NASSCO PACP

How can your town benefit?

A collaboration between
Jerry Weimer Consulting,
Nick Spano & Essential Equipment

ESSENTIAL EQUIPMENT

Jerry Weimer Consulting

What is our Goal TODAY?

1) **Arm you with information**
    a) Discuss Benefits of implementation
    b) PACP leads to more efficient use of Tax dollars for rehabilitation.
    c) Reasons to promote
2) **Learn the basics of PACP**
    a) How PACP transforms visual information into quantifiable data to make smarter rehabilitation decisions.
    b) Basic structure of codes
    c) Basic coding

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Who is NASSCO?

National Association of Sewer Service Companies

NASSCO continues to serve as the advocate for underground infrastructure funding and the continued acceptance and growth of trenchless technologies.Serving a diverse membership base consisting of contractors, suppliers, public agencies, utility owners, engineers, and everyone aligned to setting standards to ensure the health of underground infrastructure, NASSCO ultimately exists to keep our communities safe.

- History
  - •Founded in 1976.
  - •NASSCO is a not-for-profit corporation.
  - •Serves all areas of the pipeline assessment, maintenance and rehabilitation industry.

- Mission
  - To set industry standards for the assessment, maintenance and rehabilitation of underground infrastructure, and to assure the continued acceptance and growth of trenchless technologies
- Vision
  - To increase the awareness of aging underground infrastructure and to provide viable solutions through education, technical resources and industry advocacy.

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Why PACP?

- Decision making tool
- The purpose of PACP training and certification is to *ensure that all pipeline assessment data is collected and coded in a consistent and reliable manner*
- PACP assigns a condition grade value to every defect coded.
- Individual condition grades are used to calculate overall asset condition ratings:
- Used to prioritize O&M, repairs, etc.
- Develop a condition rating for each pipe segment
- Display results on a map
- Provide follow-up recommendations
- Establish benchmarks

To what assets can PACP be applied?

- Sewer Mainlines
- Sewer Manholes, vaults, lift stations
- Sewer Laterals
- Stormwater systems
- Levee Pipes
- Dam Pipes
- Water Pipes
- Force Mains

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Who Uses PACP?

- Cities & Towns
- Engineering firms
- Contractors

Most of the Largest Cities in the USA use PACP everyday

- Dallas
- Nashville
- Miami
- Los Angeles

BUT even the smallest towns can benefit from PACP

Franklinton, LA

- Pop: 3,857
- Utilized PACP defect coding to determine repair or replacement on several sanitary sewer pipes in their downtown area.

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Complimentary Programs

MACP

Breaks vertical structures into components

Adapts grading system for vertical components

LACP

Adapts PACP to small diameter lateral pipes

ITCP - Inspector Training Certification Program

Trains inspectors

- Common problems
- Grout, cementitious, epoxy
- Structural vs Protection

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Why promote PACP?

Assist Municipalities with the transition from reactive to proactive

- Moving from “what's wrong now?” to “what can we do to prevent minor issues from becoming major ones?”

Why promote PACP?

Actualize rehabilitation savings

- Structural rehab vs Maintenance
- Established Training platform that is consistent & easily accessible
- Don’t clean clean pipe
    - Avoids redundant effort
- NASSCO is helpful in writing constant specifications
    - Creates standard for bidding
    - City may contract out work - many standard specs and guidelines available to members

Why promote PACP?

Arm municipalities with information about their system so they can make more informed purchasing & contracting decisions

- “We have __ instances of roots & grease, we need to outfit our combo trucks with rotating nozzles”
- “We estimate __ pipe segments with greater than 20% debris, we need to add an additional pipe cleaning crew.
- “We have __ pipe segments with evidence of infiltration, we need to contract a CIPP professional”

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Benefits

- **Improved Infrastructure Management**
  - Condition of each asset
  - Document materials, dimensions, depth, and ground cover
  - Simplifies rehab recommendations
  - Asset location

- **Life cycle analysis of pipes, manholes , laterals separately**

Benefits

- **Standardization and Consistency**
  - Broadly accepted coding system
  - Benchmarking
  - Rate of deterioration

- **Cost Savings**
  - Avoids redundant effort
  - Creates standard for bidding
  - Established training platform

Benefits

- **Enhanced Decision Making**
  - Improves quality & consistency of data
  - Simple LoF vs CoF strategy

- **Increased Transparency and Accountability**
  - Helps Gov't push sustainability through Triple Bottom line

How Does it work? Risk Analysis

Risk = CoF x LoF

CoF

We collect information used to determine the Consequence of Failure in the Header Section of each inspection

