



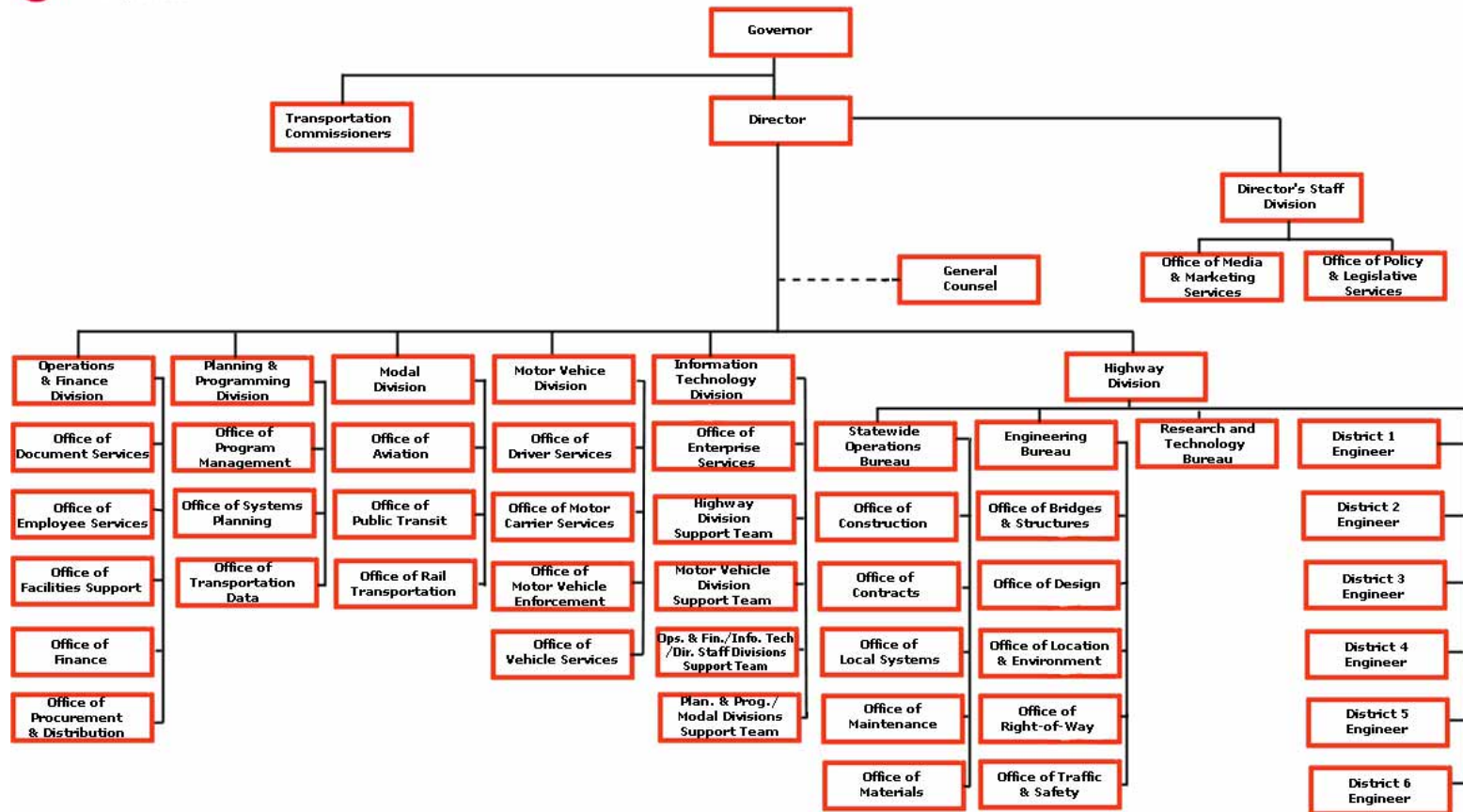
**IOWA DEPARTMENT OF
TRANSPORTATION**

HIGHWAY DIVISION

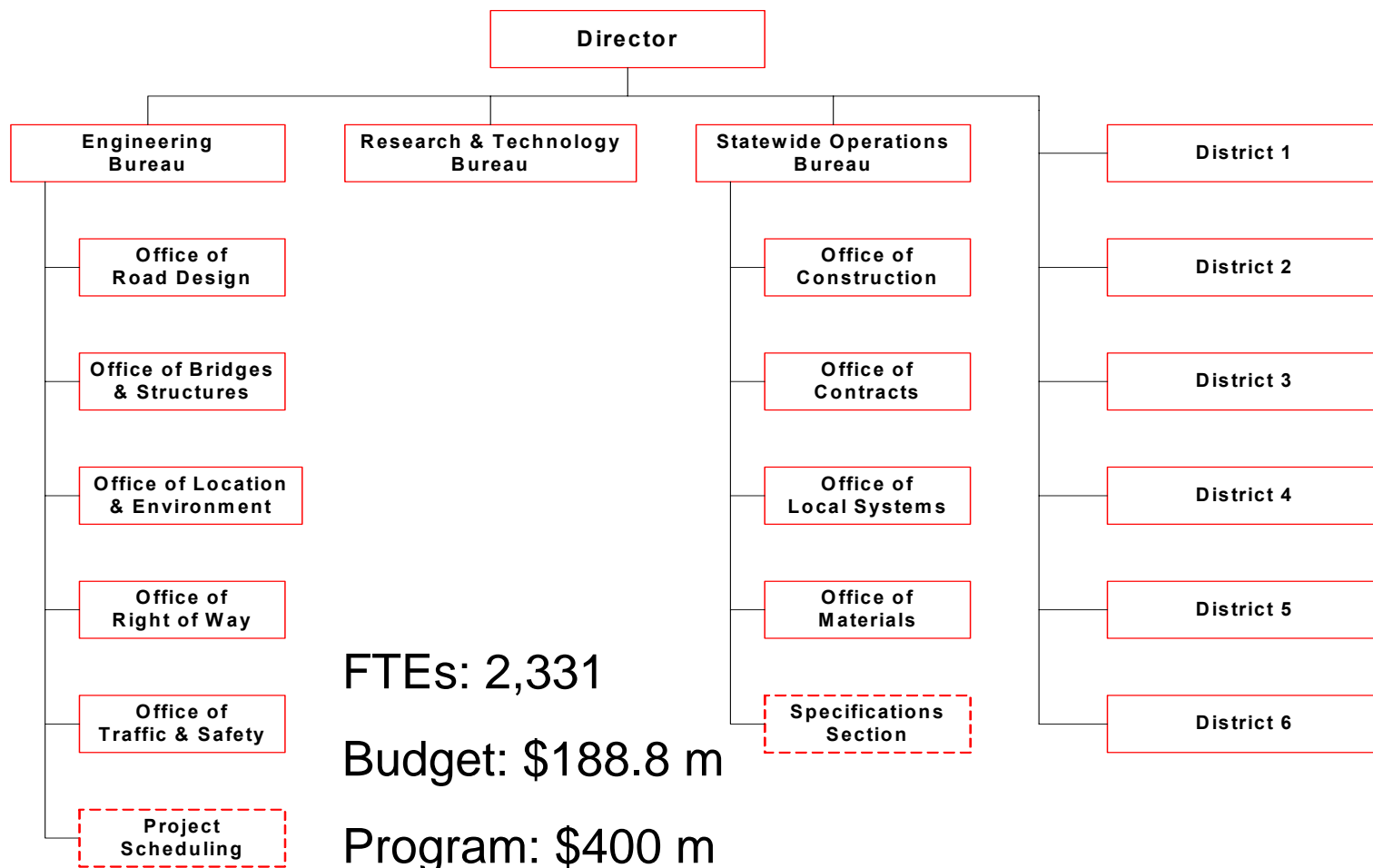
FUTURE TRANSPORTATION ISSUES

- **Kevin Mahoney, Director
Highway Division**
- **John Adam, Director
Statewide Operations Bureau**
- **Sandra Larson, Director
Research & Technology Bureau**
- **Mitchell Dillavou, Director
Engineering Bureau**

DOT ORGANIZATION



HIGHWAY DIVISION ORGANIZATION



HIGHWAY DIVISION RESPONSIBILITIES

Engineering Division

Design - 146 FTEs

- design policies and standards
- erosion control projects
- preliminary survey
- aerial photography
- consultant design projects
- pavement design/mgt./rehab
- soil survey/design
- project design
- vegetation management
- rest area design
- landscaping & erosion control projects

Bridges & Structures - 84 FTEs

- hydraulics/preliminary design
- bridge & structure final design
- consultant design projects
- policies and standards
- bridge & structure inspection
- bridge rating
- bridge database
- Superload truck permit analysis

Right of Way - 75 FTEs

- right of way design
- property market value
- property acquisition
- right of way management

Location & Environment 47 FTEs

- NEPA compliance
- prehistoric/historic resource preservation
- Native American interests
- traffic noise studies & abatement planning
- 404 permit compliance
- protected plants, animals, nature areas
- location and pre-location
- corridor preservation
- public involvement
- scenic byways
- regulated materials investigation/managment
- spill recovery
- employee safety

Project Scheduling - 3 FTEs

- develop and maintain online reporting system
- monitor and report project development status
- coordinate development and programming activities
- monitor project development and construction impacts on cash flow

Traffic & Safety - 43 FTEs

- design and operation of signing, signals and lighting
- manage safety programs, manage crash data and conduct safety studies
- advertising management
- fabricate, warehouse & distribute signs
- access, utilities and work zones

HIGHWAY DIVISION RESPONSIBILITIES

Statewide Operations

Contracts - 21 FTEs

- contract lettings
- bid estimates
- external civil rights program
- letting/cost data

Construction - 12 FTEs

- technical/administrative support for highway projects statewide
- coordination of quality improvement initiatives
- implement new technologies
- education, training, and technology transfer
- develop policies and provide guidance for construction practices

Local Systems - 13 FTEs

- liaison w/ counties, cities, utilities
- administer federal/state-aid programs
- guidance for local agency projects
- funds & reports for local agencies
- city/county agreements
- primary project & TJ agreements
- utility agreements
- training for local agencies & utilities
- Street Finance Report

Materials - 61 FTEs

- maintain AMRL accreditation
- QA of Materials per FHWA
- Final Materials audit authority
- research support and testing
- new technology & materials evaluation
- Pavement Management data base
- pavement/structural testing & evaluation
- geological investigations and research
- statewide quarry certification
- materials technician certification/training program
- I.M. Administration & policy implementation
- AASHTO Materials/Testing Reviews
- field & central lab equipment mgmt
- Certification of District Materials labs
- statewide materials engineering & Admin support
- calibration, testing, certification of: air meters for state, local, & contractors; Motor Vehicle Enforcement Scales
- Manage Laser Lux/reflectivity testing

Maintenance - 53 FTEs

- statewide winter/snow programs
- Adopt-A-Highway
- statewide performance measurement
- statewide work program
- Resource Management System
- Maintenance Management System
- equipment Repair Shop
- statewide rest area administration
- statewide line marking program
- statewide fleet administration
- division budget and personnel issues
- emergency operations
- maintenance policies & standards

Specifications - 3 FTEs

- coordinate development, implementation, and publication of specifications
- manage Specification Committee activities
- develop and produce Electronic Reference Library
- coordinate with SUDAS group for efficiency and compatibility of specifications

HIGHWAY DIVISION RESPONSIBILITIES

Research & Technology Bureau

Research & Technology 11 FTEs
<ul style="list-style-type: none">- division recruiting- student co-op program- quality initiatives- leadership skills- division IP plan- strategic automation- statistical analysis/design- highway operations research- advanced transportation technologies- ITS- Iowa Highway Research Board

HIGHWAY DIVISION RESPONSIBILITIES

Districts

Districts - 1,752 FTEs

District Engineer - 193 FTEs

- design minor projects for letting
- represent DOT at public hearings
- ROW for project construction

Construction - 244 FTEs

- support of construction projects
- project progress and vouchers
- construction project administration
- construction inspection
- process all project voucher payments
- maintain all field records for auditing

Maintenance - 1,252 FTEs

- support of all maintenance activities
- operational guidance for primary roads
- operational strategies for winter activities
- fleet maintenance strategies
- winter snow/ice removal operations
- emergency response to disasters/ crashes
- preventive maintenance
- roadside maintenance

Materials - 64 FTEs

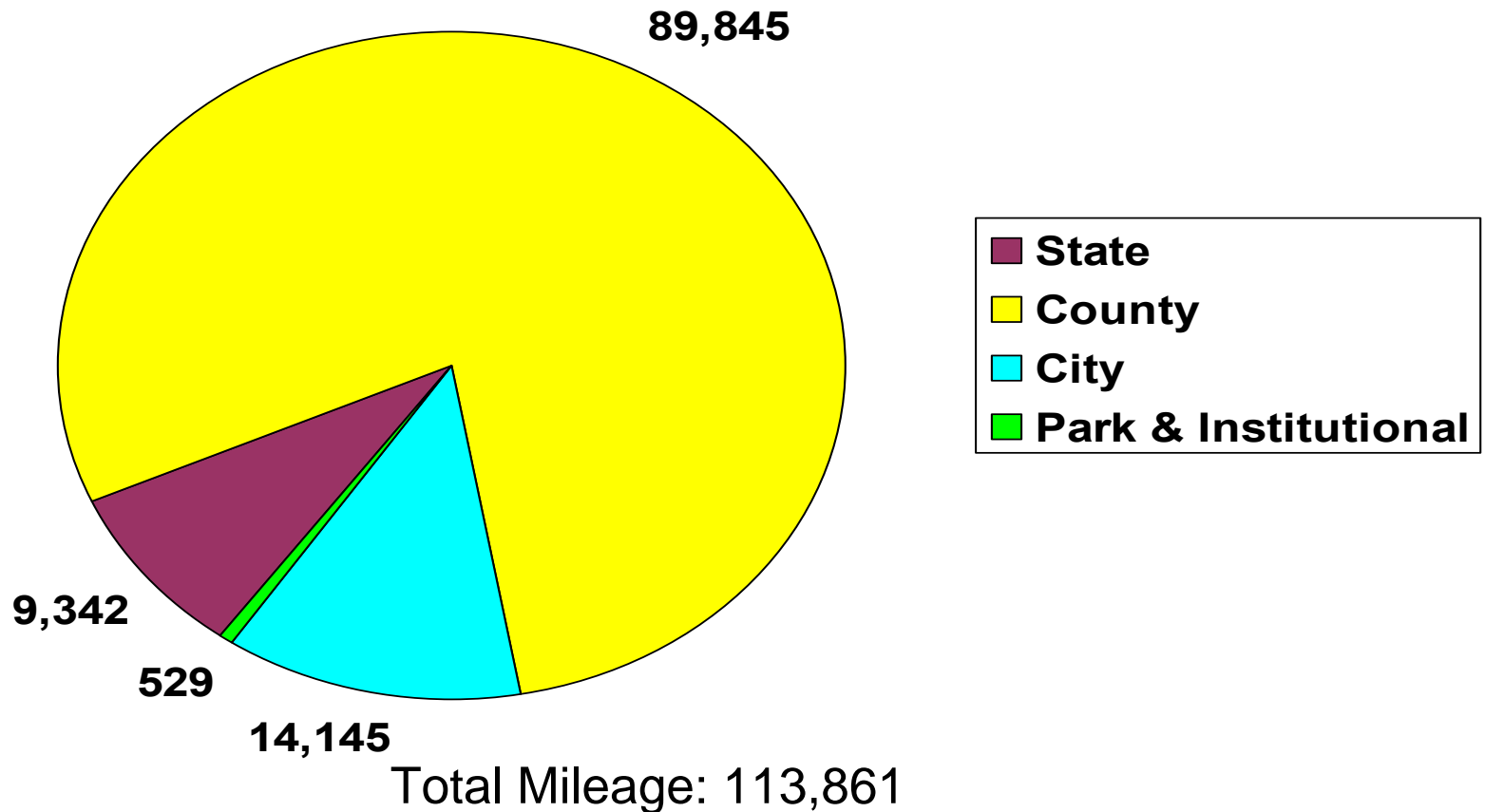
- material supply sources
- material inspection
- contractor compliance
- staff certifications

