

Status of 2015-16 County and Township Road and Bridge Investment Needs

August 20, 2015

Denver Tolliver - Director
Upper Great Plains Transportation Institute

Today's Presentation

- Status of local road/infrastructure needs studies
- Review of most recent infrastructure study and proposed study improvements
- General methodology for 2015-17 study
- General concepts and status for advancing legislative initiative for road and bridge asset management inventory toolkit development

Local Roads Infrastructure Needs Study Process

2007: NDDOT

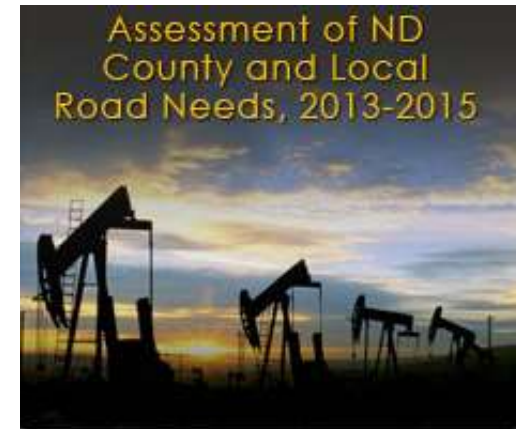
2009: NDDOT Level of Service Study

2010: ND Assoc. of Oil and Gas Producing Counties/ND Dept. of Commerce

2011-13: North Dakota Legislature

2013-15: North Dakota Legislature

2015-17: North Dakota Legislature



2013-15 Study

Data Collected

- Jurisdictional data for 52 counties
- 1,000+ vehicle counts and classifications by NDDOT & UGPTI
- 5,600 miles - pavement video image, pavement distress and ride data.
- 1,500 miles - pavement/subgrade strength and depth surveys
- Gravel costing surveys for 52 counties
- NBIS data - 2,327 local bridges

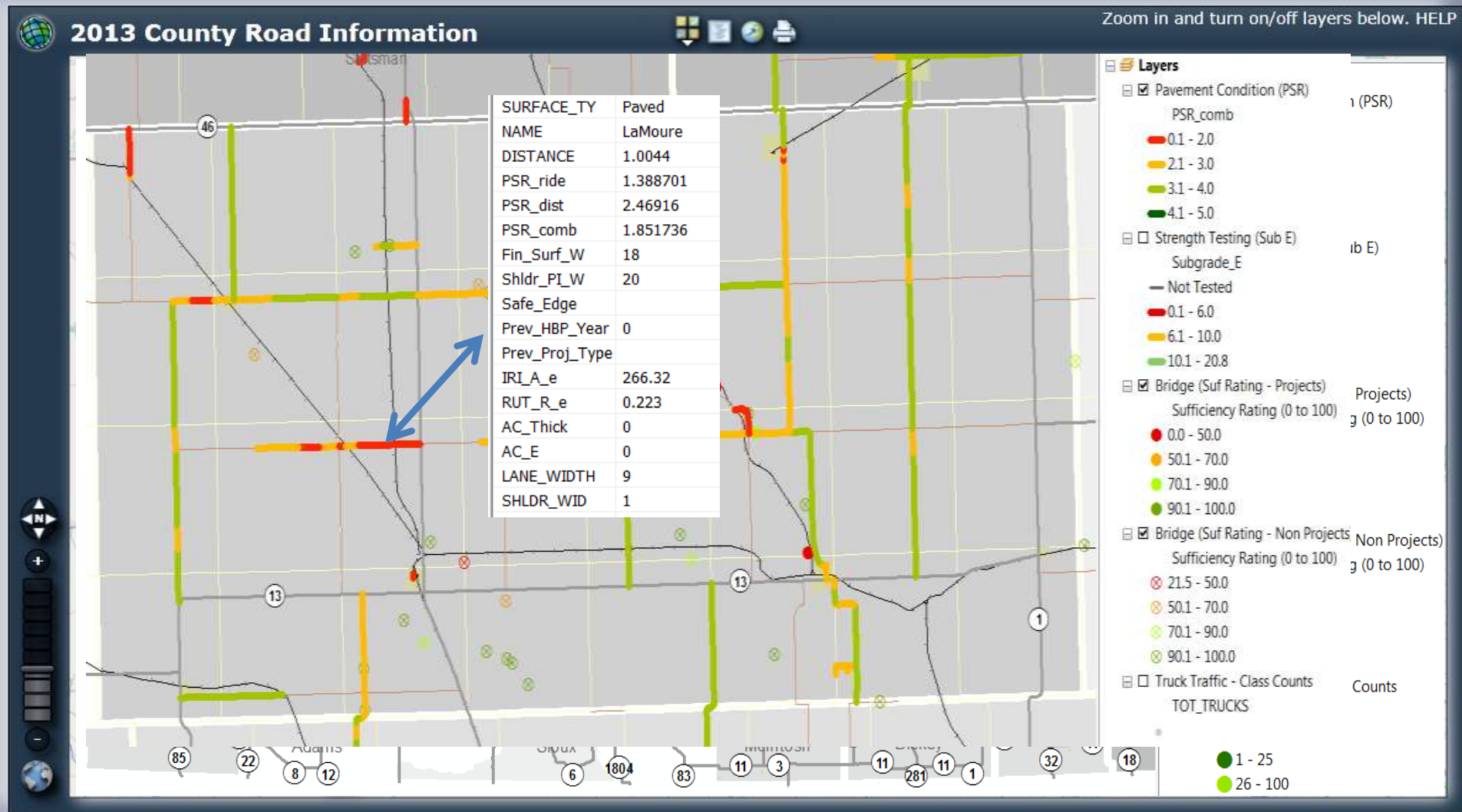
- Created a statewide truck traffic flow model
- Created AASHTO-93 Pavement Deterioration Model to predict pavement needs and remaining life
- Created Bridge deterioration and improvement model
 - Included study of bridges located on minimum maintenance roads; approximately 400 bridges excluded from analysis



