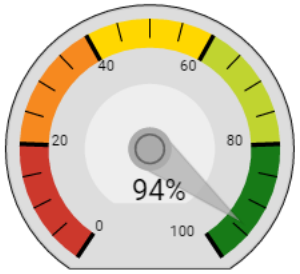
Bridges…What's the Big Deal?

What is a Bridge?

- Federal Definition
  - Over 20’ Out-to-Out Length Along Centerline of Road
  - Includes Multi-Cell Culverts
- Delaware Definition
  - Over 20 Square Feet Hydraulic Opening
  - Minimum Height of 4’

DELDOT DASHBOARD

PERFORMANCE | SAFETY | CONDITION | SATISFACTION



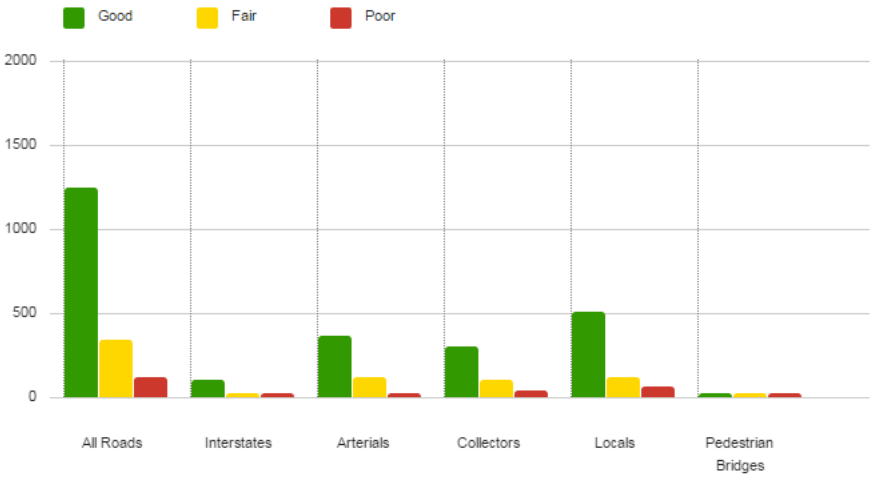
OVERALL BRIDGE CONDITION - 2015

CONDITION MEASURES

- PAVEMENT
- BRIDGES
- STATEWIDE
- NEW CASTLE
- KENT
- SUSSEX

Current Data Historical Data

BRIDGE CONDITION: STATEWIDE



GOOD AND FAIR CONDITION: 94.0%
AS OF 12/31/2015
TARGET: 95%

As of December 31, 2015, DelDOT maintains 1674 bridges in Delaware. There are 112 bridges that are owned by others, such as municipalities or railroads. The bridges range in size and type from a simple pipe culvert, to draw bridges, to the new Indian River Inlet Bridge. All bridges undergo routine bridge inspections in compliance with federal standards to ensure the bridge's integrity and the public safety. Deficiencies found during inspections are monitored at a frequency that is appropriate, with the intention to systematically rehabilitate or replace them to bring them into compliance with current standards.

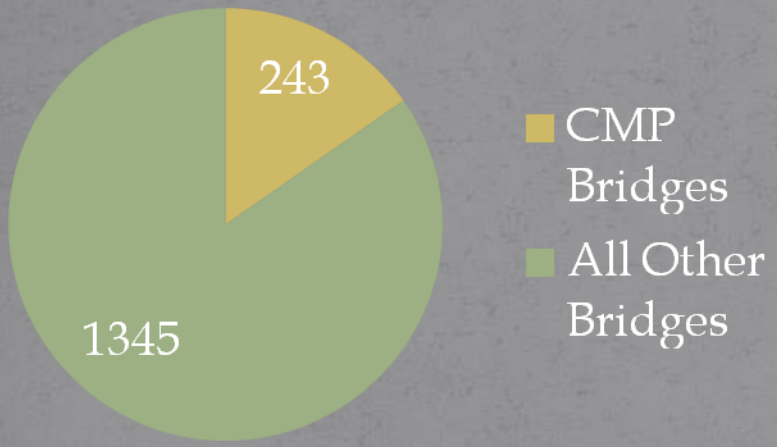
*Appraisal of the Nation's Bridges (NBI Coding Guide)

