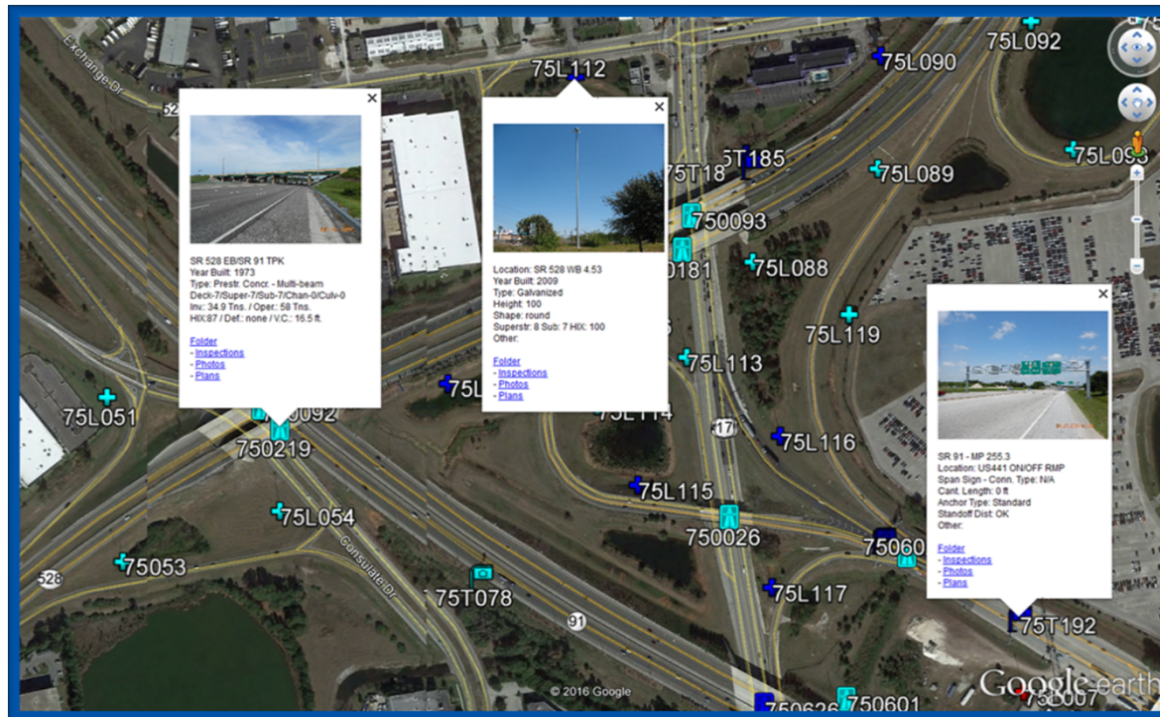


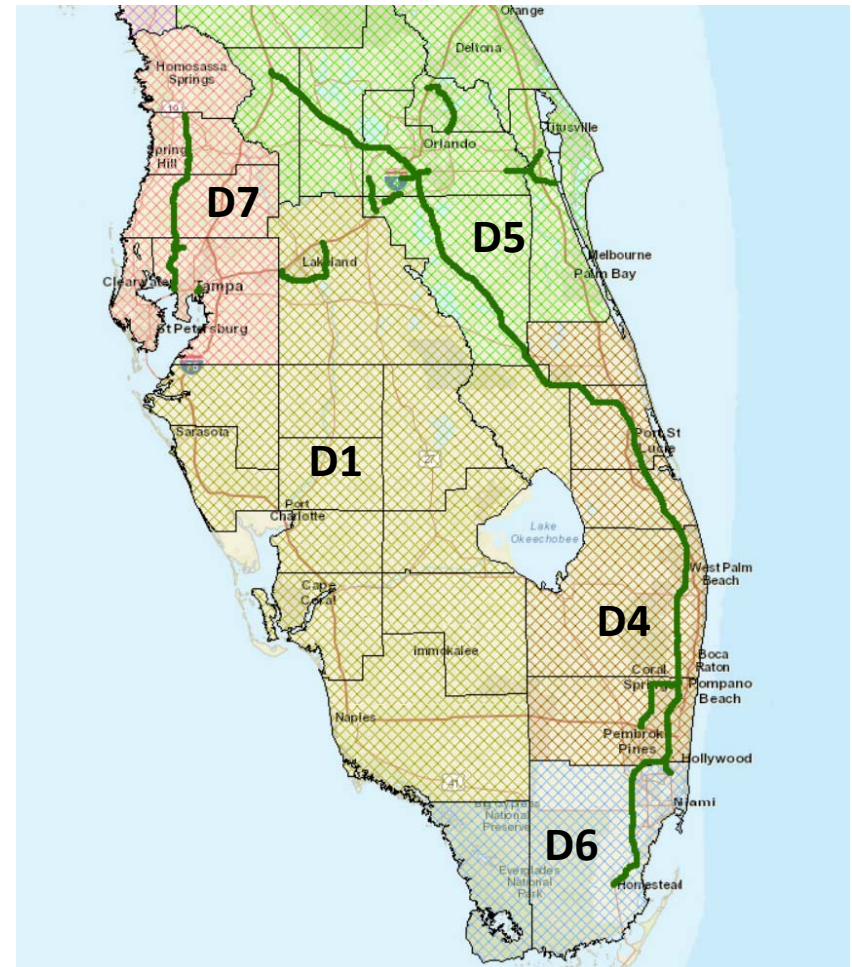
Florida's Turnpike Enterprise Infrastructure Knowledge Management System



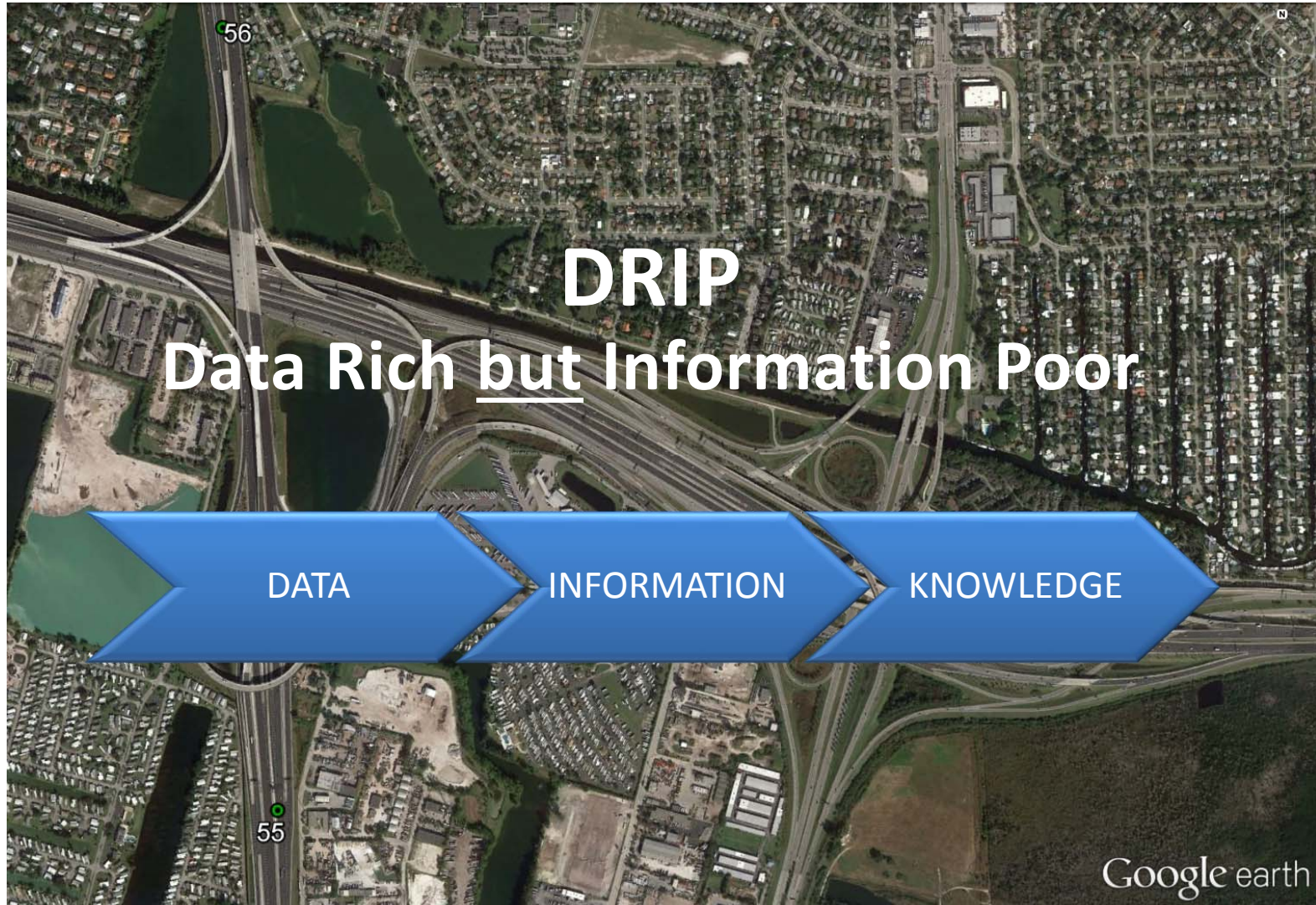
Debbie Meyer, PhD, PE and Aran Lessard, PE

