

2015-17 BIENNIAL BUDGET REQUEST

UGPTI - AGENCY 627 | DENVER TOLLIVER, DIRECTOR

NDSU UPPER GREAT PLAINS
TRANSPORTATION INSTITUTE

HOUSE APPROPRIATIONS COMMITTEE HEARING
REPRESENTATIVE JEFF DELZER, CHAIRMAN
JANUARY 15, 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:

- Road infrastructure planning
- Highway and motor carrier safety
- Small urban and rural transit
- Urban traffic analysis
- Transportation information technology
- Agricultural freight and logistics
- Supply chain planning
- Railroad transportation
- Air services planning
- Transportation security

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.

REVIEW OF 2013-2015 BIENNIUM

As shown in Table 1, UGPTI's general fund appropriation for the 2013-15 biennium was \$2,826,824, exclusive of one-time funding. By Dec. 31, roughly 62% of these funds had been expended. The remaining funds will be expended by June 30, 2015. As shown in Table 1, \$382 was carried over from the 2011-13 biennium. All of these funds have been expended.

Exclusive of one-time funding, 75% of UGPTI's budget is comprised of federal funds. Another 14% consists of other or special funds, including grants from state agencies. Only 11% of UGPTI's 2013-15 budget consists of base general funds.

Funds	Biennium Budget	Expenditures to Date*
General Funds	\$2,826,824	\$1,735,575
2009-2011 Carryover	\$382	\$382
One-Time Appropriation	\$1,250,000	\$1,250,000
Federal Funds	\$19,007,683	\$9,677,864
Special/Other Funds	\$3,445,280	\$2,184,476
*Estimated through December 31, 2014		

ONE-TIME APPROPRIATION

As shown in Table 1, the legislature provided one-time funding of \$1,250,000 to match federal grants and update the county and township road study. In addition to updating the 2012 analysis, the one-time funding was used for data collection—i.e., to count and classify truck traffic at various locations throughout the state, assess road surface conditions, and determine base and soil support levels. Using non-destructive testing methods and ground penetrating radar, soil and material profiles were developed for paved roads in oil producing counties and for major county roads throughout the state on a sample basis. These measurements have improved the reliability of UGPTI’s road investment estimates and allowed more accurate assessments of the miles of road needing reconstruction. Moreover, this effort has allowed UGPTI to create an important database for county road planning.

The results of UGPTI’s updated study were presented to three interim legislative committees in 2014 and the information and traffic forecasts from that study were made available to counties for planning purposes. Moreover, at the request of legislators and county officials, the North Dakota Department of Transportation and UGPTI are currently analyzing road networks in the top four oil producing counties. This study (currently underway) examines the value and cost of implementing a coordinated five-tier state/county road network.

FEDERAL GRANTS AND CONTRACTS

UGPTI was authorized to expend \$19 million of federal funds in the 2013-15 biennium (Table 1). This request was based on historical funding levels, short-term forecasts of federal program activities, and expected levels of competition from other universities and consultants. Forecasting the receipt of federal grants is not an exact science and involves some uncertainty. As of Dec. 31, approximately \$11.33 million in federal funds had been received by UGPTI and \$9.68 million had been expended. As the numbers in Table 1 suggest, the procurement of federal funds is lagging authorized collection levels.¹

As shown in Figure 1, most UGPTI funding comes from the Office of the Secretary of Transportation (OST) and three agencies within the U.S. Department of Transportation: Federal Highway Administration (FHWA), Federal Transit Administration (FTA), and Federal Motor Carrier Safety Administration (FMCSA). Collectively, these DOT grants account for more than

¹ Many of the grants received by UGPTI are multi-year awards in which the funds are expended in accordance with work progress over time. Work progress affects planned rates of expenditures. In addition, the pace of grant and contract expenditures is affected by the availability of matching funds.

90% of all federal funds received by UGPTI and 65% of all grants and contracts received by the Institute..

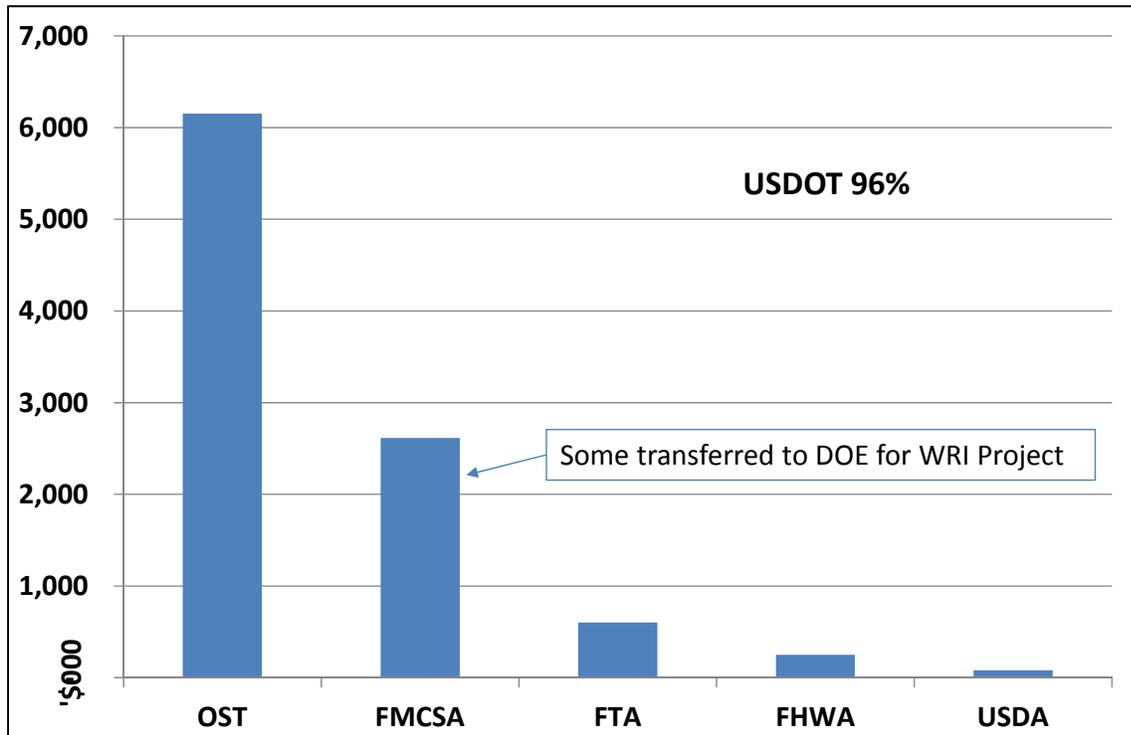


Figure 1: UGPTI's Federal Funding Sources

While additional federal grants are expected to be received during the first half of 2015, a shortfall of \$4.78 million in federal collections is projected for the 2013-15 biennium. Decreases in federal funding from previous biennia are primarily due to the expiration of earmarks and reductions in the overall availability of federal funding.

CHANGES IN FEDERAL POLICIES AND PRACTICES AFFECTING UGPTI

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

The dwindling balance in the Highway Trust Fund and the lack of a long-term vision for financing transportation programs pose serious challenges for university research. Transfers from the General Fund of the U.S. Treasury to the Highway Trust Fund are necessary to sustain programs. Transportation must compete with other federal programs for a shrinking pie. If federal funding for transportation diminishes, Congress will almost certainly focus on core highway and transit programs. Thus, fewer federal dollars will be available for research and development. The extent of the problem is illustrated by the divisive debate over extending MAP-21. The initial draft of the extension bill that emerged from the Senate Environment and Public Works Committee last summer called for the removal of the research program from the Highway Trust Fund. If this version of the bill had passed, transportation research funding would have been subjected to the annual appropriations process—greatly diminishing funding prospects and eliminating the benefits of a stable multi-year research program.

