management system that will provide counties and local governments with tools to forecast maintenance needs and provide the NDDOT and legislature with information about the expected conditions of roads and bridges throughout the state. Specifically, the funds will be used to: (1) develop a comprehensive roadway data inventory and GIS analysis system; (2) implement annual data collection procedures to continuously monitor county and township roads and bridges and provide reports to the NDDOT and legislature; (3) develop on-line tools to measure and report the performance and effectiveness of the capital investments funded by the legislature; and (4) provide technical assistance to MPOs, counties, cities, and townships. With this funding, UGPTI can help local governments implement asset management systems to preserve and maintain roads and bridges and optimize the state's capital investments.

Short-Line Railroad Infrastructure. The approximately 1,100 miles of short-line railroad in North Dakota provide essential services to agricultural-related industries and move inputs needed for oil and gas production into the state. Approximately 82% of the short-line system is built with light-weight rails that are, in many cases more than 100 years old and have exceeded their original life expectancies. Nevertheless, short-line railroads must handle the same 286,000-pound railcars as Class I railroads or the businesses located on these lines will be competitively disadvantaged. The short-line infrastructure is in need of upgrading to handle heavier railcars at economical speeds. With the requested funds, UGPTI will provide technical assistance to railroads in the state, compile a statewide inventory of track infrastructure characteristics and conditions, and provide the NDDOT with objective information to make decisions regarding potential investments in grain gathering and industrial lines to promote economic development. If these lines are abandoned, roughly 14 million additional miles of truck travel would be needed each year to move grains and oilseeds to elevators, plants, and markets.

Highway and Motor Carrier Safety. Traffic growth is increasing the risk and frequency of motor vehicle crashes. Most agricultural and oil-related traffic originates or terminates on two-lane rural roads. These roads have the highest crash and fatality rates of any class of highway. Risks are exacerbated by the growth of hazardous materials (hazmat) traffic, especially in western North Dakota. In response to escalating safety concerns, the Transportation Safety Advisory Committee (TSAC) was formed in 2013 to identify critical research and technical assistance issues. It includes the North Dakota Department of Transportation, the North Dakota Department of Emergency Services, the North Dakota Public Service Commission, the North Dakota Highway Patrol, the Federal Railroad Administration, the Pipeline and Hazardous Materials Safety Administration, and the Federal Highway Administration. The requested funds would allow UGPTI to respond to requests for studies from the TSAC and provide insights regarding the causes of heavy vehicle crashes; the benefits and costs of potential safety mitigation measures on high risk rural roads; the cost-effectiveness of enforcement strategies; hazardous material movements and emergency response planning; and applications of advanced technologies to improve highway and motor carrier safety.

Railroad Safety. Demands for railroad safety research have skyrocketed during the last two years. The requested funds would allow UGPTI to establish a railroad safety research program and respond to requests from the TSAC for studies and technical assistance. The funds would enhance the state's overall safety efforts by allowing UGPTI to work with the Federal Railroad Administration and North Dakota Public Service Commission. While these agencies are focused on inspection and safety enforcement, the UGPTI can conduct research into the causes and consequences of derailments, the risks associated with hazmat movements by rail, and rail-highway grade crossing traffic, risks, and safety enhancements.

2. Energy Logistics and Transportation Center

North Dakota energy producers are located great distances from east, gulf, and west coast markets and major distribution centers. Given its location, efficient interstate transportation is vital to North Dakota. While intrastate truck movements are indispensable, interstate pipeline and railway services are necessary for marketing crude oil, natural gas, and refined products. Similarly, railway transportation is essential to the distribution of ethanol and biofuels in distant markets. While energy production efficiencies are necessary for North Dakota to be competitive nationally, downstream logistical challenges may hamper economic growth, as crude oil from the Bakken competes with oil from other shale-producing regions (and imports) in national markets currently characterized by abundant supply and depressed demand. The delivered price of Bakken oil in various markets will be a critical factor going forward. Price relationships among markets, shifts in supply and demand, pipeline and railway

service levels, trans-loading capabilities, refiner or receiver conditions, and other logistical constraints may negatively impact North Dakota producers.

There is an urgent need to look holistically at the crude oil transportation network and analyze issues inside and outside of the state that could impact the viability and economic competitiveness of North Dakota producers. Comprehensive methods of tracking movements of North Dakota crude oil within the United States are needed to analyze midstream and downstream issues and identify options. While individual companies possess proprietary models, these data are not publicly available. Even in cases where privately-held models exist, they optimize conditions for one company only. They do not provide the type of comprehensive and objective information needed by the state to make informed decisions. There is a need for an objective entity such as UGPTI to identify options and solutions that benefit the state as a whole.

UGPTI is requesting \$747,500 to establish an energy transportation and logistics center to provide objective information to state agencies and industry associations that will assist them in their efforts to competitively position North Dakota energy products in national markets. A key objective is to develop a comprehensive GIS-based model that links North Dakota oilfields with the rest of the nation and includes domestic and export locations. Major oil-producing regions and demand locations around the United States will be represented in the model, as well as railroad route and cost details. The model will allow the identification of least-cost paths and modes and potential competitive advantages for Bakken crude oil. Once the model is built, railroad and pipeline bottlenecks and investment needs can be analyzed, as well as road cost savings generated from moving freight via pipelines or rails instead of roads. Similar models can be developed for lignite coal, ethanol, and other biofuels.