INTRODUCTION

- Florida's Turnpike Enterprise(FTE)
 - 483 miles of limited access toll facilities (2,545 lane miles)
 - FDOT District 8
 - Cross 5 FDOT Districts and 16 Counties
 - 60% of the Population
 - 2 million customers
- Structures Maintenance
 - 743 Bridges
 - 858 Overhead Structures & Toll Gantries
 - 220 Large Non-Qualifying Culverts
 - 444 High Mast Light Towers



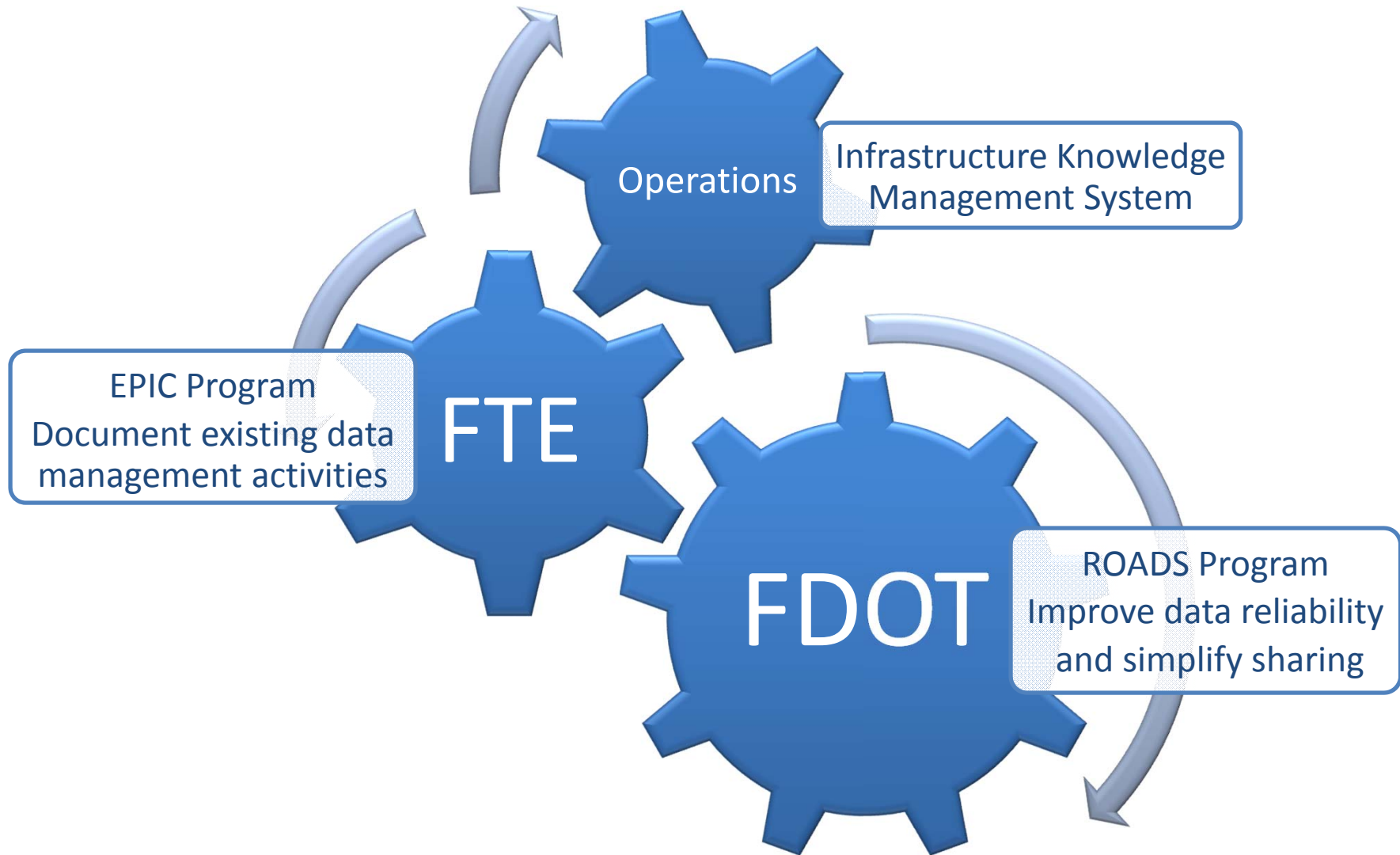
WHERE DO WE BEGIN?



WHERE DO WE BEGIN?



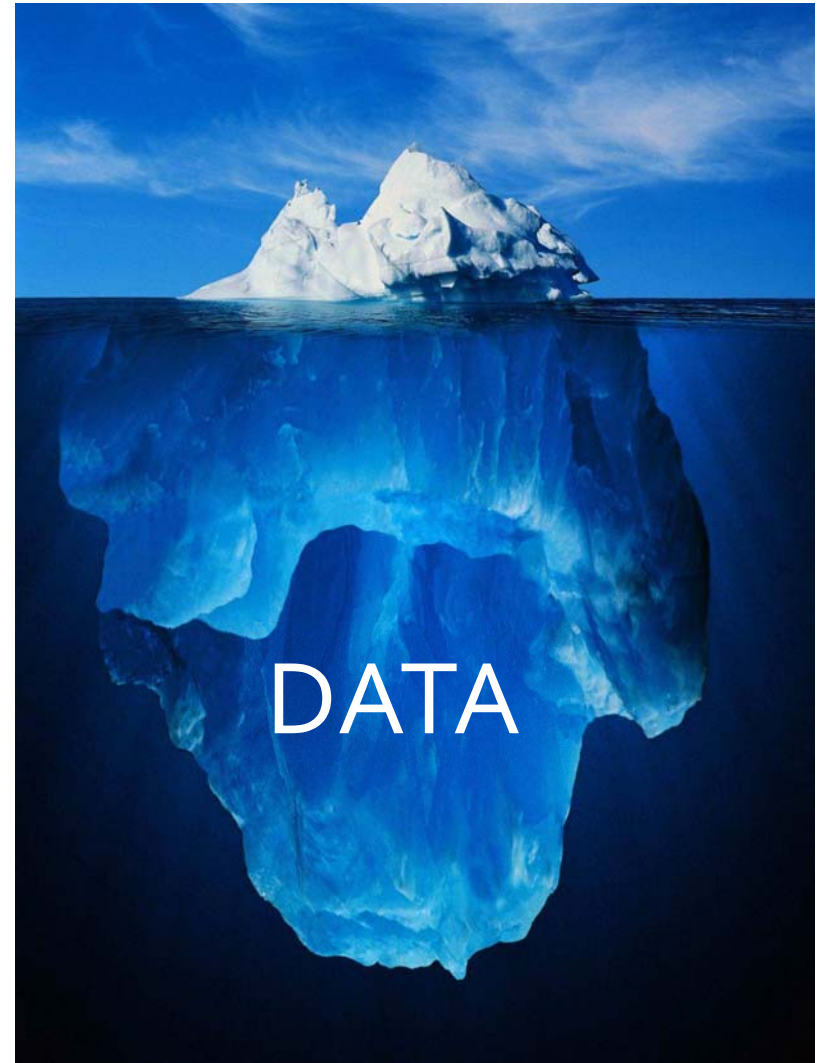
WHERE DO WE BEGIN?



