

# Economic Impact Committee

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# Today's Presentation

- Department/Tribal working relationship
- MAP 21
- Managing State Highway System

# Department/Tribal Programs

- Tribal Consultation
- STIP
- TERO
- Safety
- DOT authority to assist tribal governments with roadway work

# Tribal Consultations

- To ensure we are not adversely impacting tribal resources, NDDOT consults with Tribal Historic Preservation Officers and Cultural Resource Directors to discuss upcoming projects.
- Consult twice a year with a group of 16 different regional tribes/bands.
- NDDOT has received awards for the Programmatic Agreement, which established this process.

# Statewide Transportation Improvement Program (STIP)

- The STIP has an extensive public input process to obtain input on future projects.
- Part of the STIP process is meeting with tribal representatives, including council members to discuss projects.

# TERO Agreements

- Century Code 24-02-02.3 allows director to enter into agreements with tribal governments.
- Once a project is approved in tribal boundaries, next step is to develop a Tribal Employment Right Ordinance (TERO) Agreement for any construction project that is within the reservation boundaries.
  - TERO agreement is required by Federal rules and regulations.
- NDDOT and Tribal both sign a Memorandum of Understanding that details the type of work being performed, location of the project, applicable TERO fees and costs, and core crew.

# TERO Agreements

- 2.5% of project cost is paid to tribe for tribal members employment and training. A lower percentage is sometimes negotiated on high dollar projects.
- Agreements may occur at times between DOT and tribal governments to waive other tribal taxes and fees such as materials tax and trucking fees.