On-line Interactive Map – Pavement Condition



On-line Interactive Map – Pavement Condition



Feedback from Counties and Legislators

- Most liked the interactive map
- First time many had objective pavement ratings available to them
- Study provided basis for investing in transportation infrastructure

Concerns from Counties and Legislators

- Pavement condition scores may not reflect age of lower layers of pavement
 - More accurate shoulder width and pavement thickness
- Counties not uniformly reporting gravel costs
- No costs for minor structures
- Some counties unaware of data requests

2015-17 Study

- Emphasis on uniformity of gravel costing submissions (revised survey instrument)
- Additional improvements to county pavement condition data
- Continued improvement to traffic data and forecasting
- Updated costing and modeling concepts
- Capture more accurate data history from counties – asset inventory too
- Continued emphasis on maintaining system – not providing for major upgrades

2015-17 Study Process/Major Steps

- Data Collection
 - Gravel costs and practices surveys - underway
 - Traffic counts - completed
 - Paved road condition assessment – completed jointly by NDDOT & UGPTI
 - Non-destructive pavement strength testing – to be collected in September-October 2015
- Data Verification
 - County Township Jurisdiction
- Traffic Modeling/Forecasting
- Pavement Analysis
- Bridge Analysis

- Gather additional pavement data to improve pavement modeling
 - Roadway Width, Pavement Thickness, Pavement Age, etc.
 - Request Counties to supply this information via asset inventory tool or survey
- Review Jurisdiction Data – ownership and maintenance
 - Review past results with Counties through LTAP
- Model Traffic, Road Costs & Assess Needs
- Present Data via on-line map
 - Enhanced version of 2014 version

Gravel Cost and Practices Surveys

- Survey of both counties and townships
 - 2013-14 study:
 - 52 county responses, 635 township responses
- Responses reflective of actual improvement and maintenance activities is critical
- Comparison between neighboring counties
 - Cost
 - Overlay frequencies
 - Regional average

- Aggregate (gravel) cost at pit
- Placement cost
- Transportation cost from pit to roads
- Dust suppressant usage/cost
- Stabilization usage/cost
- Intermediate practices
 - Stabilization/armor coat
 - Double chip seal/armor coat



Traffic Data Collection



- Data collection
 - Joint collection with NDDOT staff and NDSU students
 - Normal NDDOT count schedule covers 2500 counts
 - 500 additional counts will be taken across state.
 - Will supplement with other local counts
- Traffic data processing
 - Use ATR's from around state to factor the data
 - Use classification data to factor the volume counts
 - Input all traffic data into travel demand model
- Traffic data reporting
 - Specific count location data will be made available with an interactive map on the Web.



