



Highway Needs & Financing

June 17, 2014

South Dakota Department of Transportation

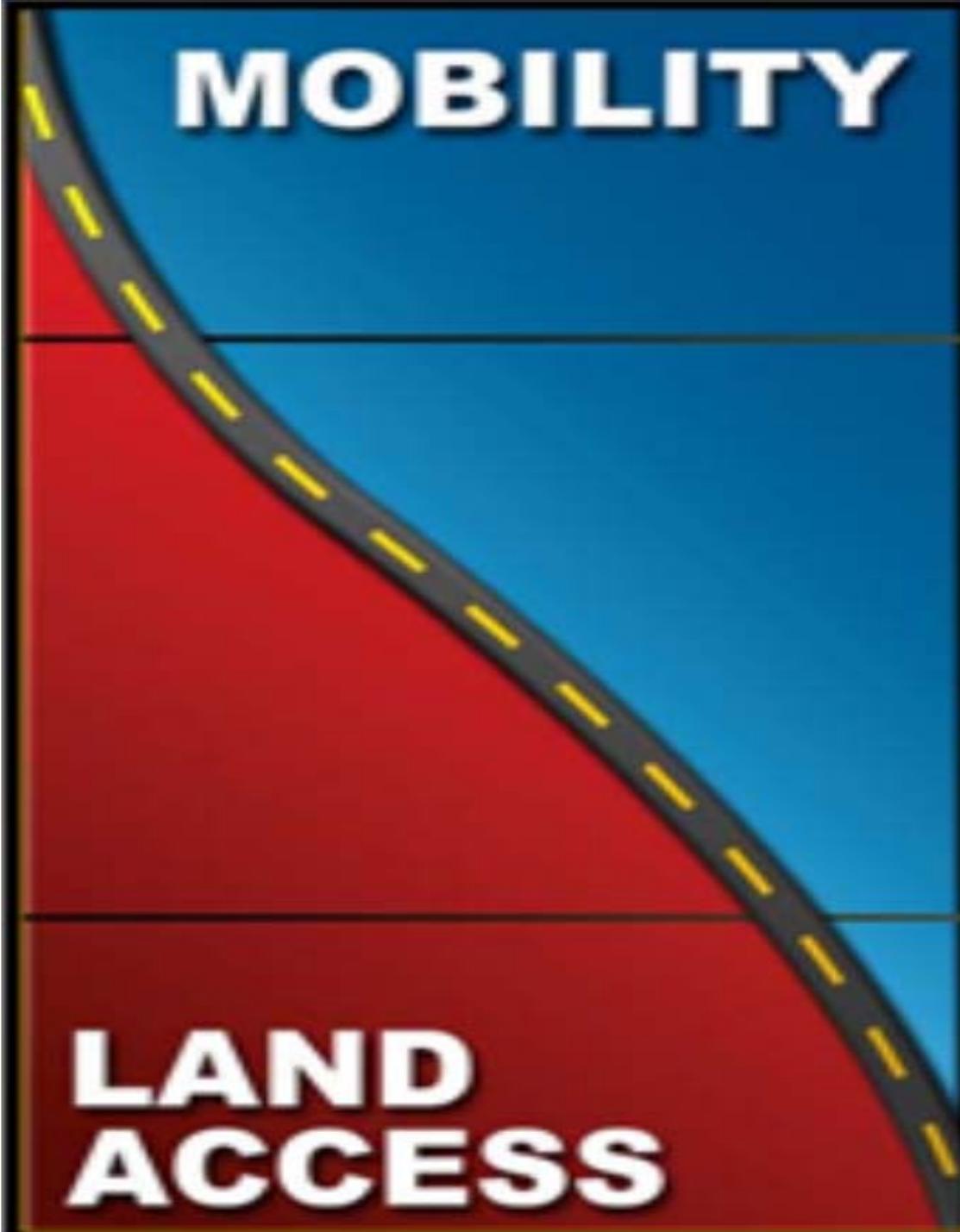
- 
- **Mission Statement**
 - To efficiently provide a safe and effective public transportation system.
 - **Vision Statement**
 - Achieve excellence in providing transportation facilities that meet the needs of the public.



Highway Needs & Financing

Agenda

- Introductions
- Highway System
 - State Highway vs. Local Highways (functionality)
 - State System
 - Current Major Assets
 - Management of the System
 - Current Condition
- Revenue
 - Federal
 - State
- Local Info
- State Highway Projections



MOBILITY

Interstate

- Highest Mobility
- Low degree of access

Principal and Minor Arterials

- High mobility
- Lower accessibility

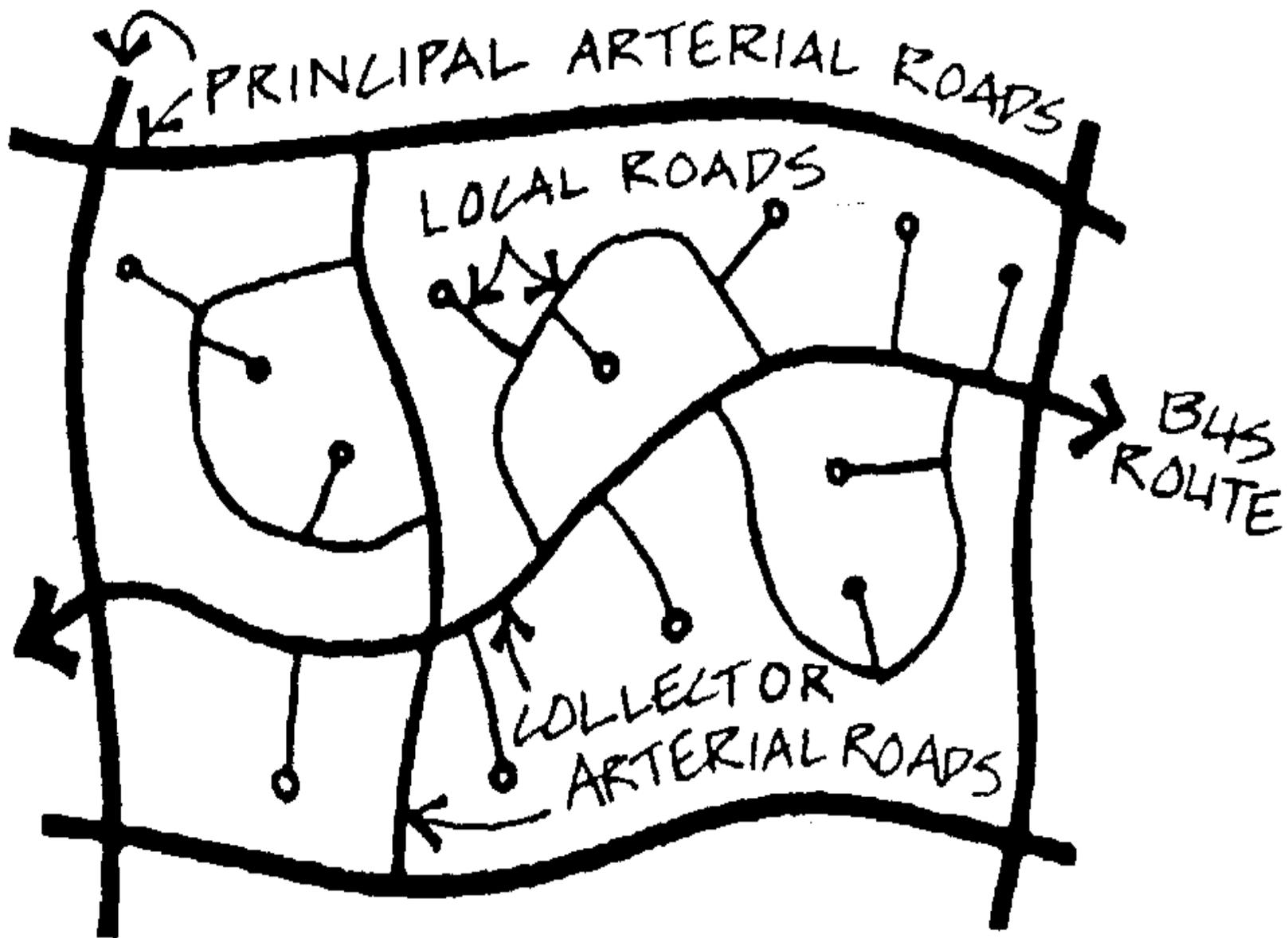
Major and Minor Collectors

- Balance between mobility and access

Local Roads

- Lower mobility
- High degree of access

LAND ACCESS

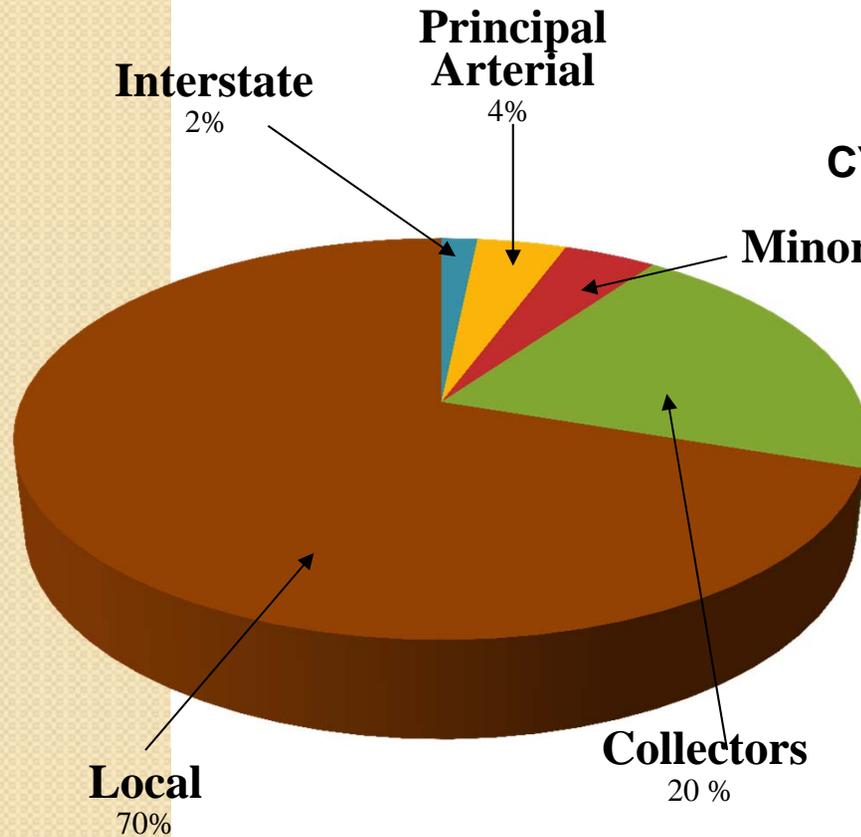




State System Priority by Functionality

1. Interstate
2. Principal (Major) Arterial
3. Minor Arterial
4. State Secondary (Major Collector)

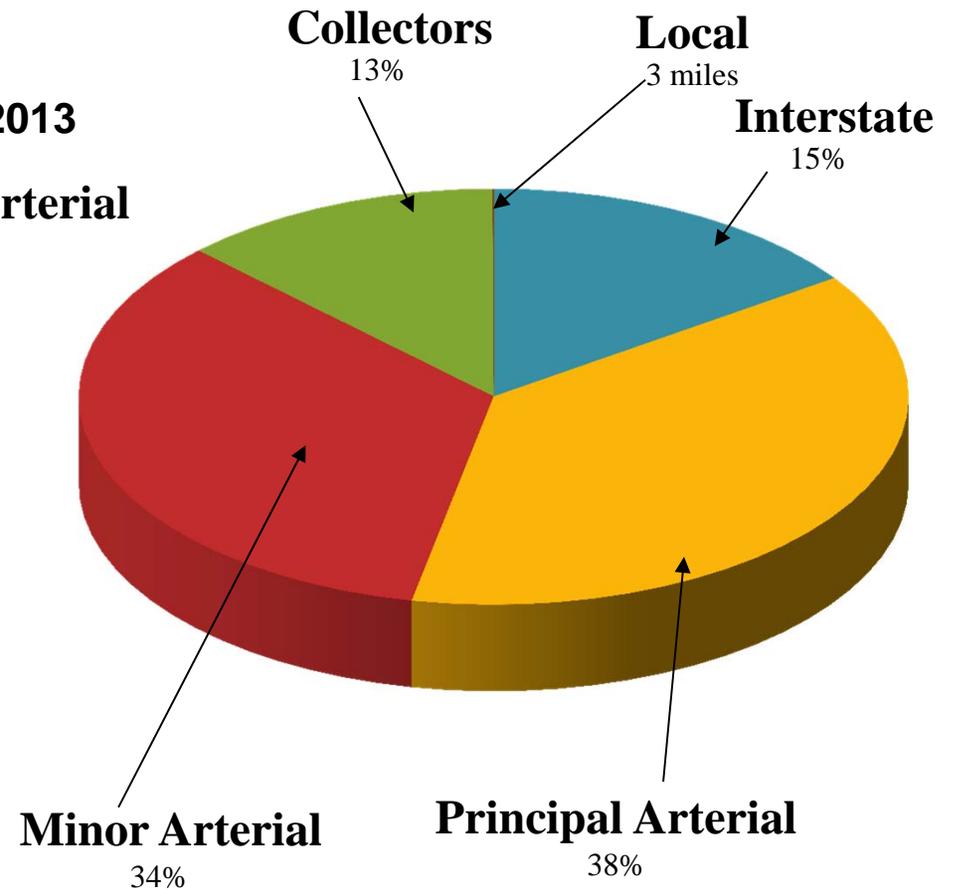
Functional Classification Mileage



All South Dakota Jurisdictions

Approximately
83,650 Miles

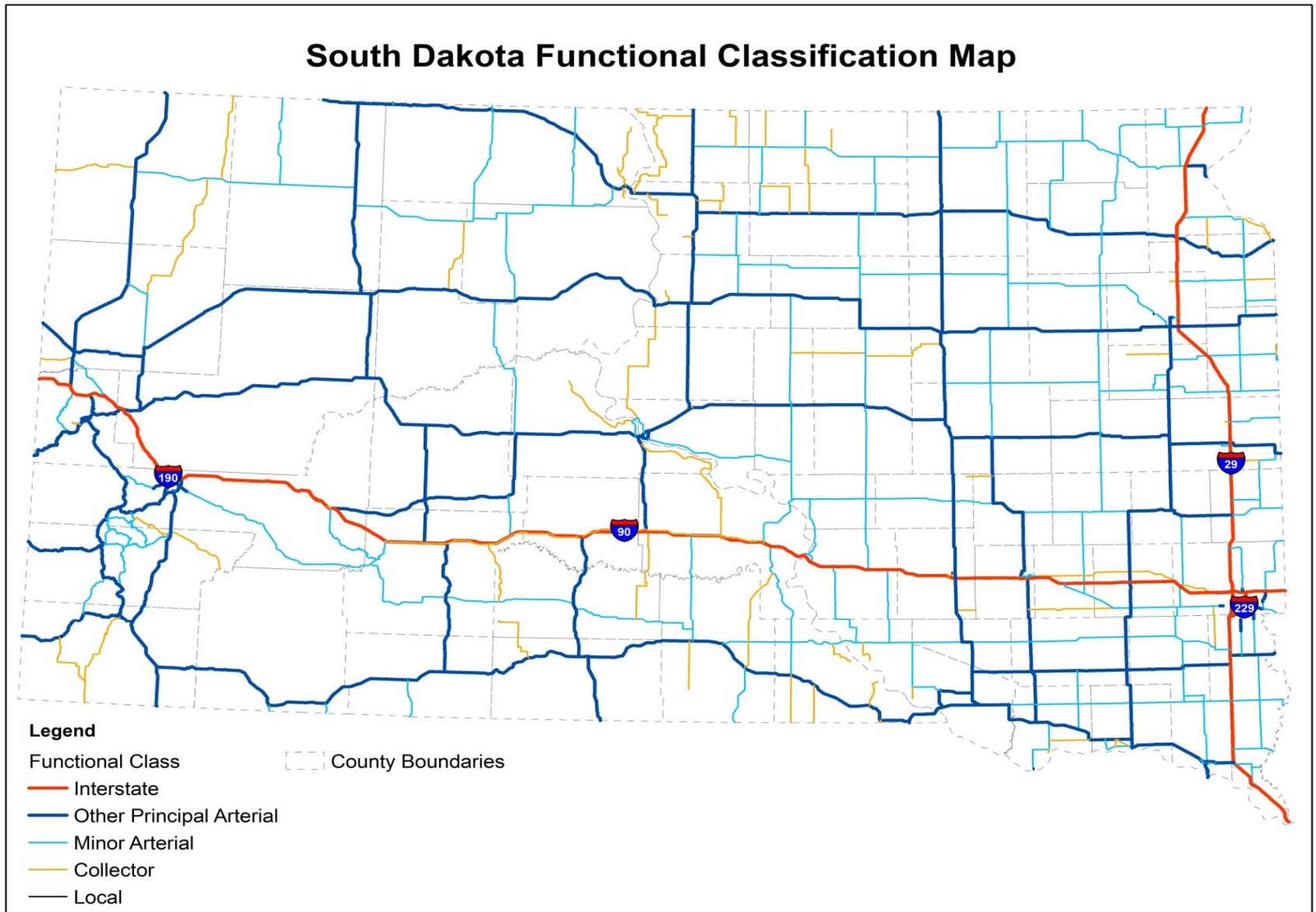
CY 2013



State Highways

Approximately
8,850 Miles

State Highway Classification Map



County Functional System

Functional Classification Map for Aurora County



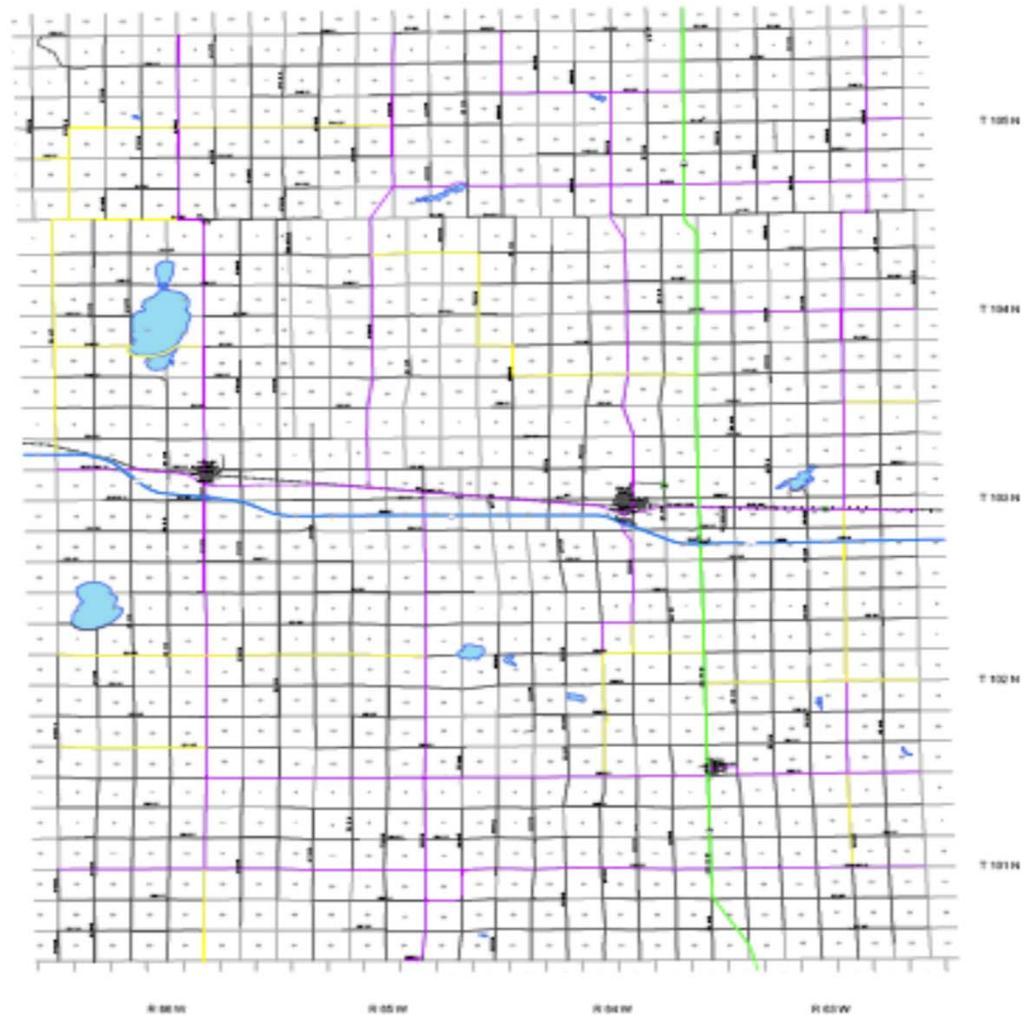
Legend

FUNC_CLASS	Description
Green line	Interstate
Blue line	Rural/Principal Arterial - Interstate
Red line	Rural/Principal Arterial - Other
Light Green line	Rural/Minor Arterial
Purple line	Rural/Minor Collector
Yellow line	Rural/Minor Collector
Black line	Rural/Local Road
Dark Blue line	Urban/Principal Arterial - Interstate
Dark Purple line	Urban/Principal Arterial - Freeway
Light Purple line	Urban/Other Principal Arterial
Light Green line	Urban/Minor Arterial
Yellow line	Urban/Collector
Black line	Urban/Local Street
Grey line	Right-of-Way
Blue area	Water

Prepared by
Project Development
South Dakota Department of Transportation
July 26, 2006

In Cooperation With The

U.S. Department of Transportation
Federal Highway Administration



Road Functionality

31-4-1. State trunk highway system designated by Legislature. Primary factors to be considered--Limitation on removal from state trunk highway system. The state trunk highway system shall be as designated by the Legislature in statute. In designating the state trunk highway system, the Legislature shall consider, but not be limited to, the following primary factors:

- 1) Highways which are functionally classified as arterials as approved by the Federal Highway Administration and which provide farm to market access;
- 2) Highways providing service to a state or federal recreational access area;
- 3) The proximity of other state trunk highways and highways providing duplicating or similar service;
- 4) The cost of construction, maintenance, right-of-way, and the extent of needs on the state system;
- 5) The traffic volumes and other traffic survey data; and
- 6) The desirability of providing an integrated system to serve interstate travel, county seats, and cities of four hundred fifty population or greater.



Road Functionality

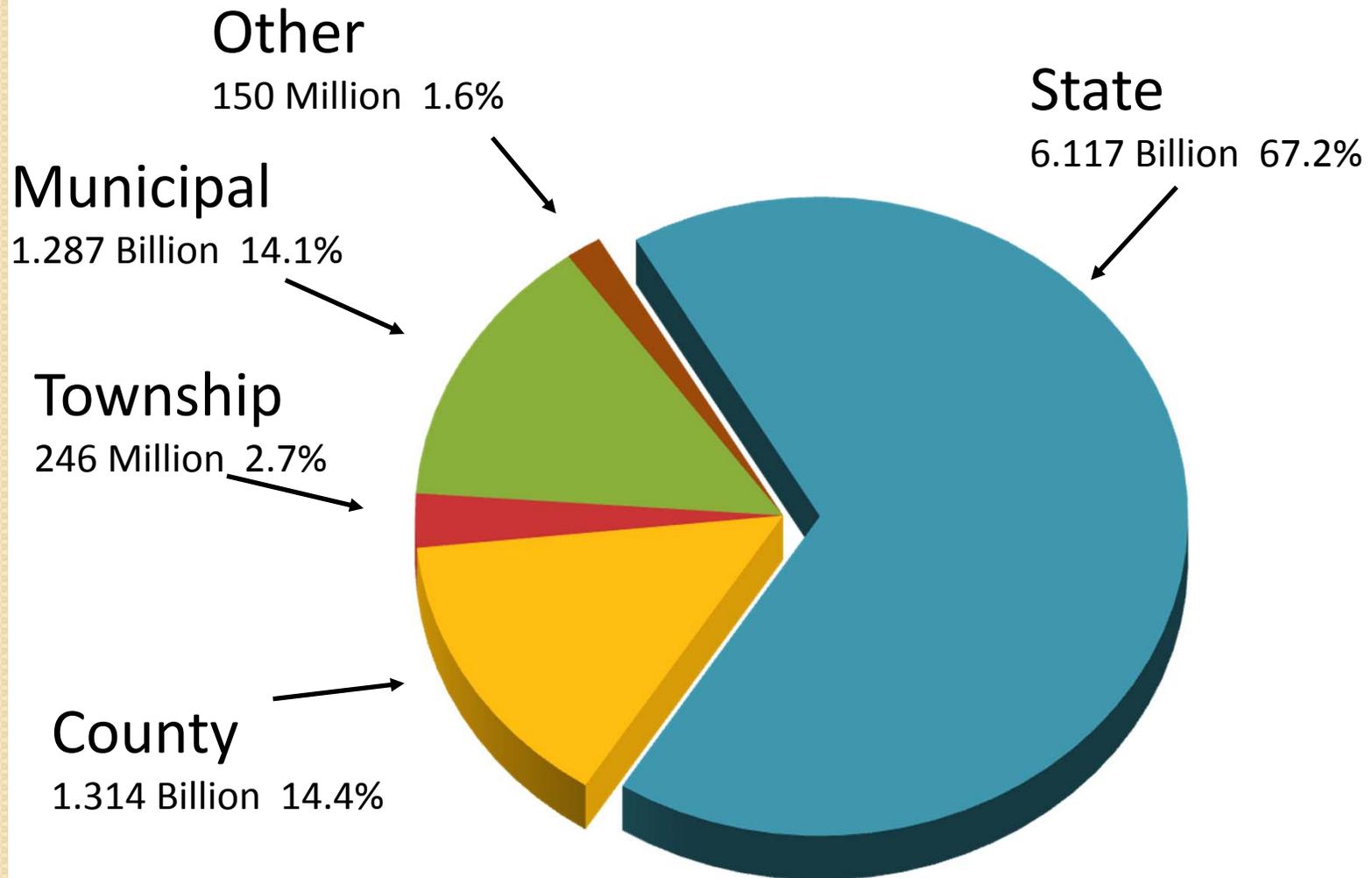
Statute for Jurisdictional Transfer 31-4-1 (cont'd)

An existing highway segment may not be removed from the state trunk highway system unless an agreement for transfer of maintenance responsibility has been executed by the Department of Transportation and the local government unit to which the title and maintenance responsibility would be transferred.