DATA STRATEGY

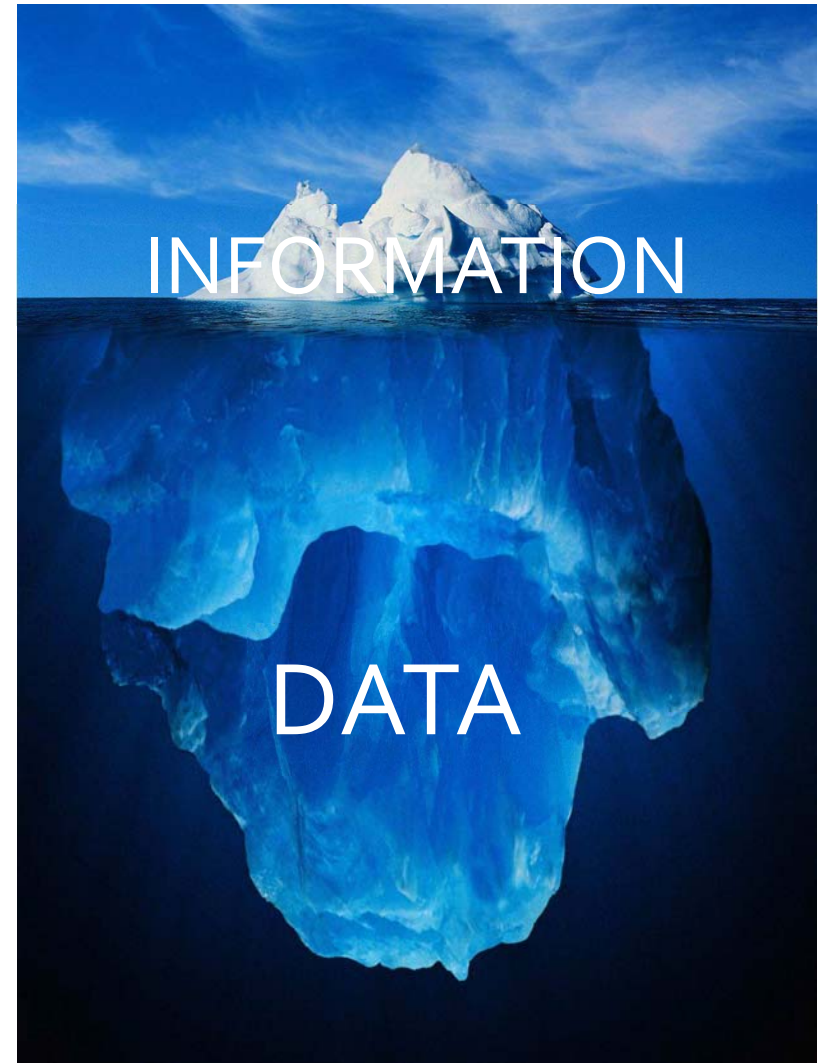
- What is a Data Strategy?
 - How do we use data?
 - Where do we keep it?
 - Who should have access?

*Ensure that the **Right Information**
is available for the **Right People**
at the **Right Time***



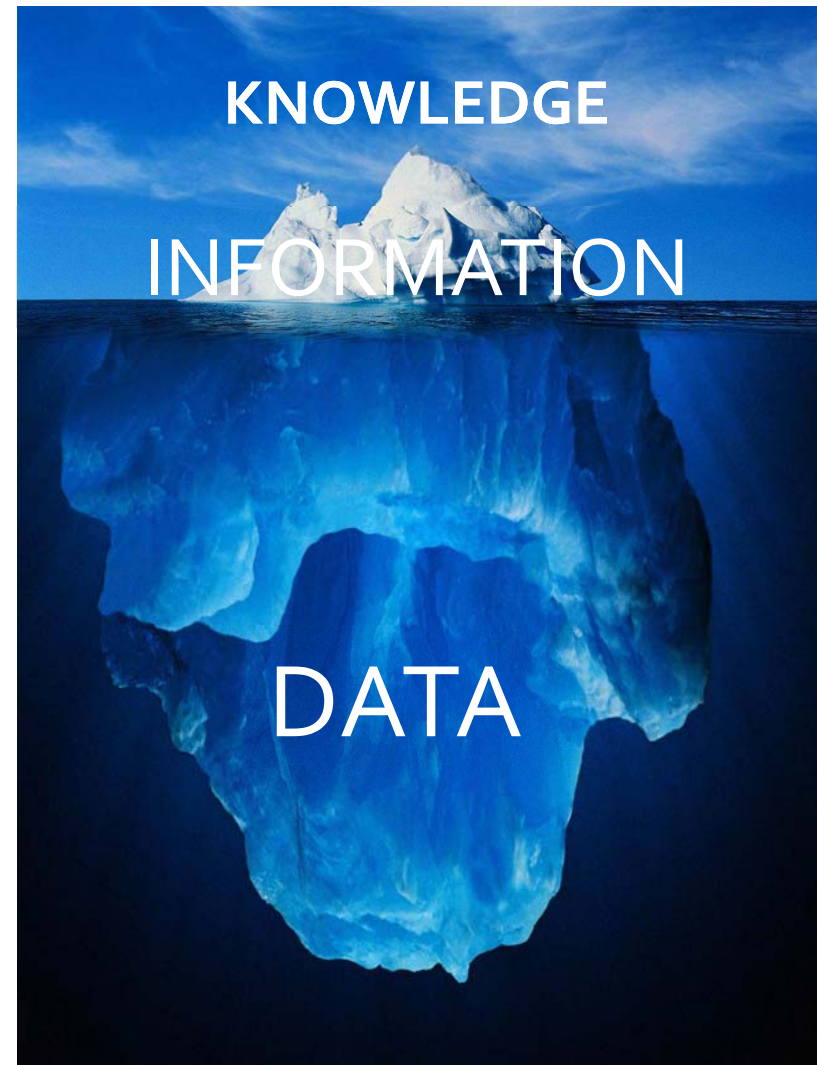
INFORMATION STRATEGY

- Data Meaning
 - Relational connection
- Raw data → Useful information
- **PROCESS DATA**
- “Eye of the Beholder”



KNOWLEDGE MANAGEMENT STRATEGY

- Organizing scattered information
 - Useful and easily shared
- Information generates value
- Identifies trends
- Informed decisions
- Capture the organization's **INTELLIGENCE**



INFRASTRUCTURE KNOWLEDGE

1

Collect available data

- Types of Data
 - Inspection reports
 - Historical records
 - Shop drawings
 - As-built drawings
 - Load ratings
- Time consuming
- Start with new data
- Inspection cycle

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection Report

BRIDGE INSPECTION REPORT

JUL 2 8 AM '10

APPROVED FOR SUBMISSION
SPEC. NO. _____
PLAN NO. _____

REVELED SOLE PLATE SP1
PL 4 15/16" x 28" x 30 3/4"
(SEE SHT. GA11)

PISTON DIA. 1 1/4" x 25" DIA.
TOP PLATE 1380(p1) TOP (22.45" FINISHED DIA. @ STM.)

COMPONENTS OF CONTRACT PLANS SET
ROADWAY PLAN
STRENGTH & MOVEMENT WORKING PLAN
LIGHTING PLANS
ELECTRICAL PLANS
STRUCTURAL PLANS
AS-BUILT INDEX DRAWINGS ON THE
KEY SHEET OF EACH CONTRACT
INDEX OF ROADWAY PLANS
KEY SHEET 11 OF 21
KEY SHEET 12 OF 21
SUMMARY OF ANY ITEMS NOT USED
DRAWING INDEX
TYPICAL SECTIONS
TYPICAL SECTION DETAILS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
FINAL "AS-BUILT" CONTRACT PLANS

FINANCIAL PROJECT ID 406104-1-52-01

PROJECT LOCATION
From Route 95 to 62

BRIDGE LOAD RATING SUMMARY FORM			
BRIDGE DATA	RANGE FOR ANALYSIS	LONGITUDINAL GOVERNING COMPONENT	OTHER SPAN OF INTEREST
Bridge Number: 10000	Starting Station: 0+00	Vehicle Spacing Type: None	(If Applicable)
Span Type (Main Span): 43'0"	Ending Station: 0+22	Deck Type: None	
Span Type (Approach Span): 19'0"	Number of Spans: 2	Substrate: Prestressed Concrete	
	Clearance: 13.5' Above Roadway	Bridge Condition: 2 Span	
POSTING DATA	Condition: Satisfactory	Span Length: 123.0'	



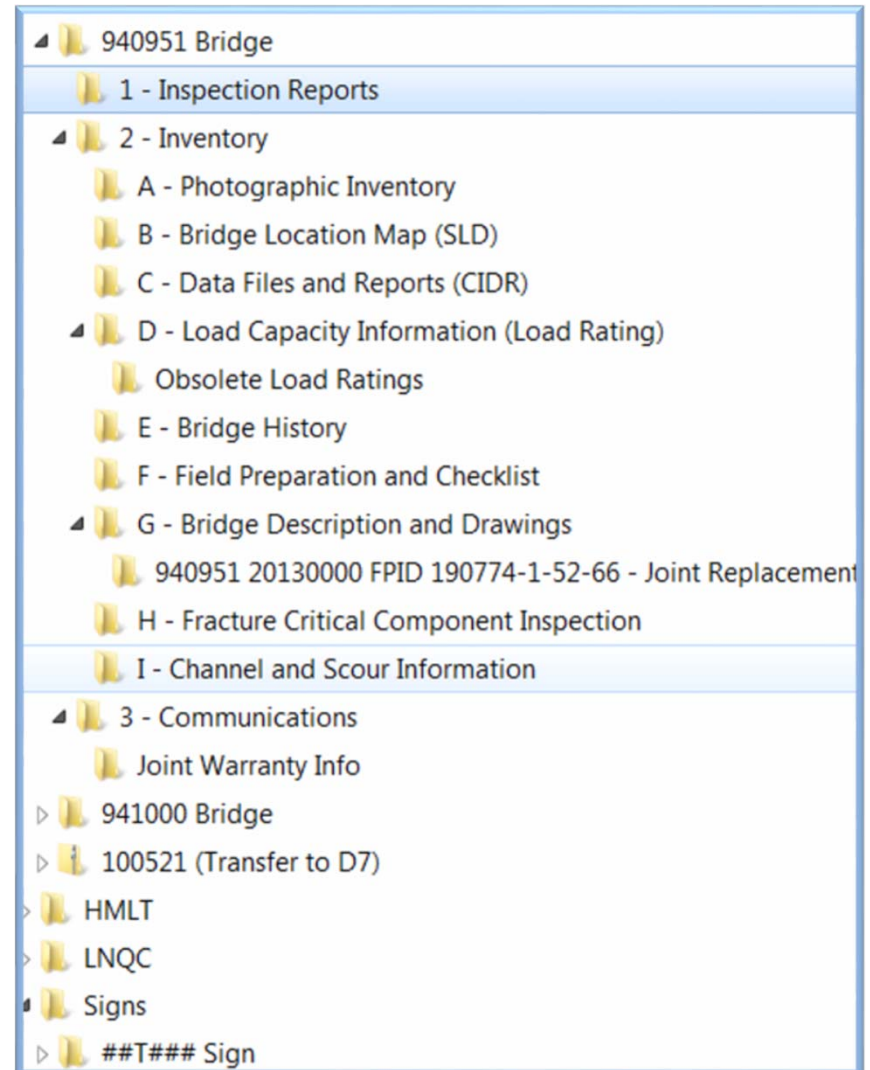
GANNETT FLEMING
 ENGINEERS
 10-15-2010

INFRASTRUCTURE KNOWLEDGE

2

Organize and optimize

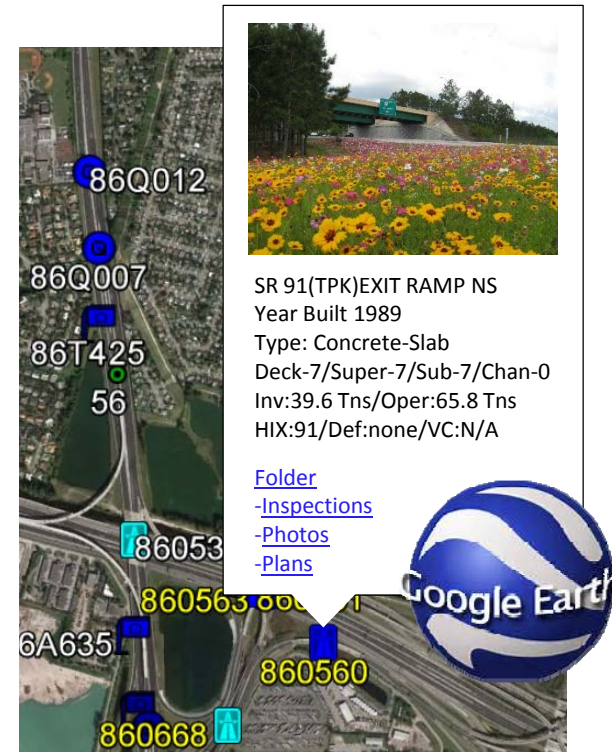
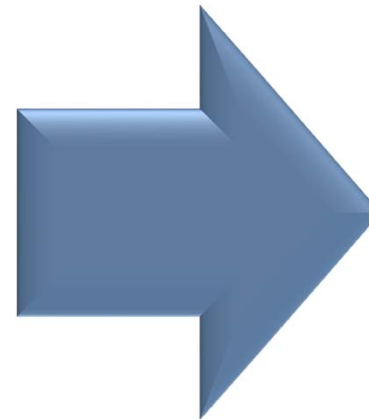
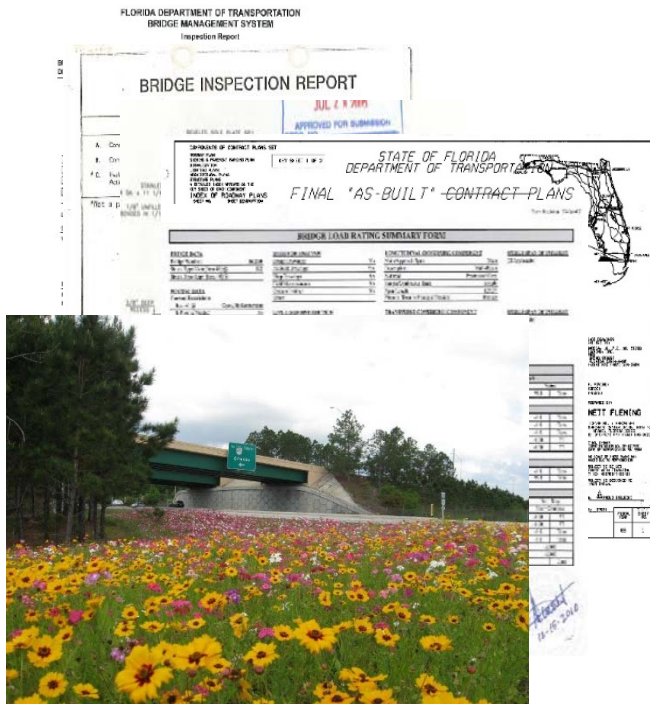
- Information resources
- Project-by-Project or Asset-by-Asset
- Organized by Structure ID
- Formalized folder structure
- Consolidated sources
- Eliminated information
- Standard file naming convention



INFRASTRUCTURE KNOWLEDGE

3

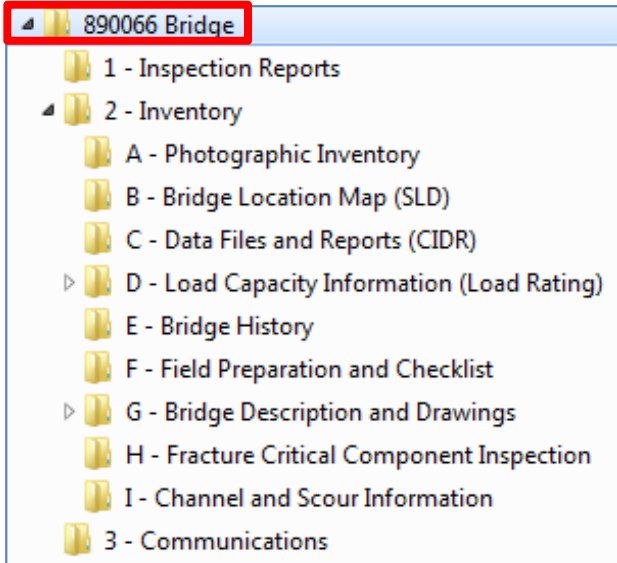
Visualize data



- Locate geographically
- Logical relationships

- Highlight problem areas
- Link to other sources

INFRASTRUCTURE KNOWLEDGE



- “One-Stop-Shop”
- All Information on Asset

INFRASTRUCTURE KNOWLEDGE

890066 Bridge

- 1 - Inspection Reports
- 2 - Inventory
 - A - Photographic Inventory
 - B - Bridge Location Map (SLD)
 - C - Data Files and Reports (CIDR)
 - D - Load Capacity Information (Load Rating)
 - E - Bridge History
 - F - Field Preparation and Checklist
 - G - Bridge Description and Drawings**
 - H - Fracture Critical Component Inspection
 - I - Channel and Scour Information
- 3 - Communications

890066 19990000 FPID 232409-1-52-01 - Repair and Rehabilitation (Shop Dwgs)

890066 20040000 FPID 404135-2-52-01 - Rehabilitation (Shop Dwgs)

890066 19570000 Contract 5A.1 (Substructure) - Construction (As-Built)

890066 19570000 Contract 5A.2 (Superstructure Steel) - Construction (As-Built)