Pavement Data Collection

- Condition data collection
 - Collect data with NDDOT Pathway van
 - Approx. 5,000 miles of paved county roads
 - Will not collect short segments
 - Van will provide consistent pavement distress and ride information
 - Collecting data currently to mid August
- Scoring and reporting of data
 - New van has automatic scoring which will need calibration
 - NDSU students will do some manual scoring for validation
 - Data will be referenced to roadways to provide on-line mapping
- Other geometric data
 - Pavement and shoulder width will also need to be collected



- Non-destructive testing
 - Purpose: Expand the number of sample sections collected
 - Falling weight deflectometer (FWD) and ground penetrating radar (GPR)
 - Western ND – all pavements not recently improved and pavements not collected in last study
 - Eastern ND – additional sample roads not collected in last study
 - FWD will be done first and GPR will be done on the sites (based on GPS) thumped with FWD

Traffic Model

- Objective –update and enhance county and local roads traffic model developed for the 2013-14 Legislative study
- Model calibration – using most recent counts, where applicable
- Non-modeled areas – counts may determine traffic levels in non-modeled areas

- The entire modeling process will utilize Citilabs' Cube Base, Voyager and Cargo
- Specific models for ag commodities and oil movements
 - PSC grain data movements
 - NDO&G oil well projections
- Coordination with NDDOT

Pavement Analysis

- Pavement deterioration and recommended improvement process
 - Given starting pavement condition and traffic, remaining pavement life is estimated
 - Verify past assumptions on subgrade strength
 - Apply traffic projections and current PSR
 - Determine recommended improvements and costs based on width, starting condition, and future traffic estimates

Gravel/Unpaved Road Analysis

- Unpaved road miles grouped by traffic volume categories
- “Normal” practices established for each county based upon traffic observations and reported maintenance practices
- For traffic volumes above normal levels increased maintenance and overlay frequencies are applied.

Unpaved Improvement Types

- Traffic Category Improvement
 - Low: low volume average
 - Baseline: county average
 - Elevated: county average increased by 50%
 - Moderate: county average increased by 100%
 - High: county average increased by 150%, dust suppressant
 - Very high: county average increased by 200%, dust suppressant

Bridge Analysis

- NBI: county and local bridges
- Open bridges (other than culverts): Not considered: recently replaced or minimum maintenance roads
- Improvements considered: replacement or rehabilitation
- Maintenance Costs
- Develop minor structure process

Data Collection Status/Schedule

- Traffic counts - currently underway
- Traffic modeling - currently underway
- Road condition assessment – currently underway
- County cost and practices survey – August
- Township cost and practices survey – August
- County/TWP/other – jurisdiction and maintenance survey – August
- Establish a periodic county briefing newsletter

Local Roads Asset Inventory Toolkit

- Focus: provide tools for local governments to preserve and maintain roads and bridges
- Initial Steps:
 - Establish an Advisory Group of County Representatives (Partner with NDAoC; 10 counties identified)
 - Focus on building data inventory important to county road managers: links on-line mapping tools built for past study

Road Asset Management Steering Team

- Sharon Lipsh - Walsh County
- Shirley Murray - Sheridan County
- Dana Larsen - Ward County
- Ken Miller - Mercer County
- Todd Miller - Stark County
- Tom Soucy - Cass County
- Jana Heberlie – Mountrail County
- Kevin Fieldsend - Ramsey County
- Dan Schriock - Burleigh County
- Tyler Michel - Stutsman County

Local Roads Asset Inventory Toolkit

- Building Data Inventory Examples:
 - Initial Items to Develop:
 - Web/Map based input system
 - Paved roadways data set
 - Gravel roads data set
 - Bridges
 - Explore Adding Minor Structures (less than 20 ft.)
 - Other critical infrastructure items

Local Roads Asset Inventory Toolkit

- Building Data Inventory Examples:

