North Dakota Transmission Authority

North Dakota Industrial Commission

BIL 40101(d) Application

Project Title: Converting Overhead Crossings to Underground Across Federal and State Highways - Phase 3

Applicant:
Capital Electric Cooperative

Date of Application:
5/30/2025

Amount of Grant Request:
$459,814.30

Total Amount of Proposed Project:
$686,290.00

Duration of Project:
18 months

Point of Contact (POC):
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Provide a description of the applicant (i.e., type of entity, corporate structure, MWh sold annually, etc.).

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Provide a description of the project with enough detail to allow the reviewers to adequately evaluate the project.

Standards of Success
Provide a description of how the proposed project will fulfill any or all of the program objectives.

Project Timeline
Provide a project timeline including anticipated start date, significant project milestones, and anticipated project completion date or project duration.

Project Budget
Provide a total project budget, clearly describing the amount of funding requested from NDTA.

Applicant Description

Capital Electric Cooperative (Capital), a rural electric distribution cooperative located in Bismarck, North Dakota, has been serving electricity to its member consumers in Burleigh and southern Sheridan counties since 1948. Capital serves more than 18,714 member consumers, providing nearly 400,000 MWh of electrical service annually to 22,155 locations. Capital owns more than 2,806 miles of distribution line, of which approximately 46% of those lines are underground cable. Capital is a member of and takes transmission service from Central Power Electric Cooperative, Inc, an electric transmission cooperative headquartered in Minot, ND.

Capital has 38 full-time and 2 part-time staff, governed by a board of directors comprised of nine member consumers. The board meets on the fourth Friday of each month, and an annual meeting for the membership is held in June each year. Capital's headquarters is located at 7401 Yukon Drive, Bismarck, ND 58503. Capital qualifies for federal tax-exemption as a qualifying organization in Internal Revenue Code Section 501(c)(12).

