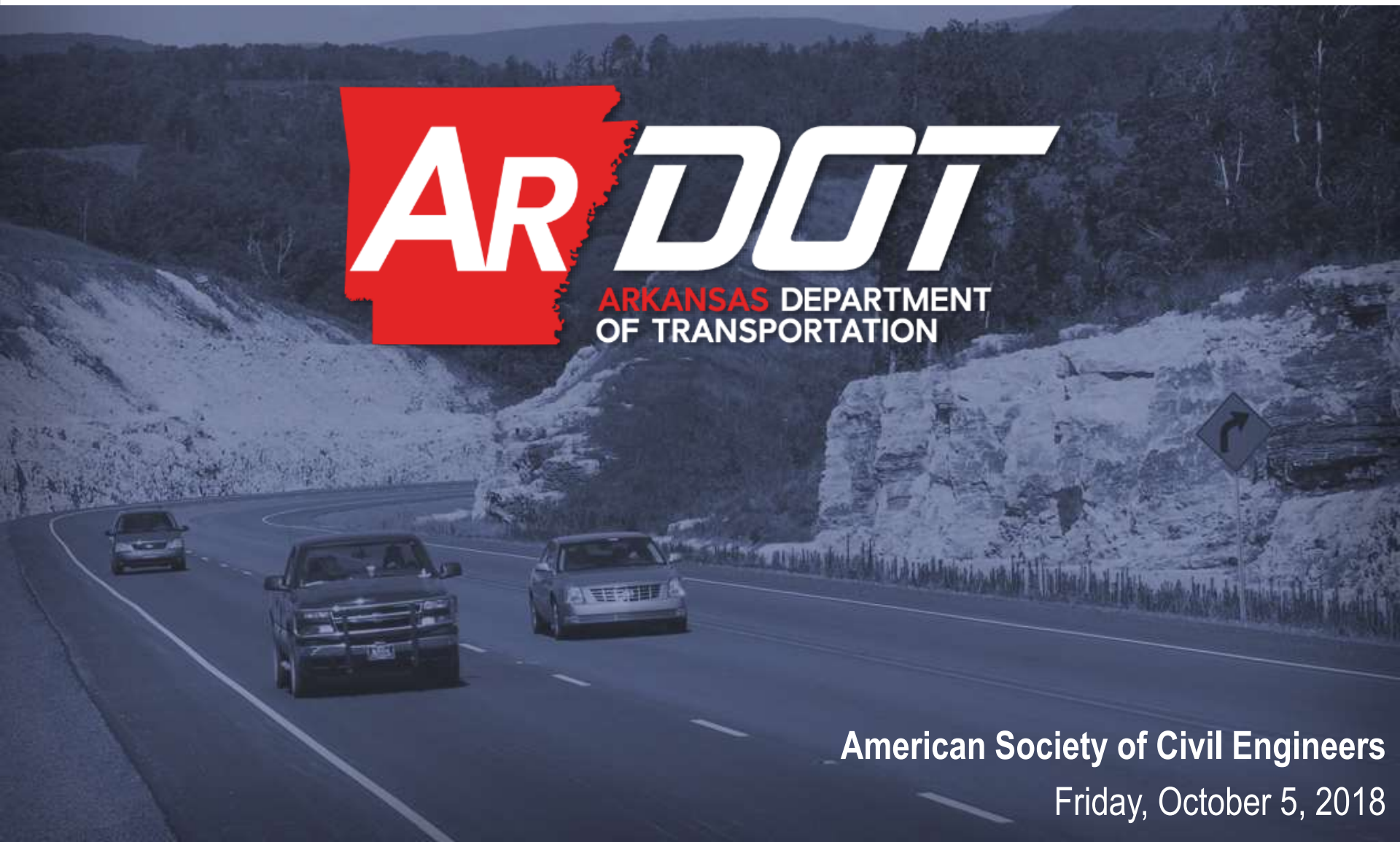
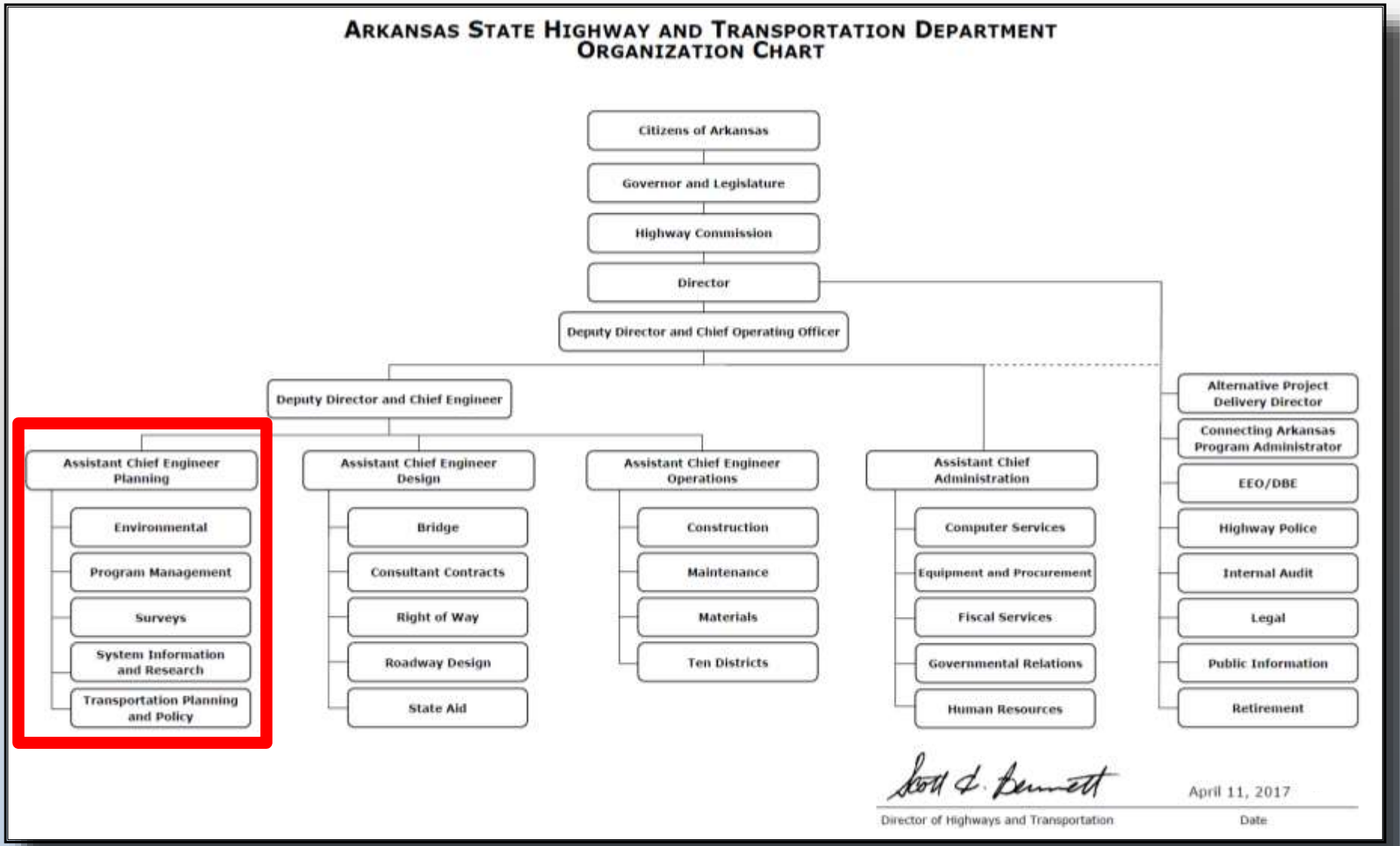
Kevin Thornton, Assistant Chief Engineer – Planning
Rick Ellis, Division Head – Bridge
Trinity Smith, Engineer of Roadway
Tony Sullivan, Assistant Chief Engineer – Operations



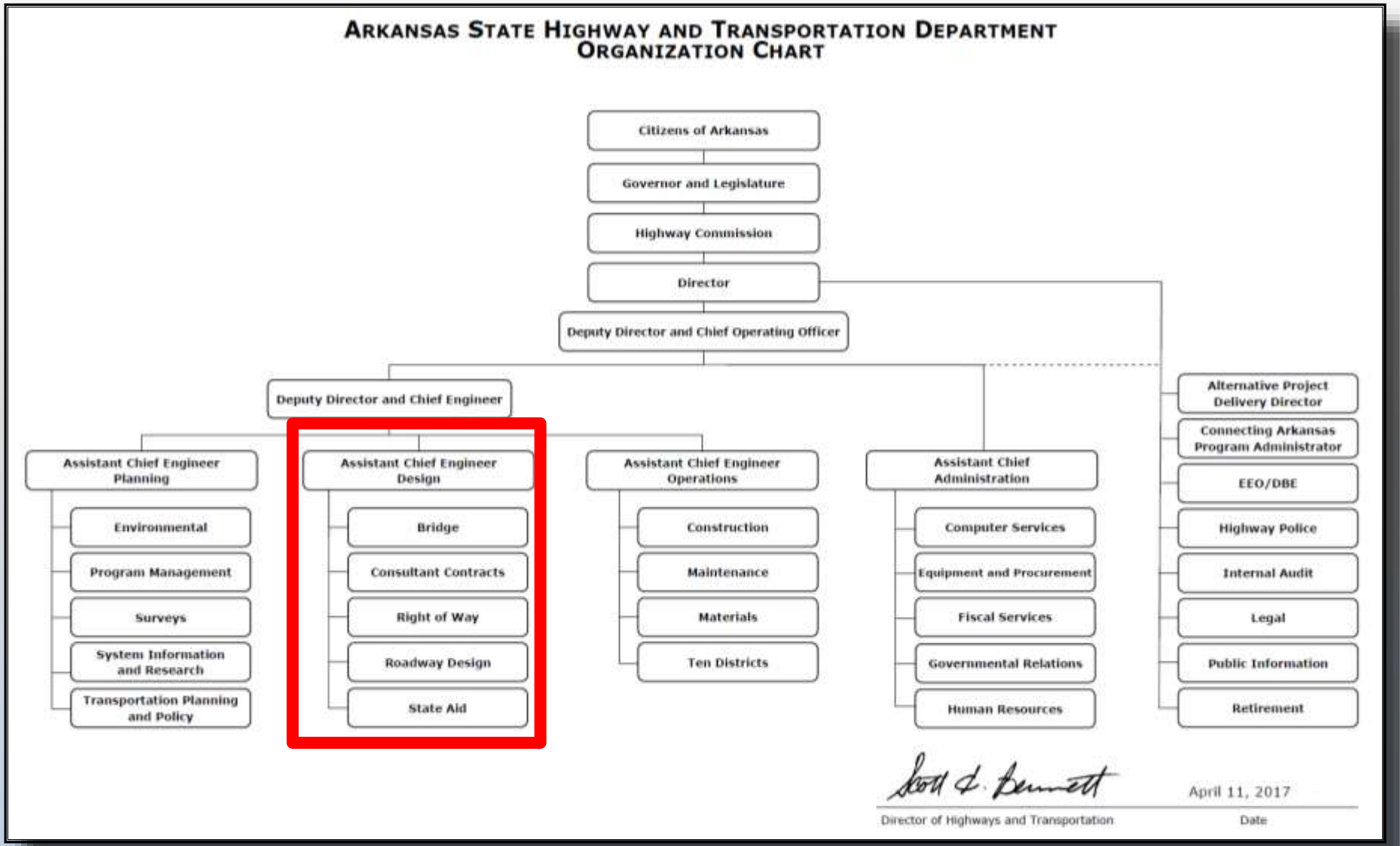
American Society of Civil Engineers

Friday, October 5, 2018

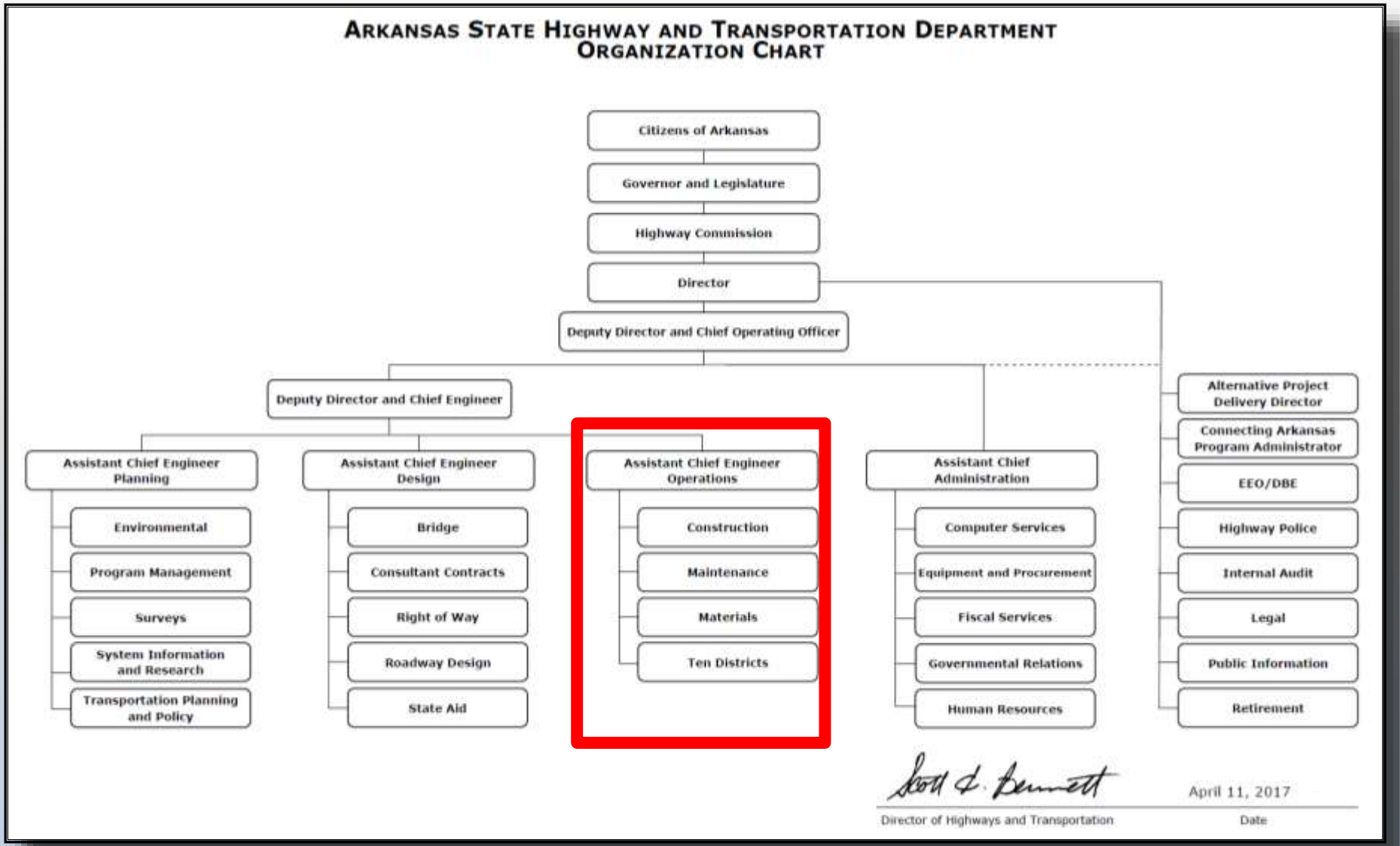
Organization Chart



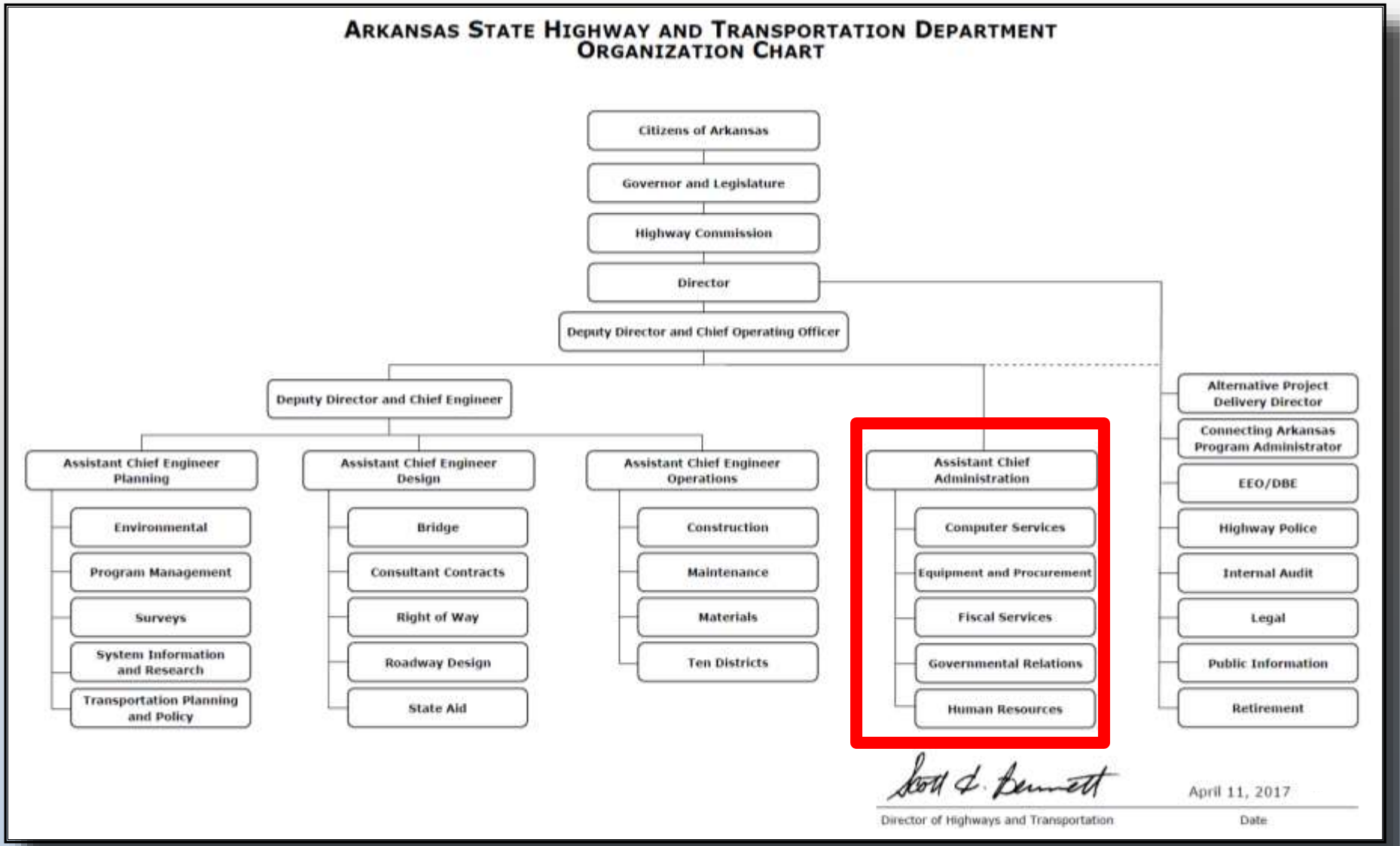
Organization Chart



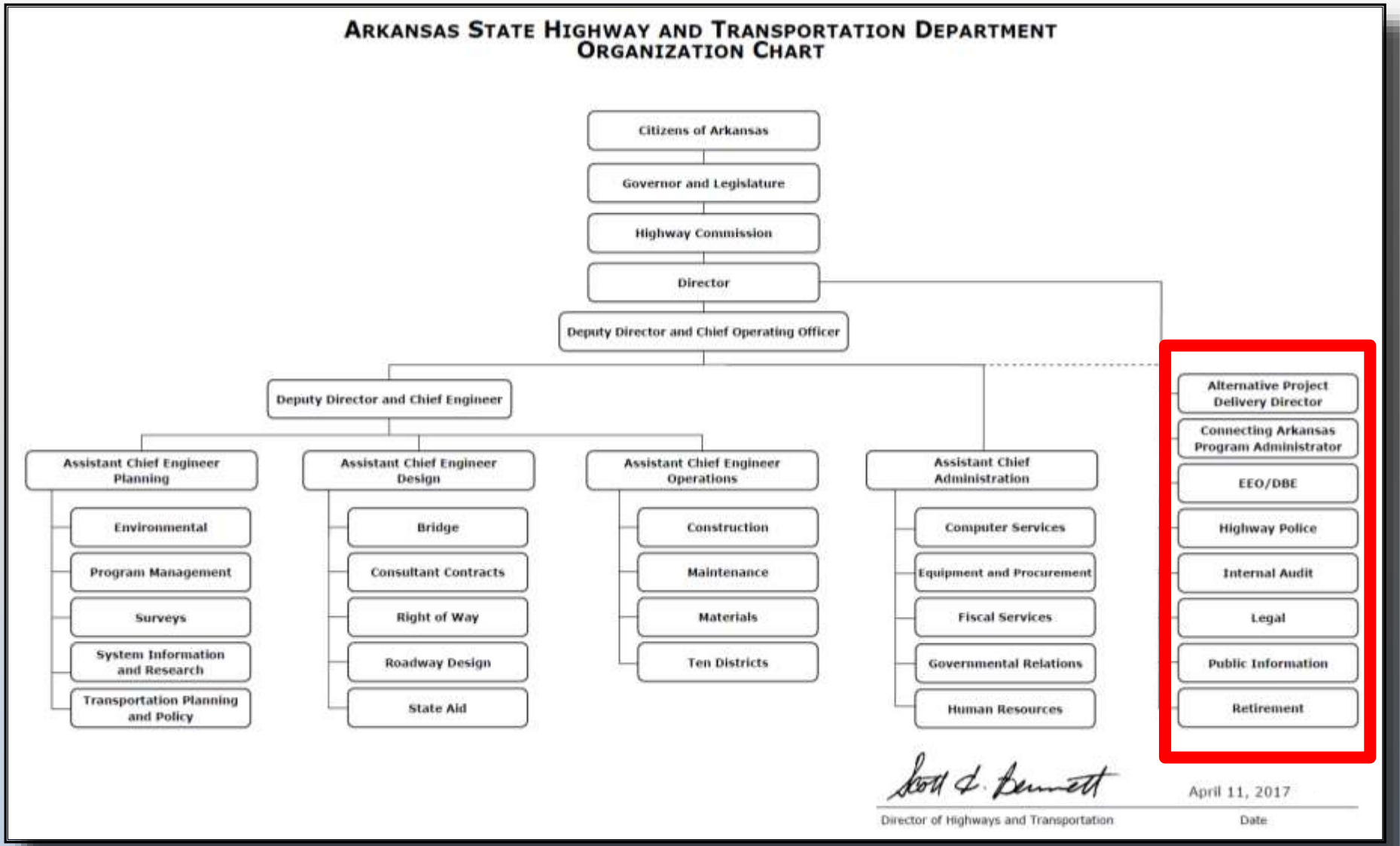
Organization Chart



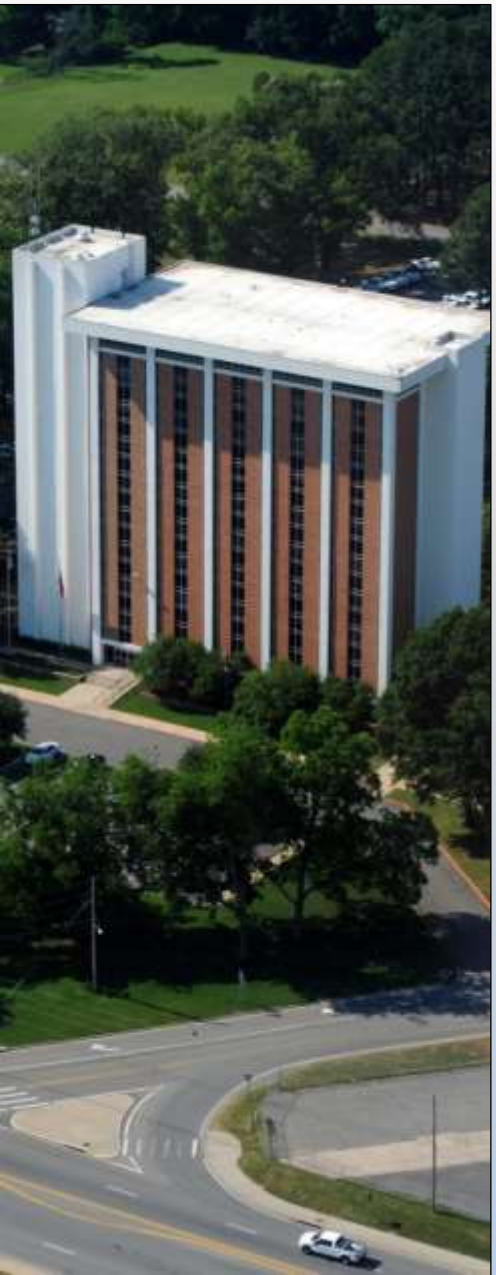
Organization Chart



Organization Chart



ARDOT Quick Facts



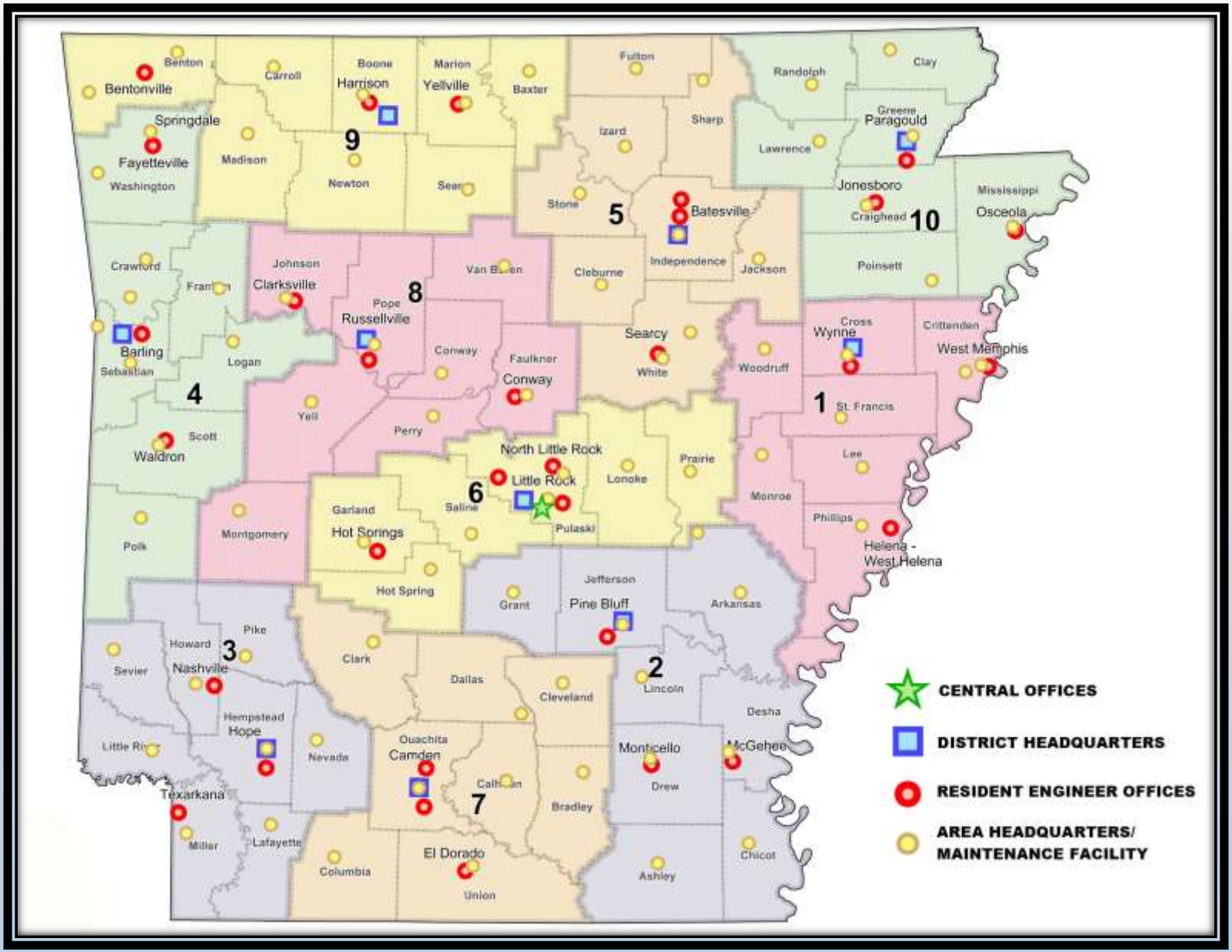
3rd Largest State Agency
(3,698 Employees)

Maintains
16,418 miles of Highway
7,335 Bridges

Central Offices in Little Rock

10 Districts Statewide

District Organization



Core Values

Safety – Safety first in all we do

Public Service – Focus on the greater good

Teamwork – One vision through collaboration and communication

Quality – Deliver reliable transportation solutions

Integrity – Commitment to ethics and transparency

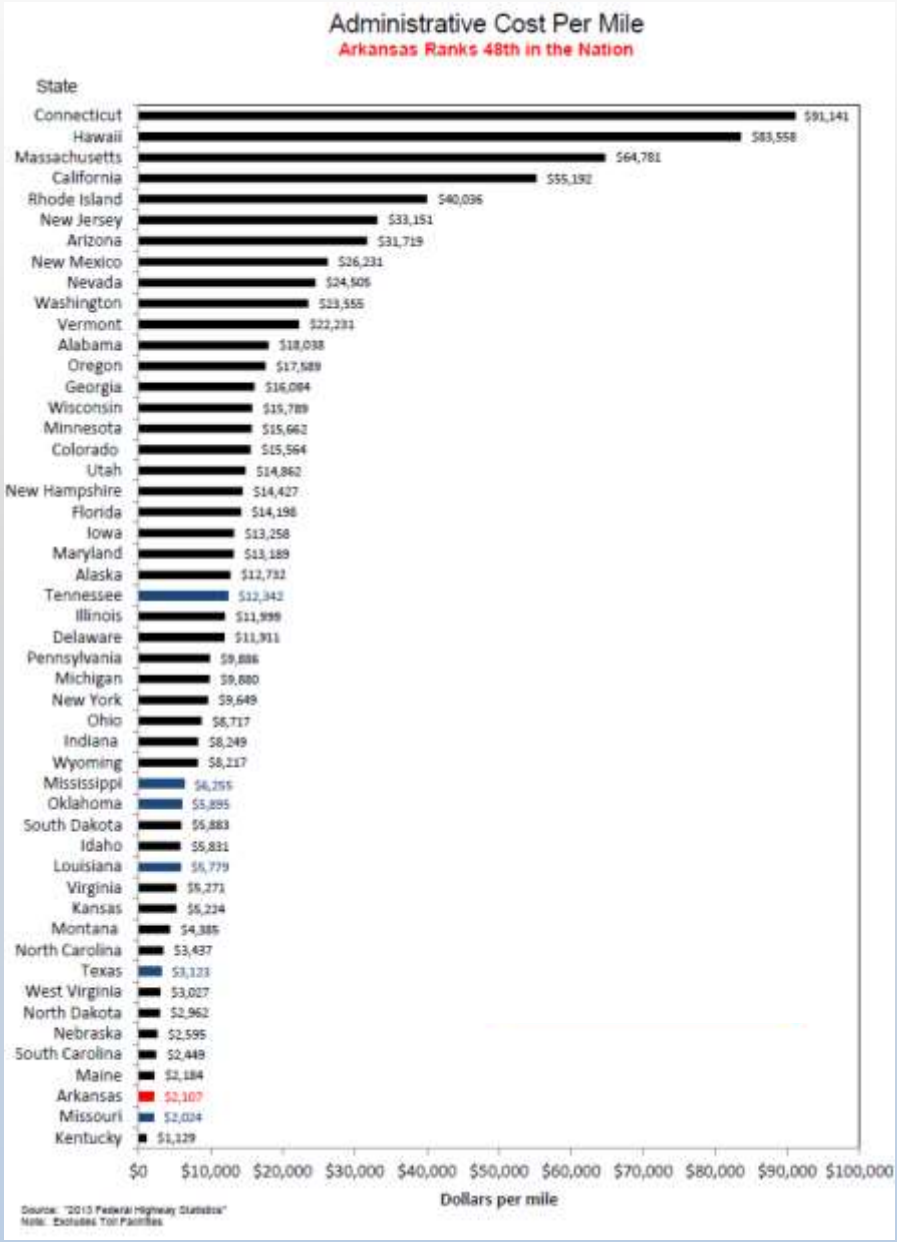
Efficiency – Achieve maximum benefit through fiscal responsibility

Mission Statement

Provide safe and efficient transportation solutions to support Arkansas' economy and enhance the quality of life for generations to come.

Adopted June 7, 2017

Efficiency



Arkansas = $2,107

Surrounding States Average = $4,334

National Average = $9,224

Arkansas has the 3rd Lowest Administrative Cost Per Mile in the Nation

Employment Levels Efficiency

Year

1979 — 4,200 Employees

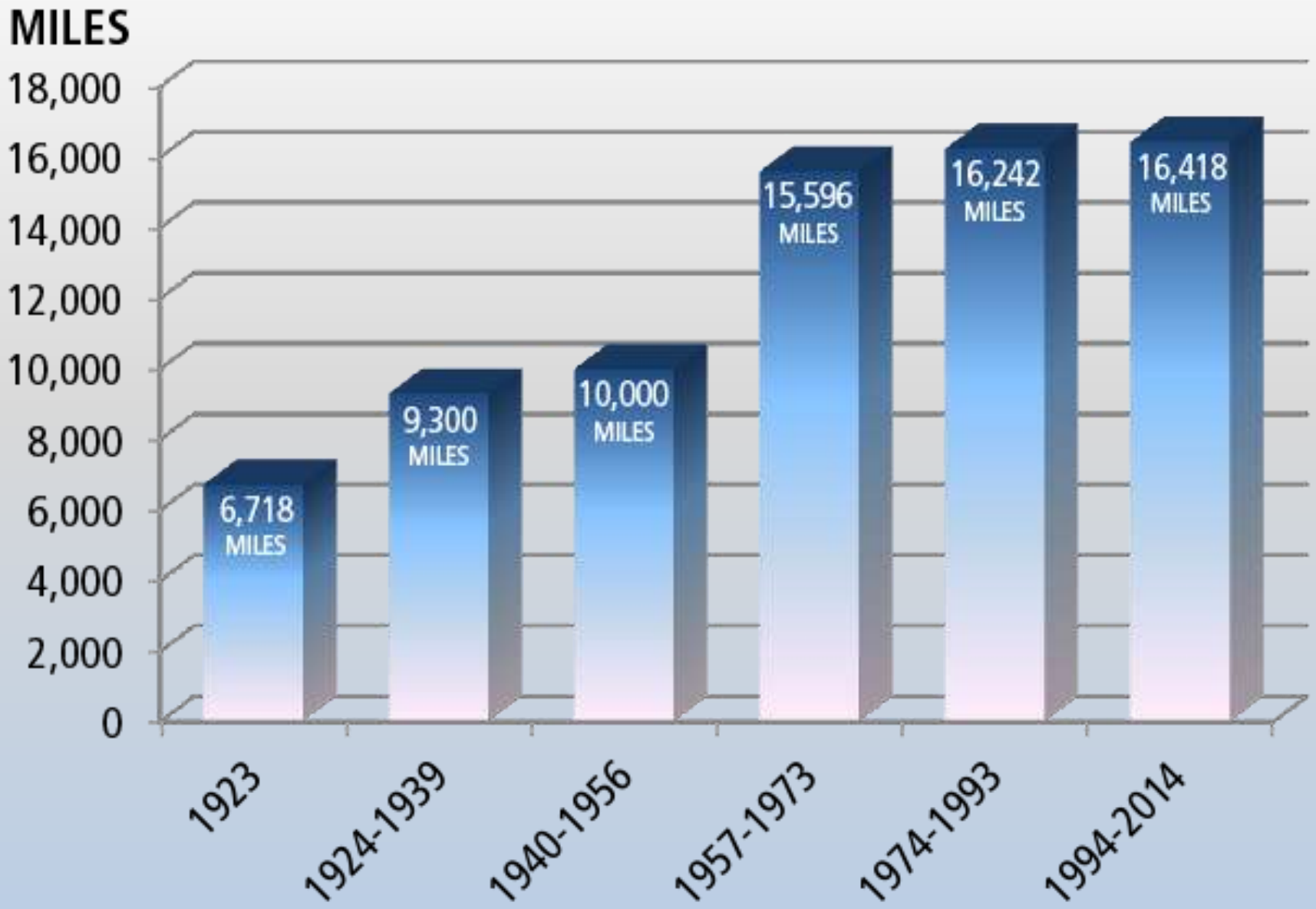
2000 — 3,800 Employees

2018 — 3,698 Employees

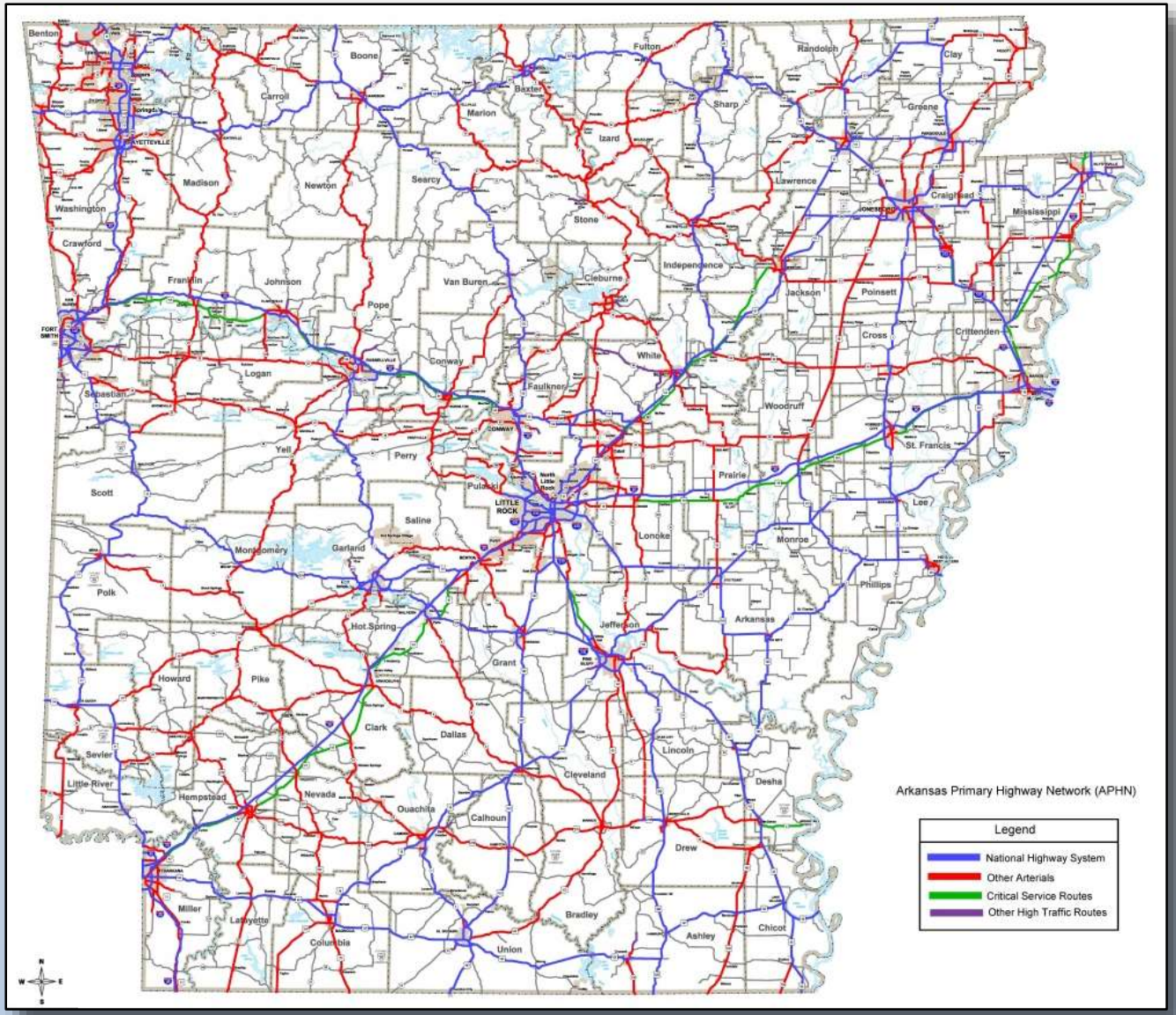




GROWTH OF THE HIGHWAY SYSTEM



Arkansas Primary Highway Network



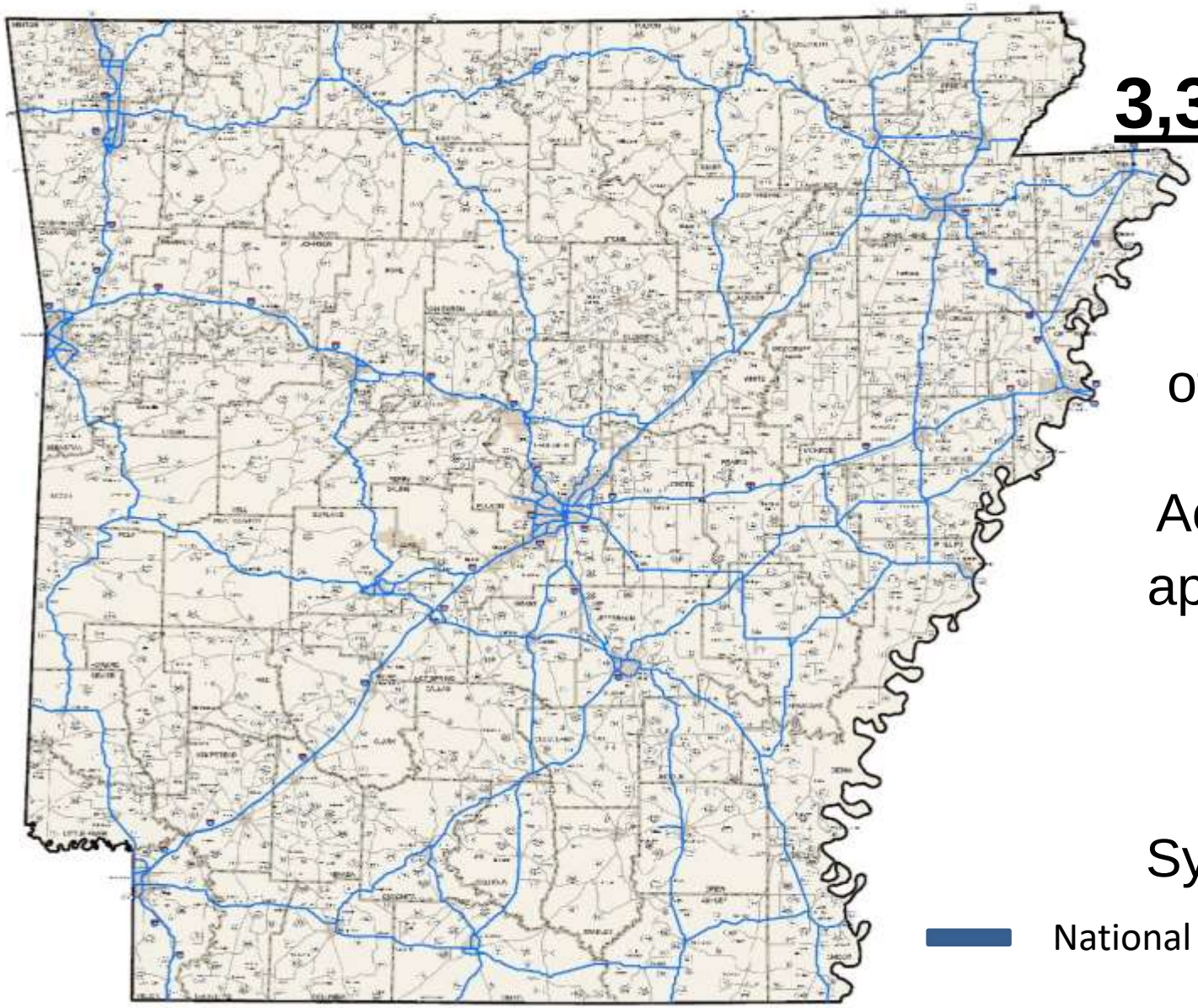
7,927 miles

Carries
90%
of All Traffic

Accounts for
approximately
48%
of State Highway
System Miles

National Highway System

Arkansas Primary Highway Network



3,331 miles

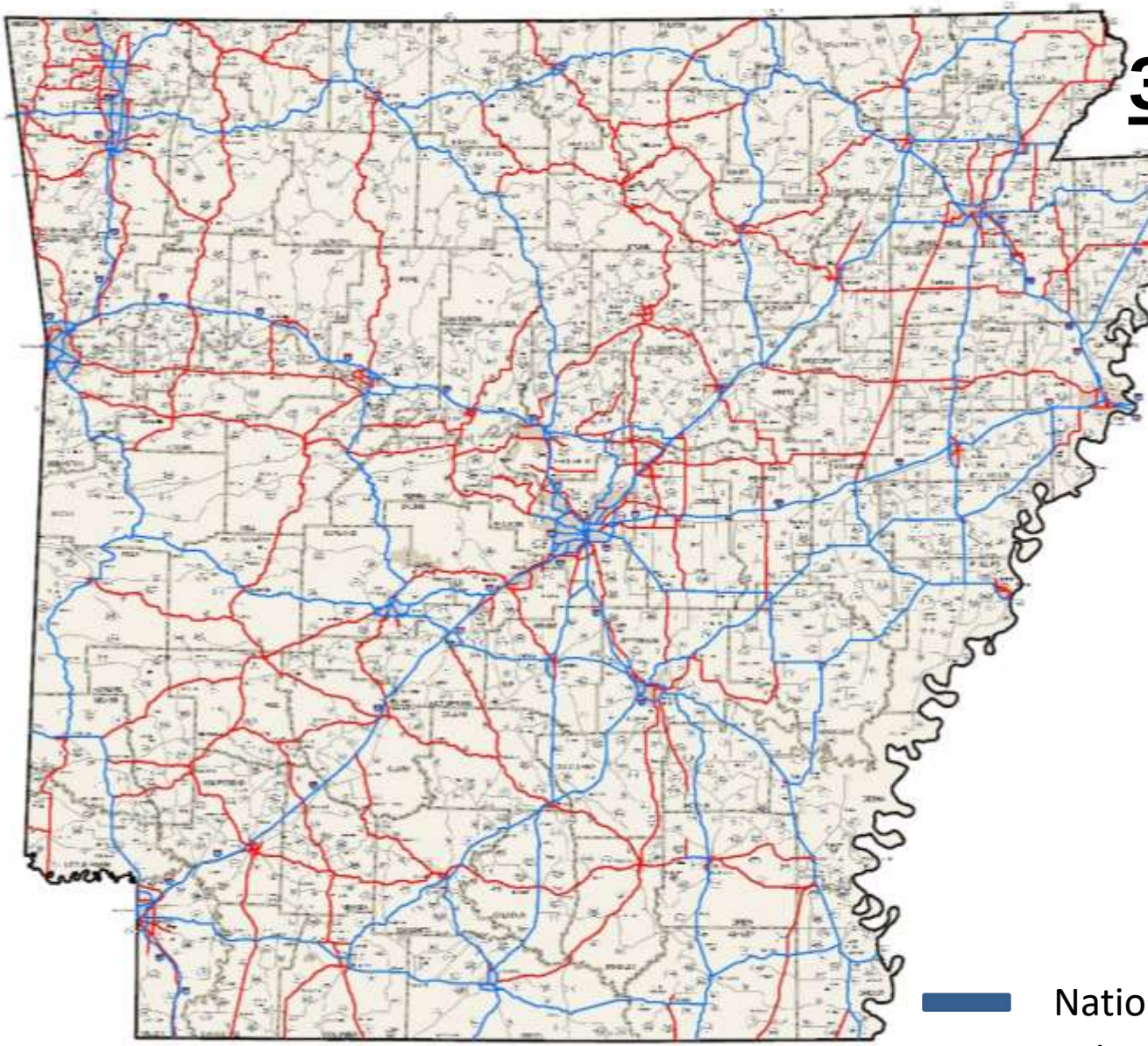
Carries
66%
of All Traffic

Accounts for
approximately
20%
of State
Highway
System Miles

National Highway System

Other Arterials

Arkansas Primary Highway Network



3,977 miles

Carries
21%
of All Traffic

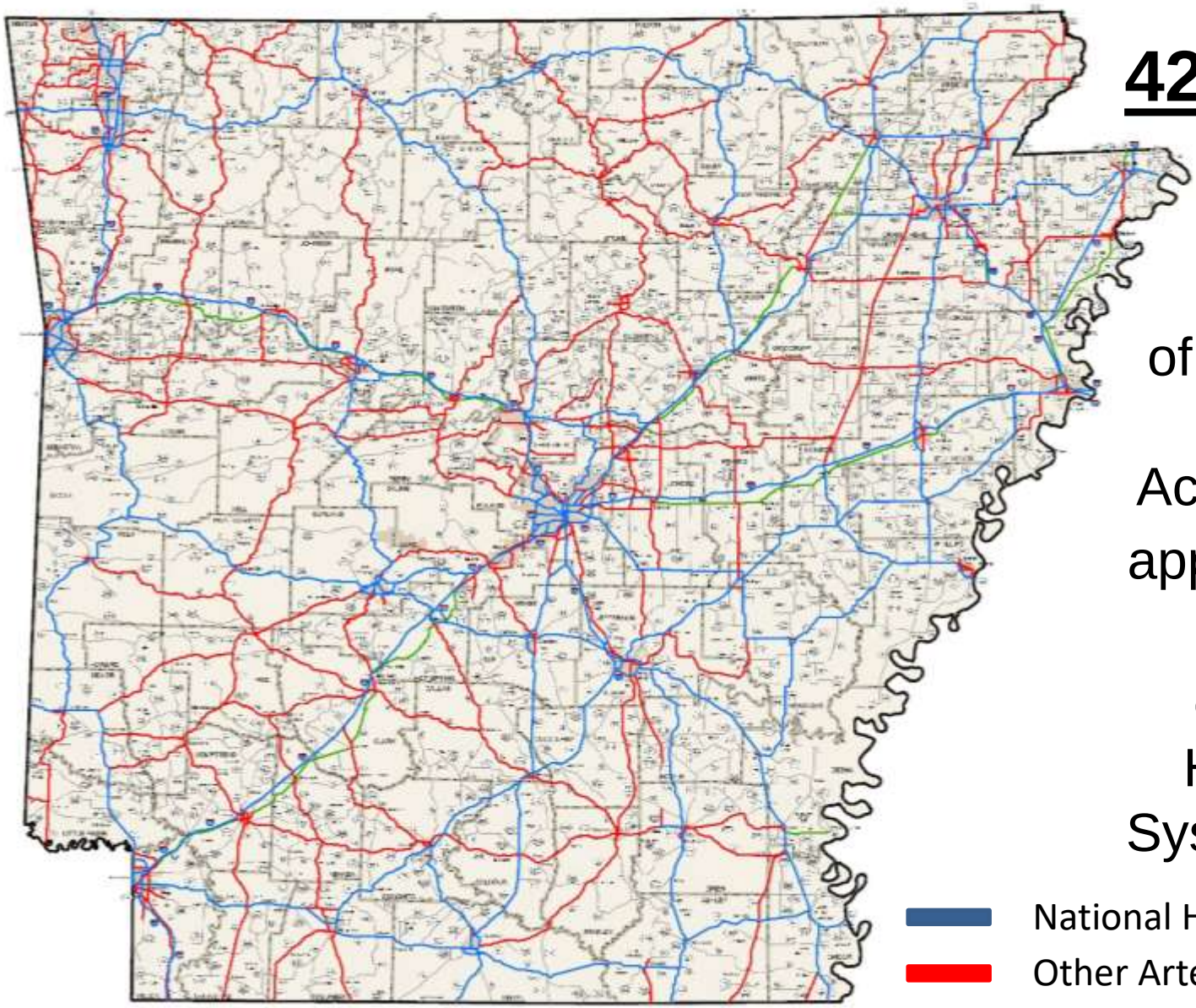
Accounts for approximately
24%
of State Highway System Miles

National Highway System

Other Arterials

Critical Service Routes

Arkansas Primary Highway Network



423 miles

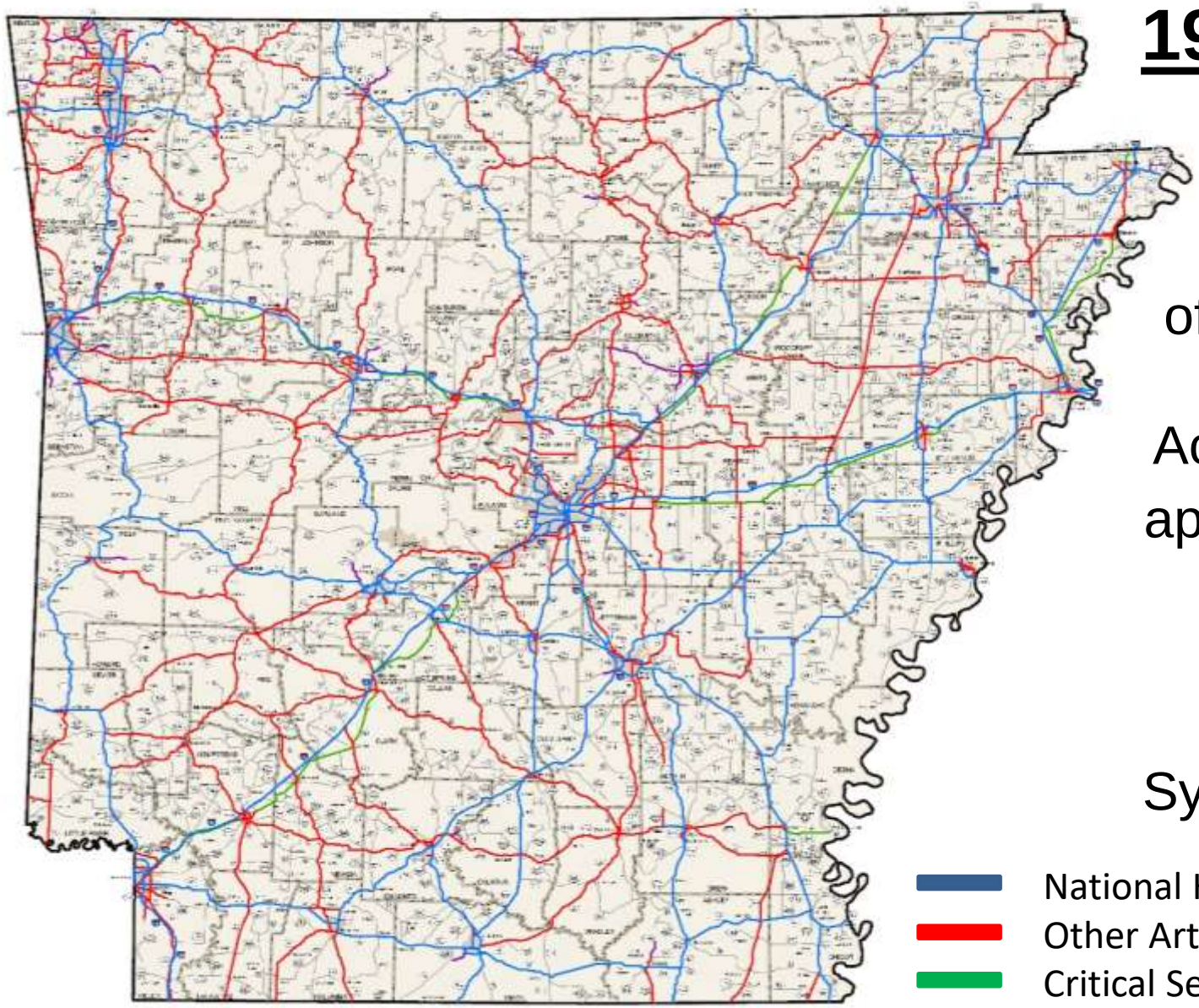
Carries
2%
of All Traffic

Accounts for
approximately
3%
of State
Highway
System Miles

- National Highway System
- Other Arterials
- Critical Service Routes

Other High Traffic Routes

Arkansas Primary Highway Network



196 miles

Carries
1%
of All Traffic

Accounts for
approximately
1%
of State
Highway
System Miles

- National Highway System
- Other Arterials
- Critical Service Routes
- Other High Traffic Routes

Arkansas Primary Highway Network

Level	Miles	Traffic
National Highway System	20%	66%
Other Arterials	24%	21%
Critical Service Routes	3%	2%
Other High Traffic Routes	1%	1%
Totals	48%	90%

Other Programs & Activities

State Aid Programs for Cities and Counties

Game & Fish Roads

State Park Roads

Institutional Roads

Airport Access Roads

Arkansas Recreational Trails

Public Transportation Programs

Transportation Alternatives Program

Other Programs & Activities

Arkansas Commercial Truck Safety and Education Program

Adopt-A-Highway Program

Litter Hotline

Research Grants to State Universities

Wildflower Program

Historic Bridge Program

Welcome Centers & Rest Areas

Wildflower Program

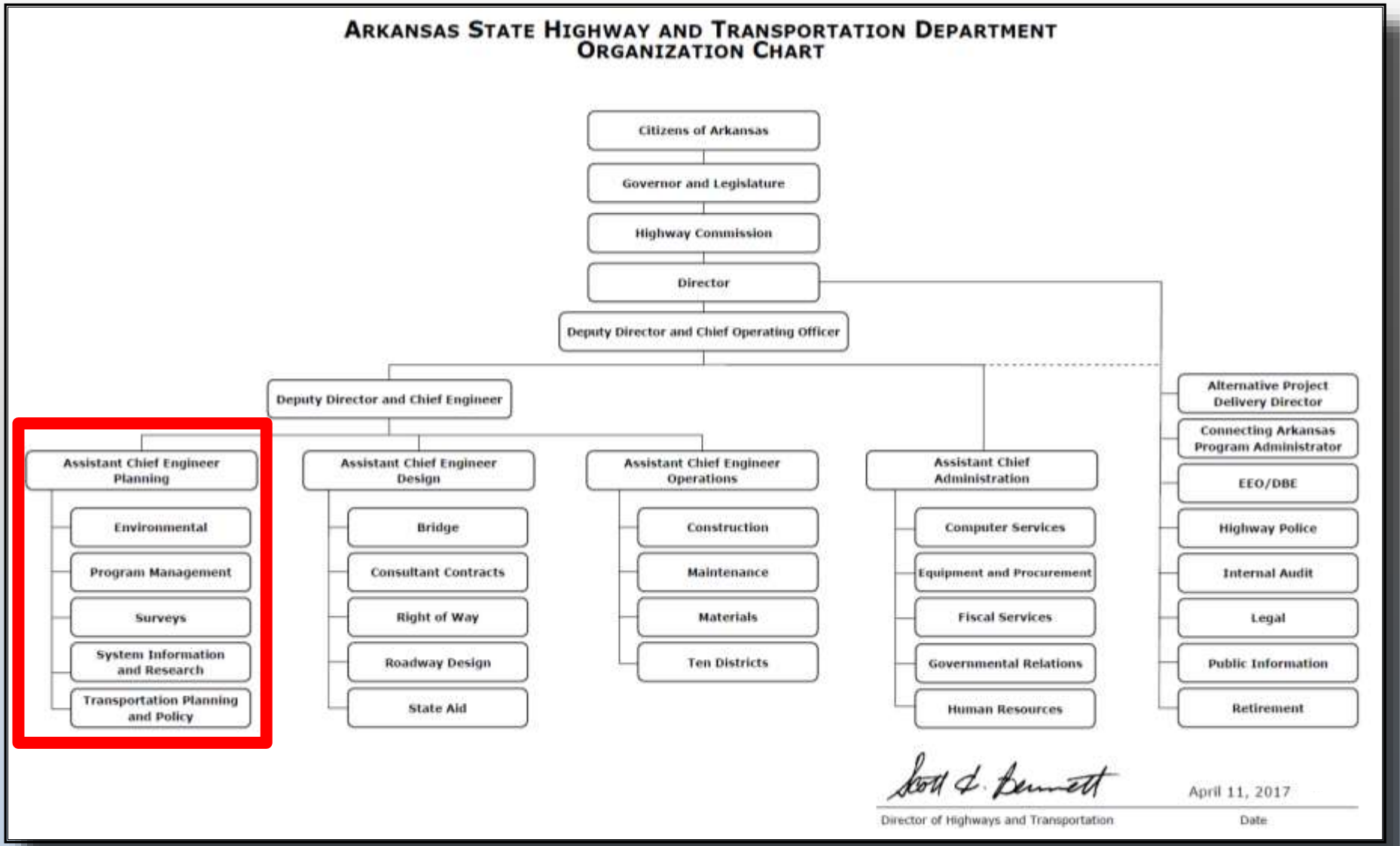
Historic Bridge Program

Welcome Centers & Rest Areas

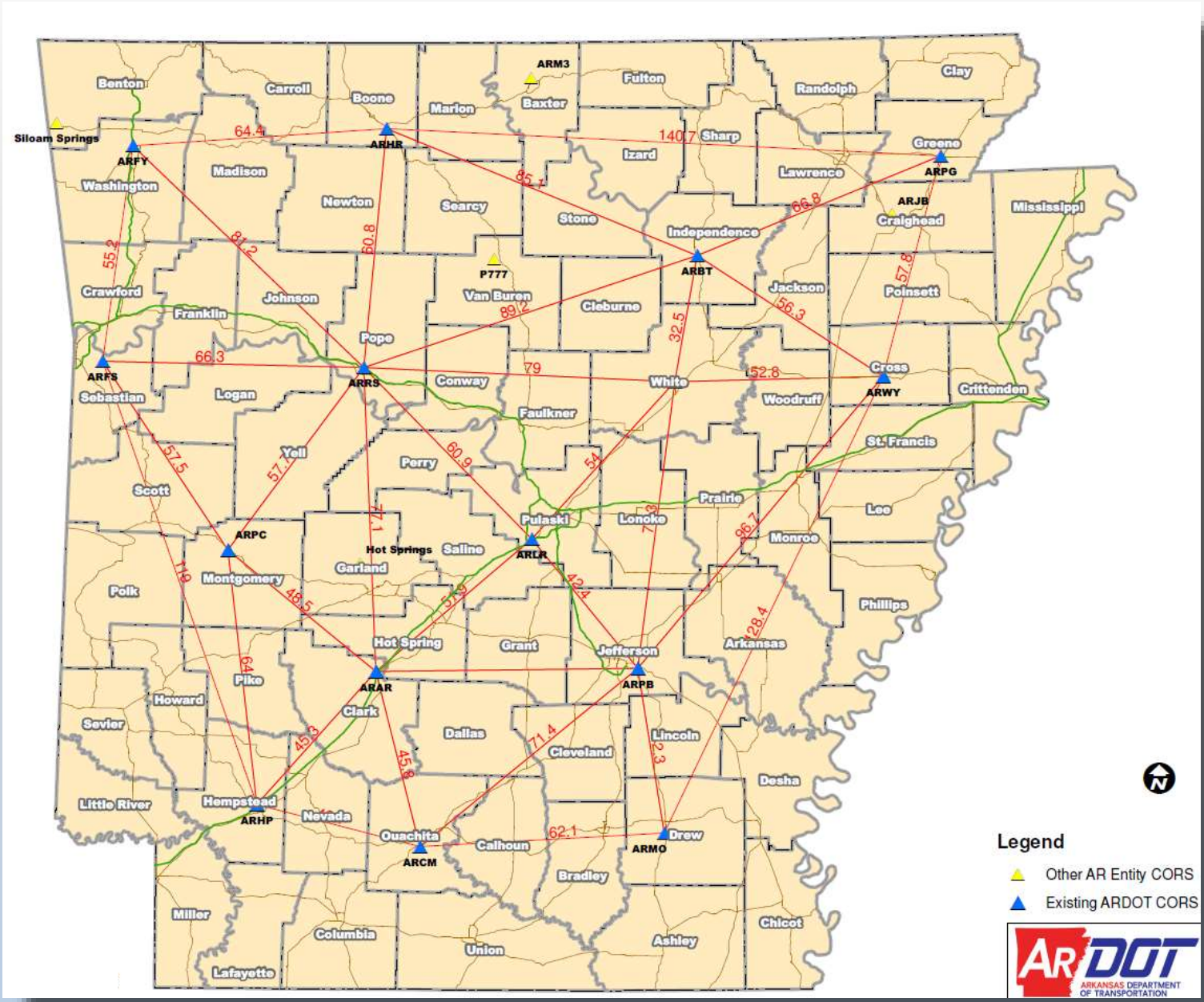
Planning

Kevin Thornton
Assistant Chief Engineer – Planning

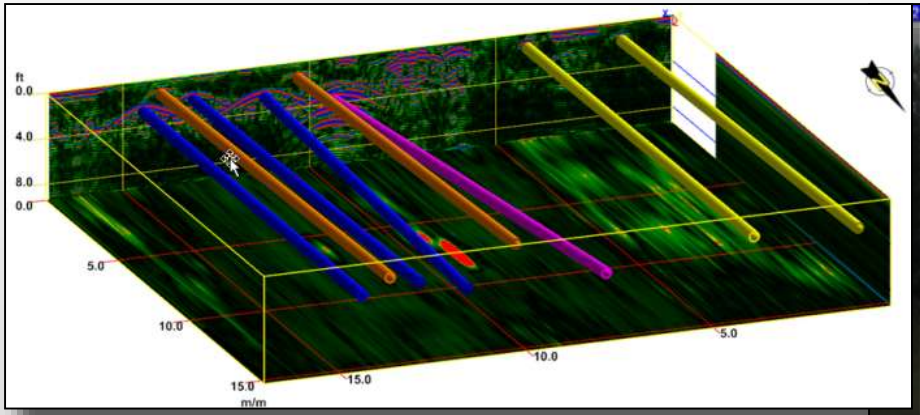
Organization Chart

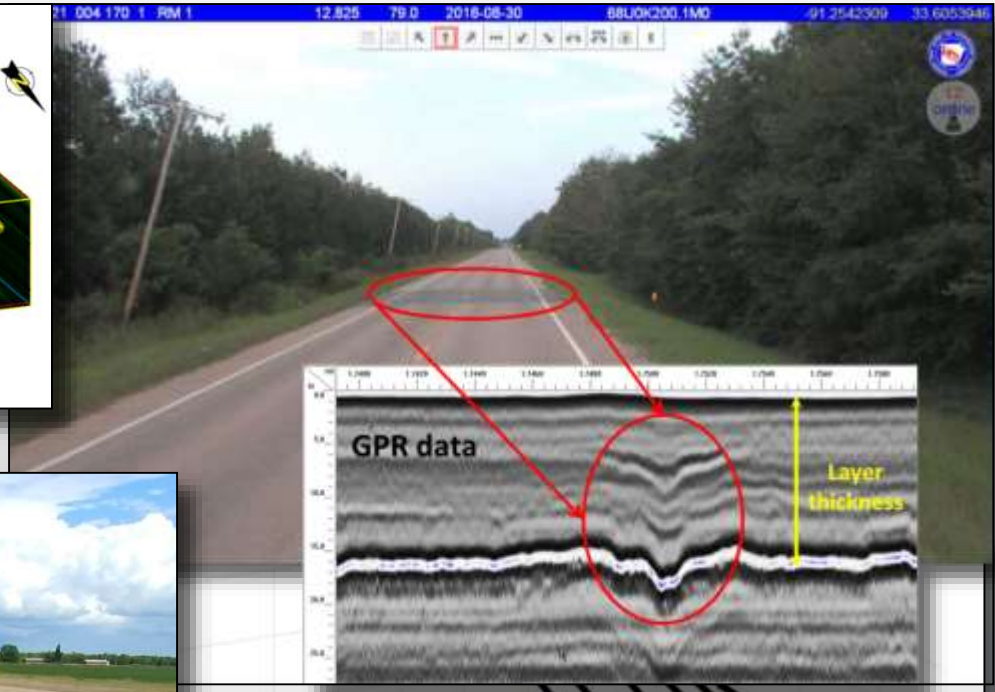


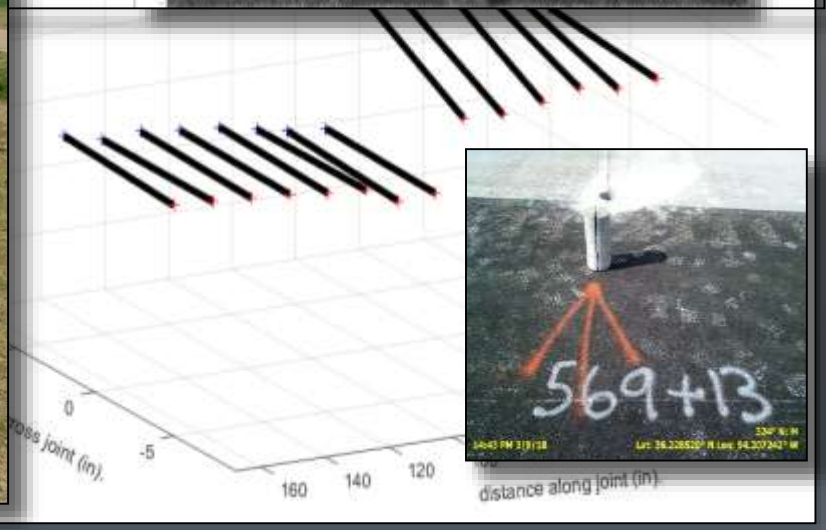
Global Navigation Satellite System



Ground Penetrating Radar (GPR)



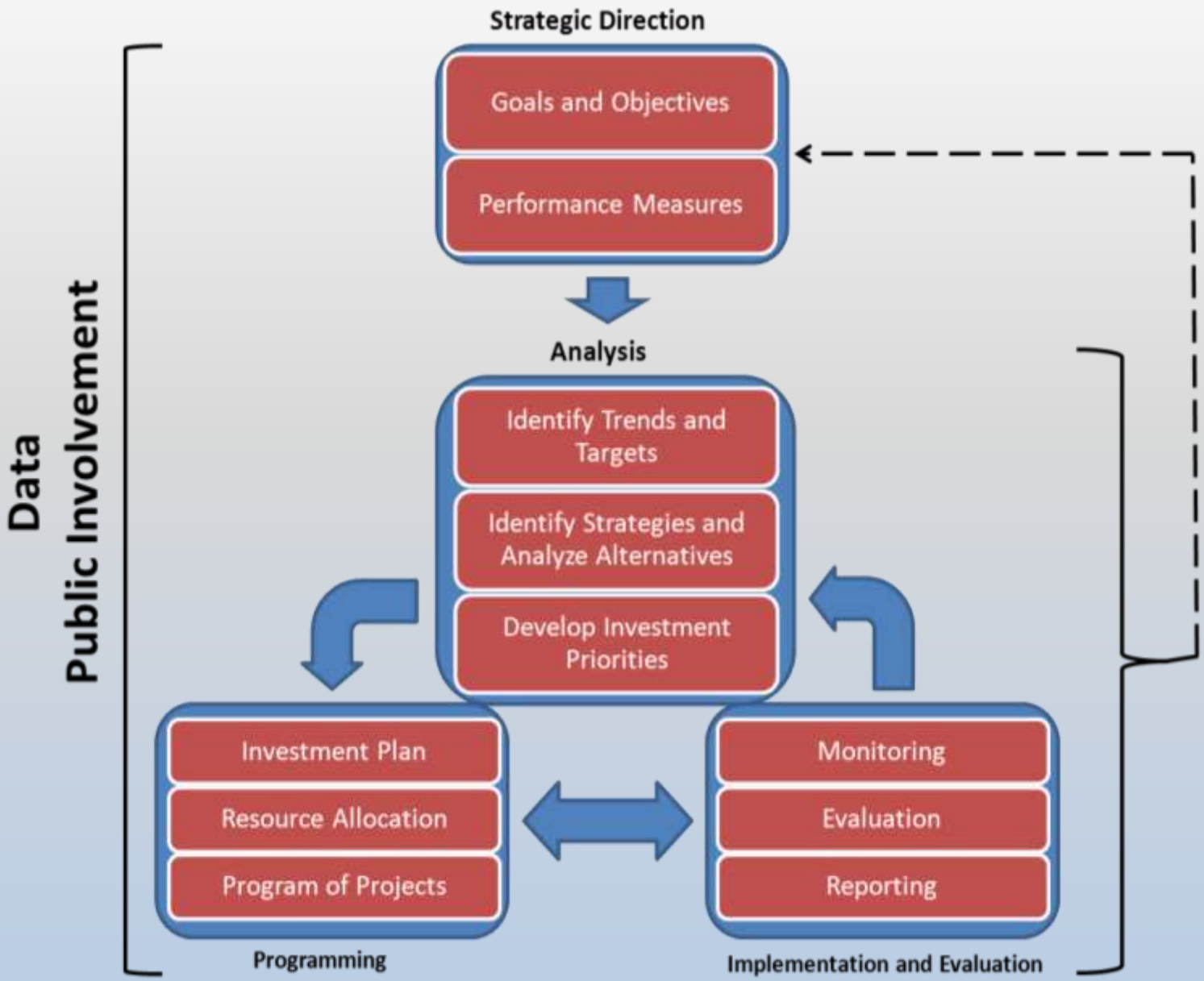




Falling Weight Deflectometer (FWD)

Improvements in Pavement Smoothness

Performance Based Planning and Programming



Performance Measures

National Performance Areas

Infrastructure Condition

Congestion Reduction

System Reliability

Freight Movement and Economic Vitality

Environmental Sustainability

Reduced Project Delivery Delays

Safety

Infrastructure Condition

- Percent of **National Highway System Bridges** classified in **Good** and **Poor** Condition

- Percent of Pavements of the **Interstate System** in **Good** and **Poor** Condition

- Percent of Pavements of the **Non-Interstate National Highway System** in **Good** and **Poor** Condition

Congestion Reduction, System Reliability, Freight Movement and Economic Vitality, and Environmental Sustainability

Statewide Area

- Percent of the Interstate System providing Reliable Travel
- Percent of the non-Interstate NHS providing Reliable Travel
- Percent of Interstate System providing for Reliable Truck Travel Time
- Percent of Interstate Mileage Uncongested

West Memphis Area

- Percent of the Interstate System where peak hour travel times meet expectations
- Annual Hours of Excessive Delay per Capita
- Total Tons of emissions reduced from CMAQ projects

Safety

- Number and Rate of Fatalities
- Number and Rate of Serious Injuries
- Number of Non-motorized Fatalities and Serious Injuries

TOWARD ZERO DEATHS

One is too many.

Safety


ARKANSAS 2017
STRATEGIC HIGHWAY
SAFETY PLAN
ARDOT
TOWARD ZERO DEATHS
5


WRONG
WAY

Safety


AR DOT
ARKANSAS DEPARTMENT
OF TRANSPORTATION
Statewide Programs
Promises Made
Promises Kept

Promises


Pave the Way
Rebuilding Arkansas Interstates


INTERSTATE
REHABILITATION
PROGRAM
IRP


CONNECTING
ARKANSAS
PROGRAM
CAP


VOTER
APPROVED

1999 Interstate Rehabilitation Program

50 Projects

356 Miles

$973 Million

Prior to Program

63% Poor or Mediocre

After Program

72% Good

2011 Interstate Rehabilitation Program

Completed
45 Projects
290 Miles
$997 Million

Under Construction
6 Projects
33 Miles
$264 Million

Scheduled
28 Projects
171 Miles
$261 Million

2012 Connecting Arkansas Program

Completed

11 Projects

61 Miles

$432 Million

Under Construction

8 Projects

40 Miles

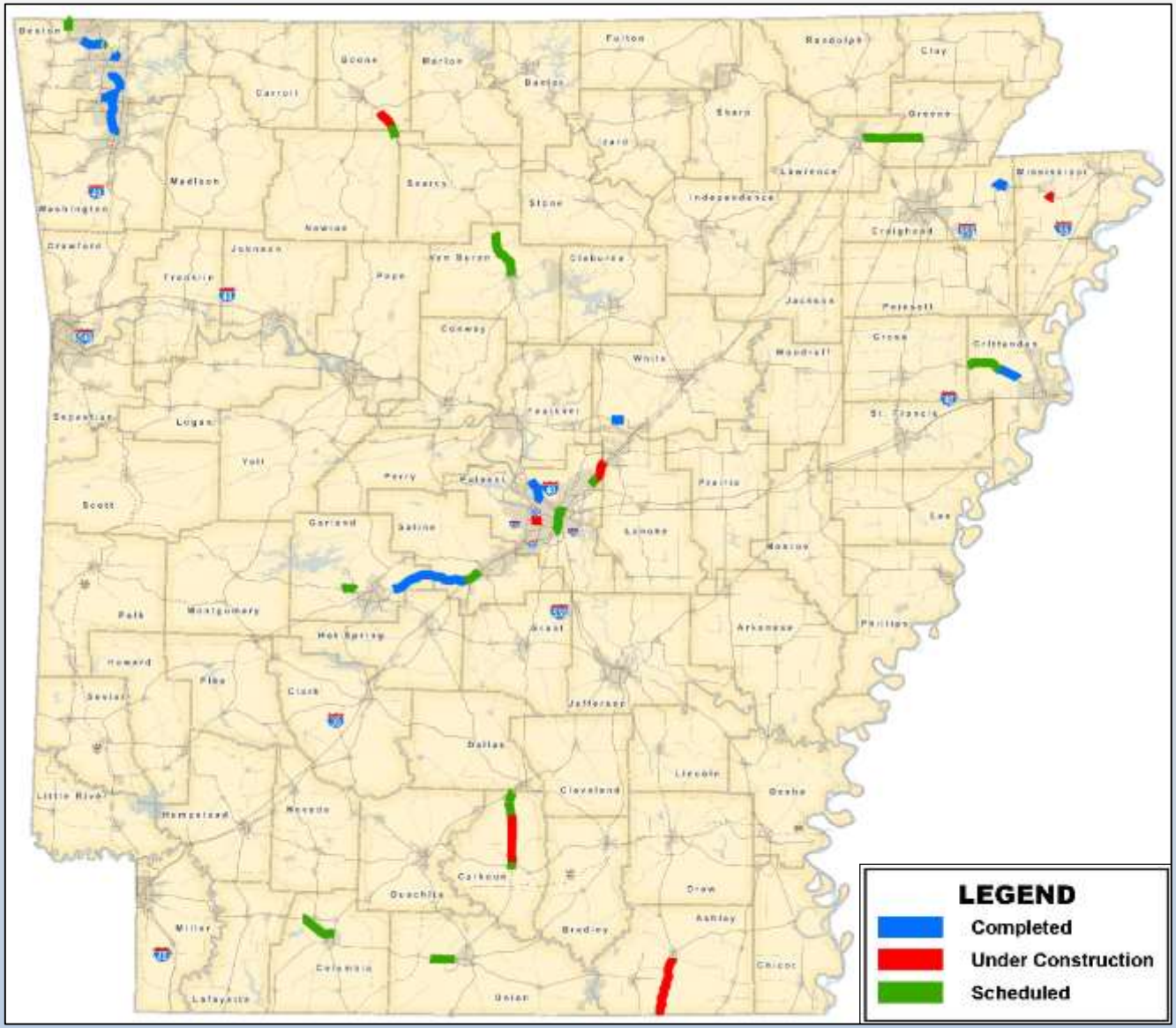
$347 Million

Scheduled

17 Projects

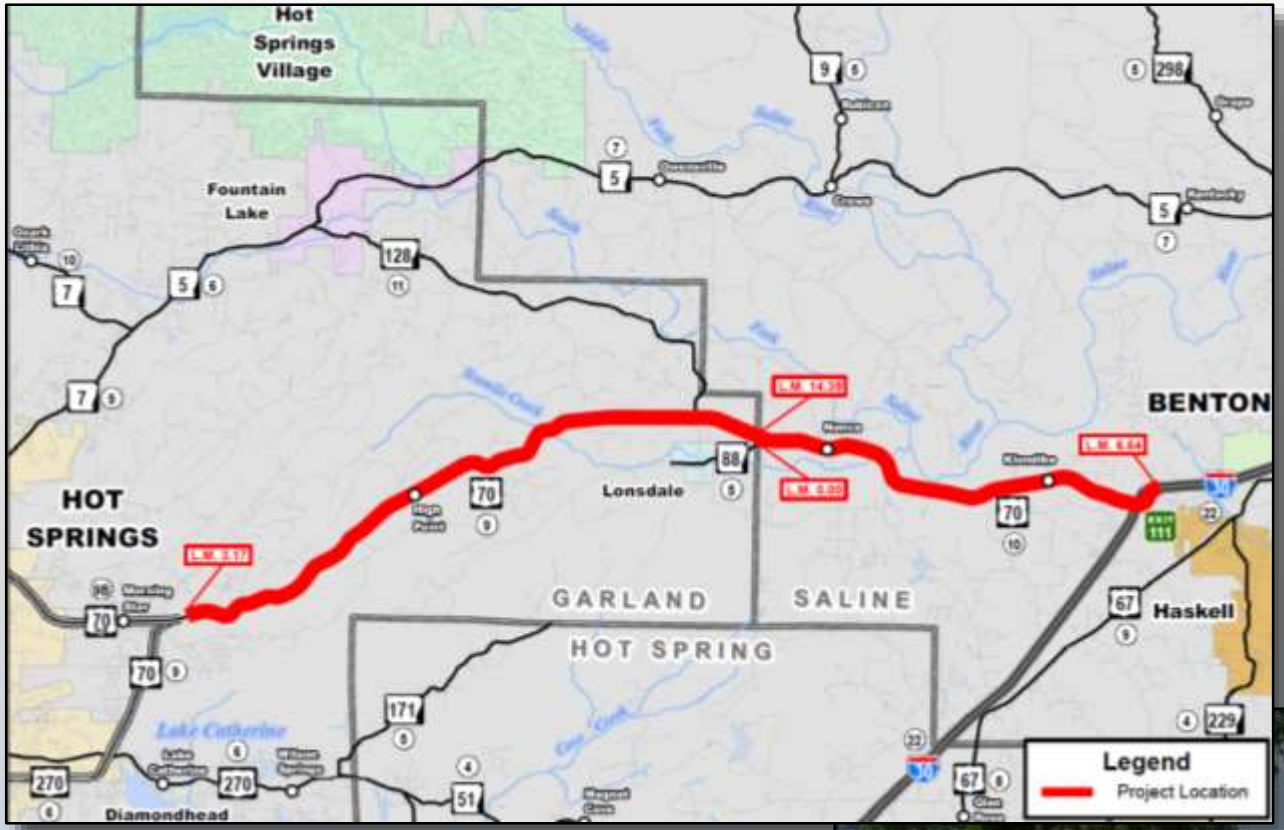
85 Miles

$1.2 Billion




AR DOT
ARKANSAS DEPARTMENT
OF TRANSPORTATION
Projects

2012 Connecting Arkansas Program

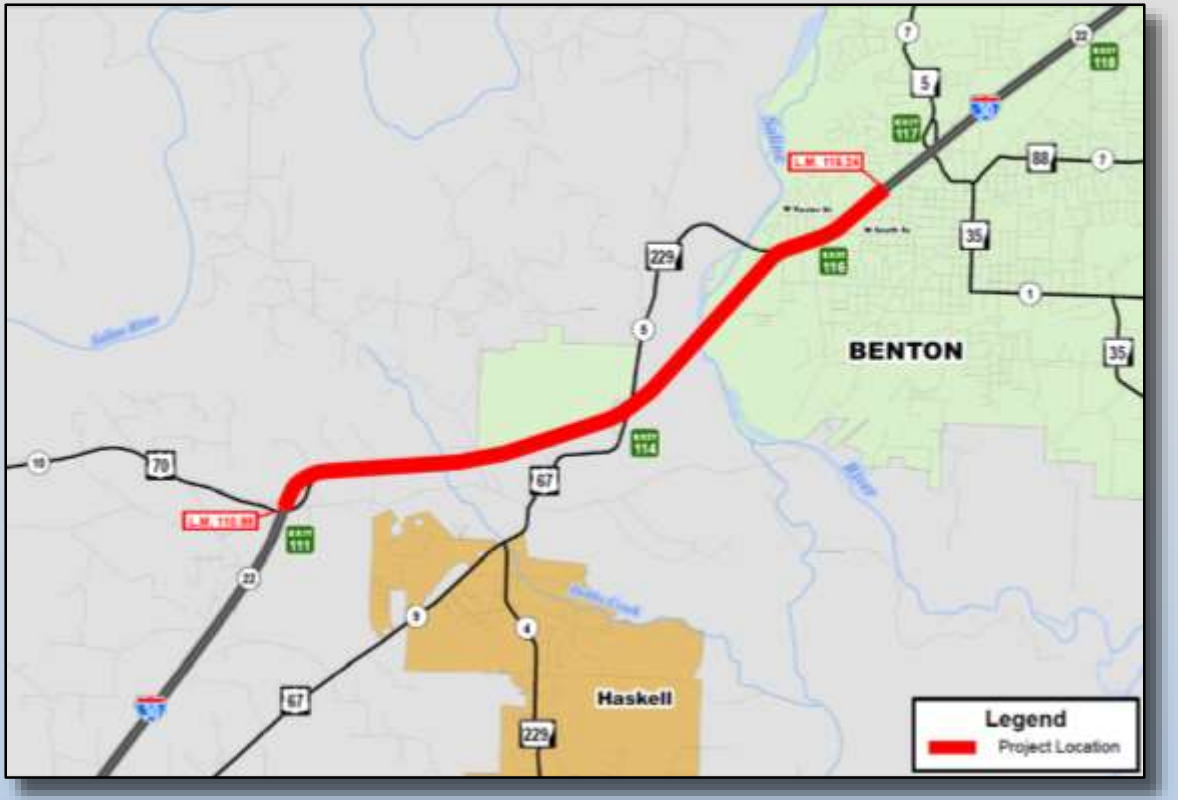


CONNECTING ARKANSAS PROGRAM

CAP

2012 Connecting Arkansas Program

- **Highway 70 to Sevier Street (Widening)**
  - ✓ Length: 6 Miles
  - ✓ Estimate: $150 - $175 Million
  - ✓ Currently Advertised for January 2019 Letting



CONNECTING ARKANSAS PROGRAM
CAP

Alternative Delivery

- ***Definition***
- ***Methods***
  - ✓ Design-Build
  - ✓ Public Private Partnerships (PPP)
  - ✓ Construction Manager/General Contractor

First Design-Build Project

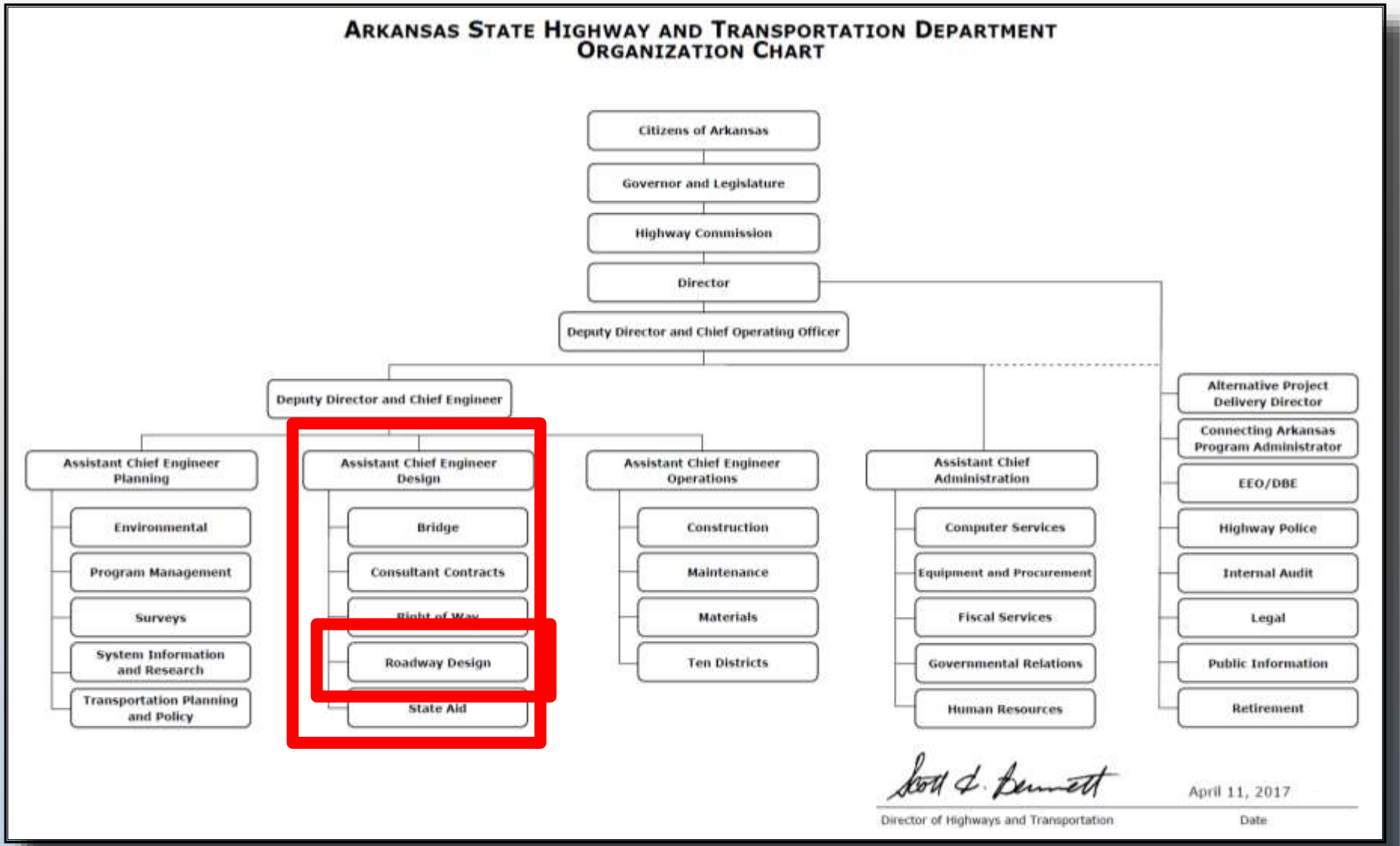
30 CROSSING

CONNECTING ARKANSAS PROGRAM CAP

Roadway Design

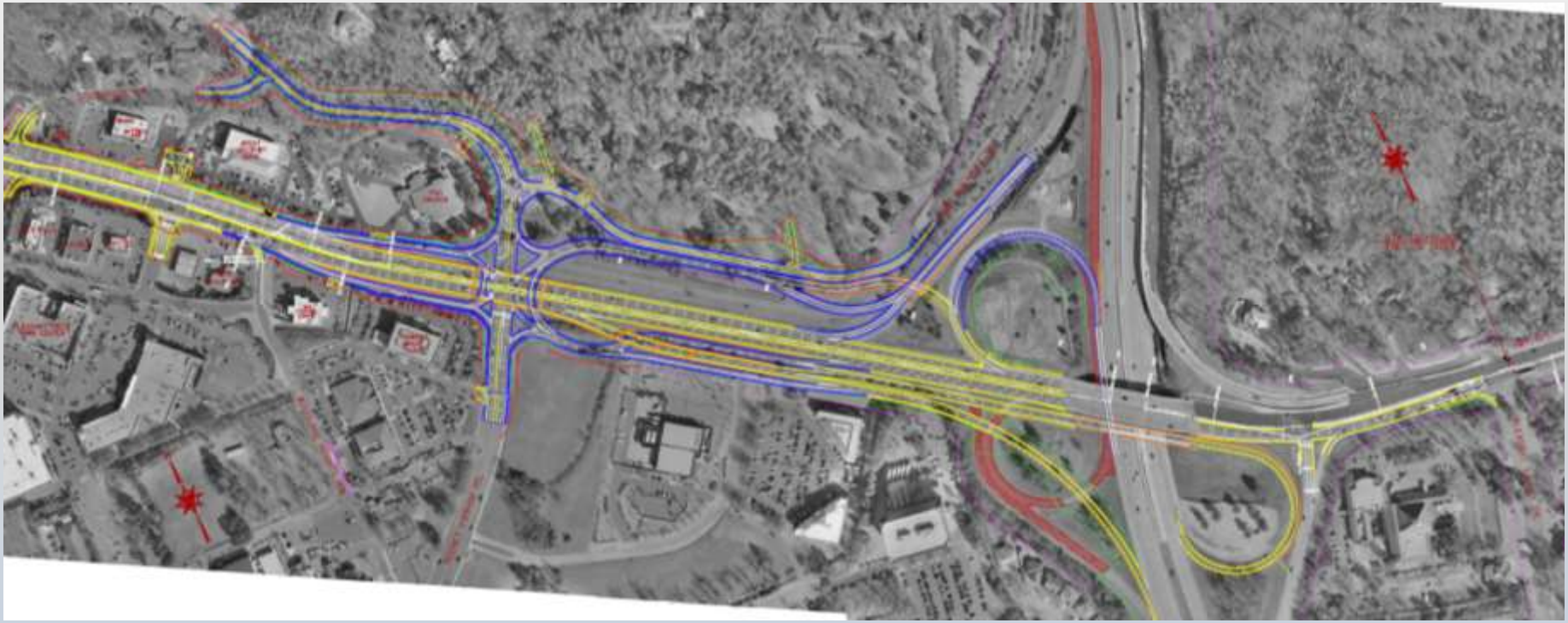
Trinity Smith
Engineer of Roadway Division

Organization Chart



Construction Manager/General Contractor

Job 061331: Sam Peck Rd. – Pleasant Valley Dr. (L.R.) (P.E.)



Construction Manager/General Contractor

SPUI: Single Point Urban Interchange

ROADWAY DESIGN

Total Employees – 32
Total Engineers – 27 (15 PE)

Sections

Hydraulics
Preliminary Engineering
Primary Design
Urban Design
Traffic Engineering
General / Estimating

ROADWAY DESIGN

DESIGN

- Geometric and Pavement Design
- Hydraulic Analysis for Bridges, Culverts, Storm Drains, and Open Channel Flow
- Design, Plan Preparation, and Traffic Signal Plans
- Proposed Right of Way
- Maintenance of Traffic, Permanent Striping, and Temporary Erosion Control Plans
- Cost Estimates and Construction Time

Intersection Control

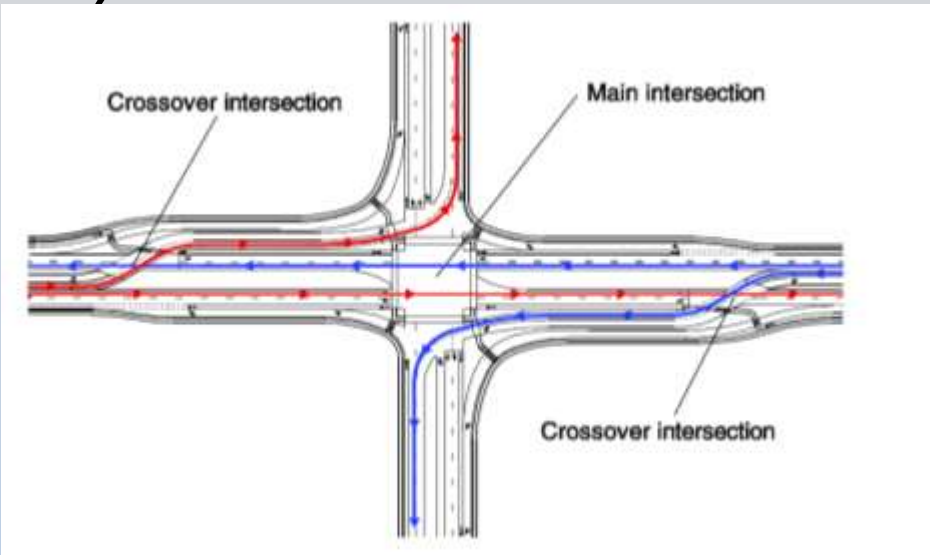
Roundabouts:

- ✓ 8 Existing
- ✓ >10 within design process
- ✓ >8 Proposed/Study

Highway 286, Conway (Google Earth, 3/1/2017)

Continuous Flow Intersection (CFI):

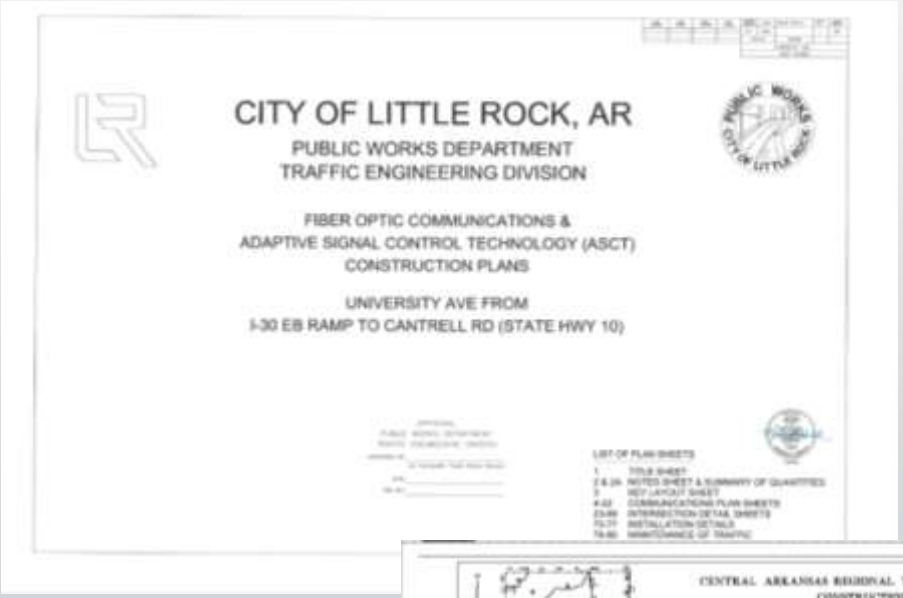
- ✓ 0 Existing



FHWA *Displaced Left Turn Intersection Information Guide, 2014*

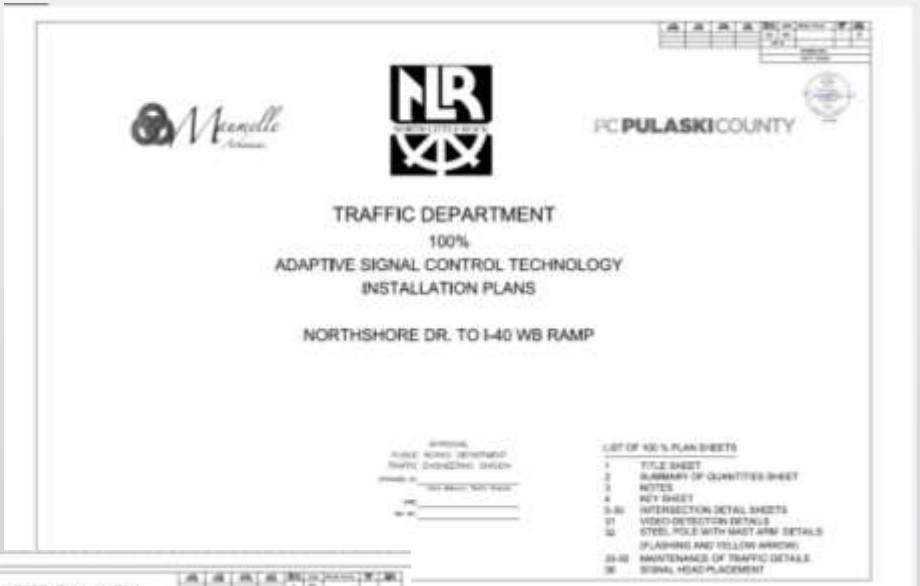
Intersection Control

Adaptive Signal Control:


CITY OF LITTLE ROCK, AR
PUBLIC WORKS DEPARTMENT
TRAFFIC ENGINEERING DIVISION

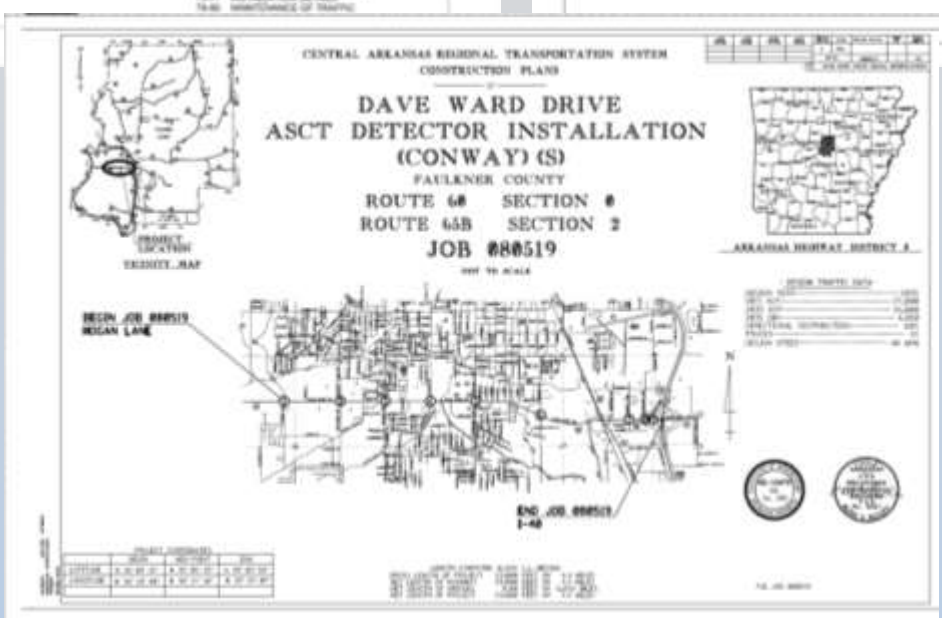
FIBER OPTIC COMMUNICATIONS &
ADAPTIVE SIGNAL CONTROL TECHNOLOGY (ASCT)
CONSTRUCTION PLANS

UNIVERSITY AVE FROM
I-30 EB RAMP TO CANTRELL RD (STATE HWY 10)


PULASKI COUNTY

TRAFFIC DEPARTMENT
100%
ADAPTIVE SIGNAL CONTROL TECHNOLOGY
INSTALLATION PLANS

NORTHSHORE DR. TO I-40 WB RAMP


CENTRAL ARKANSAS REGIONAL TRANSPORTATION SYSTEM
CONSTRUCTION PLANS

DAVE WARD DRIVE
ASCT DETECTOR INSTALLATION
(CONWAY) (S)
FAULKNER COUNTY
ROUTE 60 SECTION 0
ROUTE 65B SECTION 2
JOB 080519