FUTURE TRANSPORTATION ISSUES

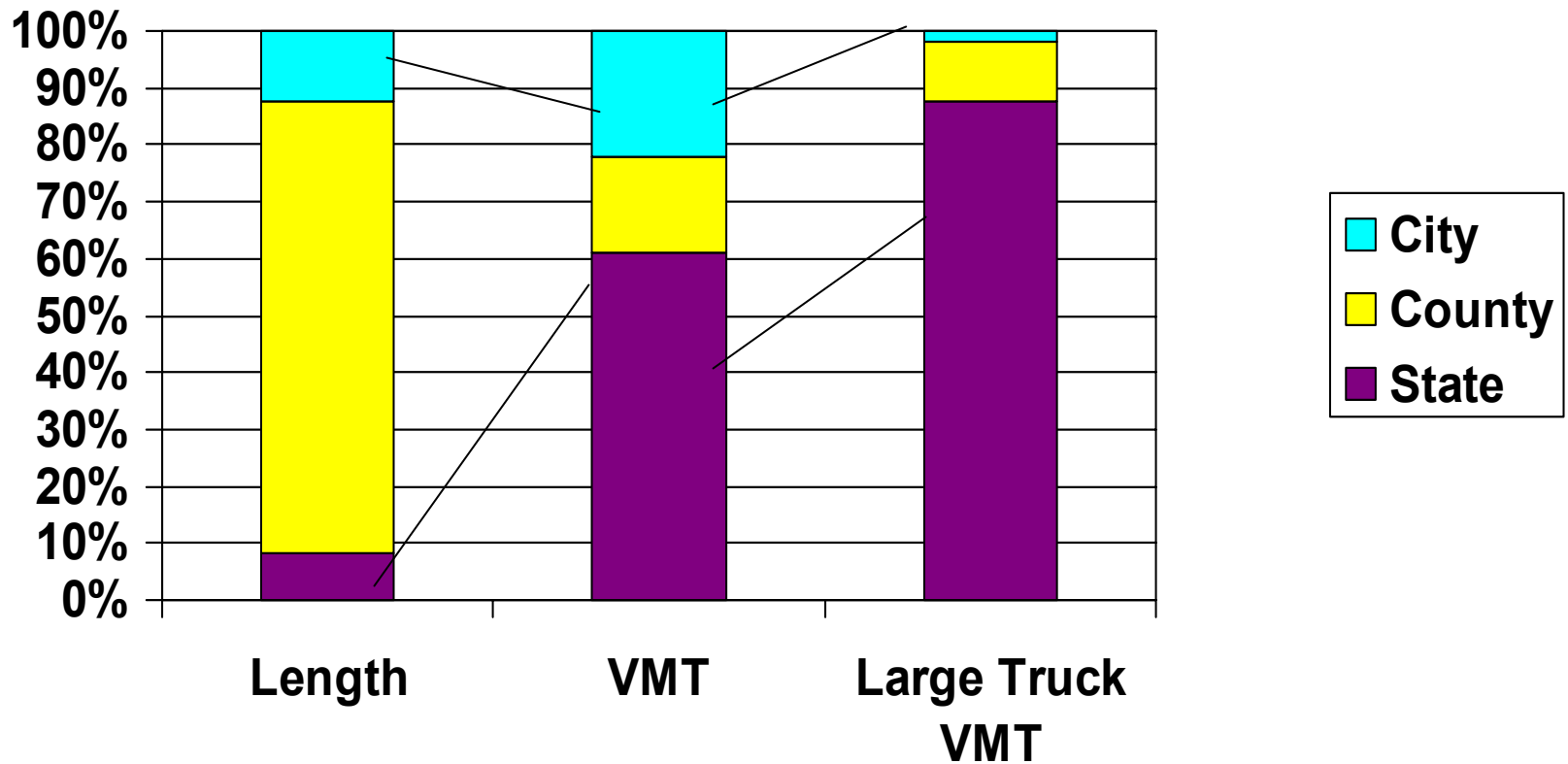
- Planning
- Road Funding Alternatives
- Safety
- Environmental
- Access Management
- Context Sensitive Design

STATE HIGHWAY PLANNING

Iowa Public Road System Mileage (As of January 1, 2004)



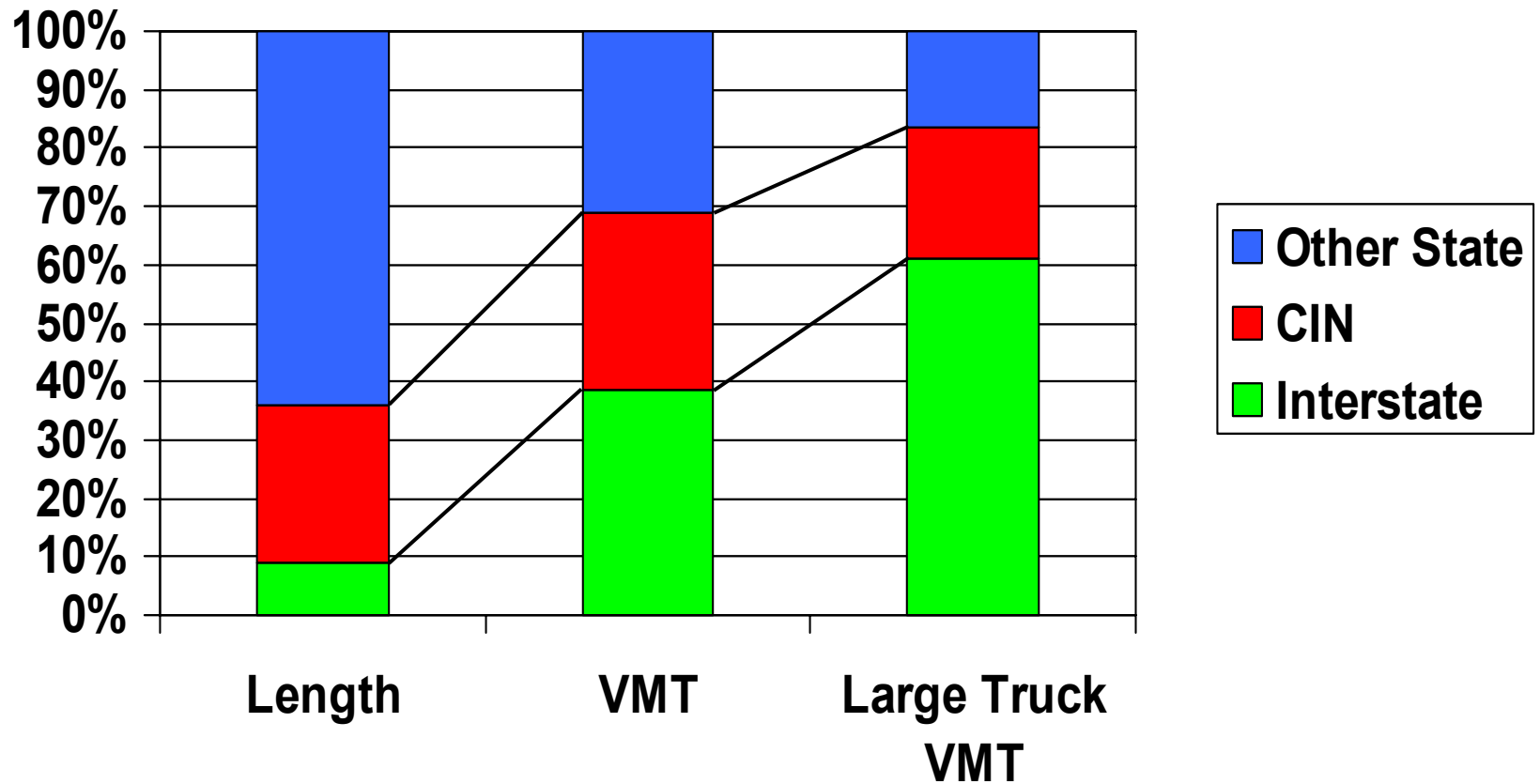
Iowa Road and Street System Comparison



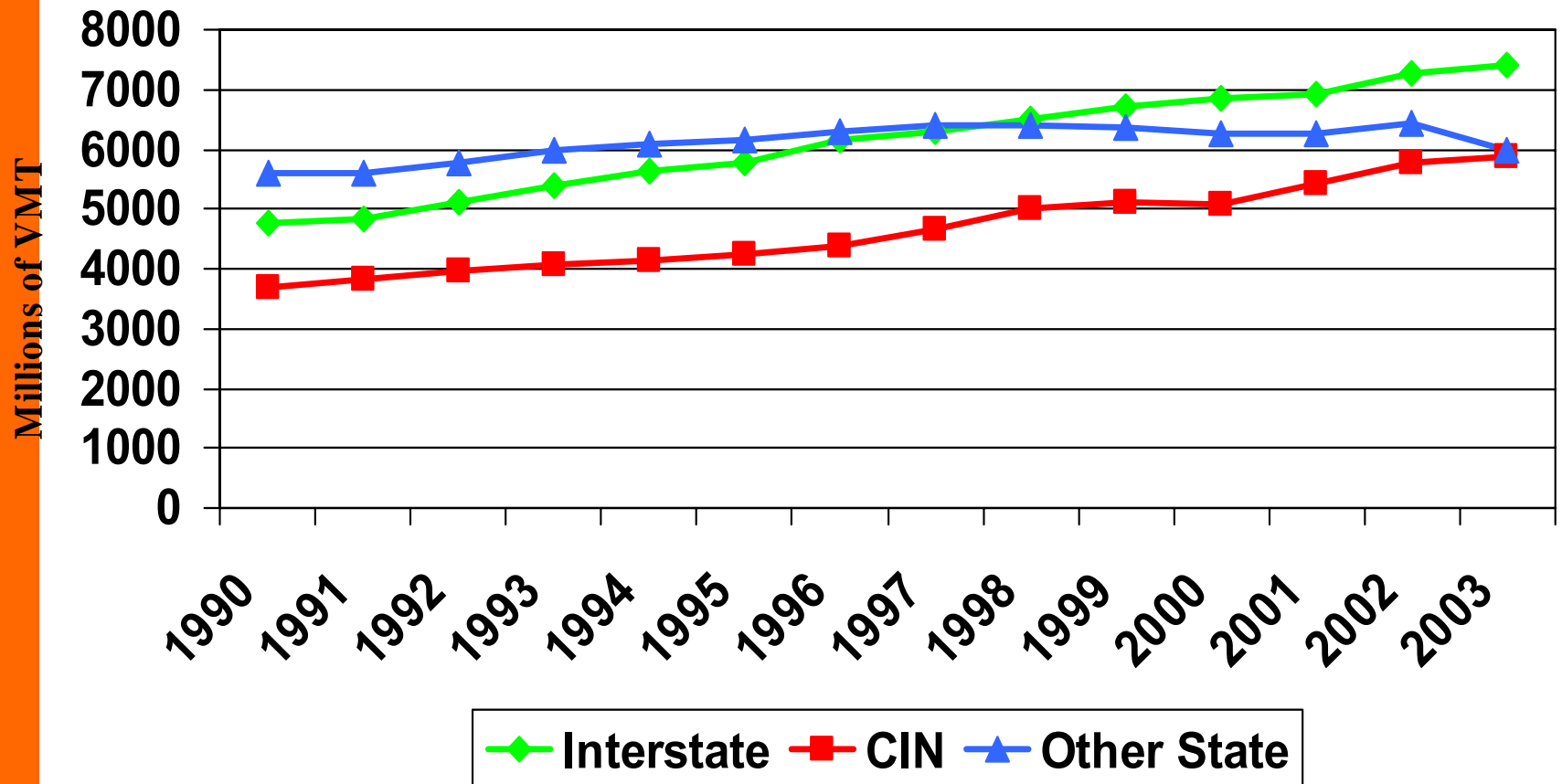
State Highway System Stratification

	Mileage
Interstate	782
Commercial and Industrial Network (CIN)	2,339
Other State	6,161
Total	9,342

State Highway System Comparison



Traffic Growth by System



Level Of Service (LOS)

- System of measure that describes operational conditions within a traffic stream
- Letter ratings A thru F designate each level with A being the best operating conditions and F the worst
- Generally applies to 'peak-hour' conditions

LOS A



- Free flow speeds
- Ability to maneuver in traffic stream is completely unimpeded
- Avg. spacing between vehicles is about 530 ft. (26 car lengths)

LOS B



- Reasonably free flow
- Lowest avg. spacing between vehicles is about 330 feet (17 Car lengths)
- Ability to maneuver within traffic stream is slightly restricted
- General physical and psychological comfort is still high
- Minor incidents and point breakdowns are absorbed

LOS C



- Speeds are still at or near free flow speeds
- Freedom to maneuver is noticeably restricted.
- Lane changes require more care.
- Minimum avg. spacing is about 220 ft. (11 car lengths)
- Queues may be expected to form behind minor incidents or point breakdowns

LOS D



- Speeds begin to decline with increasing flows
- Freedom to maneuver is more noticeably limited
- Driver tends to experience reduced physical and psychological comfort
- Minor incidents can create queuing
- Minimum avg. vehicle spacing is about 165 ft. (8 car lengths)

LOS E



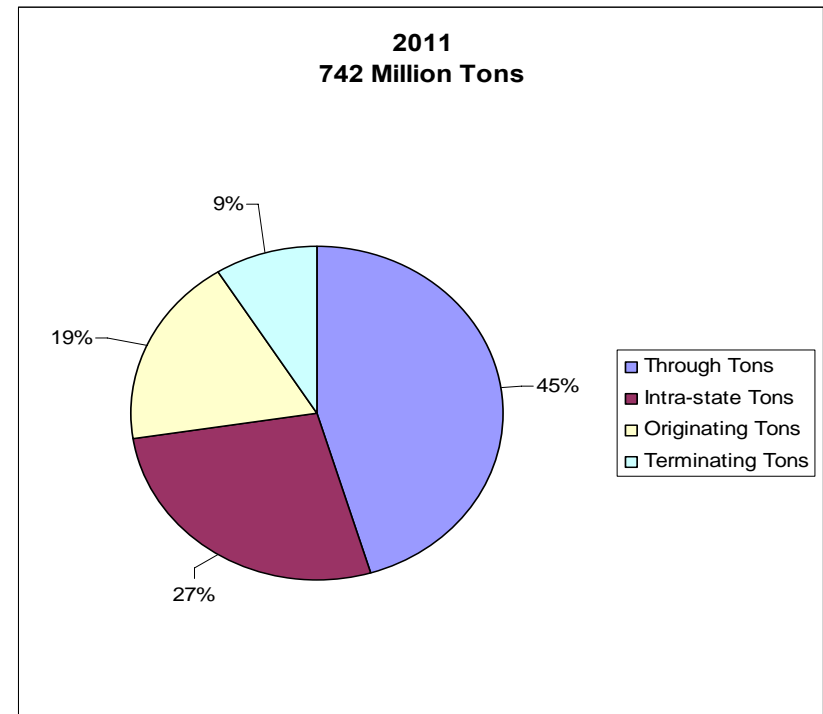
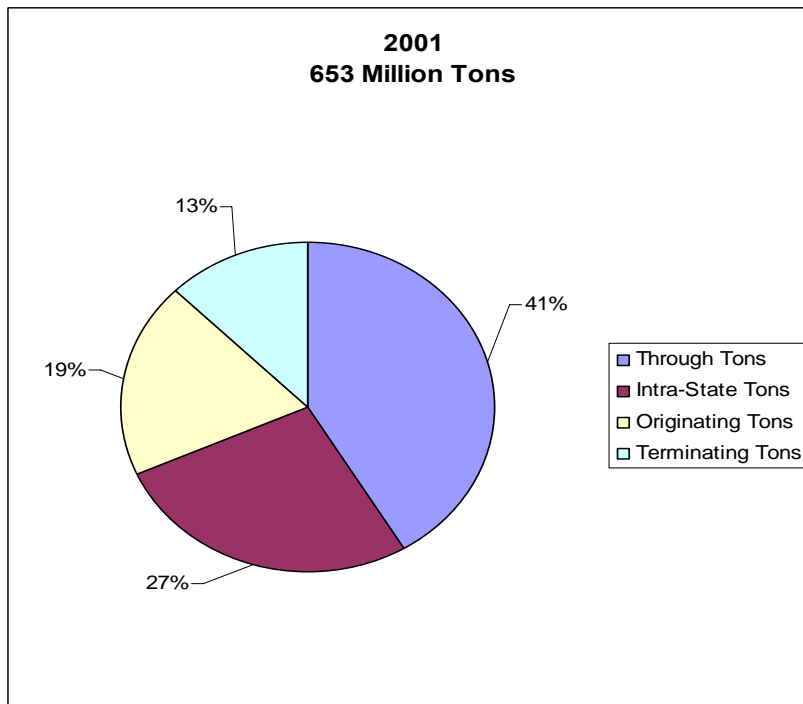
- Describes operation at capacity
- Vehicles are spaced at approximately 6 car lengths
- Minor disruptions can cause serious breakdown and extensive queuing
- Driver's physical and psychological comfort level is poor.

LOS F



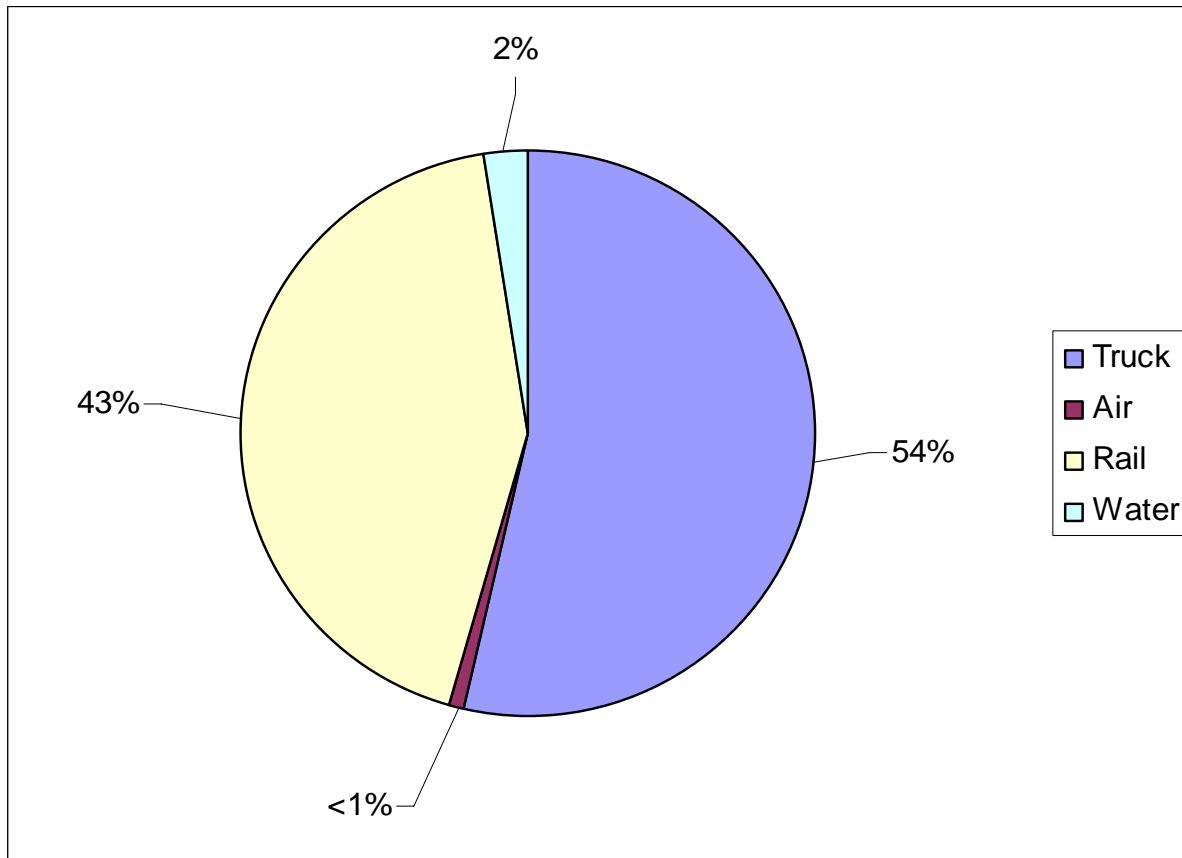
Beyond the capacity of
the roadway

Total Iowa Freight Movements 2001-2011



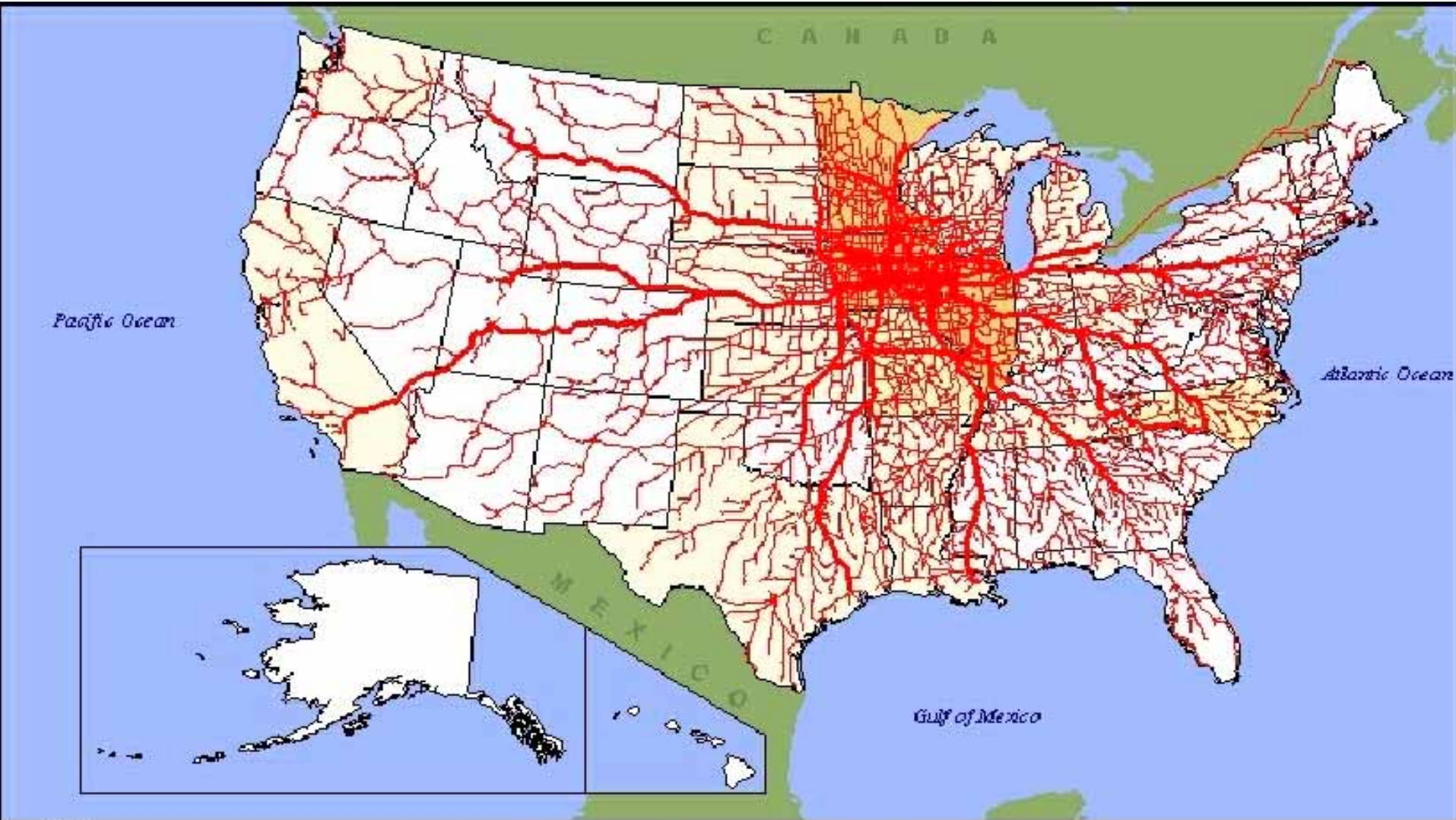
Freight Value by Mode - 2001

Total \$637 Billion



Iowa Truck Flows

(To, From, Within)



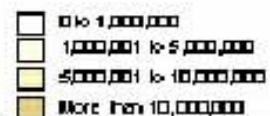
U.S. Department of Transportation
Federal Highway Administration
Office of Freight Management and Operations
Operations Core Business Unit

IOWA
Total Combined Truck Flows
(1998)

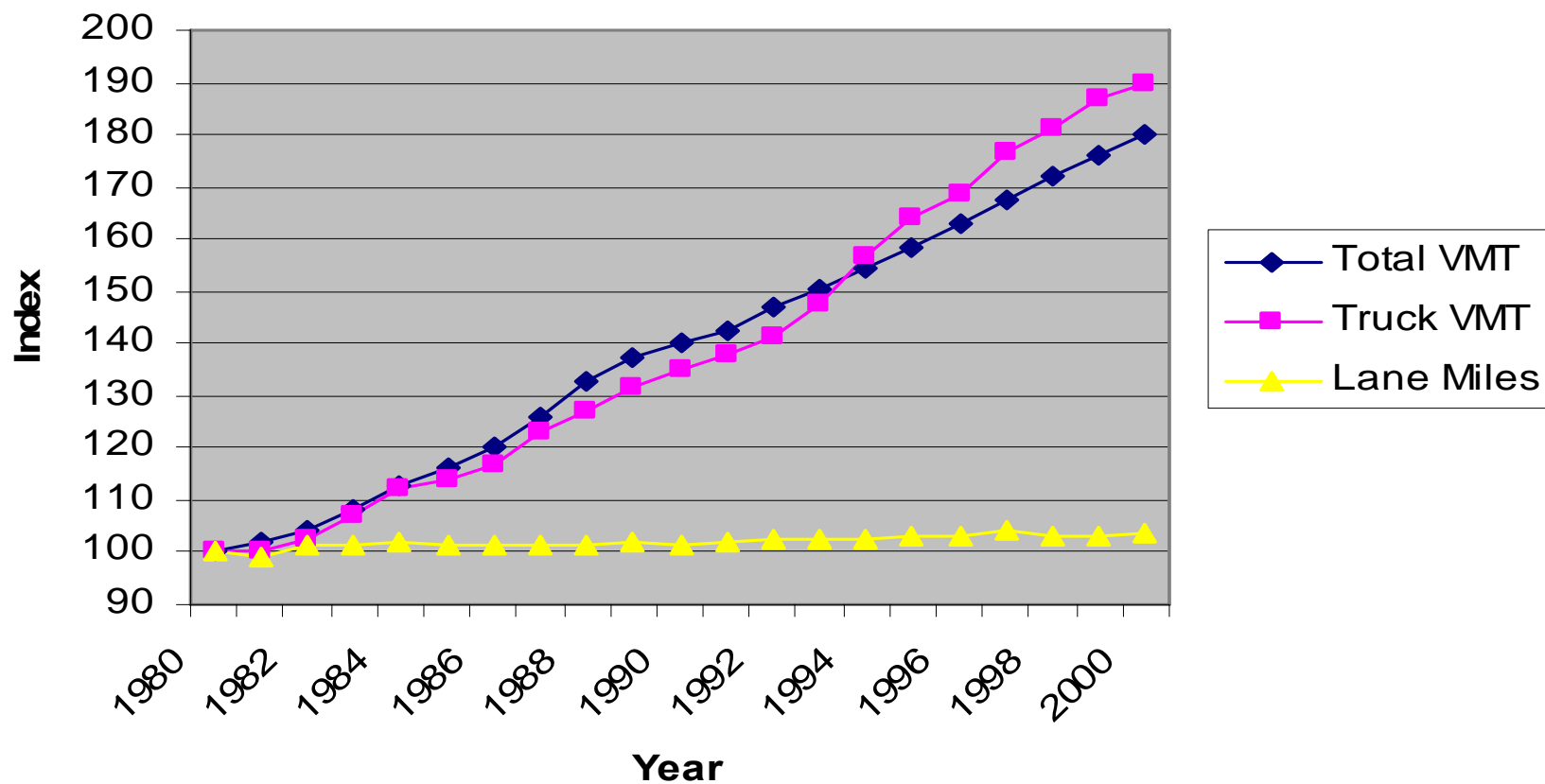
Network Flows
(To/From)