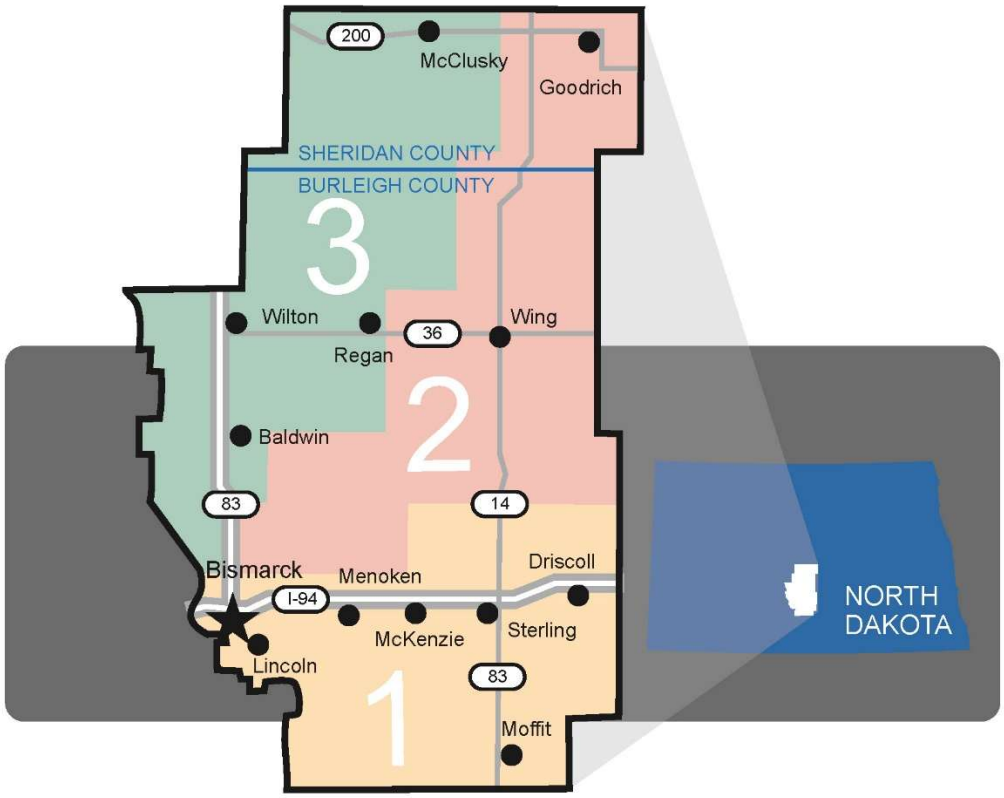

Figure 1: Capital's Service Territory Map

Project Description

Capital presented an original project proposal of converting 49 highway overhead crossings to underground cables, provided in two phases. Phase 1 encompassed converting 18 overhead distribution line road crossings to underground conductors, between Wing and the Sterling I-94 interchange. Phase 2 included 31 crossings along Hwy 36 between Regan and Kidder County, along Highway 83 between Sterling and Emmons County, and Interstate 94 between Kidder County and Bismarck. This Phase 1 & 2 proposal was selected for funding by the North Dakota Transmission Authority on 12/18/2023.

Capital is proposing a Phase 3 project, converting an additional 36 overhead crossings to underground cable. A summary of the crossing's details and locations is shown in the table below as well as Capital's project summary map is attached as Exhibit 1. Each crossing would install underground cable using directional boring techniques from boundaries of highway right of way, which is approximately 250ft in width along the project corridor. At each edge of the right of way, cables would be connected at the existing poles to the remaining overhead conductors to continue service, with the final step of removing the overhead conductors from over the roadway.

For Phase 3, the project includes 36 additional state and federal highway crossings conversions.

- Along ND Highway 14 between Wing and Highway 200, 13 overhead crossings.
- Along ND Highway 200 between Kidder and McLean Counties, 12 overhead crossings.
- Along ND Highway 41 between Wilton and Highway 200, 4 overhead crossings.
- Along ND Highway 1804 between Bismarck and Emmons County, 7 overhead crossings.
- The same techniques used on Phases 1 & 2 will be utilized on the Phase 3 project.
- A map of the proposed Phase 3 project is attached as Exhibit 1 and detailed below.

Table 1: Summary of Phase 3 Project--Highway 14, 200, 41, and 1804 Road Crossing Locations

Crossing No.	Highway	Phase(s)	CEC Map	Section(s)	Township	Range
50	ND14	A-ph	22	3	142	76
51	ND14	A-ph	19	14, 15	143	76
52	ND14	A-ph	19	14, 15	143	76
53	ND14	B-ph	12	34, 35	144	76
54	ND14	B-ph	12	26, 27	144	76
55	ND14	B-ph	12	14, 15	144	76
56	ND14	B-ph	12	11	144	76
57	ND14	C-ph	9	9	145	75
58	ND14	C-ph	9	4	145	75
59	ND14	C-ph	9	4	145	75
60	ND14	C-ph	2	20, 21	146	75
61	ND14	C-ph	2	20, 21	146	75

62	ND14	3-ph	2	16, 17	146	75
63	ND200	A-ph	1	22, 27	146	74
64	ND200	A-ph	1	20, 21	146	74
65	ND200	A-ph	2	2, 11	146	75
66	ND200	A-ph	3	1, 12	146	76
67	ND200	B-ph	3	5, 8	146	76
68	ND200	B-ph	3	6, 7	146	76
69	ND200	A-ph	4	10	146	77
70	ND200	A-ph	4	10	146	77
71	ND200	A-ph	4	7	146	77
72	ND200	A-ph	5	12	146	78
73	ND200	A-ph	5	14	146	78
74	ND200	2-ph	5	14	146	78
75	ND41	A-ph	16	19	143	79
76	ND41	B-ph	16	19	143	79
77	ND41	B-ph	16	6	143	79
78	ND41	B-ph	16	6	143	79
79	ND1804	C-ph	56	11, 14	137	79
80	ND1804	C-ph	56	11, 14	137	79
81	ND1804	B-ph	57	8, 17	137	78
82	ND1804	C-ph	63 ,64	1, 6	136	78, 79
83	ND1804	C-ph	63 ,64	1, 6	136	78, 79
84	ND1804	C-ph	63 ,64	1, 6	136	78, 79
85	ND1804	C-ph	63 ,64	7, 12	136	78, 79