890066 19570000 Contract 5A.3 (Bridge Deck and Handrail) - Construction (As-Built)

890066 19690000 Contract No. 115 - Resurface and Joint Replacements (As-Built)

890066 19811002 Bridge Description & Drawings

890066 19930000 SPN 97890-3307 - Fender System Replacement (As-Built)

890066 19990000 FPID 232409-1-52-01 - Repair and Rehabilitation (As-Built)

890066 20040000 FPID 404135-2-52-01 - Rehabilitation (As-Built)

- Structure ID
- Date (YYYYMMDD)
- Information

Standardized File Naming

INFRASTRUCTURE KNOWLEDGE

890066 Bridge

- 1 - Inspection Reports
- 2 - Inventory
 - A - Photographic Inventory
 - B - Bridge Location Map (SLD)
 - C - Data Files and Reports (CIDR)
 - D - Load Capacity Information (Load Rating)
 - E - Bridge History
 - F - Field Preparation and Checklist
 - G - Bridge Description and Drawings**
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 - I - Channel and Scour Information
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890066 19990000 FPID 232409-1-52-01 - Repair and Rehabilitation (Shop Dwgs)

890066 20040000 FPID 404135-2-52-01 - Rehabilitation (Shop Dwgs)

890066 19570000 Contract 5A.1 (Substructure) - Construction (As-Built)

890066 19570000 Contract 5A.2 (Superstructure Steel) - Construction (As-Built)

890066 19570000 Contract 5A.3 (Bridge Deck and Handrail) - Construction (As-Built)

890066 19690000 Contract No. 115 - Resurface and Joint Replacements (As-Built)

890066 19811002 Bridge Description & Drawings

890066 19930000 SPN 97890-3307 - Fender System Replacement (As-Built)

890066 19990000 FPID 232409-1-52-01 - Repair and Rehabilitation (As-Built)

890066 20040000 FPID 404135-2-52-01 - Rehabilitation (As-Built)

Structure ID

Date (YYYYMMDD)

Information

Files Optimized for Use

INFRASTRUCTURE KNOWLEDGE

- 890066 Bridge
 - 1 - Inspection Reports**
 - 2 - Inventory
 - A - Photographic Inventory
 - B - Bridge Location Map (SLD)
 - C - Data Files and Reports (CIDR)
 - D - Load Capacity Information (Load Rating)
 - E - Bridge History
 - F - Field Preparation and Checklist
 - G - Bridge Description and Drawings
 - H - Fracture Critical Component Inspection
 - I - Channel and Scour Information
 - 3 - Communications

Name

- 890066 19951016 Routine
- 890066 19951025 Completed Work Order (8250013)
- 890066 1996201 DR-1996-006A
- 890066 1996203 Completed Work Order (8056098)
- 890066 1996209 DR-1996-006
- 890066 1996209 DR-1996-006B
- 890066 19960517 DR-1996-0022
- 890066 19960606 Emergency (Vehicle Impact)
- 890066 19960701 Completed Work Order (8106009)
- 890066 19960815 DR-1996-0038
- 890066 19960829 Completed Work Order (8056197)
- 890066 19960829 Completed Work Order (8056374)
- 890066 19970214 Completed Work Order (8056373)
- 890066 19971007 Routine
- 890066 19971028 FARC Notes
- 890066 19971204 DR-1997-0030
- 890066 19980225 Completed Work Order (8456776)
- 890066 19980528 Completed Work Order (8106048)
- 890066 19980601 Completed Work Order (8056117)
- 890066 19981110 Completed Work Order (8056570)
- 890066 19990720 Completed Work Order (8056582)
- 890066 19991119 Routine
- 890066 20000425 FARC Notes
- 890066 20000920 Interim
- 890066 20010110 FARC Notes
- 890066 20011116 Routine
- 890066 20020228 FARC Notes
- 890066 20050217 Post Rehab
- 890066 20050422 Interim
- 890066 20050515 FARC Notes (Post Rehab)
- 890066 20050623 FARC Notes (Interim)
- 890066 20051109 Routine
- 890066 20060222 FARC Notes
- 890066 20060924 DR-2006-537
- 890066 20060929 Completed Work Order (8596158)
- 890066 20071109 Routine
- 890066 20080124 FARC Notes
- 890066 20091109 Routine
- 890066 20100310 FARC Notes
- 890066 20111105 Routine
- 890066 20120124 FARC notes
- 890066 20131102 Routine
- 890066 20140121 FARC Notes
- 890066 20141121 Completed Work Order (8067016)
- 890066 20141217 Completed Work Order (8459750)
- 890066 20141217 Completed Work Order (8459751)

FLORIDA DEPARTMENT OF TRANSPORTATION

Form 803-010, Rev. 4/04
Replaces 721-26
MAY 2004

BRIDGE INSPECTION REPORT

Prepared by
KISINGER, CAMPO, & ASSOCIATES

CONTENTS OF REPORT

A. Condensed Inspection Report	* F. Field Preparation
B. Comprehensive Report of Deficiencies	* G. Fracture Critical Inspections
C. Evaluation of Previous Corrective Action	* H. Scour Evaluation
D. Required Maintenance Repair and Rehabilitation	* I. Load Rating Analysis
* E. Methods, Quantities and Costs of Contract Corrective Action	J. BMS Report

* This section is not included in this report.

REPORT IDENTIFICATION

Bridge No.: 890066 Bridge Name: THOMAS B. MANUEL BRIDGE Section No. 09470

Location: A&M S of Stuart Interchange US R. N/A

NO YES	This bridge contains fracture critical components?	S.R. 91
X	This bridge is scour critical?	M.P. 12.988
X	This report identifies deficiencies which require prompt corrective action?	RD. SYS. 000

Type of Inspection: Routine Interim Special

Field Inspection Date: Above Water: 10/07/07 Under Water: 09/30/07

Name of Inspector/Diver	Initials	Engineering Registration Number	Certified Bridge Inspection No.
P.M. O'Drady, CBI (Senior Inspector in Charge)	PO		00274
C.W. Elliott			
V.L. Griswold, CBI (Senior Diving Inspector/Diver)			00050
A.T. Bittelhauser			
E.L. King			

Reviewing Bridge Inspection Supervisor
Name: K.C. Reinhold, CBI 00025 Initials: KR

Confirming Registered Professional Engineer
Name: P.G. Foley, PE P.E. Number: 40078
Signature: *P.G. Foley 11/6/07*

Page 1 of 127

INFRASTRUCTURE KNOWLEDGE

- 890066 19960701 Completed Work Order (8106009)
- 890066 19960815 DR-1996-0038
- 890066 19960829 Completed Work Order (8056197)
- 890066 19960829 Completed Work Order (8056374)
- 890066 19970214 Completed Work Order (8056373)
- 890066 19971007 Routine**
- 890066 19971028 FARC Notes
- 890066 19971204 DR-1997-0030
- 890066 19980225 Completed Work Order (8456776)
- 890066 19980528 Completed Work Order (8106049)
- 890066 19980601 Completed Work Order (8066117)
- 890066 19981110 Completed Work Order (8056570)

- 890066 19951016 Routine
- 890066 19951025 Completed Work Order (8256013)
- 890066 19960201 DR-1996-0066A
- 890066 19960203 Completed Work Order (8056098)
- 890066 19960209 DR-1996-0066B
- 890066 19960309 DR-1996-0066C
- 890066 19960517 DR-1996-0022
- 890066 19960606 Emergency Vehicle Impact
- 890066 19960701 Completed Work Order (8106009)
- 890066 19960815 DR-1996-0038
- 890066 19960829 Completed Work Order (8056197)
- 890066 19960829 Completed Work Order (8056374)
- 890066 19970214 Completed Work Order (8056373)
- 890066 19971007 Routine
- 890066 19971028 FARC Notes
- 890066 19971204 DR-1997-0030
- 890066 19980225 Completed Work Order (8456776)
- 890066 19980528 Completed Work Order (8106049)
- 890066 19980601 Completed Work Order (8066117)
- 890066 19981110 Completed Work Order (8056570)
- 890066 19990720 Completed Work Order (8056582)
- 890066 19991119 Routine
- 890066 20000423 FARC Notes
- 890066 20000920 Interim
- 890066 20010110 FARC Notes
- 890066 20011116 Routine
- 890066 20020228 FARC Notes
- 890066 20050217 Post Rehab
- 890066 20050422 Interim
- 890066 20050515 FARC Notes (Post Rehab)
- 890066 20050623 FARC Notes (Interim)
- 890066 20051109 Routine
- 890066 20060222 FARC Notes
- 890066 20060924 DR-2006-537
- 890066 20060929 Completed Work Order (8596158)
- 890066 20071109 Routine
- 890066 20080124 FARC Notes
- 890066 20081109 Routine
- 890066 20100310 FARC Notes
- 890066 20111105 Routine
- 890066 20120124 FARC notes
- 890066 20131102 Routine
- 890066 20140121 FARC Notes
- 890066 20141121 Completed Work Order (8067016)
- 890066 20141217 Completed Work Order (8459750)
- 890066 20141217 Completed Work Order (8459751)

FLORIDA DEPARTMENT OF TRANSPORTATION

BRIDGE INSPECTION REPORT
Prepared by
KISINGER, CAMPO, & ASSOCIATES

CONTENTS OF REPORT

A. Condensed Inspection Report
B. Comprehensive Report of Deficiencies
C. Evaluation of Previous Corrective Action
D. Required Maintenance Repair and Rehabilitation
E. Methods, Quantities and Costs of Contract Corrective Action
* This section is not included in this report.

