NDSU Upper Great Plains Transportation Institute: 2025-2027 Budget Requests

I. Legislative Directives and Purpose

N.D.C.C. 54-53-03	Establishment and missions
N.D.C.C. 54-53-02	Advisory Council
N.D.C.C. 54-53-01	Administration

II. UGPTI's Major Accomplishments in Current Biennium

A. Road and Bridge Investment Needs Study

Table 1. County, Township, & Tribal Road & Bridge Needs (Millions): Current Biennium

Unpaved Roads	Paved Roads	Bridges	Minor Structures	All
$707.88	$433.82	$178.94	$151.06	$1,471.70

B. Road and Bridge Asset Management Tools

a. Sign inventory layer
b. Development of AI tools

C. Freight Data and Analysis

a. Processors and manufacturers
b. Truck fleet and freight flows
c. Rail freight flows

D. Tribal Technical Assistance and Training

a. Northern TTAP Center
b. Road management and safety

E. Research and Technology Transfer

a. University Transportation Centers Program
b. UGPTI performance metrics: October 1, 2022, through Sept 30, 2024
    i. 179 peer-reviewed journal articles + 68 peer-reviewed research reports
    ii. 883 training, e-learning, and outreach events with 16,054 participants

III. One-Time Funding: Transportation Data Intelligence Lab

A. Advanced data analytics/AI solutions/Mentoring students in AI and automation
B. Status: on time, within budget

IV. UGPTI's Funding Sources

A. Special Funds: 28%

a. No revenues from fees; grants and contracts only
b. NDDOT primary funder
c. MPOs, state commissions, ag. associations, and industry

B. Federal Funds: 51%

a. USDOT (FHWA, FMCSA, FTA)
b. USDA, USACE, DOE

C. General Funds: 21%

a. Sustainable funding
b. Match for grants

V. UGPTI's Funding Requests

A. Multimodal Autonomous Surface Transportation Center

a. Benefits of autonomous trucks
b. Challenges to widespread deployment in North Dakota
c. Objectives of proposed center
d. Funding request (Base: $575,000, One-Time: $1.4 million)

B. AI for Surface Transportation

a. Potential for AI in surface transportation
b. Goals of proposed center/workforce development benefits
c. Funding request: $375,000 of base funding

C. CO2 Multimodal Transportation Network

a. State and industry needs (carbon credits, EOR, industrial uses)
b. Current network (regional, unconnected pipeline network)
c. Funding opportunities to buildout CO2 transport network
d. Multimodal network needed
e. Funding request: $408,100

Table 2. UGPTI's 2025-27 Budget Initiative Requests

	Funding Request		
Request	**Base**	**One Time**	**Total**
Autonomous Surface Transportation Center	$575,000	$1,400,000	$1,975,000
AI for Surface Transportation	$375,000	$0	$375,000
CO2 Multimodal Network	$0	$408,100	$408,100
Total	$950,000	$1,808,100	$2,758,100

Table 3. UGPTI Budget Requests Included in the 2025-27 Executive Recommendation

	Funding Request		
Request	**Base**	**One Time**	**Total**
Autonomous Surface Transportation Center	$0	$0	$0
AI for Surface Transportation	$375,000	$0	$375,000
CO2 Multimodal Network	$0	$408,100	$408,100
Total	$375,000	$408,100	$783,100

Table 4. Comparison of 2023-25 Base Funding to 2025-27 Base Funding Request

Funding Source	2023-25 Legislative Base	2025-27 Base Funding Request	Increase (Decrease)
General	$5,226,375	$6,176,375	$950,000
Federal	$12,572,811	$12,716,711	$143,900
Special	$7,008,330	$7,101,376	$93,046
Total	$24,739,473	$25,994,462	$1,186,946

Table 5. Comparison of Base Funding to Total Funding Request (Incl. One-Time Funding)

Funding Source	2023-25 Legislative Base	2023-25 Total Funding Request	Increase (Decrease)	Executive Recommendation
General	$5,328,670	$8,086,770	$2,860,395	$6,355,982
Federal	$12,309,427	$12,860,611	$287,800	$13,106,737
Special	$7,101,376	$7,194,412	$186,082	$7,301,301
Total	$24,739,473	$28,141,793	$3,334,277	$26,764,020