3. Transportation Security Research, Training, and Technical Assistance

A rapid increase in shipments of flammable liquids and other hazardous cargo has amplified the state's vulnerability to accidental and deliberate actions that could result in environmental and community disasters. With law enforcement capacity already strained, terrorists could potentially exploit security gaps. Growing international trade with Canada has increased the potential for threats across borders, heightening the need for perimeter security. In addition, crime rates in western North Dakota are rising. Throughout the state, there is growing awareness by cities, counties, and state agencies of the need to focus on transportation security to protect against potential terrorist actions and threats from radical social, environmental, and activists groups opposed to certain types of energy and land-use developments.

The proposed program will focus on the risks and vulnerabilities of land transportation and critical infrastructure, such as pipelines, rail lines, bridges, terminals, and depots, as well as the security of hazardous materials movements and other goods that could be deliberately contaminated or tampered with. The needs for advanced security protocols, including applications in remote sensing and infrastructure monitoring, will be assessed; as well as the potential for enhancing security through technological innovations and applications. A biennial appropriation of \$398,000 would allow UGPTI to study applications of emerging technologies and information systems that are useful in risk assessment, security planning, emergency response, and threat mitigation. This effort would assess the potential to deploy Intelligent Transportation Systems, sensor technologies, and unmanned aircraft systems (UAS) for security and transportation planning. Potential applications include using UAS to monitor oil pipelines, railways, and hazardous cargo loading/unloading locations and to provide perimeter security. Ground sensing applications include deploying video surveillance and sensors near "hot spots" such as oil extraction sites, bridges and other critical infrastructures. In addition to these

applications of advanced technologies, the funds would be used to expand UGPTI's training efforts for law enforcement officials and security professionals through a wide variety of media.

4. Air Services Research, Planning, and Technical Assistance

Aviation plays a critical role in supporting the state's growing economy, especially the rapidly expanding oil and gas industries. Population growth, coupled with the demand for executive and business travel to and from the region by suppliers, specialists, and other professionals, is spurring the demand for air travel and creating urgent requests for airport renovations, expansions, and improvements in flight schedules and services.

A biennial appropriation of \$651,500 would permit the UGPTI to establish an Air Services Planning Program (while partnering with the UND Aerospace Center). The requested funds would be used for research and technical assistance focusing on: (1) the long term infrastructure and capital necessary to sustain the projected growth in aviation activity; (2) the monitoring of pavement deterioration so that airports can develop pavement management programs needed to receive federal matching grants; (3) service demands at general aviation airports that are increasingly being asked to provide services typically available at mid-sized airports; (4) new navigation technologies referred to as "next-gen" that are the means by which aircraft will navigate between airports; and (5) the use of unmanned aerial vehicles safely within current airways systems and their applications in oil, gas, and agribusiness logistics.

5. Workforce Development for Western North Dakota

Oil and gas production and the development of tertiary enterprises in North Dakota are fueling the demand for skilled workers, including transportation and logistics experts, which are needed in many sectors of the state's economy. In spite of this critical need, transportation and logistics curricula are not widely available throughout the state, especially at the undergraduate level. While NDSU has faculty expertise and offers graduate programs in transportation and logistics, undergraduate programs in these fields are not available or easily accessible where they are most needed—in the western part of the state. A partnership among institutions within the North Dakota University System is needed to provide access to critical knowledge throughout the state. A biennial appropriation of \$265,000 would allow UGPTI to partner with other universities to offer undergraduate programs in transportation and logistics, making these programs widely accessible throughout the state. Many of the courses developed with this funding could be offered online or in a compressed format and utilized by programs at several universities—thus, benefiting the entire state, while offering efficiency gains through collaboration and program integration. The courses would allow other institutions to offer undergraduate certificates or minors in transportation or logistics, thereby enhancing their existing programs in management.

Total Budget Request

The Upper Great Plains Transportation Institute's 2015-17 budget requests (including federal and other funds) are summarized in Table 3, along with UGPTI's 2013-15 budget authority. Overall, UGPTI's request for budget authority is 4.7% less than in 2013-15. Much of this reduction is due to expected decreases in federal funding. While other grant funding is expected to grow, it will not offset the expected loss in federal funds.

Table 3 Upper Great Plains Transportation Institute's 2015-17 Budget Request

	UGPTI Base Budget	UGPTI Request	Engrossed HB 1020	Total Base Budget Change
UGPTI (All Funds)	\$25,280,169	\$21,744,700	\$21,036,628	(\$4,243,541)
One Time Funding: Road Study	\$1,250,000	(\$1,250,000)	\$1,250,000	\$0
Cost to Continue Salary/Retirement Inc.			\$28,306	\$28,306
Health Insurance Increase			\$157,187	\$157,187
Increase to match funds for Fed. Grants			\$300,548	\$300,548
UGPTI Initiatives		\$4,800,000	\$0	\$0
Total All Funds	\$26,530,169	\$25,294,700	\$22,772,669	(\$3,757,500)
Less Estimated Income	\$22,453,345	\$17,639,569	\$18,209,804	(\$4,243,541)
Total General Fund	\$4,076,824	\$7,655,131	\$4,562,865	\$486,041

Key changes at the federal level have intensified economic uncertainty and affected UGPTI's traditional funding strategies in several ways. (1) The agreement to eliminate Congressional earmarks has precluded certain funding opportunities that were available to UGPTI in the past. (2) The failure of Congress to enact a long-term surface transportation bill has created uncertainty for state and metropolitan agencies that fund transportation research. Although Congress enacted a two-year reauthorization bill in July of 2012 (MAP-21), this legislation resulted in a much shorter planning horizon than hoped for. (3) Although MAP-21 has been extended through May 31, 2015, it is difficult to project what the U.S. Congress will do next. This uncertainty makes it difficult for UGPTI to procure grants from agencies that rely extensively on federal funds to finance their research and planning programs.