F. Field Preparation
G. Fracture Critical Inspections
H. Scour Evaluation
I. Load Rating Analysis
J. BMIS Report

REPORT IDENTIFICATION

Bridge No.: 890066 Bridge Name: THOMAS B. MANUEL BRIDGE Section No. 09/70
Location: A1N S of Stuart Interchange US R. N/A
NO YES This bridge contains fracture critical components? S.R. 91
 This bridge is scour critical? M.P. 12.988
 This report identifies deficiencies which require prompt corrective action? RD. SYS. 000

Type of Inspection: Routine Interim Special
Field Inspection Dates: Above Water: 10/07/07 Under Water: 09/30/07

Name of Inspector/Diver	Initials	Engineering Registration Number	Certified Bridge Inspection No.
P.W. O'Grady, CBI (Senior Inspector in Charge)	<i>PO</i>		00274
C.W. Elliott			
V.L. Griswold, CBI (Senior Diving Inspector/Diver)			00050
A.T. Bibelhauser			
E.L. King			

Reviewing Bridge Inspection Supervisor
Name: K.C. Reinhold, CBI 00025 Initials: *KR*
PE or CBI Number:

Confirming Registered Professional Engineer
Name: P.G. Foley, PE P.E. Number: 40078
Signature: *P.G. Foley 11/6/07*

Page 1 of 127

- Structure ID
- Date (YYYYMMDD)
- Information

Organized Chronologically

INFRASTRUCTURE KNOWLEDGE

Inspection Recommends Repair

WORK ORDER RECOMMENDATION:
Clean and paint corroded exposed steel and repair spall in north face of the cap at Bent 15.

The screenshot shows a software interface with a list of work orders on the left and a detailed report on the right. The list includes items like '890066 20060222 FARC Notes', '890066 20060924 DR-2006-537', and '890066 20131102 Routine'. The report on the right is titled 'FLORIDA DEPARTMENT OF TRANSPORTATION' and contains several sections. One section, 'ELEMENT/ENV/2343 R/Cone Cap', has a 'WORK ORDER RECOMMENDATION' highlighted in a red box: 'Clean and paint corroded exposed steel and repair spall in north face of the cap at Bent 15.' A red dashed line connects this highlighted text to the larger text at the top of the slide.

UNIT: SUBSTRUCTURE	ELEM CATEGORY: Substructure
ELEMENT/ENV/2069 R/Cone Column	
CONDITION STATE (e)	Priority
3	1 ea. 3
WORK ORDER RECOMMENDATION:	
Clean and paint corroded exposed steel and repair pop-outs on the north face Column 14-2, 20' above the groundline.	
3	1 ea. 3
WORK ORDER RECOMMENDATION:	
Clean and paint corroded exposed steel and repair spall at the south face of Column 4-2, 15' from the groundline and 4' from the west corner.	
ELEMENT/ENV/2343 R/Cone Cap	ELEM CATEGORY: Substructure
CONDITION STATE (e)	Priority
1	1 II. 3
WORK ORDER RECOMMENDATION:	
Clean and paint corroded exposed steel and repair spall in north face of the cap at Bent 15.	
1	1 II. 3
WORK ORDER RECOMMENDATION:	
Repair spall/delamination on the east face of the top pedestal for Beam 3-8 over Bent 4.	
3	1 II. 3
WORK ORDER RECOMMENDATION:	
Clean and paint corroded exposed steel and repair spall on the north face of the cap at Bent 4, 3' above Column 4-2.	
3	1 II. 3
WORK ORDER RECOMMENDATION:	
Clean and paint corroded exposed steel and repair spall on the south face of the cap at Bent 22.	

This report contains information relating to the physical security of a structure and facilities of the structure. This information is confidential and exempt from public release pursuant to sections 119.071(2)(a) and 119.071(2)(b), Florida Statutes. Only the cover page of this report may be inspected and copied.
REPORT ID: INSP05 (continued) PRINTED: 12/21/2013

INFRASTRUCTURE KNOWLEDGE

- Inspection Recommends Repair
- Work Order Repair (before & after photos)

The image displays a screenshot of a file explorer window on the left and a report page on the right. The file explorer shows a list of files with names like '890066 2005015 FARC Notes (Post Rehab)', '890066 20050623 FARC Notes (Interim)', and '890066 20141217 Completed Work Order (8459750)'. The report page shows a table with columns for 'Image Date', 'Format', 'Last Updated', and 'Updated By'. Two photos are shown in the report, with red dashed lines connecting them to larger, magnified images of the same photos. The magnified images show a vertical crack in a concrete surface. The report page also includes a footer with 'Page 4 of 6' and '12/23/2014 10:28:43 AM EST'.

Image Date	Format	Last Updated	Updated By
12/17/2014 4:55:30 PM	jpg	12/17/2014 4:55:04 PM	gonzalezp
12/17/2014 4:55:31 PM	jpg	12/17/2014 4:56:04 PM	gonzalezp

INFRASTRUCTURE KNOWLEDGE

- Inspection Recommends Repair
- Work Order Repair (before & after photos)
- Follow-up Review of Quality and Effectiveness

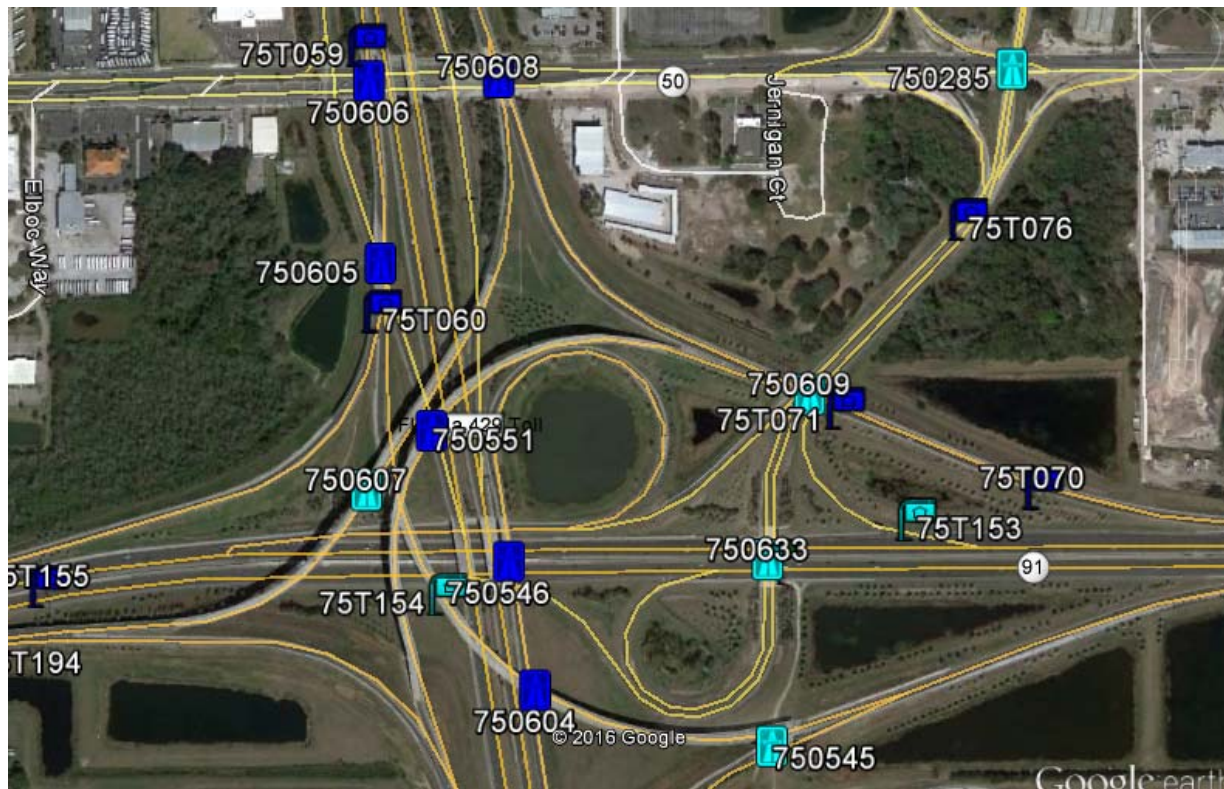
The screenshot displays the Florida Department of Transportation Bridge Management System interface. On the left, a list of work orders is shown, with the entry '890066 20160219 FARC Notes' selected. The main panel on the right shows a detailed report for a completed repair. A red box highlights the following text: '3) The corrective action listed above was satisfactorily completed. Work Order Site No. 8459750 was issued. Completion date 12/17/14.' The report includes sections for 'CORRECTIVE ACTION REQUIRED', 'PREVIOUS RECOMMENDED CORRECTIVE ACTION', and 'CORRECTIVE ACTION EVALUATION'. The evaluation section lists four items, with item 3) corresponding to the highlighted text. The report also includes a footer with the text: 'This report contains information relating to the physical health of a structure and depictions of the structure. This information is confidential and exempt from public inspection pursuant to sections 119.07(2)(a) and 119.07(2)(b), Florida Statutes. Only the cover page of this report may be inspected and copied.' and 'REPORT ID: 845965 (unreadable) PRINTED: 12/18/2015'.