North Dakota State University
Upper Great Plains Transportation Institute
Agency 627
Denver Tolliver, Director

2025—2027 Biennial Budget Request

Presented to:
The Senate Appropriations Committee
Government Operations Division

January 16, 2025

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Upper Great Plains Transportation Institute
Primary Programs, Centers, and Focus Areas

- Advanced Traffic Analysis
- ND Local Technical Assistance
- Western ND Transportation Liaison
- Transportation Mobility
- Road & Bridge Needs Assessment
- Advanced Sensors and Technologies
- DOT Support Center
- Tribal Technical Assistance
- Commercial Vehicle Safety
- Transportation Safety & Security
- Agricultural Freight
- Transportation Learning Network

Upper Great Plains Transportation Institute Advisory Council

- ND Aeronautics Commission
- Associated General Contractors of ND
- ND Association of Counties
- Greater ND Chamber
- ND Corn Council
- ND Department of Agriculture
- ND Department of Commerce
- ND Department of Transportation
- ND Farmers Union
- ND Grain Dealers Association
- ND Grain Growers Association
- ND League of Cities
- Lignite Energy Council
- ND Motor Carriers Association
- ND Public Service Commission
- ND Wheat Commission
- Dakota Transit Association
- Representative of the manufacturing sector
- Representative of the railway industry

I. Background Agency Information

Legislative Directives and Purpose N.D.C.C 54-53-03

The Upper Great Plains Transportation Institute's purpose is to "conduct and supervise research in the field of transportation and logistics in order to facilitate acquisition of a wider knowledge and understanding of marketing factors associated with the geographical location of the state of North Dakota and the upper great plains in the field of transportation and their influence on the socioeconomic systems of the state, region, and country." UGPTI's research areas "must include the study of commodity and other freight movements into and out of the state in order to better know and understand the various factors affecting the marketing of area products and services (N.D.C.C 54-53-03)."

Advisory Council N.D.C.C 54-53-02

The Legislature established a transportation council to serve in an advisory capacity and "consult with the Institute in matters of policy affecting the administration of this chapter and in the development of transportation in the state of North Dakota." The council shall elect its own chairman and the Director of the Institute shall serve as the executive secretary of the council.

Administration N.D.C.C 54-53-01

The Institute must be administered by and in conjunction with the North Dakota State University of Agriculture and Applied Science. The president and administration of the North Dakota State University are responsible for the selection of personnel for and the administration of the Institute.

II. Major Accomplishments in Current Biennium

Biennial Road & Bridge Needs Assessment

With its general fund appropriation, UGPTI conducted its biennial analysis of county, township, and tribal road investment needs in the state. The study included 71,808 miles of road, including 5,843 miles of paved county road and 56,656 miles of gravel road. UGPTI staff and student employees counted and classified vehicles at approximately 100 locations on county, township, and tribal roads throughout the state, recording the total number of vehicles per day at each site, as well as the number of trucks, by size category. When combined with NDDOT traffic counts on county roads, UGPTI's traffic data provide a comprehensive picture of traffic around the state. In addition to the traffic counts, UGPTI analyzed the surface conditions of more than 6,100 miles of paved county road, collecting ride quality data in a cost-effective manner using sensors and special smart phones apps to measure road roughness and video images to assess road conditions (e.g., cracking) and develop composite ride scores. A survey was administered to each county to determine blading and gaveling practices, the sources and costs of gravel, and other cost factors needed for the unpaved portion of the road analysis. All 53 counties responded to the survey. The current conditions of 2,079 bridges on county roads were assessed during the biennium. Analysis of minor structures was included in this study update including 2,095 structures with spans less than 20 feet. The results are summarized in Table 1.

