Bureau of Research & Technology

Sandra Larson
Mission

The Bureau of Research and Technology enhances the DOT’s ability to deliver efficient and effective transportation services by actively promoting research partnerships, knowledge and technology transfer, information technology and Intelligent Transportation Systems.
Why Research?

• Find workable solutions to problems that require more than ordinary routine investigation
• Identify and implement improved engineering and management practices
Iowa’s Research Expenditures

Total is over $6 million annually

- SPR Research Portion - $2.5 million
- Iowa Highway Research Board - $2 million
- More in Traffic & Safety, Innovative Bridge Research, Living Roadway Trust, etc.
State Planning & Research Program

• $2.5 - $3 million annual program
• Pooled fund projects
• Technology transfer
• Training
• Research support
  – Library
  – Equipment
Iowa Highway Research Board

- Formed in 1949
- Unique to Iowa
- $2 million annually in 40 projects
- Board representation: 7 county, 2 city, 4 DOT, 2 university
- Funding: Primary Road Fund, Secondary Rd Fund, Street Fund
Iowa-led Pooled Fund Projects

- ITS Study (ENTERPRISE)
- Aurora Program
- Maintenance Concept Vehicle
- Long Term Maintenance of LRFD Specifications
- Smart Work Zone Deployment Initiative
Iowa-led Pooled Fund Projects

• Materials & Construction Optimization for Prevention of Premature Pavement Distress in PCC Pavement (MCO)
• Self Consolidating Concrete
• Deicer Effects on Slag Cement Products
• Development of Performance Properties of Ternary Mixes
Supporting Pooled Fund Projects: PCC Mobile Laboratory
Inside the PCC Mobile Lab
TECHNOLOGY
Promoting Use of Technology in DOT

- System Planning & Management
- Photogrammetry
- Road Design
- Bridge Design
- Materials
- Construction
- Maintenance
Planning & Management: Coordinated Transportation Analysis & Management System (CTAMS)
Photogrammetry: High Performance Scanner for Aerial Photos
Road Design:
Using Two Screens & 3D Glasses to
Create Topographical Map
Road Design
Designing an Interchange Using Microstation
Bridges & Structures:
Designing a Bridge Using Microstation
Materials
Research Testing Equipment

Air Void Analyzer
Nottingham Asphalt Tester
Materials
Research Testing Equipment

Laser Smoothness Tester
Construction:
Bulldozers with GPS Receivers
Maintenance: Remote Sensing Applications

RWIS Sensor I-35 & 13th St in Ames

Typical GPS rover unit on roadway
INTELLIGENT TRANSPORTATION SYSTEMS
ITS Program

- Information and communication technologies
- $5 million in FY 05
- Cooperative efforts
  - DOT
  - County & city
  - Emergency management
  - Law Enforcement
ITS Projects

- CARS/511
- I-235 (Des Moines)
- I-74 Incident Warning (Davenport-Moline-Rock Island)
- Statewide Dynamic messaging
  - Traffic conditions
  - Amber Alerts
  - Incident warnings
ITS Projects

- Regional system architecture
- Rural Transit
- ITS Primary Road Implementation
CARS/511
Condition Acquisition & Reporting System

• Real-time collection and dissemination of travel information
• Statewide Availability
  – Phone: 511
  – Web: www.511ia.org
• 14 states in CARS Consortium
## CARS/511 Usage

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<th>2003</th>
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<tr>
<td>Calls</td>
<td>328,694</td>
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<td>Web Visitors</td>
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Des Moines Area ITS

- 68 sensors on 62 miles of highway
- 42 cameras on closed circuit TV
- Trip Guide - Dynamic Color-Coded Traffic Flow Map
- Transportation Management Center
- Dynamic Messaging
- Highway Advisory Radio (HAR) AM, Low power FM
42 Pan-Tilt-Zoom Cameras
68 Sensors
Transportation Management Center
Des Moines area traffic speedmap and cameras

The map will update approximately every five minutes.
Des Moines Area

Image will update every minute.

East   West

I-235 at Keo Way

Updated on: Wed Mar 30 15:25:13 CST 2005
PARTNERSHIPS & COLLABORATION
Partnerships

- Associated General Contractors
- Consulting Engineers
- Universities
- Local Governments
  - Cities
  - Counties
Iowa Transportation Research Collaboration

• Purpose: to facilitate transportation research to benefit the state of Iowa
• DOT, ISU, U of Iowa, UNI, CTRE
• Semi-annual meetings
• Focus groups
Mid-Continent Transportation Research Symposium

• August 18-19, 2005
• Co-sponsors: Iowa DOT, CTRE, ISU, Midwest Transportation Consortium
• 100 abstracts on topics:
  Environment   ITS   Security
  Finance       Planning  Transit
  Geotechnical  Safety   Weather
National Research Initiatives

• Transportation Research Board (National Academy of Sciences)
• National Cooperative Highway Research Program
  – Purpose: to provide funds and direction for research in highway matters of national concern
  – Each state contributes
  – Administered by TRB
FUTURE
Looking Forward

- Iowa is a recognized leader in transportation research.
- We will maintain this leadership.
Iowa River Bridge
A Record Setting Achievement
The Future for Research

• Results orientation required
• Basic vs applied research
  – Highways for Life
  – Safety emphasis
  – Traffic demand (volume & trucks)
• Funding & budget constraints
The Future for ITS

• We can’t build ourselves out of congestion. ITS is a solution.
• Technology changes rapidly. We must be agile and adaptable.
Co-op & Recruitment Program

- Combines education with real world experience
- Two years engineering education required
- Assignments in
  - Construction inspection
  - Materials inspection
  - Road design
  - Bridge & structure design
Your future?