Alternative Interchange Designs

SPUI:

- ✓ 0 Existing
- ✓ 1 Under Construction
- ✓ Multiple in the design process

Job BB0903, I-49/Highway 71B Interchange Bentonville/Rodgers

Diverging Diamond Interchange (DDI):

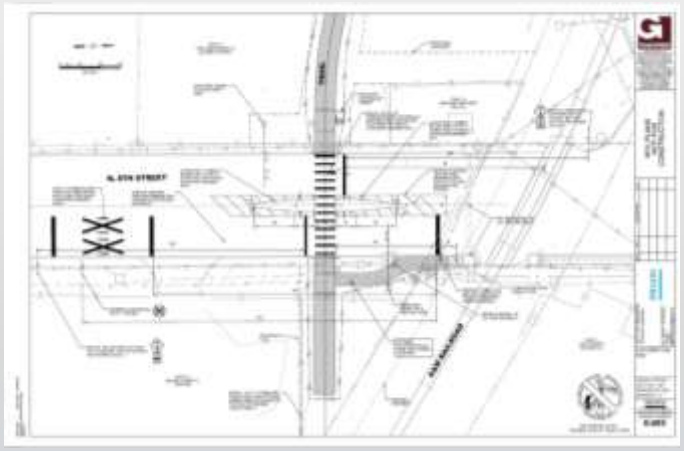
- ✓ 0 Existing

US Highway 60/Highway 13, Springfield, MO (Google Earth, 2/16/2017)

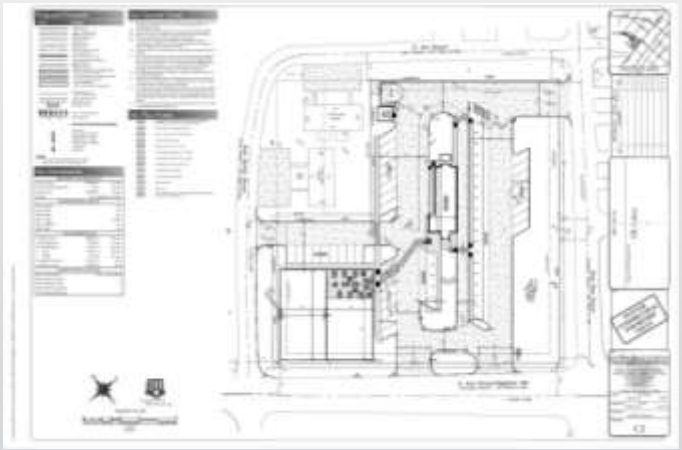
Reviews

Permit Reviews:

✓ Trail Crossings



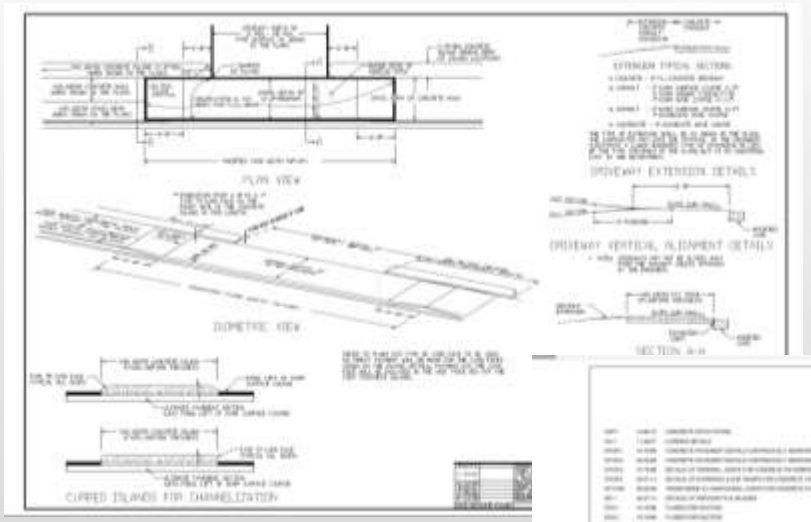
✓ Driveways & Drainage

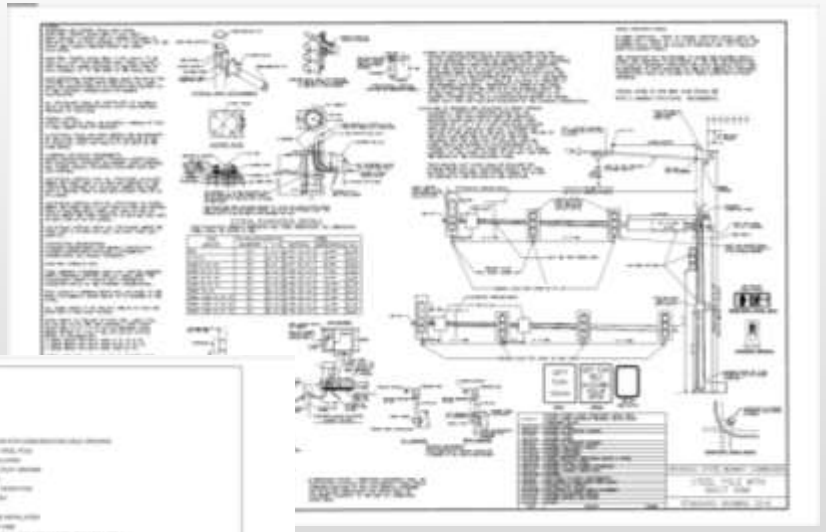


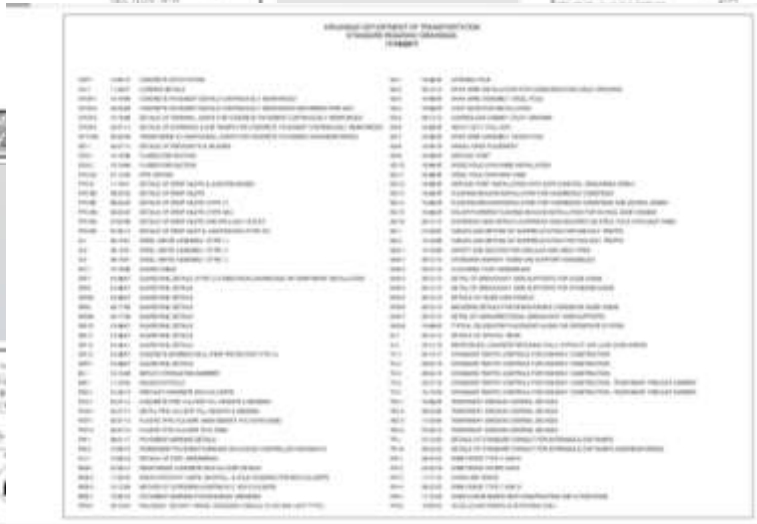
✓ Signal

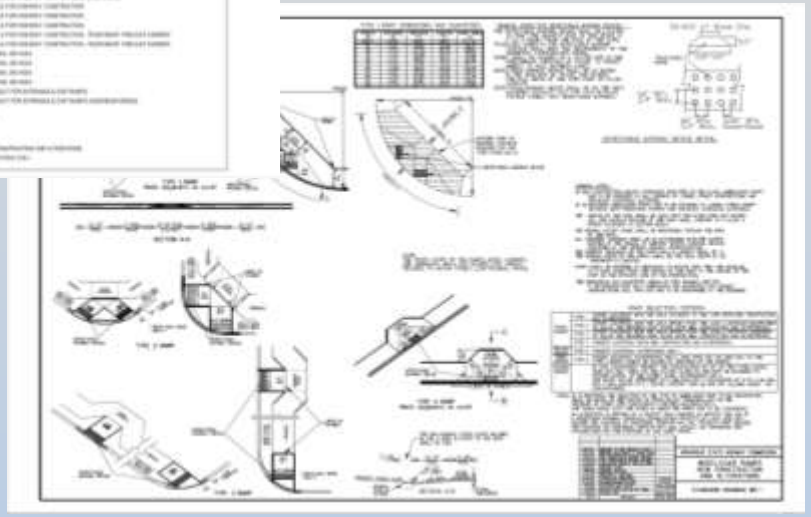
✓ Traffic Operations Studies

Roadway Standard Drawings



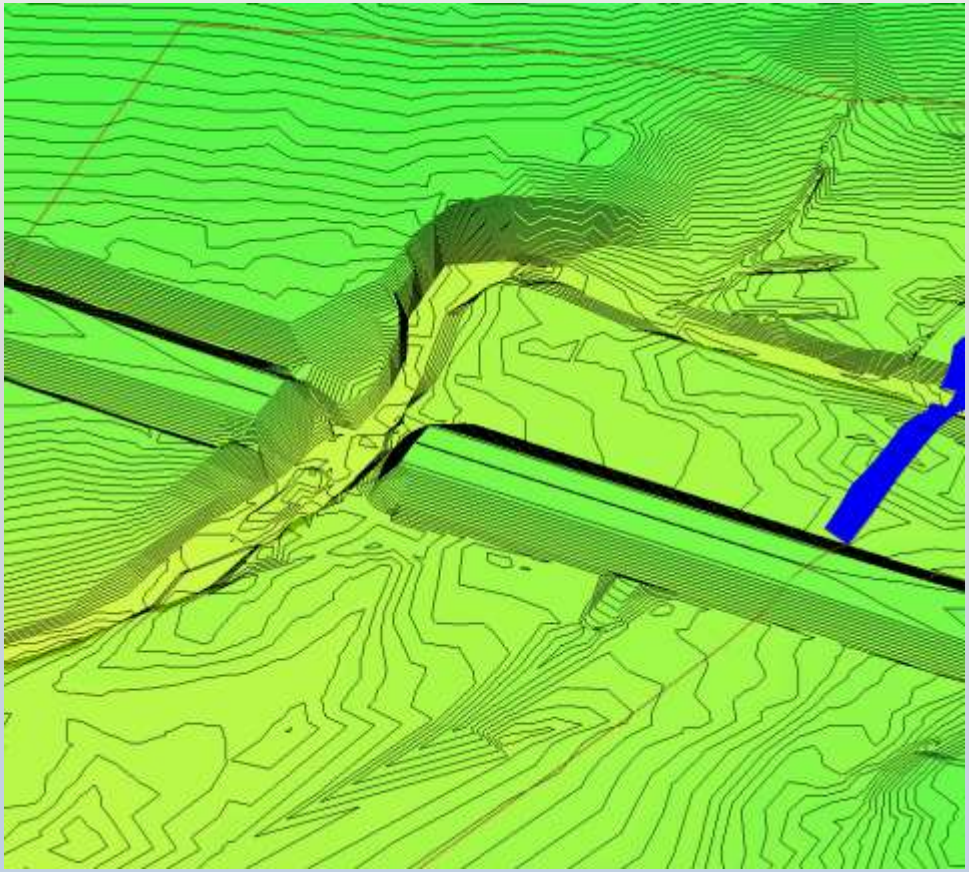






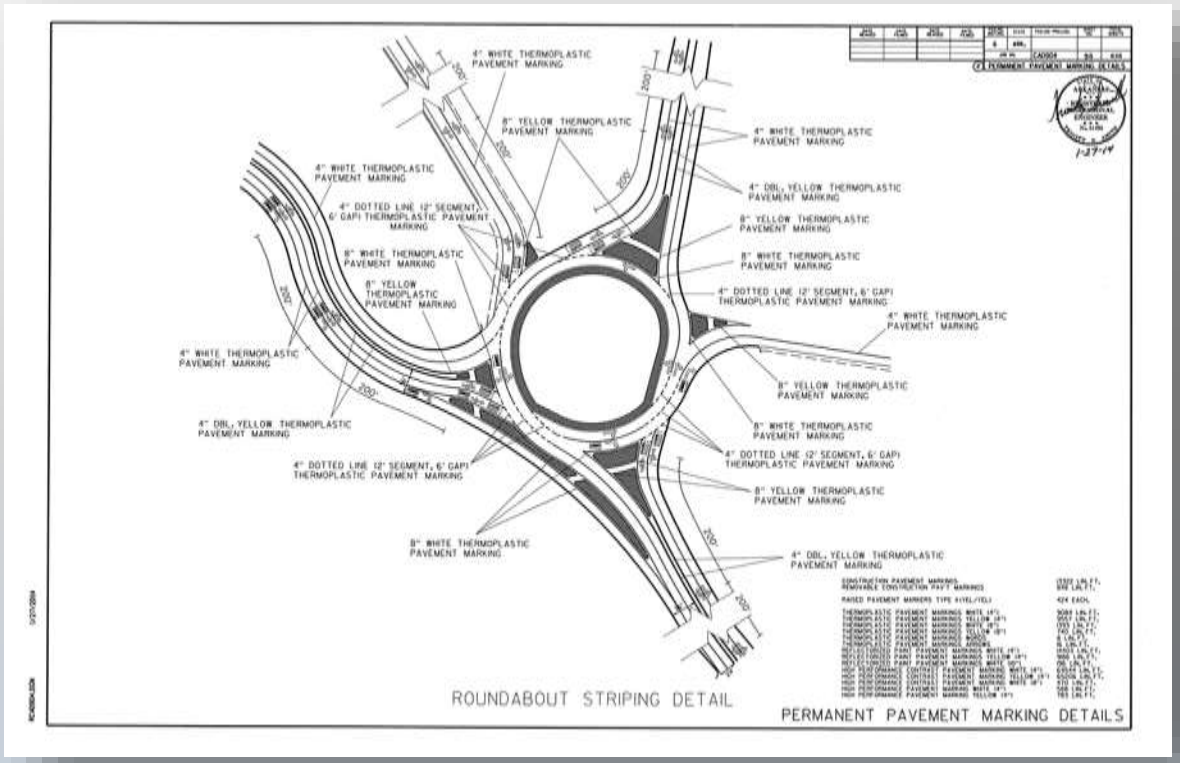
2-D Hydraulic Modeling with SMS

- 5 - projects completed through the design phase of plan development.
- 1 consultant project pending completion of the design.
- Currently developing the new coordination procedures with Roadway and Bridge designers.
- Reduced assumptions = fewer errors = better representation of what is happening on the ground.




Electronic Signatures
For Plans

Electronic Signatures for Plans

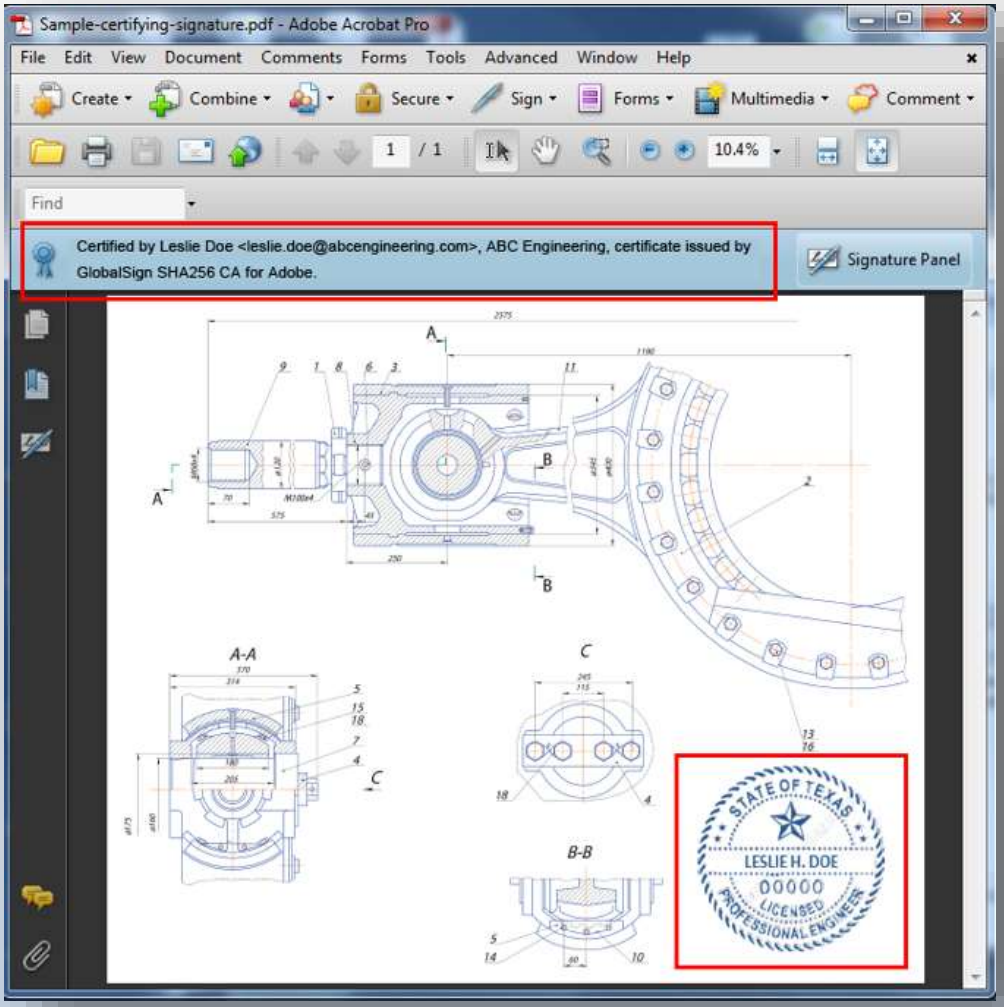


All engineering plans and details must be sealed by a Registered Professional Engineer

Electronic Signatures for Plans

Arkansas State Board of Licensure for Professional Engineers and Professional Surveyors amended the rules of the board to allow Electronic/Digital Signatures for sealing engineering documents.

Electronic Signatures for Plans

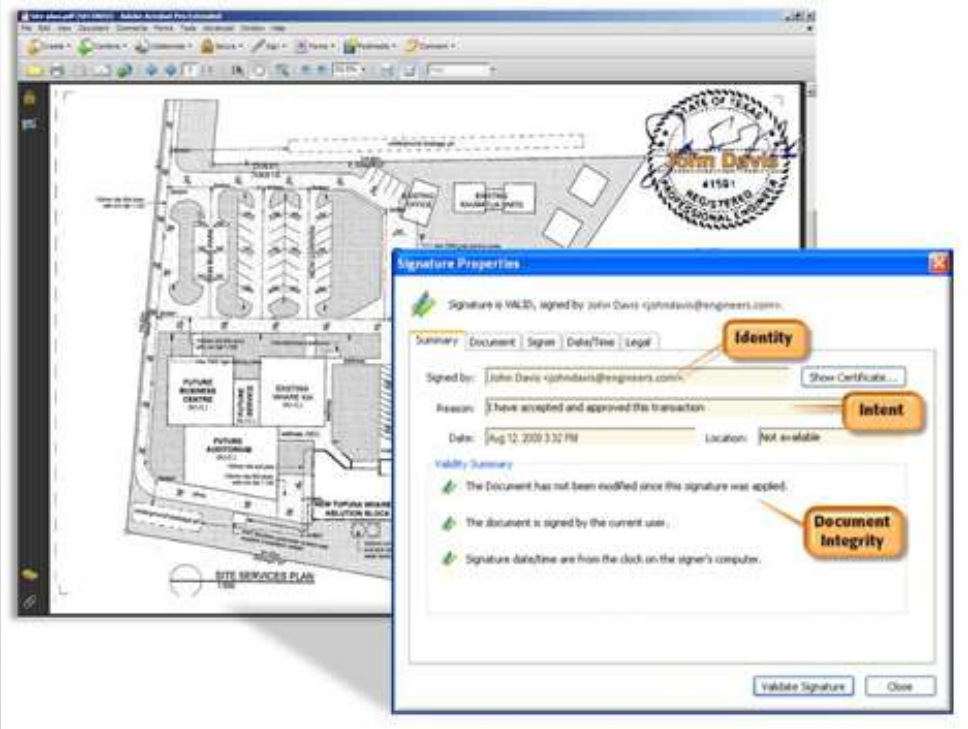


The Registered Professional Engineer electronically signs the PDF file. No paper documents are necessary.

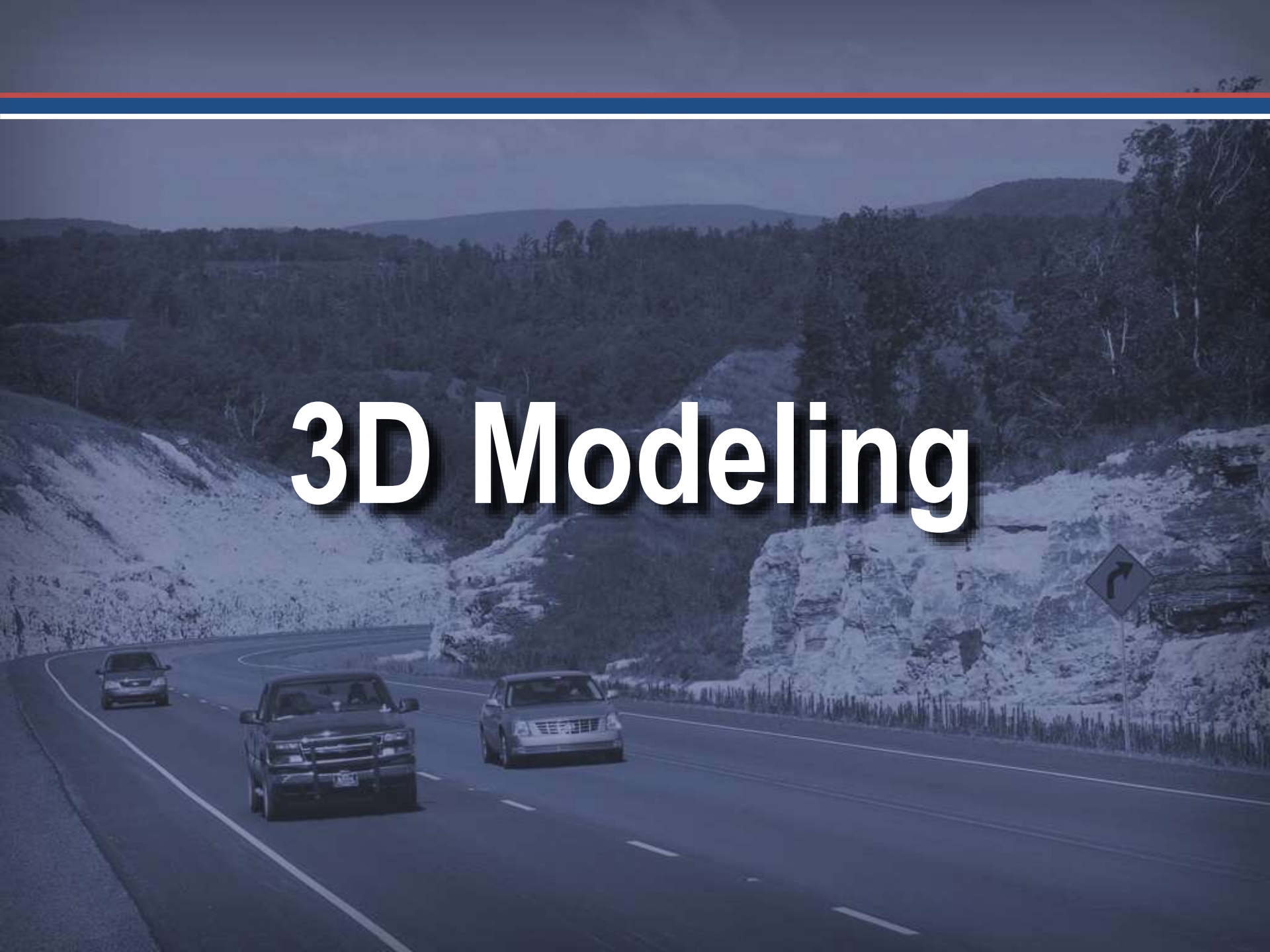
Electronic Signatures for Plans

Engineering Seals can be applied to documents electronically via mobile devices and transmitted to clients over the internet.

Electronic Signatures for Plans



After the PDF files are signed, they are locked for editing. They also contain metadata with information on when and where the document was signed.


3D Modeling

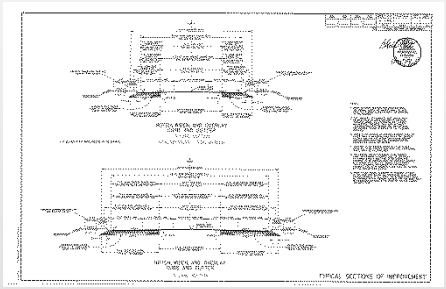
3D Modeling

3D model technology was invented decades ago.

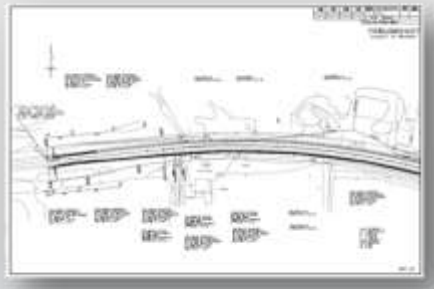
Ivan Sutherland using “Sketchpad” on the MIT TX-2 computer system in 1963.

3D Modeling

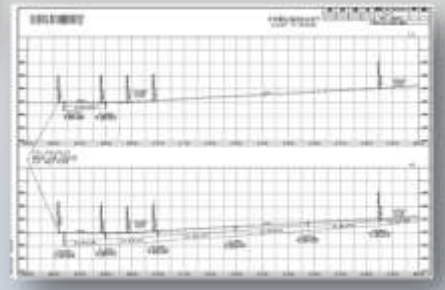
2D Plan Production Workflow



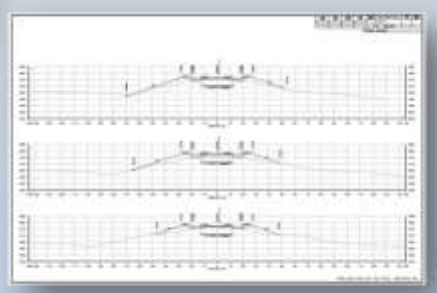
Typical Sections



Plans

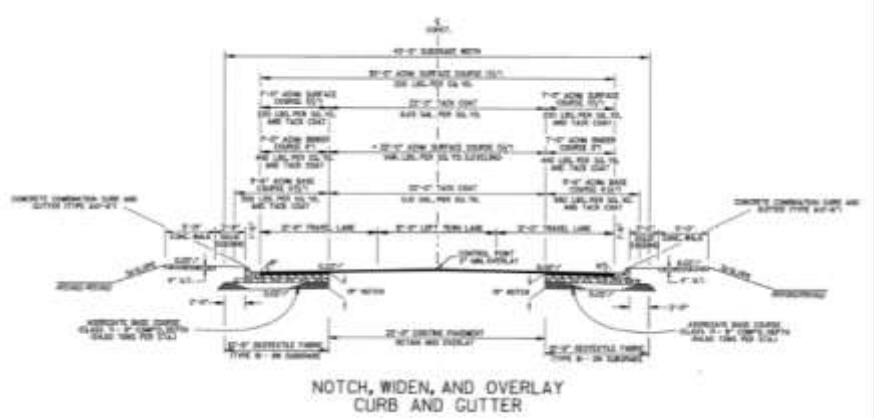


Profiles

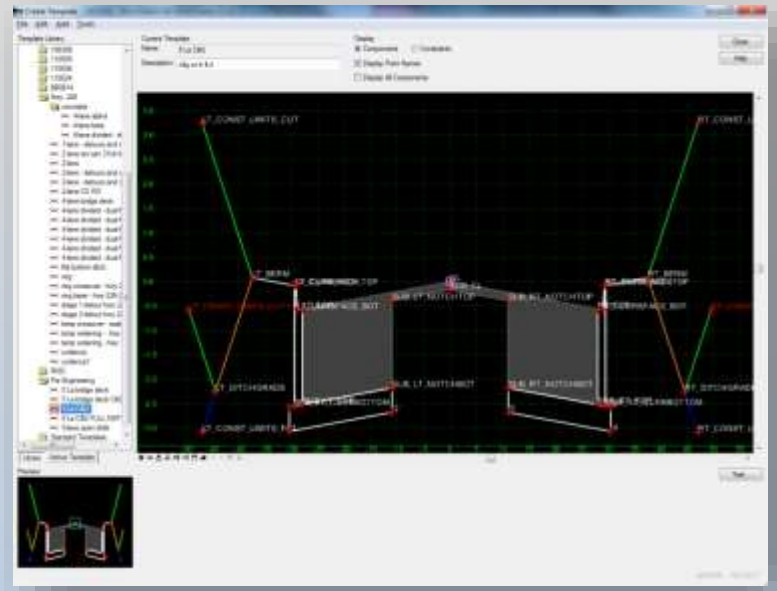


Cross Sections

3D Modeling

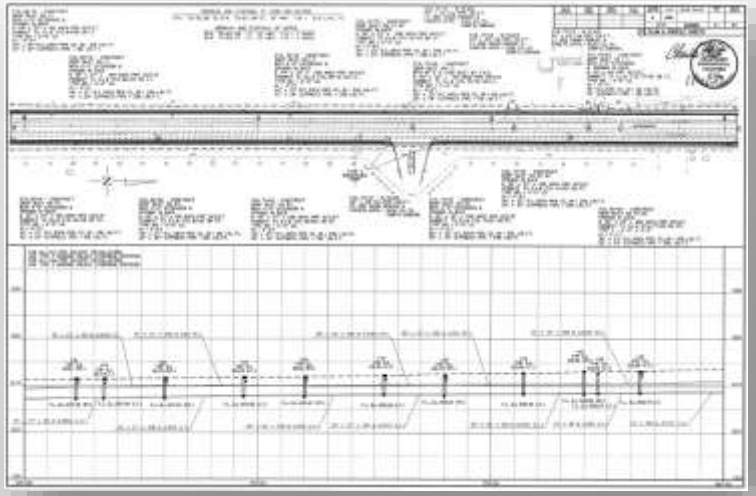


becomes

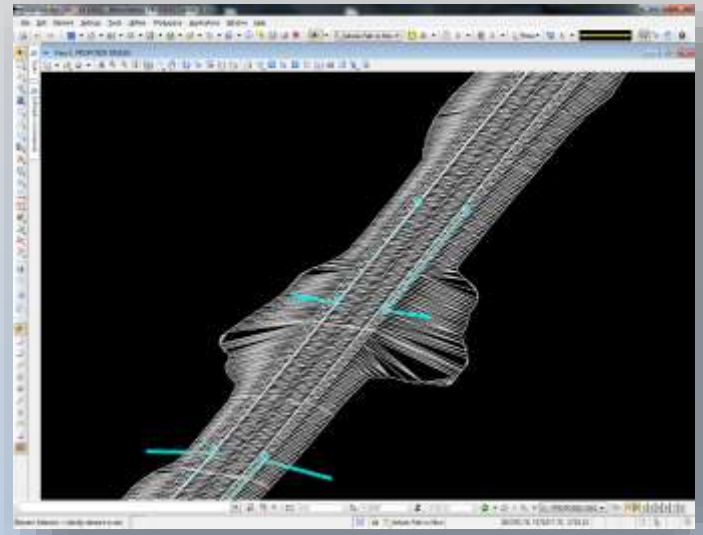


Digital creation of Typical Sections

3D Modeling

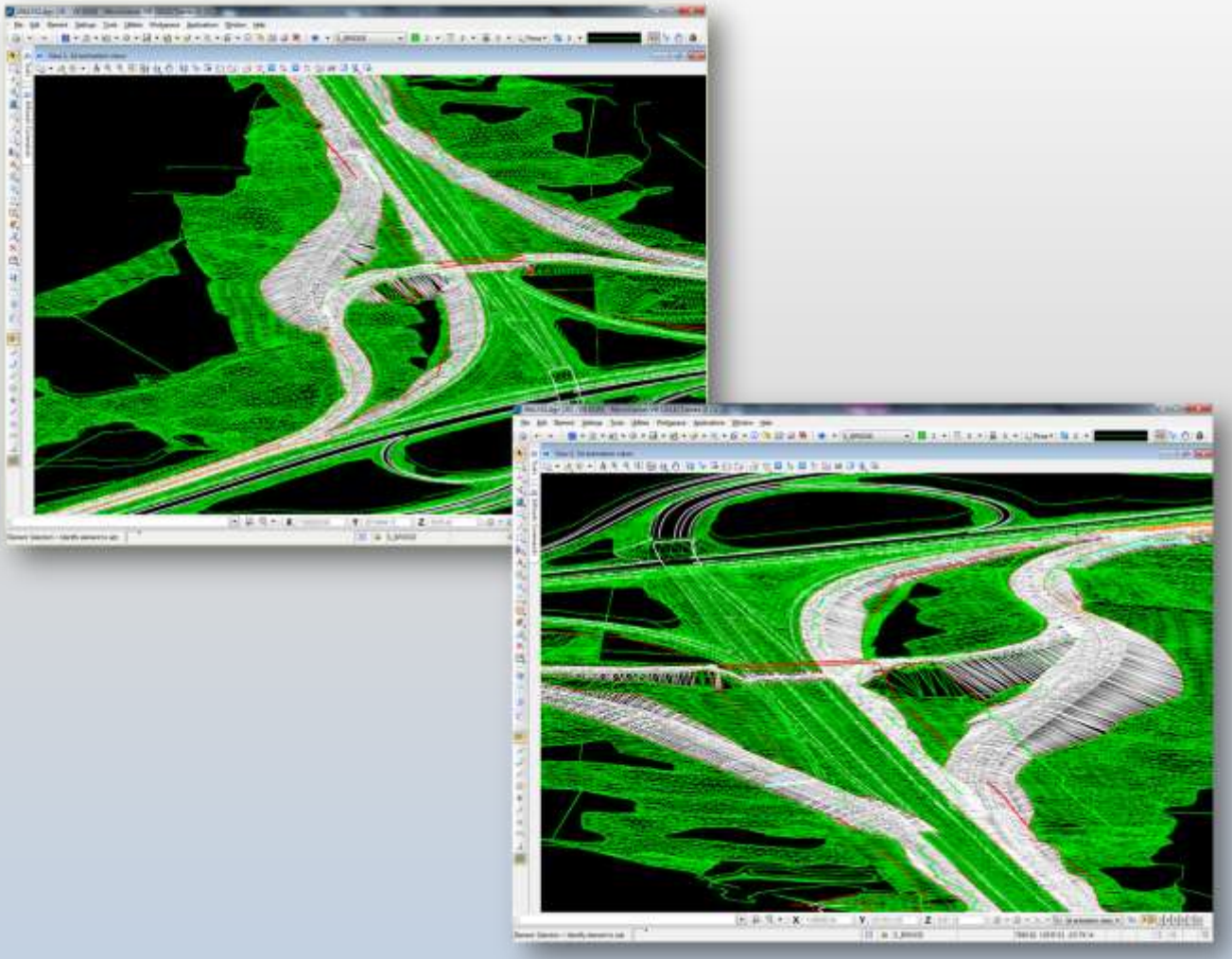


becomes



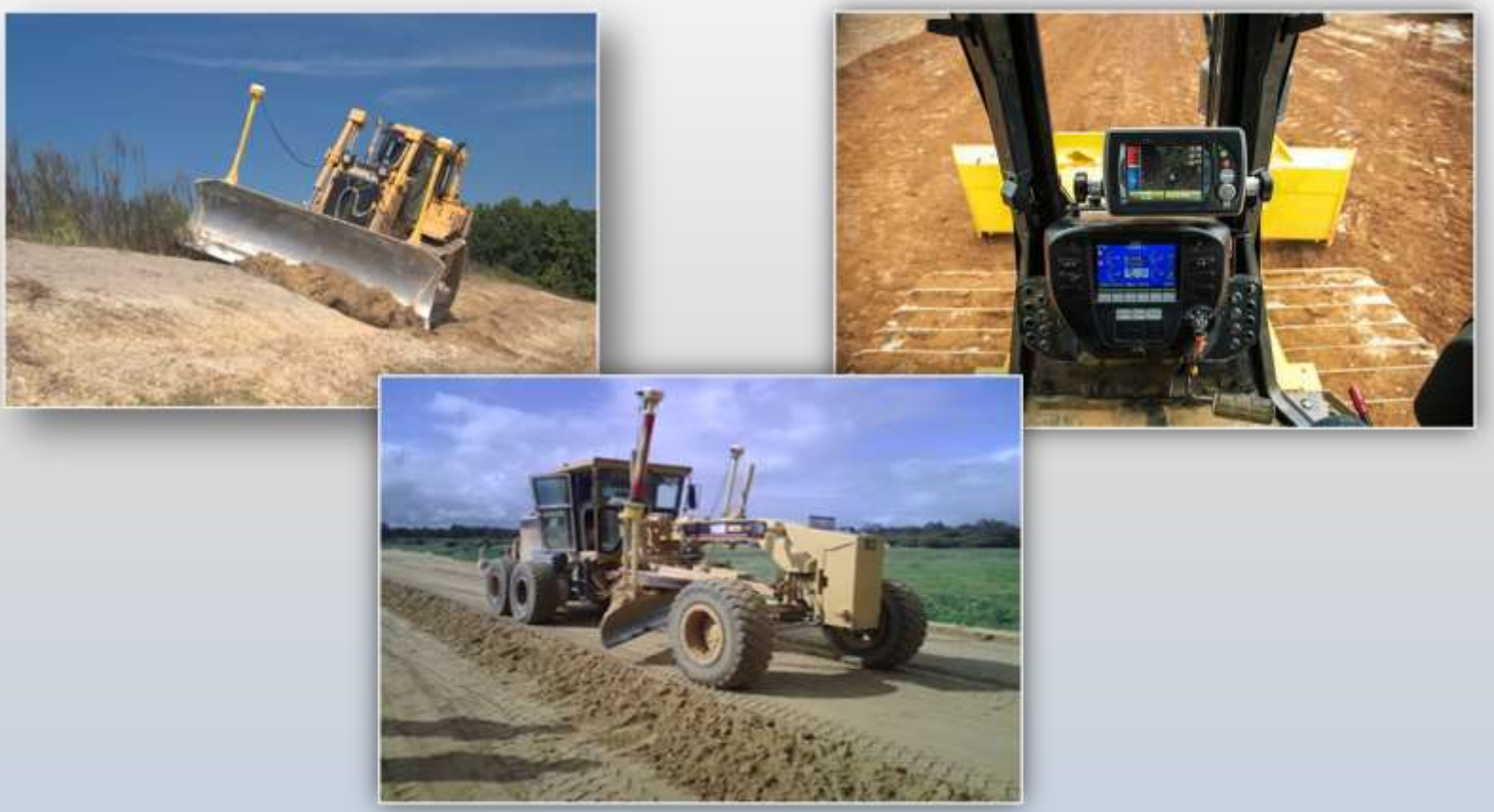
Digital creation of corridor

3D Modeling



Finished product of 3D models for Interchange improvements.