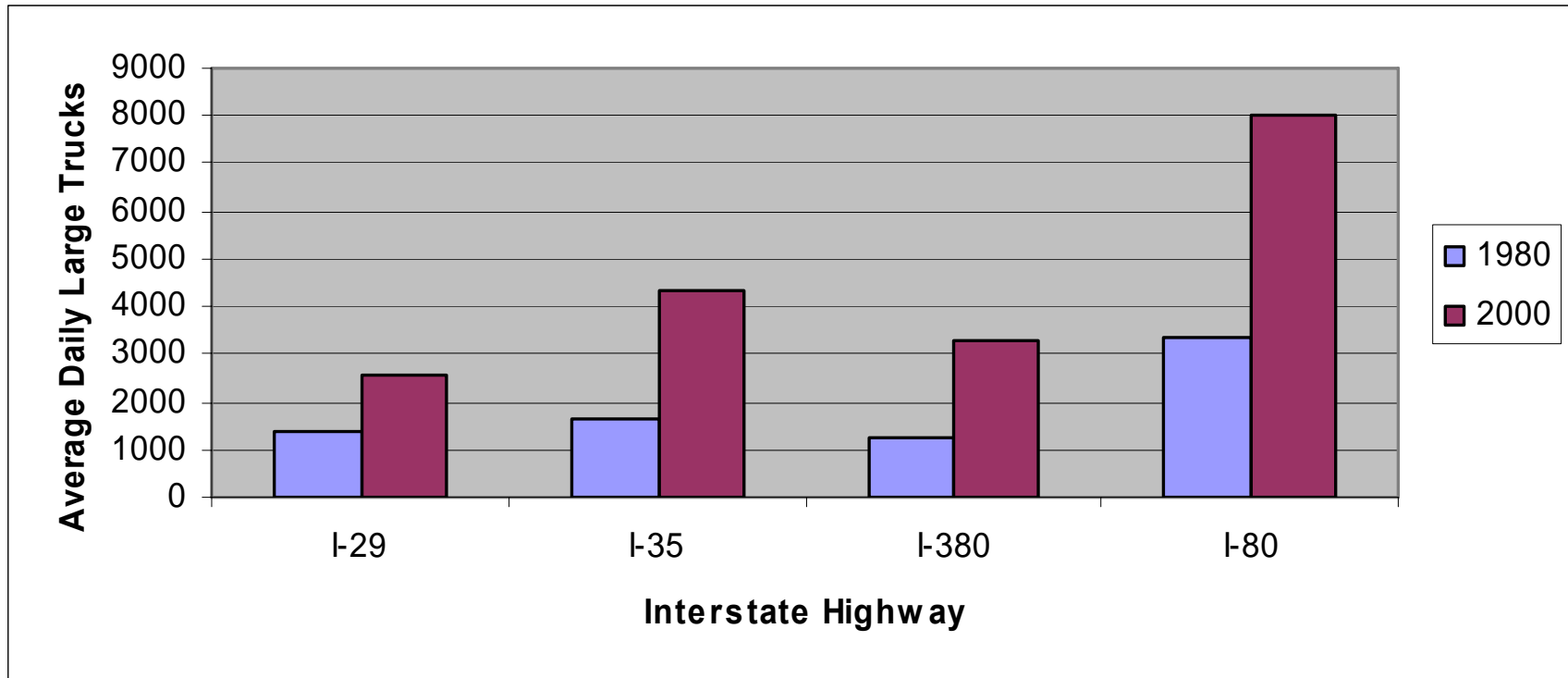
State-to-State Flows
(To/From)



VMT Growth vs. New Lane Miles



Average Daily Large Truck Increase Iowa Rural Interstates 1980-2002



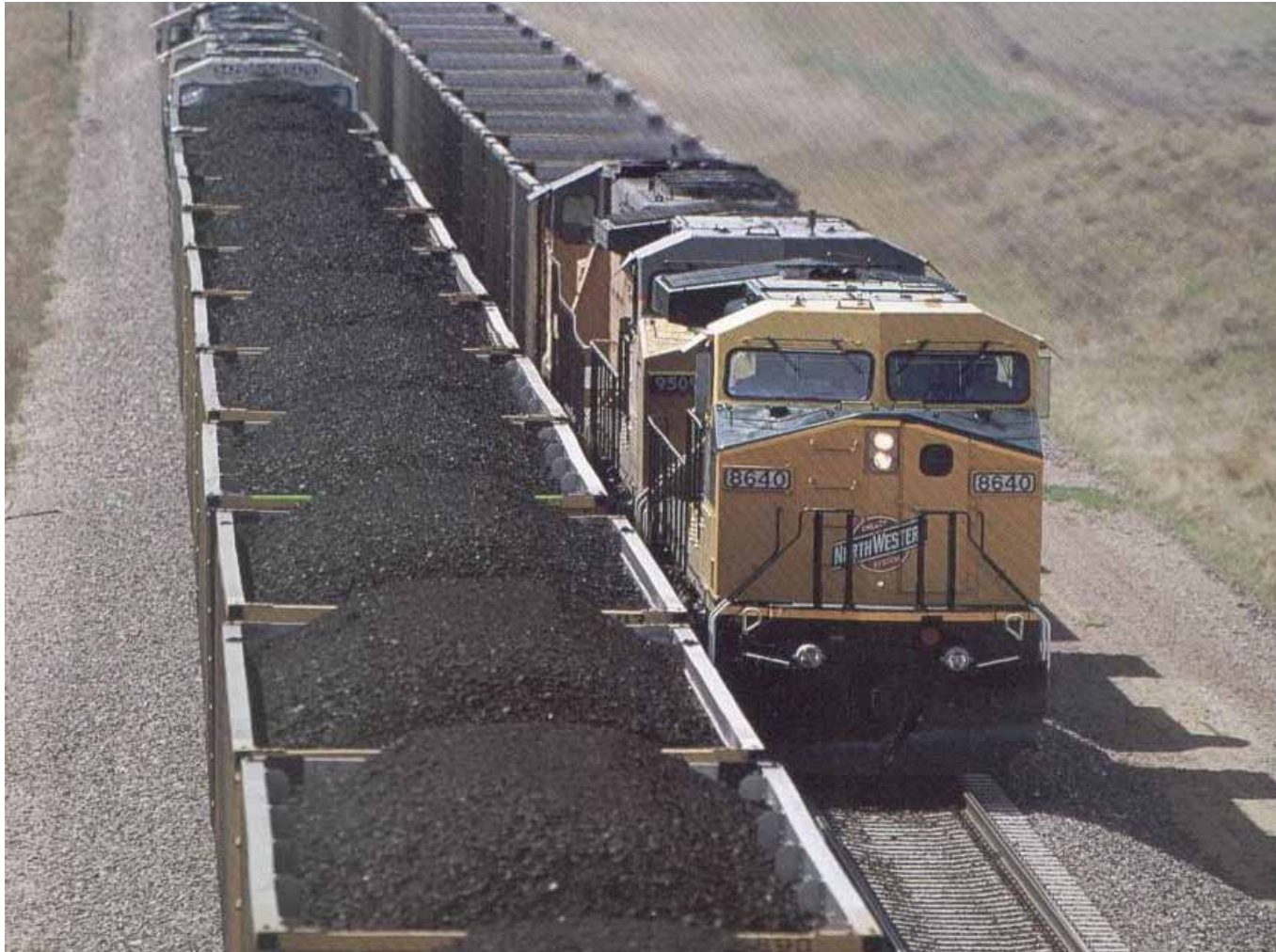
Truck as the Alternative to Rail



Increasing Truck Traffic



Wyoming Coal to Iowa Utilities



Iowa Corn to Foreign Countries



Iowa Tractors to China

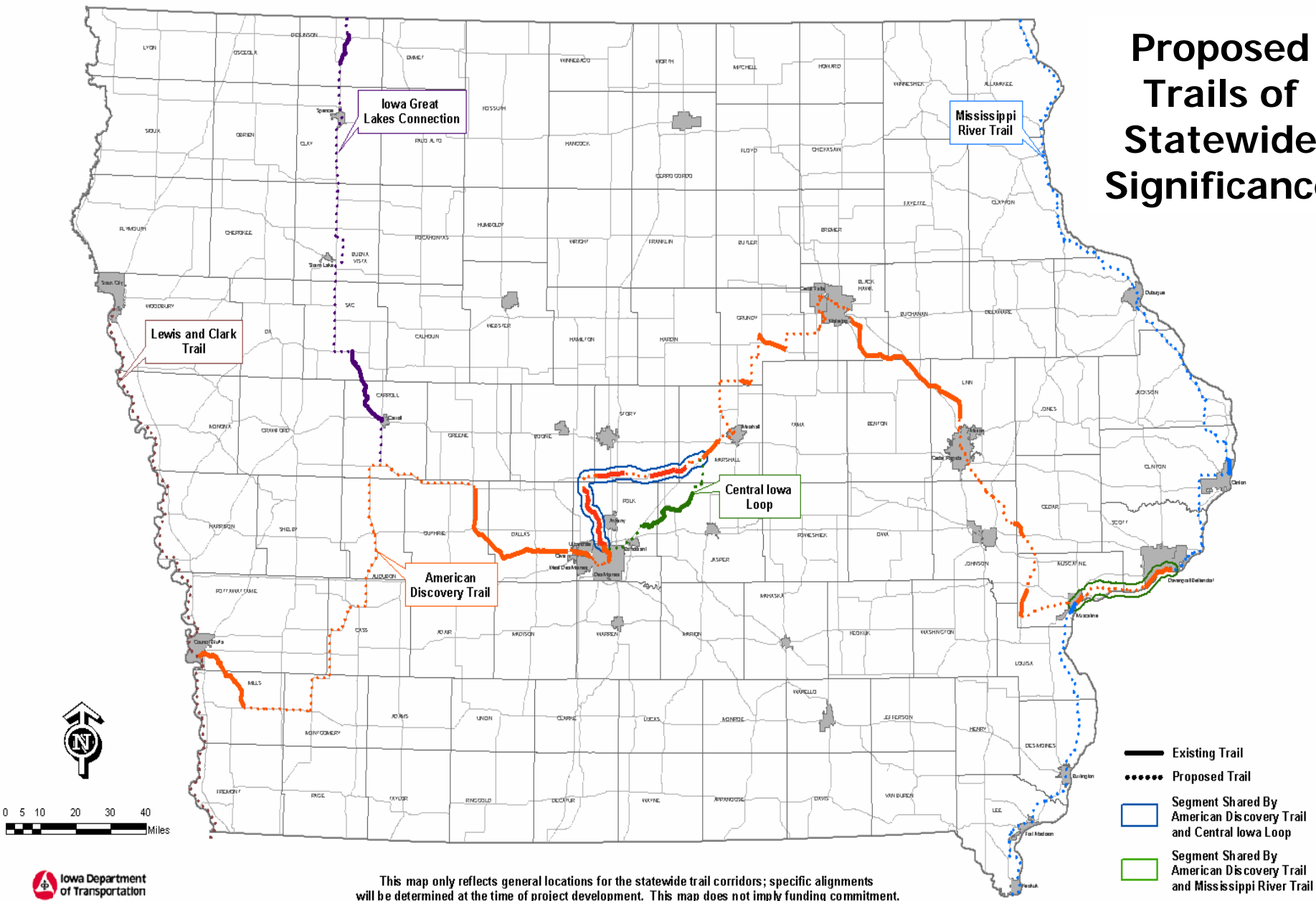


Bicycle and Pedestrian Plan

Proposed Trails of Statewide Significance

- American Discovery Trail
- Mississippi River Trail
- Central Iowa Loop
- Iowa Great Lakes Connection
- Lewis and Clark Trail

Proposed Trails of Statewide Significance



This map only reflects general locations for the statewide trail corridors; specific alignments will be determined at the time of project development. This map does not imply funding commitment.

Plan Guiding Principles

Moving people and goods through investments that strengthen our economic vitality.

Transportation investments should:

- Enhance our ability to compete economically
- Enhance Iowa's natural resources
- Provide mobility and accessibility opportunities for everyone

Plan Goals

Efficiency

To make the best use of resources

Safety

To make Iowa a safer place to travel

Quality of Life

To make Iowa a better place to live, work and travel.

