

Nebraska Information Technology Commission

Project Proposal Form

**New or Additional State Funding Requests
for Information Technology Projects**

FY2005-07 Biennium

Project Title	PioneerNET
Agency/Entity	NDOR - Operations

**Project Proposal Form
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About this form...

The Nebraska Information Technology Commission (“NITC”) is required by statute to “make recommendations on technology investments to the Governor and the Legislature, including a prioritized list of projects, reviewed by the technical panel, for which new or additional funding is requested.” In order to perform this review, the NITC and DAS-Budget Division require agencies/entities to complete this form when requesting new or additional funding for technology projects. For more information, see the document entitled “Guidance on Information Technology Related Budget Requests” available at <http://www.nitc.state.ne.us/forms/>.

Electronic versions of this form are available at <http://www.nitc.state.ne.us/forms/>.

For questions or comments about this form, contact the Office of the CIO/NITC at:

Mail: Office of the CIO/NITC
521 S 14th Street, Suite 301
Lincoln, NE 68508
Phone: (402) 471-3560
Fax: (402) 471-4608
E-mail: info@cio.state.ne.us

Submission of Form

Completed forms must be submitted by the same date biennial budget requests are required to be submitted to the DAS Budget Division. Completed project proposal forms must be submitted via e-mail to info@cio.state.ne.us. The project proposal form should be submitted as an attachment in one of these formats: Microsoft Word; WordPerfect; Adobe PDF; or Rich Text Format. Receipt of the form by the Office of the CIO will be confirmed by e-mail. If an agency is unable to submit the application as described, contact the Office of the CIO prior to the deadline, to make other arrangements for submitting a project proposal form.

Section I: General Information

Project Title	PioneerNET
Agency (or entity)	NDOR – Transportation Technology

Contact Information for this Project:

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**Project Proposal Form
FY2005-07 Biennium**

Section II: Executive Summary

Provide a one or two paragraph summary of the proposed project. This summary will be used in other externally distributed documents and should therefore clearly and succinctly describe the project and the information technology required.

In order to realize the full benefits of Nebraska's Intelligent Transportation Systems (ITS), an integrated software that actively monitors current (and future) field devices is required. The PioneerNET system software will meet those needs unlike commercial, off-the-shelf systems that offer only limited integration and do not provide the necessary flexibility for future changes. Our current systems are not integrated and the software provided by the manufacturers forces redundant entry and multiple programs to manage the system. ITS devices save time, money and lives by reducing delay on the freeway system, improving response and clearance of incidents, as well as reduction in secondary crashes. PioneerNET will be the software package managing the various components which provide functionality to each of the District Operation Centers (DOC).

PioneerNET will be consistent with National Transportation Communication for ITS Protocol (NTCIP) and NITC guidelines and is expected to have positive Benefit/Cost (B/C) Ratios. The system will include video servers, software servers, databases, and archive management servers located in each District. Without PioneerNET, NDOR will struggle to actively manage the freeway system which will result in additional delay and safety issues to the motoring public.

The financial budget is outlined in the Highway Program and the STIP and consists of three projects:

1. Functional Design of the Software
2. System Manager/Integrator
3. Software Development and Implementation

Section III: Goals, Objectives, and Projected Outcomes (15 Points)

1. Describe the project, including:
 - Specific goals and objectives;
 - Expected beneficiaries of the project; and
 - Expected outcomes.

PioneerNET is a software package that will integrate Nebraska's Intelligent Transportation Systems (ITS) devices. ITS has a wide variety of field devices that currently (and in the future) save time, money and lives. Studies of ITS deployments throughout the United States indicate substantial benefits in each of the following areas:

- reduced delay on the freeway system
- improved response and clearance of incidents (crashes, stalled vehicles, road debris, etc.)
- reduced "secondary" crashes.

Specifically in District 2, PioneerNET will integrate roadway sensors that report traffic characteristics by lane and alert the operator when substantial changes in speed or volume indicate a possible incident on a particular freeway segment. PioneerNET will also indicate the location of the nearest CCTV cameras to allow for visual confirmation, thereby improving response time and the dispatch of appropriate personnel and equipment.

**Project Proposal Form
FY2005-07 Biennium**

Additionally, PioneerNET will allow for the placement of messages on all Dynamic Message Signs with one entry. This improvement in operations will allow for an AMBER ALERT message to be placed on all signs whether statewide or regionally designated.

The beneficiaries of PioneerNET are those who use Nebraska's road system. This includes NDOR staff, Nebraska State Patrol, Nebraska Emergency Management Agency, the traveling public, commercial vehicle operators, towing operators, construction contractors and other first responders.