Standards of Success

Enhancing grid resiliency is a core element of Capital's long-term infrastructure plans, demonstrated by annual investments in rebuilding 25 miles of overhead line and strategic conversions of overhead to underground conductors. Specific to overhead highway crossings, Capital converted the final overhead crossing of Highway 83 north of Bismarck in 2022; the selection by NDTA of Capital's Phase 1 & 2 project also emphasizes the importance of these conversion both to Capital as well as the community.

The success of the proposed project can be summarized by the following impacts:

1. Reducing the magnitude and duration of grid outages. Power lines, distribution in particular, tend to follow and cross major roadways due to the increased population and development near the roadways. As such, greater numbers of consumers are impacted when these segments are damaged by a major event. Spans between poles tend to be longer, often utilizing taller structures to ensure clearance over the roadways, making them more suspect to weather events such as lightning or strong winds. The same spans present additional hazards when heavily laden with ice or frost, causing extreme sag in the conductors. A downed conductor, especially in these storm conditions, requires additional care and response time to first clear the roadway of debris then utilize additional bucket trucks and/or stringing equipment to safely install new conductor over the roadway. By eliminating overhead roadway crossings, durations of outages are reduced by avoiding the challenges of reconductoring over an active roadway. Putting sections of underground conductors within an overhead segment also reduces the magnitude of grid outages by limiting the domino effect of one downed pole pulling down the next and the next; this is an alternative to installing specialized, expensive overhead structures designed for this cascade-limiting purpose.
2. Reducing the frequency and impacts of a major storm/non-storm event. While most overhead outages are temporary in nature (ex. lightning strikes, animal/tree contact), permanent outages such as a downed line or broken pole have significant effects on grid service. Crews must be dispatched, often after normal business hours, to clear the cause of the fault and then rebuild the overhead structures. By converting the overhead conductors to underground, the temporary causes of outages are eliminated simply by removing the possibility of contact. Road right of way, especially state or federal right of way, has procedures for entities looking to install facilities within the right of way, so the chances of an unintentional dig-in are yet further reduced specifically in the case of road crossings; thus, the most likely cause of an outage in a crossing location would be a cable fault, of which Capital has yet to experience one in the 30+ years of installing modern underground cable. While Capital cannot guarantee outage-free service, the installation of underground cables presents the best solution for obtaining the lowest outage frequency possible.

3. Providing lower-cost energy access to disadvantaged or underserved communities. The impacts in this category of the proposed project can be highlighted as follows:
    a. Converting the overhead lines to underground conductors in this project will utilize larger gauge (diameter) conductors, which inherently have a lower impedance per foot than the existing overhead conductors, resulting in reduced line losses on these segments. Reduction in line losses helps eliminate wasted energy and thus better financial cost of service to the member consumers. Kidder county, east of the proposed project area, is identified as a disadvantaged community (38043966800); while Capital's lines impacted by this project do not directly extend service into Kidder County, the roadways within the Phase 3 project do serve as a path to this disadvantaged community.
    b. House movers and oversized loads do utilize the Highway 200/14 corridor to move homes, grain bins, etc. through Capital's service territory. As such, Capital is called to raise overhead crossings in this project area to ensure safe passage of a moved home. In a typical year, Capital crews escort 6 homes through the territory, with each move committing one crew for the day to raise lines. While movers are charged for the crew's time, this effort makes the crew unavailable for other tasks during the day, which can result in inefficient dispatching of remaining crews in the event of an outage. Each time the lines are raised puts additional stress on the conductors and hardware, making them more susceptible to outages in future storm events. By burying overhead highway crossings, the member consumers benefit from greater crew availability and productivity, as well as reduction in future outage events made more susceptible by these activities.
    c. Perhaps most importantly, converting overhead roadway crossings to underground presents enhanced safety and services to the public. A downed overhead line on a roadway is an extreme hazard to the public, as the line can stay energized without tripping a protective device (asphalt is an excellent insulator). It is commonly thought that a line on the ground is dead and safe to drive over—not true! Education helps, but the best safeguard against accidental contact is to remove the possibility completely. Similarly, eliminating overhead crossings also ensures a downed line is not an impediment to public services such as snowplows, highway patrol, and ambulance services. After hours response time to the proposed project area is often 30 minutes during good driving conditions, with longer times expected during storm events; any minute of delay to a first responder arriving on-scene can make the difference between life or death, thus eliminating the overhead roadway crossings presents a significant benefit to public safety and services. A letter from NDDOT supporting Capital's Phase 3 project is attached as Exhibit 2.