INFRASTRUCTURE KNOWLEDGE

- Translate Data to .kml File Format:

<http://www.earthpoint.us/ExcelToKml.aspx>

(or “Excel to kml” in www.Google.com)



INFRASTRUCTURE KNOWLEDGE

The screenshot displays a GIS interface with an aerial view of a highway interchange. A callout window for bridge 750607 is open, showing a photo of the bridge and its details. A file tree on the right lists various data folders for this bridge, with red boxes highlighting '750607 Bridge', '1 - Inspection Reports', '2 - Inventory', 'A - Photographic Inventory', and 'G - Bridge Description and Drawings'. Red lines connect the 'Inspections', 'Photos', and 'Plans' links in the callout to the corresponding folders in the tree.

75T060

750607

Florida's Turnpike

750609

75T070

SB SR 91 TPK TO SR 429 NB
Year Built: 2001
Type: Steel Cont. - Multi-beam
Deck-7/Super-7/Sub-6/Chan-0/Culv-0
Inv.: 38.2 Tns. / Oper.: 63.6 Tns.
HIX:91 / Def.: none / V.C.: 16.25 ft.

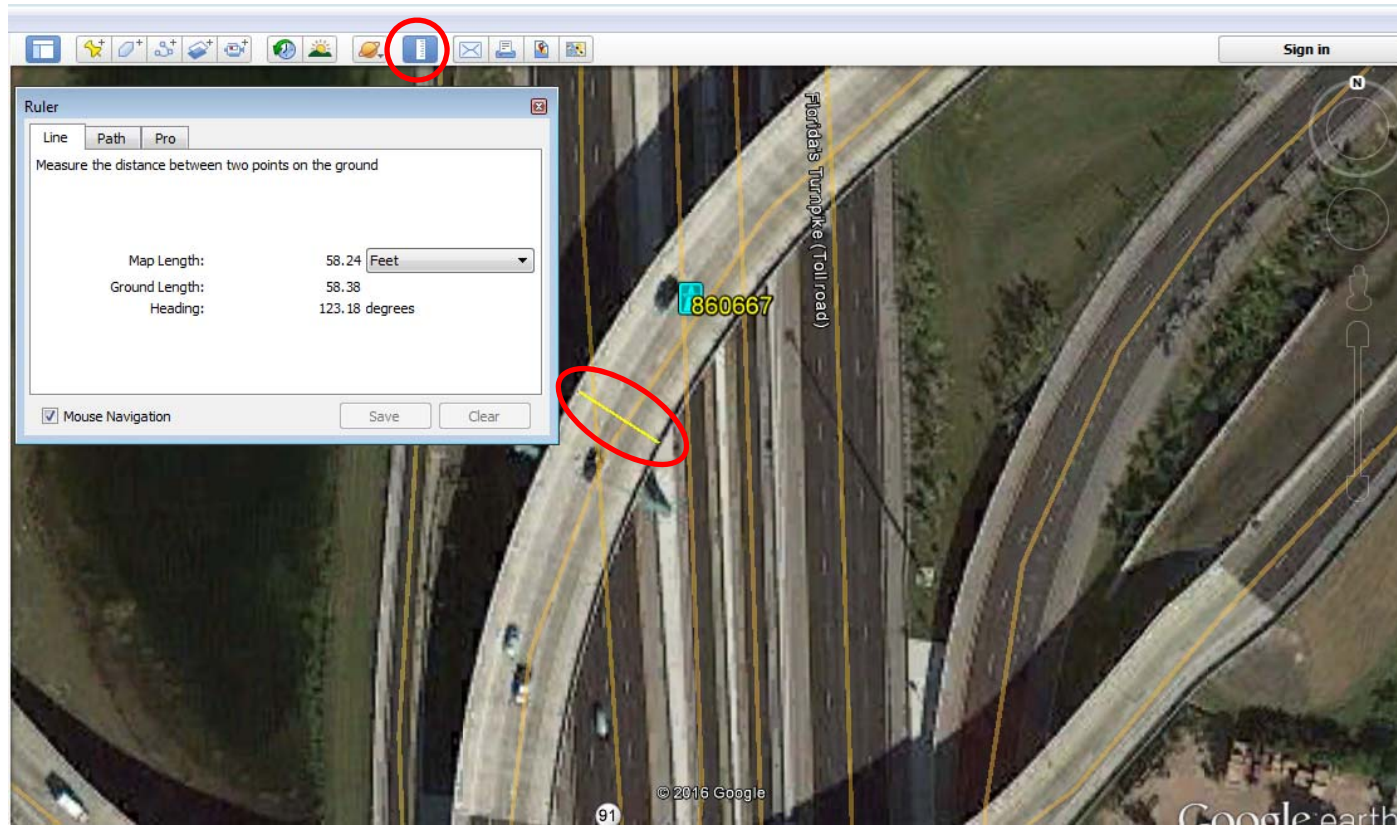
Folder
- Inspections
- Photos
- Plans

- 750607 Bridge
 - 1 - Inspection Reports
 - 2 - Inventory
 - A - Photographic Inventory
 - B - Bridge Location Map (SLD)
 - C - Data Files and Reports (CIDR)
 - D - Load Capacity Information (Load Rating)
 - E - Bridge History
 - F - Field Preparation and Checklist
 - G - Bridge Description and Drawings
 - H - Fracture Critical Component Inspection
 - I - Channel and Scour Information
 - 3 - Communications

