Bridge Management at New York State DOT

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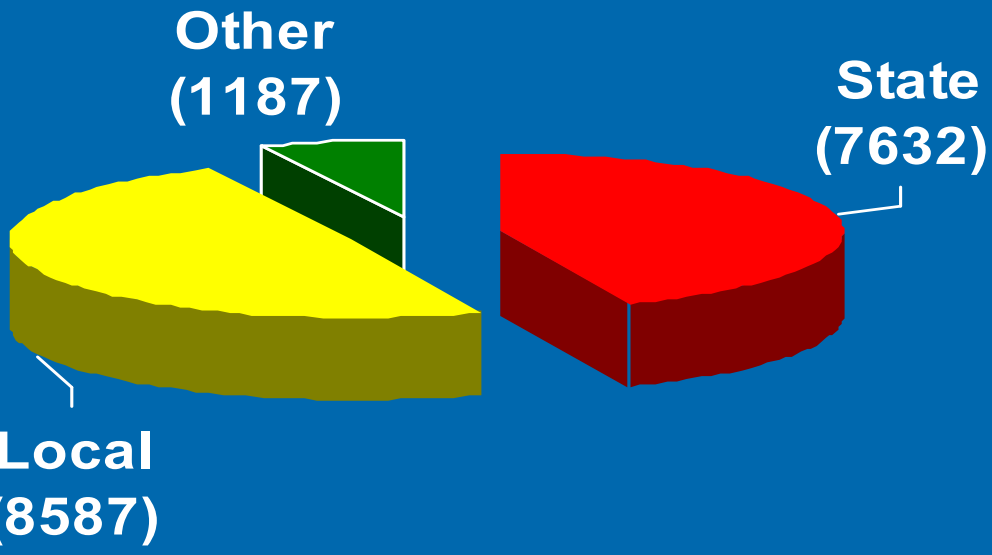
AASHTO BRIDGEWare Task Force

NYS Highway Bridge Ownership



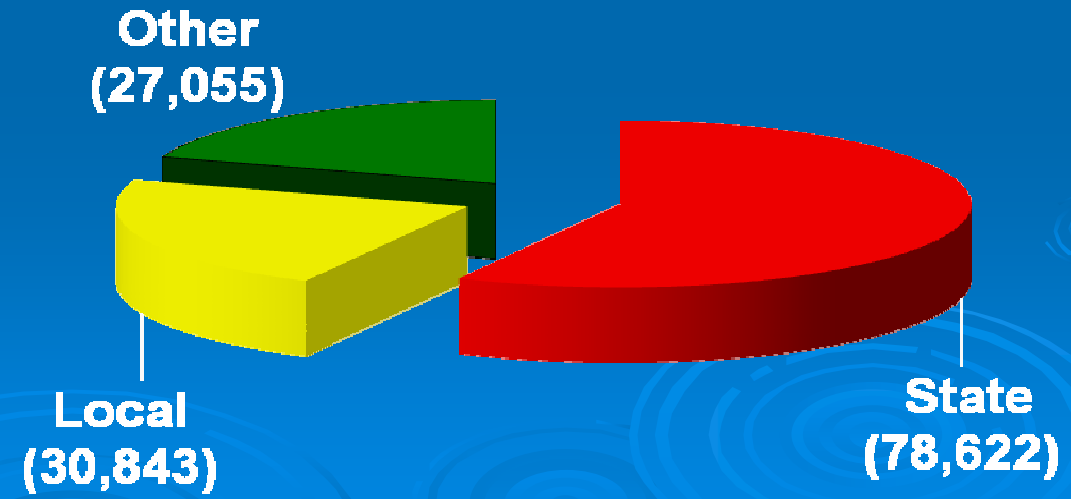
Numbers of Bridges

(17,406 Total)

Deck Area

(x 1,000 s.f.)