Based on Triple Bottom Line Principles

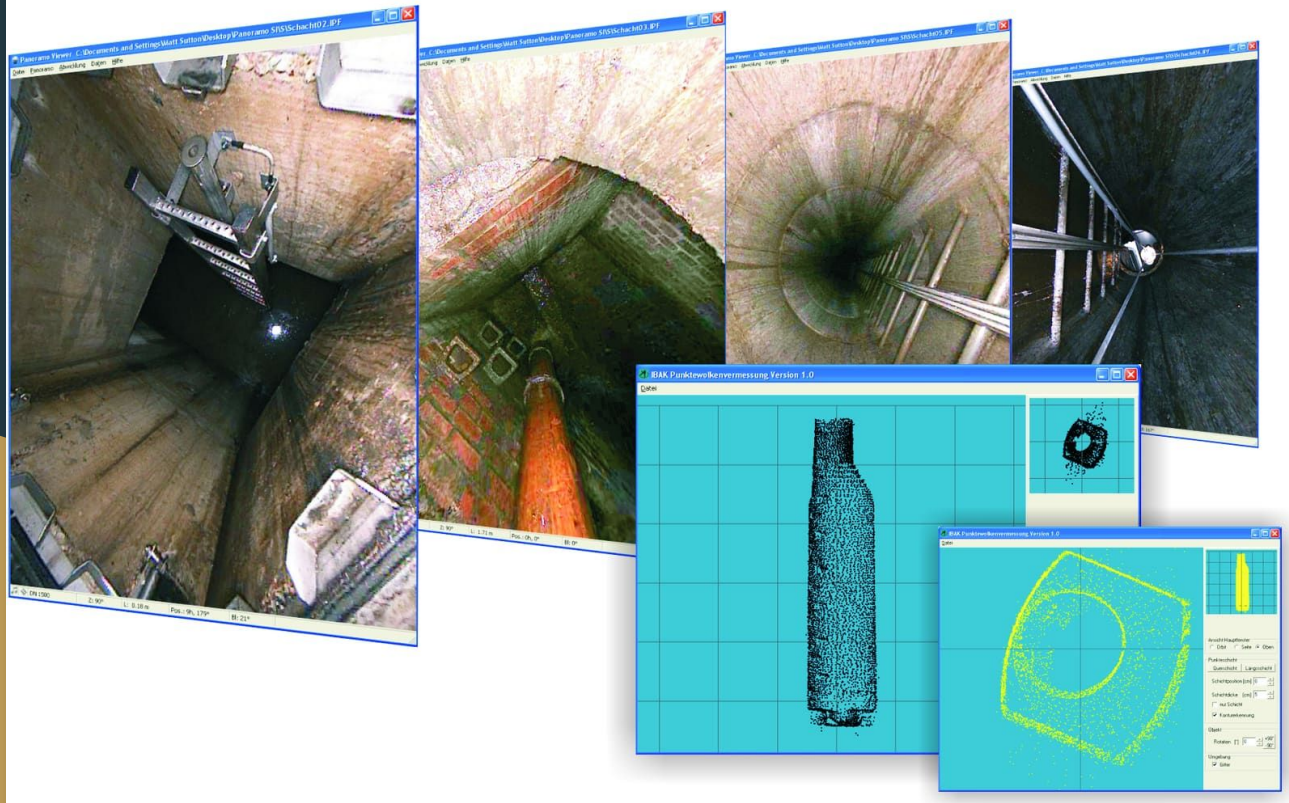
LoF

We collect information used to determine the Likelihood of Failure in the Details Section of each inspection

Grading Based on pipe use & severity

Software uses the condition grades to score & rank pipes

What new technologies can assist?



