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

August 20, 2015

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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: