

An introduction and overview of the CTAM program

ICTIS: Instituto Colombiano de Tecnologías de Infraestructura Subterránea

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BAMI-I

Buried Asset Management Institute - International





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- Chair, Buried Asset Management Institute-International (BAMI-I)

What is BAMI-i?

BAMI-i = Buried Asset Management Institute–Intl .

- Initiated in 2003, in Atlanta’s Department of Watershed Management under the leadership of Shirley Franklin (Mayor) and Jack Ravan (Commissioner).
- In June 2004, formed as non-profit organization.



<http://bami-i.com/>

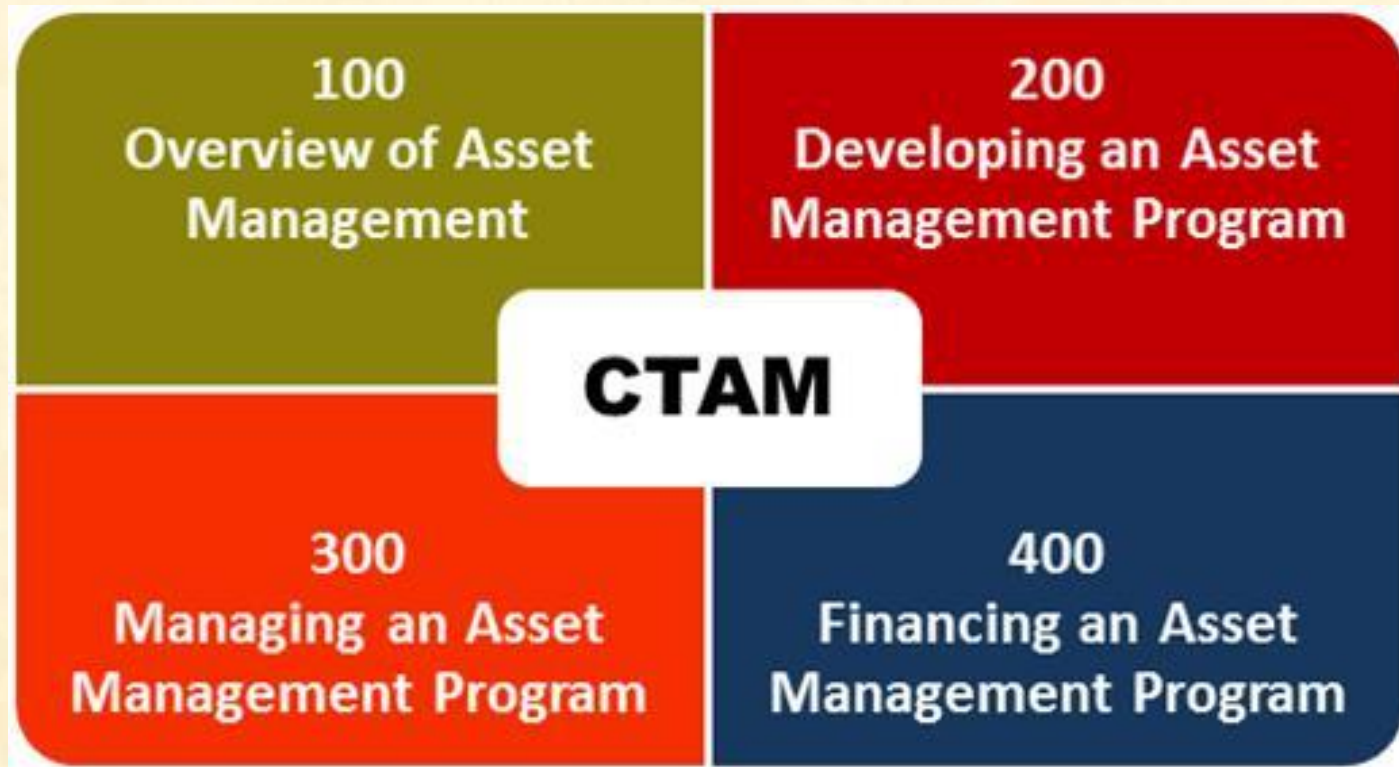
Need for Asset Management Certification Program

- EPA Grant CP 83 282901-1
 - To determine what utility managers and operators need to achieve water utility infrastructure management excellence
 - Cooperative research effort of four universities: IUPUI, VATECH, LATECH, UTA
 - Initial finding: The lack of knowledge is the major barrier to pursuing and implementing an effective asset management program.
 - Conclusion: Need to establish online asset management certification program.



What is CTAM?