Table 1. County, Township, & Tribal Road & Bridge Needs (Millions)

Time Period	*Unpaved Roads*	*Paved Roads*	*Bridges*	*Minor Structures*	*All*
Twenty Years	$6,971.45	$3,496.17	$1,087.16	$805.00	$12,359.78
Current Biennium	$707.88	$433.82	$178.94	$151.06	$1,471.70
Avg. Biennial	$697.15	$349.62	$108.72	$80.50	$1,235.98

Road & Bridge Asset Management

With its general fund appropriation, UGPTI continues to maintain and improve the Geographic Roadway Inventory Tool (GRIT), which is an on-line resource for North Dakota's local and Tribal Governments to use for inventorying and efficiently managing their road and bridge infrastructure assets and maintenance activities. Information gathered within GRIT further provides a critical foundation for the North Dakota County and Local Needs Study conducted for the Legislature and state and local agencies each biennium. GRIT also includes tools for local governments to do performance-based construction and maintenance planning based on continually updated pavement condition and traffic data collected by UGPTI. GRIT also includes on-line reporting with web- based maps and dashboards which provide transparency and critical information for the public and decision makers. Capabilities recently added to GRIT include a sign inventory layer and the development of artificial intelligence tools to make the road inventory and evaluation process more efficient for short-staffed local governments.

Freight Data & Analysis

As part of its Biennial Freight Analysis, UGPTI is compiling data on shipment volumes, weights, and the values of commodities originating or terminating in North Dakota, including: (1) an inventory and analysis of the farm truck fleet, (2) commercial truck inventories and use patterns, (3) grain flows from farms to elevators and processing plants, and (4) goods movements within and through the state by truck. In addition, UGPTI developed a railroad freight analysis tool that summarizes rail freight shipments to, from, and within the state by commodity group. Moreover, a North Dakota Community Freight Survey has been implemented to assess existing and desired transportation services in North Dakota communities and their impacts on economic development.

Tribal Technical Assistance Program Center

UGPTI is the home of Federal Highway Administration's Northern Region Tribal Technical Assistance Program (TTAP) Center. Its vision is to enhance the quality of life in Tribal communities by building capacity for Tribes to administer and manage their transportation programs and systems. The mission is to "serve as a go-to local resource for Tribal transportation training, technical assistance, and technology transfer needs and opportunities."

Productivity and Results

For the latest two federal fiscal years (extending from October 1, 2022, through Sept 30, 2024), the UGPTI and the Mountain-Plains Consortium led by UGPTI have published 179 peer-reviewed journal articles and 68 peer-reviewed transportation research reports, which are available from our website. In addition, UGPTI has offered 883 training, e-learning, and outreach events, in which there were 16,054 participants. These measures are typical of UGPTI's outputs for a biennium.

III. Report on One-Time Funding

Funding Amount and Source

The 68th Legislative Assembly provided $432,600 of one-time funding to repurpose and equip a room in the Quentin Burdick Building at North Dakota State University to receive, process, archive, and analyze data from field sensors, vehicles, and many other sources. The Transportation Data Intelligence Lab will enable UGPTI to perform advanced data analytics, develop artificial intelligence solutions and tools, contribute timely transportation information to travelers and service providers, and train students in artificial intelligence and automation. The project is nearing completion. It is on schedule and within budget.

IV. UGPTI's Funding Sources

Special Funds

UGPTI does not operate facilities or assess fees that generate revenue on a continuous basis. Rather, UGPTI's special funds appropriation request represents the authority to collect grants and contracts from state and local agencies and private industries. Most of UGPTI's special funds originate from the North Dakota Department of Transportation under a strategic agency partnership that has benefited North Dakota for the last four decades. The ND Wheat Commission and several metropolitan planning organizations (MPOs) also regularly provide grant funding. There is uncertainty in the levels of these grants and contracts that will be received during any biennium.

Federal Funds

The federal fund request represents a ceiling for UGPTI's federal grant collections. It is the agency's best projection of the authority needed to procure all grants that may become available during the biennium. The vast majority originates from the U.S. Department of Transportation (U.S. DOT), including grants from the Office of the Secretary, Federal Highway Administration, Federal Transit Administration, Federal Motor Carrier Safety Administration, and the National Highway Traffic and Safety Administration. Some grants (such as the University Transportation Center grant) are provided directly to UGPTI by federal agencies. In other cases, the funds are "federal source funds" provided by third parties through the federal procurement process. Although federal funds are important to UGPTI's budget, they have pre-determined uses. Ultimately, UGPTI has limited discretion in determining which critical issues are researched with federal funds. Federal research funds (although very important) are not a substitute for state research dollars.

