Initial Questions

- How many culverts do you have?
- What type of problems do you have?
- How are you going to fix the problems that you have?
- How much funding do you need to address the culvert problems?
Culvert Inventory, Inspection, and Management
Culvert Inventory purpose is to quantify the asset

- Identify the number of culverts
- Identify the location
- Identify the size and depth
- Identify the different material types
- Identify site conditions
Culvert Inspection

- Culvert Inspection purpose is to quantify the conditions of the asset

- Identify and address safety concerns for the travelling public

- Identify assets requiring maintenance

- Justify the need for funding to constituents (government and public)

- Identify problems that are not readily apparent at the surface (i.e.: hidden problems)
LTAP Training offered.
See LTAP website
Examples - Culvert Inspection

CUY-71-18.65
Examples - Culvert Inspection

WYA-23-9.33 – Incorrect D-load concrete pipe
Examples - Culvert Inspection

LOR-90-13.31

LOR-90-13.31
Examples - Culvert Inspection

CUY-480-15.55
Examples - Culvert Inspection

- LIC-310-6.2 - HDPE
- CHP-29-0.35
- CLA-40-1.75
- MER-707-4.05
Examples - Culvert Inspection

CUY-271-2.32
Examples - Culvert Inspection

BUT-75-4.97

Future Culvert Inspectors?
Culvert Management will:

- Apply cost effective rehabilitation/maintenance methods to culverts in an effort to extend service life
  - Why do you change the oil in our car?
  - Why do you change the air filter in your home furnace?

- Extend the “spending power of funding”
  - Applying less costly rehabilitation/maintenance methods

- Reduce the risk of unexpected emergency replacements due to failed culverts
Culvert Rehabilitation
Culvert Rehabilitation

  - Section 1002.3.7 - Culvert Rehabilitation

- Designer Guidelines for Culvert Repair and Rehabilitation on ODOT Webpage at:
Office of Hydraulic Engineering

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Mission Statement:
Our mission is to provide cost effective and environmentally sound solutions to surface and subsurface roadway drainage that maintains public safety by using innovative methods and materials and fostering working relationships with all our customers.

Hydraulic Engineering Introduction
Common ODOT Conduit Rehabilitation Specifications

- CMS 611.11 – Field Paving of Existing Pipe ~ $162/LF
- SS 834 – Conduit Renewal Using Resin Based Liner (non-structural) ~ $380/LF
- SS 837 – Liner Pipe ~ $492/LF
- SS 833 – Conduit Renewal Using Spray Applied Structural Liner ~ $673/LF
- SS 841 – Conduit Renewal Using Spiral Wound Liner ~ $2,800/LF
CMS 611- Field Paving

Round Pipe

SCI-23- Pipe Arch
SS 834 – Resin Based Liner (Non-Structural)

Before [Image of a tunnel before the liner]

UNI-33

After [Image of a tunnel after the liner application]

20
SS 837 – Pipe Liner

SCI-73-10.37

MOE-7-0.57

WAY-23-9.33
SS 833 – Structural Based Spray Liner

CUY-480-15.55

MRW-61
SS 841-Spiral Wound Liner

HAM-22-18.65

WAS-7-20.31

DEL-36-Stone Arch
Other Methods Used by ODOT

- Internal Joint Band – special plan note
- CMS 611 – L&D, Vol. 2 Plan Note D112 - Conduit Bored or Jacked – 0.5” thickness casing pipe
- Cured In-Place Liner – CMS 611 special plan note
- Tunnel Liner Plate – CMS 611 special plan note
- Microtunneling – special plan note
Internal Joint Band

DEL-36-7.28
CMS 611 – Conduit Jacked or Bored

VIN-50 Steel Casing Pipe 0.5” Thick

Reinforced Concrete Box
Cured In-Place Liner

City of Columbus

BUT-127
Tunnel Liner Plate

LOR-90-13.31

WAR-28-5.01
Microtunneling

FRA-71- Downtown Columbus
Future ODOT Rehab. Specifications

SS 8xx – Conduit Pipe Bursting

Pipe bursting is appropriate for conduit sizes up to and including 36 inches for the following materials:
- Corrugated Metal
- Unreinforced Concrete
- Clay
- Plastic

Cured In-Place plan notes to be added to the L&D, Vol. 2 at next update in July 2015
Pipe Bursting

Upstream End  NOB-340-4.1  Downstream End
Conclusion
Initial Questions

- How many culverts do you have?
  Culvert Inventory

- What type of problems do you have?
  Culvert Inspection

- How are you going to fix the problems that have been identified?
  Rehabilitation Methods

- How much funding do you need to address the culvert problems?
  Culvert Management
Questions?

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