Iowa in Motion Directions

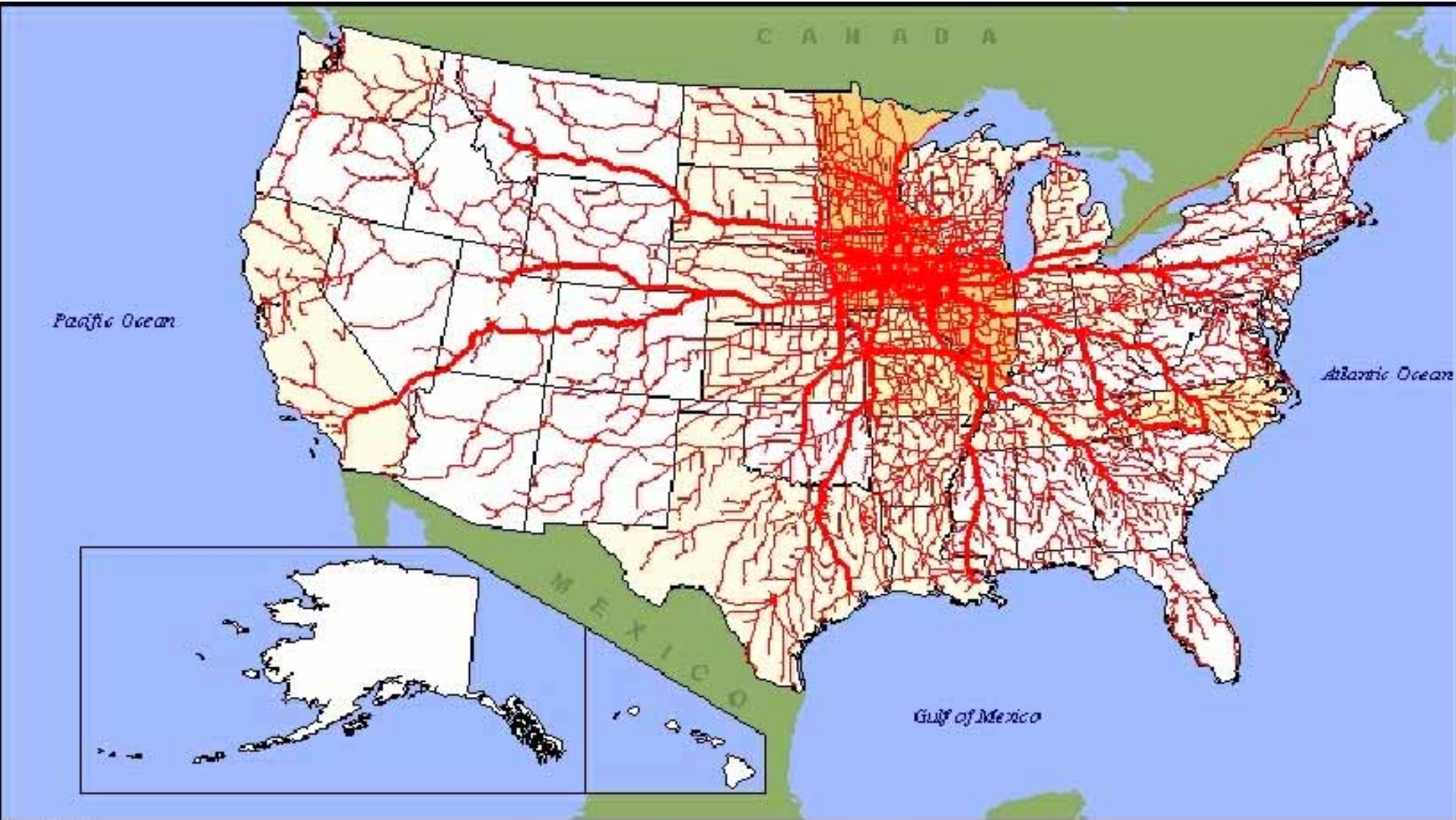
- Interstate system will have highest priority and be assured of adequate funding
- Increase Interstate system investment
- Maintain safe travel and to connect Iowa to regional, national, and international markets
- Maintain current pavement conditions
- Capacity improvements as needed generally in and around urban areas

Implementation of Iowa in Motion Program Objectives

- Detailed analysis of Interstate, pavement preservation and bridge needs.
- Program Objectives: 2003-2007 Highway Program
 - Complete six priority corridors
 - Complete I-235
 - Interstate: Establish \$190 million funding level for 2007 and beyond
 - Pavement Preservation: Maintain \$100 million funding level
 - Bridges: Establish \$35 million funding level for 2006 and beyond
- Safety: Discussions in early 2004 of \$3 million to \$5 million funding level

Iowa Truck Flows

(To, From, Within)



U.S. Department of Transportation
Federal Highway Administration
Office of Freight Management and Operations
Operations Core Business Unit

IOWA
Total Combined Truck Flows
(1998)

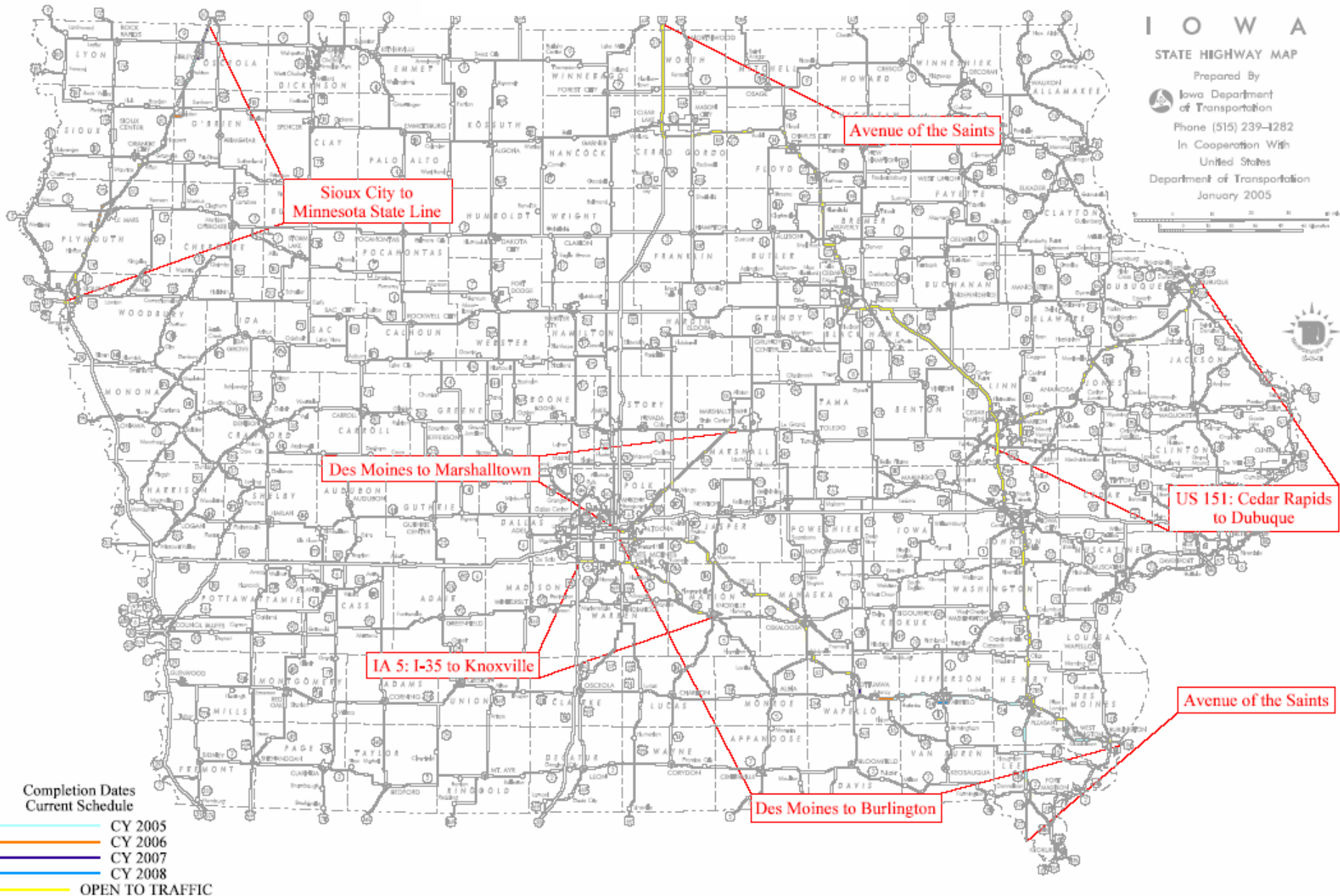
Network Flows (To/From)



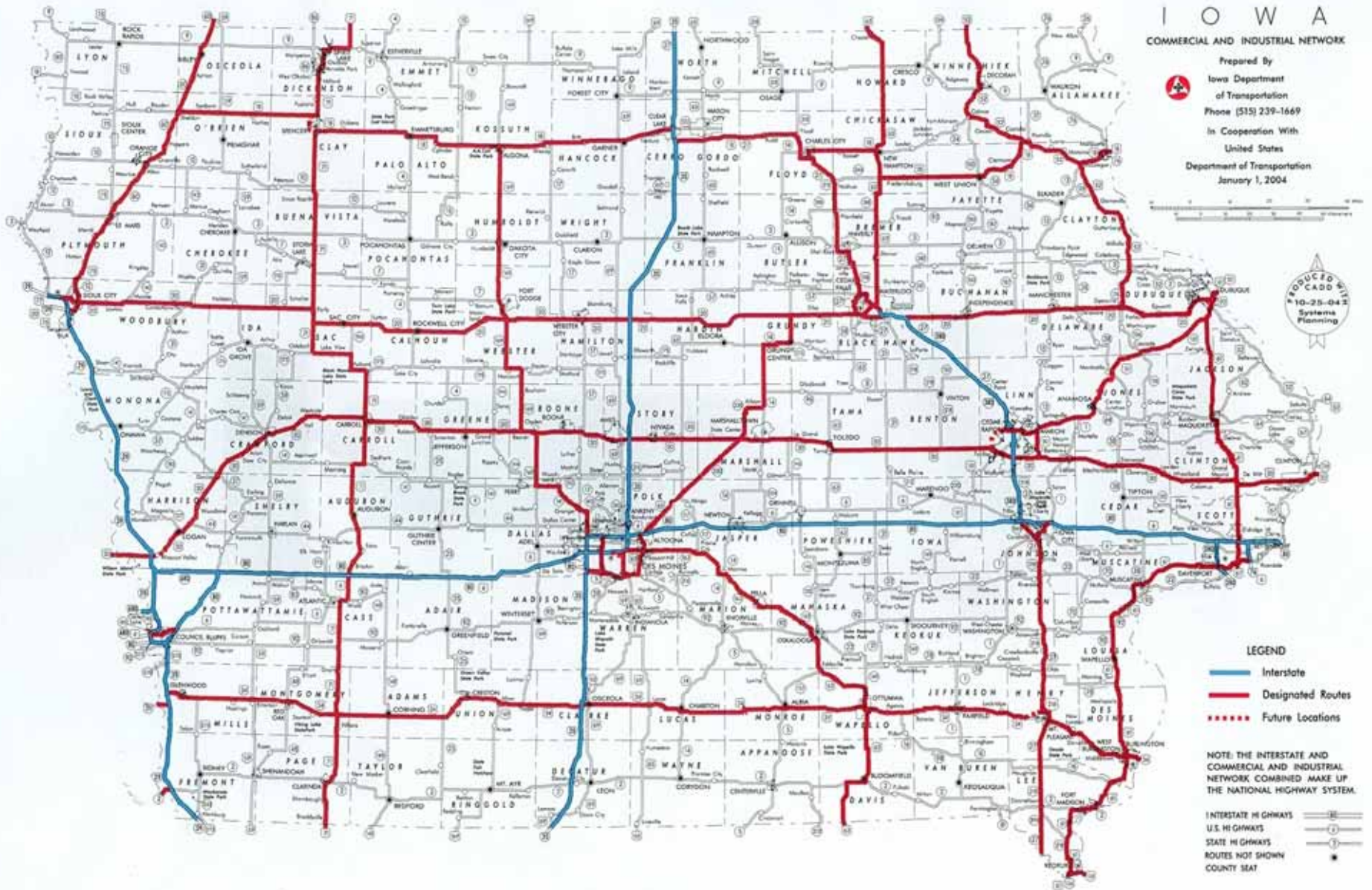
State-to-State Flows (To/From)



Priority Corridors



Commercial and Industrial Network



Interstate Analysis

Annual Summary of Needs (x \$1,000,000)

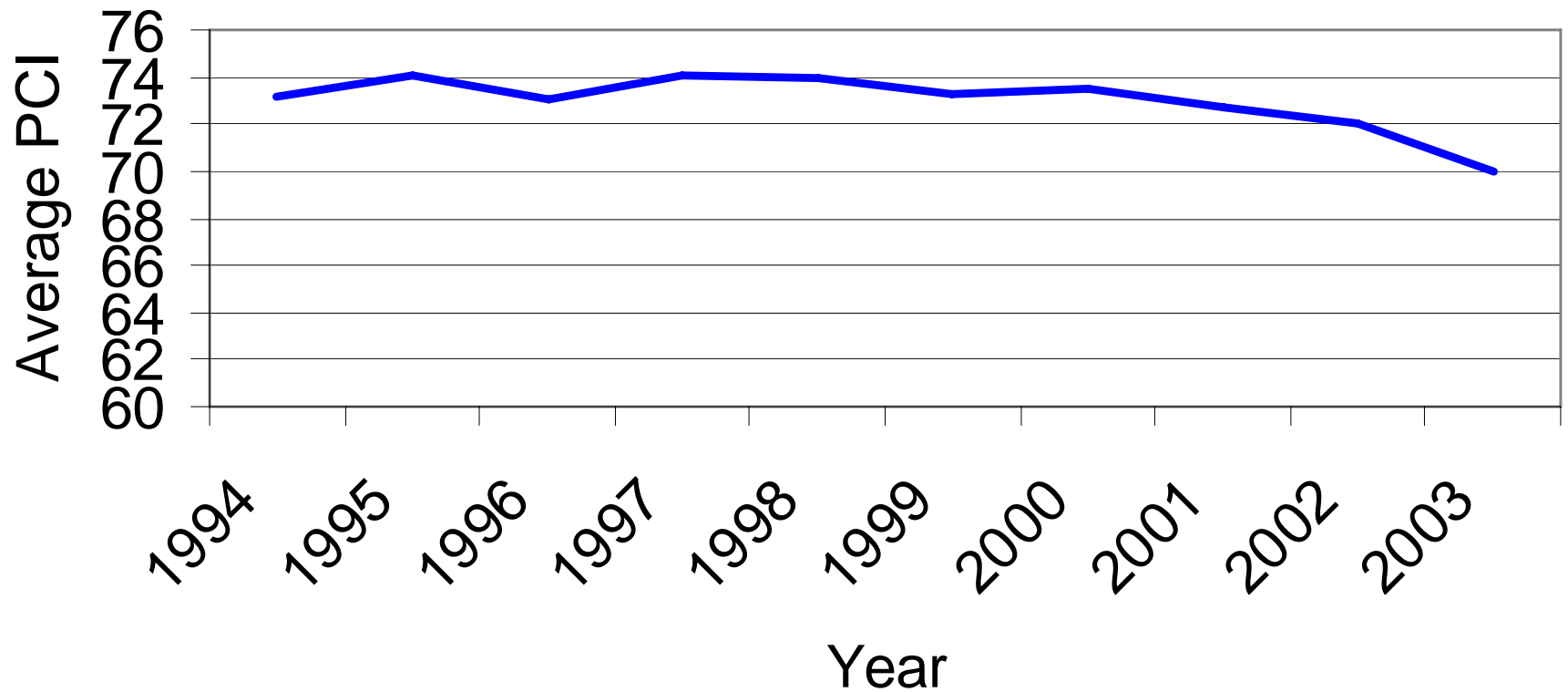
– Pavement:	\$103.0
– Capacity/Operational:	\$ 73.9
– Miscellaneous* :	<u>\$ 14.1</u>
– Total:	\$191.0