3D Modeling



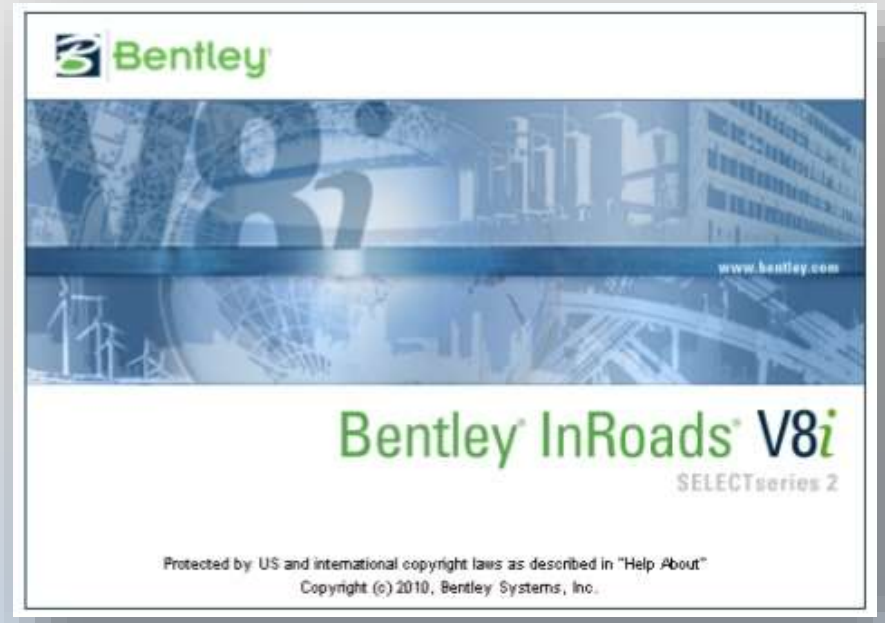
Advances in Automated Machine Guidance (AMG) created the demand for 3D engineered models with much greater amounts of detail than what had previously been needed.

3D Modeling

3D models can be used to created realistic renderings of designs.

3D Modeling

The Next Step…

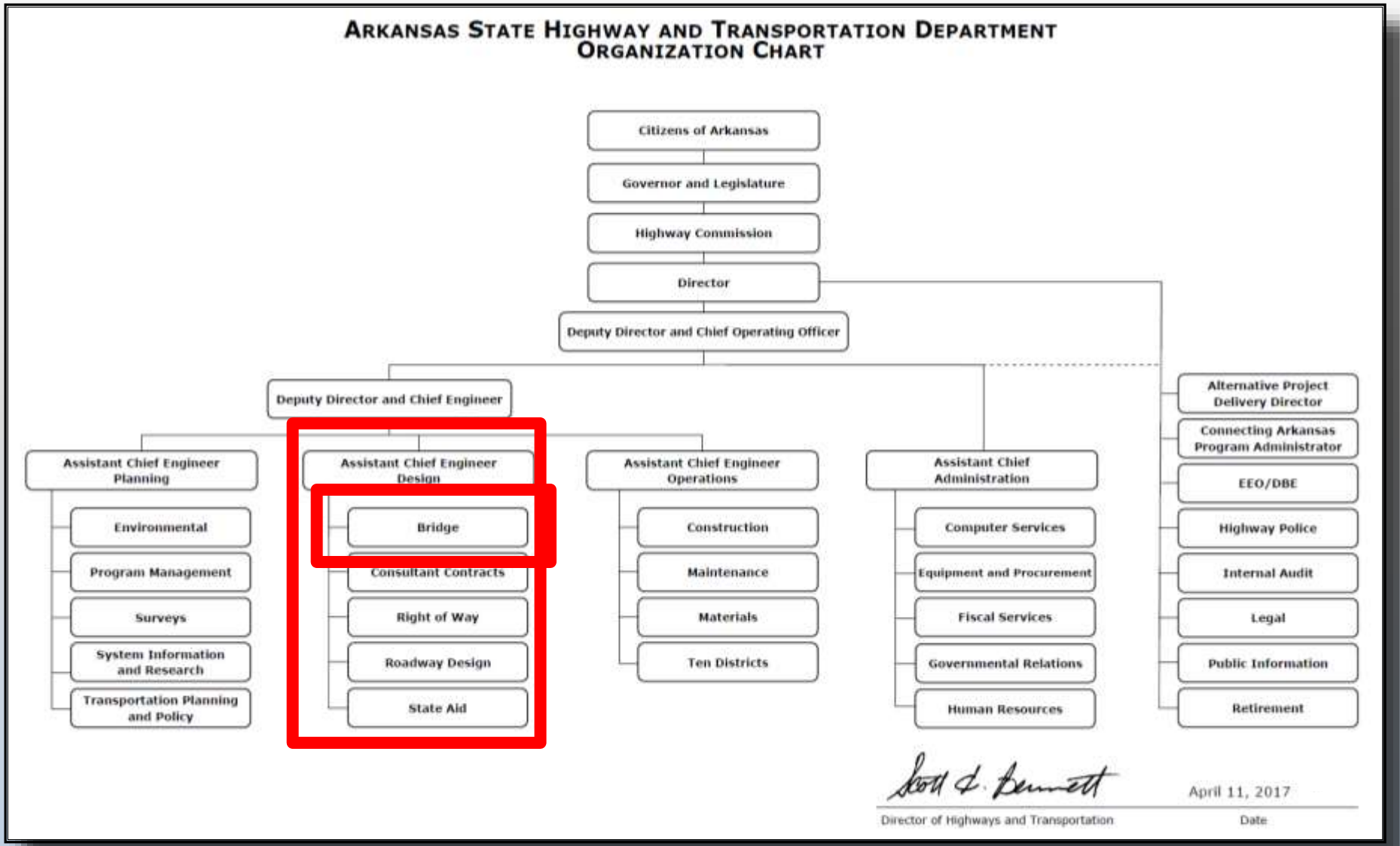


ARDOT is currently moving from Bentley's Inroads V8i SS2 to Bentley's OpenRoads

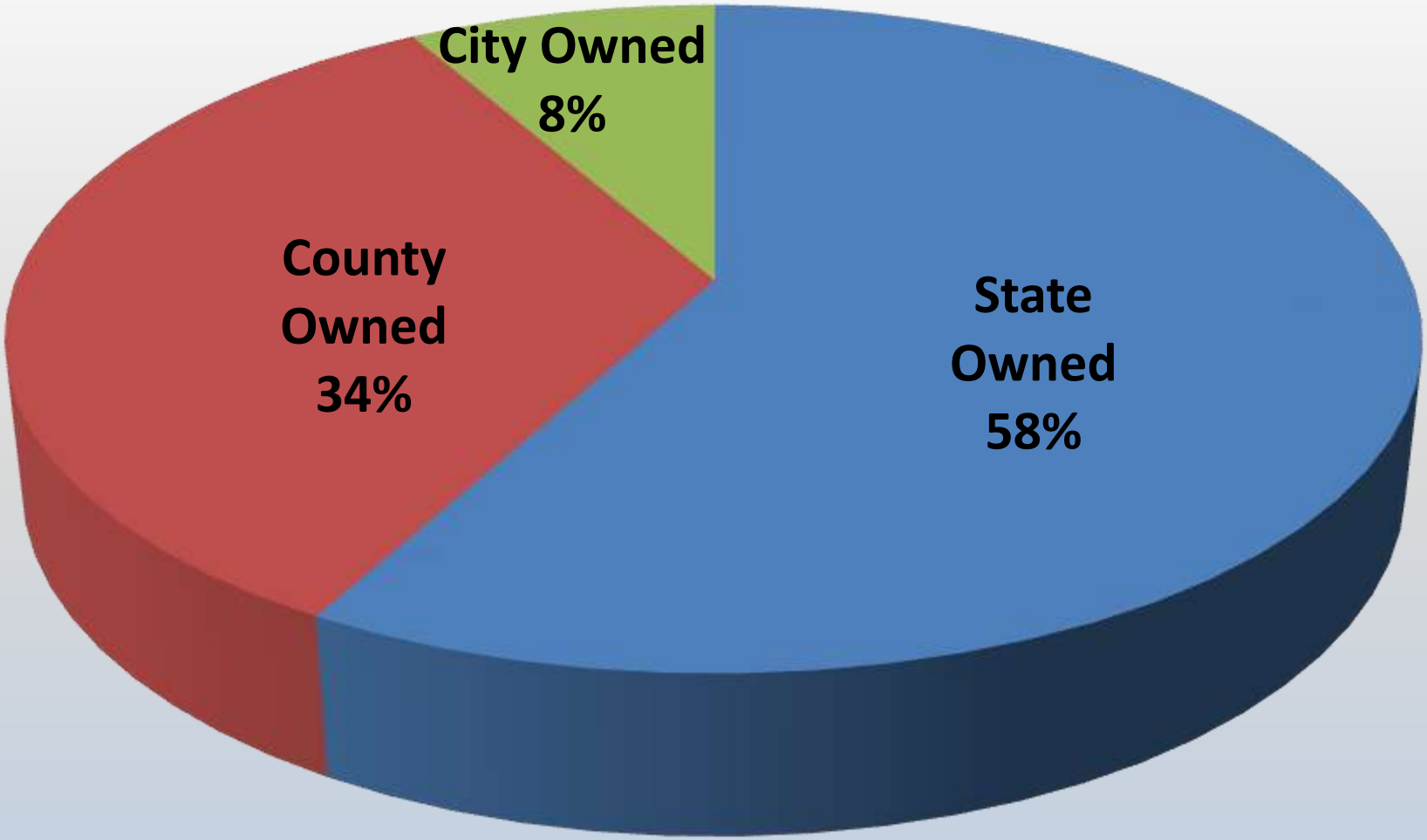
Bridge Design

Rick Ellis
Division Head – Bridge

Organization Chart



Arkansas Bridges



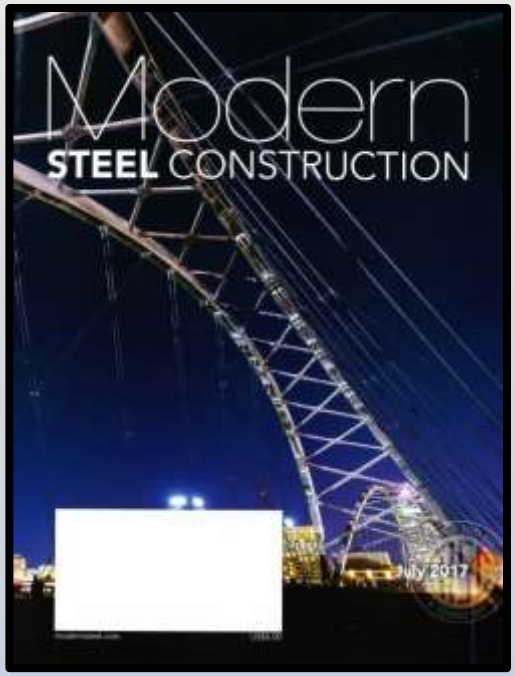
Almost 13,000 Publicly Owned Bridges, 5% Poor Condition

Recent Awards – Big Rock Intchg.

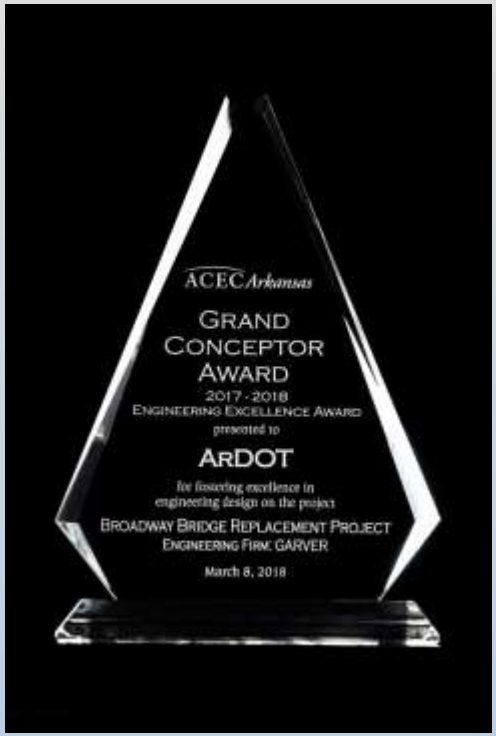
2017 Grand Conceptor Award
American Council of Engineering Companies (ACEC) - Arkansas

Recent Awards – Broadway Bridge

2017 Eugene C. Figg Award
International Bridge Conference



July 2017 cover



2018 Grand Conceptor Award
ACEC - Arkansas

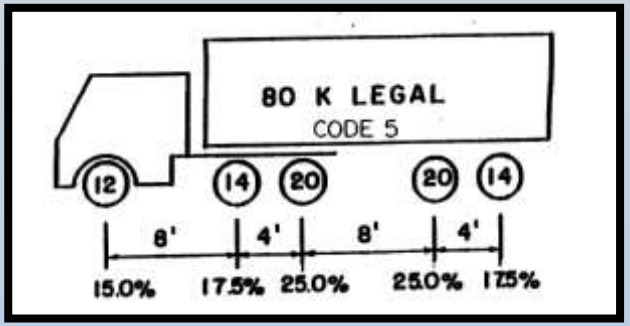
Historic or Unique Bridges

Bridge Staff

- 32 Employees, 26 Engineers (15 PE)
  - Concrete & Steel Fabrication (2018)
  - Rating & Inventory
  - Design
- 5 On-Call Consultants
- We have openings!

Rating & Inventory

- Load Rating Analysis of all publicly owned bridges
- Review and Approval of overload permits
- Manage Scour Critical bridges



Bridge Design

- About 40 bridges per year
- Almost $124 million annually (not including Preservation or Rehab)
- 1/3 Consultant Design

Accelerated Bridge Construction

7/2011 MassDOT FAST 14 Showcase in Boston

2/2013 PBES for ABC Peer Exchange in Norfolk, VA

8/2013 I-84 Echo Rd. Showcase in Echo, UT

2013-2014 EDC-2 ARDOT/FHWA ABC Committee in LR

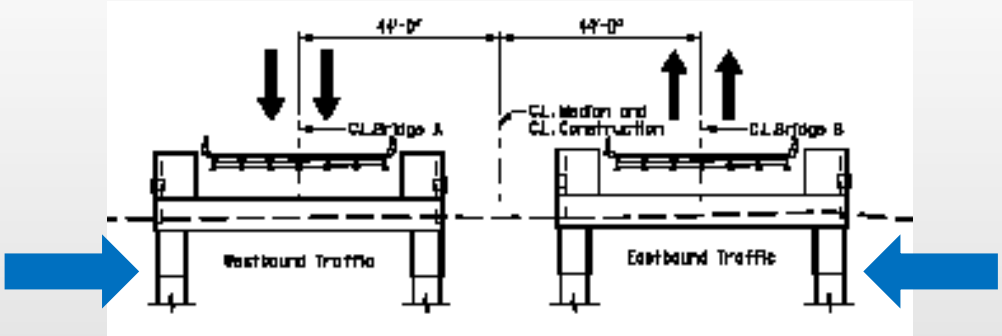
10/2014 EDC-3 Showcase in St. Louis

12/2015 National ABC Conference in Miami, FL

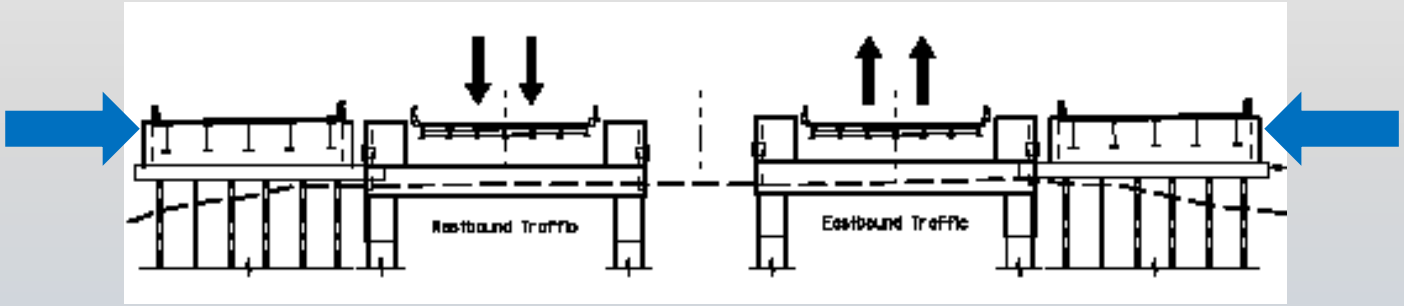
12/2016 SHRP2 Workshop for Innovative Bridge Designs for Rapid Renewal in LR

6/2018 UHPC Workshop in LR

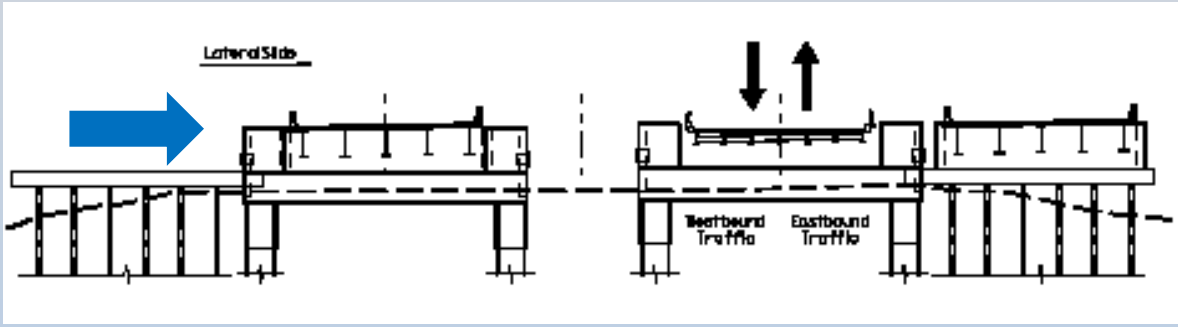
ABC – Lateral Slide



Step 1 – Construct Substructure under existing bridges

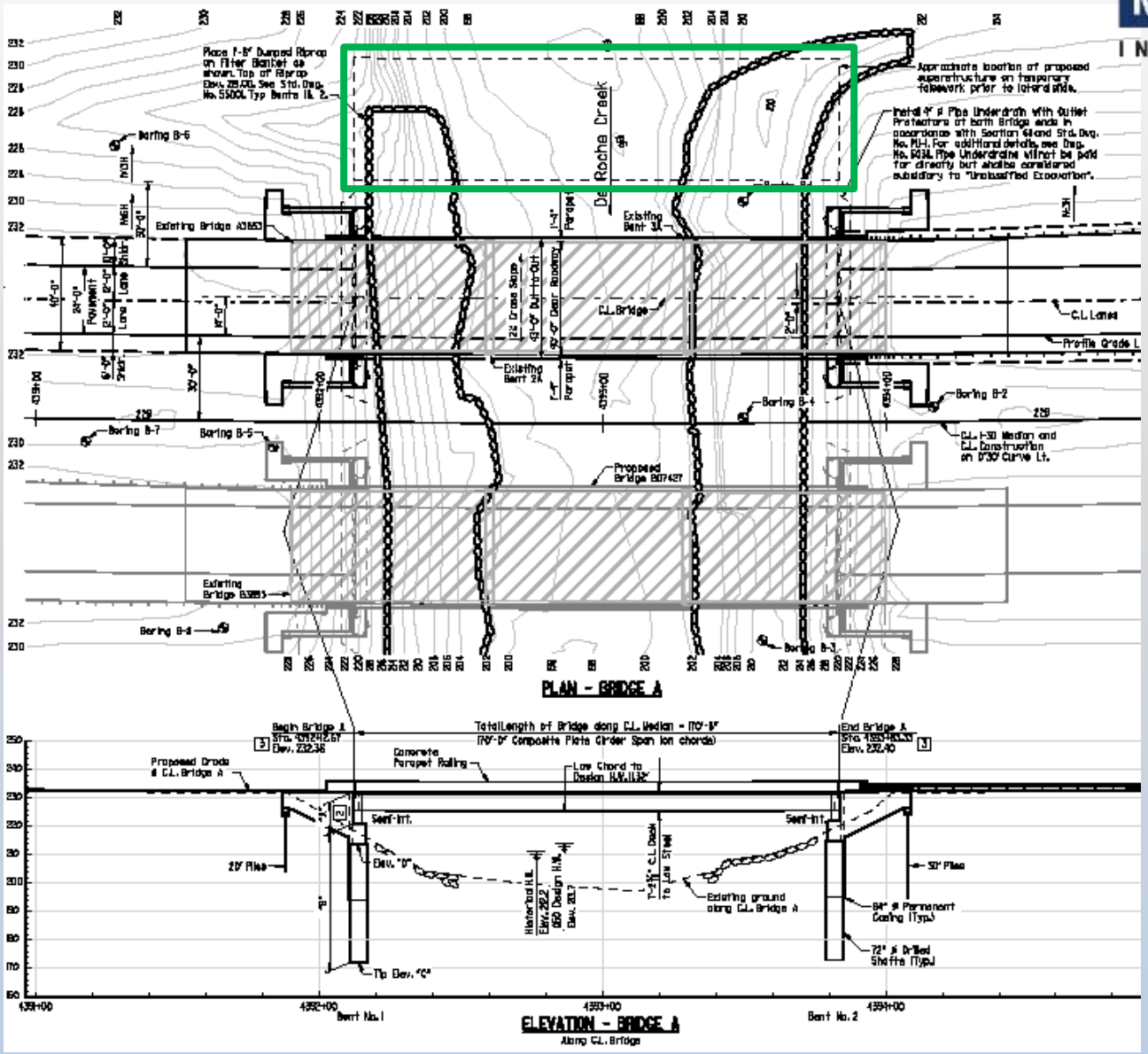


Step 2 – Construct Superstructure on temporary foundations

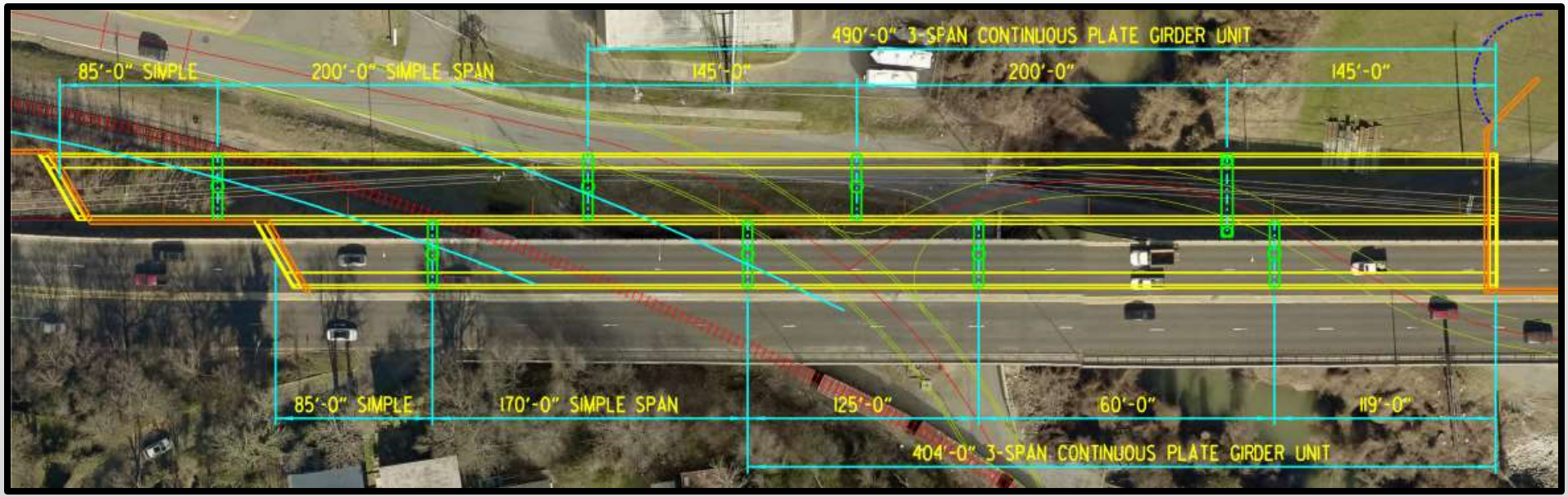


Step 3 – Demolish existing bridges, slide new bridges and complete approaches.

ABC – Lateral Slide



ABC – PBES – Cantrell Rd.

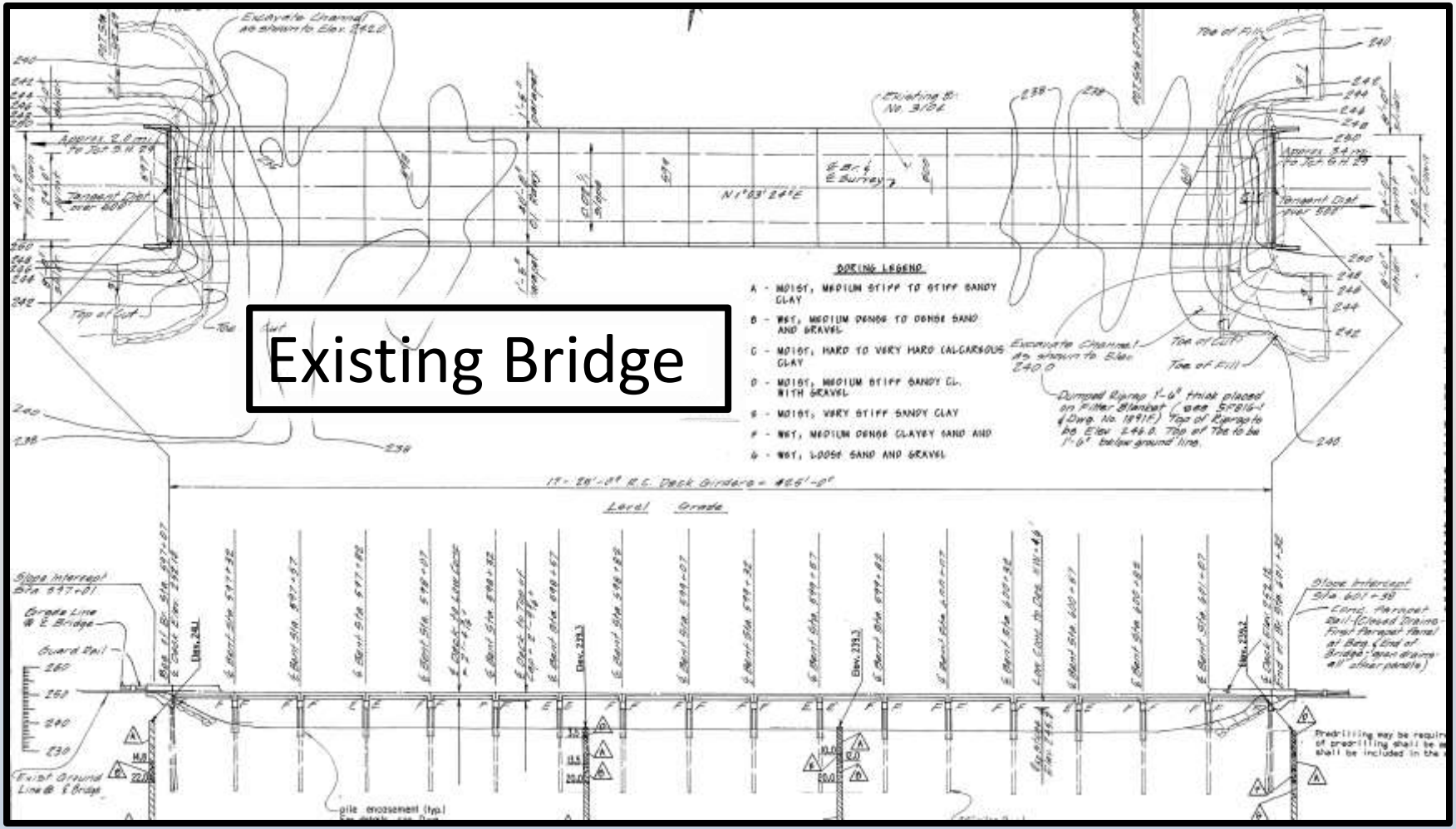


- Railroad & Site Constraints Resulted in Longer Spans
- Modular Superstructure Units Eliminated

ABC – PBES – Cantrell Rd.