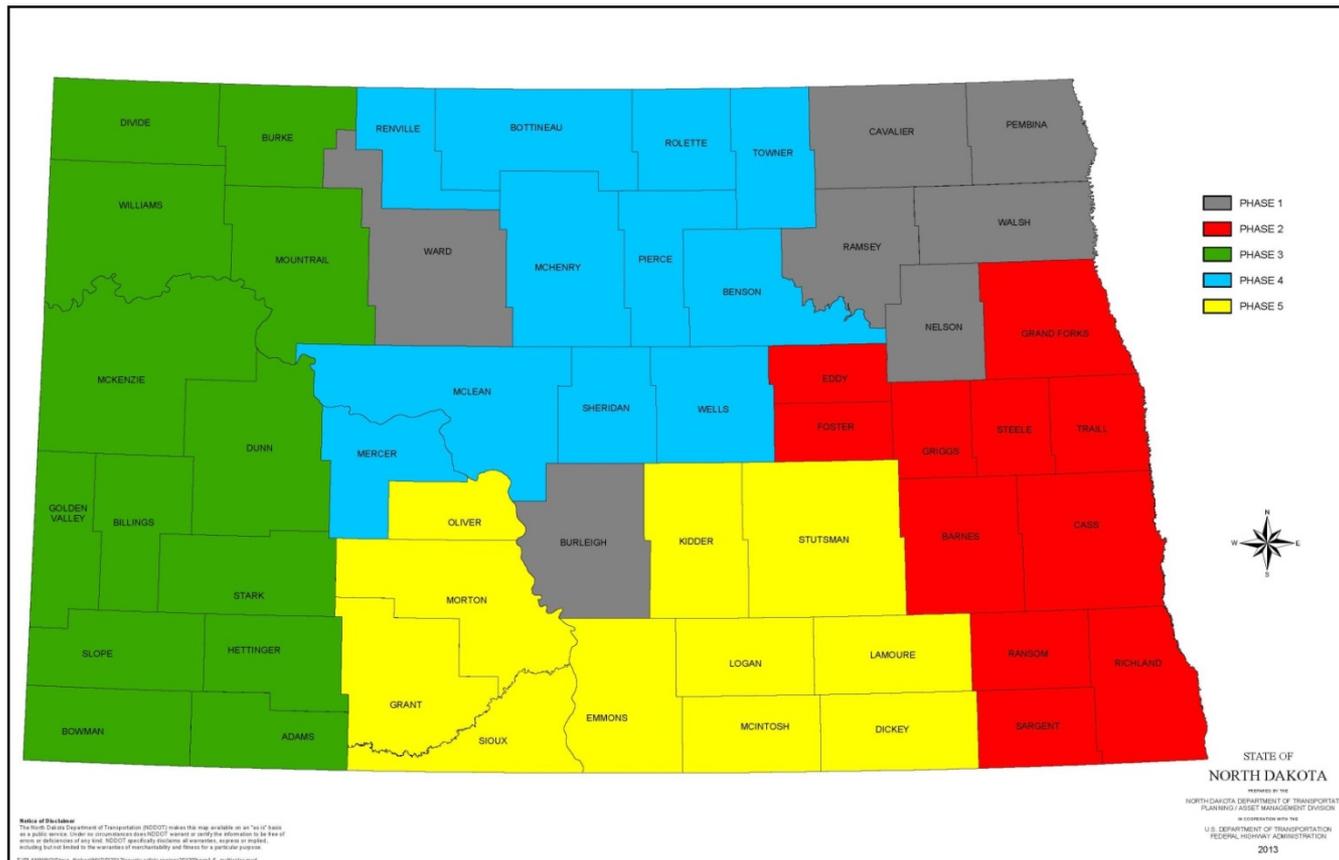
# Tribal Safety Programs

- Highway Safety Improvement Program
- Local Road Safety Program
- TraCS -Traffic and Criminal Software
- Safety Coordination with tribes

# Highway Safety Improvement Program (HSIP)

- Annual project solicitation from all governmental agencies, including tribal government.
- The HSIP is discussed at the STIP tribal consultations. Project submittal forms are shared as part of tribal discussions.

# Local Road Safety Program (LRSP)



# Local Road Safety Program (LRSP)

- Provides low-cost, effective safety strategies on county roads.
- Tribes will be invited to participate in workshops used to develop LRSP.

# TraCS - Traffic and Criminal Software

- TraCS is a traffic and criminal software program used by law enforcement to accurately document vehicle crash statistics and locations.
- NDDOT is working to encourage use of TraCS (electronic crash reporting system) on all four tribes.
- Implemented a multi-agency enforcement campaign in 2010 in which about 80% of law enforcement agencies are working together including all four tribes.

# Safety Coordination

- NDDOT provides National Highway Traffic Safety Administration (NHTSA) funds of \$50,000 annually to each tribe.
- The tribes use the funds to hire and maintain a traffic safety outreach coordinator to develop and implement traffic safety programs.
  - In place on Three Affiliated, Turtle Mountain and Standing Rock tribes.
- NHTSA funds are also used to bring safety messages to the tribes in various media venues including print, radio and GoodHealthTV (programming located at each of the Indian Health Service locations in the state).

# NDDOT authority on tribal roads

- Century Code 24-02-36 allows state funds allocated to NDDOT to be spent only on the state highway system.
  - Jack Rabbit Road is not on a state highway system, therefore no state funds are available.
- Approximately 5 years ago, state highways were placed onto tribal roads system to help secure BIA funding for tribal governments.
  - NDDOT remains in control of these roadways.

NDDOT has no statutory or legislative authority to spend funds on tribal roads not on the state highway system.

# Federal Highway Program

- Funding
- Policy Change
- Performance Measure Requirements
- Future



# Federal Funding Map- 21

- Map 21 is a two-year bill.
- The bill states North Dakota has an apportionment of:
  - \$240.5 million in 2012 and 2013.
  - \$242.5 million in 2014.
- Received \$241.2 million in obligational authority for 2013.
- To date NDDOT has received \$62.8 million in obligational authority through Jan. 15 for FY 2014.

# Map 21 Policy Changes

- Allows states to acquire or preserve right-of-way for a transportation facility prior to completion of the environmental review process.
- Provides for earlier coordination and greater linkage between the planning and environmental review process.
- Establishes a framework for setting deadlines for decision making in the environmental review process. (Penalties for agencies that fail to make decisions in a timely manner).
- Expands the use of Categorical Exclusions (CEs) when there are no significant environmental impacts.
  - Expands the usage of CEs to projects within the existing operational right-of-way.