Condition Definitions

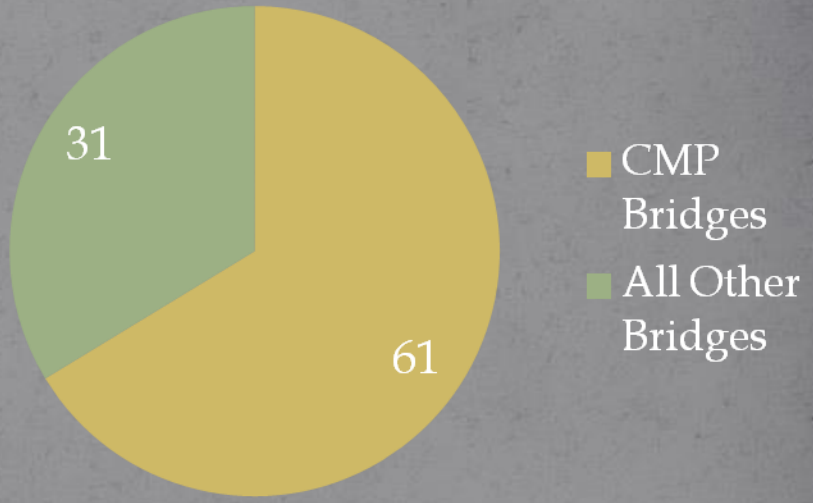
Good Fair Poor

Look Closer At the Data

CMP Inventory Comparison



Structurally Deficient CMP Bridge Comparison



CMP bridges account for ~15% of our entire bridge inventory, but they account for ~66% of the number of Structurally Deficient bridges in our inventory

How Did We Get Here?

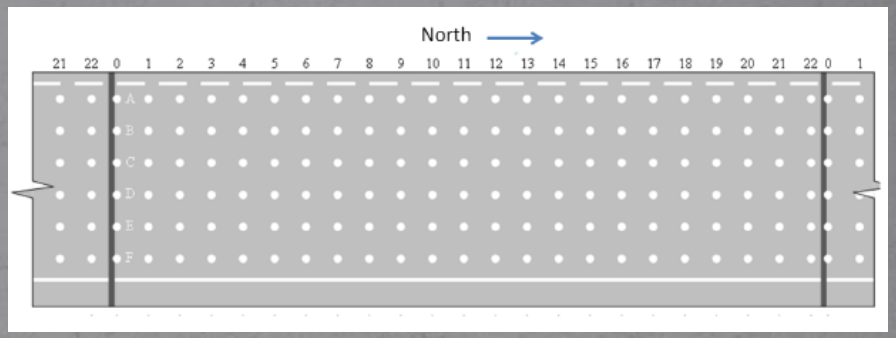
- Mid 1980s
  - Replaced Original Hot Mix Overlays With Latex Modified Concrete Overlays on Interstate
  - Life Expectancy 30 Years
- Late 1970s/Early 1980s
  - Replaced Hundreds of 75+ Year Old Timber Bridges with Corrugated Metal Culverts
  - Sold as 50-Year Design Life (Average Actual Life of 25-30 Years)
  - Removed From Bridge Inventory Because No Longer a Bridge

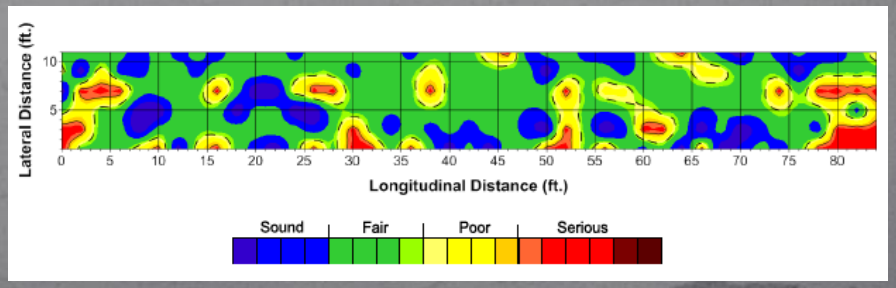
How Did We Get Here?

