

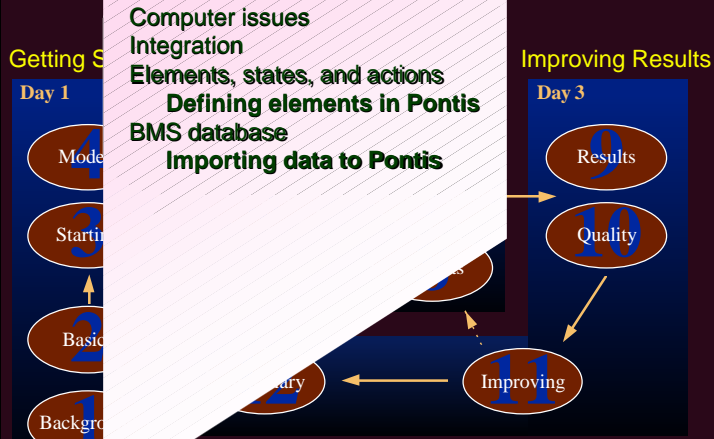
Where to Begin



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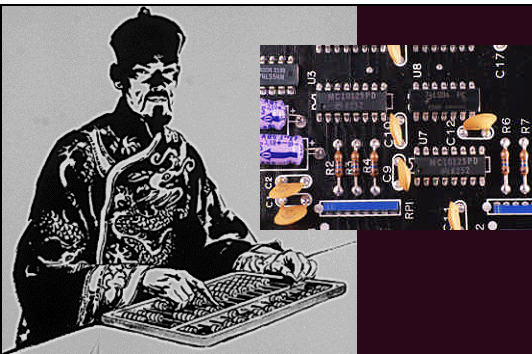
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What We'll Cover



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Computer Issues

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Hardware and Software



- Existing BMS use a **variety of computer platforms**
- Many agencies are moving toward **open client/server systems**
- **Multi-user** capability is very valuable, if it doesn't become too complicated
- **Graphical user interfaces** (e.g. Windows) are all the rage

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BMS Computer Platforms

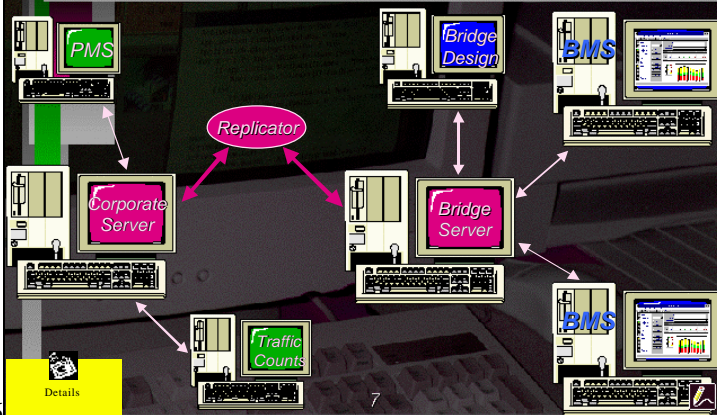
| | |
|------------------|----------------------------------|
| ■ Pennsylvania | Mainframe |
| ■ North Carolina | Mainframe+PC |
| ■ New York | PC |
| ■ Alabama | Mainframe |
| ■ Bridgit | PC |
| ■ Pontis | PC/Windows client, any server |



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Open Client/Server Systems



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Multi-User Systems

- *Multiple users access same database*
- *Users share data with other systems*
- *Users hand off workflow responsibilities to other users*
- *Users engage in discussions about shared BMS information*

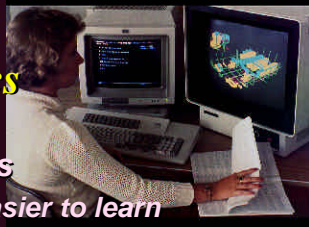


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Computer Graphics

- **Microsoft Windows**
 - *Makes software easier to learn*
- **Statistical graphics**
 - *Trend lines, distributions, comparisons*
- **Pen-based computers**
 - *Fewer moving parts to damage*
 - *Handwriting recognition useful to some*
 - *Durability and visibility in bright sun*



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Integration of BMS with Other Systems



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Why Integrate?

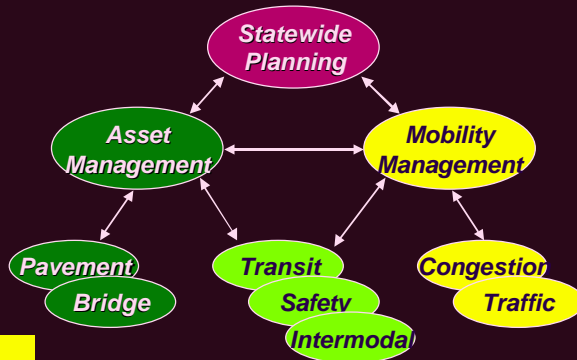
- Lower data collection costs
- Easier to learn and operate
- Fits the way DOTs do business
- Analysis can fit decision-making
- Get everyone on the same page



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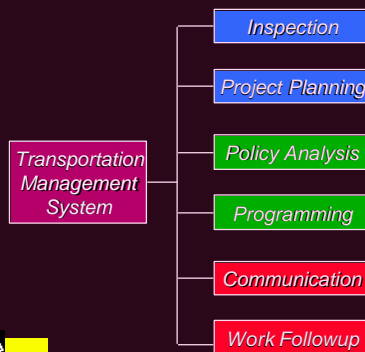
Commonality of ISTEA Management Systems



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Organizing Management Systems Around Business Processes



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Ownership of Data in a Client-Server System

| | "Agency" Owned | User Owned |
|-------------------------|-------------------|---------------|
| Databases | Summary | Detail |
| Standards and Functions | Standards | Functions |
| Technologies | Server | Client |

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Geographic Information

Three separate components:

- **Referencing System** - spatial relationship between data points
- **Mapping** - ability to draw maps showing selected data
- **Analysis** - inferences drawn from geographic relationships among data



Details

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Stand-up Break!