General Funds

Although state general funds comprise a minor portion of UGPTI's overall budget, they are essential to the agency's success and sustainability. State general funds are needed to match federal grants and provide continuity in times of delay or disruption in federal funding. Many of UGPTI's direct grants (such as the University Transportation Centers grant) require a 100% match of non-federal source funds. UGPTI's general funds are the only dependable source of match for these funds. Moreover, general funds are the only hard dollars in UGPTI's budget. Federal and special funds are provided at the discretion of intermediate agencies and third parties and are subject to the budget limits placed on these agencies.

V. Budget Initiative Requests for 2025-2027

1. Multimodal Autonomous Surface Transportation Center

Critical Driver Shortages

North Dakota's economy is dependent on efficient, reliable freight transportation services. However, the trucking industry is plagued by driver shortages and rapid turnover. The average turnover rate for truck drivers exceeds 90%, meaning that more than 90% of drivers leave the company after one year on the job. Driver shortages are hurting the agriculture and energy industries, which depend heavily on contract trucking. Additionally, 95% of all truck crashes involve human factors.

Benefits of Autonomous Trucks

Autonomous trucking is developing rapidly in the southwestern United States and spreading to other regions. Autonomous trucks have the potential to mitigate driver shortages, improve safety, increase freight transportation efficiency, maintain and improve freight services to rural communities, spur economic development, and create new and attractive jobs. The vehicles are not limited by hours-of-service regulations and do not need to stand idle while drivers take mandatory breaks. The number of operational hours per week is limited only by vehicle servicing requirements and constraints imposed by logistical operations (e.g., loading, unloading, queueing, and traffic delays). Autonomous trucks may be especially valuable to the agricultural industry (particularly during peak harvest periods) and in first- and last-mile deliveries.

Challenges to Autonomous Trucks in Rural North Dakota

Autonomous trucking is proliferating in Texas, California and other states under ideal weather conditions on interstate and well-designed highways. However, the spread of autonomous trucks to rural areas, where the vehicles must travel over two-lane rural roads under challenging conditions, could be considerably slower. Rural operations pose unique challenges related to (1) roadway conditions (e.g., edge markings and stripes, deteriorated or damaged traffic signs, narrower shoulders, and irregular roadway geometry); (2) sparsity of roadside landmarks; (3) snow, ice, and weather extremes; (4) near-zero visibility at times due to fog and drifting snow; and (5) numerous at-grade highway-railroad crossings with lower levels of protection. Currently, most autonomous driving systems (ADSs) rely on detailed and highly accurate digital maps enhanced by data from repeated runs of primary roads by instrument-equipped vehicles. However, sensing-based high-definition maps are not readily available for most rural areas. Localization (the process by which autonomous vehicles precisely identify their positions) is hampered by difficulty in finding distinct references or landmarks, such as the buildings and traffic signals commonly found in urban areas. Infrastructure improvements and advances in autonomous driving systems are needed before North Dakota can widely realize the benefits of autonomous trucks.

Long-Term Research Effort is Needed

As North Dakota makes the transition to autonomous freight transportation systems, research, technology transfer, and training are necessary to optimize emerging opportunities and make the transition as smooth as possible. UGPTI has a tentative program in autonomous trucking, primarily as a result of a federal grant that ends in 2025. However, reliable funding is needed to continue research and demonstrations and expand the research focus.

Goals of Proposed Center

If this request is funded, a Multimodal Autonomous Surface Transportation (MAST) Freight Center would be established at the Upper Great Plains Transportation Institute. The center would focus on applied research and technology transfer rather than basic research. It is not UGPTI's goal to develop competing autonomous driving systems or autonomous vehicles that might be in competition with private sector proprietary systems, most of which are in the advanced stages of development. Rather, UGPTI's roles would be to: (1) propose new directions for ADS development to address challenges posed by rural and northern operations; (2) work with private-sector autonomous vehicle developers to better understand the markets, types of freight operations, and conditions most conducive to autonomous trucking operations (such as hub-to-hub, last- and first-mile, and short-haul intra-industry movements); (3) identify adjustments in government policies and regulations needed for autonomous trucks to operate effectively while complying with the safety oversight responsibilities of government; (4) analyze and evaluate highway infrastructure enhancements and investments that will support automated driving and allow autonomous trucks to penetrate edge markets such as rural communities; and (5) contribute to a collaborative strategic planning process that involves all stakeholders and increases the transparency of developments in the autonomous trucking industry.