- Still Opportunities for ABC
  - Precast Substructure Components
  - Full-Depth Concrete Deck Panels w/ UHPC Closures

ABC - Little Missouri River Relief



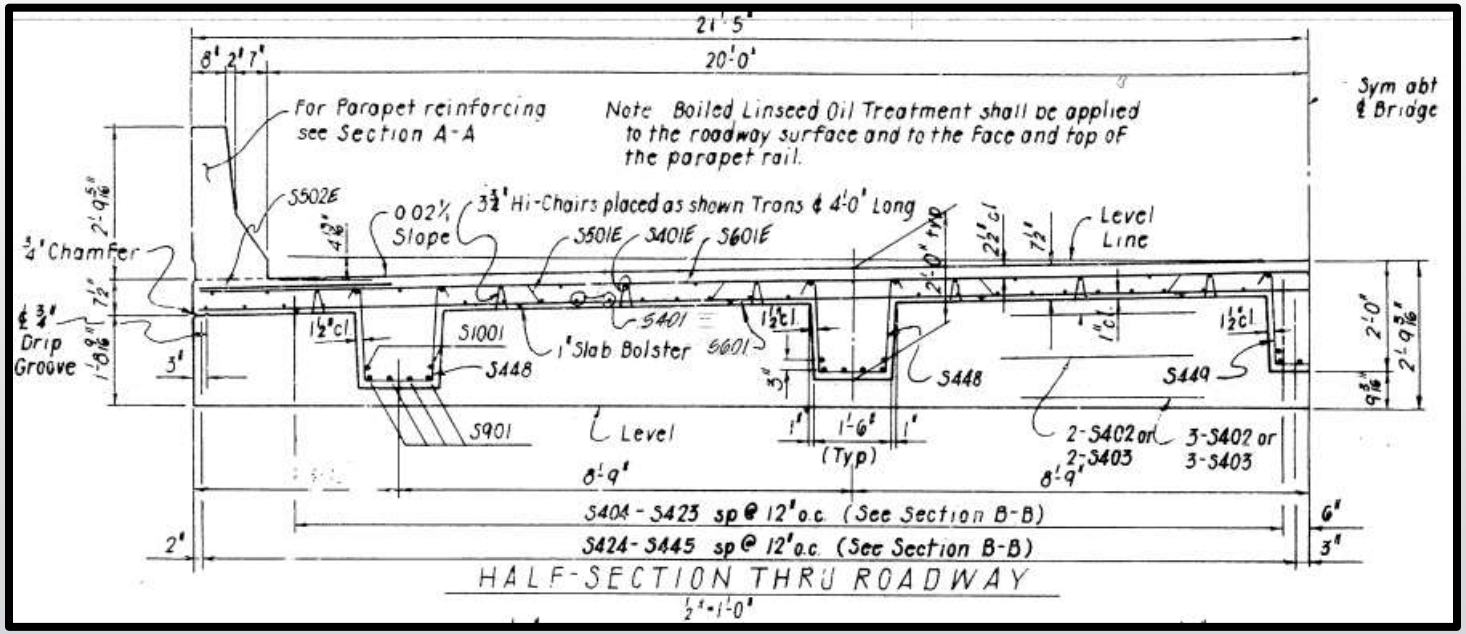
- 17 – 25’-0” RC Deck Girder Spans = 425’ Bridge
- 40’ Clear Roadway (1 Travel Lane Ea. Direction)

Traffic Data

2017 ADT = 860

Truck % = 30%

ABC – Little Missouri River

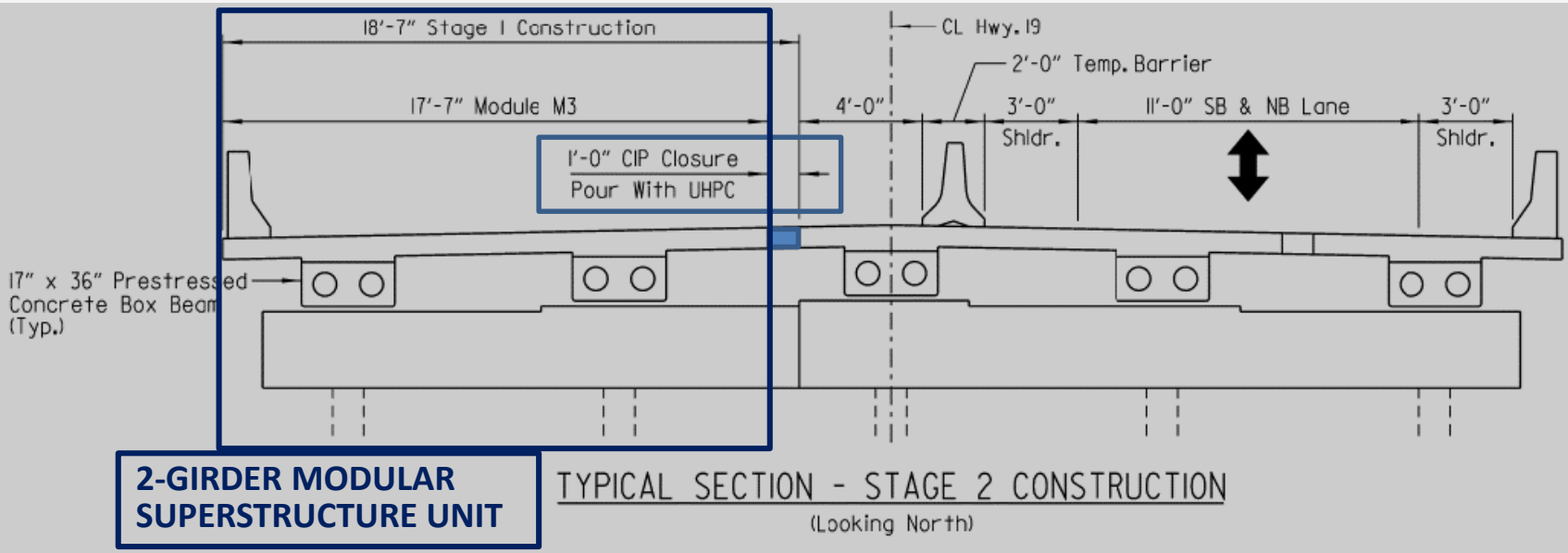


Existing Bridge

- Likely Repairs
  - Replacement of 4-5 Spans
  - Bent Cap Repair or Replacement (Where Needed)
- Detour Too Long
- Temporary Bridge Costly

- Consider ABC
- Maintenance of Traffic
  - One Lane of Traffic To Remain Open
  - Traffic Lights at Each End of Bridge

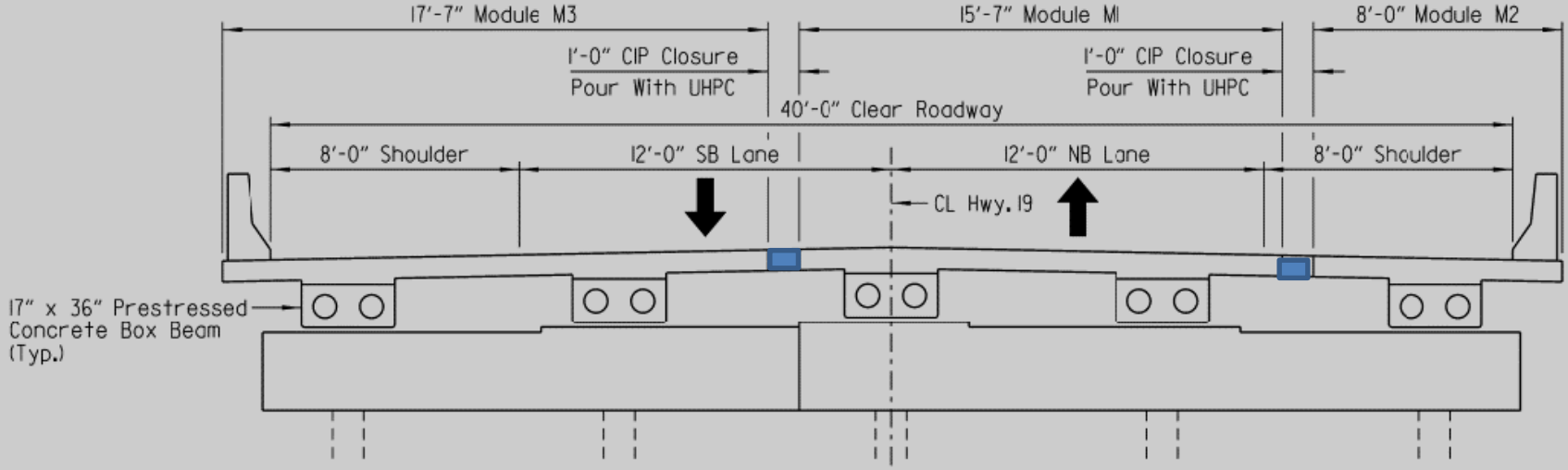
ABC – Little Missouri River



2-GIRDER MODULAR SUPERSTRUCTURE UNIT

TYPICAL SECTION - STAGE 2 CONSTRUCTION

(Looking North)



TYPICAL SECTION - FINAL CONDITION

(Looking North)

Milestones & Goals

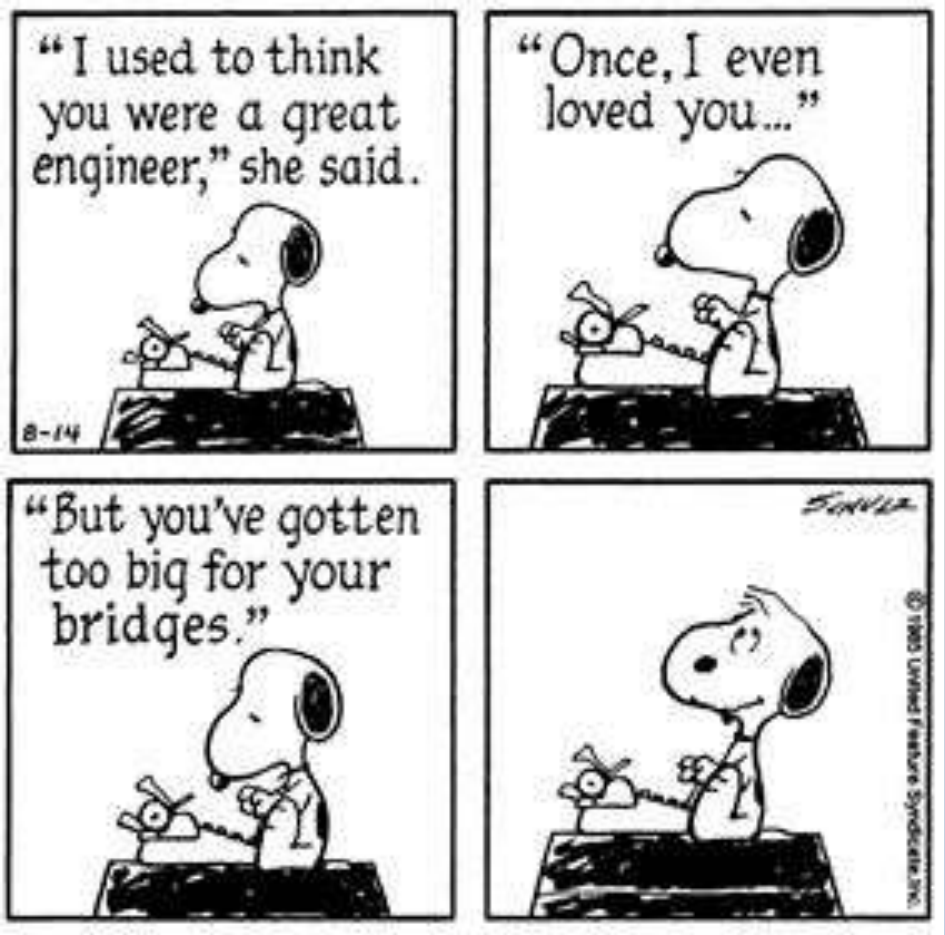
Recent Milestones

- Written Policy Guidelines (similar to a Design Manual)
- Design Program and Microstation file for R.C. Box Culverts

Upcoming Goals

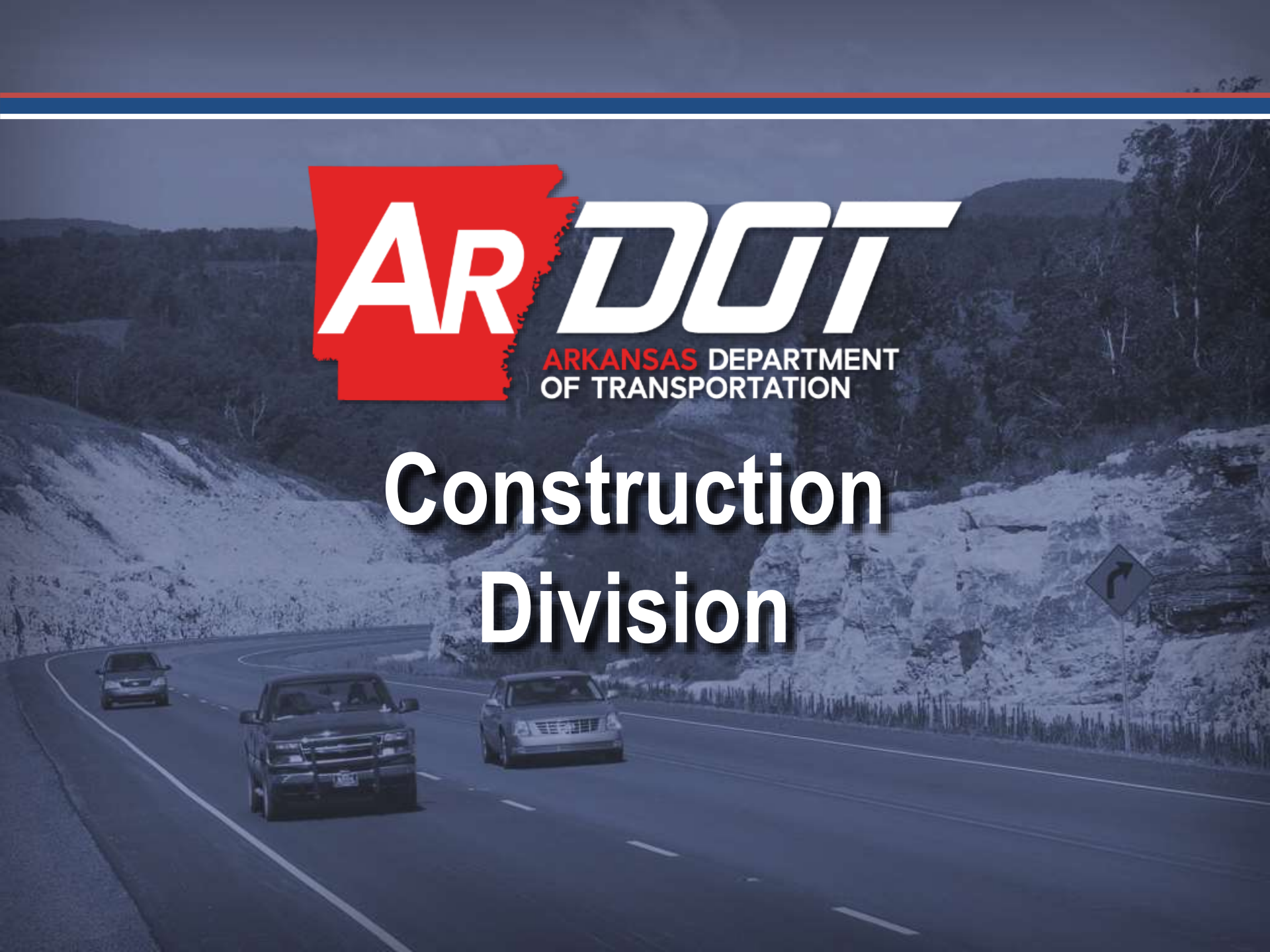
- MASH bridge rail by Dec. 31, 2019
- LRFD Sign Structure Standard Drawings
- Continue implementation ABC
- Training for inexperienced staff

Bridge Humor

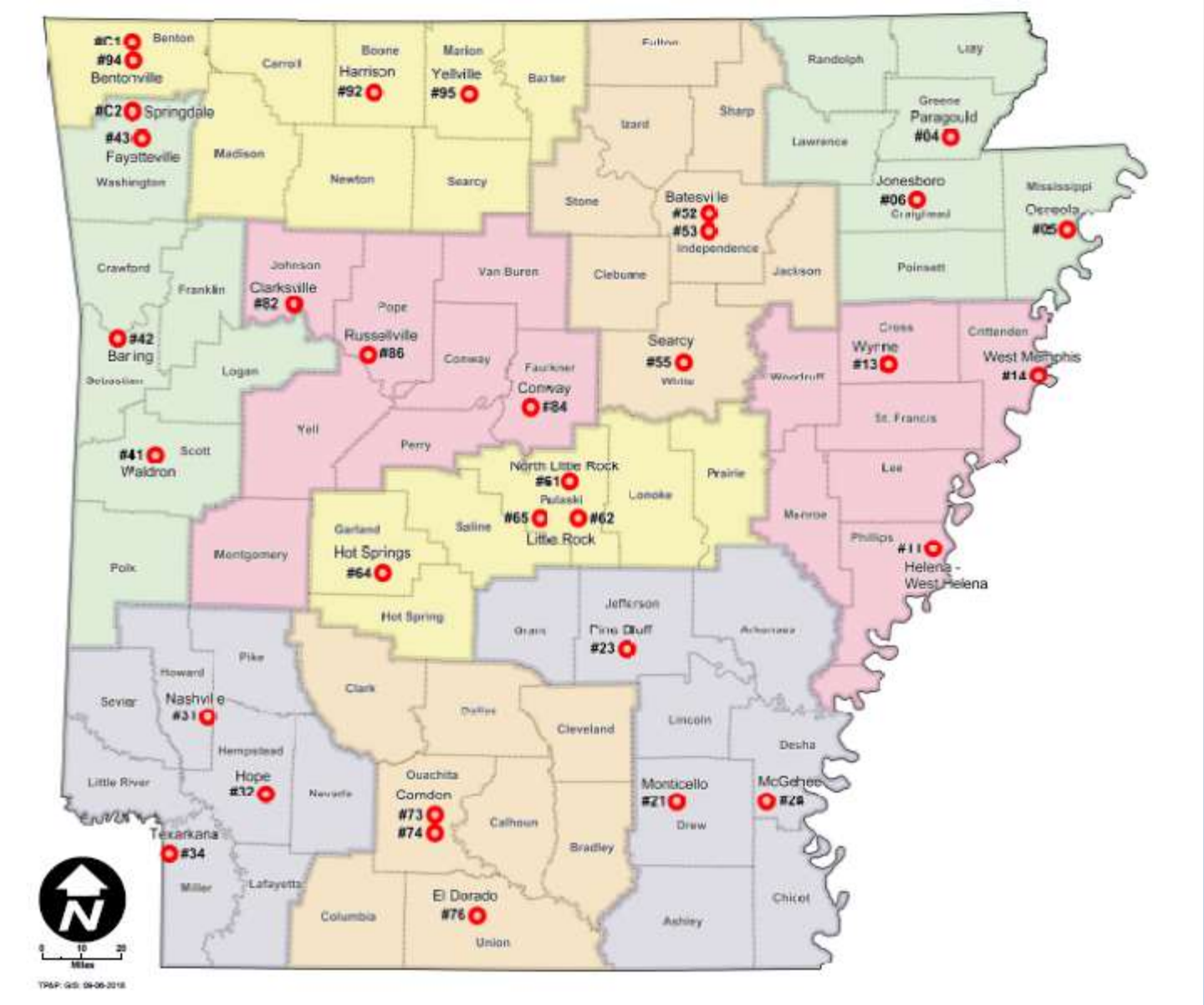


Operations

Tony Sullivan
Assistant Chief Engineer - Operations


AR DOT
ARKANSAS DEPARTMENT
OF TRANSPORTATION
Construction
Division

Resident Engineer Offices



Construction Statistics

- Contracts under construction: 173
- Value of Active Contracts: $1,197,493,151

- Amount paid to contractors this year: $578,430,098
- Total paid in 2017: $1,047,161,640

- Miles of Roadway Under Construction: 759

- Tons of Asphalt Placed this Year: 2,295,711 ($182,000,937)
- Total Asphalt Placed in 2017: 3,506,660 ($265,263,497)

Scheduling

- Contracts containing A+C bidding method require contractor submittal of Critical Path Method (CPM) schedules.
  - Contractor submits Bid Schedule for review and approval before Contract awarded
  - Acceptance of Baseline Schedule before Contractor commences work
  - RE and contractor review schedule and perform schedule update every 28 days

- Intent of scheduling is to build the project in a time-efficient manner while providing the ability to review time delays.

Increased Connectivity

- Tablets distributed to every RE office
  - Built in LTE Wireless Connection
  - Promotes efficiency, especially in remote areas of the state

- USB air cards with LTE wireless connection
  - No need to drive back to office or field shack for Daily Work Reports, check email, access plans and specifications, etc.

Increased Connectivity

Survey Equipment

- Every District now has GPS equipment.
  - (2) Trimble R10 base/rovers per District
  - Increases speed of surveying
  - Requires less manpower

- Construction Project Uses:
  - Measure earthwork quantities
  - Verify contractor's construction control

Paperless Documentation

- Construction contracts now have a Special Provision requiring use of paperless documenting software

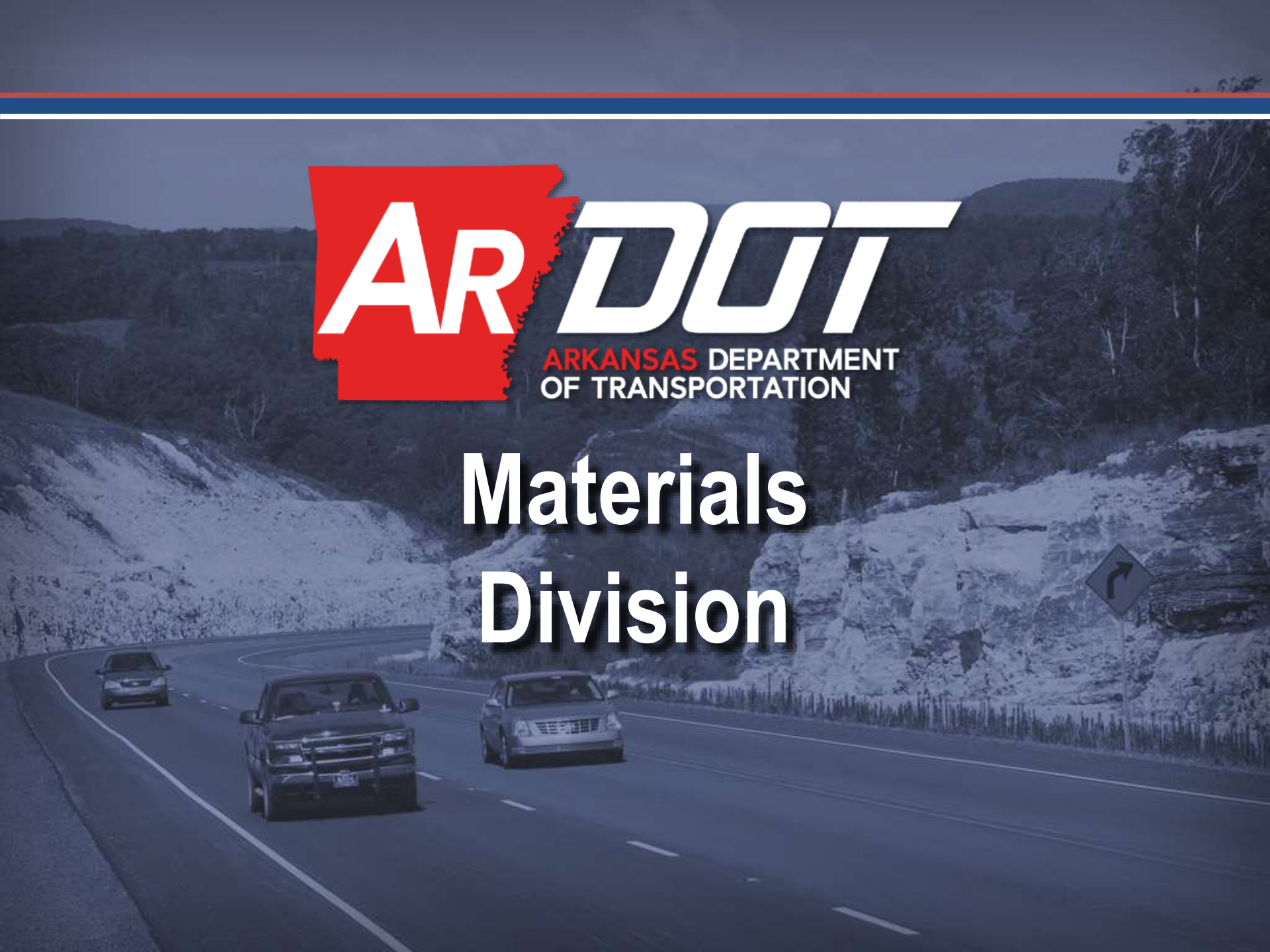
- Allows transparency inside and outside of ARDOT
  - Provides audit trail of signatures, comments, date reviewed, etc.
  - Electronic archive means data can be stored indefinitely.

- Replaces filing cabinets at ARDOT main building, District offices, and Resident Engineer offices.
  - Single-source location for documentation.

Future Endeavors

- Construction AASHTOWARE Project Construction and Materials
  - Replaces SiteManager for project documentation
  - Web-based and accessible with any internet-connected device

- Open to contractors for direct input of:
  - Material tests and certifications
  - Subcontract information
  - Payrolls


AR DOT
ARKANSAS DEPARTMENT
OF TRANSPORTATION
Materials
Division

Materials Division

- The mission of the Arkansas Department of Transportation Materials Division is to:
  - **Provide support service to the Department to assure the use of quality materials for design, construction, and maintenance of a safe and efficient transportation system.**

Materials Division Organization

- Central Laboratory (AASHTO Accredited)
  - Sample Preparation Lab
  - Geotechnical/Soils Lab
  - Bituminous Lab
  - Structural Materials Lab
  - Chemistry Lab
- Geotechnical Section

Central Laboratory

- Sample Preparation Lab
  - Performs basic operations and tests on samples going to other labs for further testing.
    - Sample Reduction
    - Drying
    - Gradation Analysis

Central Laboratory

Central Laboratory

- Geotechnical/Soils Lab
  - Tests soils and aggregates, evaluates rock and soil samples obtained by Geotechnical field crews and makes recommendations to Bridge Design, Roadway Design, and Construction and Maintenance Divisions.
    - Hydrometer Analysis
    - Atterberg Limits tests
    - R-value determinations
    - Triaxial tests

Central Laboratory

- Geotechnical/Soils Lab (continued)
  - Resilient Modulus tests
  - pH tests
  - Sodium sulfate soundness test (freeze/thaw)
  - Proctor tests
  - Permeability tests
  - Subgrade and base material stabilization analysis

Central Laboratory

Central Laboratory

- Bituminous Lab
  - Verifies asphalt concrete hot mix (ACHM) designs submitted by contractors and performs Loaded Wheel Testing for evaluation of rutting potential of designs.
    - Absorption and specific gravity of aggregates and ACHM
    - Volumetric analysis of contractor submitted ACHM mix designs
    - Loaded Wheel testing
    - ACHM density
    - Asphalt binder extractions

Central Laboratory

Central Laboratory

- Structural Materials Lab
  - Tests portland cement, portland cement concrete, structural steel components and connectors and plastic drainage pipe.
    - Tensile strength of bolts
    - Reinforcing steel and cable
    - Compression strength of portland cement and portland cement concrete
    - Elongation and compression strength of plastic pipe
    - Rockwell/Brinell hardness of structural steel components

Central Laboratory

Central Laboratory

- Chemistry Lab
  - Performs chemical analysis on items as diverse as structural paint and pavement marking paint to treated fence posts and diesel fuel. Also tests asphalt cement, emulsified asphalts. Examples are:
    - Aluminum sign materials and sign posts
    - Fly ash and portland cement
    - Galvanized steel
    - Pavement markings and glass beads
    - Epoxies
    - Asphalt binder
    - Concrete curing compounds

Geotechnical Section

- Geotechnical Section
  - Performs subsurface investigations to obtain:
    - General information on subsurface soil, rock, and water conditions for proposed highway locations.
    - Specific information on the subsurface conditions of soil and/or rock properties that are important to the project design.
    - Specific information on the subsurface conditions of soil, rock, and water in areas where problems are encountered, i.e. landslides, pavement failures.

Geotechnical Section

Geotechnical Section

Geotechnical Section

Maintenance

Tony Sullivan
Assistant Chief Engineer - Operations

Maintenance

- $237M budget per year
- 16,400 miles of state highways
- 2,009 field maintenance employees
- 10 Districts
- 85 Area Maintenance Headquarters

Heavy Bridge Maintenance

Heavy Bridge Maintenance

One of the few states in the nation that has In-House skilled workers that can quickly be mobilized to address emergencies.

Heavy Bridge Maintenance

Heavy Bridge Maintenance

HBM crew doing a heat straightening repair on a county road overpass over I-40

Striping

Old school A.H.D.

Striping

Thermoplastic

Striping

Striping

In the fiscal year of 2018, we striped
~5,000 centerline miles.
9 Independent Crews
Plan to restripe the State every two years

Striping

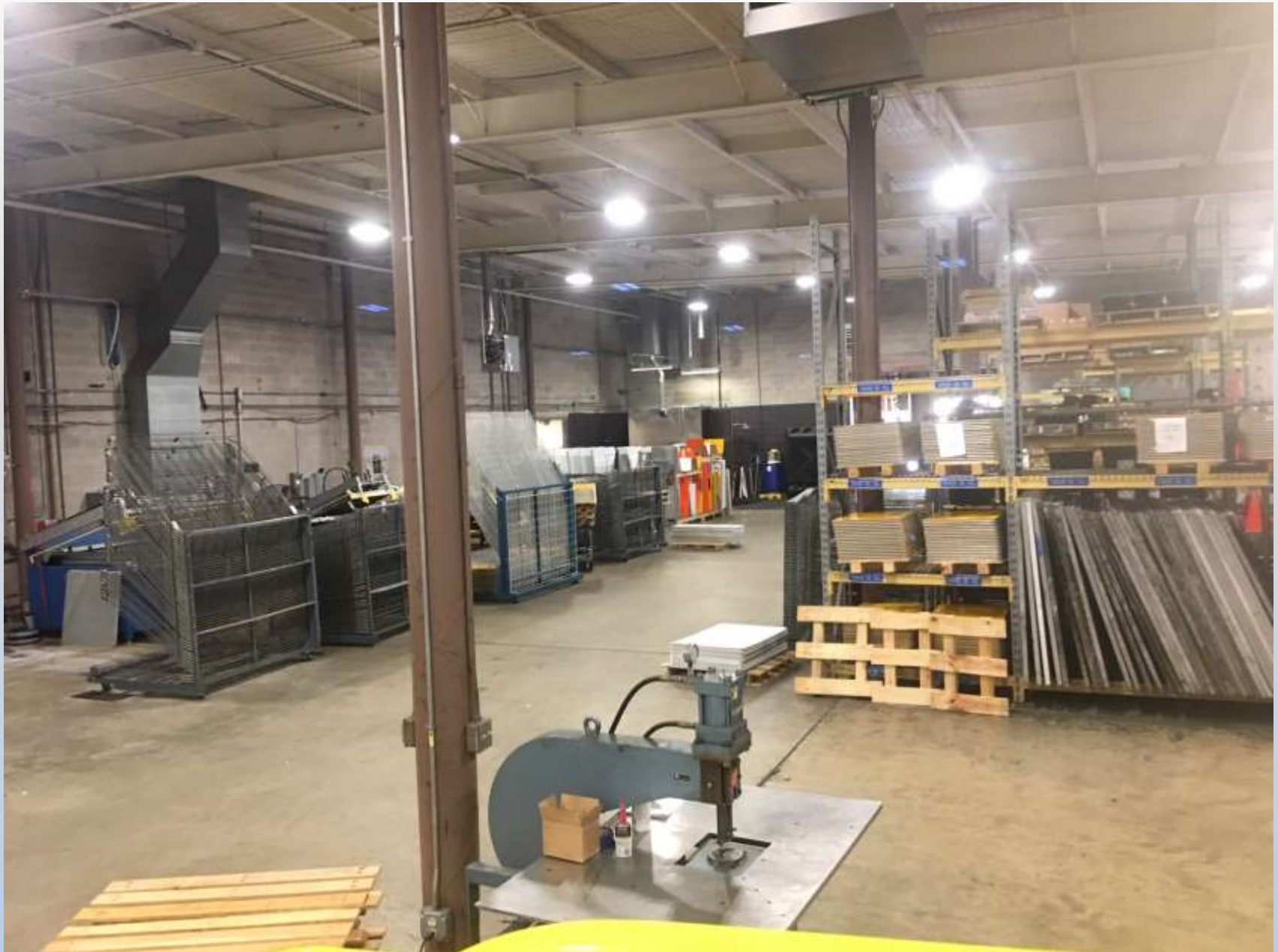
Baseline Road 2017

Changed striping
width from 4” to 6”

Signing

- Our sign shop services the entire state with only 8 employees.
- >75,000 signs produced last year

Signing



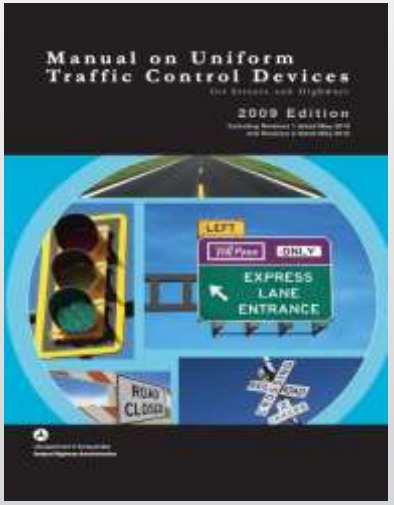
Signing


Dale Bumpers
White River
NATIONAL
WILDLIFE REFUGE
Crowley's
Ridge

Traffic Investigation

Traffic Investigation

- Primary Mission: Review traffic operation and recommend low cost safety improvements for signing and striping.
- 3 Traffic Investigators, 10 Districts, 100's of request, 1 mission.
- Practices & Standards:
  - 2009 MUTCD (FHWA Publication)
  - 2017 ARDOT Signing Polices and Guidelines



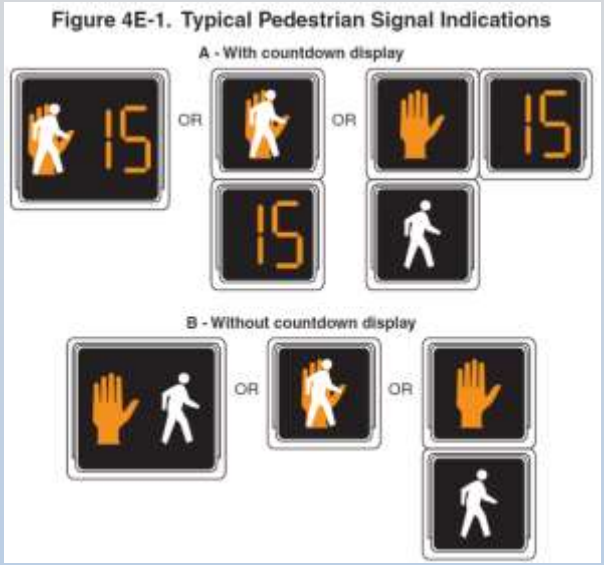
Traffic Signals Operations/Studies

- ITS Management Section – Traffic Engineering
- 10 Districts, 75 Counties, more than 1500 Traffic Signals on State Highways
- Primary Mission:

  Provide safe and efficient Intelligent Transportation System and Operation to support the traveling public using the proper technology statewide.