Annual Vehicle Miles of Travel By Jurisdiction

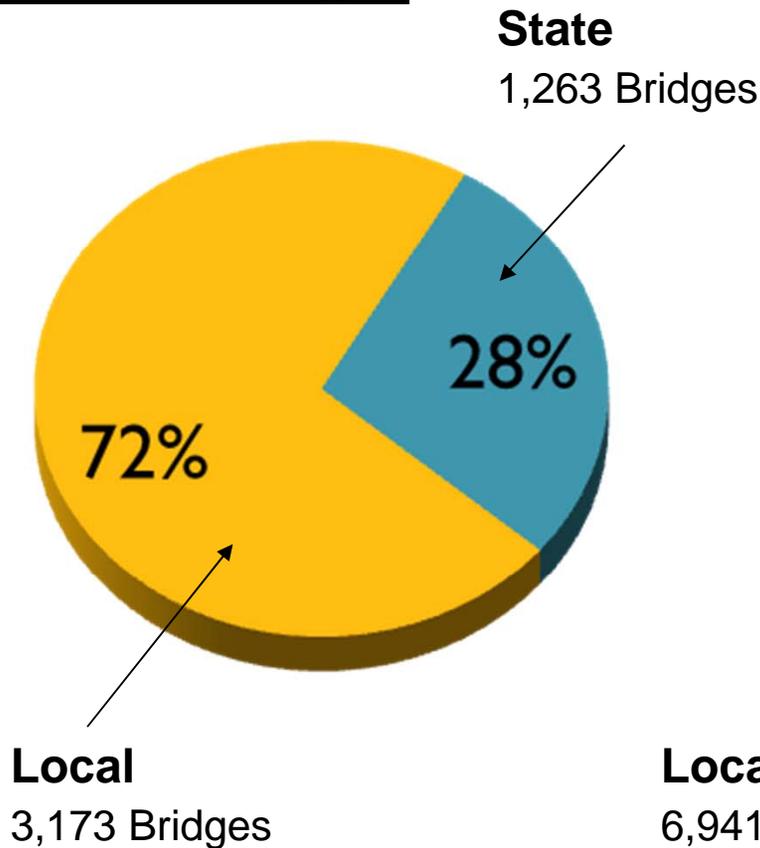
CY 2013

Total = 9.114 Billion

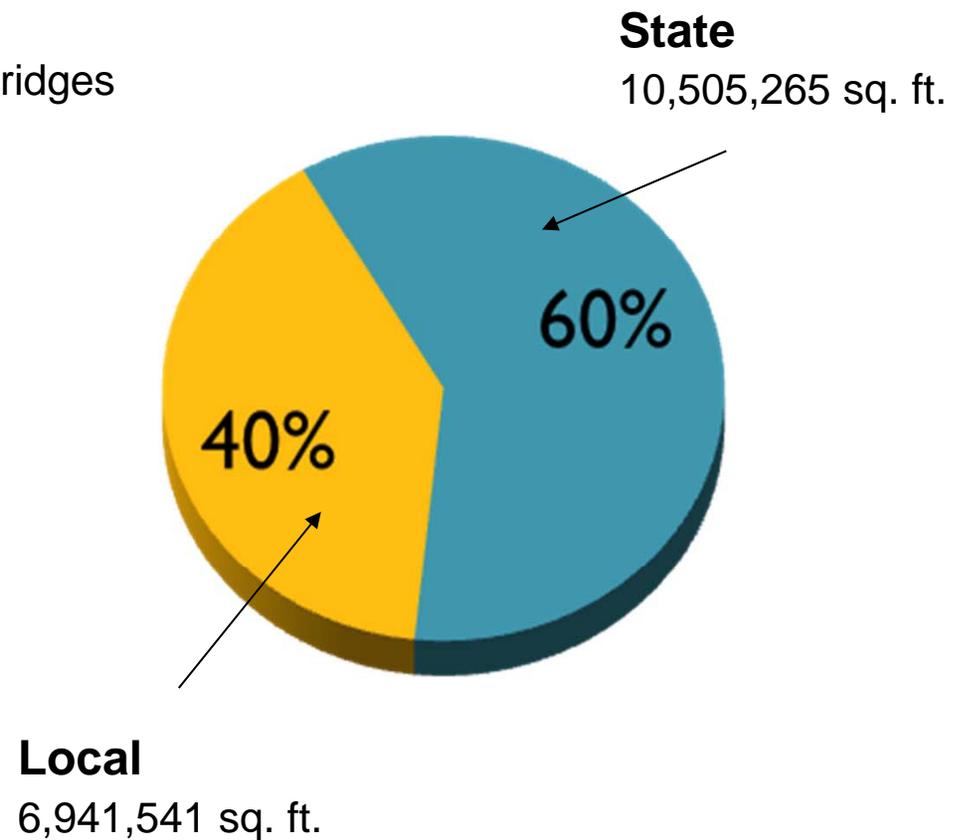


Comparison of State and Local Bridges

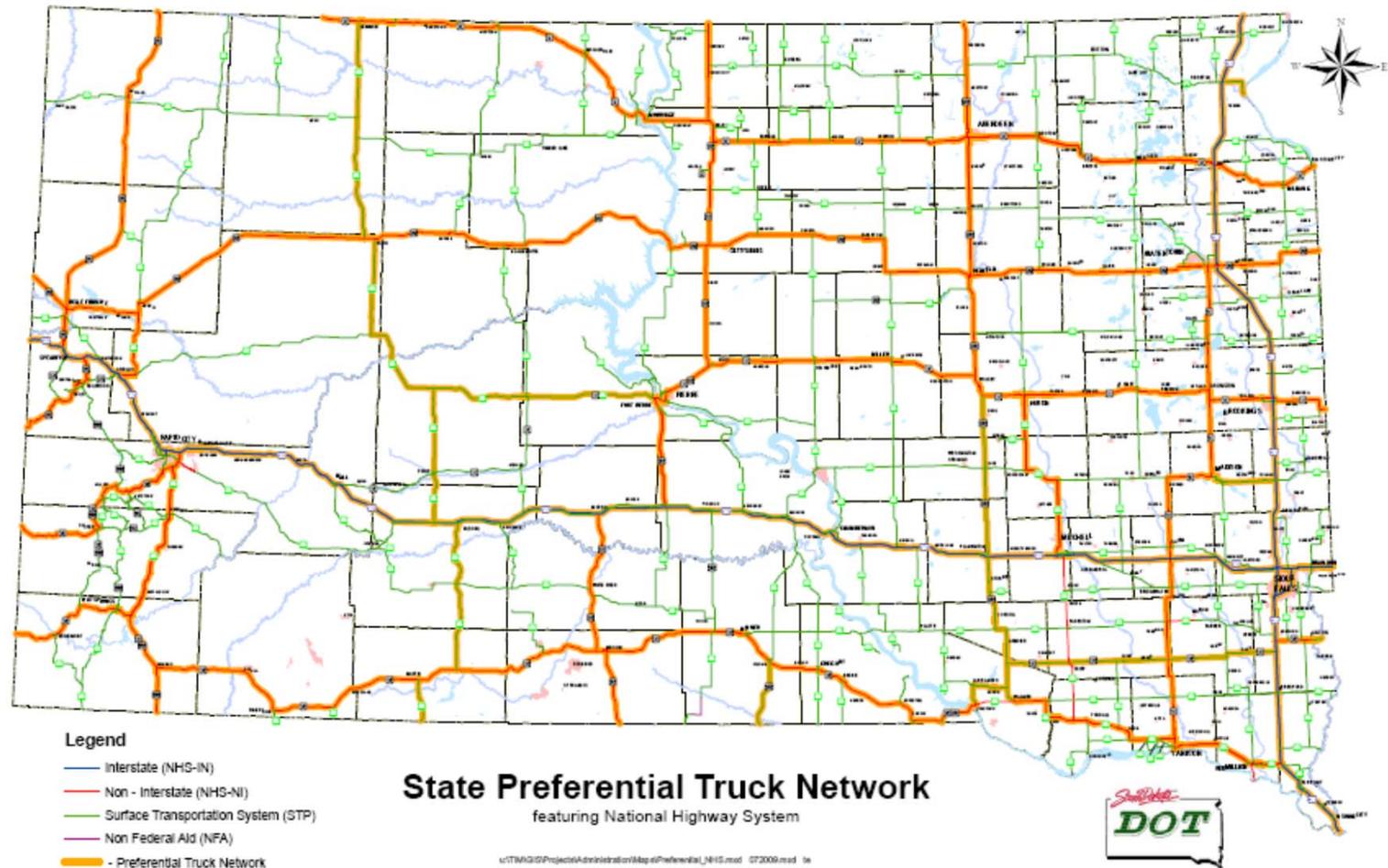
Number of Bridges



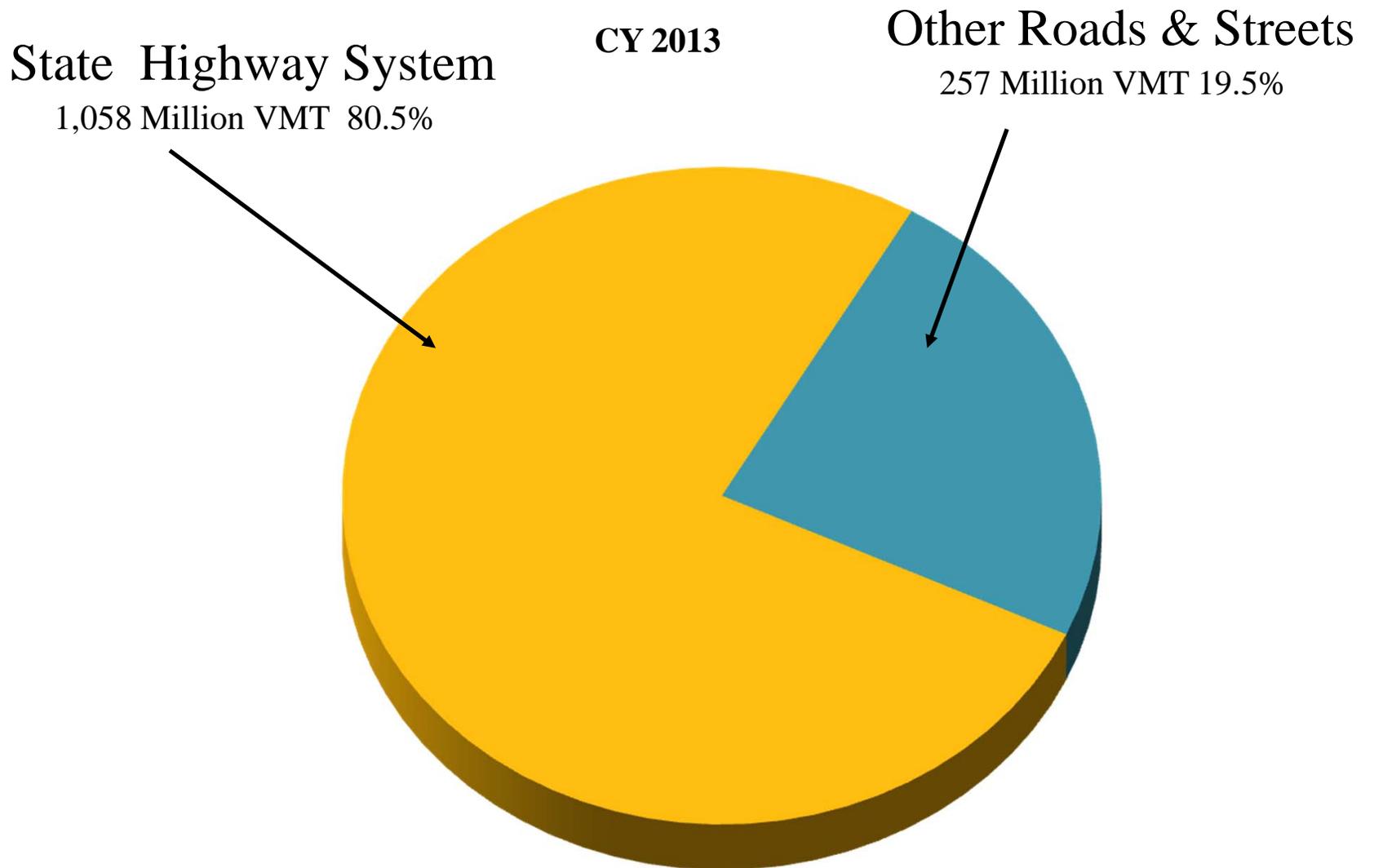
Deck Area



Truck Network & NHS



Heavy Truck Vehicle Miles of Travel By Jurisdiction





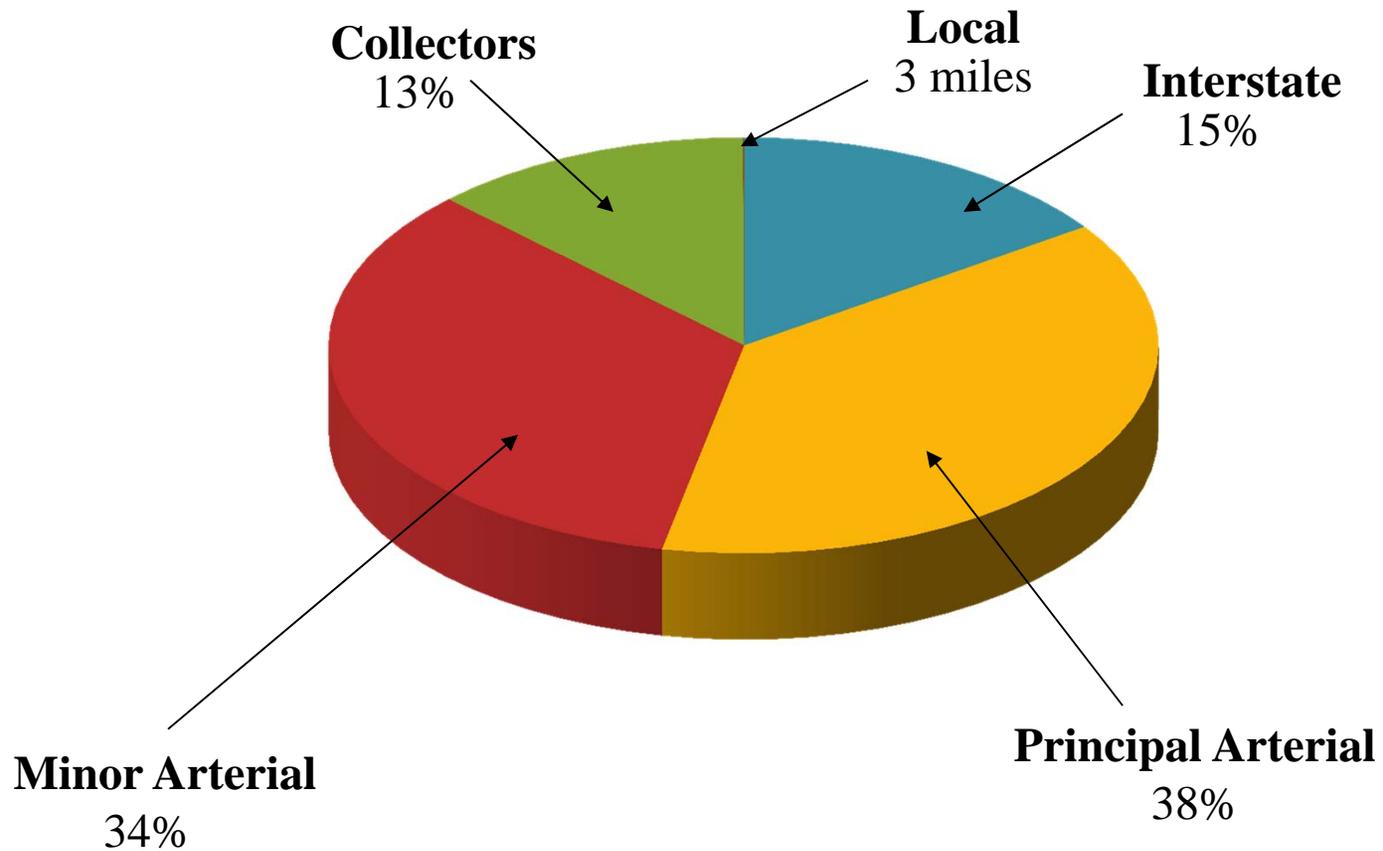
State Highway System

Current Major Assets

- Pavements
- Bridges
- Expansion
- Safety
- Other (Signals, Rest Areas/Buildings, Equipment, Signs, Culverts, etc)

State Highway Classification

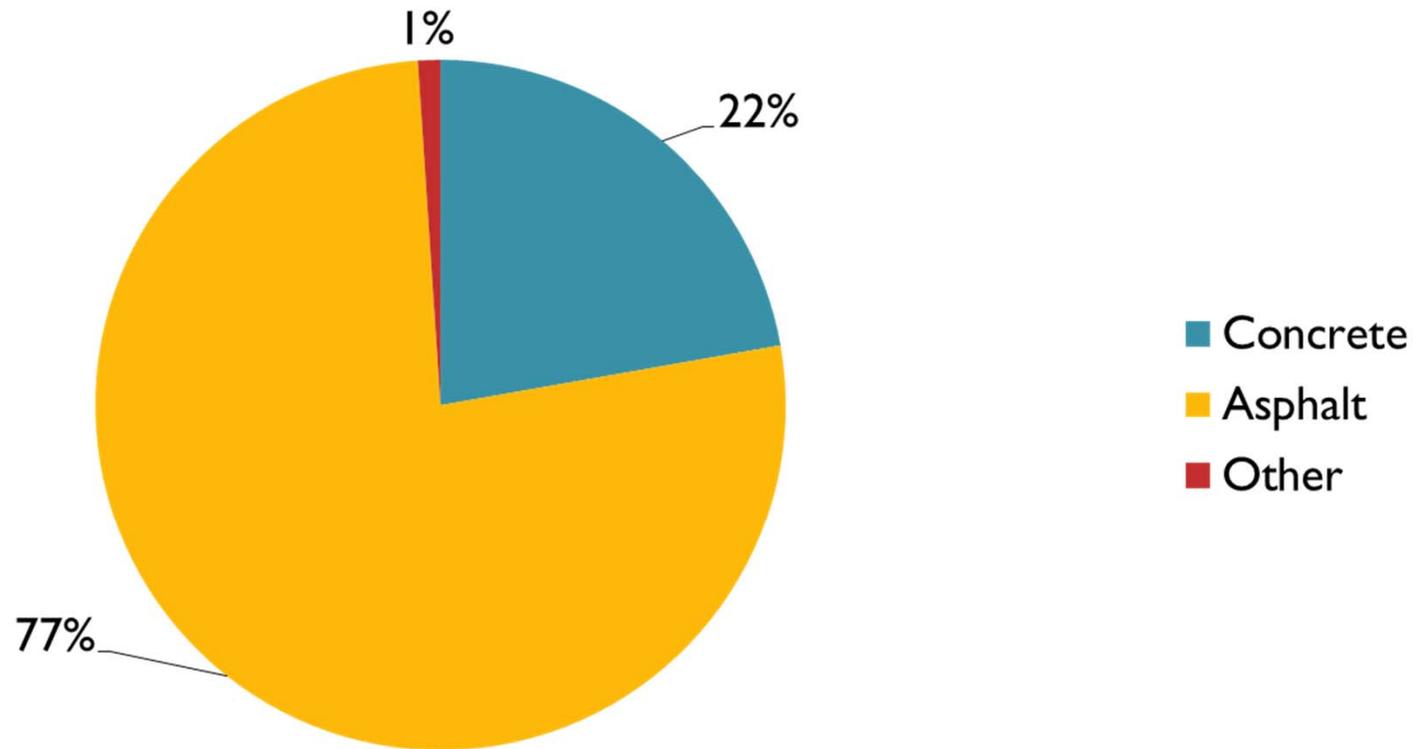
CY 2013



Approximately
8,850 Miles

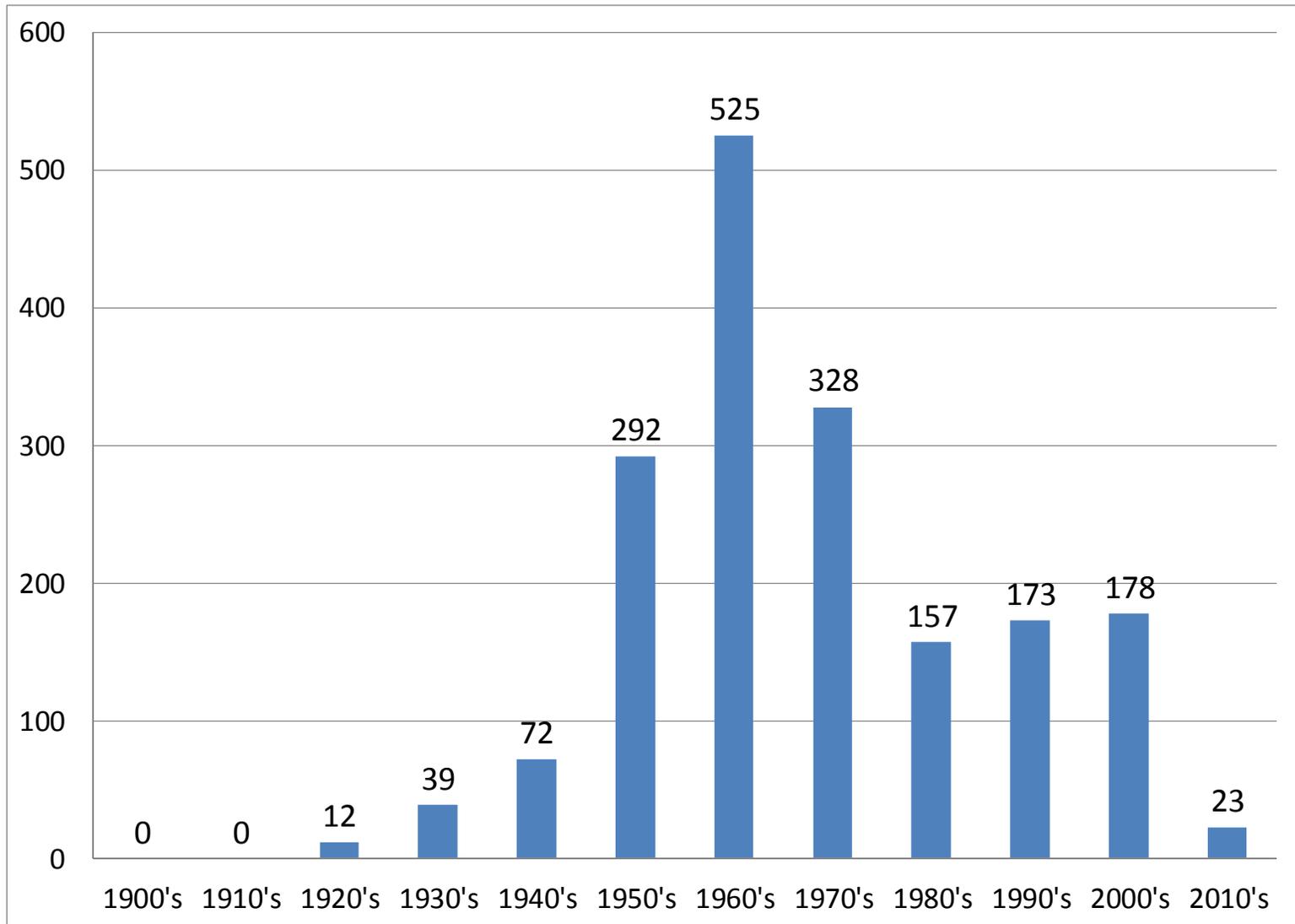
Amount of Asphalt & Concrete Highways

Pavement by Summary Pavement Type



State Structures Built by Decade

Number of Structures





Structurally Deficient

- Structurally Deficient is an engineering term used in the federally mandated National Bridge Inspection Standards (NBIS) program.
- The term is an indicator for when certain elements of a bridge are in need of repair or replacement.
- The bridge is not unsafe, but the department would be considering repairing the deficiency.
- A structurally deficient classification does not necessarily mean a bridge is unsafe.
- 4.7% of state structures are structurally deficient.



Functionally Obsolete

- Functional obsolete: refers to a substandard feature within the structure relative to current design standards.