Project Timeline and Team

Capital's proposed Phase 3 project is anticipated to be in 2026-2027. With the construction of Phases 1 & 2 to begin in the summer of 2025 and likely completion in the spring of 2026, work would then begin on Phase 3. Following the results of the competitive bidding process for Phases 1 & 2, Capital would evaluate the results of the team's performance and make any necessary changes for Phase 3.

Phase 3 environmental (i.e. NEPA) review would take place in 2025 following notification of grant award. This review would be completed prior to snow fall to ensure any cultural resource reviews can be completed. Since Capital would utilize Rural Utilities Service (RUS) funding for cost match, environmental reviews would also be sent to RUS for clearance. **Capital is aware of the requirement to utilize Build America, Buy America (BABA) Act compliant materials**, and procurement of necessary materials would occur in the winter/spring of 2026, with resources in place by start of the 2026 construction season.

While construction progress is anticipated to complete 2 crossings per week, lessons-learned from Phases 1 & 2 will help shape the probable construction schedule of Phase 3. An 18-week construction schedule would be achievable to complete in 2026 if work can commence by July 1; however, the more likely scenario is partial construction in 2026 with completion of the project in 2027.

Capital has planned to utilize the following team to complete the proposed projects:

- Greg Owen, Manager of Engineering Services: point of contact for the projects.
- Beau Townsend, Staking Engineer: design of overhead to underground.
- Corey Bruner, Staking Specialist: design of overhead to underground.
- James Keller, GIS Specialist: edits electronic mapping system.
- Michelle Starck, Work Order Coordinator: compiling project accounting records & grant administration.
- Operations Department, including Operations Manager, Foreman, Lead Linemen, Journeymen Linemen, and Apprentice Linemen: responsible for overseeing field work performed by contractors as well as performing line switching to support cutting over of overhead to underground cables. All field personnel in the Operations Department participate in Local Union 1593, International Brotherhood of Electrical Workers.
- Underground and Overhead Contractors, selected by Capital via competitive bidding. All construction labor will be performed by Contractors to ensure compliance with Davis-Bacon Act requirements.

Capital's internal team and contractors are highly experienced in completing this type of project. The engineering team utilizes software tools to directly enter and track design and materials throughout a project lifecycle. GIS edits are quickly made to ensure field crews have

up-to-date information on their mobile devices. Operations personnel routinely perform these types of overhead retirements and underground connections and will provide guidance and support to ensure contractors are successful. Capital's contractors are familiar with NDDOT and ND One Call requirements to ensure permits and locates are properly documented. Resumes of specific individuals or positions can be made available upon request. While Capital does not plan on directly hiring additional staff to support this project, an additional dedicated contractor crew of up to four workers may be hired to complete this scope of work. This is demonstrated in Capital's first round of funding, where an underground contractor selected for the work will keep a second crew dedicated to the work, rather than being furloughed or reassigned to a different location.