- Purpose of Traffic Control Devices:

  Traffic control devices are used to provide, inform, guide, warn, regulate, control and improve the flow of traffic for motor vehicle drivers, pedestrians and bicyclists in a safe and efficient manner.



Traffic Signals Operations/Studies

- Traffic Equipment:
  - Detection: Video, loops, Radar, ..etc.
  - Traffic Controllers and Smart Monitors.
  - Ethernet and/or Serial Radios
  - Traffic Camera Trailers
  - Traffic Count Trailer
  - Cellular Routers

Traffic Management Center

TMC Operations Include:

- Traffic Incident Management
- Freeway Management
- Radio Dispatching
- Operating ITS Assets
- Winter Weather Operations
- Special Events
- Incident Notifications
- Emergency Operations

Traffic Management Center

7 Workstations, 42 monitors, 20 HDTV's

Communication Modes:

- Land Mobile Radio
- Telephony
- Cellular
- Email
- SMS
- Twitter
- iDriveArkansas
- HAM Radio for ADEM fallback communications (planned)
- Live Video Feeds
- WEBEX (under study)

Traffic Management Center

Traffic Incident Management

Quickly Locating Incidents and Reporting to First Responders

High-Centered Vehicle in Highway 67 construction zone thru Jacksonville

Traffic Management Center

Corridor Management

Incident response, public notification, alternate route advisories

The Great Pizza Event Little Rock 8/9/17

No serious Injuries

4 hour 21 minute road closure

$400,000 estimated road user cost

Many slices of pizza

Intelligent Transportation Systems (ITS)

Dynamic Message Signs (DMS)

- Provide ***Real-Time*** and ***Actionable*** traveler information to improve safety and efficiency for our traveling public
- 51 boards statewide
- AMBER and SILVER Alerts

*Example

*Example

*Example

Intelligent Transportation Systems (ITS)

Dynamic Message Signs (DMS)

Public Safety Announcements (PSA) to encourage safe driving behavior

Traffic Cameras

Monitor traffic and weather conditions
check them out at: ***www.iDriveArkansas.com***

- 129 cameras statewide
- 63 ARDOT
- 66 Partnering Cities, surrounding State DOT's, and News Outlets

Intelligent Transportation Systems (ITS)

Highway Advisory Radios (HAR)

Used to communicate lengthy messages beyond what a Dynamic Message Sign could support

11 Statewide locations

Intelligent Transportation Systems (ITS)

Innovations and other items that are in mind for the future

Helical Screw Foundations

- Faster build times
- No concrete
- Smaller install crews

Tilting Towers (20-60ft)

- Easier Maintenance
- One person operation
- No bucket truck needed
- Balanced, not under tension when down hauling

Intelligent Transportation Systems (ITS)

Innovations and other items that are in mind for the future

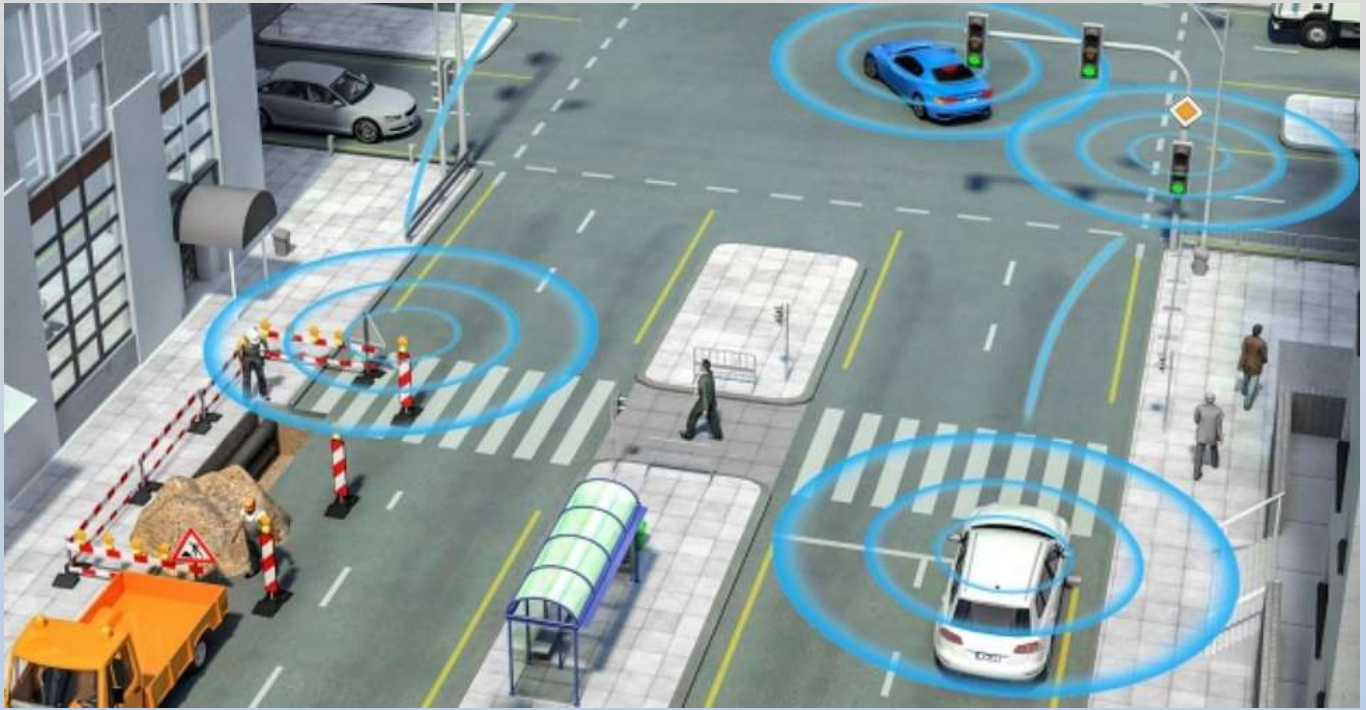
Travel Time Signs –
Using both hybrid static/dynamic and full dynamic.
Submitted proposal for ATCMTD Grant Opportunity (Advanced Transportation and Congestion Management Technologies)

Traffic Operatons

Innovations and other items that are in mind for the future

Connected Vehicles

“Connected vehicles have the potential to transform the way Americans travel through the creation of a safe, interoperable wireless communications network--a system that includes cars, buses, trucks, trains, traffic signals, smart phones, and other devices.” USDOT.



Traffic Operations

Innovations and other items that are in mind for the future

Dedicated Short Range Communications (DSRC)

- Installed in Infrastructure and Connected & Autonomous Vehicles (CAV)
- Dedicated Spectrum (5.9GHz)
- Bi-directional communications: V2V or V2I
- Transmits **S**ignal **P**hasing **a**nd **T**iming (SPaT) Data
- Infrastructure transmits MAP data (intersection geometry)

Innovations and other items that are in mind for the future

Connected Vehicles

Benefits include:

- Safety
  - Red Light Violation Warning
  - Pedestrians in Signalized Crosswalk Warning
  - Curve Speed Warning
  - Traffic Management

- Mobility
  - Improved Signal control applications (V2I)
    - Intelligent Traffic Signal Systems
    - Freight Signal Priority
    - Transit signal priority
  - Emergency Vehicle signal preemption
  - Cooperative adaptive cruise control and speed harmonization (V2V)

- Environmental
  - Fuel Savings
  - Lower emissions

    Both thru optimized transportation systems and vehicles

Snow and Ice

2009 Northwest Arkansas

Snow and Ice

Arkansas Missouri Border

Snow and Ice

Winter Storm

Snow and Ice

I-55 and I-40 Snowmageddon 2014

Snow and Ice

Equipment

• Plow Trucks	731
• Belly Plows	74
• Pre-wetting Systems	325
• MARWIS	11
• Strike Force Trucks	12

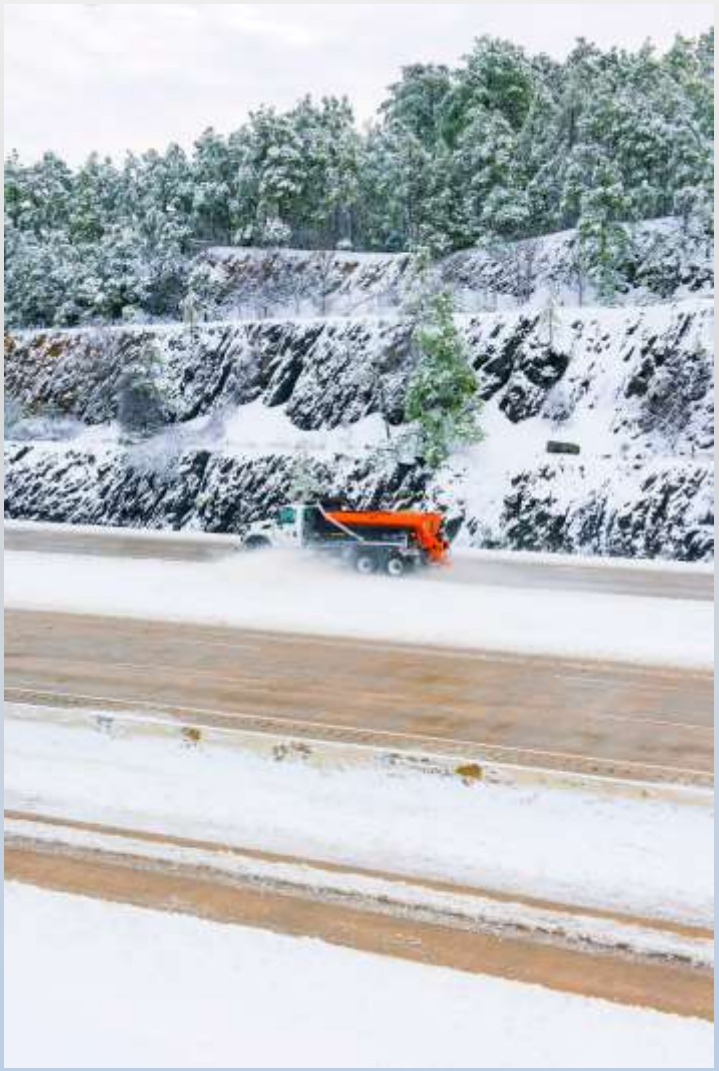
Snow and Ice Removal

Equipment

Increased: 3 to 74

Snow and Ice Removal

Equipment



Snow and Ice

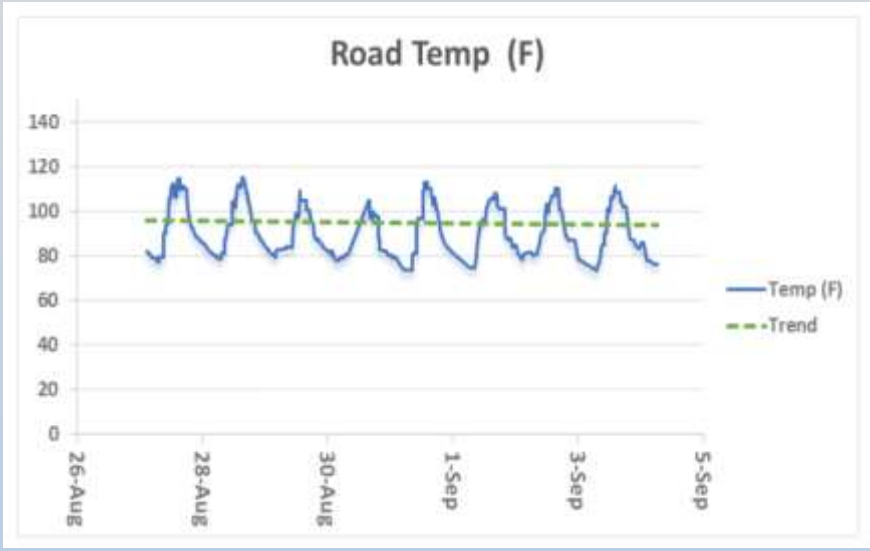
Equipment

- New Additional Equipment
- Three ¾ 4WD trucks outfitted with a brine tank, small salt spreader, and a front plow.

Intelligent Transportation Systems (ITS)

Roadside Weather Information Systems (RWIS)

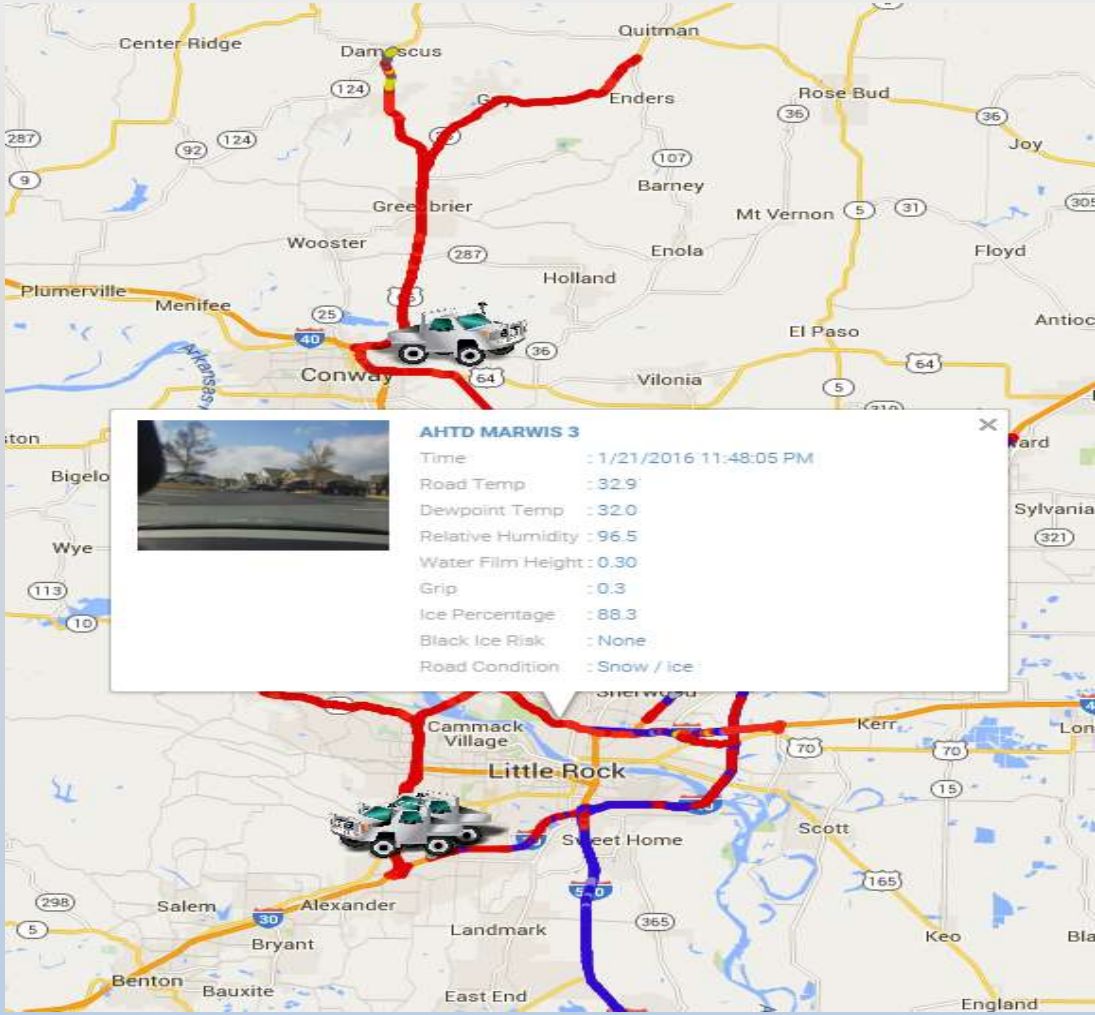
- 4 test sites
- Supports Department staff in preparing for winter weather conditions
- Detects:
  - road temperature
  - presence and state of water: liquid, snow, ice, slush



Intelligent Transportation Systems (ITS)

Mobile advanced Roadside Weather Information Systems (MaRWIS)

- 11 units deployed
- Reports the same information as stationary RWIS
- Included Driver view of road conditions
- ARDOT investigating how to integrate with www.iDriveArkansas.com



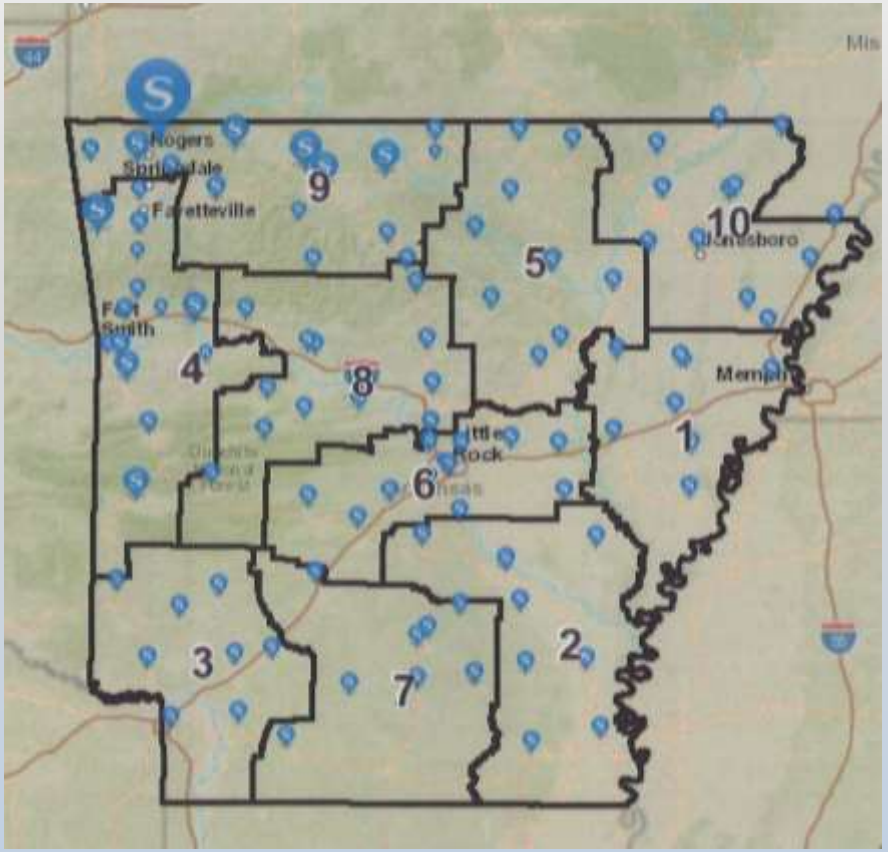
Snow and Ice

WINTER WEATHER OPERATIONS
As of 2017

• Treated Rock Salt	35,611	tons
• Rock Salt	15,775	tons
• Treated Rock salt	6,309	bags
• Rock salt	2,776	bags
• Calcium Chloride	9,772	bags
• Brine	475,781	gallons
• Super Brine	40,875	gallons
• Liquid Calcium	10,126	gallons
• Beet Juice	124,134	gallons
• Liquid Mag	21,630	gallons

Snow and Ice

Statewide Salt House



Career Opportunities

- Job opportunities available for engineers and non-engineers.
- If interested, please contact carla.edwards@ardot.gov.


AR DOT
ARKANSAS DEPARTMENT
OF TRANSPORTATION
Funding Challenges

Federal Highway Funding Issues

We Are Now in Federal Fiscal Year 2019

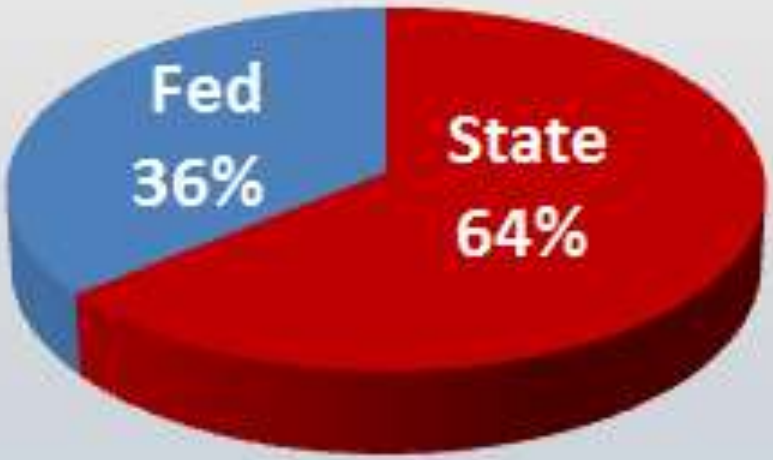
Congress Did Not Agree On A Spending Bill

Congress Did Agree on A Continuing Resolution Until December 7th

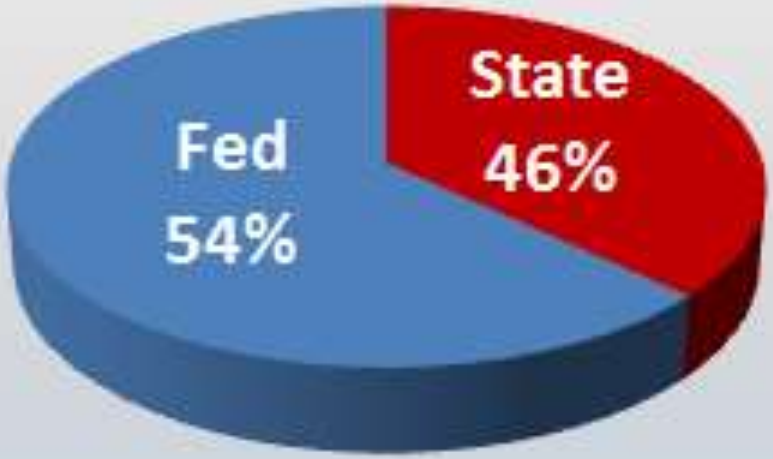
Provides Funding Until After Mid-Term Elections

Federal vs. State Funding

1993
Hwy. Funding Breakdown



2016
Hwy. Funding Breakdown



Current Highway Funding Sources

State

Per-Gallon Motor Fuel Taxes

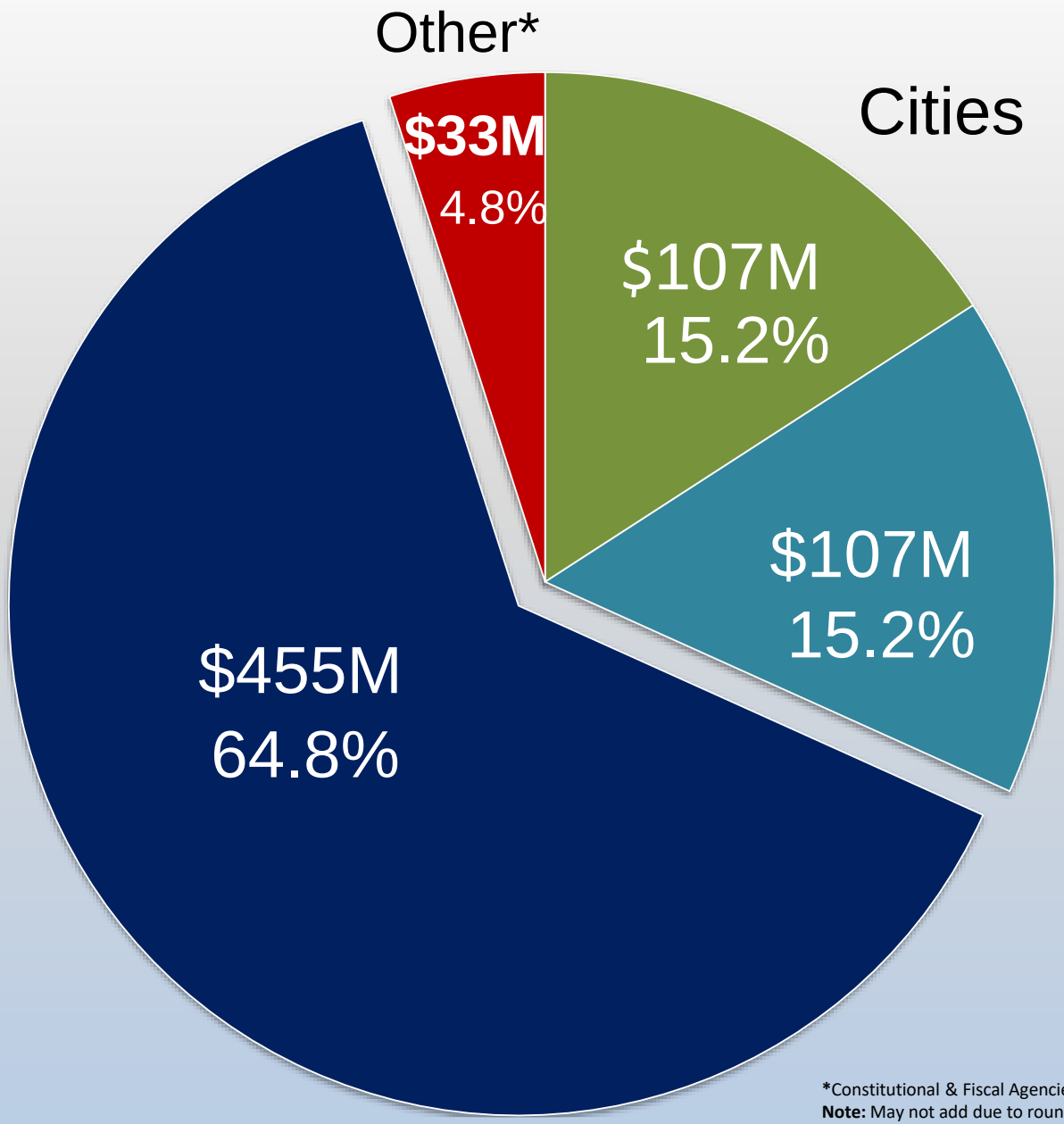
Vehicle Registration Fees

License/Permit/Inspection Fees

Severance Taxes

Temporary Sales Tax Increase

Average Annual Highway User Revenue Distribution



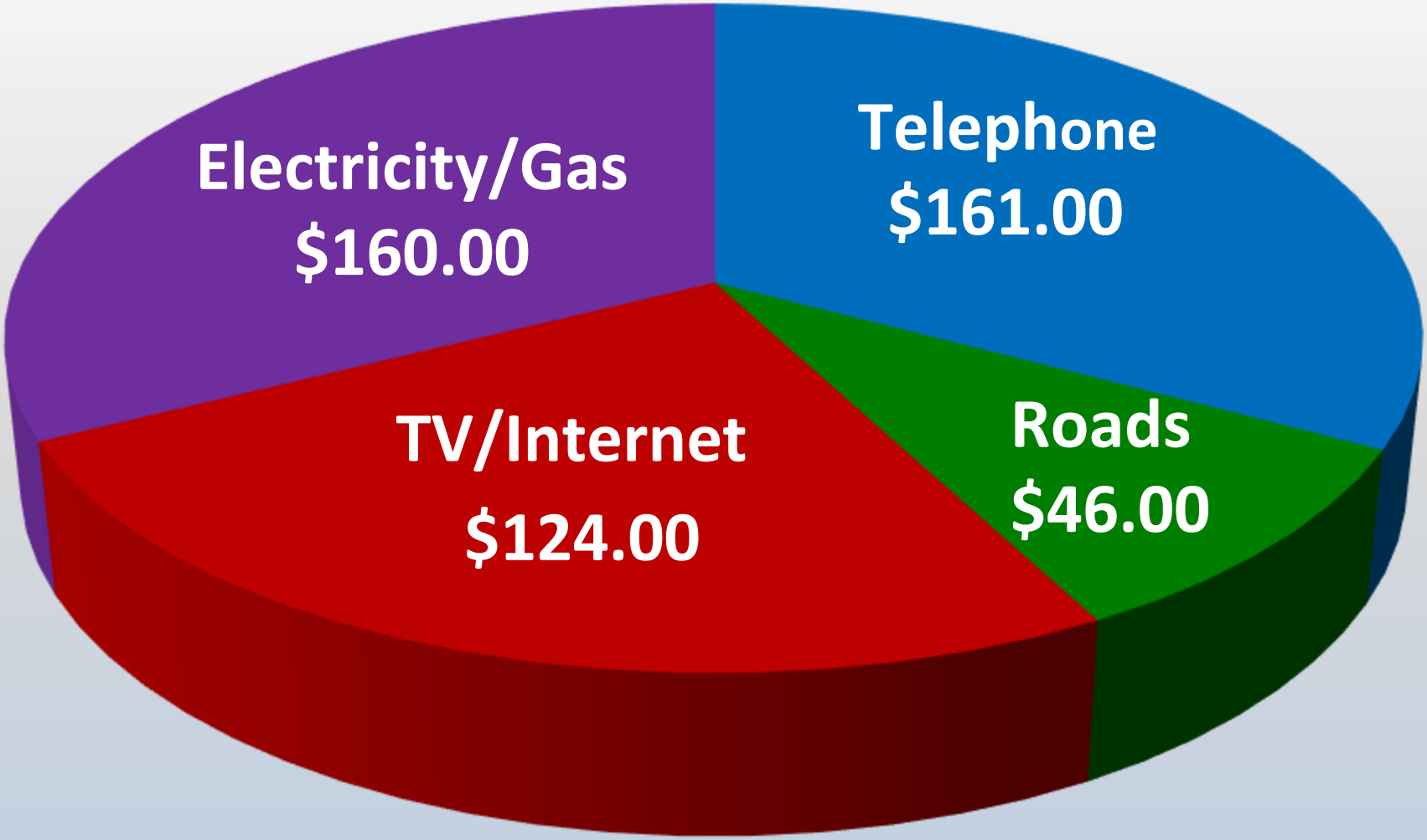
*Constitutional & Fiscal Agencies and Non-Highway Uses.
Note: May not add due to rounding

Challenges

- **12th** largest system in the country
- **42nd** in highway revenue per mile.

- **$9.2 billion** in needs
- **$4.4 billion** in available revenue

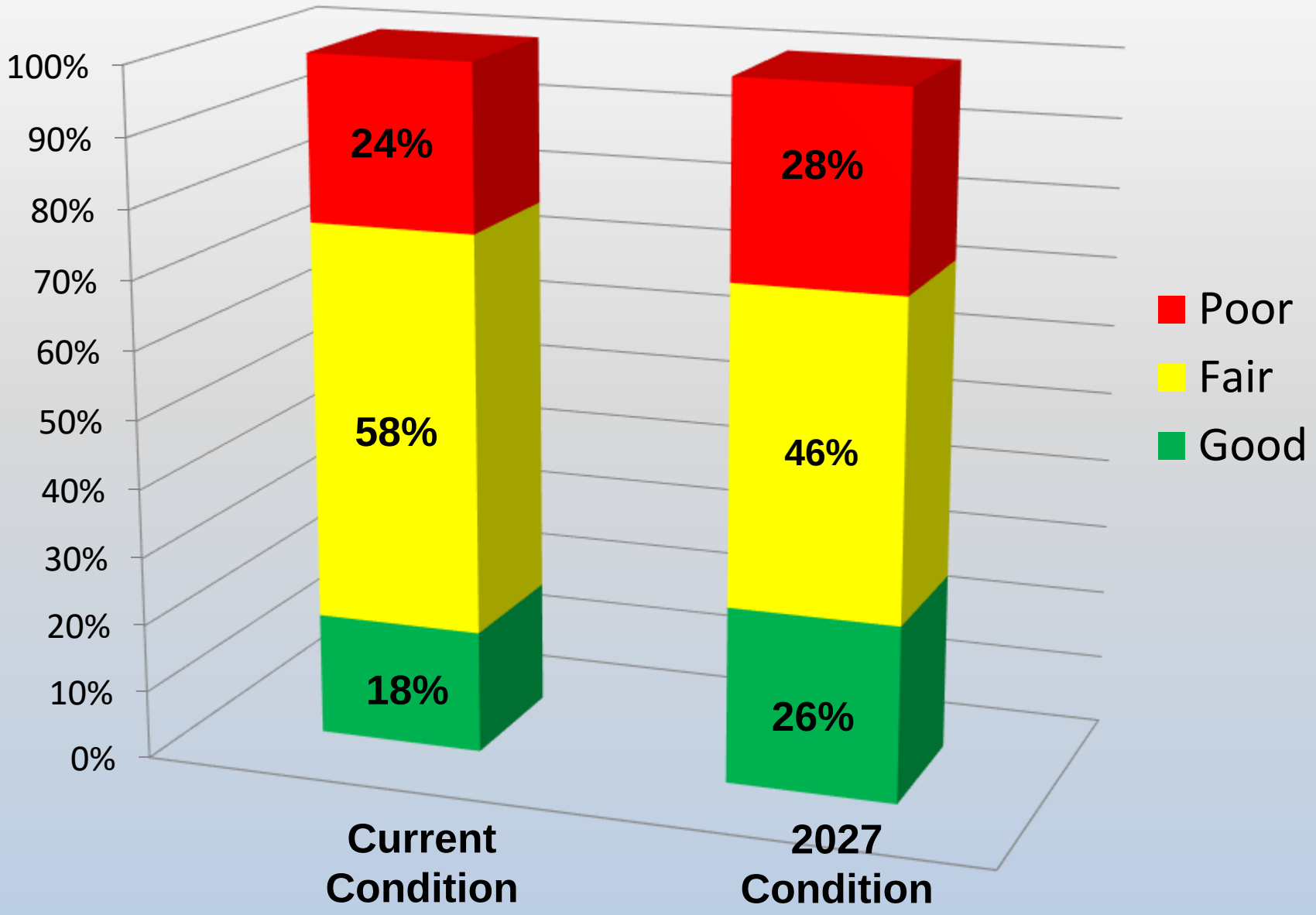
Average Monthly Household Expenditures



Effects of Inflation

The Shrinking Highway Dollar	
Category	**1997-2016 Percent Increase**
Construction Cost Index	146 %
Overlays – Cost Per Lane Mile	145 %
Bridges Replacement – Cost Per Square Foot of Deck Area	131 %
Widening from 2 to 5 Lanes – Cost Per Mile	139 %

All State Highways – Including Interstates



Pay a **Little** Now

Overlay

$100,000

per lane mile

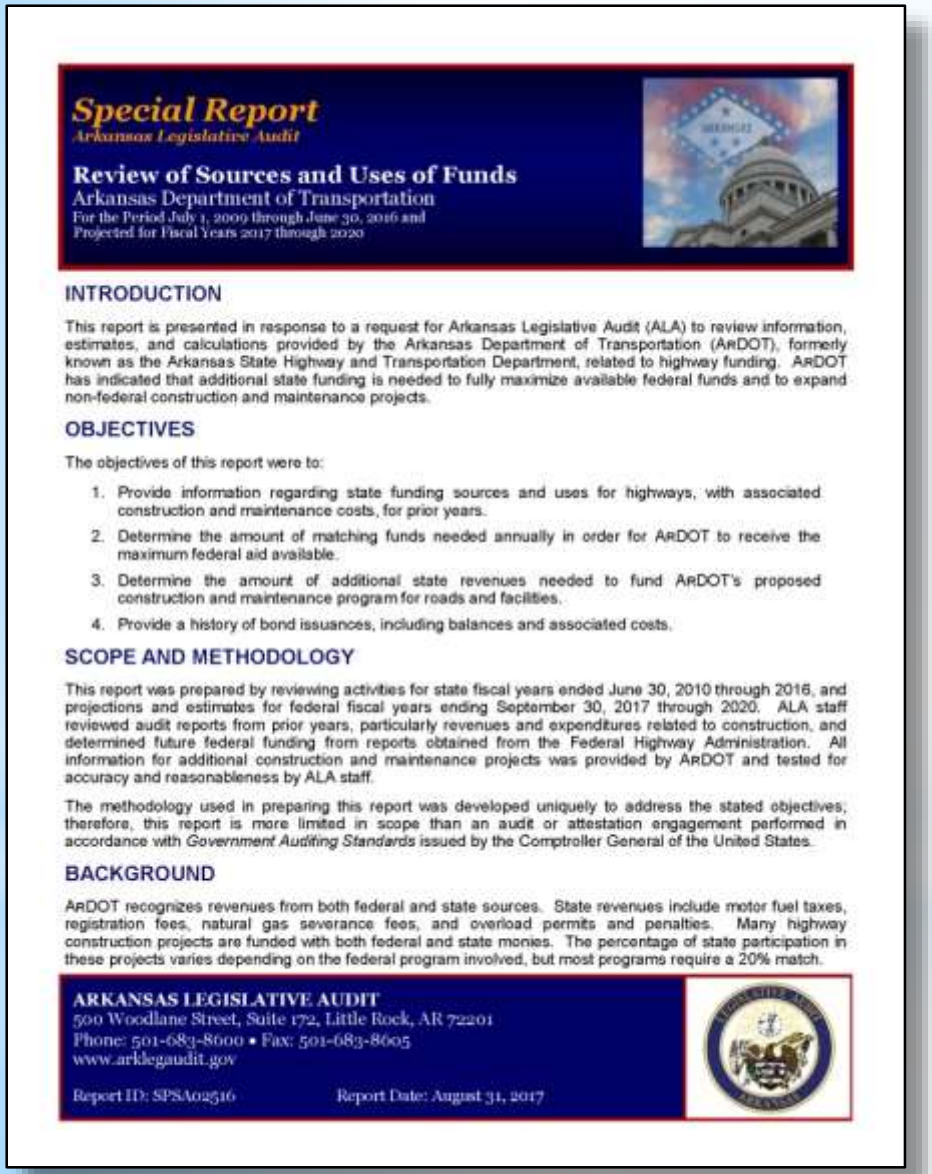
Pay a **Whole Lot** Later

Reconstruction

$1,500,000

per lane mile

Arkansas Legislative Audit



Special Report
Arkansas Legislative Audit

Review of Sources and Uses of Funds
Arkansas Department of Transportation
For the Period July 1, 2009 through June 30, 2016 and
Projected for Fiscal Years 2017 through 2020

INTRODUCTION

This report is presented in response to a request for Arkansas Legislative Audit (ALA) to review information, estimates, and calculations provided by the Arkansas Department of Transportation (ARDOT), formerly known as the Arkansas State Highway and Transportation Department, related to highway funding. ARDOT has indicated that additional state funding is needed to fully maximize available federal funds and to expand non-federal construction and maintenance projects.