# Map 21 Performance Requirements

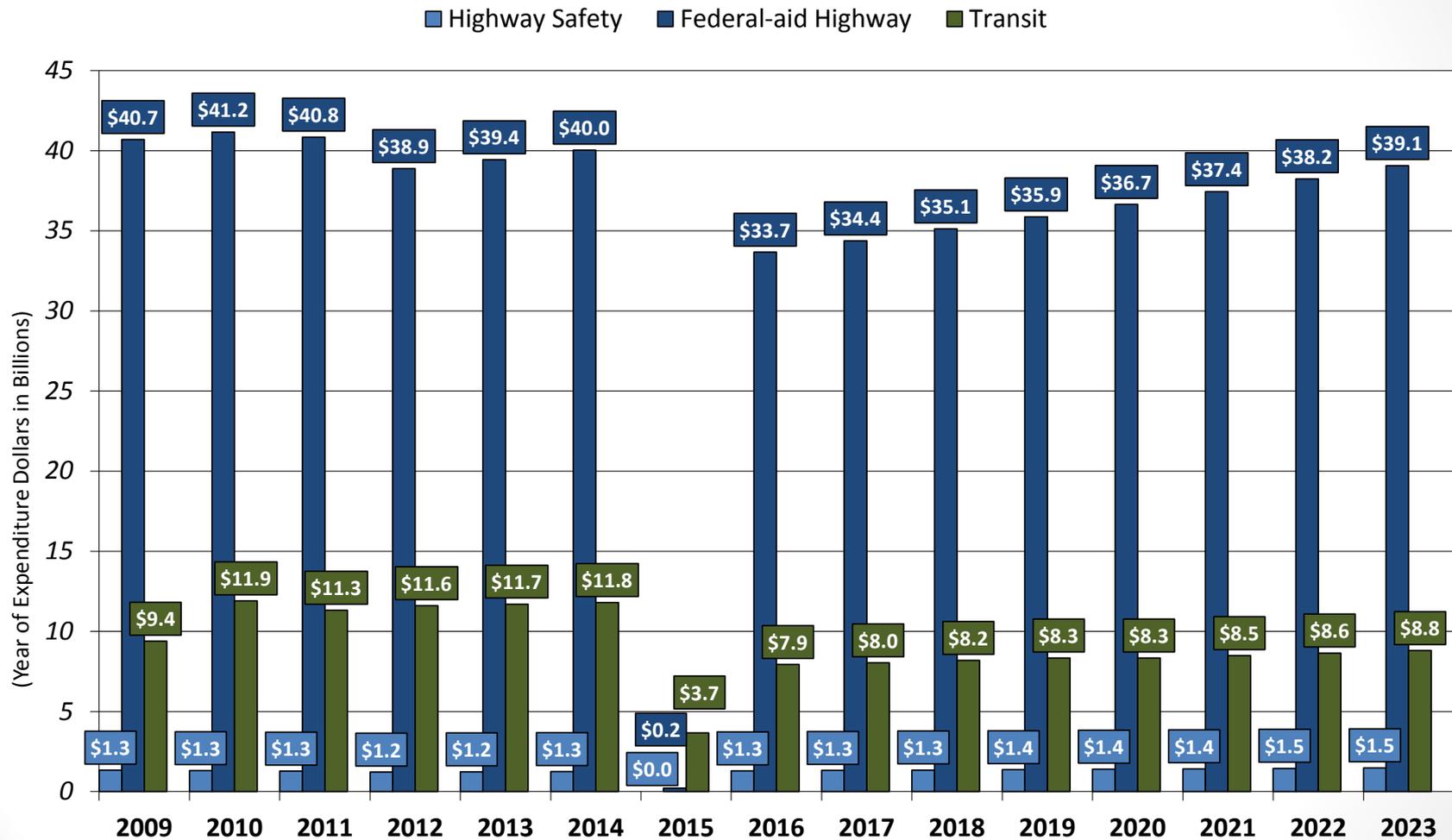
- ▶ Performance-based planning & programming for MPOs and NDDOT
  - Measures & targets used to evaluate effectiveness
  - Most cases, USDOT sets measures; state &/or MPO sets targets.