*Signing, Patching, Landscaping, Rest Areas

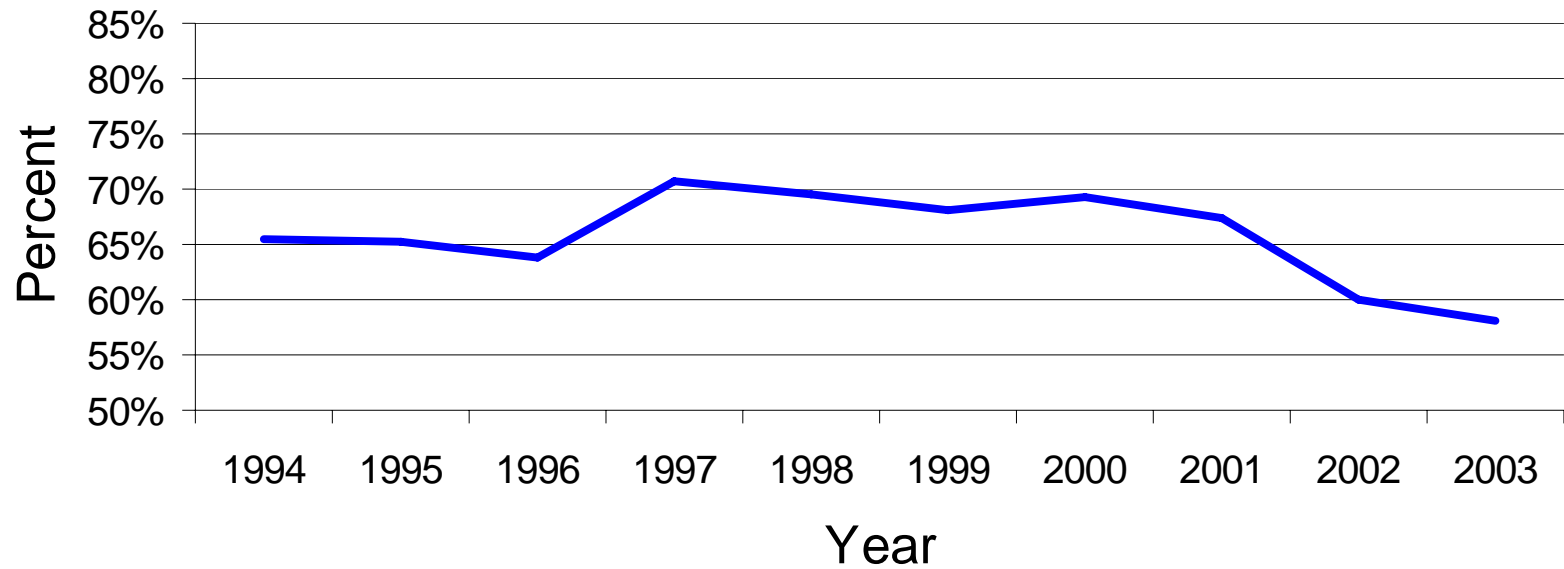
Pavement Condition Index (PCI)

- Measure of pavement condition only
- 0-100 rating representing the condition of state highway pavements (0 worst – 100 best)
- Tool to identify pavement improvement needs

Interstate Average PCI



Percentage of Interstate Which Meets or Exceeds Targeted Pavement Condition



4R

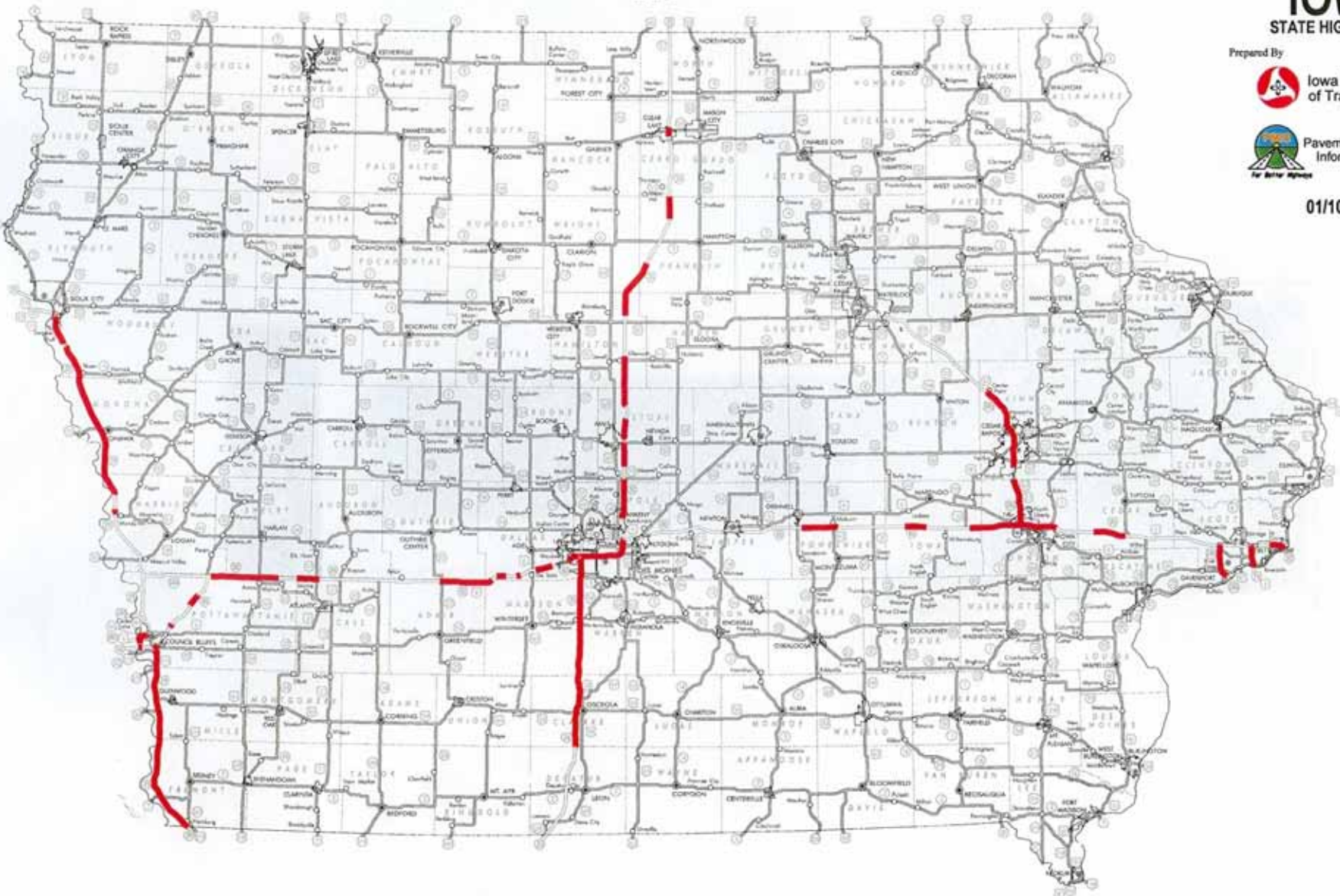
IOWA

STATE HIGHWAY MAP

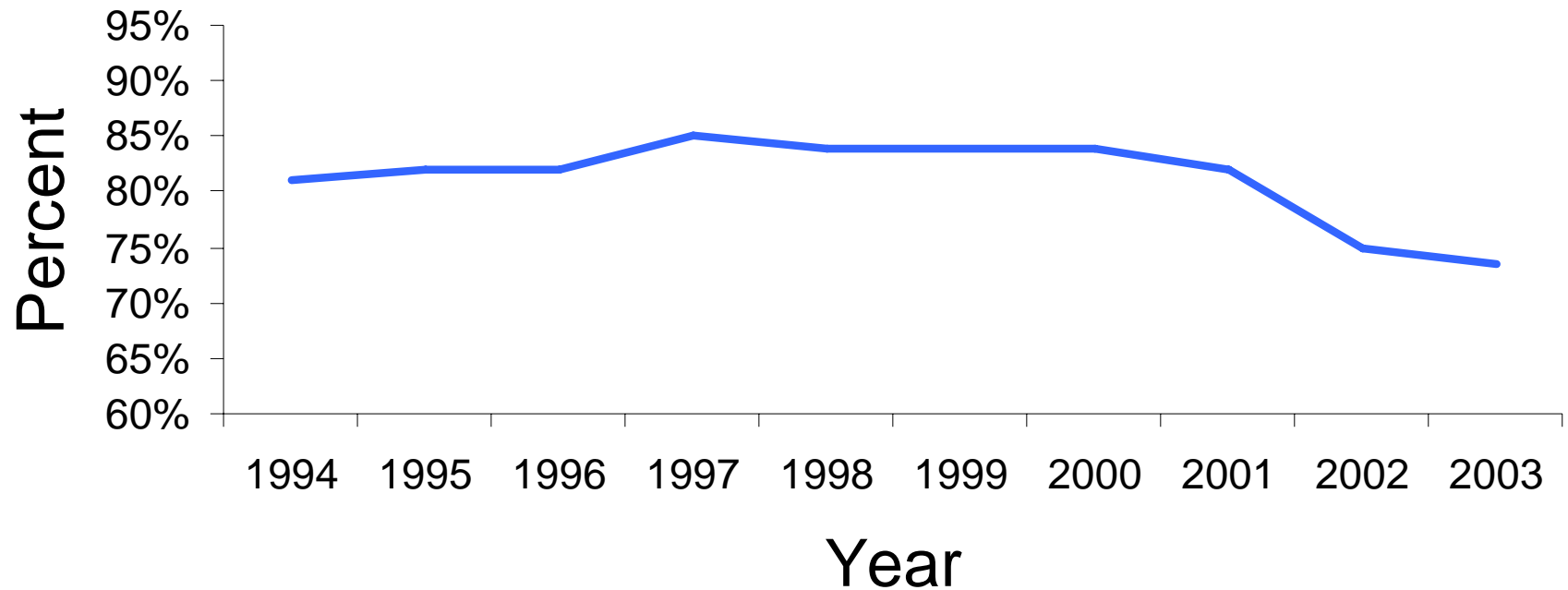
Prepared By

Iowa Department
of TransportationPavement Management
Information System

01/10/2005



Percentage of Primary System Which Meets or Exceeds Targeted Pavement Condition



3R

IOWA

STATE HIGHWAY MAP

Prepared By



Iowa Department
of Transportation



Pavement Management
Information System

01/10/2005



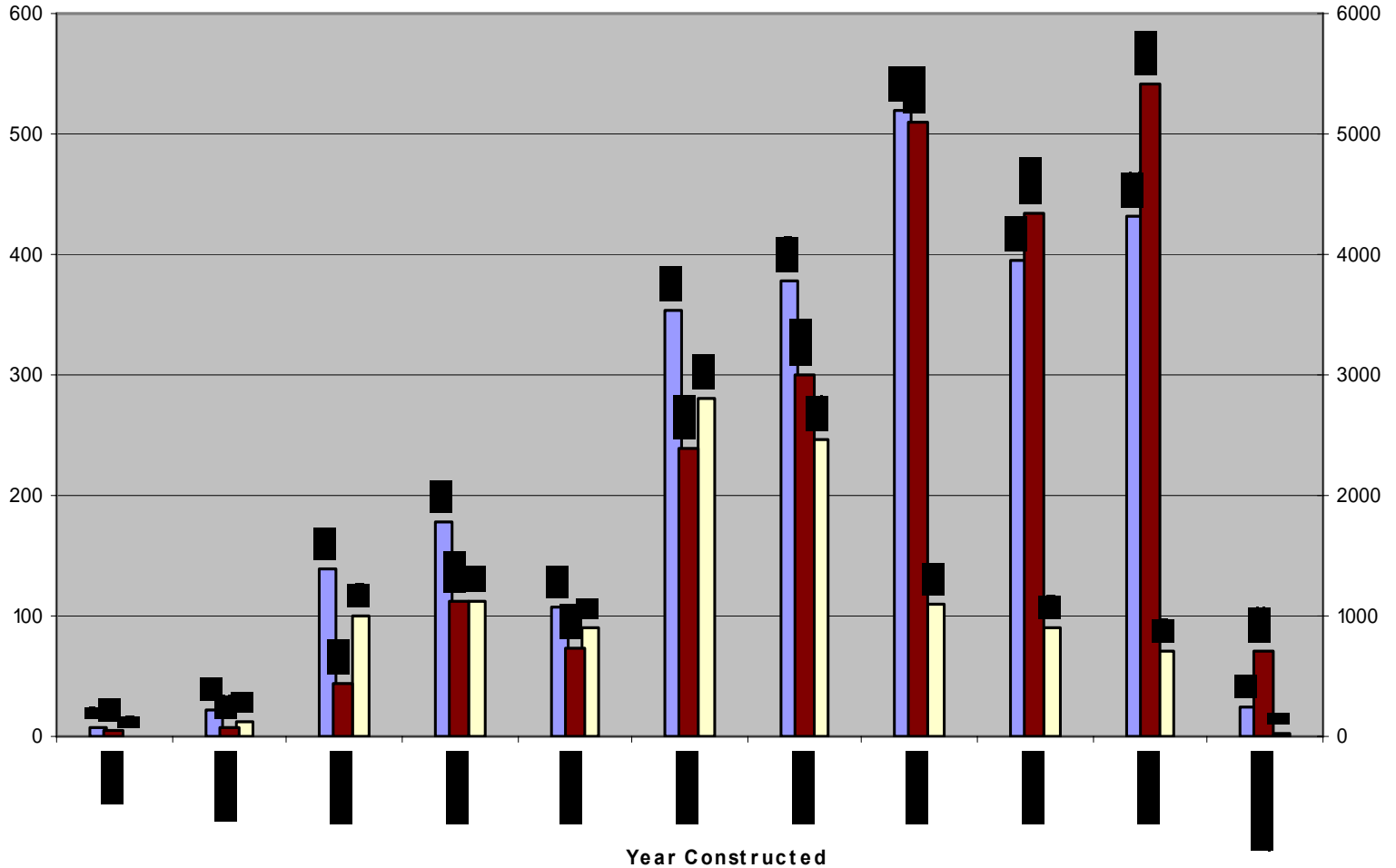
Iowa DOT Bridges

(Exclusive of the Interstate)