OBJECTIVES

The objectives of this report were to:

1. Provide information regarding state funding sources and uses for highways, with associated construction and maintenance costs, for prior years.
2. Determine the amount of matching funds needed annually in order for ARDOT to receive the maximum federal aid available.
3. Determine the amount of additional state revenues needed to fund ARDOT's proposed construction and maintenance program for roads and facilities.
4. Provide a history of bond issuances, including balances and associated costs.

SCOPE AND METHODOLOGY

This report was prepared by reviewing activities for state fiscal years ended June 30, 2010 through 2016, and projections and estimates for federal fiscal years ending September 30, 2017 through 2020. ALA staff reviewed audit reports from prior years, particularly revenues and expenditures related to construction, and determined future federal funding from reports obtained from the Federal Highway Administration. All information for additional construction and maintenance projects was provided by ARDOT and tested for accuracy and reasonableness by ALA staff.

The methodology used in preparing this report was developed uniquely to address the stated objectives; therefore, this report is more limited in scope than an audit or attestation engagement performed in accordance with *Government Auditing Standards* issued by the Comptroller General of the United States.

BACKGROUND

ARDOT recognizes revenues from both federal and state sources. State revenues include motor fuel taxes, registration fees, natural gas severance fees, and overload permits and penalties. Many highway construction projects are funded with both federal and state monies. The percentage of state participation in these projects varies depending on the federal program involved, but most programs require a 20% match.

ARKANSAS LEGISLATIVE AUDIT
500 Woodlane Street, Suite 172, Little Rock, AR 72201
Phone: 501-683-8600 • Fax: 501-683-8605
www.arklegaudit.gov

Report ID: SPSA02516 Report Date: August 31, 2017

Report Released
August 31, 2017

Presented to
Legislative Joint
Audit Committee in
September 2017

Arkansas State Legislative Audit

Exhibit III

Arkansas Department of Transportation (ArDOT)
Summary of Annual State Funds Needed to Meet
Proposed Highway Construction Plan Over a 10-Year Period

Description	Annual Funds Needed for Highway Construction Plan	Annual Funds Available for Highway Construction	Additional Annual State Revenues Needed for Highway Construction Plan
System Preservation			
Pavement	$ 387,000,000	$ 137,000,000	$ 250,000,000
Bridges	117,000,000	90,000,000	27,000,000
Total System Preservation	504,000,000	227,000,000	277,000,000
Capacity Relief	305,000,000	157,000,000	148,000,000
Safety Improvements	86,000,000	44,000,000	42,000,000
Maintenance			
Equipment upgrades	19,000,000	19,000,000	
Facilities upgrades	8,000,000		8,000,000
Intelligent Transportation System (ITS)	3,000,000		3,000,000
Total Maintenance	30,000,000	19,000,000	11,000,000
Totals	**$ 925,000,000**	**$ 447,000,000**	**$ 478,000,000**

Note: Amounts shown are rounded.

$ 447,000,000

Arkansas Legislative Audit

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$ 925,000,000

Does Not Include Capital Improvement Projects

Arkansas State Legislative Audit

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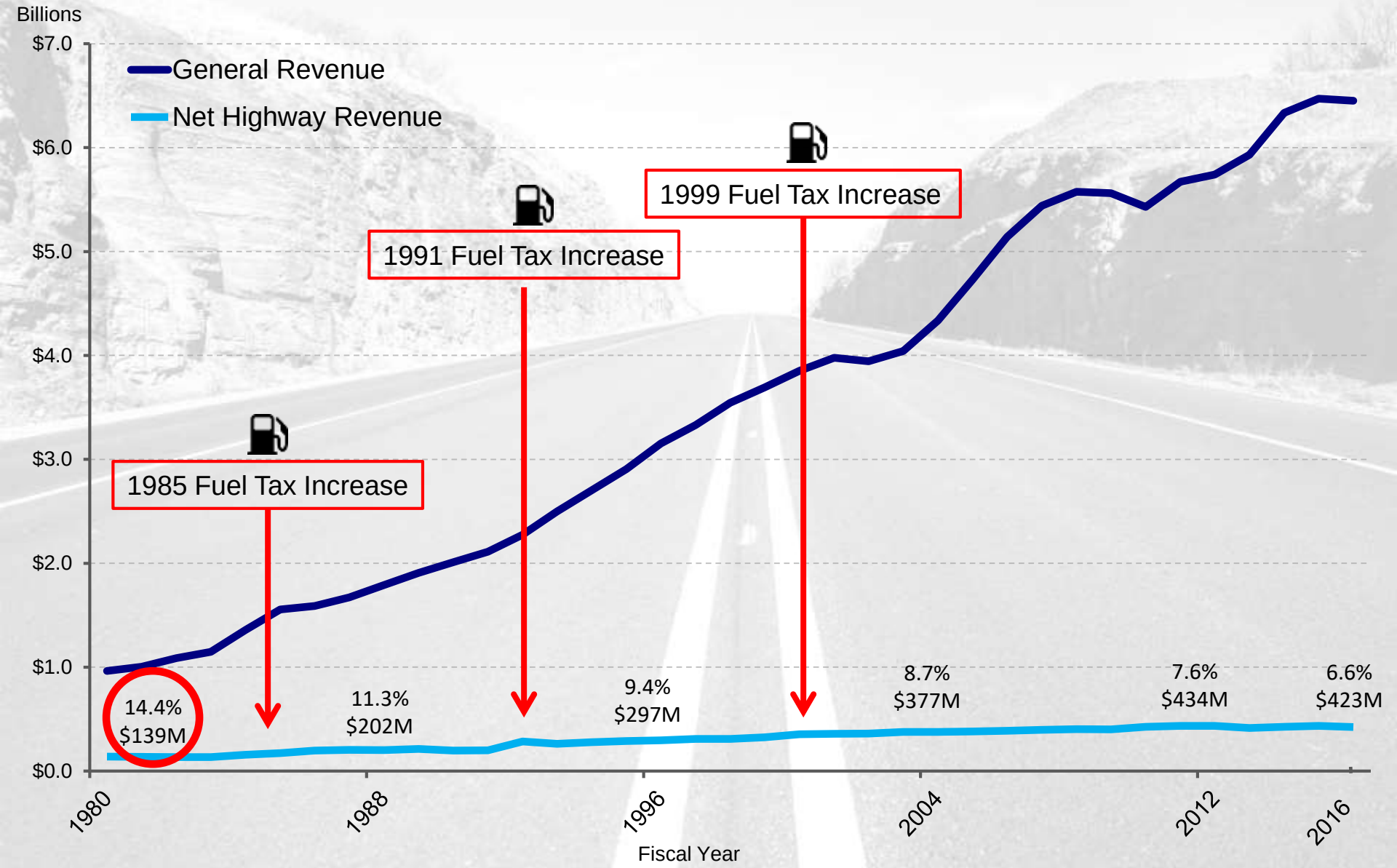
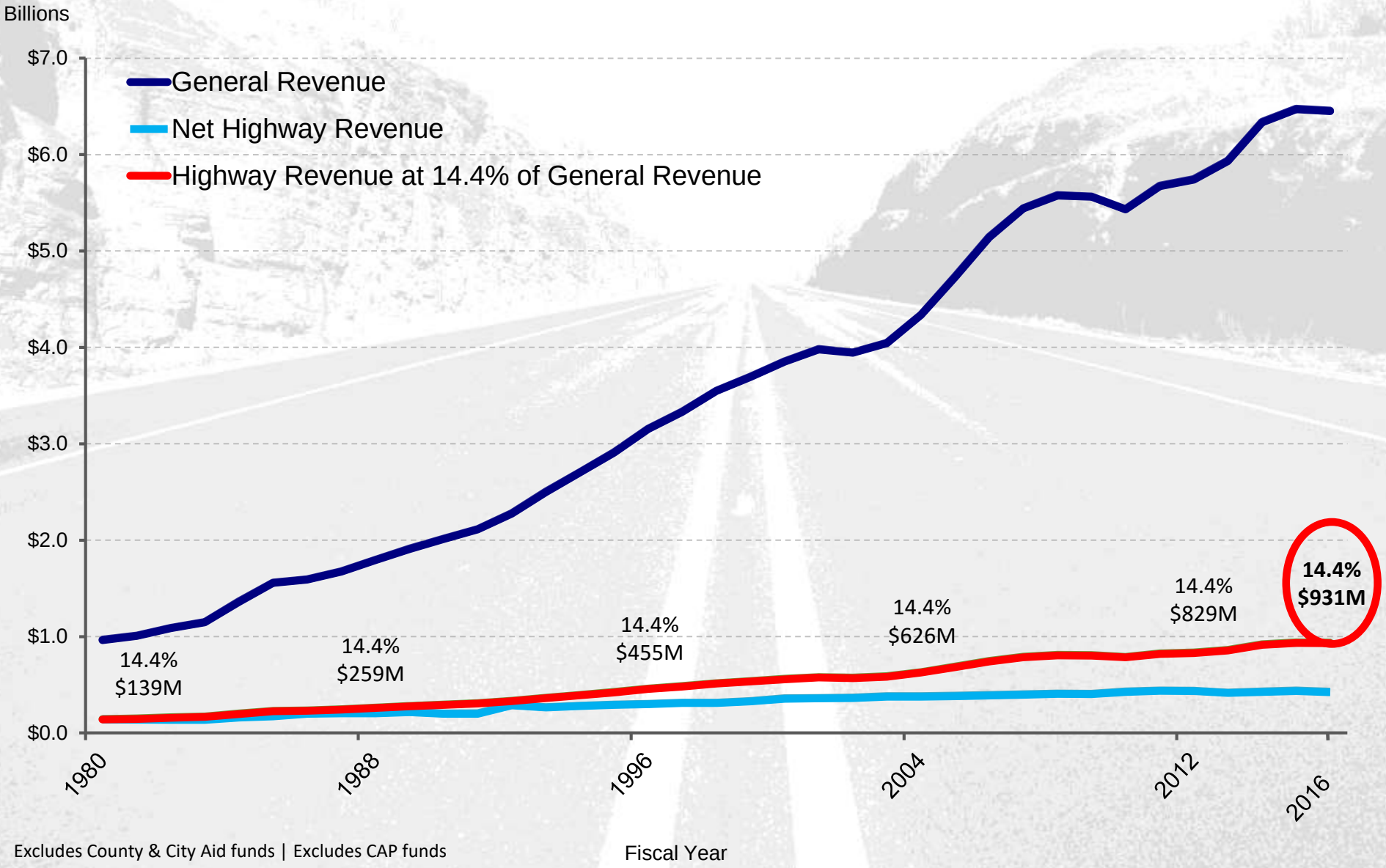
Percent of Highway vs. General Revenue



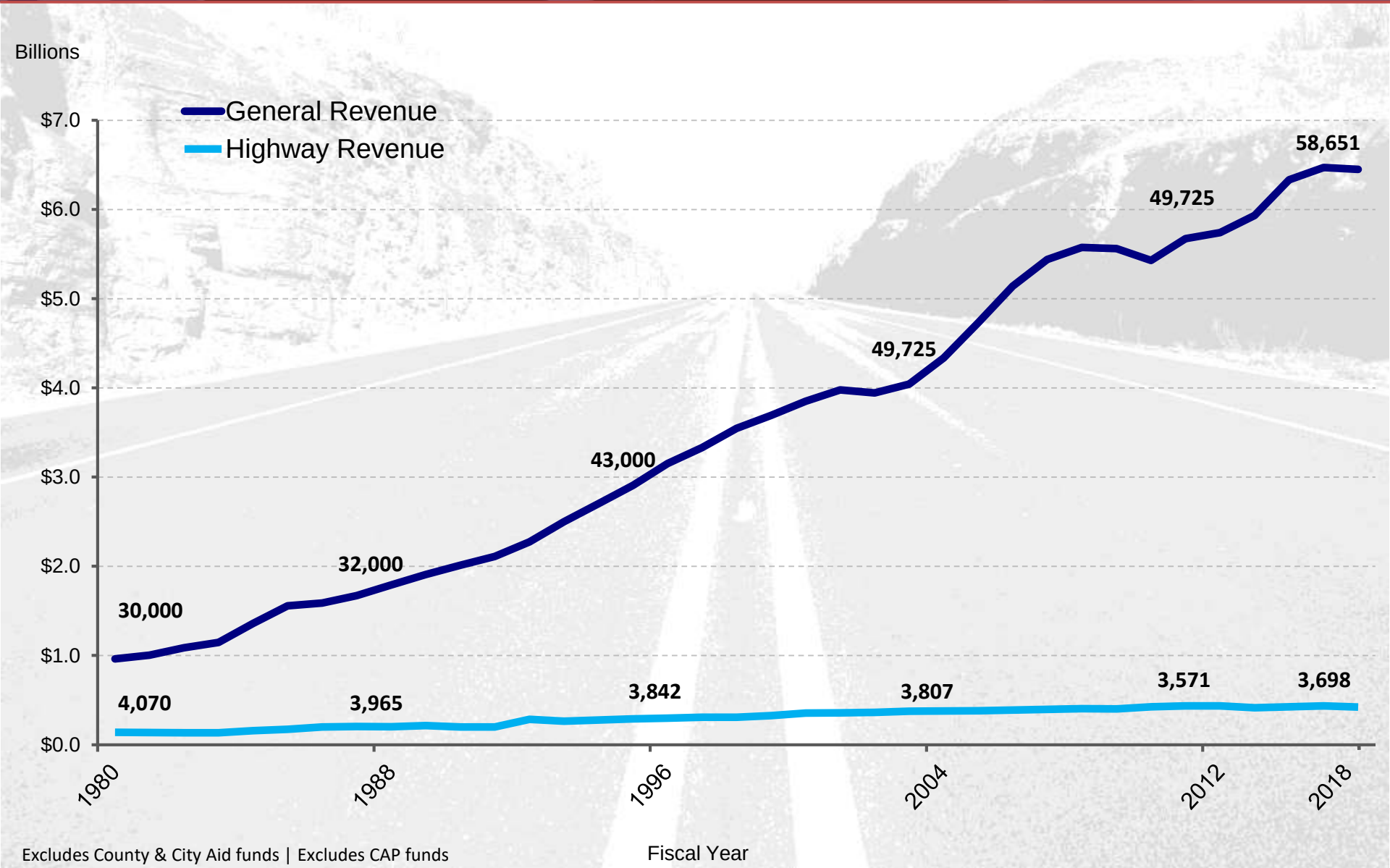
Excludes County & City Aid funds | Excludes CAP funds

Highway Revenue at 14.4% of General Revenue



Excludes County & City Aid funds | Excludes CAP funds

Highway vs. General Revenue Compared to Employment Levels



Excludes County & City Aid funds | Excludes CAP funds


AR DOT
ARKANSAS DEPARTMENT
OF TRANSPORTATION
Possible Potential
New Program Discussion

Options for Generating Additional Revenue for Highways

Source	$400 Million for Highways[1]
Fuel Tax	28.4¢
Sales Tax on Fuel (wholesale)	16.67%
Registration Fee	$208
General Sales Tax[2]	1.16%

1 Amount shown is annual net to highways – after deduction for CFA/CSF and 30% to cities and counties.

2 Transfer of 4.5% (“general” portion of statewide sales tax)

Citizens Opinion Survey

CITIZENS OPINION SURVEY ON HIGHWAYS IN ARKANSAS

MAIL OR EMAIL RESPONSES TO:
ArDOT
Public Information
P.O. Box 2261
Little Rock, AR 72203
info@ardot.ar.gov

Are you satisfied with the condition of the existing state highway system?

❍Yes ❍No

What highways in your area need improvements, and what type of improvements do they need?

Priority 1: _____
Priority 2: _____
Priority 3: _____
Priority 4: _____

If you want better highway conditions, the Arkansas State Highway and Transportation Department will need additional funds. Would you support a new highway program that would generate additional revenue?

❍Yes ❍No

Which of the following sources do you recommend be utilized in obtaining additional funds (check all that apply):

❍ Increase in gas tax
❍ Increase in diesel tax
❍ Increase in sales tax (dedicated to highways)
❍ Increase in registration fees
❍ Add sales tax on wholesale price of motor fuels
❍ Transfer existing sales and use tax on motor vehicles and related parts and service (currently collected but not paid to highways)
❍ Other: _____

Would you be willing to sign a petition to put a highway revenue proposal on the 2018 general election ballot?

❍Yes ❍No

How did you hear about this survey

❍Presentation ❍TV/Radio/Print ❍Website/Search Engine
❍Social Media ❍Family or Friend
❍Other: _____

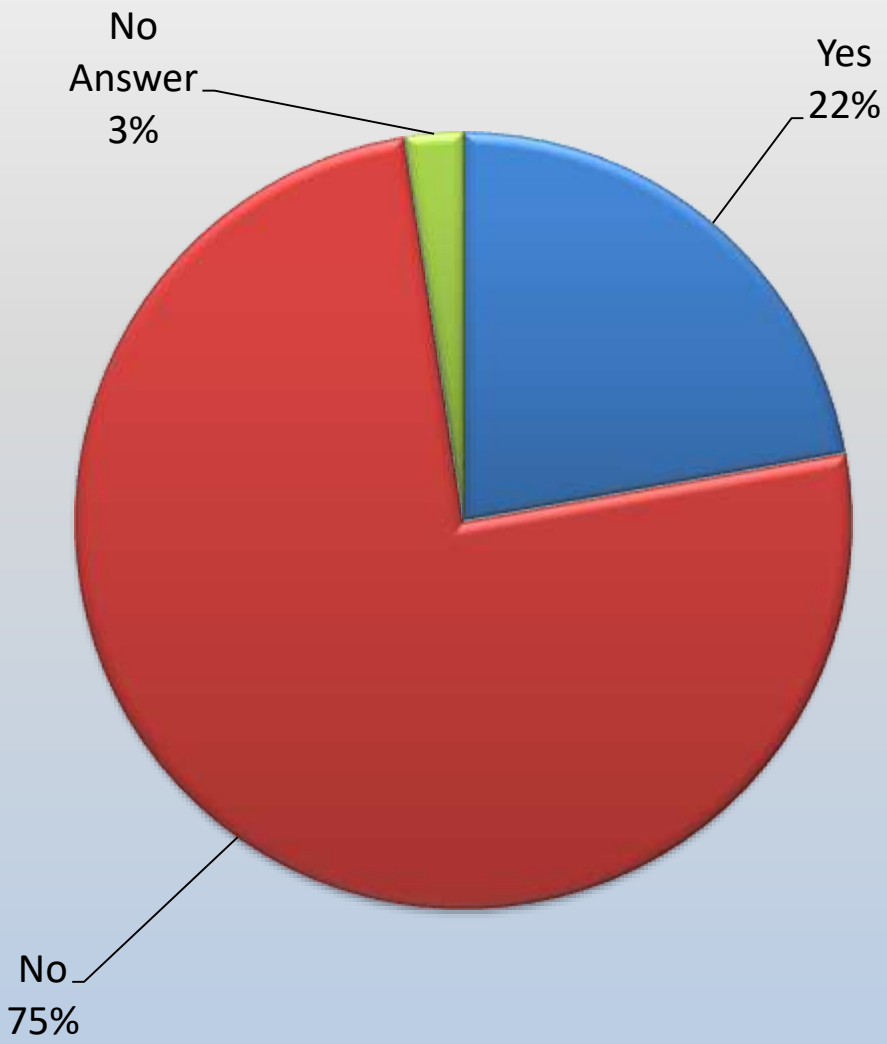
Optional:

Name: _____
Address: _____
City, State, Zip: _____

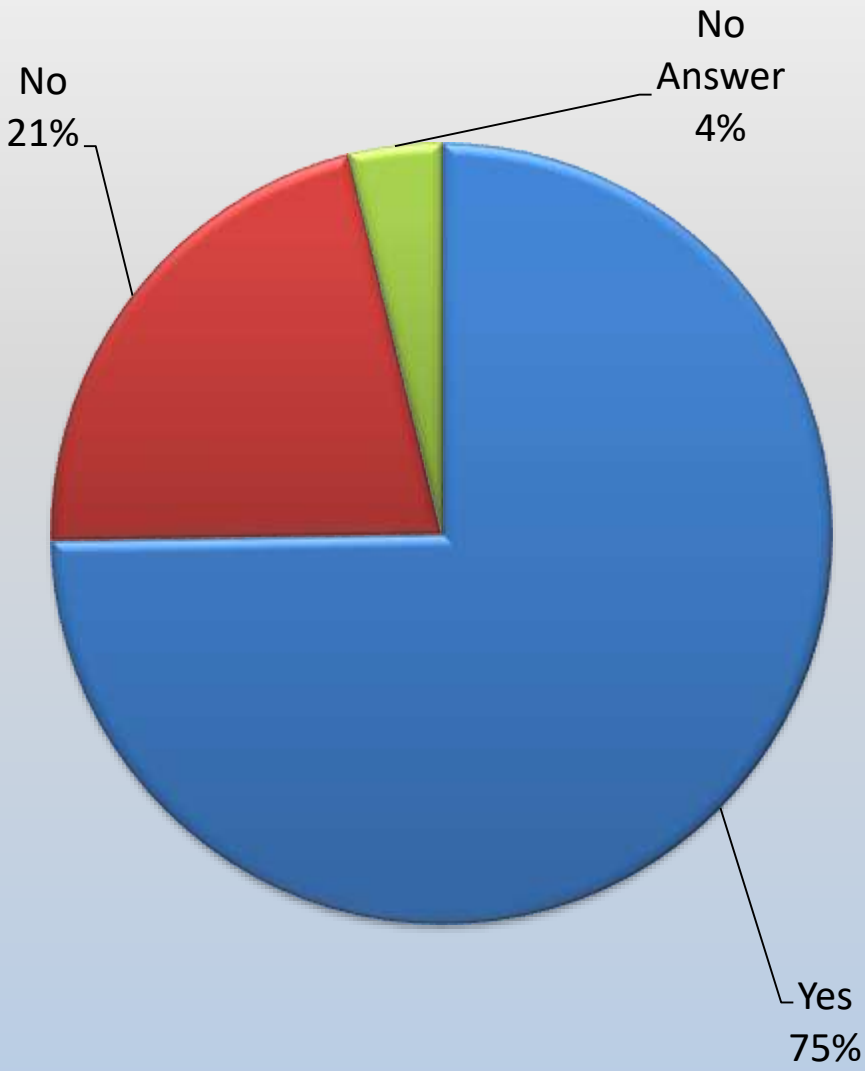
Online Form Available Here:

Survey Results

Are you satisfied with the condition of the existing highway system?

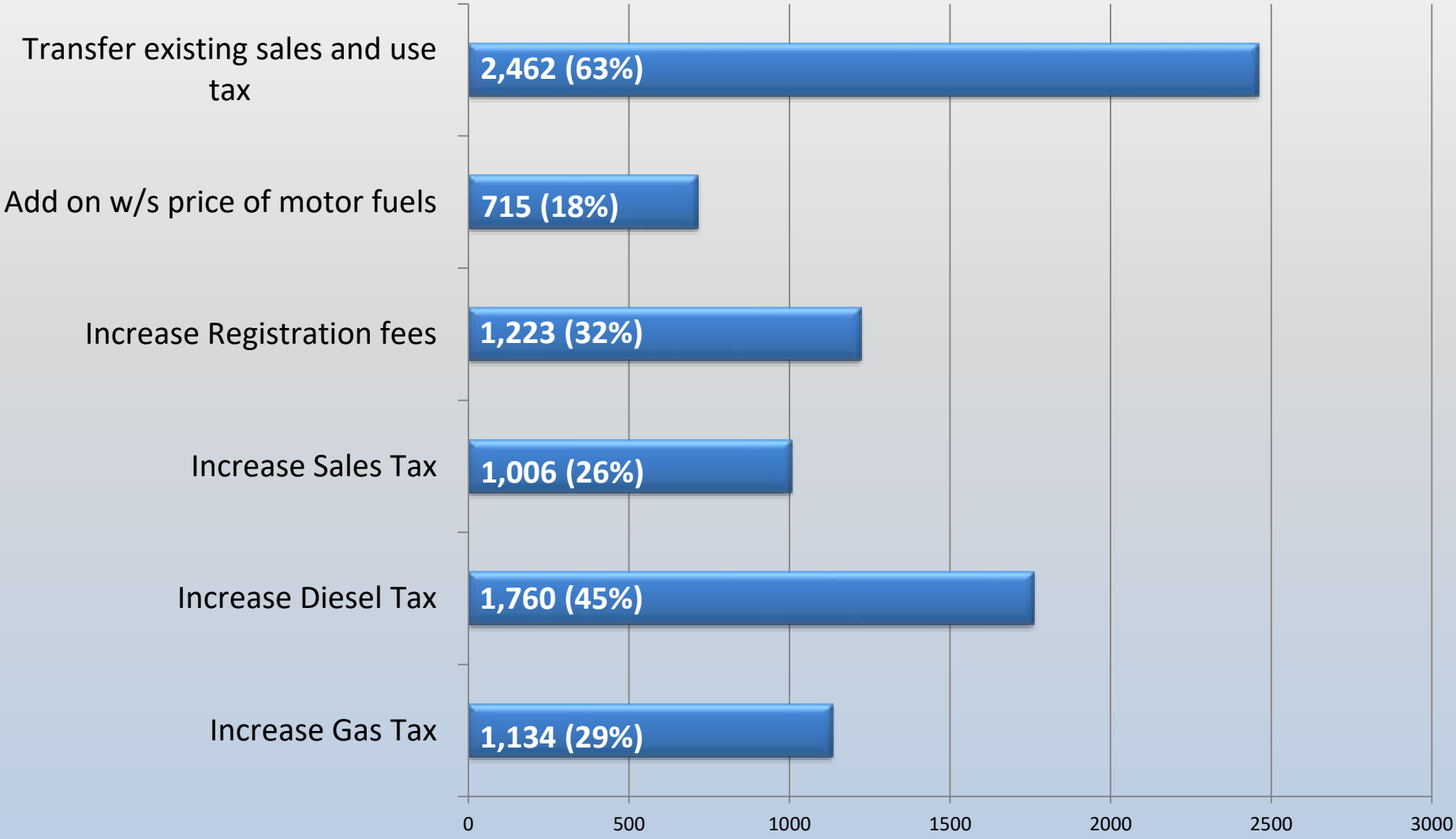


Would you support a new highway program that would generate additional revenue?



Survey Results

Which of the following sources do you recommend be utilized in obtaining additional funds?



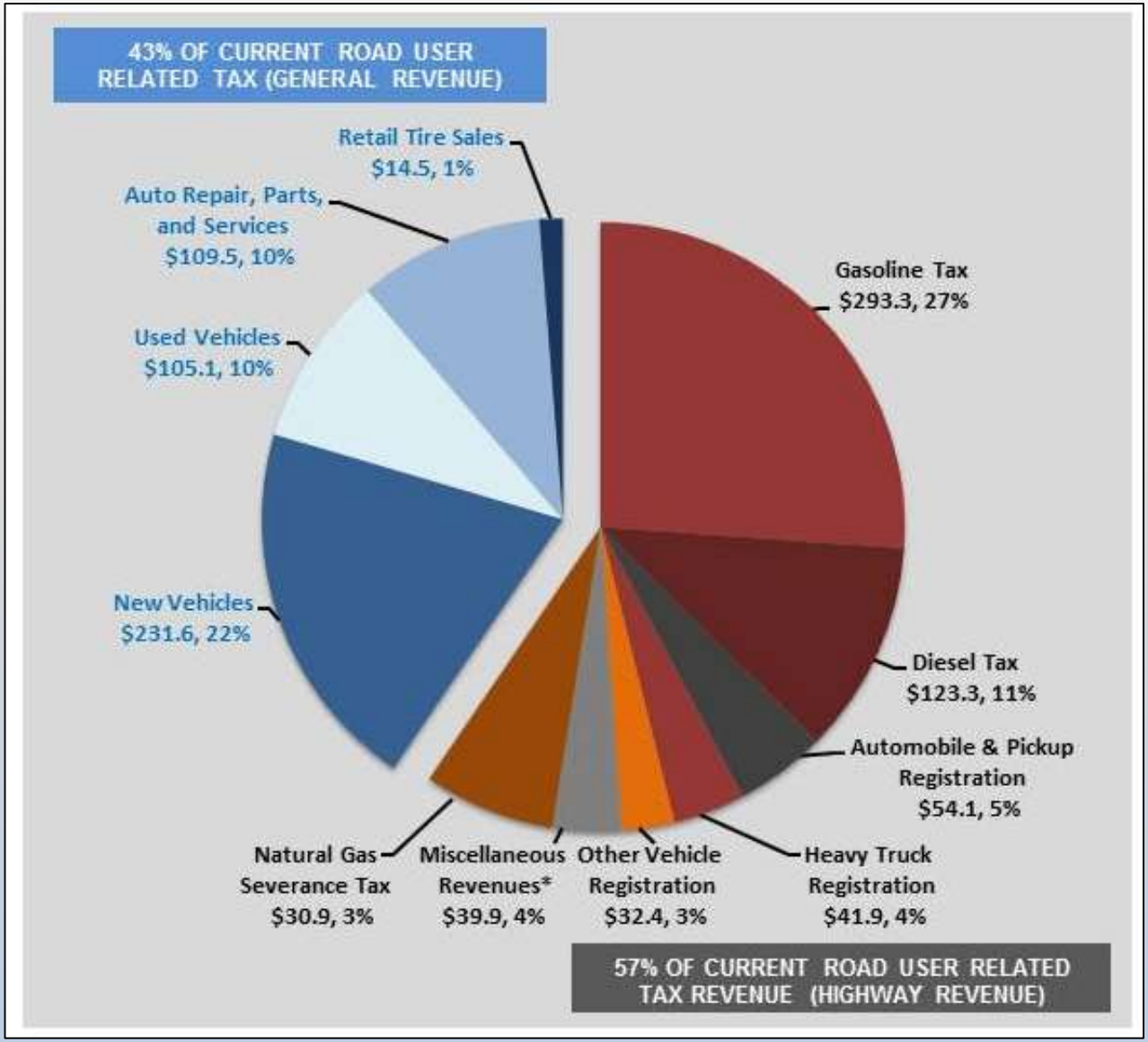
Road User Related Tax Revenue (SFY 2016)

Total Road User Revenue
$1,076.5 Million

Distribution:

General Revenue
$460.7 Million (43%)

Highway Revenue
$615.9 Million (57%)



Arkansans Need to Decide How to Fund


AR DOT
ARKANSAS DEPARTMENT
OF TRANSPORTATION
Questions?