Funding Requests

This request involves two types of funding requests: (1) $1,400,000 of one-time startup funding, and (2) $575,000 of base funding to sustain the effort. The startup funding is necessary to effectively launch the autonomous freight center with several timely deliveries during the 2025-2027 biennium and includes funds to temporally hire national experts in autonomous vehicles—people and organizations that can forge deep connections within the autonomous vehicle and automotive industries, assist the director in strategic planning, and position the new center for federal grants. In addition, the base funding will allow for the hiring of a full-time expert at UGPTI (by filling a vacant position), the hiring and mentoring of postdocs and students, and funding for research faculty. Moreover, the base funding is essential for leveraging federal grants, many of which require a 50% to 100% match in non-federal funds.

Planned Activities

If this request is funded, a technical advisory panel will be established to provide input to the MAST Freight Center. The panel will include representatives from the Departments of Transportation, Commerce, and Agriculture; the trucking and regional railroad industries; agricultural and energy industries; autonomous trucking companies; and national experts. Potential activities for the 2025-27 biennium include:

- Consultations with autonomous trucking companies, original equipment manufacturers, and other stakeholders that will result in long-term strategic partnerships in autonomous freights systems
- Analysis of transition strategies and timelines for the deployment of off-farm autonomous trucking as part of an autonomous agricultural production and supply chain
- Identification of other opportunities for autonomous freight transportation in first- and last-mile segments and short-haul intrastate movements

- Analysis of related industries needed to support and sustain autonomous trucking, the potential workforce opportunities resulting from these support industries, and potential curricula/training needed for new job creation in North Dakota
- Estimates of the benefits of autonomous truck operations at various levels of market penetration for specific types of operations
- The development of enhancements to optimize the routing of autonomous freight vehicles with considerations for energy efficiency, weather conditions, and dynamic traffic patterns
- Outreach events and a newsletter regarding developments in autonomous trucking in the state and region that will keep decision makers abreast of developments and emerging issues
- A strategic plan for the MAST center and the identification of federal and private funding opportunities

2. Artificial Intelligence in Surface Transportation

Potential for AI in Transportation

Artificial intelligence (AI) has the potential to alleviate many workforce shortages, improve worker safety, boost the consistency and reliability of data, and foster cost-effectiveness in transportation operations and asset management. Using data from smart sensors, high-resolution cameras, drones, and vehicles, AI can automate and improve the reliability of transportation infrastructure inspection and monitoring; traffic monitoring, control, and safety; and autonomous and connected vehicle operations. In addition to alleviating worker shortages, AI can reduce the exposure of employees to risks during inspections and increase worker productivity and job satisfaction.

Goals of Transportation AI Research Program

The 68th Legislative Assembly provided $432,600 of one-time funding for room renovation, equipment, and sensors to establish a Transportation Data and Intelligence Center, focused on advanced data analytics and artificial intelligence. The main goals of the Transportation Data and Intelligence Center are to: (1) conduct leading edge research in intelligent transportation solutions that benefit transportation planning and infrastructure/asset management; (2) develop new planning and forecasting models of freight and passenger transportation in a connected/automated vehicle environment; (3) provide advanced data analysis capabilities for the North Dakota DOT, MPOs, cities, Tribal nations, and other clients in the state and region; and (4) train and mentor future transportation specialists in machine learning, artificial intelligence, and agency operations in a highly automated environment. The focus of this effort would be restricted to transportation-related research and workforce development and the development of prototypes which could potentially be implemented by state and local agencies or commercialized by private industry with further development and integration.

Funding Request

This request (for $375,000 in base funding) will cover some senior researcher time and the hiring and mentoring of 1 to 2 postdocs and 3 to 4 students. Moreover, the base funding will be used to leverage federal grants, many of which require a 50% to 100% match in non-federal funds.