The expected outcome of the deployment of PioneerNET will be consistent with the outcomes experienced in surrounding states and nationally.

2. Describe the measurement and assessment methods that will verify that the project outcomes have been achieved.

Each District will have a functioning District Operations Center (DOC). PioneerNET will be the software package that manages the various components providing functionality to the DOC. Operators of the system should be able to clearly distinguish the improvements to the current practice for the deployment of DMS messages and the use of CCTV cameras. Additionally, NDOR operators will be able to use various ITS field devices (roadway sensors, automatic gate closure, etc) that are integrated through PioneerNET. This will decrease the need for multiple sets of procedures and reduce the time required in training new operators.

3. Describe the project's relationship to your agency comprehensive information technology plan.

PioneerNET is consistent with the concept of operations for the statewide deployment of ITS. The open architecture is consistent with the Business Model that NDOR's ISD requires for the development of software.

Section IV: Project Justification / Business Case (25 Points)

4. Provide the project justification in terms of tangible benefits (i.e. economic return on investment) and/or intangible benefits (e.g. additional services for customers).

PioneerNET will integrate a wide variety of field devices that currently (and in the future) save time, money and lives. Studies of ITS deployments throughout the United States indicate substantial benefit in each of the following areas:

- reduced delay on the freeway system
- improved response and clearance of incidents (crashes, stalled vehicles, road debris, etc.)
- reduced "secondary" crashes

Nebraska's ITS deployment, of which PioneerNET is a key component, is expected to have positive Benefit/Cost (B/C) Ratios. Early Deployment Studies completed by UNL indicated an 11:1 B/C Ratio for Traveler Safety and Security Programs which PioneerNET would manage. Overall, PioneerNET is just one of many ITS projects with an estimated B/C ratio of 4.5:1.

5. Describe other solutions that were evaluated, including their strengths and weaknesses, and why they were rejected. Explain the implications of doing nothing and why this option is not acceptable.

Commercial, off-the-shelf systems provide only limited integration of ITS devices and do not have the flexibility to add/integrate future devices. Without PioneerNET, NDOR will struggle to actively manage the freeway system resulting in additional delay and safety issues to the motoring public.

**Project Proposal Form
FY2005-07 Biennium**

6. If the project is the result of a state or federal mandate, please specify the mandate being addressed.

Section V: Technical Impact (20 Points)

7. Describe how the project enhances, changes or replaces present technology systems, or implements a new technology system. Describe the technical elements of the project, including hardware, software, and communications requirements. Describe the strengths and weaknesses of the proposed solution.

Currently, NDOR's ITS systems are not integrated. Software currently provided by ITS device manufacturer's forces redundant entry or multiple programs to manage ITS products from various vendors.

The components of the PioneerNET system will include video servers, software servers, databases, and archive management servers located in each District.

To realize the benefits described earlier, an integrated software that actively monitors field devices is required. Currently each District must enter the IP address for a camera and utilize camera specific software to control the view. With the current system, a Cohu camera could be next to a Panasonic, which would require an operator to access cameras and control with two different software programs, panning features, zoom features will likely be different.

Specifically in District 2, PioneerNET will integrate roadway sensors that report traffic characteristics by lane and alert the operator when substantial changes in speed or volume indicate the possibility of an incident on a particular freeway segment. PioneerNET will also indicate the location of the nearest CCTV cameras to allow visual confirmation. This type of system will improve response time and dispatch of appropriate personnel and equipment.

Additionally, PioneerNET will allow for the placement of messages on all Dynamic Message Signs with one entry. This improvement in operations will allow for an AMBER ALERT message to be placed on all signs, whether statewide or regionally designated, without the current time consuming process which requires multiple entries.

8. Address the following issues with respect to the proposed technology:
- Describe the reliability, security and scalability (future needs for growth or adaptation) of the technology.
 - Address conformity with applicable NITC technical standards and guidelines (available at <http://www.nitc.state.ne.us/standards/>) and generally accepted industry standards.
 - Address the compatibility with existing institutional and/or statewide infrastructure.

Commercial, off-the-shelf systems are not suitable for this deployment. Limitations in the above issues are the primary reason for the development of PioneerNET. Currently the Functional Requirements for PioneerNET are being developed. By working with ISD software reliability, security, and scalability will be addressed.

PioneerNET will be consistent with National Transportation Communication for ITS Protocol (NTCIP) and NITC guidelines. A preliminary review identifies; Accessibility, Data and Information, E-Government, Groupware, Hardware, Network, and Security Architectures.