- Certification of Training in Asset Management
- Exclusive four-part series training



Levels of Certification

- Certificate of Completion.
 - Issued for any CTAM course upon completion.
- Associate Water Asset Manager (AWAM). Required:
 - Completion of CTAM 100-400
 - Apply to BAMI-I Asset Mgt. Certification Board
- Professional Water Asset Manager (PWAM). Required:
 - Completion of CTAM 100-400
 - Four years of relevant asset mgt. experience
 - Apply to BAMI-I Asset Mgt. Certification Board

Highlights

- **CTAM-100** has 405 registrants from 15 countries;
154 have graduated (38% of registrants)
- **CTAM-200** has 106 Registrants from 5 countries
66 have graduated (65% of registrants)
- **CTAM-300** has 69 Registrants
- **CTAM-400** has 58 Registrants

Highlights

- **AWAM Certificates**

51 Issued

- **PWAM Certificates**

12 Issued

TTC AND BAMI-I LAUNCH A COMPREHENSIVE ASSET MANAGEMENT CERTIFICATION PROGRAM

Raleigh, NC August 17 – 20.





CTAM 100

Overview of Asset Management

CTAM 100 Contents

- Introduction to Asset Management
- Sharing Asset Management Knowledge on a Global Scale
- Asset Management Technologies
- Risk Management
- Government Regulations
- Case Studies

AMPLE Development

AMPLE=Asset Management Program Learning Environment

- Processes and practices from all over the world regarding asset management
- Objectives
 - Drive asset management improvements
 - Allow cost-effective training of staff in all aspects of advanced life-cycle infrastructure asset management
 - Permit tailoring to suit individual organizations
 - Facilitate a rollup of information and strategies across the whole enterprise

Asset Management Technologies

- Need to know available technologies and how they are used to improve the services, conserve resources in the water and wastewater industry.
- Examples:
 - Automated Meter Reading (AMR) systems
 - Acoustic Monitoring Technology
 - Zoom Camera with GIS

Information Technology

- Critical to every organization: a driver for performance of multitude of activities, often a key role in the development of organization
- Historically a support service, enabled industry to process an ever-increasing number of data points.
- Now the Lever in Government for Asset Life-cycle Policy Formulation, Service Delivery Implementation
- Key to understanding the relationship between data, information and the act of knowledge in any service delivery process.

Risk Management

- Risk management is at the heart of AM.
- Briefly explained how to:
 - Identify and understand the kind of risks present in the water and wastewater industry.
 - Become familiar with the elements necessary to create a risk prevention plan.
 - Evaluate how an asset management program contributes to risk reduction.
- The use of risk management leads to better asset decisions regarding asset creation, operation, maintenance, rehabilitation and replacement.

Government Regulations

- Be aware of existing government regulations and initiatives to promote Asset Management in the water and wastewater industry
- Judicial Consent Decrees specify elements of AM as remedies to address faulty infrastructure
- The EPA's CMOM initiative
- The “modified approach” alternative of GASB 34

Case Studies

- Examine specific cases and evaluate the application of technology and management plans in each particular situation.
- Multiple case studies referenced:
 - Asset Management in New York
 - Columbus Water Works (CWW)
 - City of Forth Worth
 - Challenges in the Water Industry
 - Massachusetts Town
 - City of Tucson
 - City of Hamilton
 - Etc.

CTAM 200

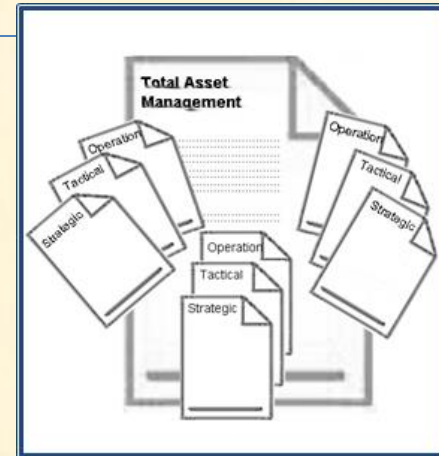
DEVELOPING BURIED ASSET MANAGEMENT PROGRAMS

CTAM 200 Contents

- Total Asset Management Plan (TAMP)
- Buried Asset Management Program (BAMP)
- Asset Registry
- Wastewater & Water Data Management Assessment
- Condition Assessment

Total Asset Management Plan (TAMP)

- Provides a framework to tailor individual departmental plans while retaining the integrity of the organization's goals
- Three Level Plan:
 1. Strategy – Set attainable goals.
Long range strategic planning 10-30 years.
 2. Tactics – Implement Strategies.
Tactical planning to support Level 1 strategies.
 3. Operation Plans – Tactical Support.
Detailed plans to support Level 2 tactics.