Number of Bridges, Narrow Bridges & Deck by Age

Number of Bridges
&
Narrow Bridges

Deck Area
SQ FT (1000s)



Number of Bridges Narrow Bridges** Deck Area

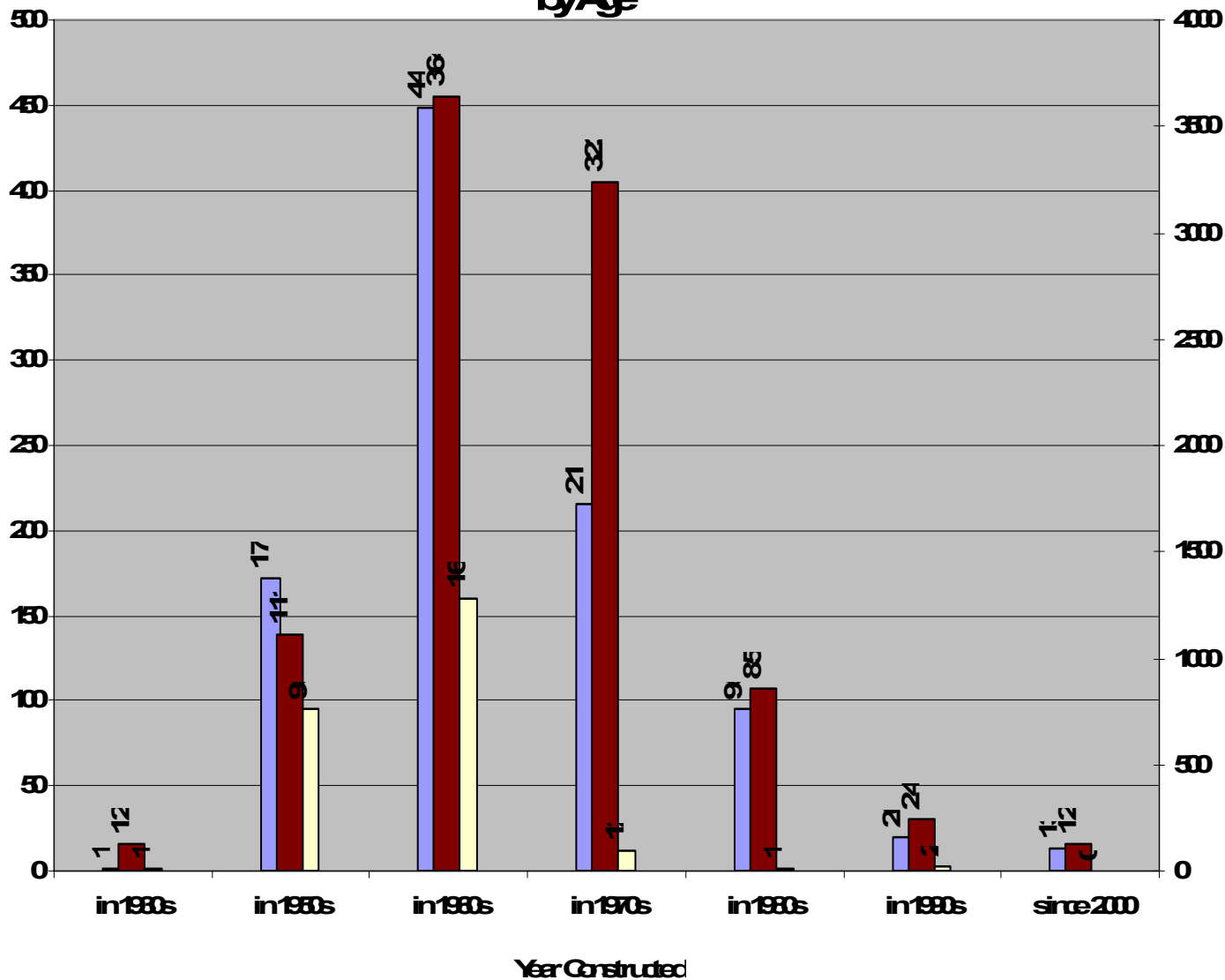
*Bridges on and over Interstate Routes not included

**Narrow Bridges- Bridge narrower than approach roadway. These are included in "Number of Bridges"

Number of Bridges
&
Narrow Bridges

Iowa DOT Bridges (Interstate System)* Number of Bridges, Narrow Bridges & Deck Area by Age

Deck Area
SQFT (1000s)

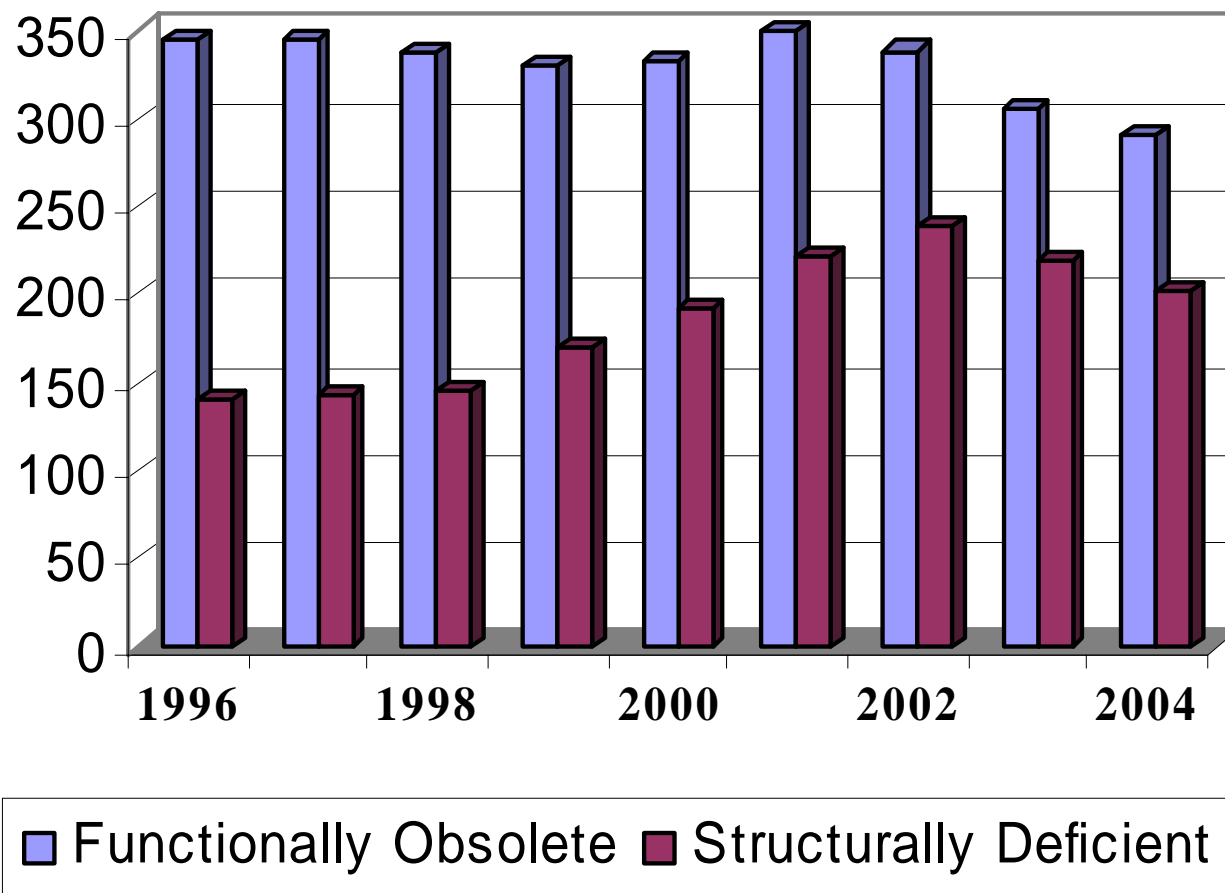


Number of Bridges Narrow Bridges** Deck Area

*Bridges on and over Interstate Routes

**Narrow Bridges- Bridges narrower than approach roadway. These are included in "Number of Bridges"

Iowa Bridges on the Primary System



Safety Investment Strategy

Candidate Safety Projects

- Paved shoulders
- Milled in shoulder rumble strips
- 2-lane shoulder widening
- High severity crash intersections
- High severity crash 2-lane roads
- High crash curves
- Expressway intersections
- Centerline rumble strips
- Cross-median head-on crashes¹



ROAD FUNDING ALTERNATIVES

Existing Road Funding

- State RUTF (FY 05 - \$1.1 billion)
 - Fuel Tax (FY 05 – 39 percent)
 - Registration Fees (FY 05 – 36 percent)
 - Use Tax (FY 05 – 21 percent)
- Federal Funding (~\$375 million)

Impact of Hybrid/Alternative Fueled Vehicles

- Hybrid Vehicles
 - 2004 – 0.2 percent of vehicles on road
 - 2010 – 3 percent share of market
 - 2020-2025 – 15 percent share of market
 - Consume 10 to 50 percent less fuel than fleet average
- Alternative Fueled Vehicles
 - 0.02 percent of market share in 2020

Alternative Funding Mechanism: Pooled Fund Study

Preferred Methodology

- Per-mile based fee
- On-board computer and GPS
 - State boundaries are kept on computer
 - Mileage tracked within each state (backed up by odometer readings)
 - Each state's per-mile fee stored on computer
- On-board computer calculates total fees by state and stores on smart card
- Periodically smart card is removed by user and entered into a reader. (e.g. gas stations)
- Encryption used to preserve privacy

Conclusions/Future Actions

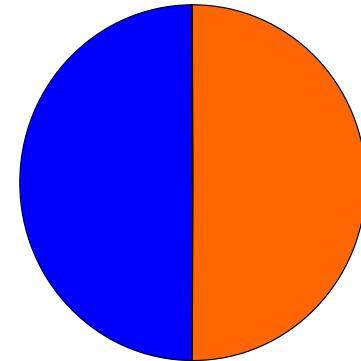
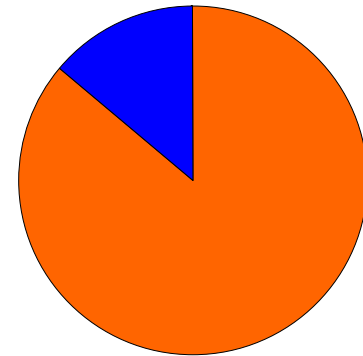
- Biggest impact on revenue is inflation
- Hybrid vehicles will have an impact as will alternative fueled vehicles but well into the future
- Need to start planning now
 - Pooled fund studies
 - Reauthorization
- Need to address privacy concerns

Iowa's Future Highway Safety Challenges

- Growth in travel
 - Increase in truck travel
- Changes in vehicle size and design (SUV)
- Population demographic shifts (older drivers)
- Changing driver behavior (aggressive driving)
- Increasing driver distraction (more vehicle-based devices)
- High-speed congestion
- Ability for local governments to incorporate low-cost safety improvements in resurfacing projects.

Iowa Seat Belt Use and Fatalities

- **14% of Iowa's drivers remain unbelted**
- **≈50% of Iowa's crash fatalities were not wearing a seatbelt***



* A large number of victims are reported as passenger restraint "unknown"

“Back to the Basics”

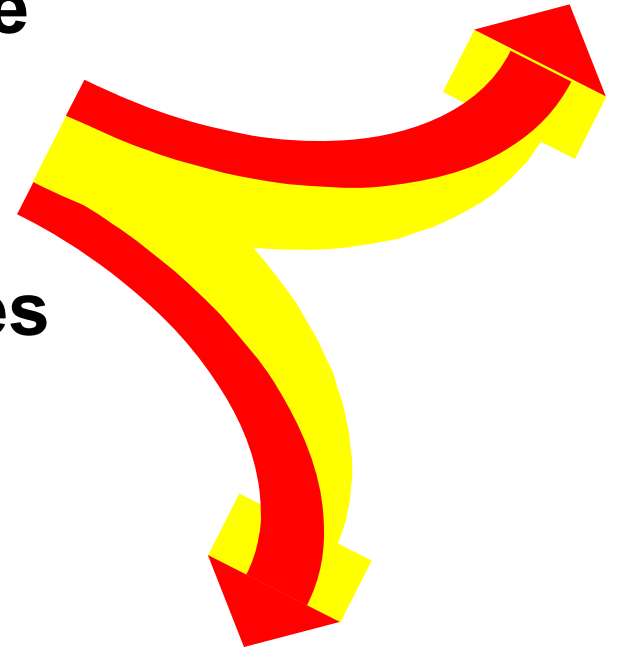
Safety Investment Emphasis

- 52% of Iowa’s fatalities are related to “lane departure crashes.”
- Candidate projects focus on lane departure and identified high crash locations or conditions.