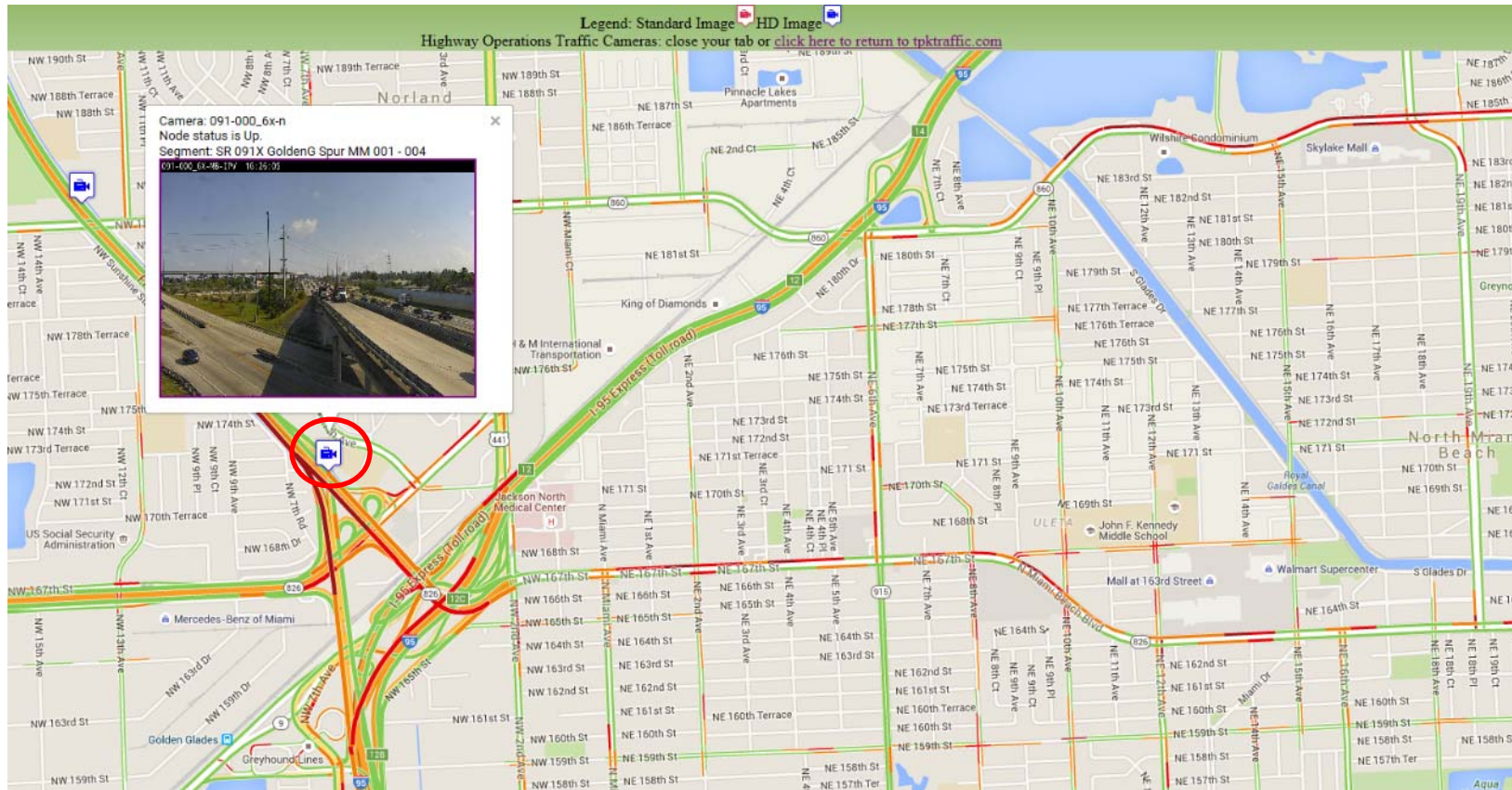
INFRASTRUCTURE KNOWLEDGE



INFRASTRUCTURE KNOWLEDGE



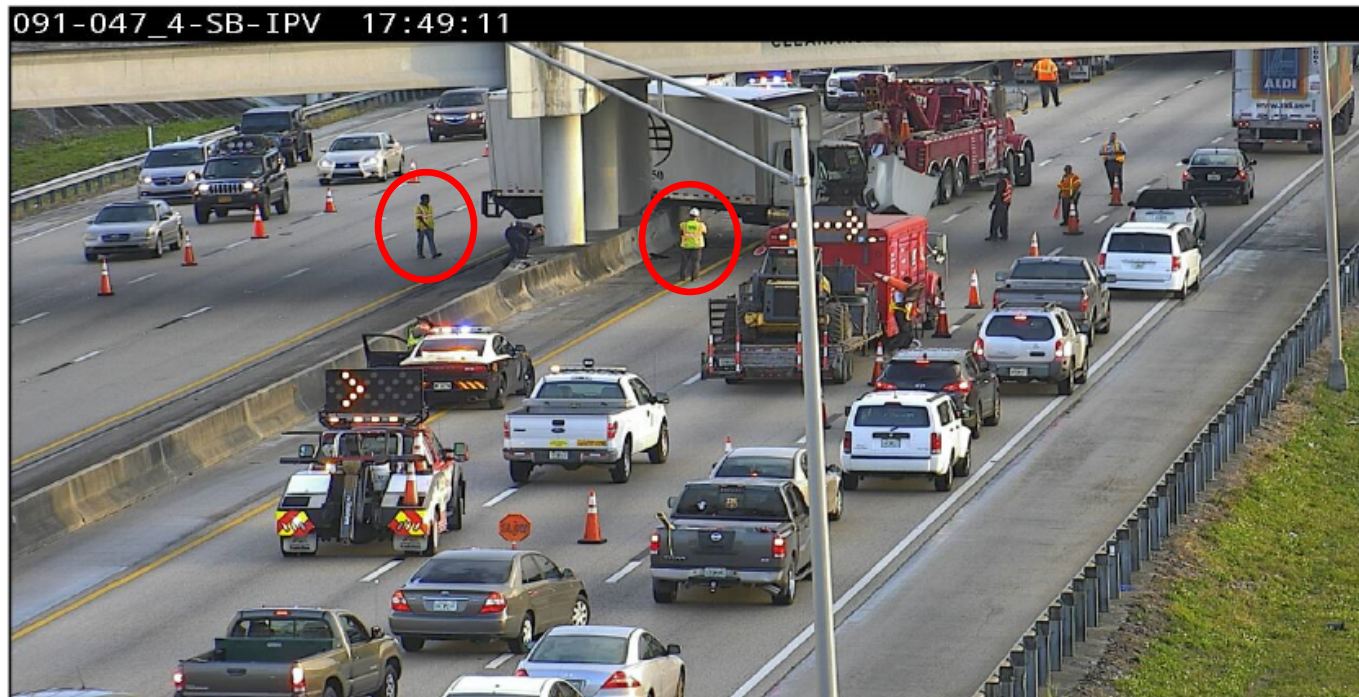
INFRASTRUCTURE KNOWLEDGE



INFRASTRUCTURE KNOWLEDGE

Highway Operations Traffic Stream

Traffic Camera Location: 091-047_4-sb



INFRASTRUCTURE KNOWLEDGE



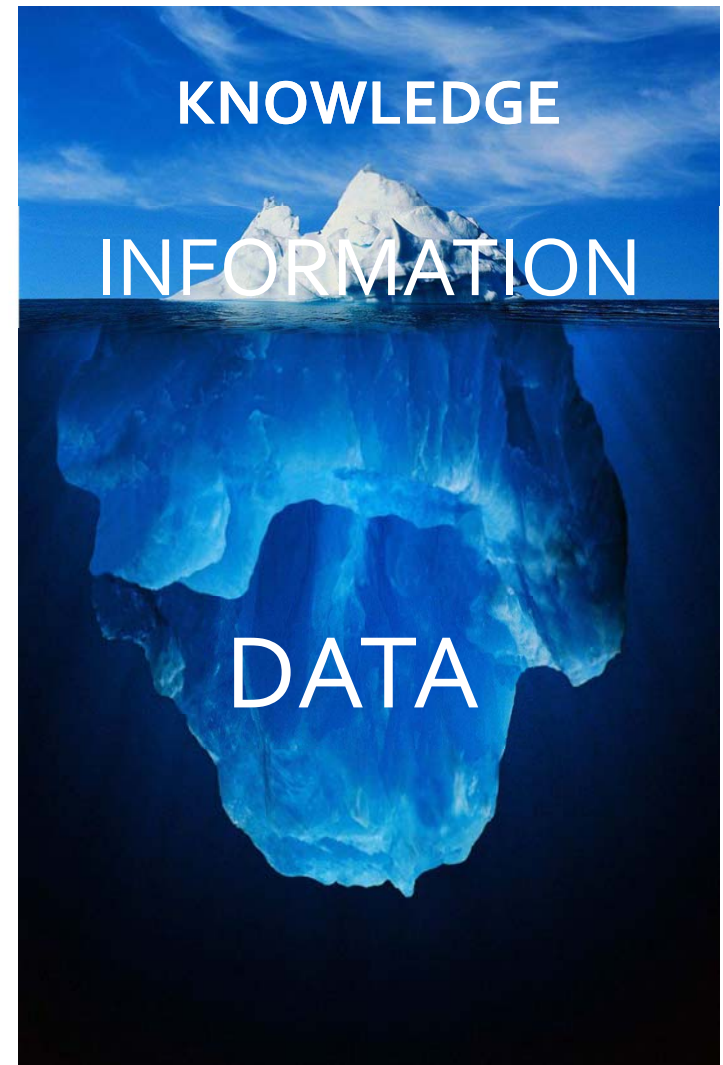
Summary

Knowledge Management...

- Ensure **Right Information** is available for the **Right People** at the **Right Time**.
- Data - Information - Knowledge
- Organize & Optimize
- Create Value – Improve Efficiency

Looking Forward...

- Integrate New Types of Information
- New Technologies (Mobile App's, etc.)



KNOWLEDGE MANAGEMENT



Questions?

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(954)934-1228

Aran Lessard, PE
aran.lessard@dot.state.fl.us
(954)934-1234