Section VI: Preliminary Plan for Implementation (10 Points)

**Project Proposal Form
FY2005-07 Biennium**

9. Describe the preliminary plans for implementing the project. Identify project sponsor(s) and examine stakeholder acceptance. Describe the project team, including their roles, responsibilities, and experience.

The Functional Requirements have started with a consultant HWS-PB Farradyne. Sponsors of PioneerNET are the Transportation Technology Group, which is part of Operations and Maintenance Unit. Stakeholders include:

- NDOR ITS Policy/Program Committee
- District Engineers
- District ISD Representatives
- ISD Representatives
- Nebraska State Patrol
- Traffic Engineering

The Concept of Operations for the statewide deployment identifies the need for PioneerNET. District support for a software package that integrates ITS devices is strong. While other elements of ITS are being debated, the need for ITS management software has been recognized.

HWS-PB Farradyne will serve as the facilitator to assist NDOR-TTG and ISD in establishing the functional requirements for the software.

10. List the major milestones and/or deliverables and provide a timeline for completing each.

Functional requirements will be completed in late 2005, with software development initiated in early 06 and deployment of version 1 in July of 2006. This is time dependent as the DOC in Omaha is expected to be complete in July of 2006.

11. Describe the training and staff development requirements.

Additional training and staff development will be required for 2-3 staff in each district. PioneerNET will be part of operator training.

12. Describe the ongoing support requirements.

TTG has programmed budget for training, staff development, and version upgrades.

Section VII: Risk Assessment (10 Points)

13. Describe possible barriers and risks related to the project and the relative importance of each.

Potential Barriers are discussed below:

Time Schedule: The completion of the DOC and Freeway Management Center Building in Omaha will bring attention to the actual operation of the center. PioneerNET needs to be complete and ready to operate within a short time after completion of the building. Potential software providers have indicated that a simpler version of the software, with limited initial functionality, could be put in place while revisions are made to PioneerNET.

Cost Over Run: Software development for DOC systems have ranged from \$350,000-\$4,500,000. Detailed functional requirements and scope will need to be developed to manage cost over runs. Co-management with ISD and TTG staff will help manage scope creep.

**Project Proposal Form
FY2005-07 Biennium**

Personnel Changes: One of the lessons learned by deployments nationwide is that staff will change over the course of deployment. Good documentation will be necessary to maintain continuity and a small steering committee has been recommended to assist in that process.

14. Identify strategies which have been developed to minimize risks.

Listed above.

Section VIII: Financial Analysis and Budget (20 Points)

15. Financial Information

The financial budget is outlined in the Highway Program and the STIP and consists of three projects:

1. Functional Design of the Software
2. System Manager/Integrator
3. Software Development and Implementation

ITSN(2) - 2	ITSN(2) - 001	Statewide & FMS Final Design		
ITSN(2) - 3a		FMS Planning / Preliminary Engineering Study	\$	250,000
ITSN(2) - 3b		Omaha FMS Design	\$	400,000
ITSN(2) - 2d		Statewide ITS Element Design / PS & E	\$	500,000
ITSN(2) - 2a		Statewide (DOC) Design/Software Functional Design (2000-E1: RFP)	\$	900,000
ITSN(2) - 3c		Omaha FMS Software Functional Design	\$	250,000
	ITSN(2) - 003	System Manager		
ITSN(2) - 2c		Statewide Software System Manager	\$	600,000
ITSN(2) - 3e		Omaha FMS Software / Systems Manager	\$	350,000
	ITSN(2) - 004	Software Development/Implementation		
ITSN(2) - 2b		Statewide Software Development/Implementation	\$	1,250,000
ITSN(2) - 3d		Omaha/D-2 Software Development and Implementation	\$	750,000
ITSN(2) - 3f		Hardware / Video Design	\$	200,000

16. Provide a detailed description of the budget items listed above. Include:

- An itemized list of hardware and software.
- If new FTE positions are included in the request, please provide a breakdown by position, including separate totals for salary and fringe benefits.
- Provide any on-going operation and replacement costs not included above, including funding source if known.
- Provide a breakdown of all non-state funding sources and funds provided per source.

The Hardware and software will be determined during the first project listed above. New FTE's are not required to develop the software, but ultimately are needed to operate the ITS system. Initial discussions have considered contract staff to operate the system.

Currently, TTG is programming \$500,000 annually for system maintenance and enhancements.

Project Proposal Form
FY2005-07 Biennium

State Funds are used to match (50/50) the Federal Dollars of an ITS Deployment Grant.

17. Please indicate where the funding requested for this project can be found in the agency budget request, including program numbers.

Yes, in the Highway Program and STIP.