Examples:

- narrow roadway width
- inadequate water capacity for current conditions
- inadequate vertical and horizontal clearances
- Functional obsolescence is not an indicator that a bridge is structurally unsafe.
- 5.1% of state structures are functionally obsolete

Expansion / Capacity



Safety



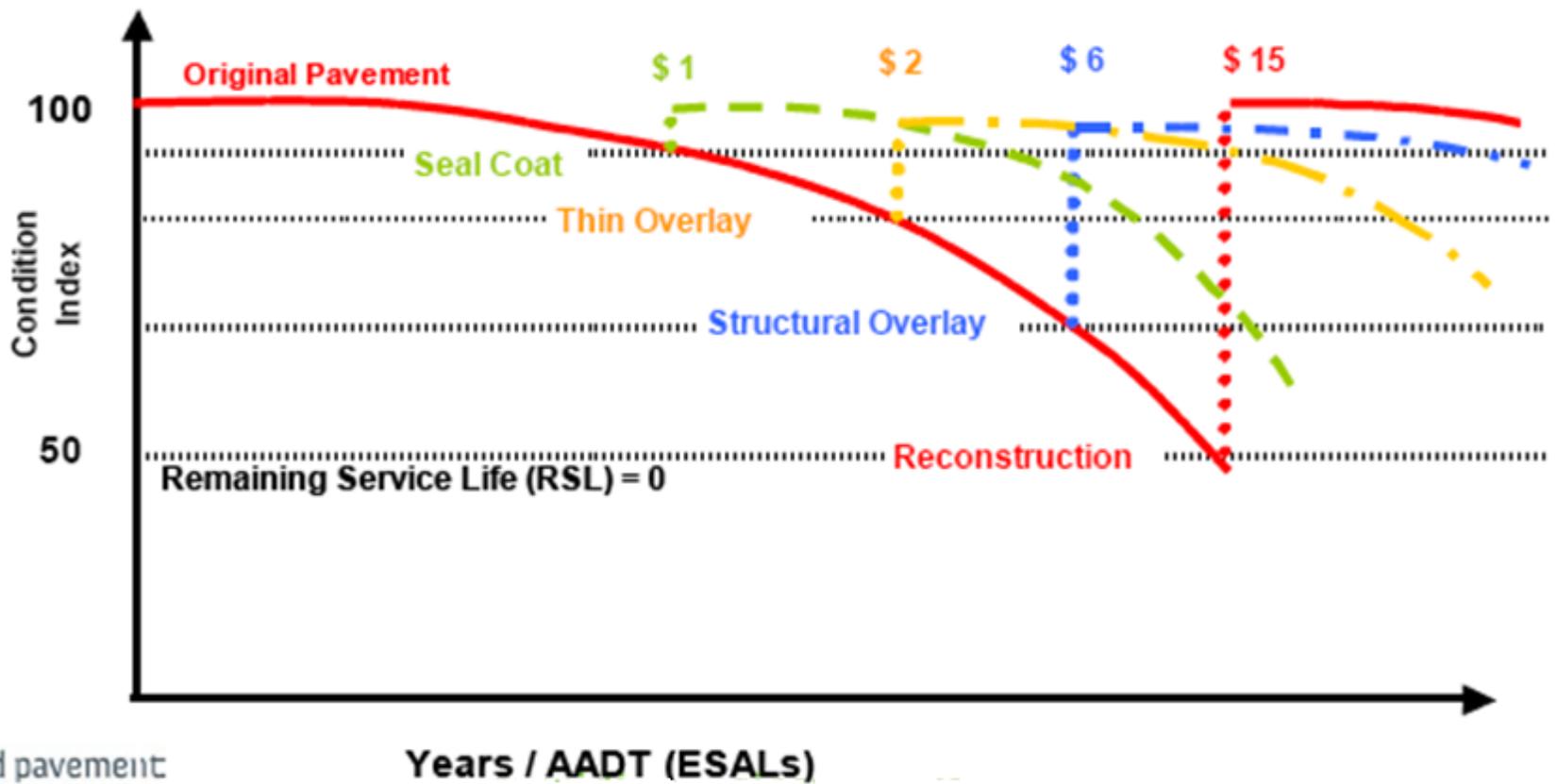


State Highway System

Management of System

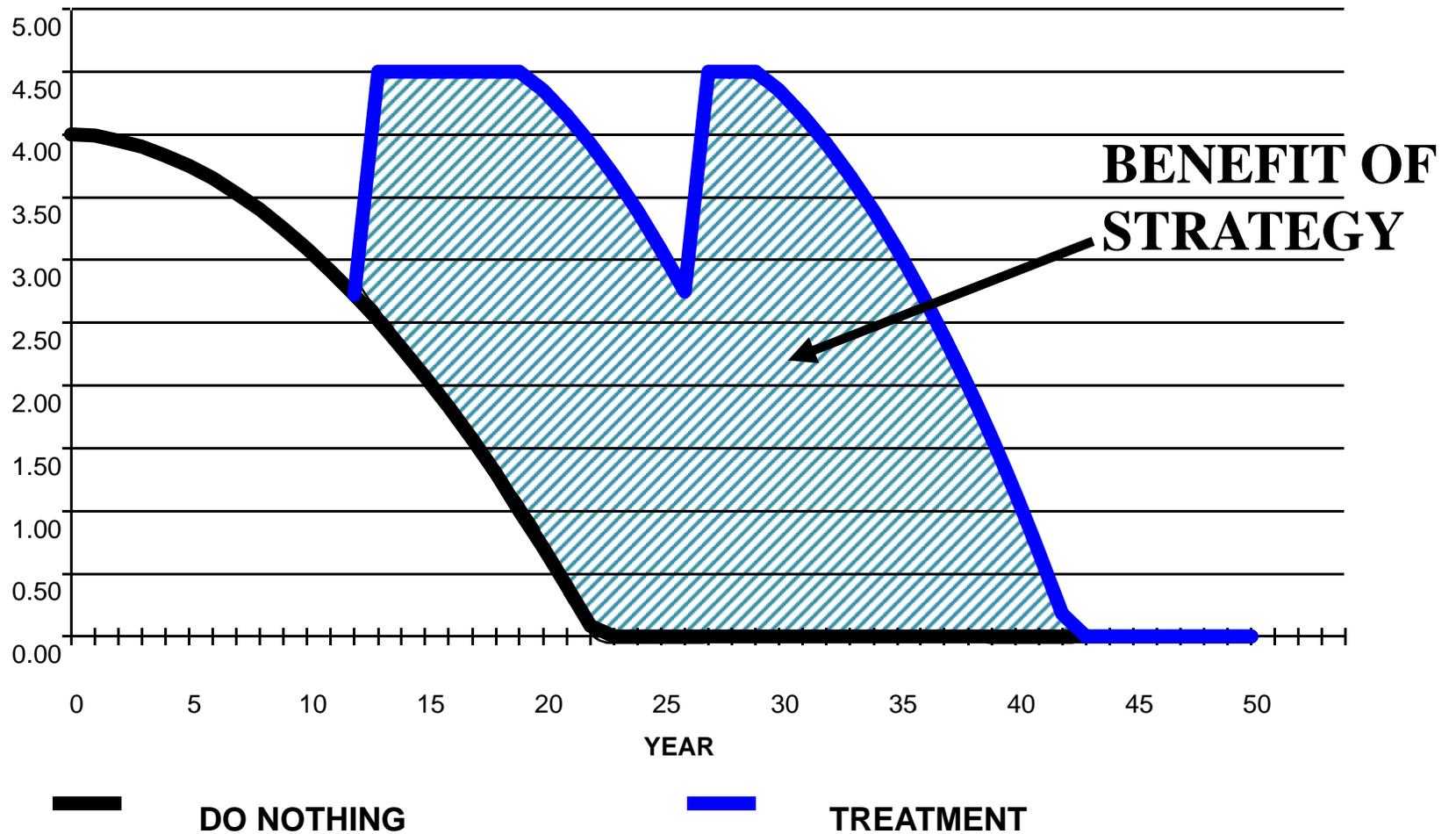
- Pavements
- Bridges
- Expansion
- Safety

Condition Deterioration & Treatment Triggers / Resets

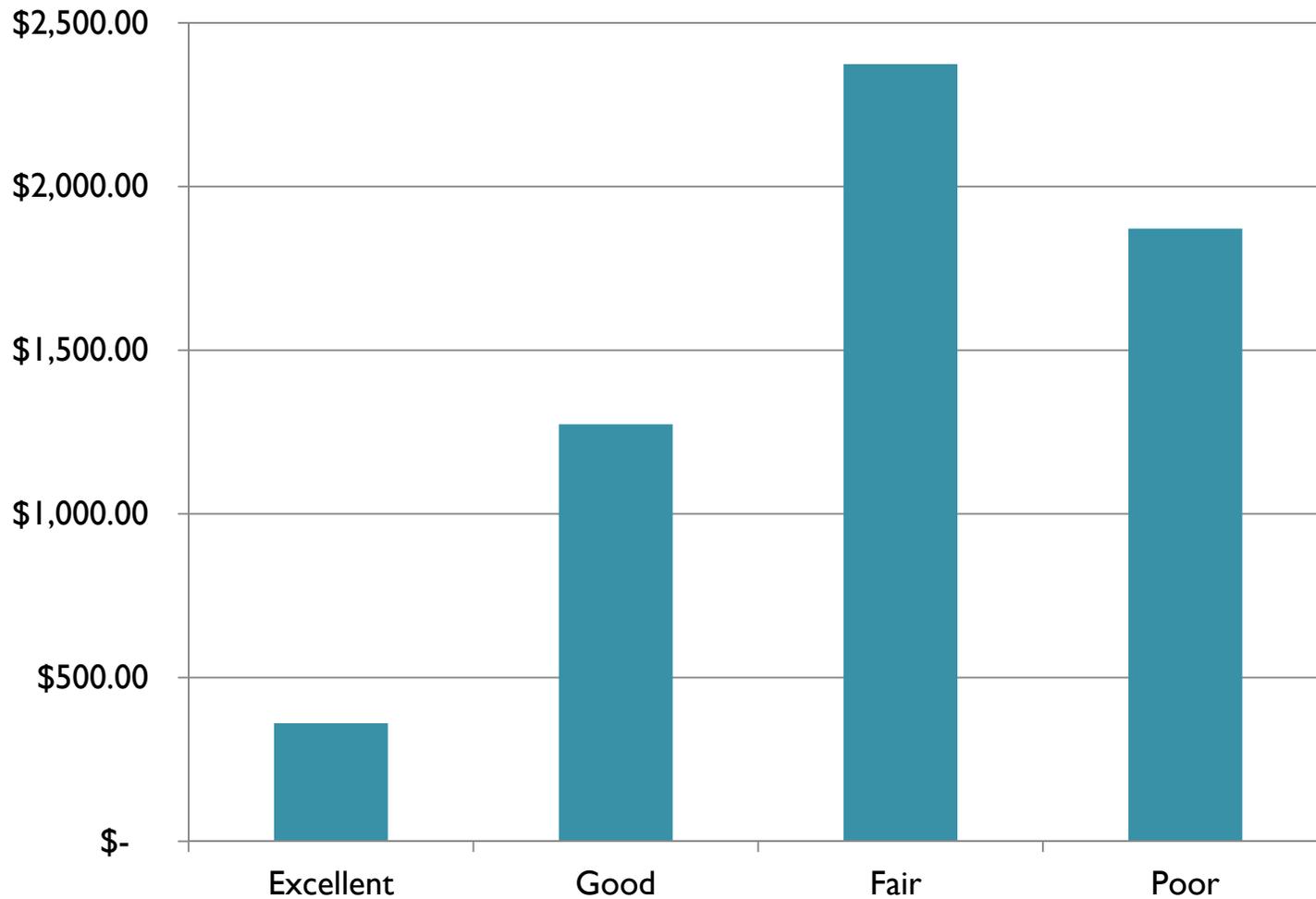


Benefits of Asset Management

Condition Index



Pavement Maintenance Costs Per Mile



What's the Best Treatment?



What's the Best Treatment?



What's the Best Treatment?





How Highway Projects are Selected

Pavement Management System

- Annual Condition Inspections
- Different for Asphalt and Concrete
- Based on Lowest Life Cycle Cost for the Available Budget

Average Construction Cost/Mile

Reconstruct Urban 5 lane Concrete -	\$4,950,000
Reconstruct Interstate to Concrete (4 Lane) -	\$2,050,000
Reconstruct Rural 2 Lane (Asphalt) -	\$1,360,000
Reconstruct Rural 2 Lane (Concrete) -	\$1,450,000
Mill & Overlay 2 Lane Asphalt Roadway -	\$ 215,000
Chip Seal 2 Lane Asphalt Roadway -	\$ 25,000
Reconstruct 100' long bridge -	\$ 745,000

What's the Best Treatment?





Bridge Preservation

Maintenance Treatments

- Deck Overlays & Epoxy Surface Seal Coats
- Bridge Painting
- Joint repair and modification
- Scour protection
- Regularly scheduled maintenance and inspection



Expansion / Capacity Management

- Traffic Analysis
 - Annual Traffic Data
 - Projected Traffic Analysis
- Corridor Analysis
 - Uses roadway characteristics and traffic data to review and project Level of Service
- Special Studies
 - County, community, statewide analysis of infrastructure needs

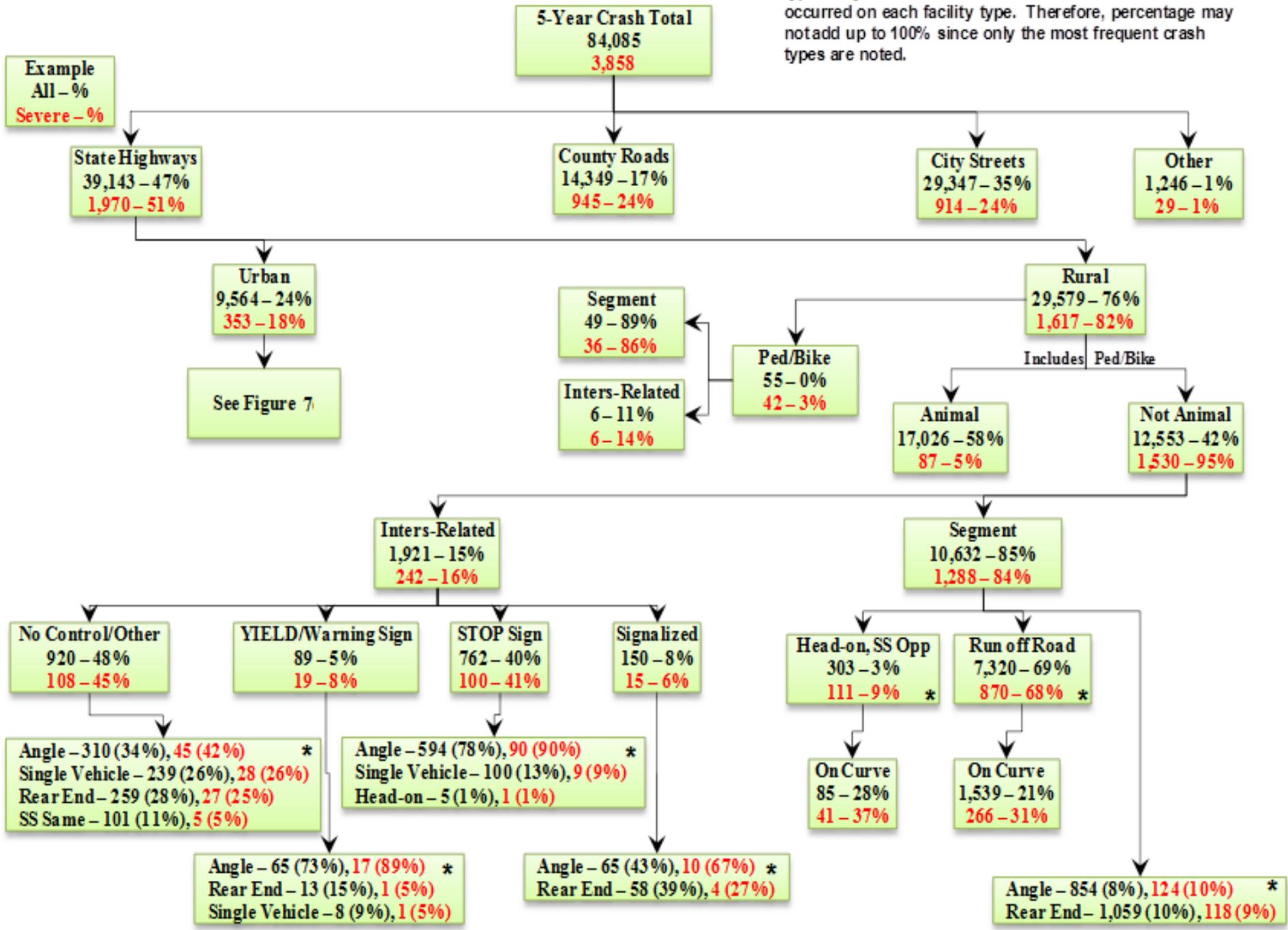


Safety Management

- **Historical Crash Data**
 - Review of locations where crashes have occurred

- **Predictive Methodology**
 - Uses roadway characteristics to predict crash potential along corridors

* Reported crash types are the most frequent severe crash types only and do not account for all crashes that occurred on each facility type. Therefore, percentage may not add up to 100% since only the most frequent crash types are noted.





Strategic Highway Safety Plan

Emphasis Areas

- Roadway Departure Crashes
- Intersection Crashes
- Motorcycle Crashes
- Unbelted Vehicle Occupant Crashes
- Speeding-Related Crashes
- Drug and Alcohol Related Crashes
- Young Driver Crashes



State Highway System

Current Conditions

- Pavements
- Bridges
- Expansion/Safety



State Highway System

Pavement Conditions

Surface Condition Index

- Excellent 5.0 - 4.5
- Good 4.5 - 3.4
- Fair 3.4 - 2.1
- Poor 2.1 - 0

Excellent Road Condition

- Today about 42% of highway system



Good Road Condition

- Today about 47% of highway system



Fair Road Condition

- Today about 9% of highway system



Poor Road Condition

- Today about 2% of highway system



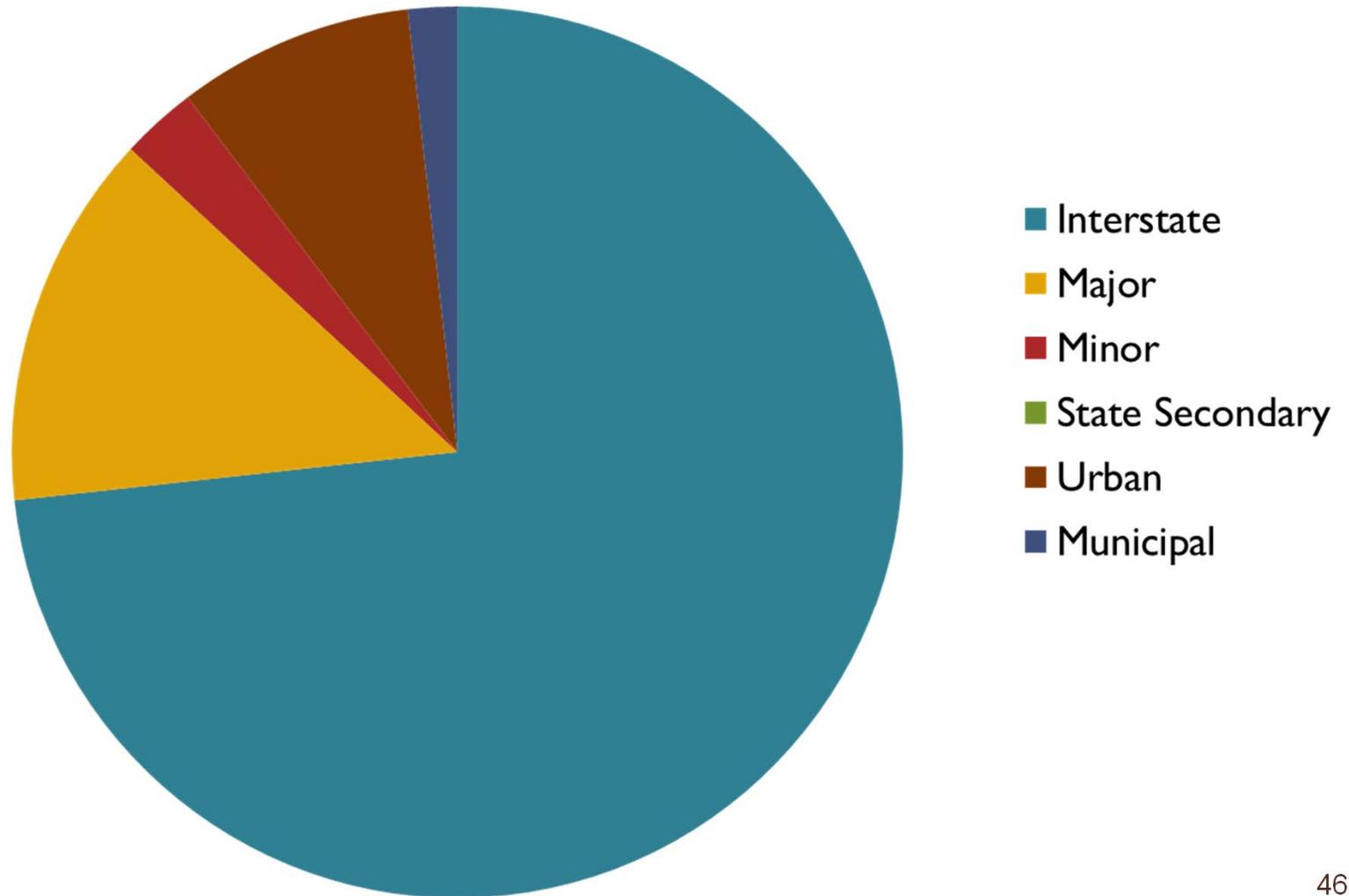


Surface Condition Index Performance Measures

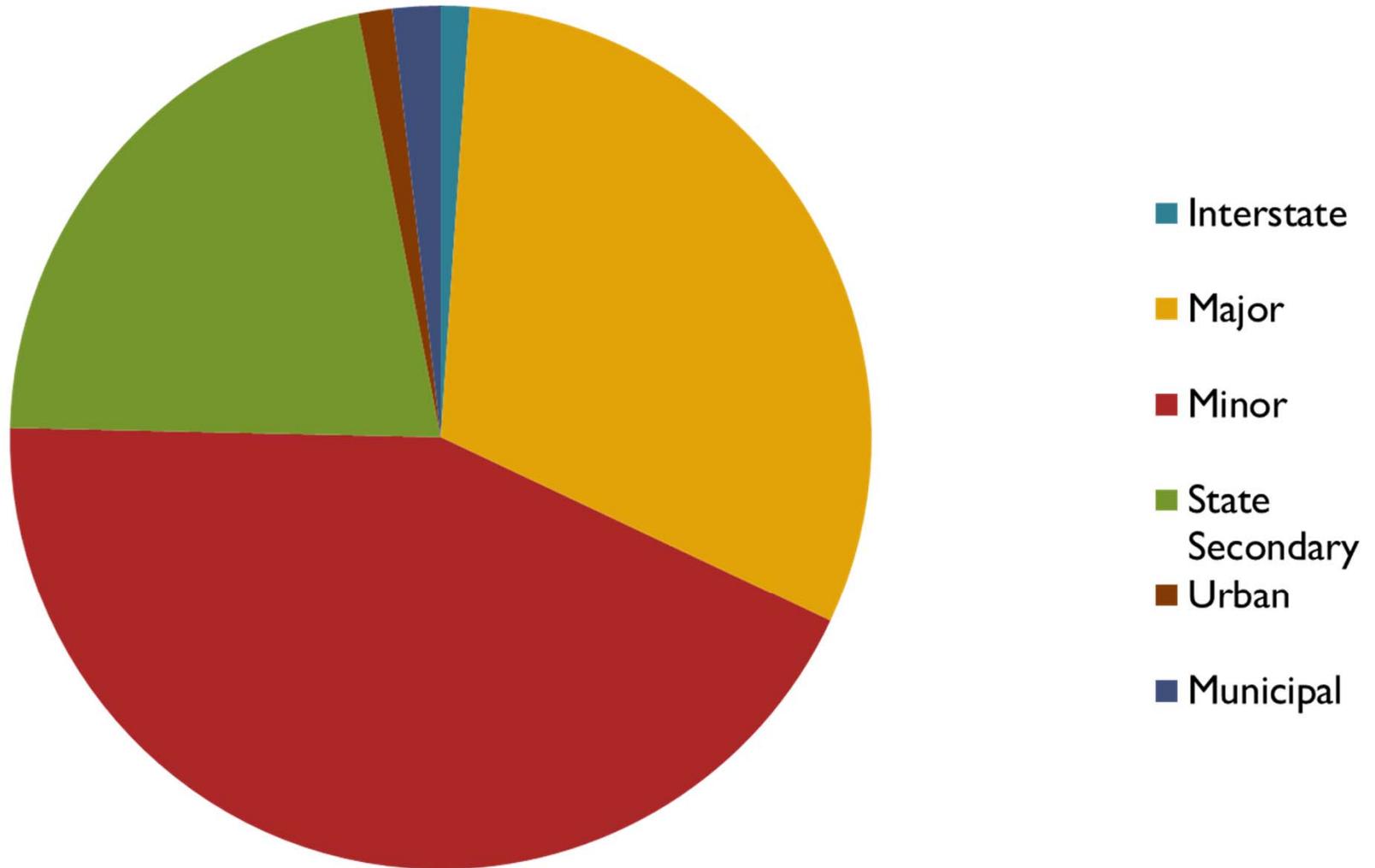
Minimums and goals per classification

- Interstate (3.94): Goal: 4.20; Minimum: 3.90
- Major Art (4.34): Goal: 4.00; Minimum: 3.70
- Minor Art (4.00): Goal: 3.80; Minimum: 3.40
- State Sec (3.96): Goal: 3.60; Minimum: 3.00