(136,420,000 Total)



NYSDOT Bridge Management Organization

- Centralized:
  - Network Analysis, Goals
  - Program Review / Oversight
  - Funding Allocation
  - Engineering Services

- Decentralized:
  - Ownership
  - Maintenance
  - Operations
  - Program Development
  - Regional Structures Management Teams

Bridge Management Goals

- Safety:
  - Eliminate poor conditions of critical components
  - Address failure vulnerabilities
- Preservation:
  - Reduce the overall number of deficient bridges
  - Maintain Interstate bridges in good condition
  - Maintain NHS bridges in at least fair condition
- Serviceability:
  - Reduce load restrictions
  - Eliminate highway bridge clearance restrictions

Performance Measures

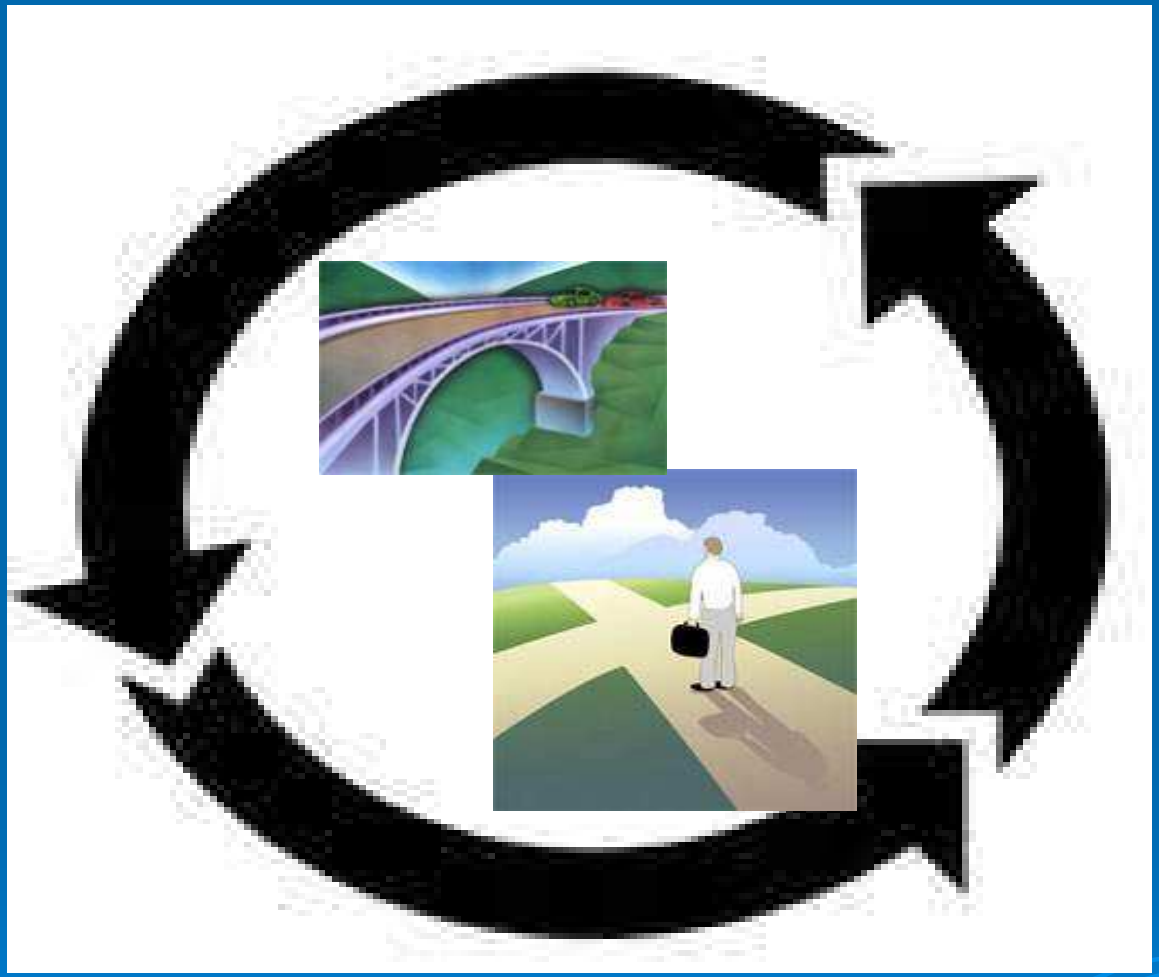
NYS Condition Rating (CR)

- Single rating value for each bridge
- Weighted average of element inspection ratings
  - Uses up to 13 different element ratings
  - When multiple rated elements exist, the calculation utilizes lowest rated element
- If CR < 5.00, the bridge is considered "Deficient" according to NYSDOT
- CR is NYSDOT's most widely used bridge condition performance indicator

What Do We Use?