Also note that Capital does not employ foreign nationals nor allows foreign investments in ownership. Occasionally, a business entity will request service in Capital's service territory where their corporate office may be located in another country (most recent example is a Canadian company); however, the usage of Capital's electrical service is 100% within the United States, contained further within the service territory of North Dakota counties.

One variable with scheduling can often be the time required to complete an environmental review. Capital contracted with HDR Engineers to complete an environmental review for Phase 1 in accordance with the RUS review guidelines. A similar effort, either with internal resources or utilizing third party environmental consultants, will be undertaken in 2025 to support the proposed Phase 3 project construction in 2026-2027.

Capital is aware that all construction labor must be compliant with Davis-Bacon Act requirement; Phases 1 & 2 of the project utilize contracted labor for all construction activities, with contractors fully aware of the requirements for prevailing wages and weekly payroll submissions via LCPtracker. Capital's internal labor will be for administration, design, and oversight, which will not fall under the Davis-Bacon provisions; this demarcation keeps the labor reporting distinction clear between which entities are required to comply and report.

Capital is aware of the importance of environmental stewardship, having followed NEPA review criteria from RUS since inception and working in close coordination with local game and fish representatives when animal contacts are made or when projects are in/near sensitive areas. Additionally, Capital is aware of the need to document disposal of retired assets, whether at the landfill or recycling centers. In all cases, surface conditions are restored to pre-construction conditions, which may require fill material and grass seed.

In summary, Capital is prepared and committed to beginning construction in 2026 and completing construction in 2027.

Project Budget and Business Plan

Due to the variation in road right of way widths, the costs for each Phase 3 crossing are based on an assumed 250ft of directional boring. Additional costs are included for each two or three-phase crossing, as well as anticipated costs for administering the required compliance and reporting associated with the grant itself. A contingency of ~10% is included to account for the unknowns of each location (ex. excavation of large rocks) as well as potential cost pressures of materials, labor inflation, and those not yet quantifiable.

In terms of costs avoided by the proposed projects, a downed line over a roadway could take two crews two hours to mobilize/demobilize, plus four hours to remove and repair the damaged overhead conductors. This time may be extended in the event of a major storm, along with utilizing additional resources to string new conductors over an active roadway. This will most likely occur in the afterhours, quite possibly totaling >$2,500 in labor and materials for a single crossing. Each house move through Capital's system typically costs $1,200 in labor and equipment time. Considering the costs if a life was lost, whether due to direct contact or due to impeded first responders, the costs can be hundreds of thousands if not millions of dollars. While the cases of an outage or death are difficult to quantify on an annual basis, at minimum the costs for six house moves a year is $7,200, which is approximately equal to one roadway crossing conversion.

Capital is willing to provide more of a cost share (up to 50%); however, due to the overall size of the projects consisting of many smaller components, Capital strongly encourages NDTA to consider providing 2/3 of the cost recovery for Capital to fully realize the benefits of the grant, awarding an amount of $459,814.30. A summary of the proposed project budget is shown in the table below.

If compared to Capital's previously awarded project budget, it will be noted that this application is carrying a higher $/crossing average than the original submission. Experience since that submission has shown that BABA-compliant material and Davis-Bacon compliant wages drive overall costs higher than typical estimates would suggest. Due to these factors, this application has adjusted figures to be more in line with actual costs. While higher costs of execution are not favorable, results from competitive bids indicate the proposed budget to bear market conditions.

Table 2: Budget Summary for Capital's Proposed Projects

Phase 3 Project Costs: Direct Labor, Overhead, Materials, and Contracted Services, per RUS Accounting			
Crossing No.	Contracted Costs	Internal Costs	Total
50-85	$ 429,000.00	$ 167,900.00	$ 596,900.00
Environmental Review:			$ 12,600.00
Grant Administration Costs:			$ 14,400.00
		Ph3 Subtotal	$ 623,900.00
		Ph3 Cont. ~10%	$ 62,390.00
		Ph3 Grand Total	**$ 686,290.00**
		Ph3 CEC 1/3	$ 226,475.70
		Ph3 Grant 2/3	$ 459,814.30