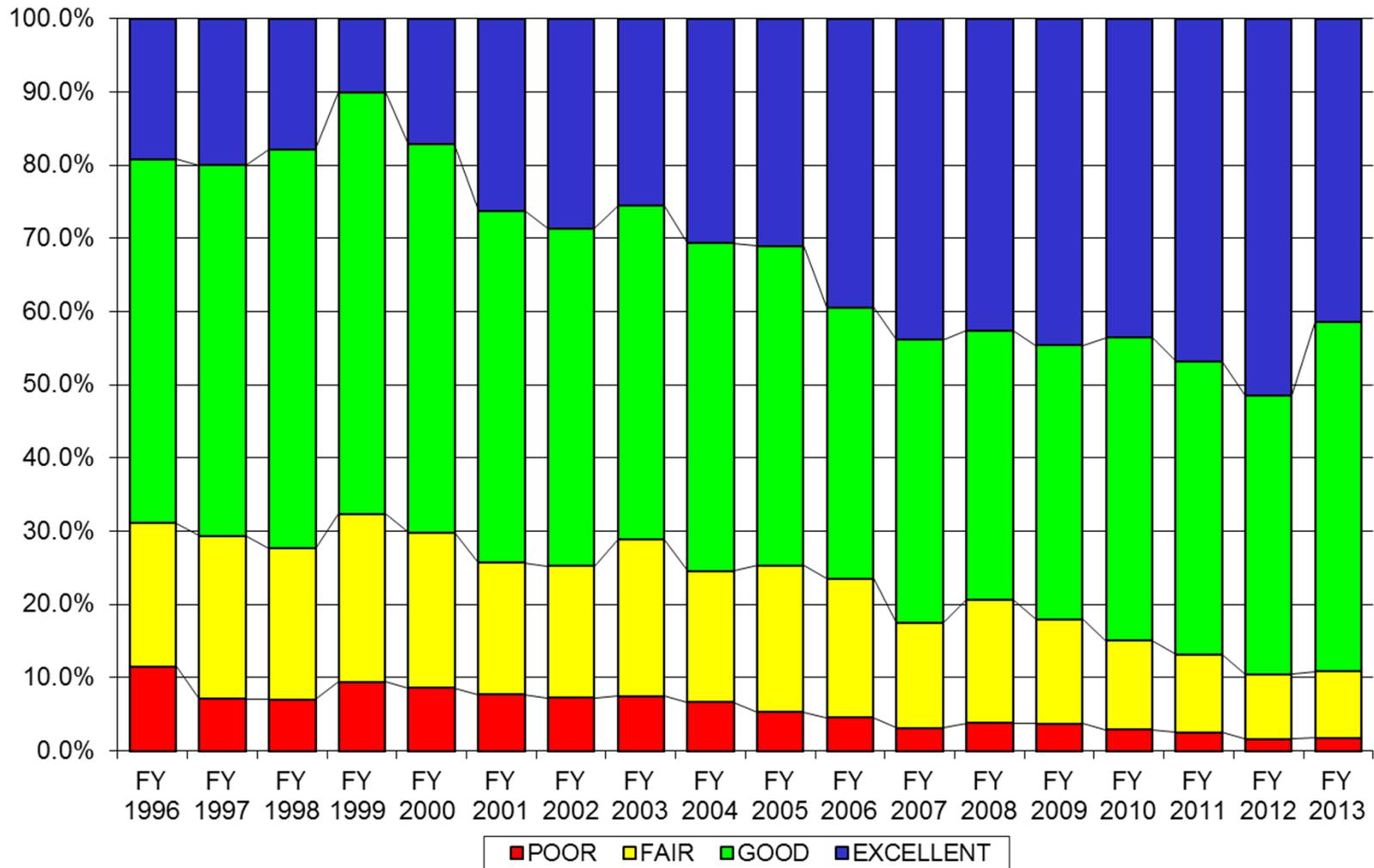
Concrete Pavement Near End of Service Life (226miles)



Asphalt Pavement Near End of Surface Service (2400 miles)

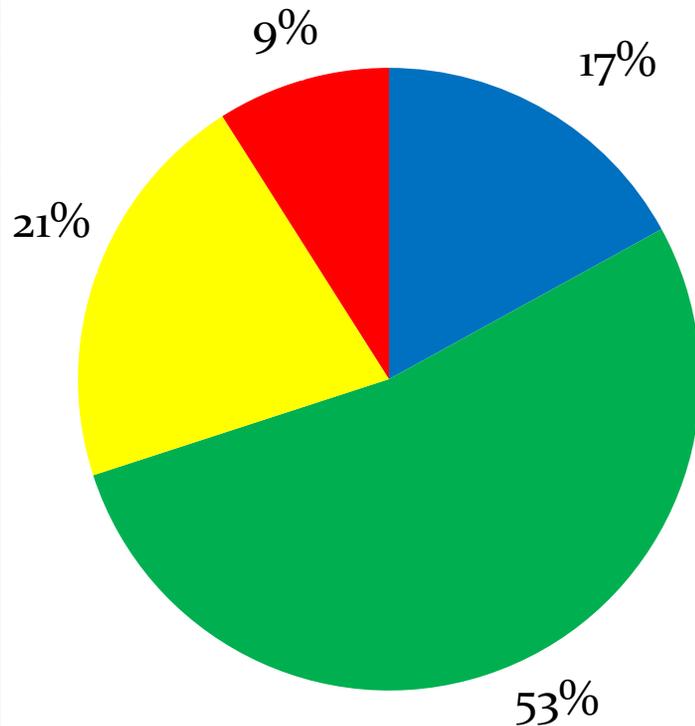


State Highway Network Pavement Condition Trend

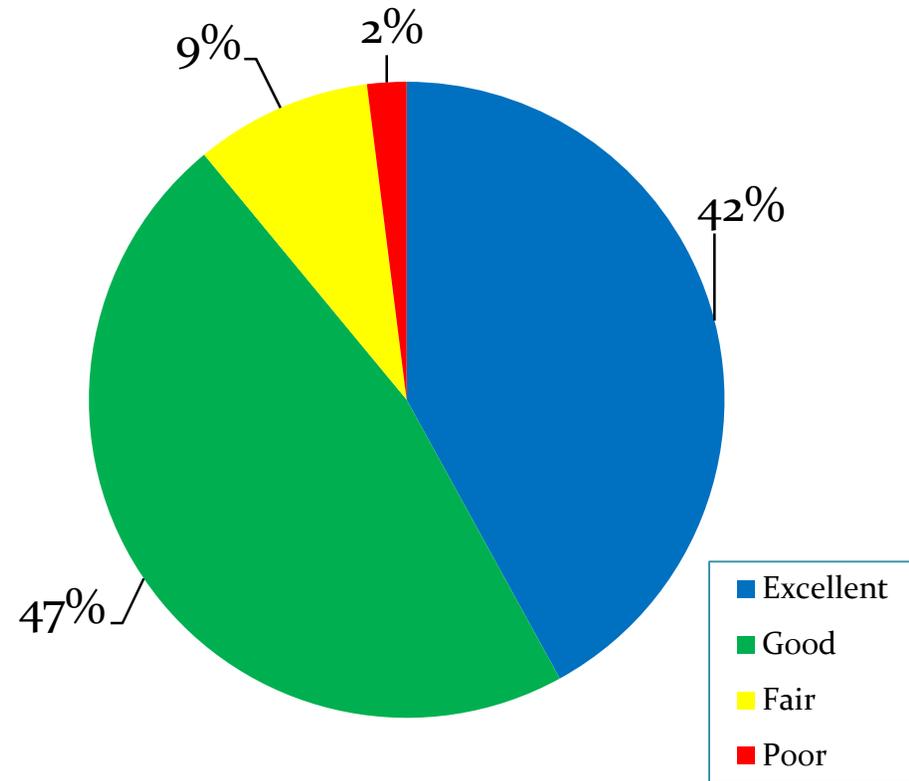


1999 & 2014 State Pavement Condition

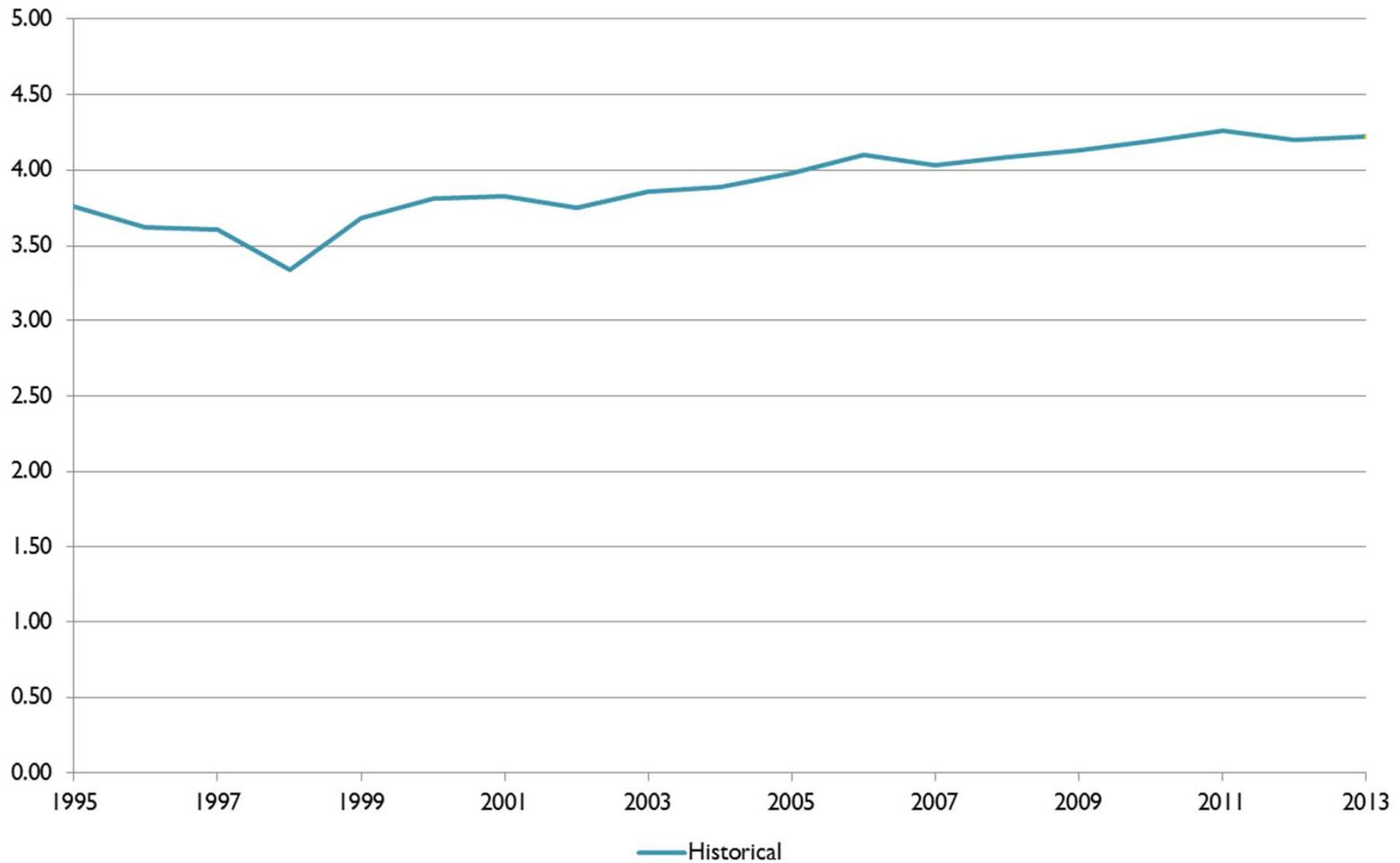
1999 Pavement Condition Distribution



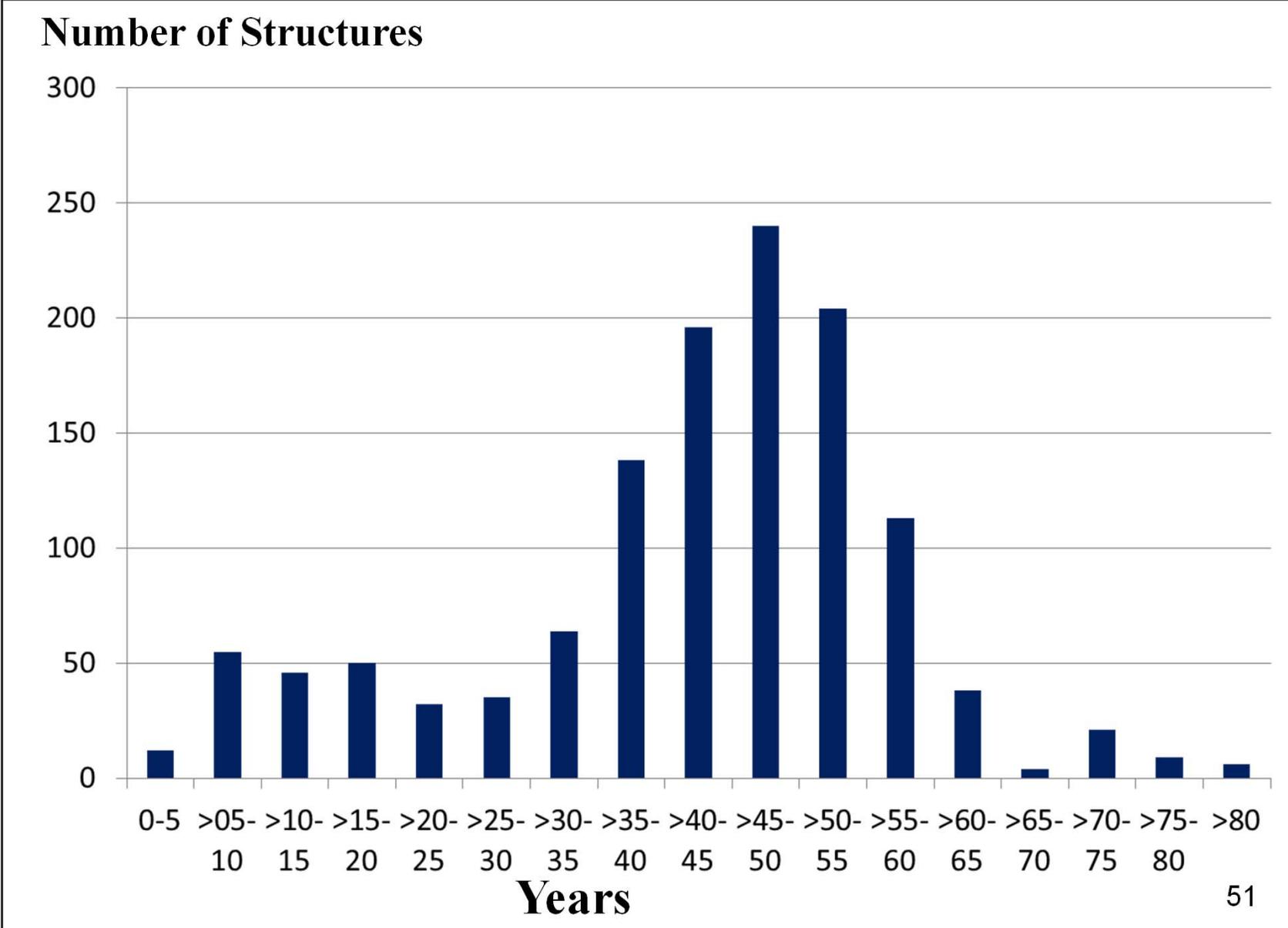
2014 Pavement Condition Distribution



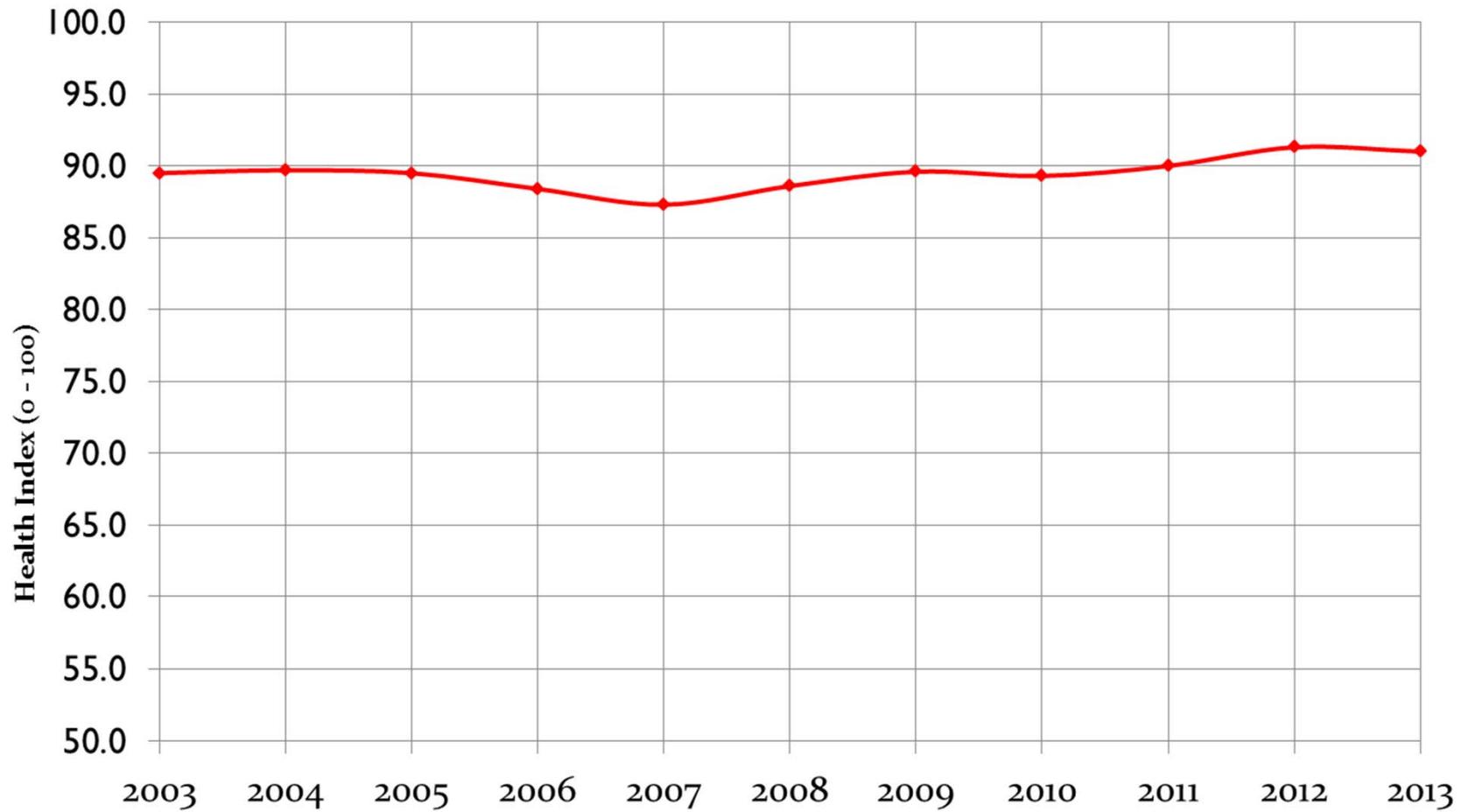
Historic Average Pavement Condition Index