Planned Activities

Potential activities and topics that could be included in the 2025-2027 work plan include:

- AI tools and algorithms for predictive data modeling to support traffic management, route optimization, traffic safety management, and infrastructure management systems
- Tools such as advanced 3D graphical animation and generative AI that can facilitate seamless integrations of autonomous multimodal transport systems with existing physical and digital infrastructures
- AI models that leverage historical data and real-time inputs to predict future demands for goods movements across various sectors, improving the accuracy of logistics planning
- AI algorithms that dynamically optimize routes and schedules for freight transportations based on traffic conditions, weather, and delivery priorities
- Training and mentoring of students in writing AI algorithms and identifying potential AI solutions in transportation

3. Multimodal Transportation System for Captured Carbon Dioxide

Relevant State Goals and Policies

As stated in N.D.C.C. 38-22-1, "it is in the public interest [of North Dakota] to promote the geologic storage of carbon dioxide. Doing so will benefit the state and the global environment by reducing greenhouse gas emissions." Governor Burgum provided a vision for North Dakota to lead the nation in carbon capture, utilization, and storage (CCUS) and achieve carbon neutrality by 2030. CO_2 has many industrial uses—including enhanced oil recovery—that could spur economic growth and productivity in the state. However, this CO_2 vision requires that captured carbon dioxide be transported from producing locations to utilization and sequestration sites. Although some regional CO_2 pipelines are in place (mostly in Texas and surrounding states), the transportation network needed to support these movements does not exist on a national scale and must be built to accommodate greatly increased future demands.

Federal Funding Opportunities

The Department of Energy (DOE) has introduced several programs to encourage the expansion and interconnection of a CO_2 transportation network, including the Front-End Engineering and Design (FEED) and Transportation Infrastructure Finance and Innovation (CIFIA) Future Growth Grants programs. The CIFIA program is intended to "support shared infrastructure projects, including pipelines, rail transport, ships and barges, and ground shipping, that connect anthropogenic sources of carbon dioxide with endpoints for its storage or utilization." These programs are intended to "finance projects that build shared transport infrastructure to move CO_2 from points of capture to utilization facilities and storage wells" and "help form a domestic interconnected carbon management ecosystem." However, a piecemeal approach to constructing CO_2 transportation infrastructure requires "close coordination and alignment in the development of each element of the CCUS value chain" to realize the nation's goals.

Funding Request

The purpose of this one-time funding request of $408,000 is to conduct a strategic study of multimodal CO2 transportation options and infrastructure needs to support

North Dakota's goals and position the state (including private industries and transportation modes) to develop proposals for federal funding. Having a CO2 transportation network plan in place could provide competitive advantages in seeking DOE infrastructure funds. Moreover, one-time funding is needed to match federal research grants. If funded, this one-time request could provide an initial boost to the state's CCUS aspirations and provide benefits for years to come.

Planned Activities

In this study, UGPTI will seek input from the Departments of Agriculture, Commerce, and Transportation; the Oil and Gas Division; the Public Service Commission; the Energy and Environmental Research Center; biofuels and ethanol industries; national DOE labs; Class I and regional railroads; and other interested industries. The project will result in assessments of:

- An inventory of sources of potential CO_2 suppliers in the United States, including sources that are not connected to pipelines, but which have railroad service and could potentially ship CO_2 into the state without large-scale infrastructure investments
- The potential for a multimodal system to transport CO_2 into and within North Dakota that could serve key industries and allows access to sequestration sites
- The potential for transportation of CO_2 by rail and truck in complementary roles to pipelines in a comprehensive transportation system that includes service to potential CO_2 hubs and distribution centers
- The initial development of a multimodal GIS-based network model that could identify connecting links and hubs that would enhance the connectivity of the CO_2 network
- The need for intermodal connections and possible spur tracks within North Dakota, which would allow railroads to directly serve hubs and distributions centers where direct connections do not currently exist

VI. Budget Requests

As noted earlier, UGPTI's 2025-2027 request includes both base and one-time funding requests. The base funding requests are shown in Table 2. Only two of these requests are included in Governor Burgum's Executive Recommendation (Table 3). Comparisons of UGPTI's 2023-2025 base funding to UGPTI's 2025-2027 base funding request and to Govern Burgum's Executive Recommendation are shown in Table 4.