Iowa's Roadway-Related Fatal Crashes

- 52% of Iowa's fatalities are related to Lane Departure
- 39% of Iowa's fatal crashes are single-vehicle Run-Off-the-Road (ROR)

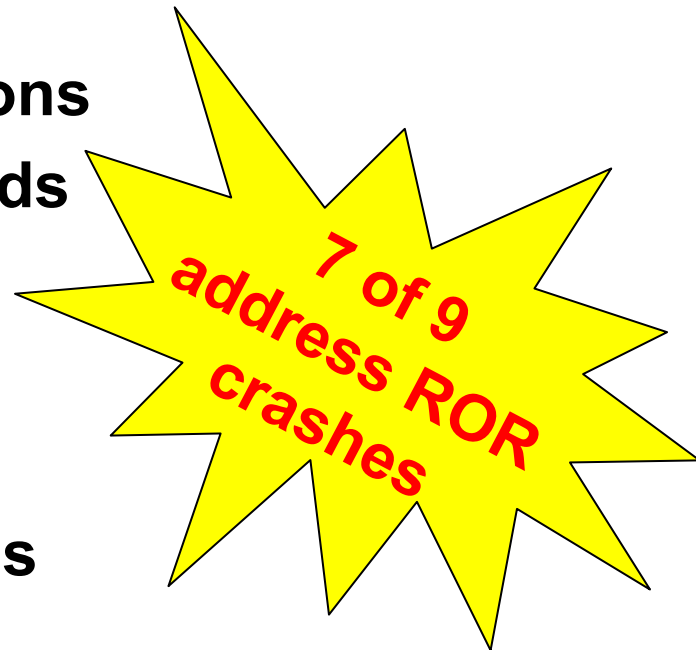


HES

Safety Investment Strategy

Candidate Safety Projects

- Paved shoulders
- Milled in shoulder rumble strips
- 2-lane shoulder widening
- High severity crash intersections
- High severity crash 2-lane roads
- High crash curves
- Expressway intersections
- Centerline rumble strips
- Cross-median head-on crashes





ENVIRONMENTAL PERMITTING

Introduction

- One of the most strictly regulated aspects of our project development process
- ~ 40 major Federal and 20 State statutes, regulations and orders governing our environmental compliance mission
- Integrated decision-making process
- Includes human & natural
- Involves dependency on an agencies/entities outside zone of direct influence

Concurrence & Approvals

(Major program areas)

- National Environmental Policy Act (NEPA)
 - Documents:
 - “Purpose and Need” - the reason for the project
 - Potential environmental impacts as a result of work on this project
 - Selected alternative for best balancing “Purpose and Need” vs impacts to Environment
 - Public involvement
 - NEPA document signed/approved by FHWA

Concurrence & Approvals (Cont)

- Archaeological & Historic Properties:
- SHPO advises FHWA as to conformance with the National Historic Preservation Act
- Endangered Species (Federal & State listed)
- Air Quality

Concurrence & Approvals (Cont)

- Environmental Justice
- Tribal Notification and Consultation
- 4(f) Properties
- 6(f) Properties

Permits

- Wetlands Protection (Section 404)
- State Water Quality (401)
- Floodplain Management
- Stormwater Discharge (NPDES)
- Coast Guard Permits

Major Stakeholders:

- **Sovereign Nations** (Native American Tribes)
 - Twenty seven (27) different tribes are recognized as having affiliation and interest in Iowa
- **Federal Agencies**
 - FHWA
 - Corps of Engineers
 - Environmental Protection Agency - Region 7
 - Coast Guard
 - Fish & Wildlife Service
 - Advisory Council on Historic Preservation
 - Natural Resource Conservation Service (NRCS)
 - National Park Service
 - Housing and Urban Development (HUD)
 - Homeland Security

Major Stakeholders (cont.):

- State Agencies
 - Iowa DNR
 - State Historic Preservation Office (SHPO)
 - Office of the State Archaeologist (OSA)
 - Iowa Dept. of Economic Development
- Local Governments and Agencies
 - Cities and Counties
 - Metropolitan and Regional Planning Agencies (MPO/RPA)
- Public
 - Anyone having an interest in a particular project including special interest groups

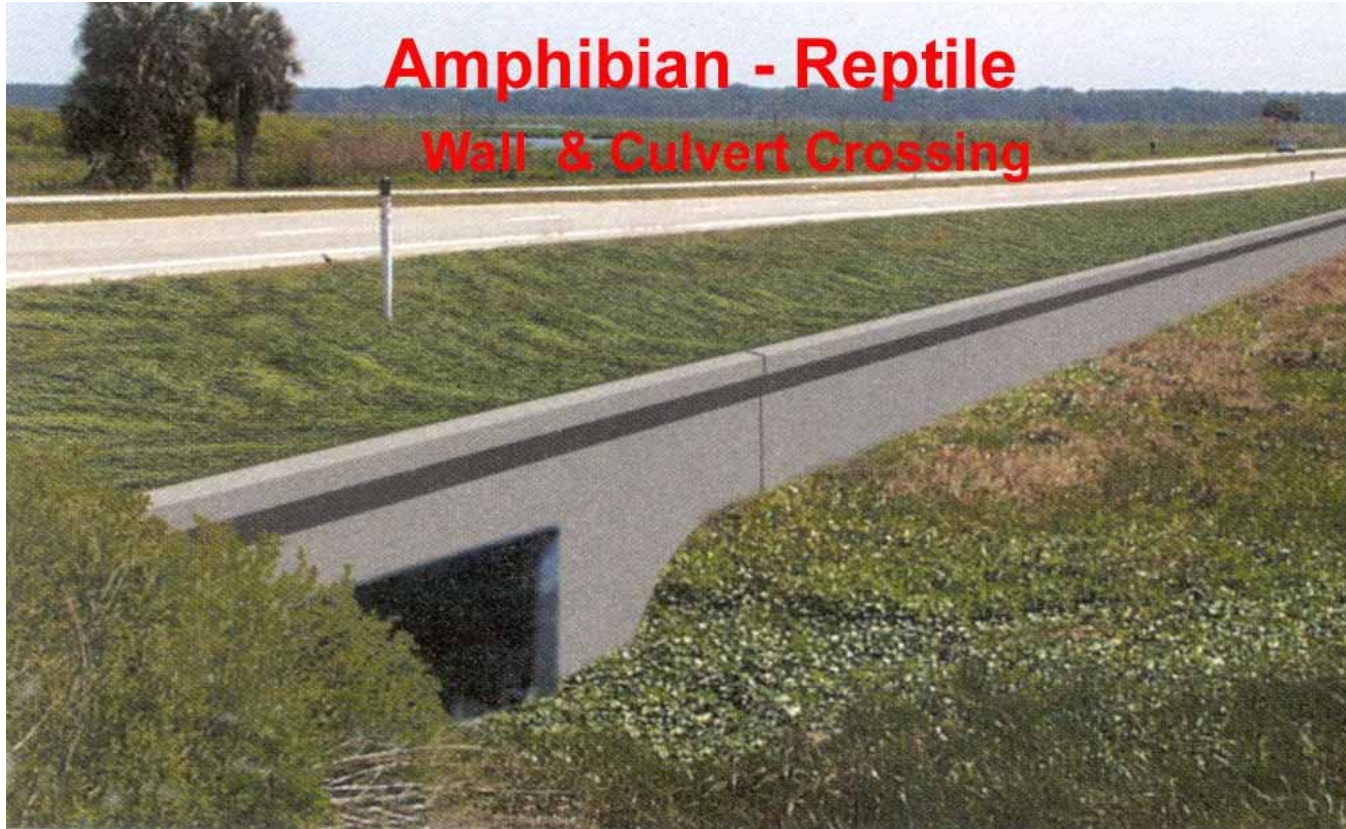
Massasauga



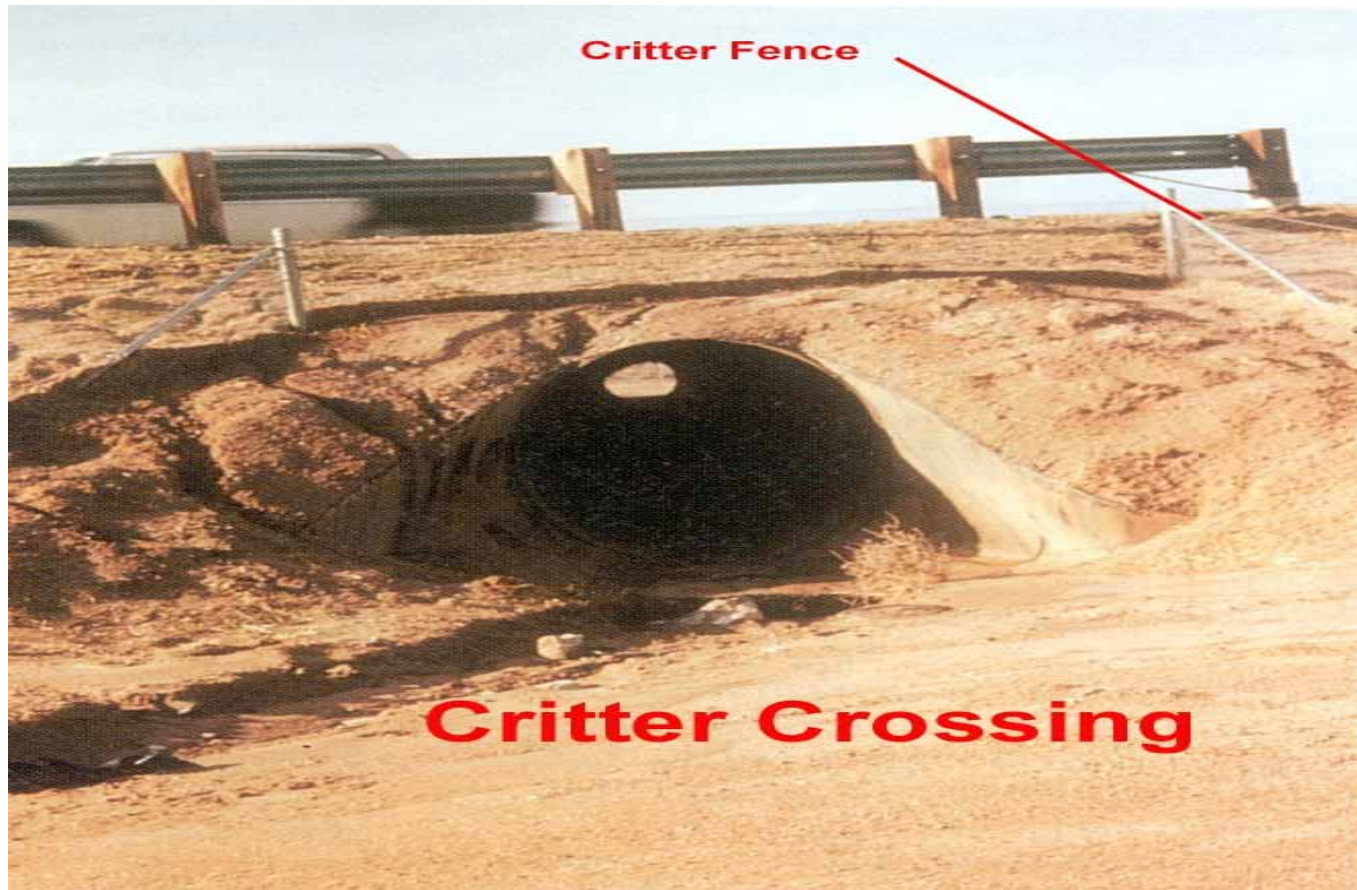
Turtle



Critter Barrier



Critter Crossing



Shiner



Stream Baffles



Mitigation Site Construction



October 2003



Emergent Wetland



Freeway Site Pan View



Sound Wall Fill 3



Building the Iowa River Bridge





ACCESS MANAGEMENT

What Is a Corridor Access Management Plan?

- It is an agreement that involves both state and local jurisdictions.
- It defines how accesses are to be managed on a highway. (It may be specific or it may be general.)

What Does a Corridor Access Management Plan Do?

- It provides all the jurisdictions a set of rules to use for development of the property along the route.
- It puts in writing how accesses can be utilized so developers can plan accordingly.

What Is the Goal?

- Preserve the capacity of the highway.
- Safety
 - Reduce crashes
- Optimize \$\$\$
- Optimize property.

Examples of Corridor Access Management Plans

- US 6 in Polk/Dallas Counties
- State of Iowa
- Clive
- Urbandale
- Waukee

1990 Clive to Waukee



2002 Clive to Waukee



2004 Clive to Waukee

- 
- The image is an aerial photograph of a suburban corridor in Iowa, running from Clive in the west to Waukee in the east. A horizontal line of markers is overlaid on the map, indicating specific locations along the corridor. The markers consist of orange crosses and purple circles. The background shows a mix of residential developments, including large housing tracts with winding streets, and commercial areas with parking lots and buildings. There are also some undeveloped or less-dense areas interspersed throughout the corridor.
-  Signal location
 -  Non-signalized access



CONTEXT SENSITIVE DESIGN



Okoboji Lakes Bridge and Causeway



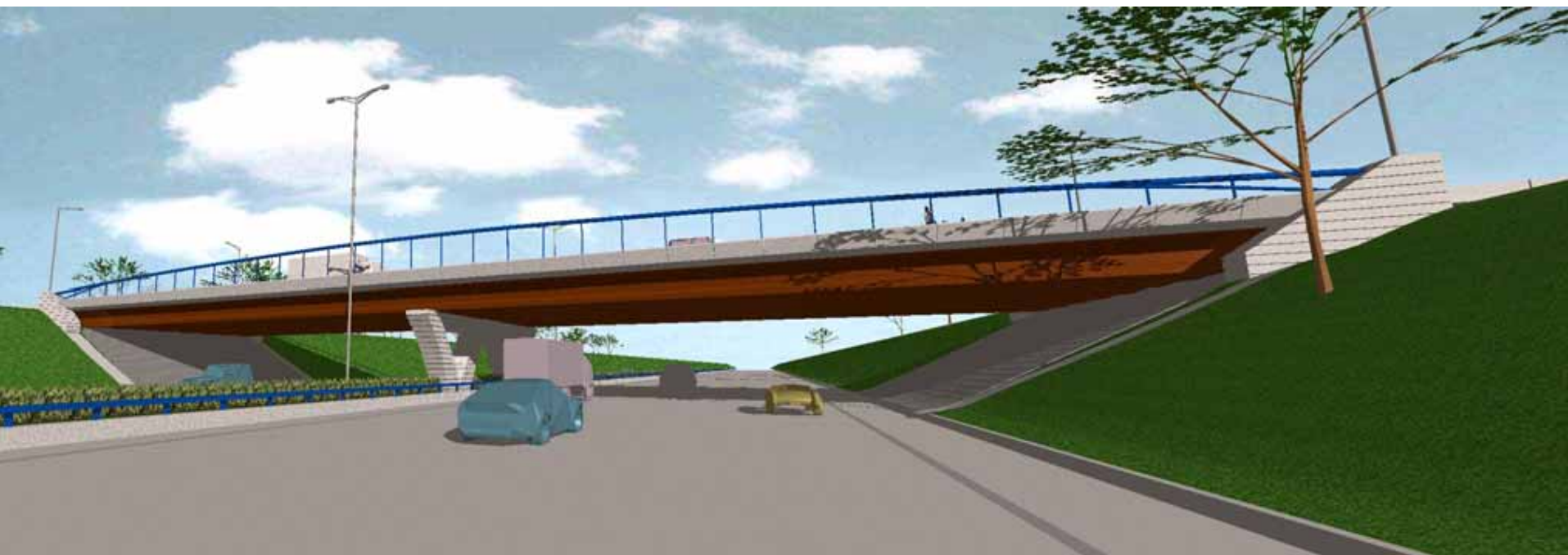


NO
WAKE



I-235

















The Bridge at Keosauqua