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9/9

0800 Antenna started

1000 stopped - antenna ✓

1300 032 MP-MC 2.1304

032 PRO 2 2.1304

conv 2.1306

Relays 602 in 033 failed speed speed test

in relay 11.00 test

Relays changed

1100 Started Cosine Tape (Sine check)

1525 Started Multi-Address Test

1545

Relay #70 Panel F (Moth) in relay.

First actual case of bug being found.

1630 antenna started.

1700 closed down.

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Defining Elements, Condition States, and Actions

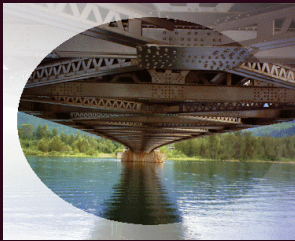


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Rules for defining elements

- *Similar material*
- *Similar deterioration modes and rates*
- *Similar actions and unit costs*
- *Measurable*



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Rules for condition states

- *Predictable progression over time*
- *State transition implies change in feasible action*
- *State differences visually observable*
- *Only one major deterioration mode represented in each transition*



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Rules for preservation actions

- **Separate action list for each element and condition state**
- **Differences reflect cost and/or resulting condition**



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Rules for action types

- **Meaningful sets of similar actions**
- **Relevant to management reports**



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Defining Elements in Pontis

| ID | Short Name |
|----|----------------|
| 1 | No damage |
| 2 | Distress <= 2% |

| ID | Short Name | Long Name |
|----|------------|---------------|
| 0 | DN | Do Nothing |
| 1 | Protect | Add a protect |

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Setting up a BMS Database



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Why Do BMS Need Data?

- *Identification of Needs*
- *Accurate Economic Forecasts*
- *Predictions of Physical Condition*
- *Continuous Improvement*



Back-tracing

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Basic Inventory Information

About the Bridge

- Identification
- Age/Service
- Geometrics
- Clearances
- Condition
- Appraisals
- Navigation
- Load Rating

About Elements

- Material
- Type
- Environment
- Quantity

About Roadways

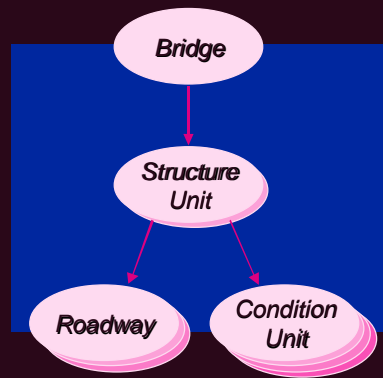
- Identification
- Traffic
- Routes
- Dimensions

About Structure Units

- Design
- Material

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Database Structure



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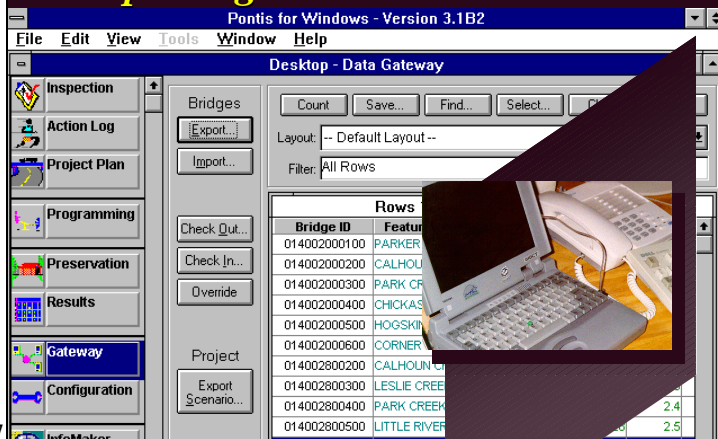
Planning for Data Importing

- **Know the data format requirements**
 - *Character vs. numeric*
 - *Field widths*
 - *Blank spaces*
- **Know the database structure**
- **Take advantage of the opportunity to clean up the data**

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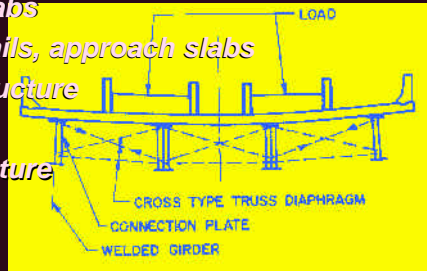
Importing Data to Pontis



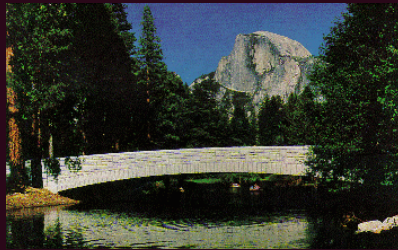
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Building Element Lists

- ***Work from plans or inspection***
- ***Identify each type of element:***
 - ***Decks/slabs***
 - ***Joints, rails, approach slabs***
 - ***Superstructure***
 - ***Bearings***
 - ***Substructure***
- ***Quantify***



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...Next: Expert Judgment Models

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