Table 2. UGPTI's 2025-27 Budget Initiative Requests

	Funding Request		
Request	**Base**	**One Time**	**Total**
Autonomous Surface Transp. Center	$575,000	$1,400,000	$1,975,000
AI for Surface Transportation	$375,000	$0	$375,000
CO2 Multimodal Network	$0	$408,100	$408,100
Total	$950,000	$1,808,100	$2,758,100

Table 3. UGPTI Budget Requests Included in the 2025-27 Executive Recommendation

	Funding Request		
Request	**Base**	**One Time**	**Total**
Autonomous Surface Transp. Center	$0	$0	$0
AI for Surface Transportation	$375,000	$0	$375,000
CO2 Multimodal Network	$0	$408,100	$408,100
Total	$375,000	$408,100	$783,100

Table 4. Comparison of 2023-25 Base Funding to 2025-27 Base Funding Request

Funding Source	2023-25 Legislative Base	2025-27 Base Funding Request	Increase (Decrease)
General	$5,226,375	$6,176,375	$950,000
Federal	$12,572,811	$12,716,711	$143,900
Special	$7,008,330	$7,101,376	$93,046
Total	$24,739,473	$25,994,462	$1,186,946

Table 5. Comparison of 2023-25 Base Funding to Total 2025-27 Funding Request (Including One-Time Funding) and to the Executive Recommendation

Funding Source	2023-25 Legislative Base	2023-25 Total Funding Request	Increase (Decrease)	Executive Recommendation
General	$5,328,670	$8,086,770	$2,860,395	$6,355,982
Federal	$12,309,427	$12,860,611	$287,800	$13,106,737
Special	$7,101,376	$7,194,412	$186,082	$7,301,301
Total	$24,739,473	$28,141,793	$3,334,277	$26,764,020

Note the Executive Budget Recommendation provides $408,100 of one-time funding from the General Fund for the carbon dioxide transportation network study and $375,000 from the General Fund for artificial intelligence in surface transportation. In addition, it restores $339,241 that was removed from UGPTI's 2023-25 budget for the new and vacant FTE funding pool. Of this total, $102,295 is General Fund, $143,900 is federal funds, and $93,046 is special funds. In addition, the Executive Recommendation includes a compensation package.

The restoration funds described above are included in UGPTI's 2023-25 Total Funding Request shown in the third column of Table 5 above. However, the cost of the compensation package is not included in this column. We respectfully request that UGPTI's final budget be increased in accordance with the compensation package ultimately determined by the Legislature.

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

UGPTI Transportation Data Intelligence Lab

Mission

Support data and information needs of transportation agencies for planning, design, construction, maintenance, operations, safety, and research in support of the safe and efficient movement of people and goods.

Objectives

- Develop and enhance a classroom Transportation Management and Traffic Operations Center Emulation Lab with interconnected transportation data feeds from all available State, County, City, and Tribal sensors.
- Provide workforce development to State and Local agencies by giving students hands-on experience with monitoring and analyzing real-time traffic, weather, and operations data along with the skills necessary to interpret and provide decision support to improve safety and operational efficiency.
- Develop advanced artificial intelligence models and technologies to collect and interpret real-time data feeds and provide decision support to transportation management center operators.
- With all data sources develop artificial intelligence models to support the ability to predict the future performance of assets, measure the cost-benefit and performance of maintenance and operations practices, communicate timely information to managers, operators, and the public, and support research to achieve safe and efficient highways.

Tools

Emerging technology and techniques will be used to collect, transmit, process, and analyze data for managing transportation systems and conducting research.

- Artificial intelligence / machine learning / deep learning will improve accuracy.
- Edge computing components will collect data, run algorithms, perform results, and communicate data at low cost.
- Internet of things components communicate data packets to online data server.
- Power components provide long-term power at low cost.
- Sensors include video, image Infrared, radar/ lidar, ultrasonic, vibration, and soil moisture and temperature sensors.
- Connected vehicles are equipped with vehicle-to-everything technologies and can capture geo-referenced data such as speed, trajectory information, acceleration and other data.