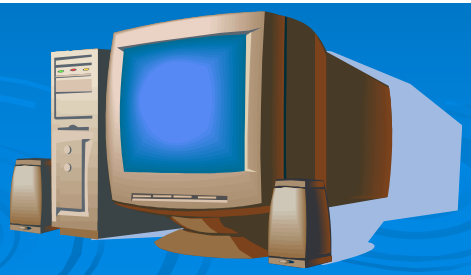
Deterioration Modeling

Bridge Program Worksheet



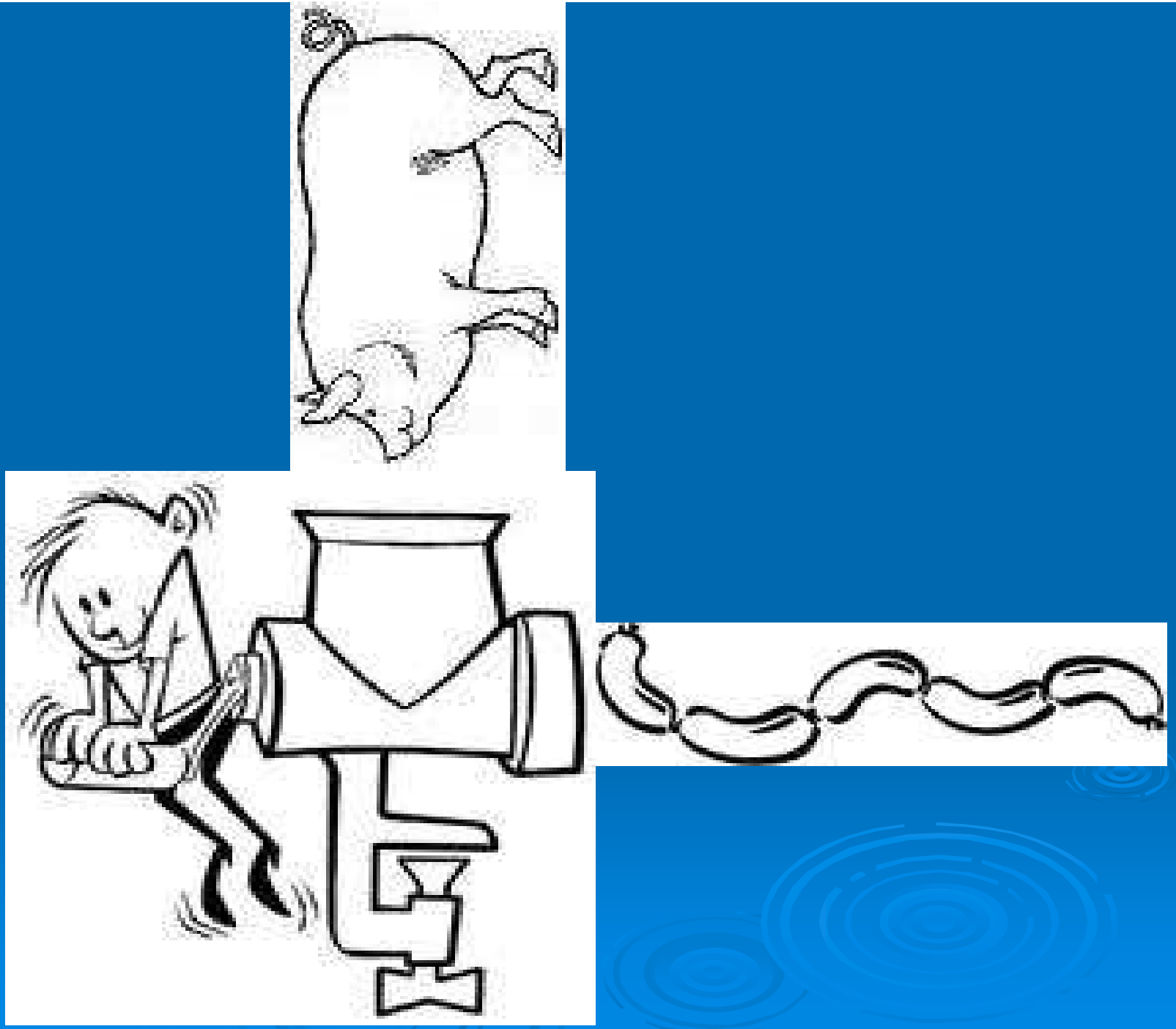
BNAM-2008

Needs Tool



NYS BMS Tools - Commonalities

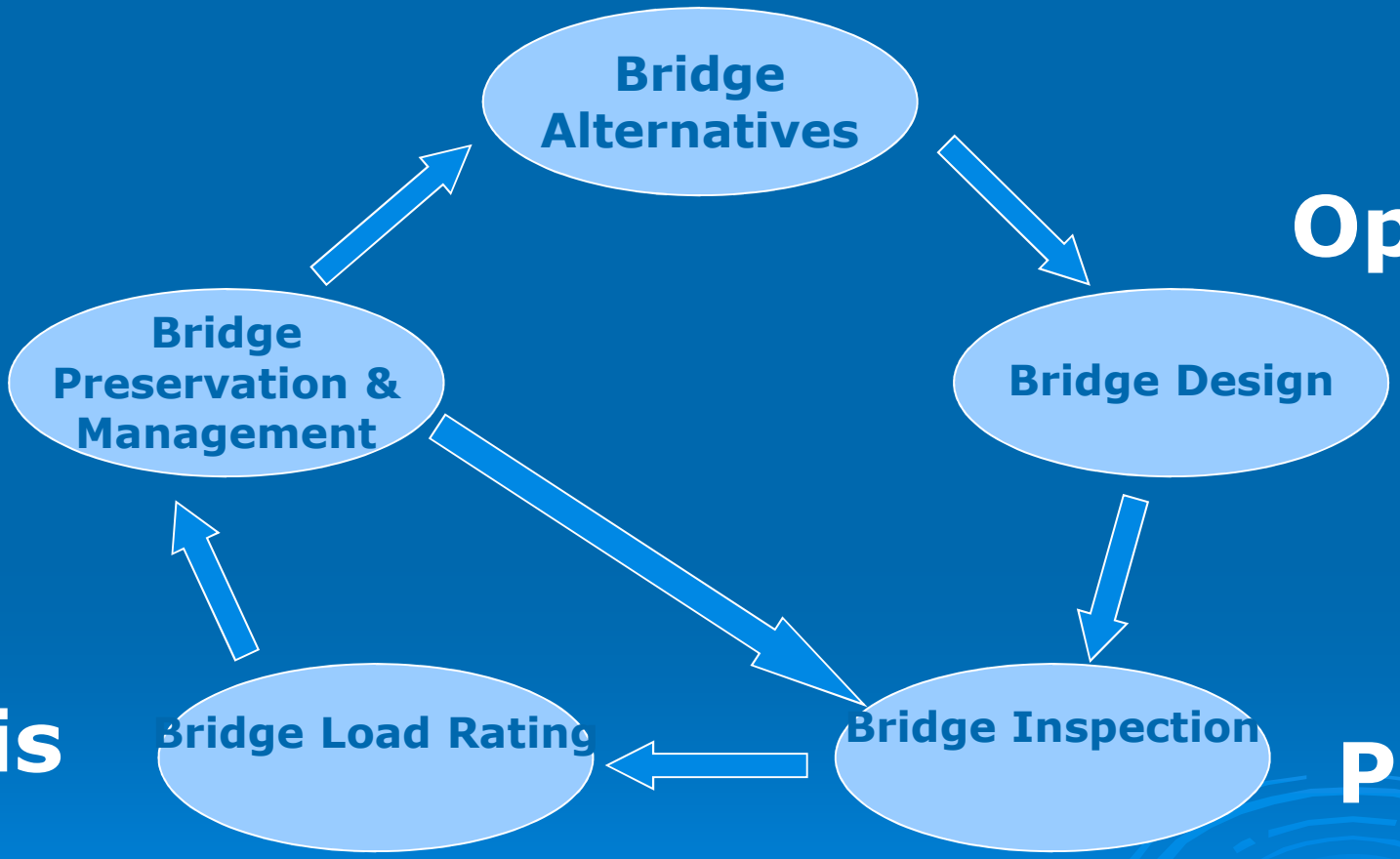
- Use NYS Inspection Ratings and Inventory Data
- Aggregate Data into Component, Span and Bridge Condition Indices
- Use NYS BMS Logic
- Use NYS Deterioration Models
- Provide “Network Level” analysis of bridge preservation and serviceability needs