Manhole Sidewall Scanning

-Pano SI

Mainline Sidewall Scanning

-Panoramo

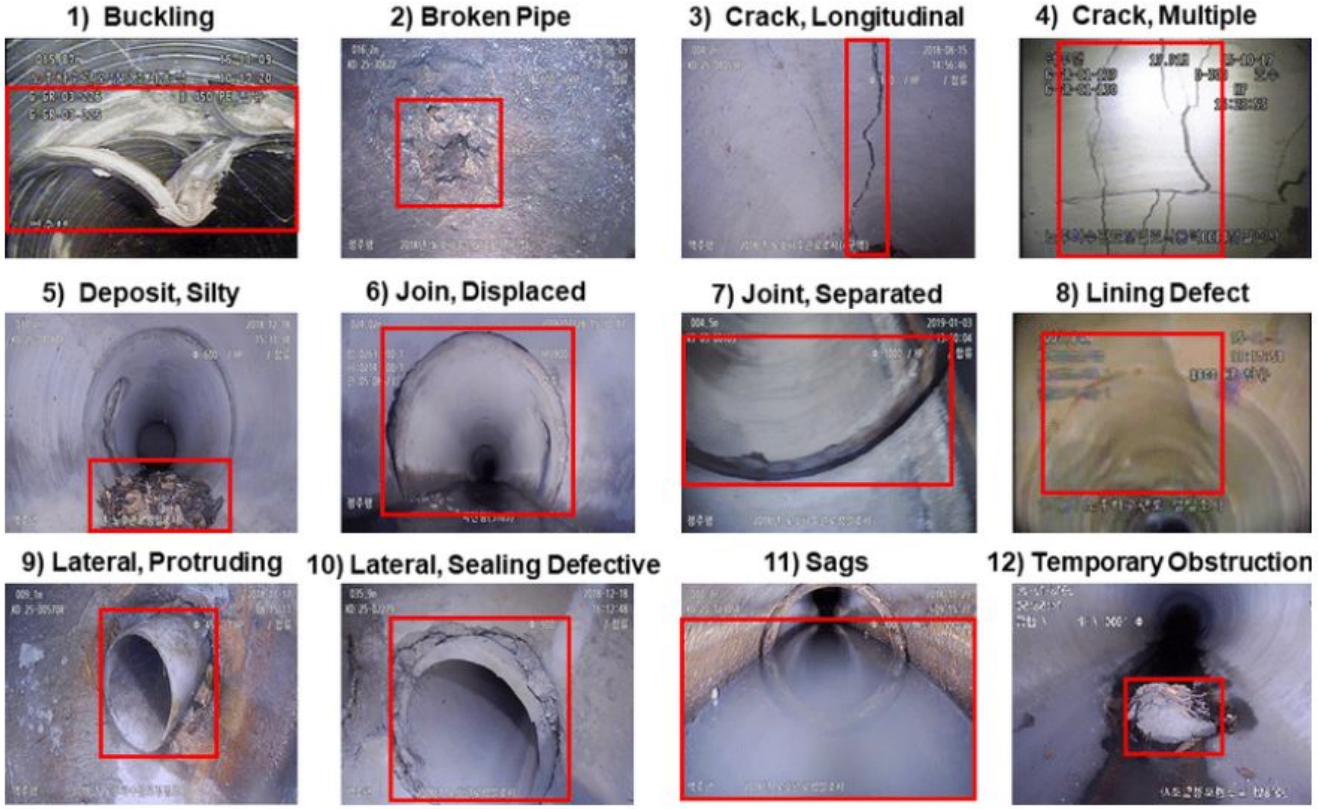
What new technologies can assist?

Laser Profiling

- Measures deformation

What new technologies can assist?

Automated Defect Recognition



What do students learn through PACP training?

- Correctly identify and document
  - Structural defects
  - Maintenance issues
  - Construction Features

→ Likelihood of Failure

- Collect detailed information
  - Pipe location
  - Pipe materials
  - Pipe Size
  - Pipe Use
  - Depth
  - Surface cover

→ Consequence of Failure

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CoF - Economic Impacts

Impact of Direct and Indirect economic losses

Direct costs

- Asset Repairs
- Legal Fees
- Fines

Indirect costs

- Property Values
- Increased Insurance Rates
- Utility's Credibility

Typically expressed in dollars and include property damage, repair cost, and production loss, etc.

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CoF - Social Impacts

Impact on Society due to asset failure

Factors include

- Number of properties/clients affected
- Types of affected properties (hospitals, schools, businesses, parks, “critical services”, etc.)
- Duration of Failure
- Utility’s Credibility
- Public Health and Safety

In addition, there must be consideration for safety issues (i.e. public exposure to health-threatening problems, injuries, or even fatalities)