National Goal Area	National Performance Measure
Safety	1. Serious Injuries and Fatalities per VMT 2. Number of Serious Injuries and Fatalities
Infrastructure Condition	3. NHS Bridge Condition 4. Interstate System Pavement Condition (including minimum levels set by the Secretary) 5. NHS Pavement Condition (excluding Interstate)
Congestion Reduction	6. Traffic Congestion
System Reliability	7. Interstate Sys. Performance 8. NHS Performance (excluding the Interstate)
Freight Movement and Economic Vitality	9. Freight Movement on the Interstate System
Environmental Sustainability	10. On-Road Mobile Source Emissions

# Map 21 System Additions

- Map 21 expands the National Highway System (NHS) to include all principal arterials (roadways) in urban areas.
- Some of the requirements as a result of this expansion are:
  - Work with the urban areas to collect pavement and bridge data of main arterials.
  - Lady Bird Johnson Act (Billboards).

# Future of Federal Funding



***If no new revenues are found, federal highway obligations will fall by almost 100% in FY 2015***

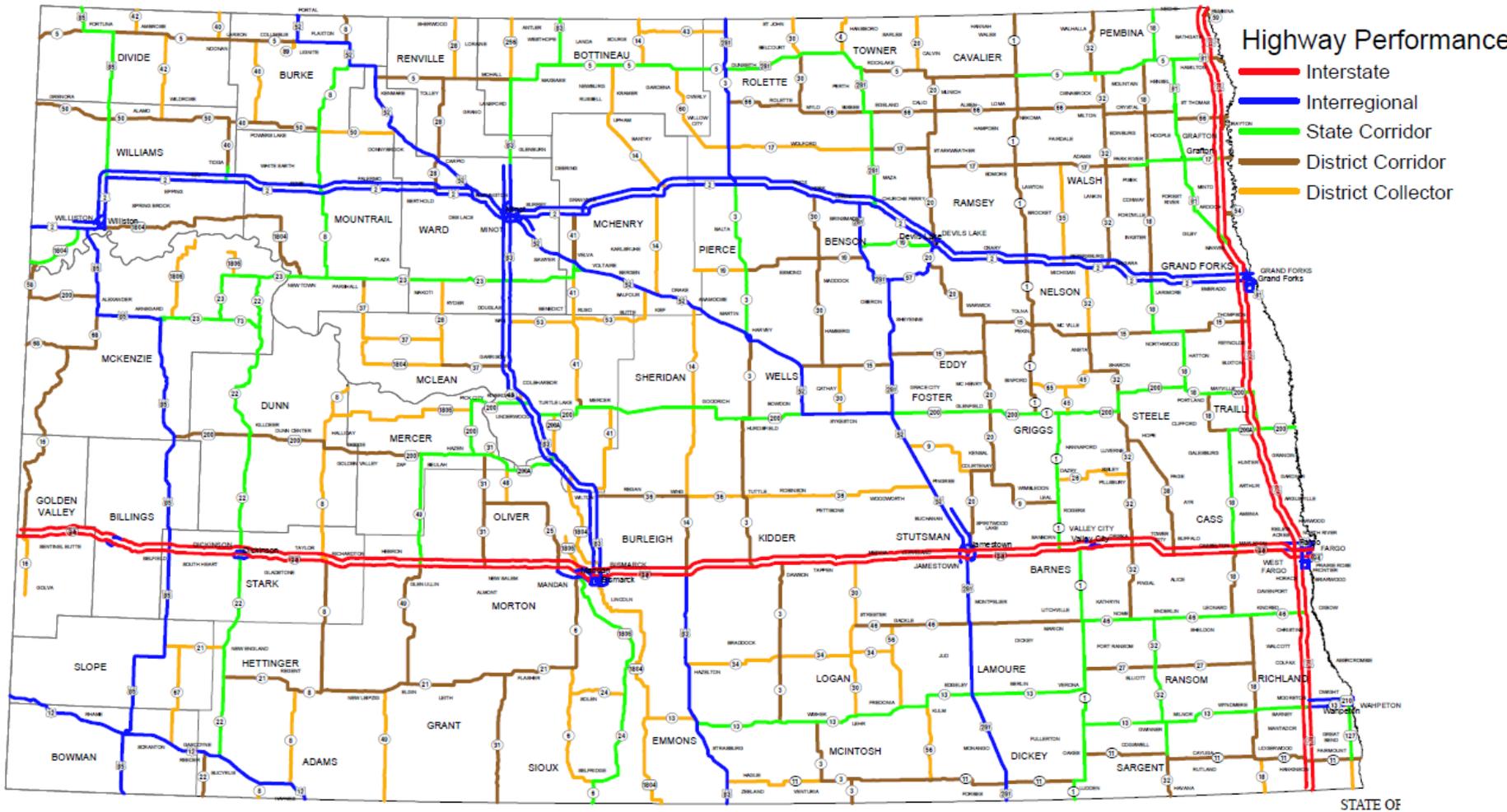
# State Highway System



# Managing The State Highway System

- Authority given to DOT Director through state Century Code Chapter 24.
- DOT currently manages over 8,500 roadway miles.
- 2005 Legislative session approved the state Highway Performance Classification System (HPCS).