State Structure Age

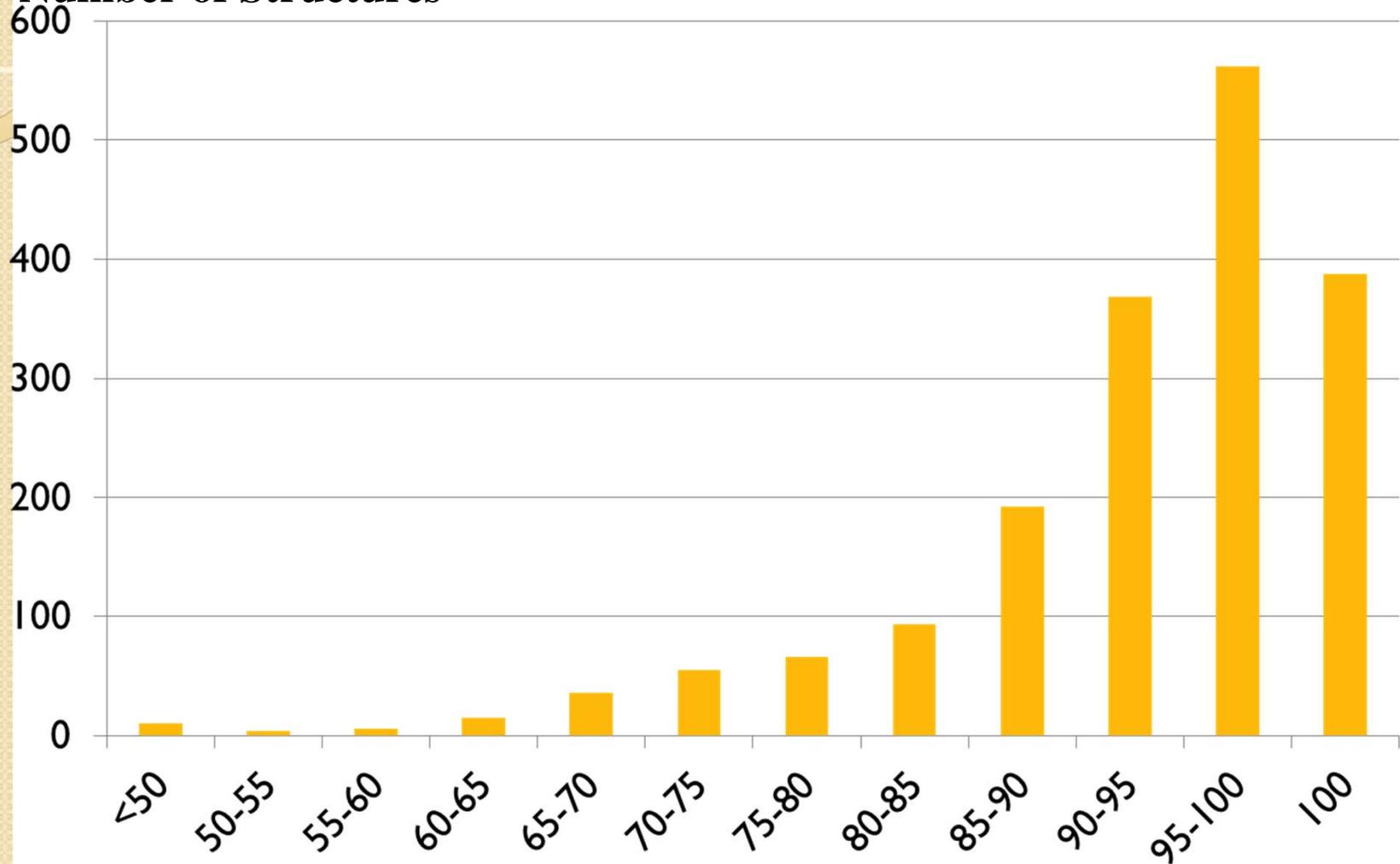


State Structure Health Index



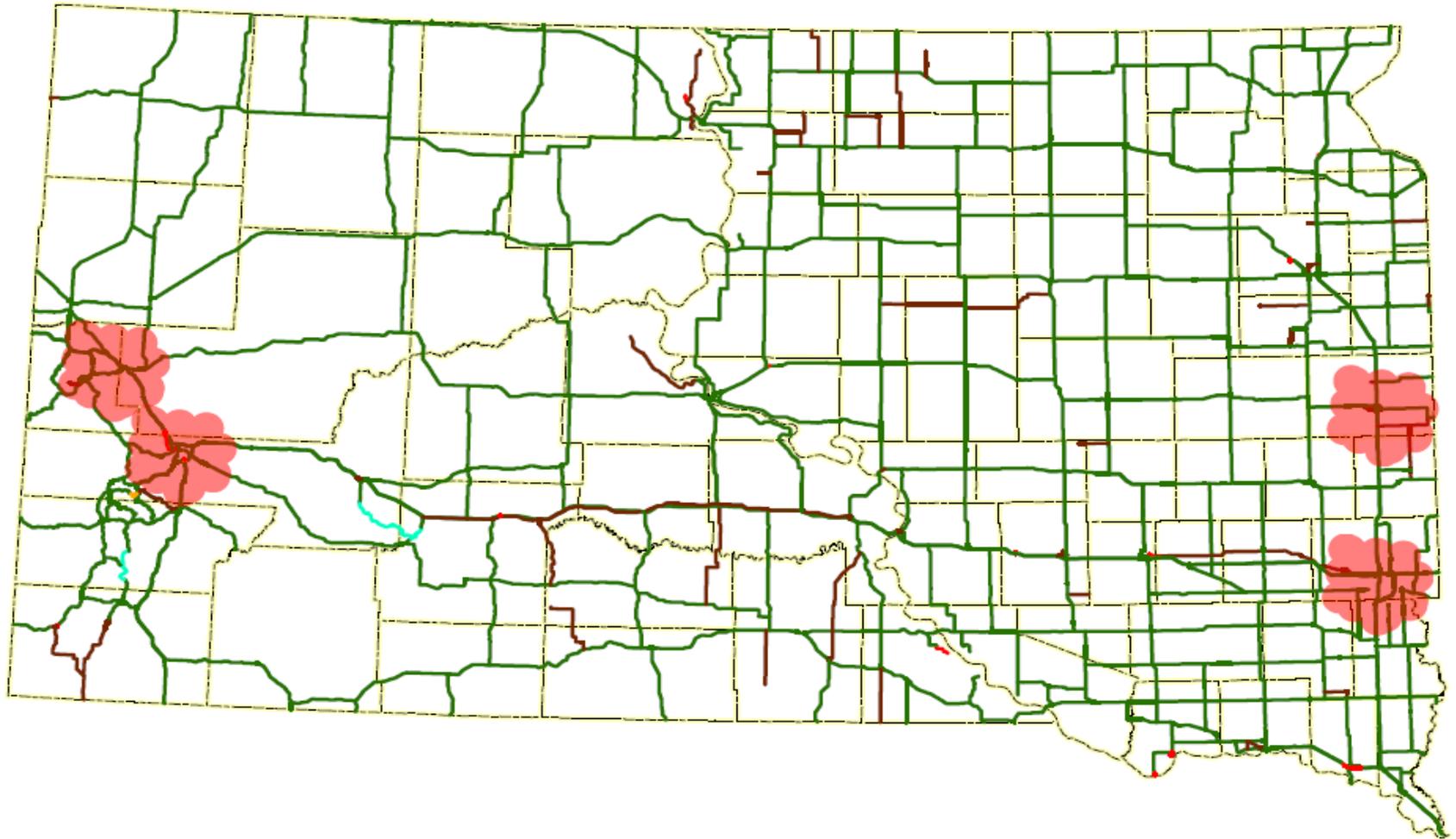
Structure Health Index

Number of Structures

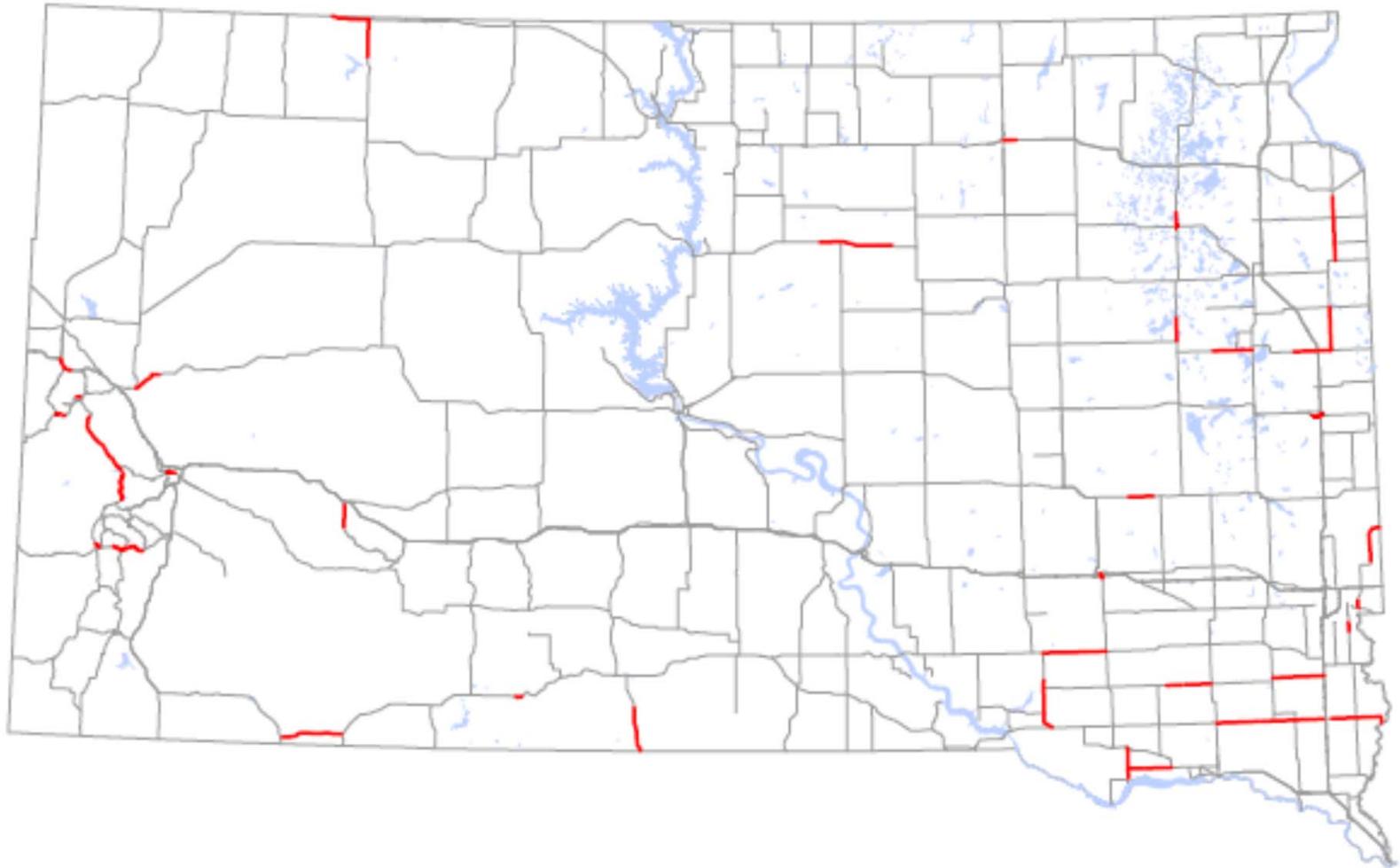


Health Index

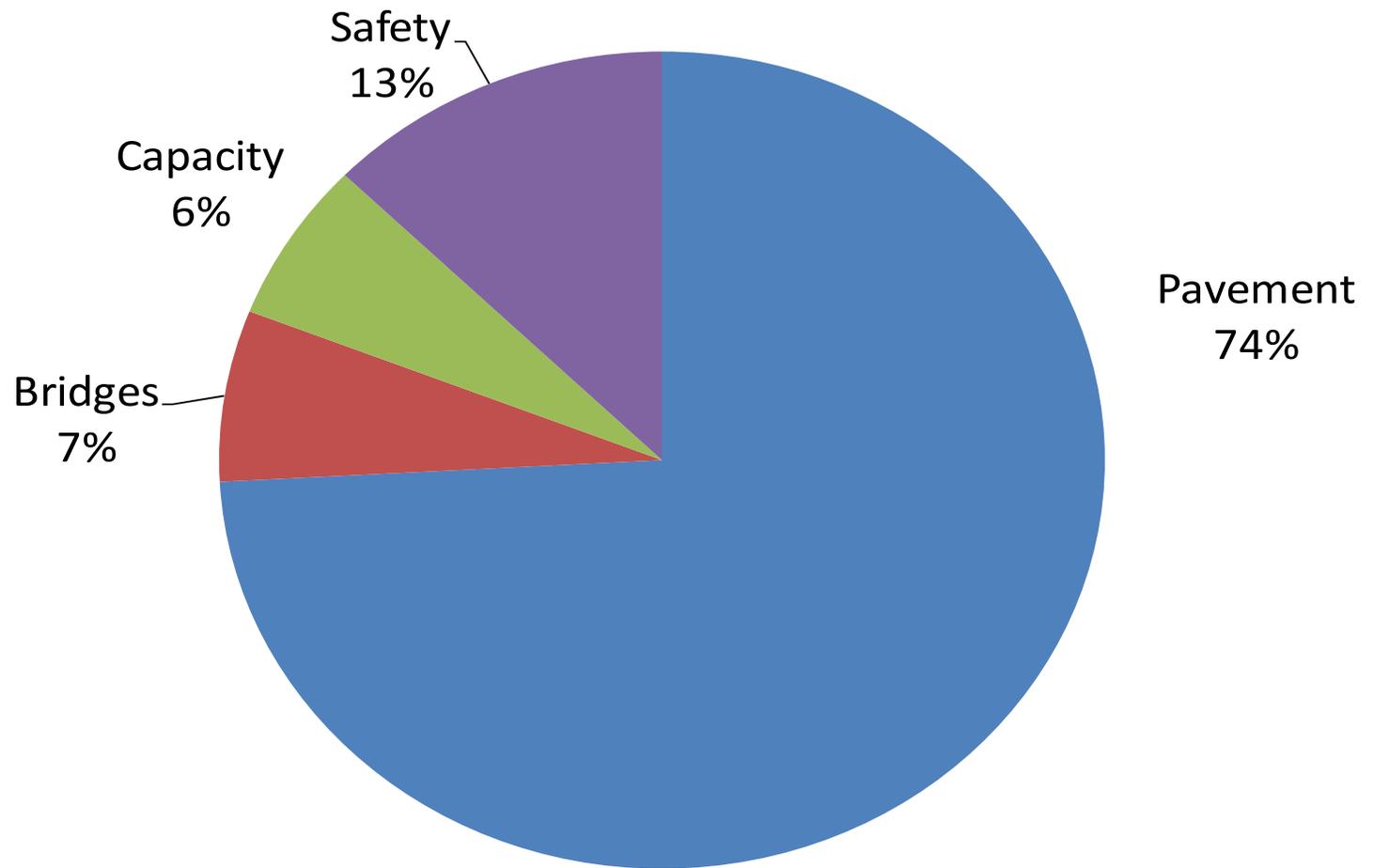
Expansion



Planned Safety Projects



State Highway Investment





Highway Needs & Financing

Revenues

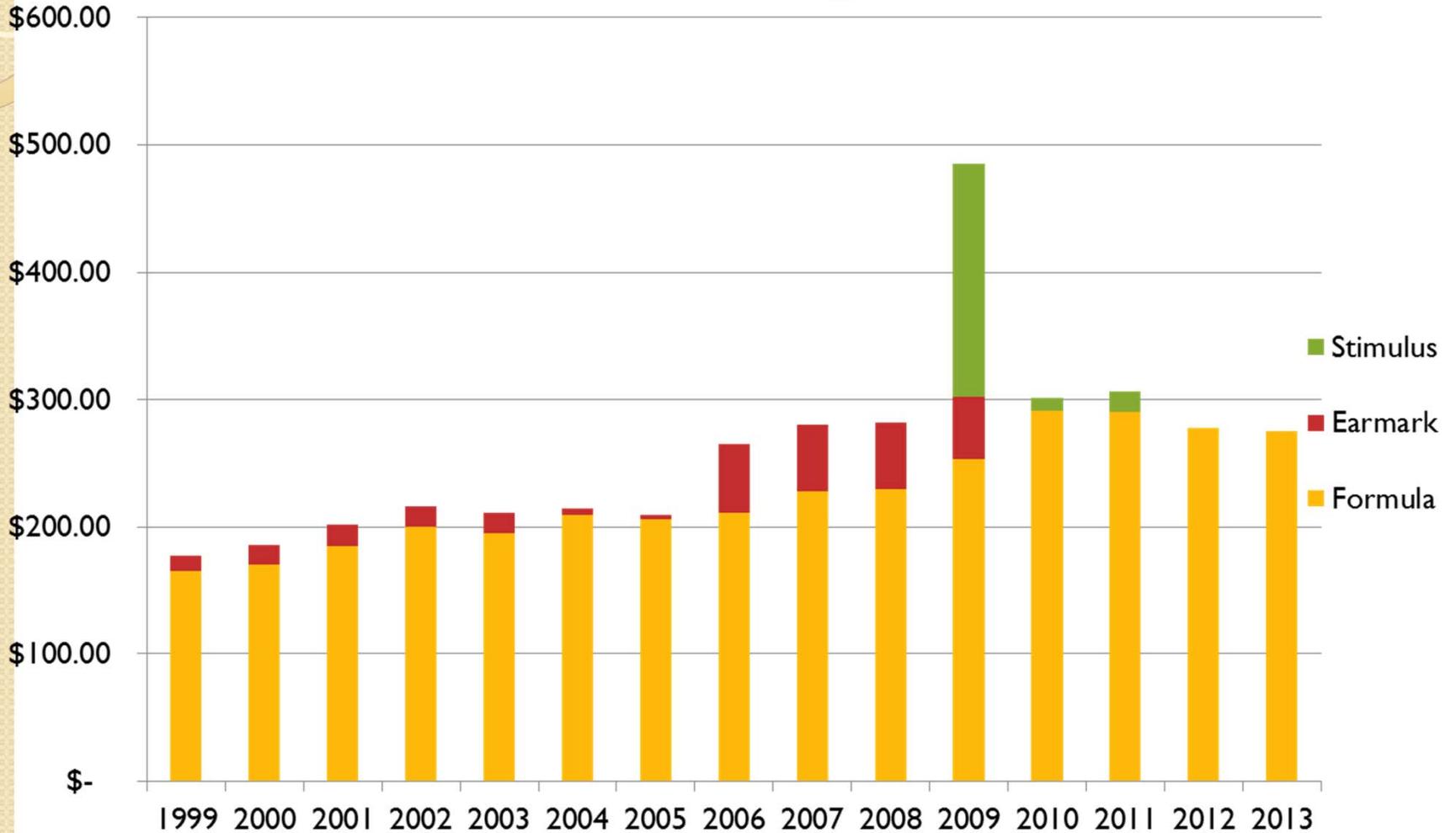
- Federal
- State

Federal vs. State Funding

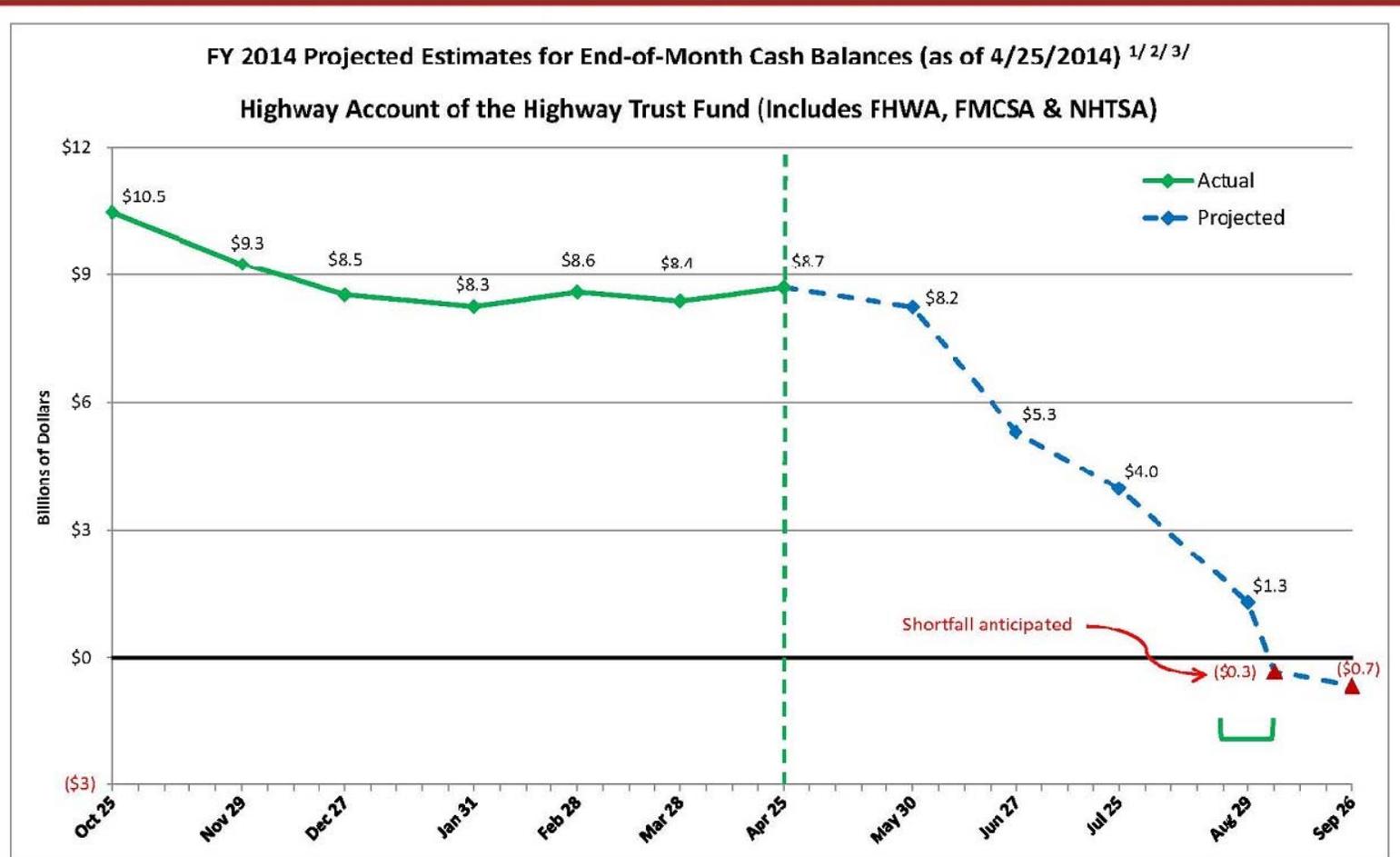
- Federal Funds are only eligible for
 - Construction
 - Preservation
 - Planning & Research
 - Safety
- High dependence on federal funds for construction program
- State Funds are constitutionally dedicated to the maintenance and supervision of highways.

History of Federal Highway Funding

Millions



Federal Highway Trust Fund



1/ Graph reflects actual data through 4/25/14 and end-of-month projections for the remainder of the fiscal year.

2/ Total receipt and outlay projections are based on FY 2015 President's Budget Baseline assumptions. Projected monthly receipt and outlay rates are based on historic averages.

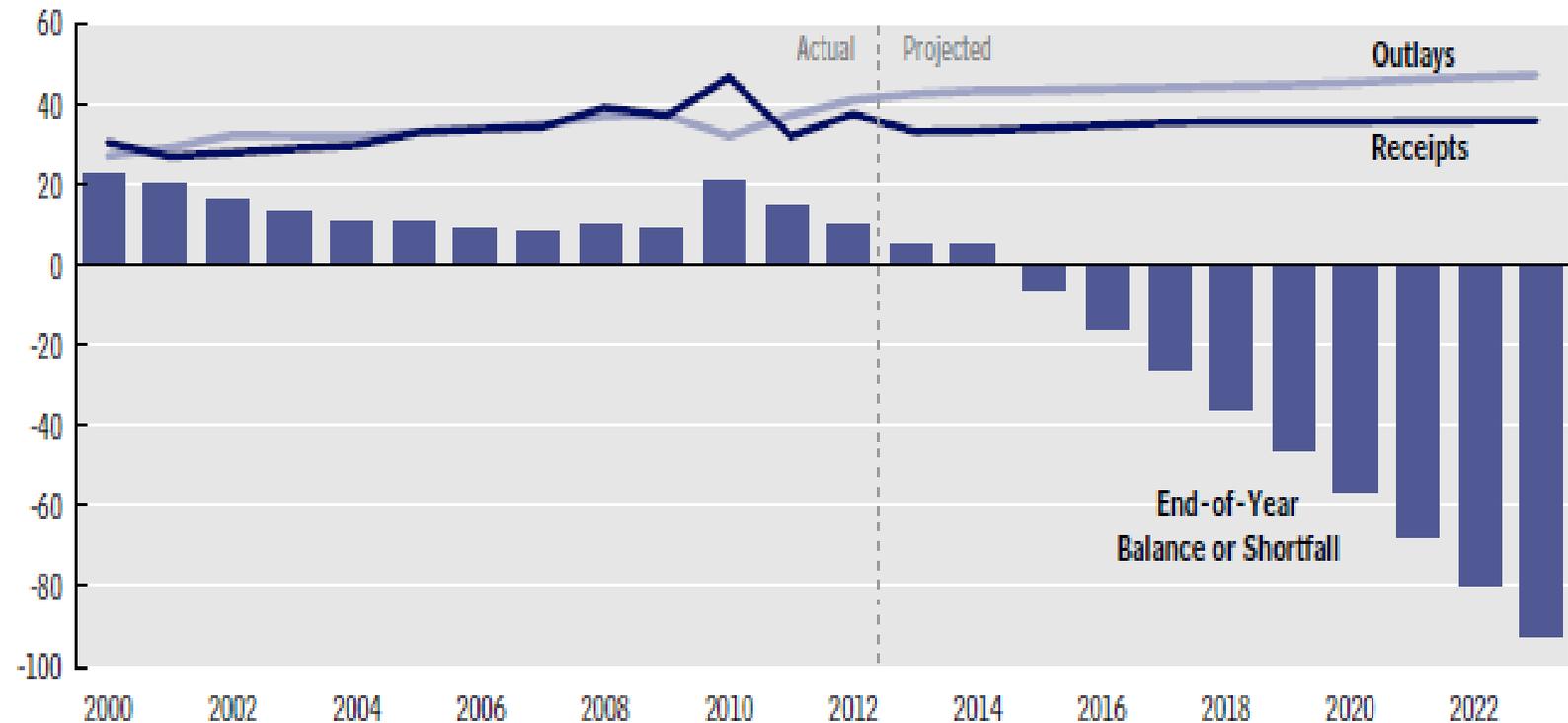
3/ Range of anticipated shortfall: Green brackets denote the estimated window of when the anticipated shortfall will occur.

Source: FHWA

2014 Federal Legislative Issues

Receipts, Outlays, and Balances of the Highway Trust Fund

(Billions of dollars)



Source: Congressional Budget Office.

Note: Estimates are based on CBO's February 2013 baseline projections.



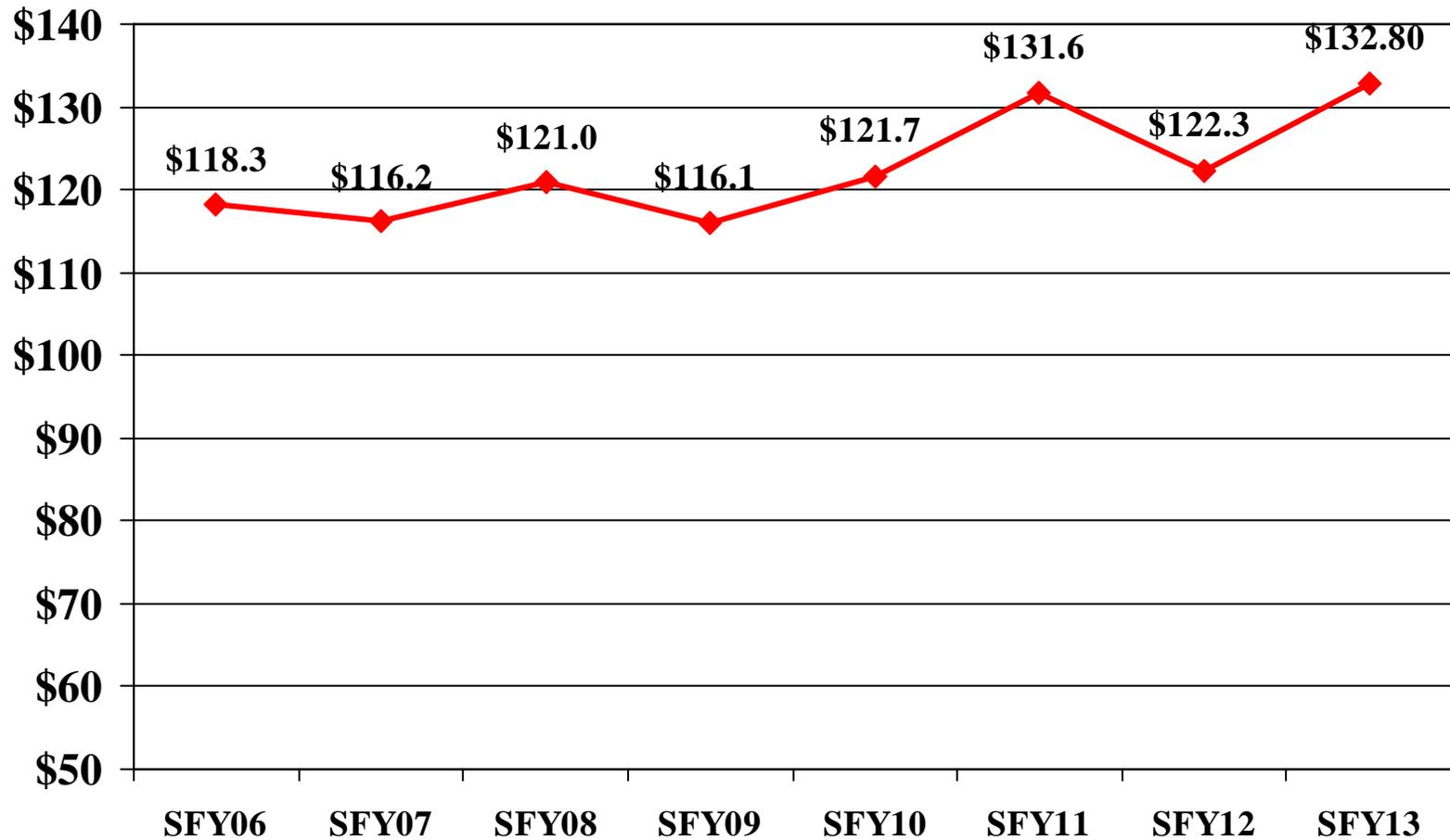
Reauthorization Proposals for Highways

- **Senate Version**
 - 6 year bill
 - Average of \$43.6 Billion per Year
 - No Funding Provision
- **House Version**
 - No Proposal
- **President version**
 - 4 Year Bill
 - Average of \$49.7 Billion per Year
 - Revenue from Corporate Tax Reform