Because most of UGPTI's funds come from the U.S. DOT, a discretionary approach to funding would greatly increase the Institute's vulnerability. Much of the expertise that has been developed over time could be lost due to interruptions in federal funding and limitations on the availability of grants and contracts. If this occurs, UGPTI would not have the capacity to respond to requests from the legislature and state agencies as it has in the past. Moreover, the federal programs that remain are likely to require substantial match contributions. The University Transportation Centers Program, for example, already requires a 100% non-federal match and the demonstration of a substantial "institutional commitment" from the university and state.

NON-FEDERAL GRANTS AND CONTRACTS

UGPTI's authority to collect and expend other funds is roughly \$3.445 million (Table 1). As of Dec. 31, approximately \$3.216 million of non-federal grants had been received and \$2.185 million expended. Of these non-federal grants, 98% originate from state agencies. The remainder comes from local governments, industry associations, and short-line railroads. Grants and contracts have been obtained from six state agencies, including the North Dakota, Minnesota, and South Dakota Departments of Transportation, the North Dakota Highway Patrol, the South Dakota Department of Public Safety, and the North Dakota Wheat Commission. Additional grants have been received from three in-state Metropolitan Planning Organizations, two short-line railroads, and the American Association of State Highway Transportation Officials. While additional grants and contracts are expected, collections of non-federal funds for the 2013-15 biennium are expected to be considerably less than budget authority.

2015-2017 BUDGET REQUESTS

The Upper Great Plains Transportation Institute's 2015-17 budget requests are summarized in Table 2, along with UGPTI's 2013-15 budget authority. No request is made for accrued leave in 2015-17, although this was a line item in the 2013-15 budget. 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.

An increase of 87.8% in general funds is requested to continue, expand, or initiate five high-priority program areas that offer great benefits to the state (Table 3). These initiatives were

recommended by UGPTI's Advisory Council and have been approved by President Bresciani and the State Board of Higher Education. The Executive Recommendation does not explicitly address UGPTI's initiatives. Instead, the recommendation calls for \$300,000 to match federal grants. While this funding is appreciated, it does not provide the resources necessary to achieve the goals described below.

Description	Present Budget 2013-15	Requested Budget 2015-2017	2015-2017 Requested	
			Increase (Decrease)	% Change
Core Program	\$26,530,169	\$25,294,700	-\$1,235,469	-4.70%
Total Major Programs	\$26,530,169	\$25,294,700	-\$1,235,469	-4.70%
Accrued Leave	\$241,627	\$0	-\$241,627	-100.00%
UGPTI	\$26,288,542	\$25,294,700	-\$993,842	-3.80%
Total Line Items	\$26,530,169	\$25,294,700	-\$1,235,469	-4.70%
General Fund	\$4,077,206	\$7,655,131	\$3,577,925	87.80%
Federal Funds	\$19,007,683	\$11,700,195	-\$7,307,488	-38.40%
Special Funds	\$3,445,280	\$5,939,374	\$2,494,094	72.40%
Total Funding Source	\$26,530,169	\$25,294,700	-\$1,235,469	-4.70%
Total FTE	54.98	58.98	4	7.30%

	SBHE Approved 2015-17 Budget Request	Included in 2015-17 Executive Recommendation
Base Funding Initiatives		
Transportation Infrastructure and Safety	\$2,738,000	N/A
Energy Logistics and Transportation	\$747,500	N/A
Air Services Planning	\$651,500	N/A
Transportation & Logistics Workforce Development	\$265,000	N/A
<i>Increase Matching Funds for Federal Grants</i>	N/A	\$300,548
Total Requested Base Increase vs. the Executive Recommendation	\$4,402,000	\$300,548
One-Time Funding Initiatives		
Transportation Security	\$398,000	N/A
Total Requested Increase vs. the Executive Recommendation	\$4,800,000	\$300,548

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.