# Highway Performance Classification System



The HPCS concept was adopted by the state legislature in 2005.

# Managing The State Highway System

Tools used for managing the state highway system:

- Pavement Management System
- Traffic Forecasting Model
- Bridge Management System
- Comprehensive Asset Management System – currently under development.

# How A Project Is Selected

Road projects are selected by using:

- Management Tools
- Public Input
- Economic and Social Impacts

# Project Selection

Once a project is selected the NDDOT follows standards that are adopted by the American Association of State Highway Transportation Officials (AASHTO).

- Utilized by DOTs throughout the United States.

NDDOT is actively involved in AASHTO. We work closely with the association to develop standards for:

- Materials
- Roadway Design
- Bridge Design
- Road Sign Design
- Traffic Control

# Pavement Design

The type of pavement used (asphalt, concrete, or composite) for roadway improvements is based on:

- Management Tools
- Revenue Available.

# Pavement Design

As part of the Pavement Design process  
NDDOT considers:

- Pavement Condition
- Roadway Geometrics
- Soil Types
- Climate
- Traffic (Existing and Future)
- Design Life Expectancy

# AASHTO Pavement Design

$$\log_{10}(W_{18}) = Z_R \times S_0 + 9.36 \times \log_{10}(SN + 1) - 0.20 + \frac{\log_{10}\left[\frac{\Delta PSI}{4.5 - 1.5}\right]}{0.40 + \frac{1094}{(SN + 1)^{5.19}}} + 2.32 \times \log_{10} M_R - 8.07$$

Calculated  
Damage over the  
Design Period

=

Required Pavement Structure, Based on Available  
Foundation Strength;

*Modified for:*

- Condition at the End of the Design Period
- Acceptable Level of Risk

# AASHTO Pavement Design

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- $W_{18}$  = Accumulated Flexible ESALs
- $Z_R$  = Reliability
- $S_o$  = Standard Deviation
- $SN$  = Structural Number
- $\Delta PSI$  = Present Serviceability Index
- $M_R$  = Subgrade Resilient Modulus

# AASHTO Pavement Design

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- **$W_{18}$  = Total Accumulated Flexible ESALs for Pavement Design Period**
- Predicted Number of 18,000 lb. (18kips) ESALs
  - $T/2 \times 365 \times \frac{[(1+i)^n - 1]}{i}$

Where:

T = Two-Way Daily Flexible ESALs

i = Growth Rate

n = Design Period – (20 years for flexible pavements)

# AASHTO Pavement Design

$$\log_{10}(W_{18}) = Z_R \times S_0 + 9.36 \times \log_{10}(SN + 1) - 0.20 + \frac{\log_{10} \left[ \frac{\Delta PSI}{4.5 - 1.5} \right]}{0.40 + \frac{1094}{(SN + 1)^{5.19}}} + 2.32 \times \log_{10} M_R - 8.07$$

- **$Z_R$  = Reliability Factor**
- Probability that a Pavement Section Will Perform Satisfactorily Over the Design Period.
  - Reliability Dictated by HPCS
  - Higher Reliability on Higher Traveled Systems
  - Used to Mitigate Risk of Early Deterioration

# Pavement Design Life

The life of the pavement depends on the estimate of the variables. Each of the variables are input into the pavement design process equation.

The longer the design life the more difficult it is to accurately predict each of the variables.

As a result states nationwide typically design for a 20-30 year design life for pavement.

The 20-30 year design life anticipates additional periodic roadway improvement projects.

# Highway Design Standards

We have only discussed pavement design today. There are other designs that are also part of the highway projects including:

- Curve Design
- Road Signing Design

# Thank You!