State Motor Fuel

SFY 2006 – SFY 2013 COLLECTIONS

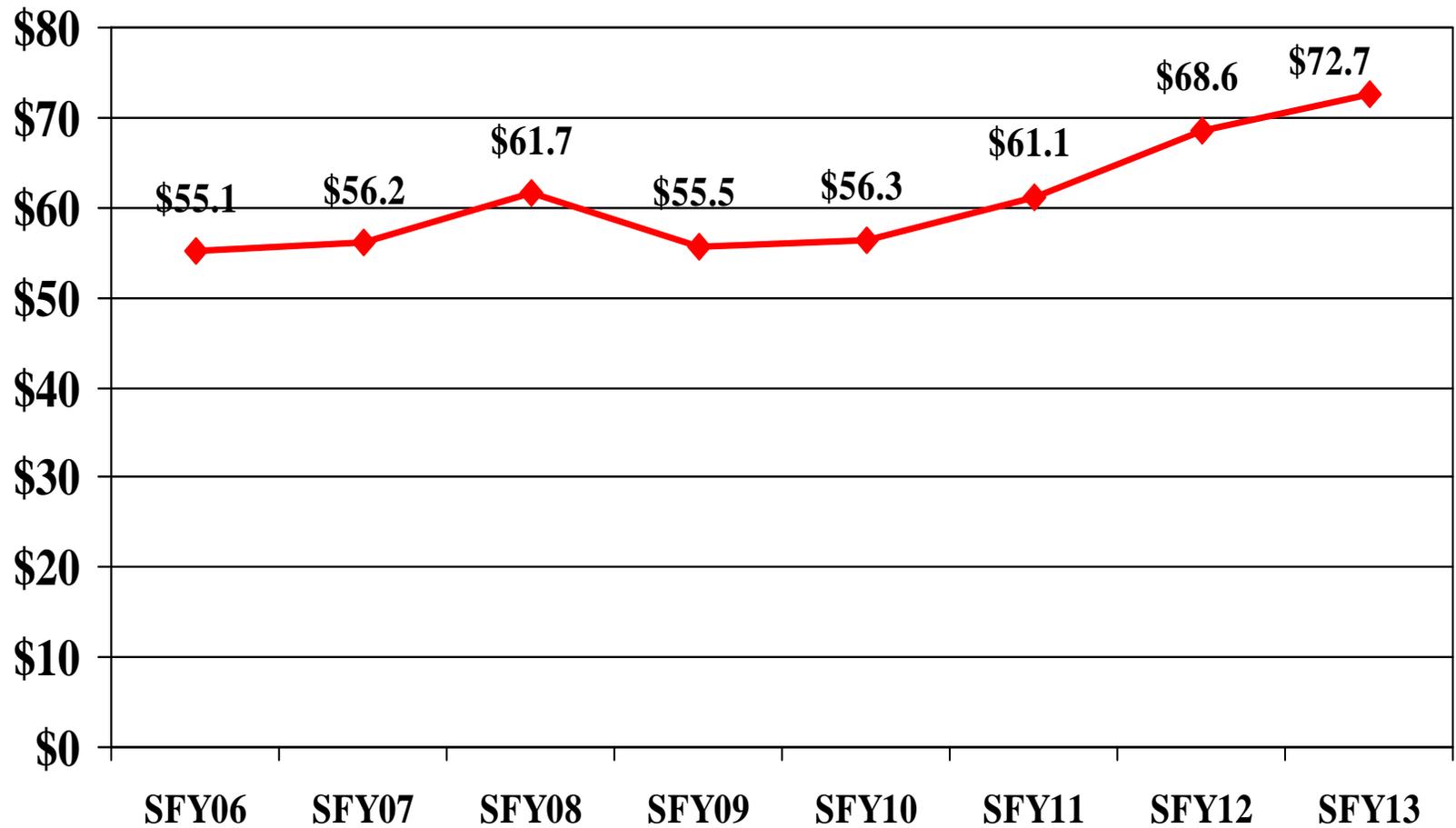
MILLIONS OF DOLLARS



State Motor Vehicle 3% Excise Tax

SFY 2006– SFY 2013 COLLECTIONS

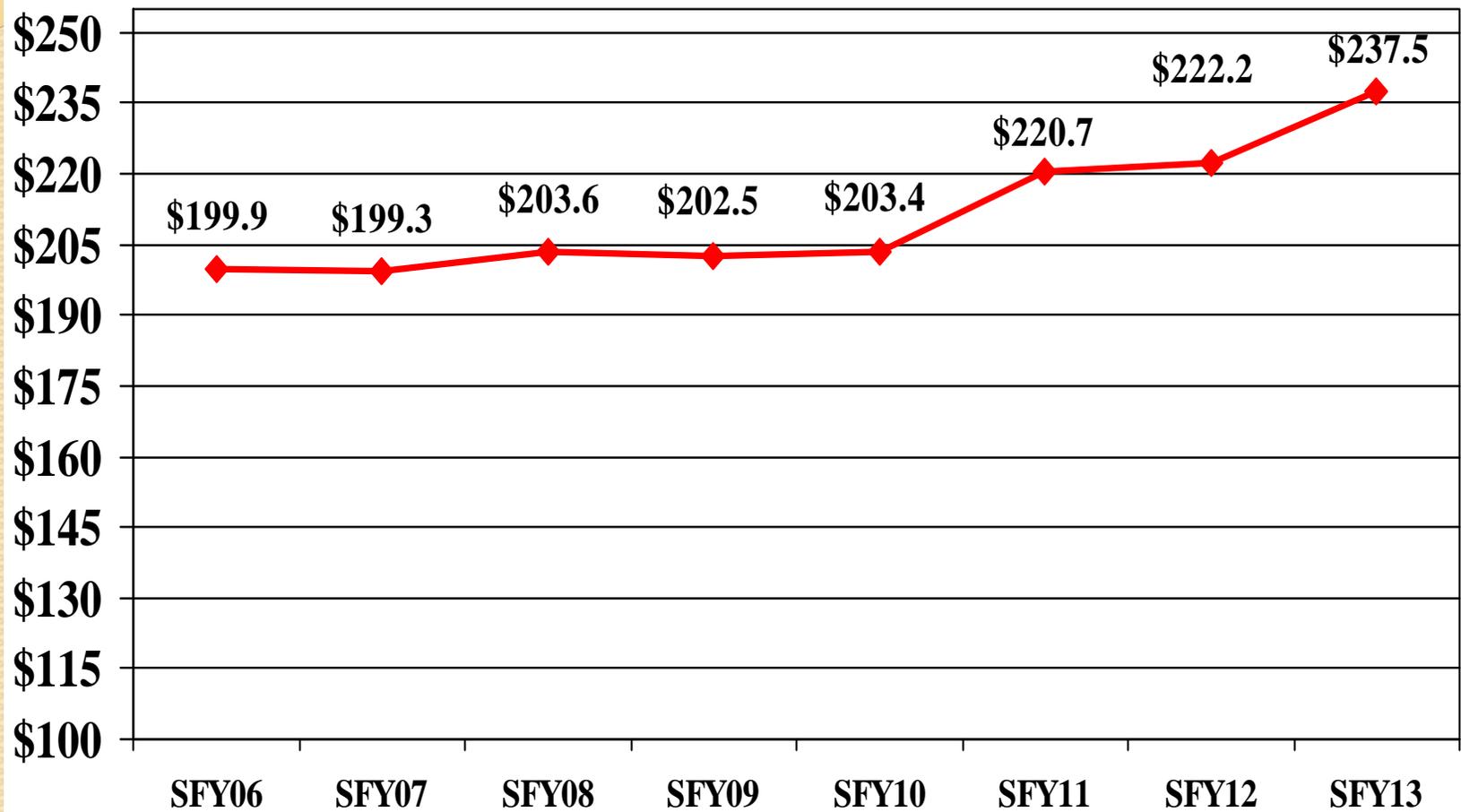
MILLIONS OF DOLLARS



Total State Highway Fund Revenues

SFY 2006 – SFY 2013 COLLECTIONS

MILLIONS OF DOLLARS



State and Federal Tax Rates

Fuel Type	State Tax	Federal Tax	Total
Ethyl Alcohol	8.0	18.4	26.4
Gasoline	22.0	18.4	40.4
LPG	20.0	13.6	33.6
Diesel	22.0	24.4	46.4

Net Yield of Each Penny of Motor Fuel Tax to Highway Fund



= \$6.6 Million

*based on FY13 collections

Net Yield of 1% of Excise Tax to Highway Fund



= \$24.0 Million

*based on FY13 collections

FY13 State Highway Fund Expenditures

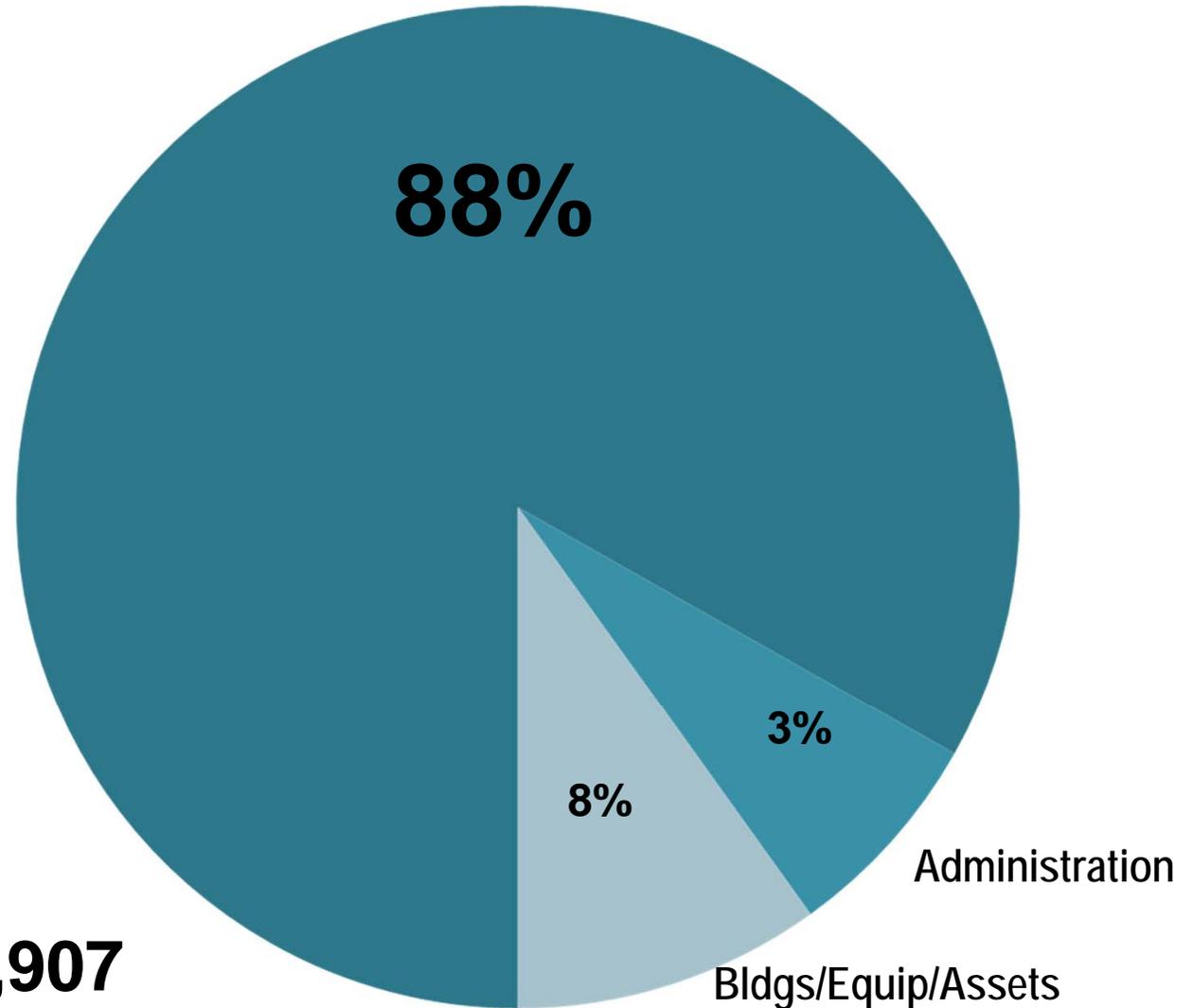
State Hwy
Maintenance

(Snowplowing, Mowing,
Labor, Signing, etc)

&

Hwy Construction

(Design, ROW, Materials,
Labor, etc)



TOTAL:
\$228,669,907

Winter Maintenance

- FY13 - \$17,923,932
- FY12 - \$11,995,361
- FY11 - \$18,408,482
- 435 snowplows



Funds for Local Government's

	MILLIONS
FEDERAL FUNDS	
STP – COUNTIES	\$15.0
STP – CITIES	\$13.6
BRIDGE	\$7.9
SAFETY PROJECTS (SIGNING)	\$3.0
TRANSPORTATION ALTERNATIVES	\$2.2
STATE PLANNING AND RESEARCH FUNDS	\$0.4
STATE FUNDS	
COMMUNITY ACCESS GRANT	\$1.0
INDUSTRIAL PARK GRANT	\$0.5
AGRI-BUSINESS GRANT	\$0.5
REGION WIDE STRIPING	\$0.5
TOTAL	\$44.6



Funding Exchange Program

□ 2011 - \$7.9 M

- Counties – 37 Participated
- Cities – 4 participated

□ 2012 - \$6.5 M

- Counties – 28 Participated
- Cities – 2 participated

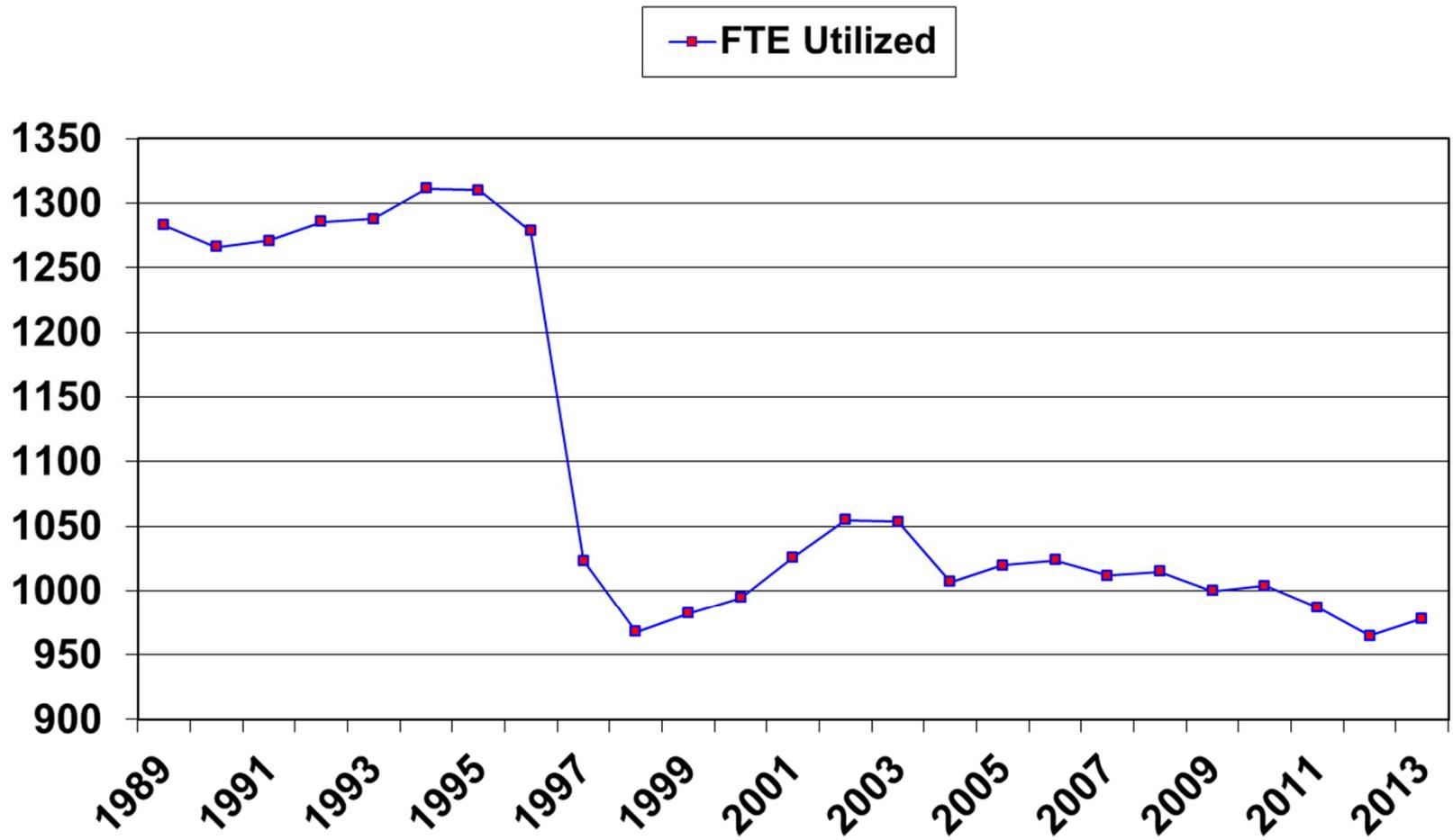
□ 2013 - \$6.9 M

- Counties – 31 Participated
- Cities – 3 participated

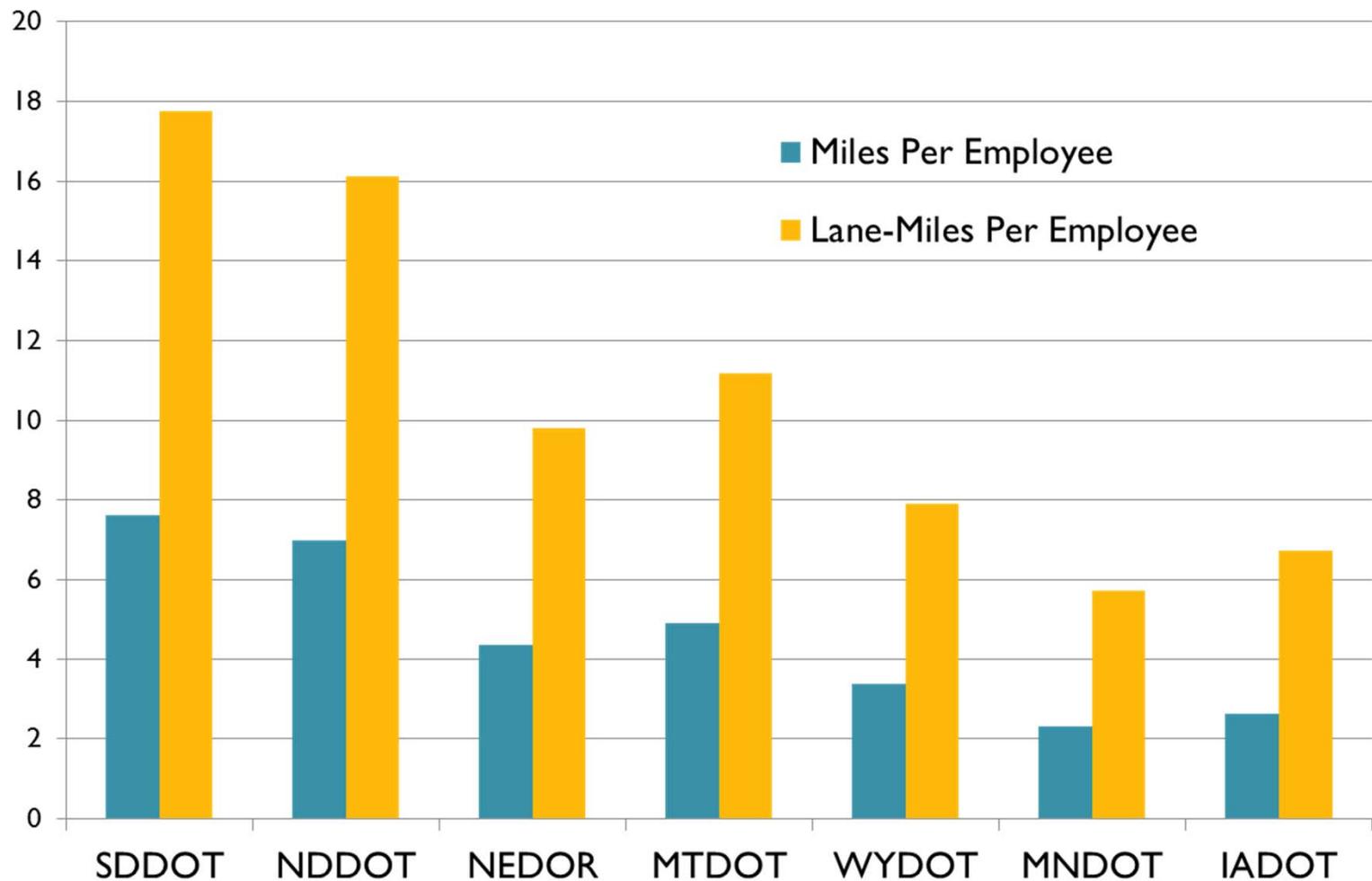
□ 2014 - \$5.5 M

- Counties – 25 Participated
- Cities – 3 participated

History of FTE

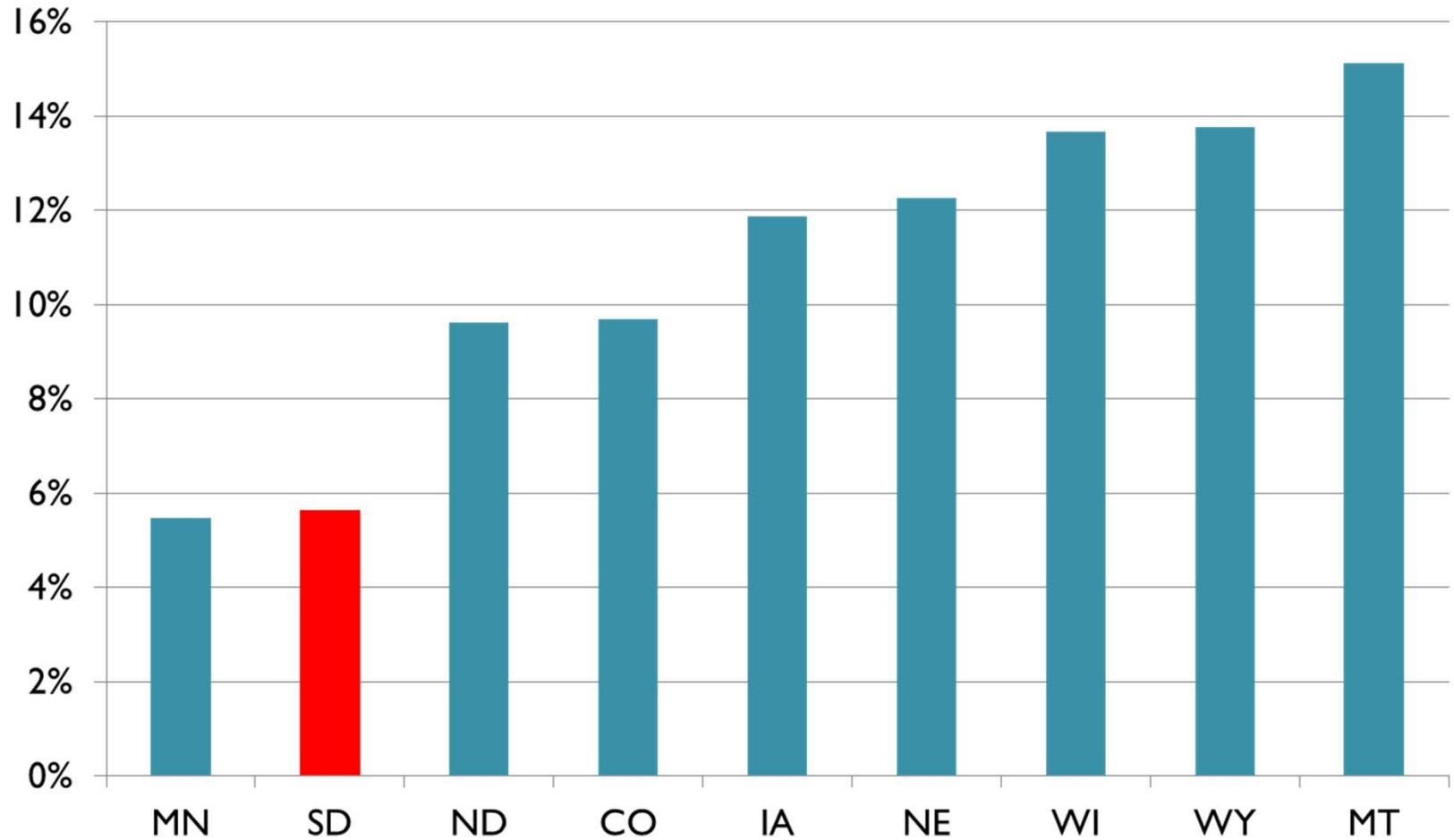


Size of State Highway System Compared to the Number of DOT Personnel



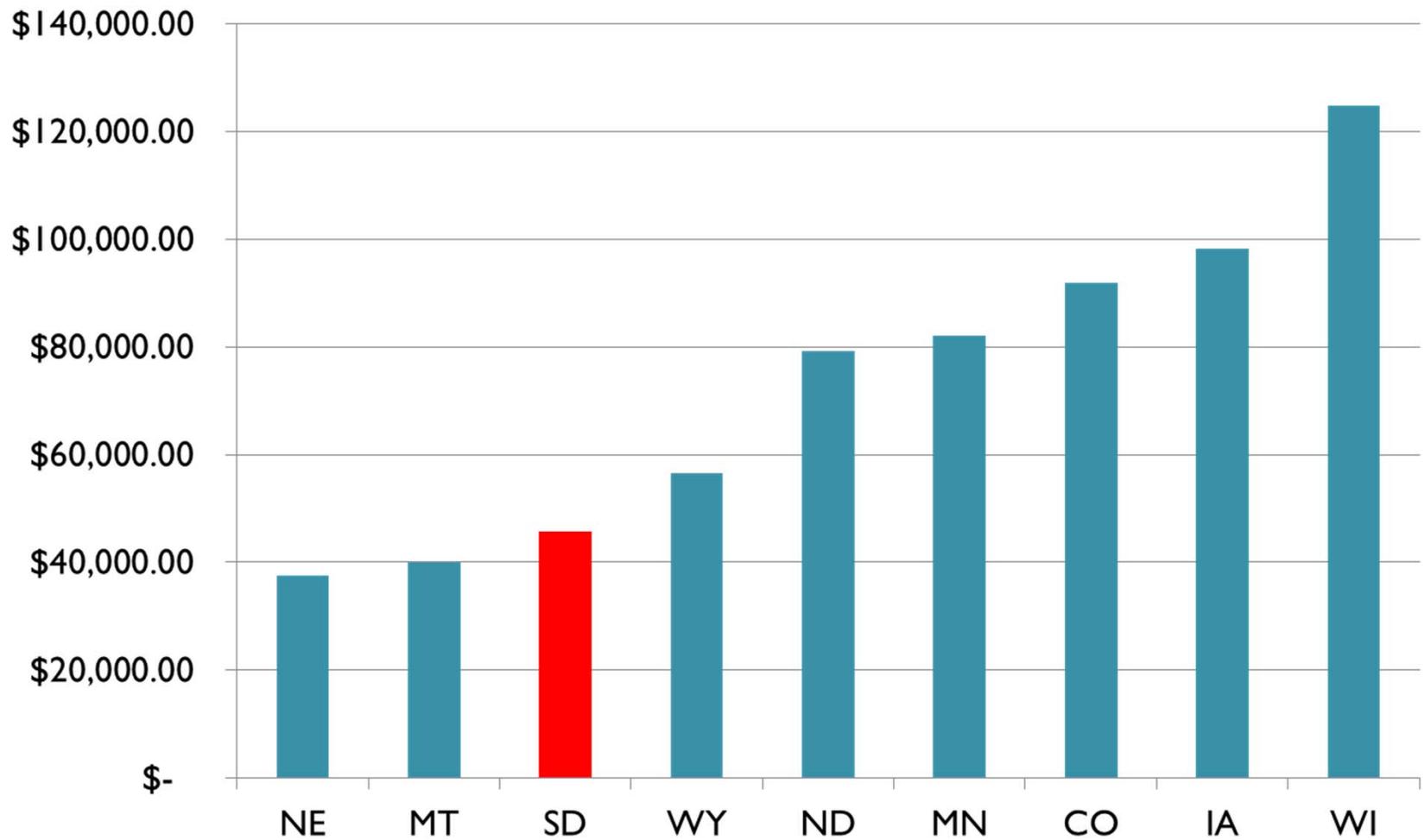
Source: FHWA Statistics (2011) & AASHTO Transportation Governance and Finance (2011)