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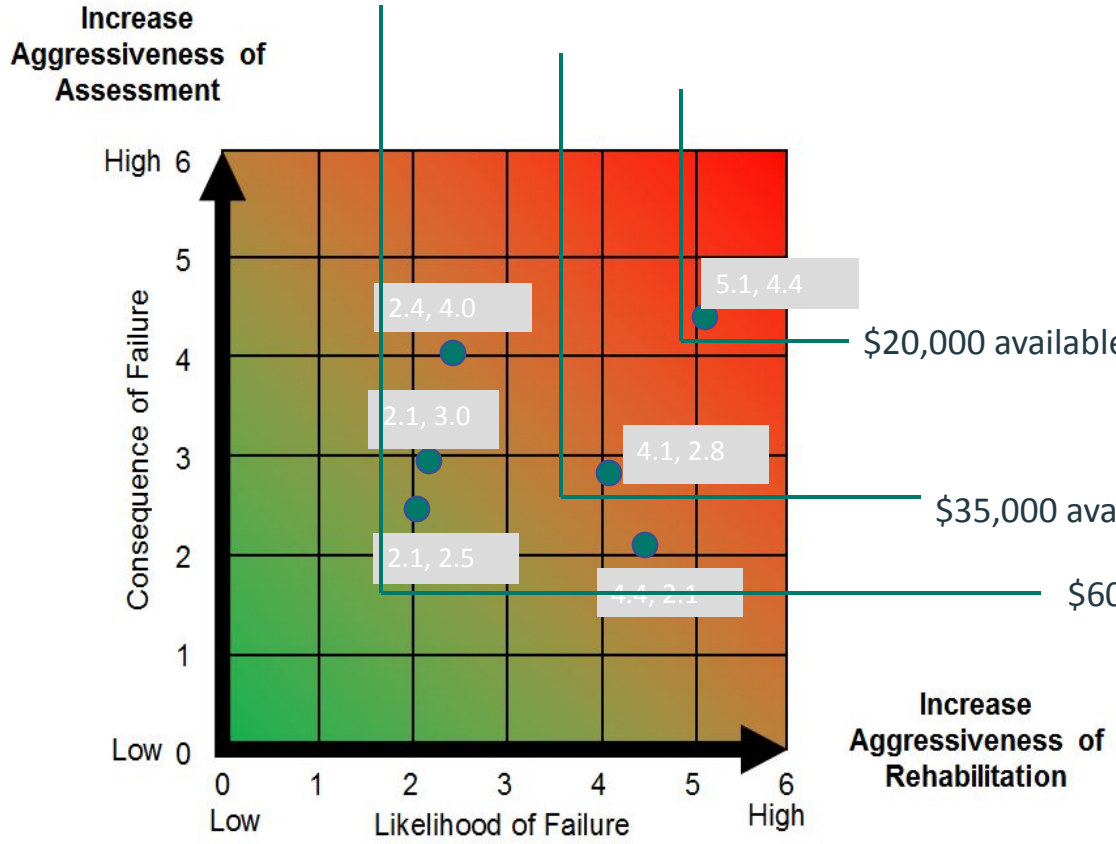
CoF - Environmental Impacts

Impact to ecological conditions occurring as a result of asset failure

Environmentally cost considerations based on

- Proximity to wetlands and waterways
- Federal Emergency Management Agency (FEMA) flood zones
- Possible contamination of potable water sources
- Sensitivity of nearby soils

Managing Asset Risk (Examples)



One Sentence to remember

PACP is the system that transforms visual information into quantifiable data to make smarter rehabilitation decisions.

PACP Basics

- How are codes formed
- What info is in a defect / observation entry
- Camera Calibration Point
- Know the Groups
    - Software helps w the rest

What info is in a code?

1) Distance
    a) Measured from start MH
2) Group / Descriptor / Mod
3) Clock Position
    a) At / From
    b) To
4) % of cross sectional area
    a) Loss of capacity

Structure of Codes

4 Families

- Distinct grouping of codes

Groups in each Family

Specific types of defects

Descriptors & Modifiers make codes very specific

Structural Defects

1. Crack (C)
2. Fracture (F)
3. Broken (B)
4. Hole (H)
5. Deformed (D)
6. Collapse (X)
7. Joint (J)
8. Surface Damage (S)
9. Lining Features (LF)
10. Weld Failure (WF)
11. Point Repair (RP)
12. Bolts (BT)
13. Brickwork

Operation & Maintenance

Operation and Maintenance

The PACP Operation and Maintenance (O&M) family describes foreign objects that may interfere with the operation of the conveyance system:

1. Deposits (D)
2. Roots (R)
3. Infiltration (I)
4. Obstacles/Obstructions (OB)
5. Vermin (V)
6. Grout Test and Seal (G)
7. Leak (LK) – Pressure Pipe Appendix (Appendix F)

Operation and Maintenance

- O&M defects can significantly affect the rate of deterioration.
- Repetitive or aggressive cleaning procedures over time may damage the pipeline.
- Thorough and consistent documentation of O&M problems help form a basis for the development of a preventive maintenance program.

Construction

The PACP Construction family describes various features and conditions associated with the methods used to construct and connect to pipes:

1. Tap (T)
2. Intruding Sealing Material (IS)
3. Line (Direction/Alignment of the Pipe) (L)
4. Access Points (A)
5. Valves (VA) – Appendix F – Pressure Pipe

Miscellaneous Features (M)

General

- Includes general features and defects that are not described by or included in other PACP categories.
- Used to record features or special observations.

Miscellaneous Codes specific to Pressure Pipe are listed in the Pressure Pipe Appendix (Appendix F).

Thank you!

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