- Bridge Program Is Unique
  - Condition-Based Service Life Similar to Pave & Rehab Program
    - Bridges Can Fail Causing Road Closures
  - Design Restraints Similar to Project Development Program
    - Design Process is Lengthy

Bridge Decks

- 1.9 Million Square Feet of Bridge Deck (1.5 Million on Viaduct and Brandywine River Bridge Alone)
- Impact Echo Testing of all Interstate Decks in 2015





Bridge Decks

- $180 Million Investment in Interstate Bridge Decks over the Next 10 Years (Including Viaduct Project)
- $10 Million Per Year After Viaduct Project

Bridge 1-148A on Greenbank Road over Red Clay Creek

Bridge 1-251 on Harmony Road over White Clay Creek

Bridge 1-717 on I-95 over SR1

Bridge 1-714 on Chapman Road over I-95

Bridge Decks

- ~$100/SF Cost for Deck Replacement/Rehab
- $180 Million Investment in Interstate Bridge Decks over the Next 10 Years (Including Viaduct Project)
- $10 Million Per Year After Viaduct Project
- Other Notable Projects:
  - I-95/SR141 Interchange Projects
  - Bridge 3-150N/S (SR1 over Lewes-Rehoboth Canal)
  - Bridge 1-680 (SR141 over US13)