Preliminary & Construction Engineering % of Construction



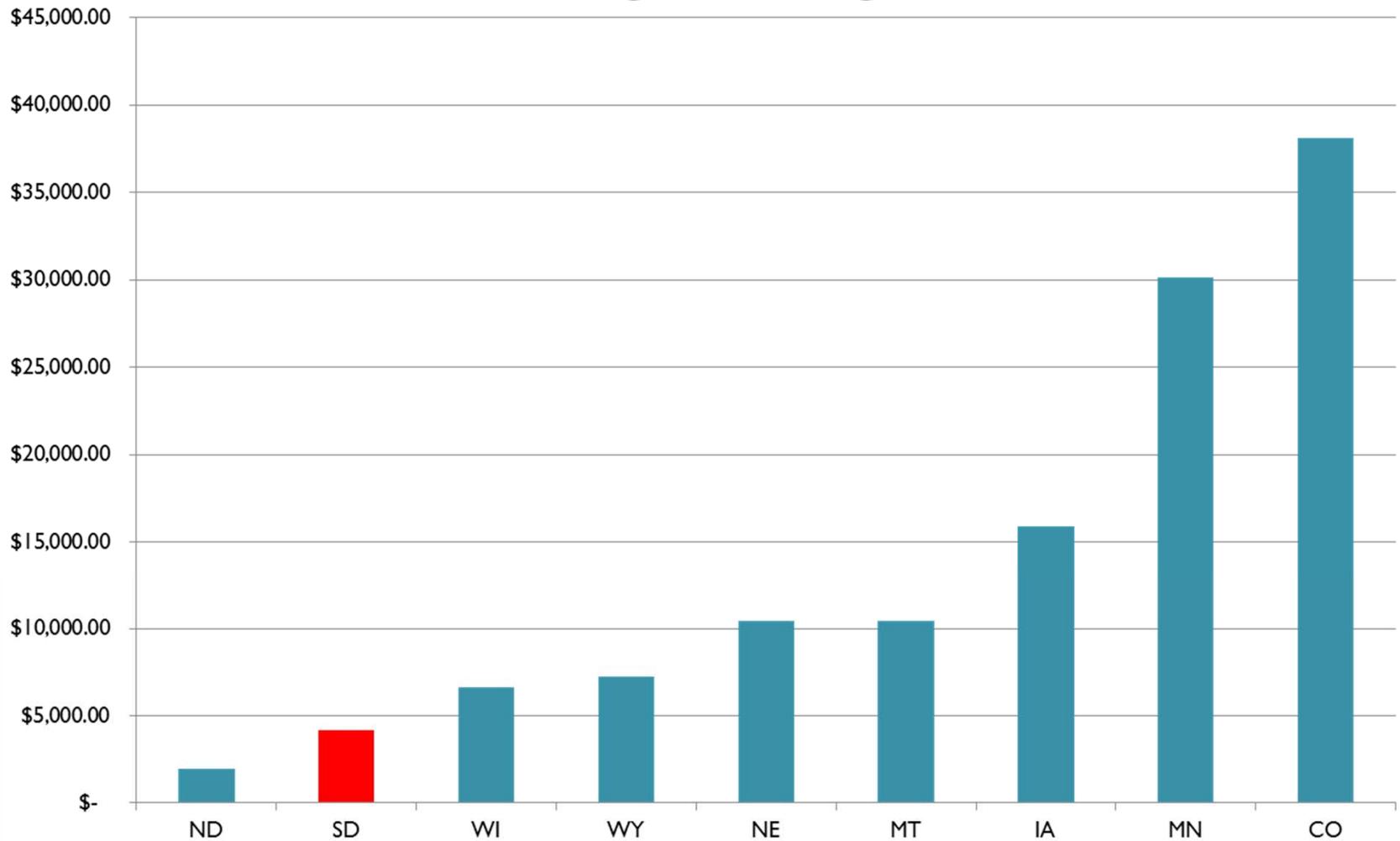
Source: 2012 Highway Statistics FHWA

Average Construction Investment Per Mile



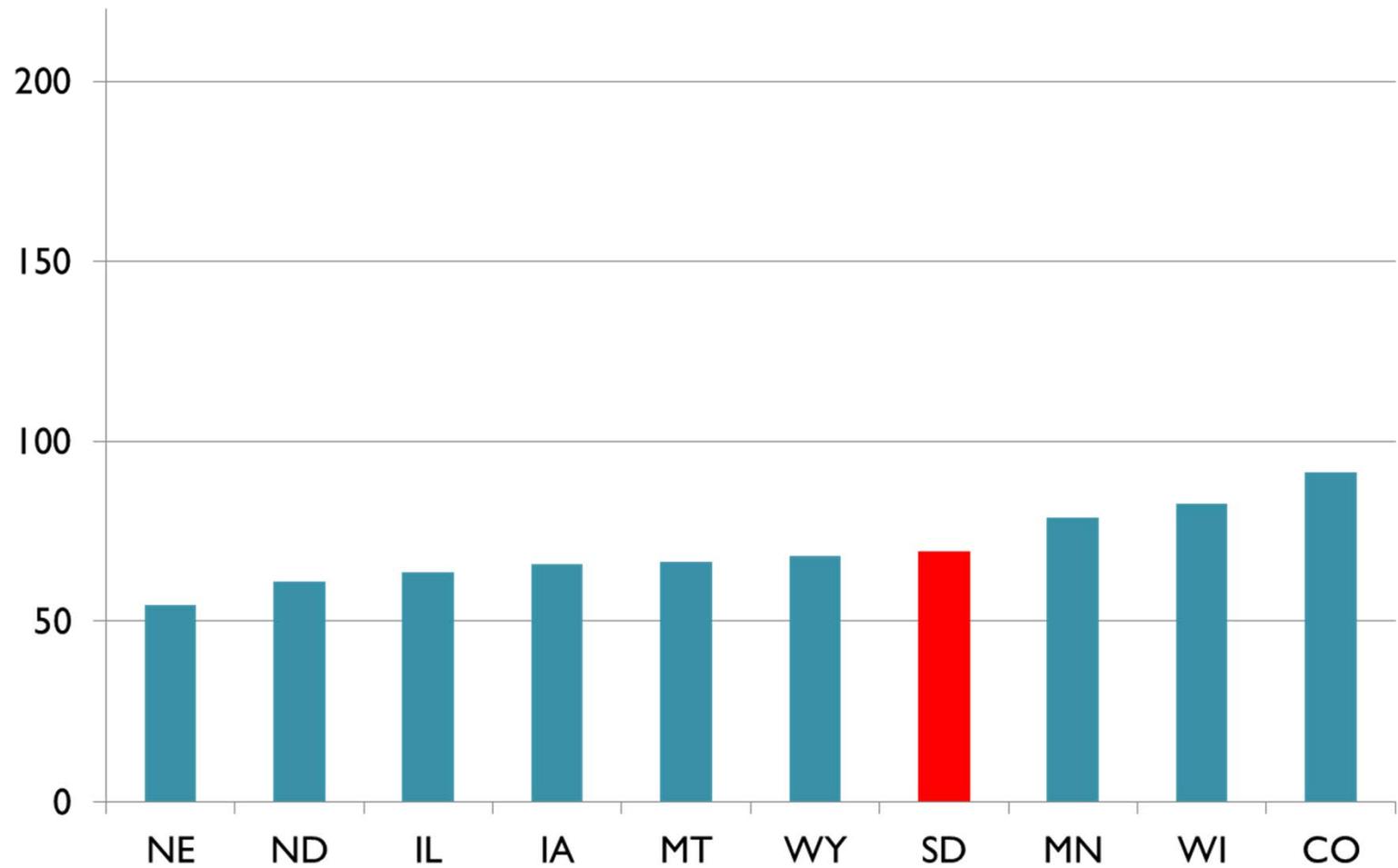
Source: 2012 Highway Statistics FHWA

Roadway Maintenance Cost Per Mile

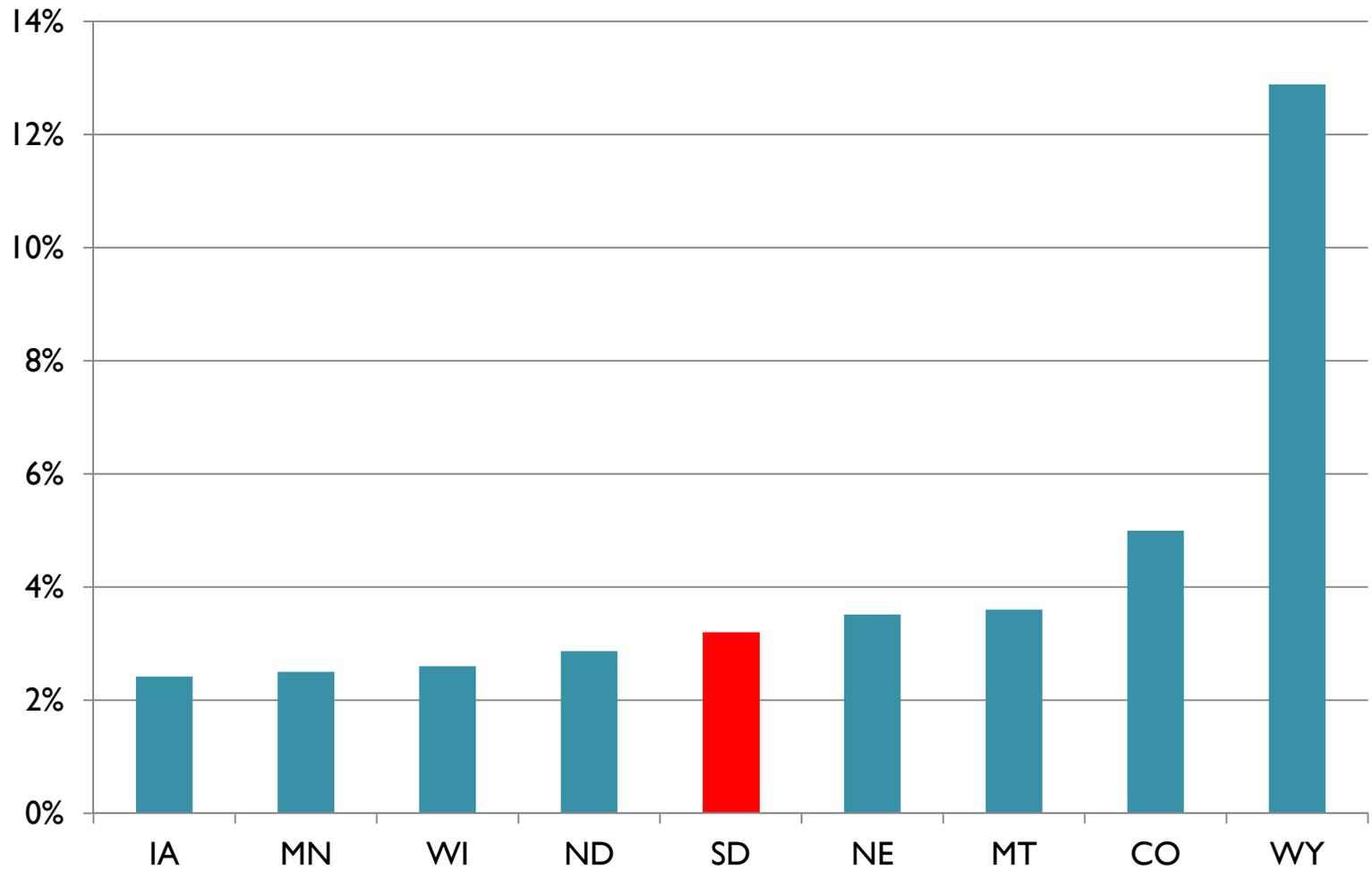


Source: 2012 Highway Statistics FHWA

Estimate of Rural IRI



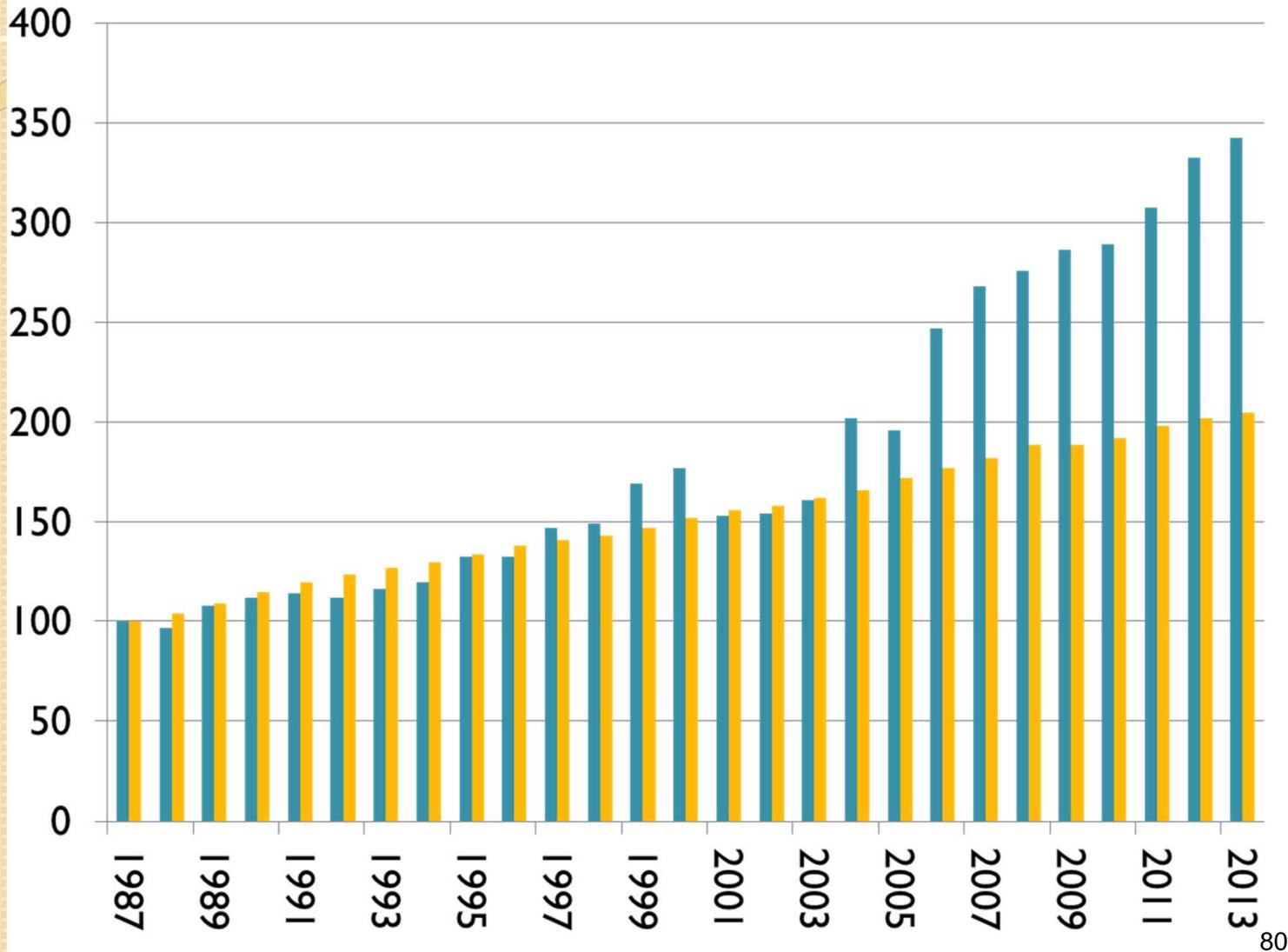
% Deficient by Number of Structures on NHS



Construction Cost Index & Consumer Price Index on all Goods

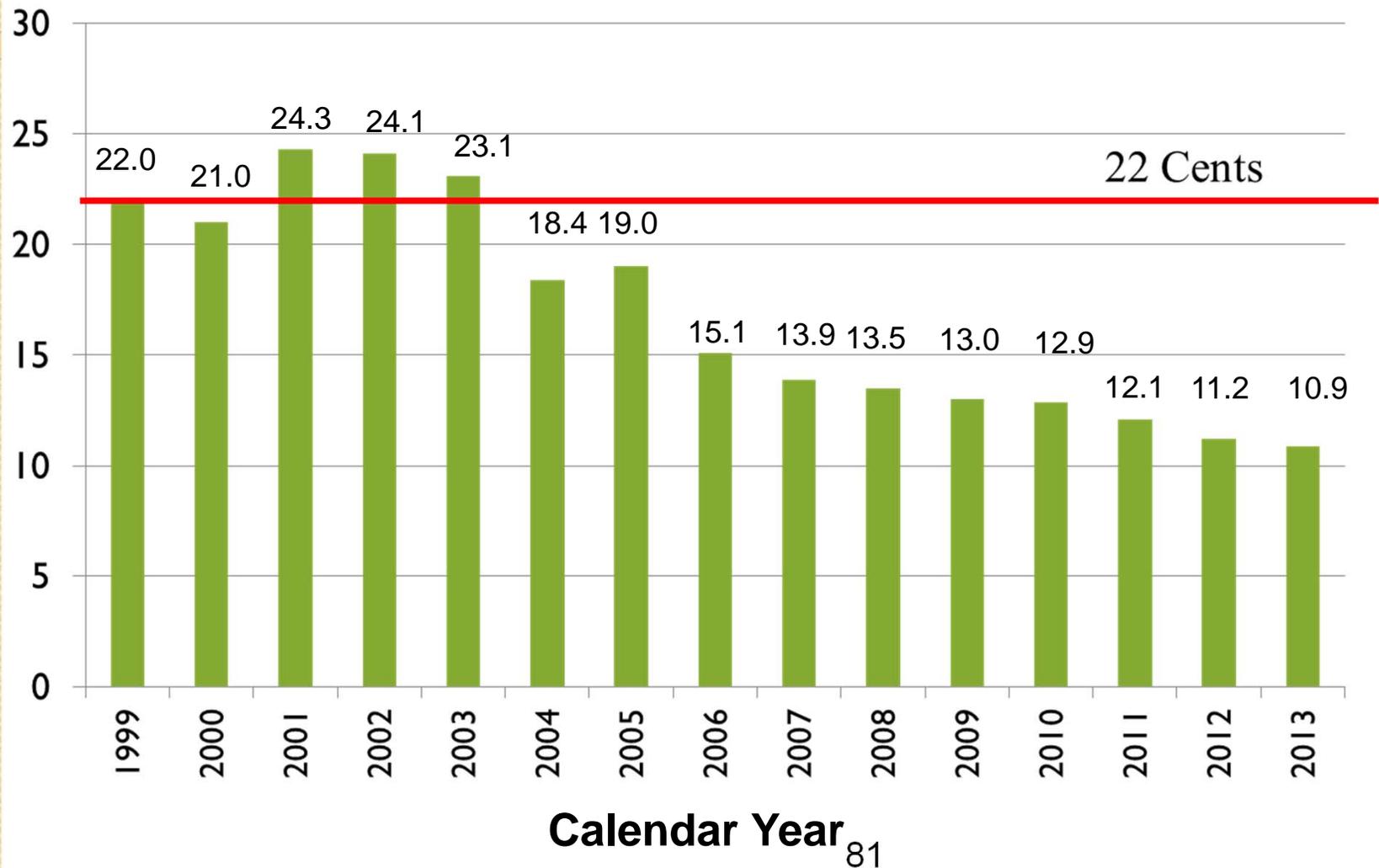
■ DOT COMPOSITE INDEX

■ NATIONAL AVERAGE CONSUMER PRICE INDEX



SD Gas Tax Purchasing Power Adjusted for the Inflation of Road & Bridge Construction

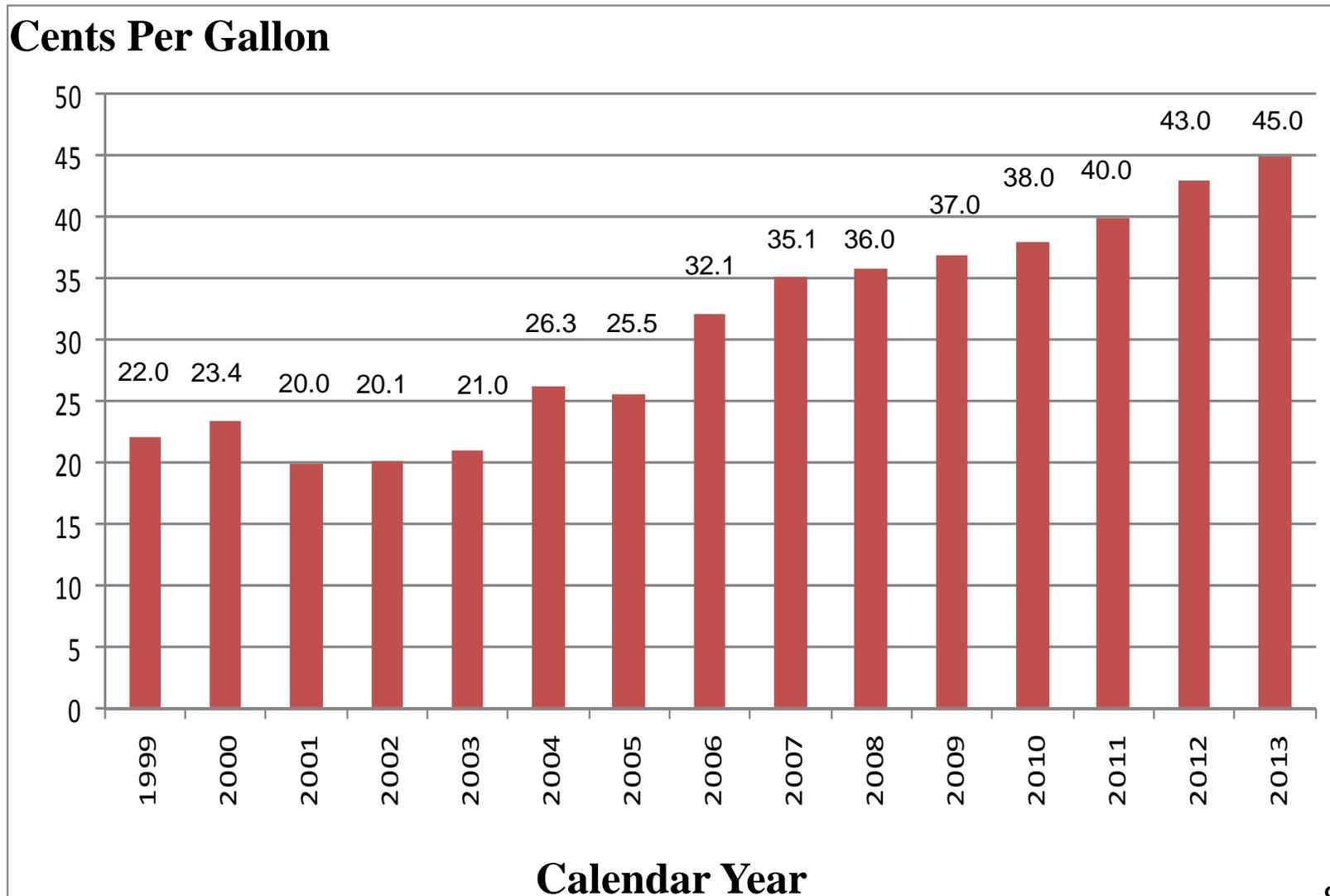
● Cents Per Gallon



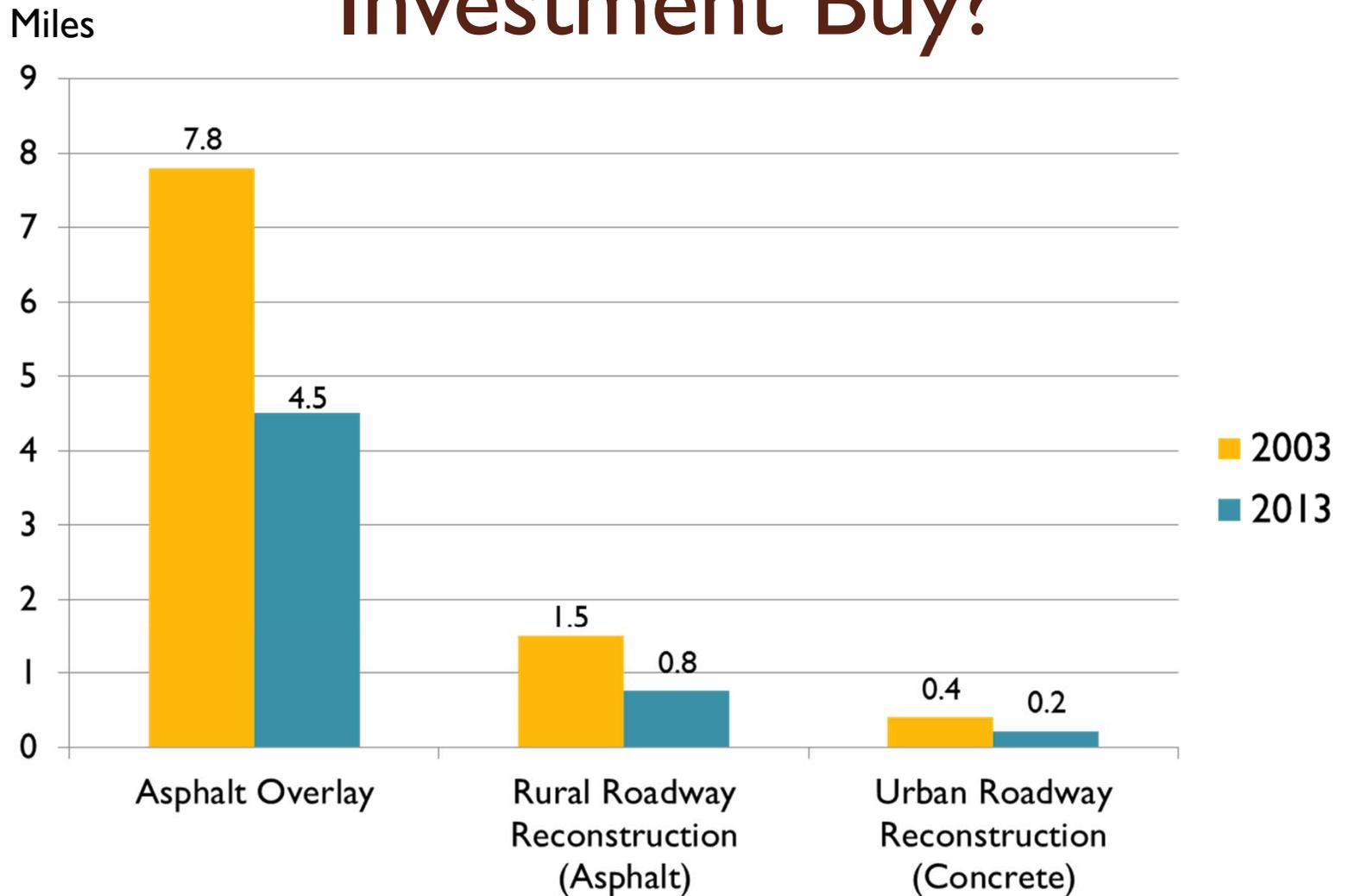
22 Cents

Equivalent SD Gas Tax Purchasing Power

Adjusted for the Inflation of Road & Bridge Construction



What Does a Million Dollar Investment Buy?