NYS BMS Tools - Limitations

- Economic Optimization
- Need to “knit” together existing stand-alone tools
- Applications are more cumbersome to maintain and enhance as more functionalities are added
- Significant IT resources required to maintain and update applications

BRIDGEWare Product Suite And Bridge Life Cycle



- Products Share a Common Database
- Products May Be Licensed Together or Separately

So Why Pontis?

- AASHTO BridgeWare nationally and internationally recognized “off shelf” BMS software
- A Software Tool For:
  - Recording Bridge Inventory and Inspection Data
  - Simulating Bridge Conditions
  - Generating Work Candidates
  - Developing an Optimal Preservation Plan
  - Developing a Bridge Program

NYSDOT's Assessment of Pontis

Pontis benefits:

- Economic Optimization
  - Replacement vs. Major Rehab
- Enhance network analysis capabilities
- Enhance preservation program development capabilities
- Enhance element specific modeling capabilities
- Develop NBI and SR based forecasts
- System Support – Service Units

NYSDOT's Assessment of Pontis

Pontis limitations:

- Pontis' Least Long Term Cost optimization model is *at times* inconsistent with NYSDOT Condition focused BMS logic
- Lacks effective methodology to incorporate risk based criteria into models such as:
  - Scour and Seismic Vulnerabilities

NYSDOT's Assessment of Pontis

Pontis ongoing activities:

- Continue to refine Preservation Models
- Continue to refine Cost Models
- Continue to refine model customization rules
- Continue to learn how input and parameters impact models and results
- Assess Pontis Post Processer and Optimizer used by VA, OK, HI

A Pontis Road Map to the Future

Where are we now?

- Pontis 4.x
  - Developed in 1995 (Version 3.0)
  - Last Development 2005 (Version 4.4)
  - Last Release 2009 (Version 4.5 – Maintenance and Bug Fixes)
- Pontis 5.1 Inspection Data Collection Module
  - September 2009 Release

A Pontis Road Map to the Future

Where Are We Going?

- Pontis 5.2 Enhancements:
  - Incorporate enhanced CoRe element definitions adopted by AASHTO in May 2010
  - Incorporate multi-objective optimization (NCHRP-590)
  - Prioritization occurs at need, project and network levels
  - Reflect typical DOT project-centric business process and work flow

A Pontis Road Map to the Future

Where Are We Going?

- Pontis 5.2 Enhancements:
  - Trade-off and Balance
    - Life Cycle Cost
    - Condition
    - Risk and Vulnerability
  - Incorporate risk assessments including:
    - Likelihood and consequences of adverse risk events
    - Benefits of Risk Mitigation actions

A Pontis Road Map to the Future

Where Are We Going?

- Pontis 5.2 Enhancements:
  - Incorporate “Utility Function” – a unit less measure that allows combination of dissimilar benefits for:
    - Condition, Load Capacity, Vulnerability/Risk, Functional Needs, etc.…
  - Rich Graphical Interface allowing:
    - More interactivity with user
    - Better communication of model results and recommendations


Questions?