Bridge Decks

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  - I-95/SR141 Interchange Projects
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  - Bridge 3-150N/S (SR1 over Lewes-Rehoboth Canal)
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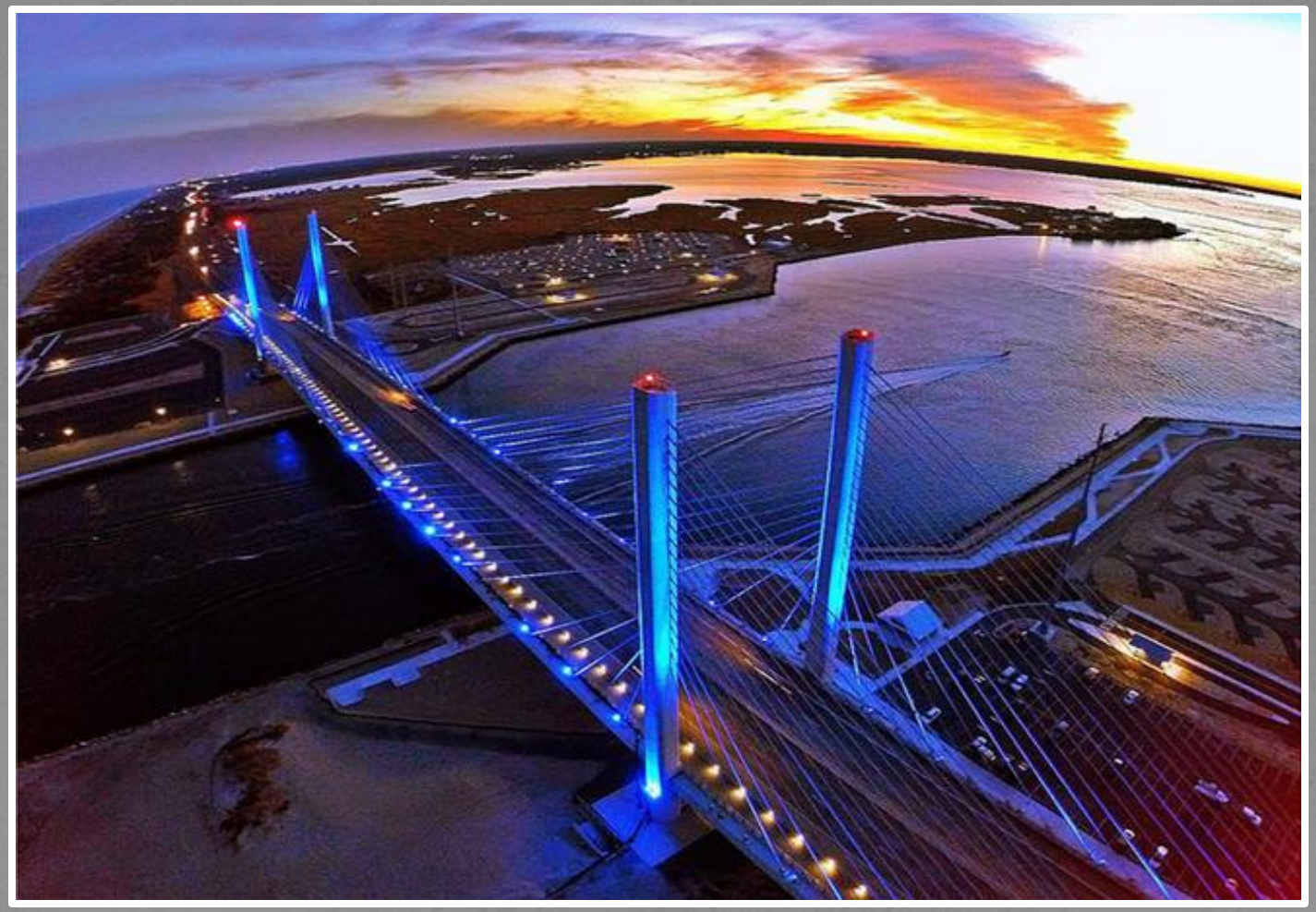
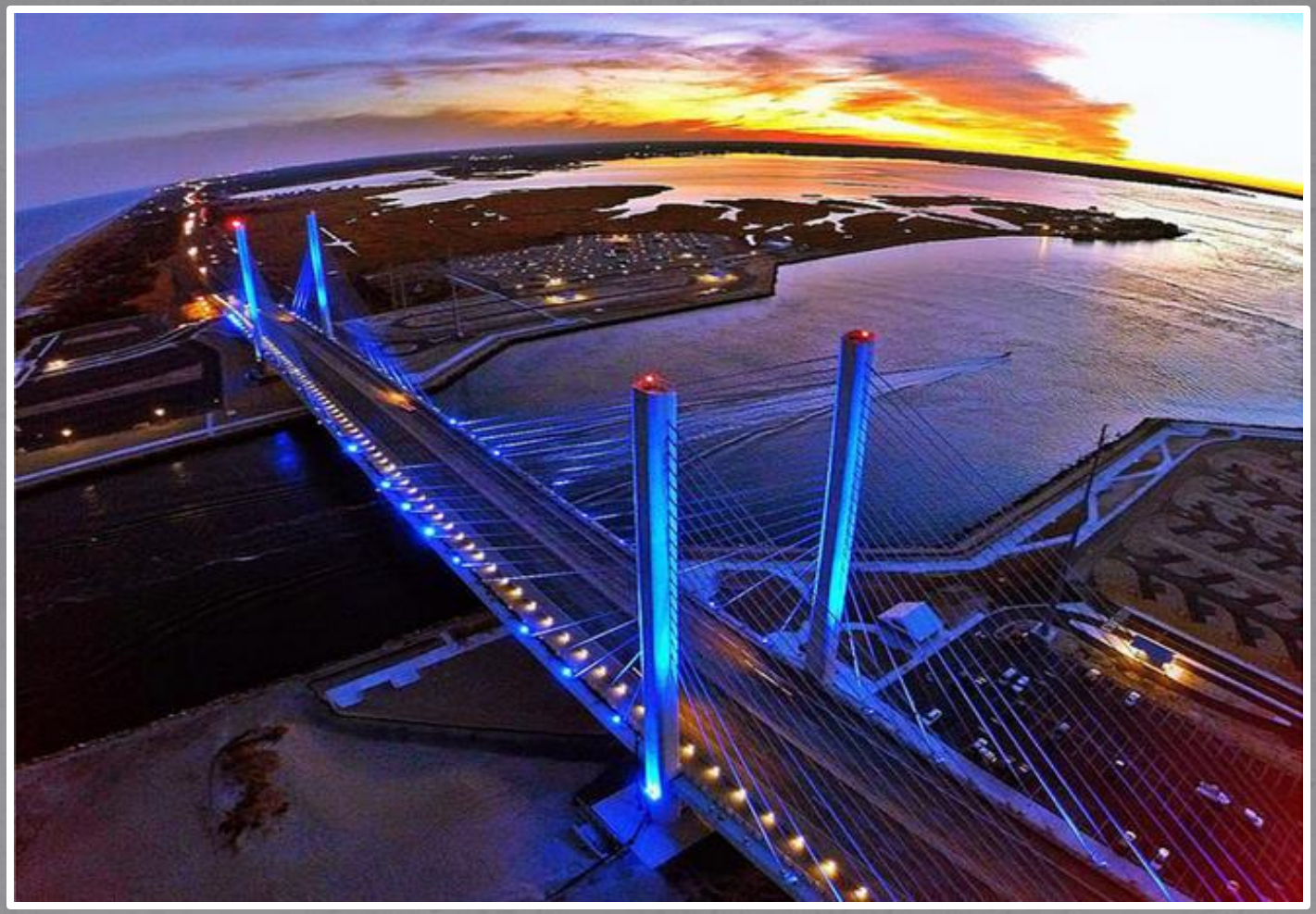
In Case You Forgot...

The Most Beautiful Bridge in the



World!

Did you know…



This is how Kevin Lindell sees the World!

Let's Talk Bridge Design…

Does anyone like them?

Who is Bridge Design?

What a bunch of weenies!

They sure are loud!

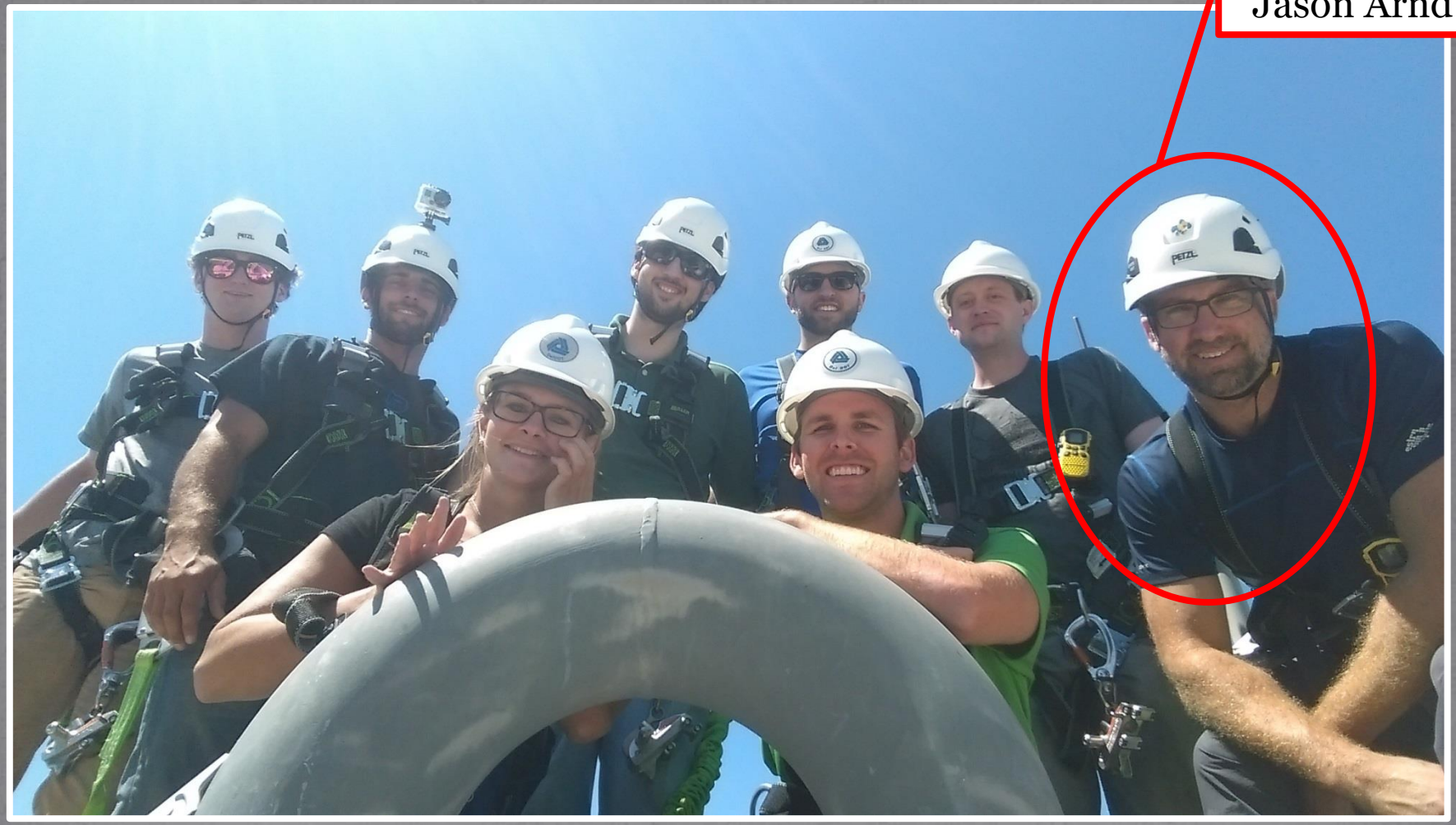
They need to use Primavera correctly!

Why are all of their projects so urgent?

Who cares about corrugated metal pipes?

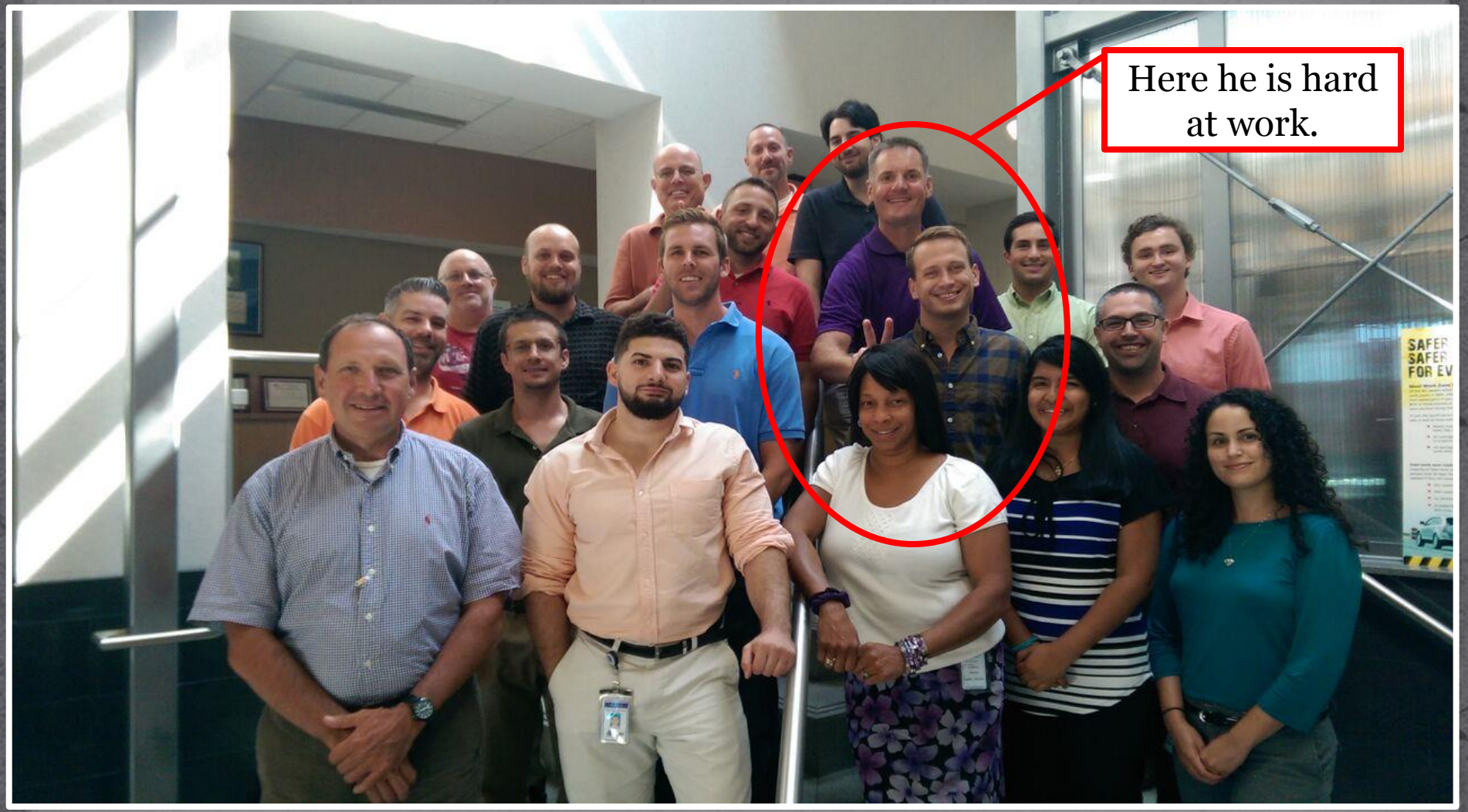
Who is Bridge Design?

Whose fault is it?



Bridge Management keeps finding bridges, we'll blame Jason Arndt.

Whose fault is it?



Then Bridge Management tells Barry Benton what bridges they found.

Whose fault is it?

Then Barry and Jason Hastings get together and give each other Challenge Coins…

Whose fault is it?

Then it rolls down hill to me. They get awards; I get yelled at in Project Status from Billy Sweeney.

The Problem… CMPs are Deteriorating quickly

1. Corroded Corrugated Metal Pipes will fail.
2. Roads will be closed causing high user costs.
3. Failure of pipes is obviously unsafe to traveling public.
4. Cost of construction to replace pipes in an emergency situation is costly.
5. Deteriorating and failing pipes is bad for Community Relations.

CMP Deterioration…

CMP End Rot

CMP Deterioration…

Jason Arndt does work!

CMP Longitudinal Separation

Current Pipe Facts…

1. Approximately 1600 bridges in DelDOT's Inventory.
   14% of these are CMPs
2. What defines a bridge (state length)?
   20 sf hydraulic opening
3. Bridge Management recently found 57 CMPs that are bridges (last 2 yrs.)
   Found 160 between 2007-2010.
4. Department averages 15 -18 replacements a year including the ones replaced by maintenance.
   Leaving 238 CMPs needing to be replaced
5. At average pace it will take 15 years to replace all CMPs
   The CMPs account for 72% of our Structurally Deficient Bridges.

15 YEARS is Too Long!

The Problem

We need to get from this…

To this…

Quickly!

Where does the time go?

1. Survey completed and uploaded for all locations.
   - Average time = 1 month
   - Time savings can be achieved by requesting survey for many sites at once so Survey can plan and manage crews.
2. Reinforced pipe design and site lay-out.
   - Average time = 1-2 months
   - Time savings achieved by using common sized pipes and lumping the design of many similar locations together.
3. Construction completed
   - Average time = 2 weeks to 1 month.
   - Construction methods are simple and if multiple sites are lumped together contractor can easily mobilize to multiple locations.
4. Traditional plan submission from Survey to PS&E
   - Average time = 2 years and 3 months (approximately)
   - Time savings can be achieved by eliminating survey plan submission and coordinating needs to other sections.
   - Time savings can be achieved with different contracting methods.

Average contract time 2 ½ yrs.

Contracting Methods

Traditional Design-Bid-Build (Contract Time = 2 ½ years)

1. Environmental coordination and permitting takes time as with more complex bridge replacements.

   Time savings = None

2. Utility coordination takes time as with more complex bridge replacements.

   Time Savings = None

3. ROW coordination takes time as with more complex bridge replacements

   Time Savings = None

4. Real Estate Purchases takes time as with more complex bridge placements.

   Time Savings = None

5. Advertising, Bidding and Awarding takes same amount of time as more complex bridge replacements.

   Time Savings = None

Not fast enough!


Contracting Methods

Open-End (Contract Time = 20 months to 2 years)

1. Environmental Section was open to scoping jobs and speeding up the process.

   Time savings = Low

2. Met with Utility Section and Contractor in field to plan utility coordination.

   Time Savings = Low

3. Team Support was willing to speed up process through good communication and a tracking spreadsheet.

   Time Savings = Low

4. Real Estate Purchases still takes time as with more complex bridge placements.

   Time Savings = None

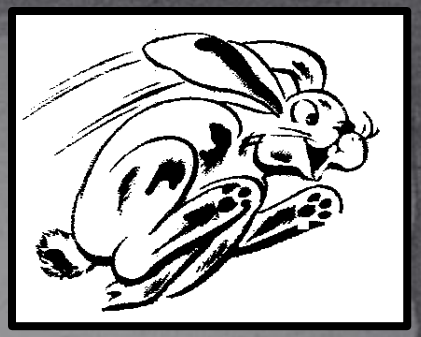
5. Only have to Advertise, Bid and Award once.

   Time Savings = High


Still…Not fast enough!

Contracting Methods

Design-Build (Contract Time = TBD)



1. Environmental Section was open to scoping jobs and speeding up the process.

   Time savings = Low
2. Design-Build Team will manage the utility coordination which should save Department resources and time.

   Time Savings = Moderate
3. Design-Build Team will manage the ROW coordination which should save resources and time.

   Time Savings = Moderate
4. Trying Right of Entry agreements but progress is slow.

   Time Savings = None (subject to change)
5. Only have to Advertise, Bid and Award Once.

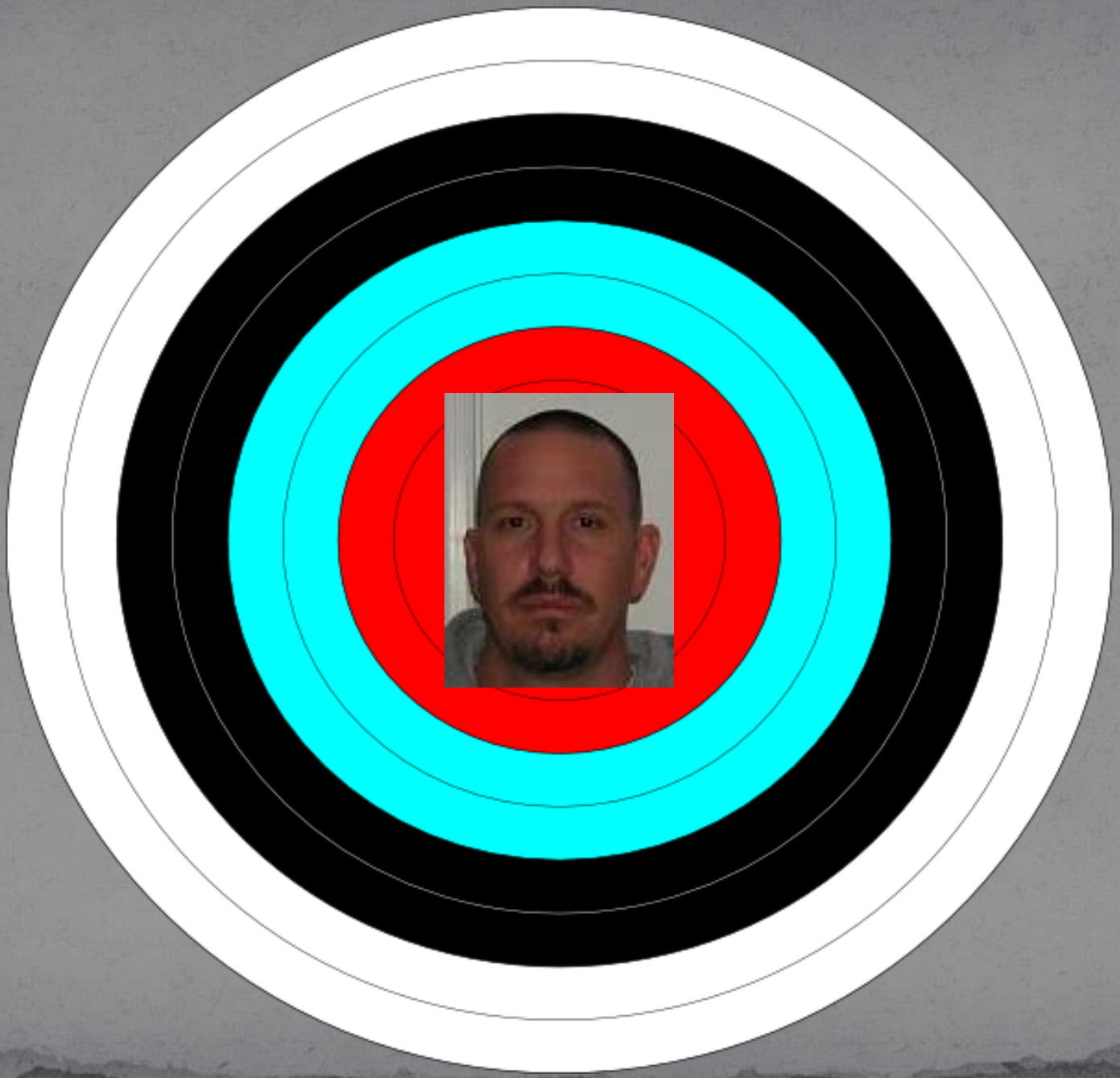
   Time Savings = High

Hopefully this works!

What does this mean…

Bridge Design's Popularity

Here's something to help you cope with the stress…



QUESTIONS?

Completed Indian River Inlet Bridge