Major Construction Items

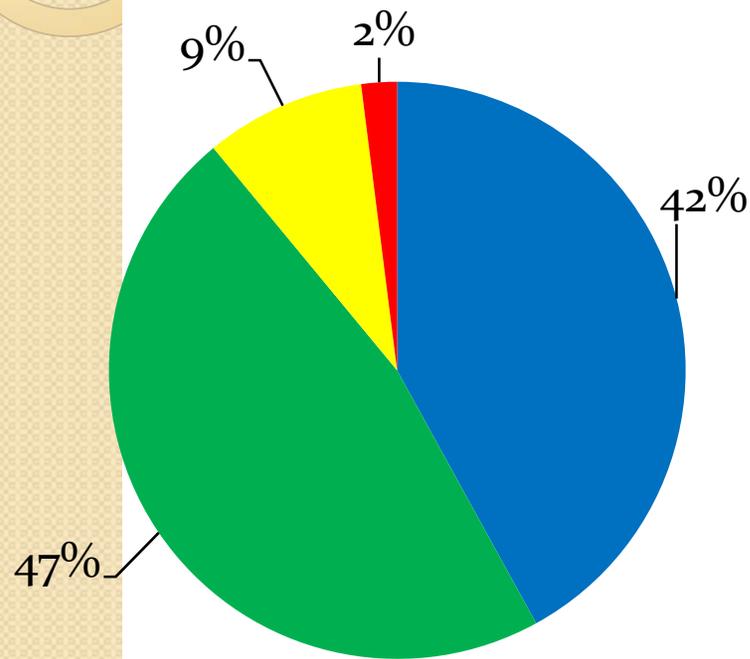
QUANTITY	DESCRIPTION	2005	2007	2009	2013	2005 to 2013 Percentage Change	2009 to 2013 Percentage Change
Ton	Asphalt Binder	\$292.90	\$448.95	\$672.56	\$682.86	133%	2%
Ton	Asphalt Concrete	\$22.38	\$26.72	\$31.93	\$39.42	76%	23%
Sq. Yd.	9" Non- Reinforced PCC Pavement	\$26.98	\$30.19	\$32.28	\$32.27	20%	0%
CU. YD.	Unclassified Excavation	\$1.36	\$1.72	\$2.22	\$2.63	93%	18%
Ton	Base Course	\$9.06	\$10.24	\$12.53	\$13.18	45%	5%
Cu. Yd.	Concrete Bridge Deck	\$531.65	\$629.75	\$709.32	\$726.28	37%	2%
Lb.	Reinforcing Steel	\$0.90	\$0.94	\$0.98	\$1.25	39%	28%
Sq. Yd.	Cold Milling Asphalt Concrete	\$0.56	\$0.69	\$0.68	\$0.91	63%	34%



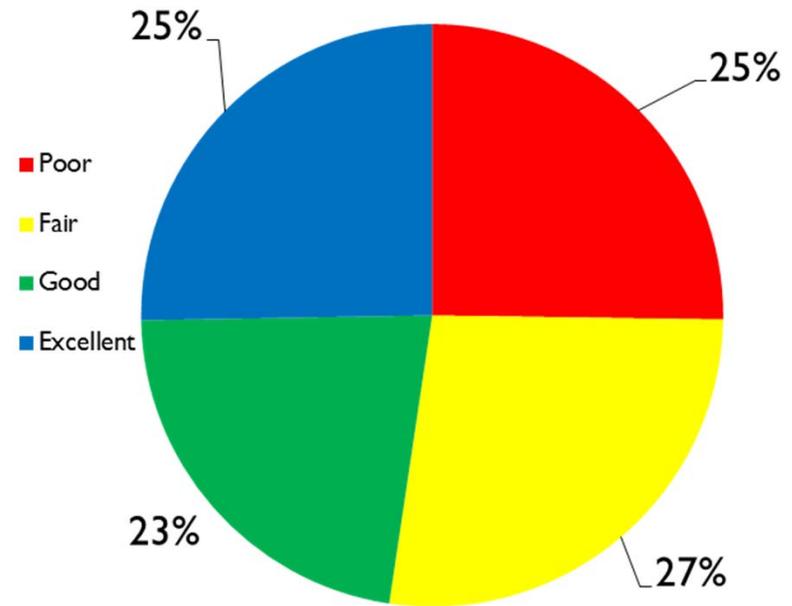
PROJECTION / FUTURE

- Assumptions
 - Flat revenues (state and federal)
 - Maintain existing investment strategy
 - Reasonable construction cost increases

Future Pavement Condition

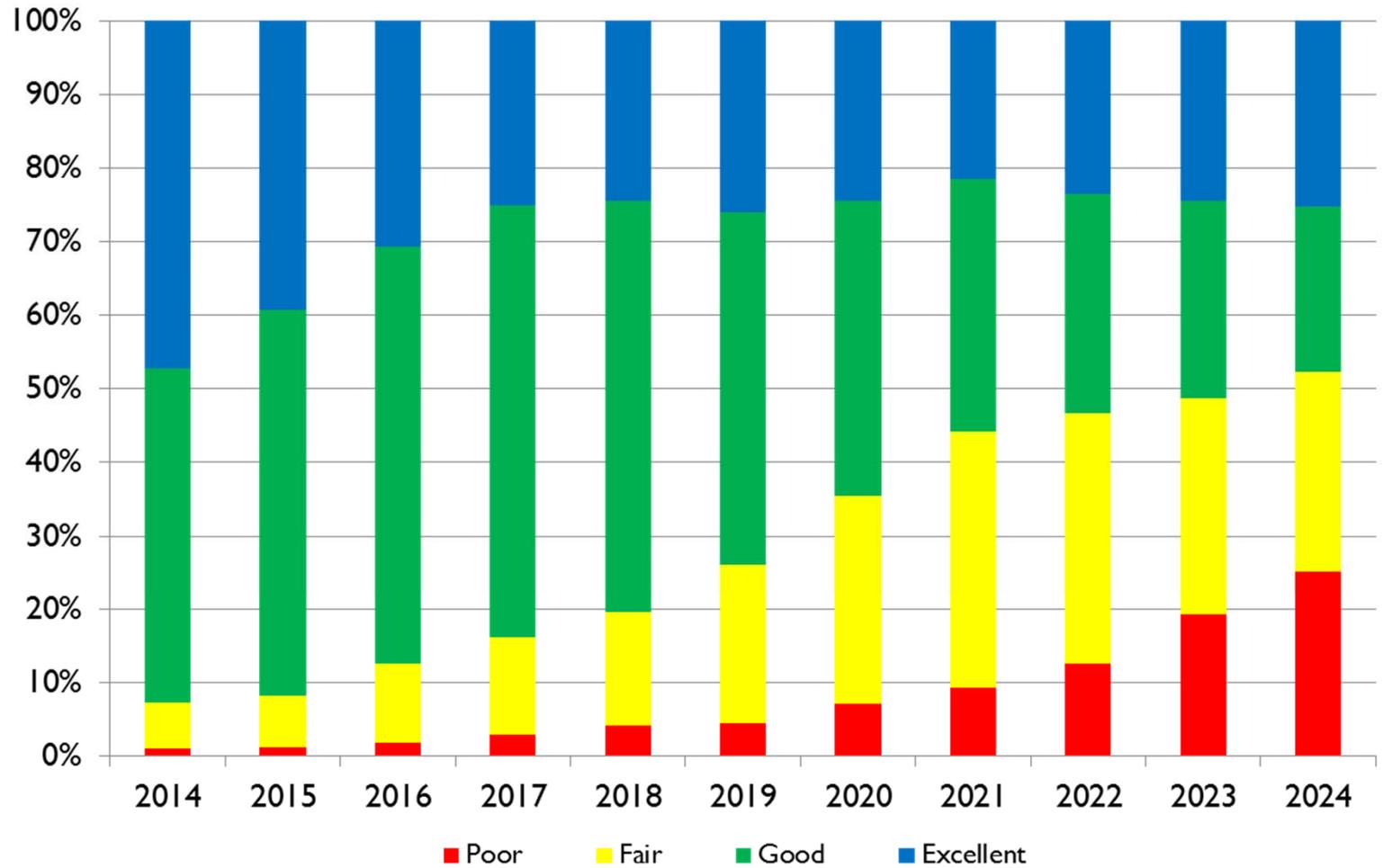


2014 Condition

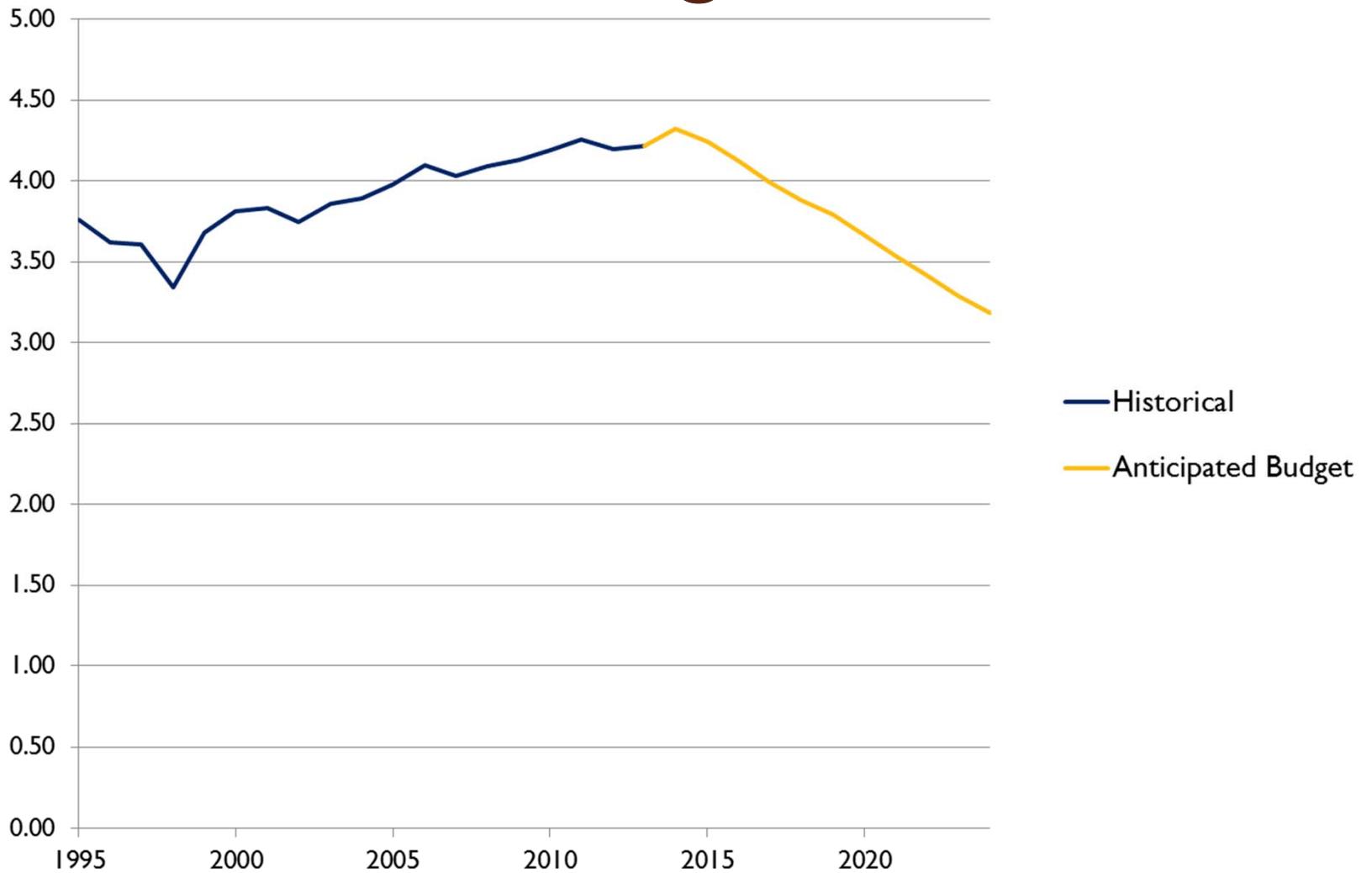


2024 Projected Condition

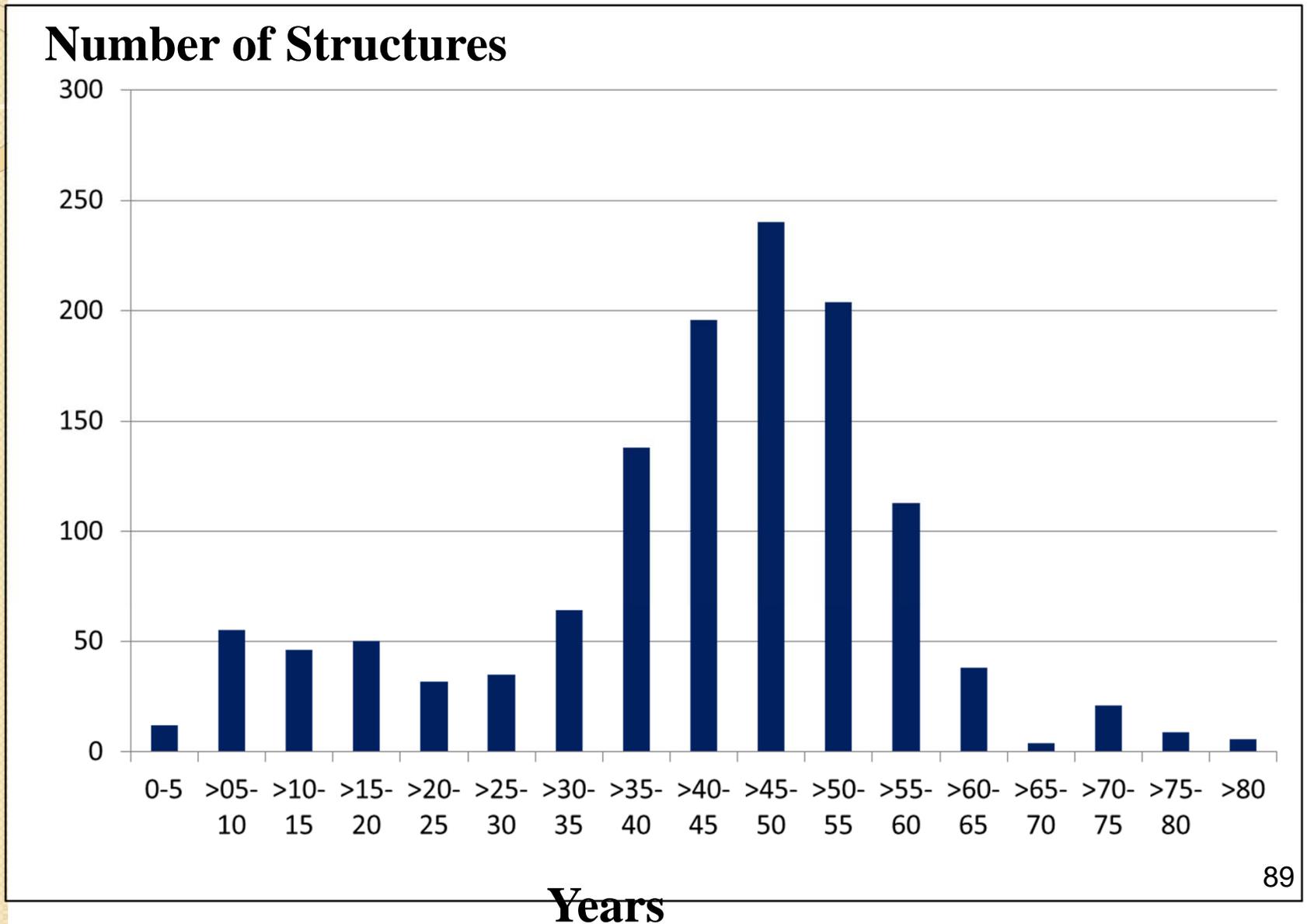
Future Pavement Condition



2014 Pavement Historic & Future Average Condition

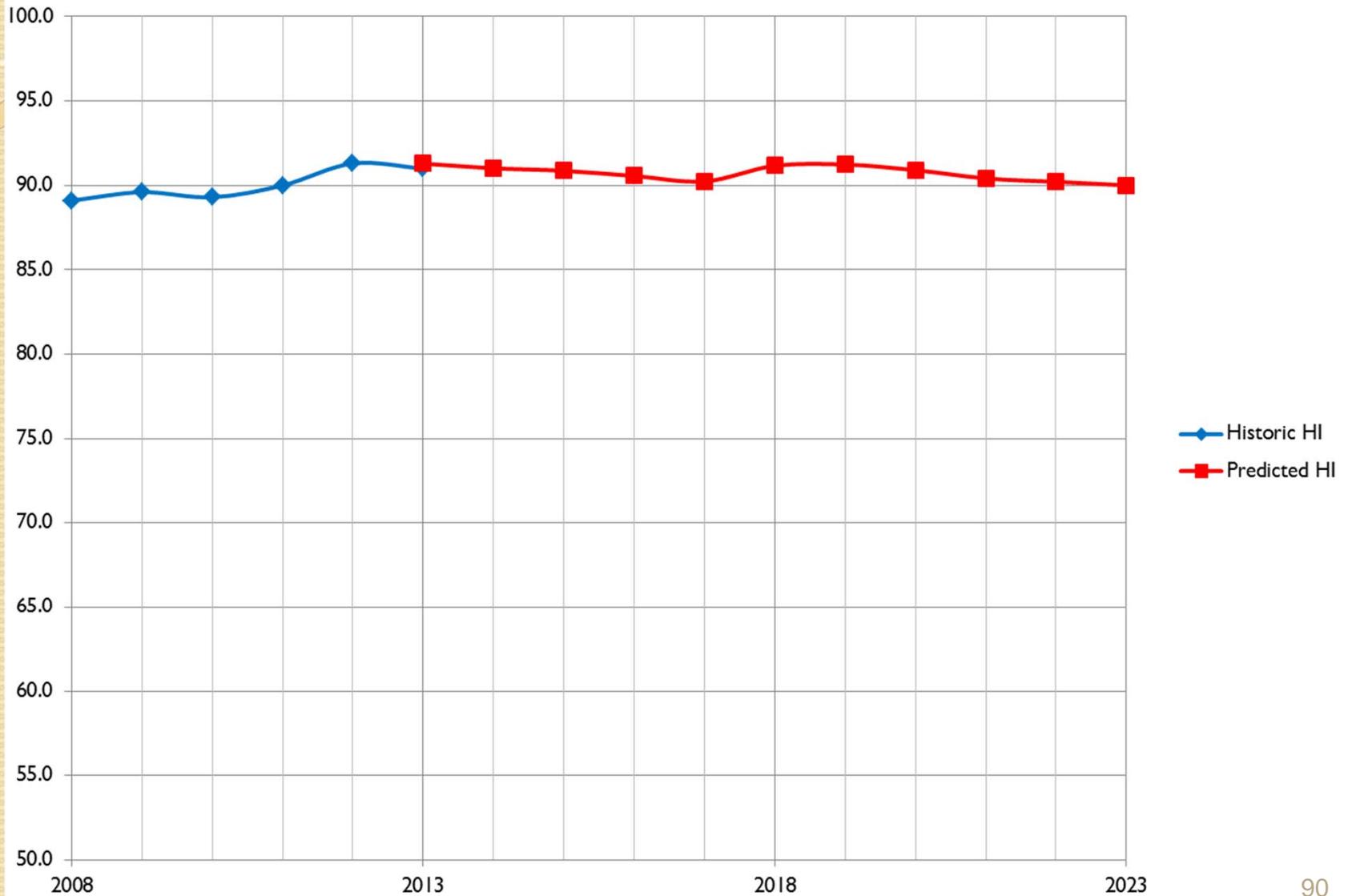


State Structure Age

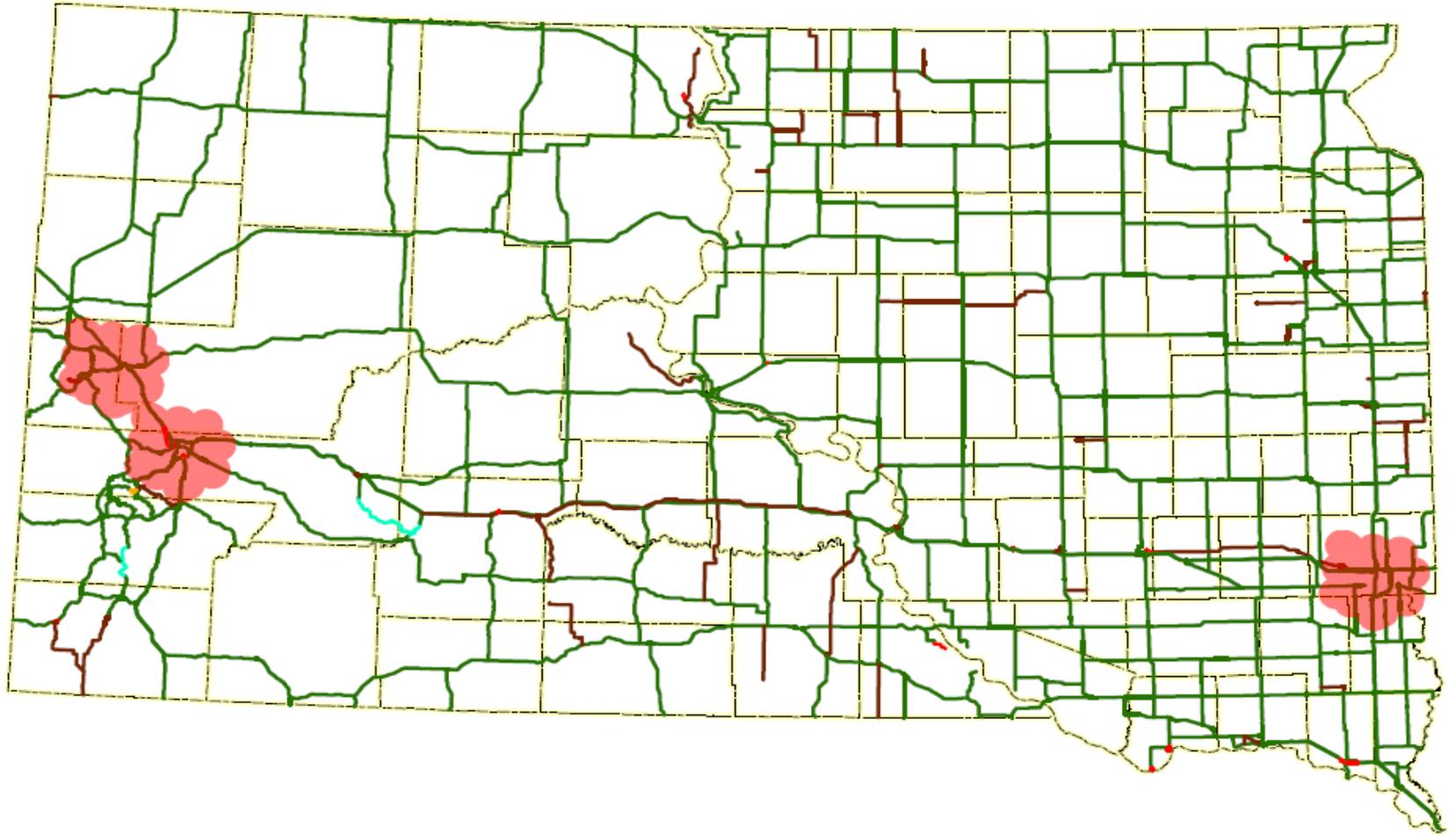


Future Structure Health Index

Condition Compared to a New Structure



Future Expansion





Safety

- **Strategic Highway Safety Plan**
 - Vision Statement: Every life counts - Partnering to save lives
 - Goal :15% reduction in fatal injury crash rate by 2020



Questions?