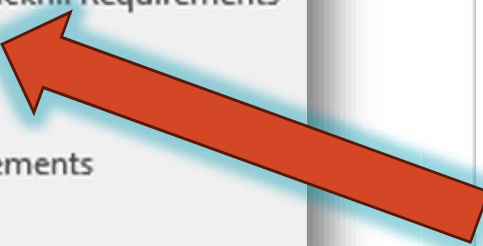


NDDOT Pipe Manual (70% to 75% Complete)

- Comprehensive reference manual:
 - Covers all stages: **Design** → **Construction** → **Inspection** → **Maintenance** → **Data/Asset Management**
 - Consolidate pipe culvert information from other portions of the design manual
- Meant to guide both engineering decisions and field practices
 - Manual broken into 6 sections

Resources

Headings	Pages	Results
		
▷ Section 1: Introduction, Definitions, and Roles and Responsibilities		
▷ Section 2: Design Guidelines, Principles, and Considerations		
▷ Section 3: Pipe Culvert Classifications, Pipe Materials, and Backfill Requirements		
▷ Section 4: Inspection Types, Intervals, and Procedures		
▷ Section 5: Maintenance Guidelines		
▷ Section 6: Pipe Inventory, Ownership, & Post Project Requirements		

Design Manual

[Chapter I: Project Development and Design Guidelines](#) 

[Chapter II: Environmental, Cultural Resources, and Public Involvement](#) 

[Chapter III: Roadway Design](#) 

[Chapter IV: Structural Design](#) 

[Chapter V: Hydraulic Studies and Drainage Design](#) 

[Chapter VI: CADD Manual](#)

[Chapter VII: Geotechnical Studies and Design](#) 

[Chapter VIII: Pipe Culvert Manual](#)

NDDOT Pipe Team

Why we are here (objective)

- Proactive verses reactive
- No formal inspection process
- Inaccurate/incomplete inventory
- Lack of centralized software/system.

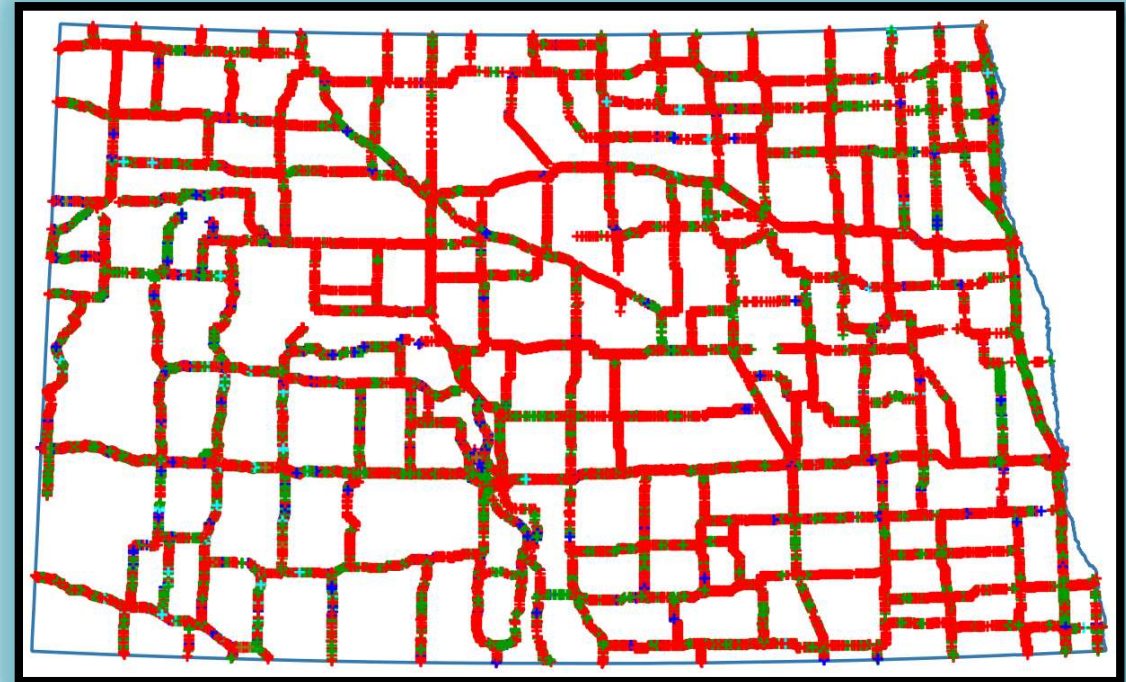
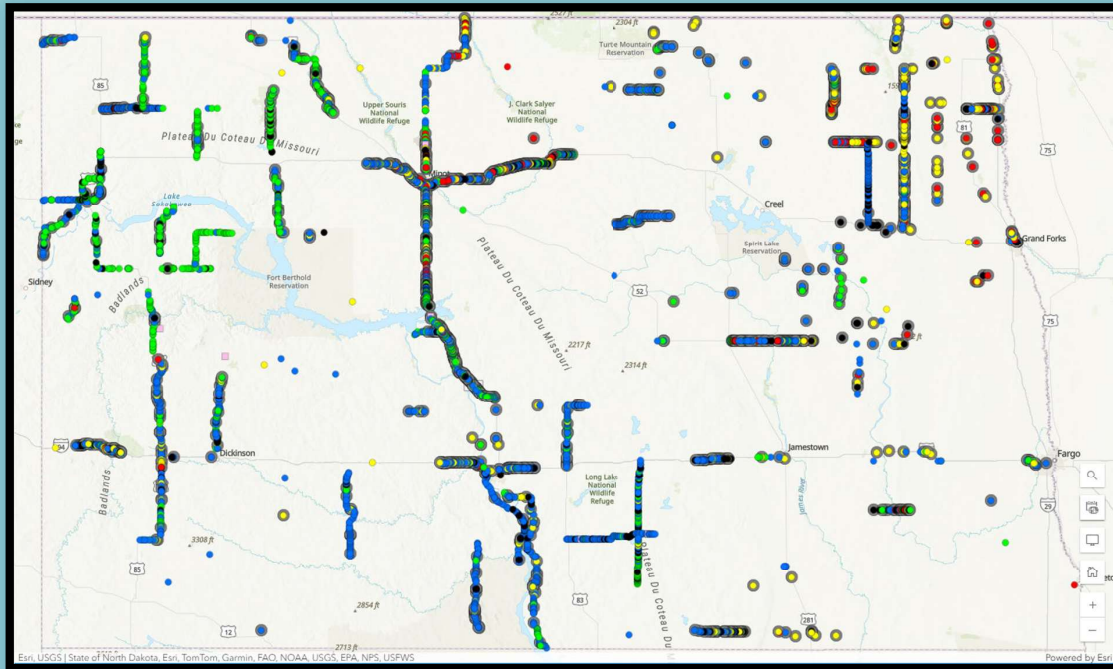
Why it matters

- Critical unseen infrastructure that is aging
- Asset management
- Safety and reliability
- Funding and compliance (FHWA, etc.).
- Project Planning

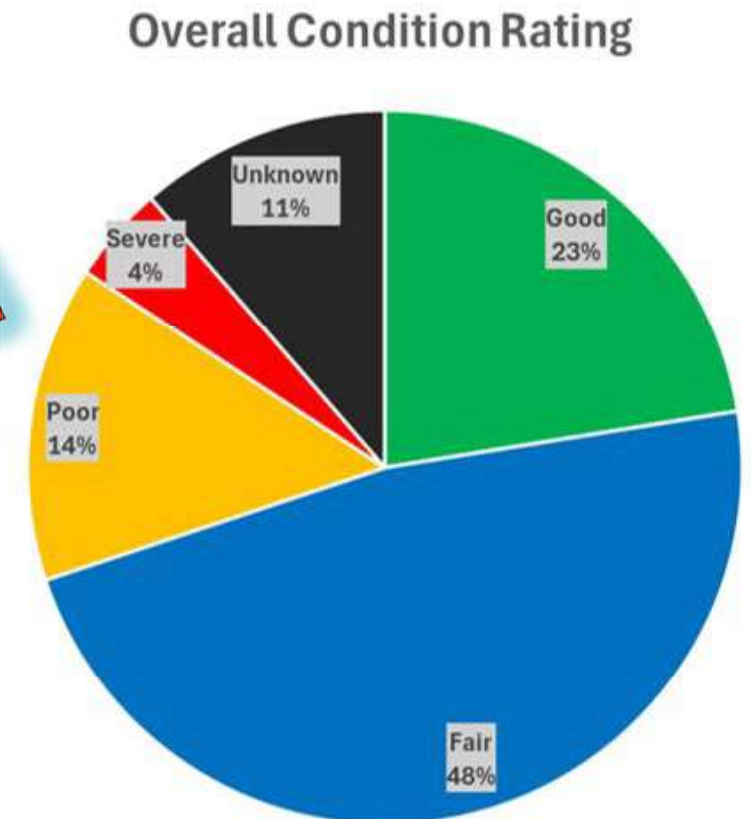
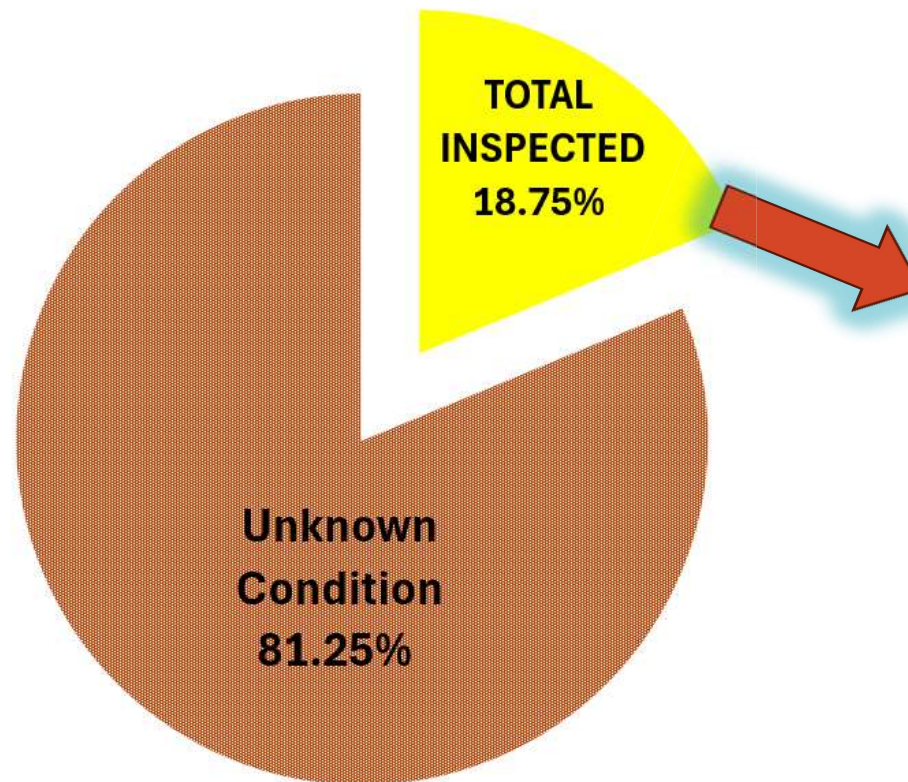
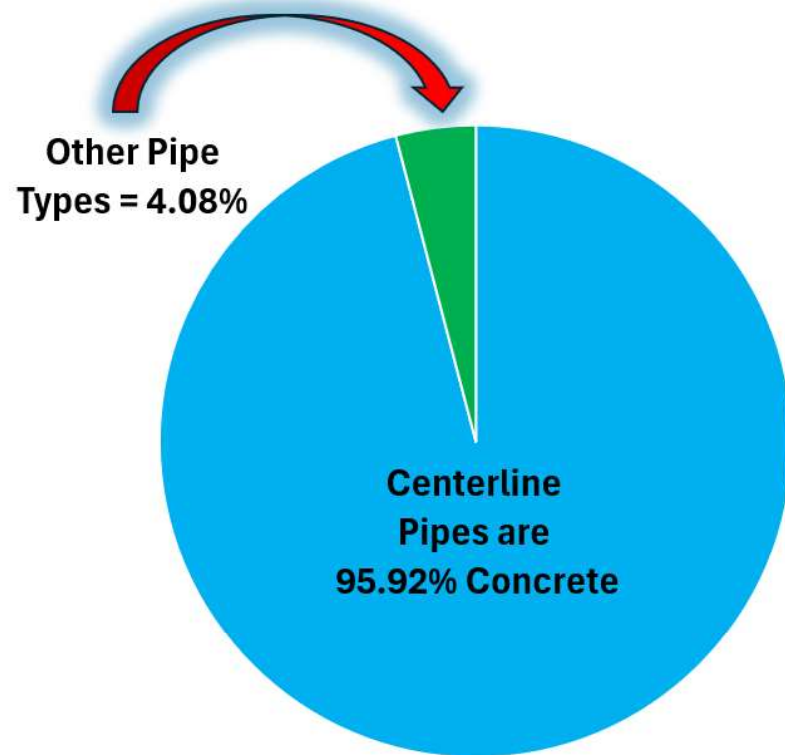


NDDOT Pipe Team Goal

- **GOAL is full inventory of centerline pipes by 2030 (22,500 pipes)**
 - **Currently have ~19% inspected**



NDDOT Pipe Team Goal



NDDOT Pipe Team Goal

Routine Inspection

- No video
 - Good → 10 years
 - Fair → 6 years
 - Poor → 3 years

In-Depth Inspection

- Video
 - Good → 20 years
 - Fair → 12 years
 - Poor → 6 years

4.2 Inspection Intervals

4.2.1 General

All inspections are required to be performed in the calendar year that they are scheduled. Pipes may be inspected during the winter months, provided that all components requiring inspection are accessible and not obstructed by snow or ice.

4.2.2 Inspection Frequencies

Inspection Type	Culvert Material Type	Good	Fair	Poor	Severe
Baseline	All Types	Within the calendar year that construction was completed.			
Routine	Concrete	10 years	6 years	3 years	≤ 1 year
	Metal	6 years	6 years	2 years	≤ 1 year
In-Depth	Concrete	20 years	12 years	6 years	≤ 1 year
	Metal	12 years	12 years	4 years	≤ 1 year
Underwater	All Types	20 years	20 years	5 years	≤ 1 year
Special	All Types	No defined inspection interval			
Approach	All Types	Approach pipes will be inspected when a minor rehabilitation or higher project is scheduled.			

4.2.3 Timely Updating of Data

Inspection data must be entered into the State's inventory within 180 days of the date of inspection.