Buried Asset Management Program (BAMP)

- Buried Assets associated with water and wastewater utilities generally represent a greater cost when compared to other infrastructure units
- Need for a long-term commitment to a “Buried Asset Management Program” (BAMP)
- A “Plan-Within-A-Plan” – narrowing the focus of TAMP to include underground water and wastewater infrastructure.
- The same three levels as TAMP:
(1) Strategy, (2) Tactics, (3) Operation

BAMP Development

- Requirements:
 - Clear statements of attainable near term goals including economic benefits, acceptable LOS
 - Task definitions
 - Task schedule
 - Cost estimates
 - Committed funding for initial plan
- Requires approval by the utilities board of directors
- Board members and management work as a TEAM to develop, review and fine tune BAMP

Introduction of BAMP (Level 1 BAMP)

- Successful AM requires understanding and commitment at every level of utility operations
- Need to explain the AM concept and approved BAMP to all stakeholders . Need to explain the role each employee plays in its success .
- BAMP can be formally introduced to stakeholders as a series of programs explaining the steps involved with Strategic Planning
(Level 1 of the BAMP)

Level 1 - Strategic Planning Buried Asset Management Plan (BAMP) (Long-range 10 to 30 year timeline)
1. Define Utility's Mission (Core Values, Purpose, and Vision)
2. Define Organizational Functions (a) Administrative (b) Operations
3. Establish Level of Service Commitment
4. Establish and Maintain Best Practices In Underground Infrastructure (a) Wastewater Collection (b) Water Distribution
5. Set Benchmarks to Monitor Performance
6. Perform Periodic Updates - Revisions

Tactical Planning (Level 2 BAMP)

- Step 1 - Mission statement.
Defines a utilities purposes and commitments in broad terms
- Step 2 – Define organization structure
Typically defined using a functional organization chart - displays functions, relationships
- Step 3 - Level of Service (LOS) Commitment
Defines the manner in which the stakeholders expect the utility to perform over the long term.

Operations Planning (Level 3 BAMP)

- Stage 1 Operations Plan consists of determining:
 - What are the assets?
 - Where they are located?
 - What condition are they in?
- Stage 2 Operations Plan (once level 1 is complete)
 - Data Evaluation
 - Recommendations
 - Implementation Plan

Asset Registry

- Wastewater & Water System Inventory – Inventory of assets and their components, a listing of “What” we have and “Where” it’s located
- Provide sufficient asset nomenclature and location detail to accurately identify each asset (What) in a database and on a map (Where)
- Wastewater Component Attributes

Wastewater & Water Data Management

- Utility systems inventory tabulations include a staggering amount of data
- Support Software and Tools
 - Geographic Information Systems (GIS)
 - Global Positioning System (GPS)
 - CCTV Data Management Software
 - Computerized Maint Management System (CMMS)
 - Spreadsheet Software

Condition Assessment

- Introduction to condition assessment (details in CTAM 300):
 - How to identify known deficiencies
 - Review available history and current data
 - Initiate component inspections using proven methods
 - How to tabulate findings

CTAM 300

MANAGING AN ASSET MANAGEMENT PROGRAM

CTAM 300 Contents

- Levels Of Service
- Condition Assessment
- Repair/Restore Options
- Priority Development
- Tabulation and Presentation of Priority-Based Long-Term Plan

Levels of Service (LOS)

- Introduction to LOS:
 - LOS Commitments
 - LOS reflects the goals and core values of organization
 - What LOS may include
 - Gain an understanding of developing LOS through:
 - Key performance indicators
 - Risk assessment process
 - Prioritization methods
 - Evaluation technologies
 - Asset life estimation



Manholes

Inspection

- Man-entry
- Above ground:
 - Pole camera
 - Digital 3D Scanning



Rehab Options

- Frame, Cover, Chimney Rehab
- Mechanical Inserts
- Concrete Patching, Plugging
- Chemical Grouting
- Coatings
- Poured-In-Place Concrete
- Thermoplastic Liners
- Pre-Formed Fiberglass Inserts
- CIP Liners
- Composite Systems
- Dig & Replace



Collection System Lines

Inspection

- Pipe lamping
- Acoustic
- CCTV
- Laser Profiling
- Digital Scanning
- Sonar
- Multi-sensor
- Walk-through



Rehab Options

- Dig & Replace
- Slip-lining
- CIPP
- CIPP Short Sleeves
- Fold & Formed
- Internal Joint Sleeves
- Mechanical Spot Repairs
- Robotic Repairs
- Spiral Winding
- Grout-in-Place Liners
- Panel (Segmental) Lining
- Sprayed-on Cement. Liners
- Chemical Grouting
- Flood Grouting
- Pipe Bursting
- Roots Removal

Service Laterals

Inspection

- Smoke Testing
- Pressure Testing
- Dyed water testing
- Closed Circuit TV Inspection
- Electro Scanning

Rehab Options

- Open Cut Point Repair
- Lateral CIPP
- Lateral Pipe bursting
- Chemical grouting
- Flood grouting
- Robotic repair
- Root control
- Lateral Slip-lining

Developing Priorities

- Develop priorities using the risk analysis process.
- Develop a rehabilitation schedule using:
 - The useful life and life cycle costing analysis.
 - The cost and budget analysis.
- Risk Based Budgeting
 - Based on a risk priority for each asset along with other considerations (funds available)

Risk Analysis

$$\text{Risk} = \text{LOF} \times \text{COF}$$

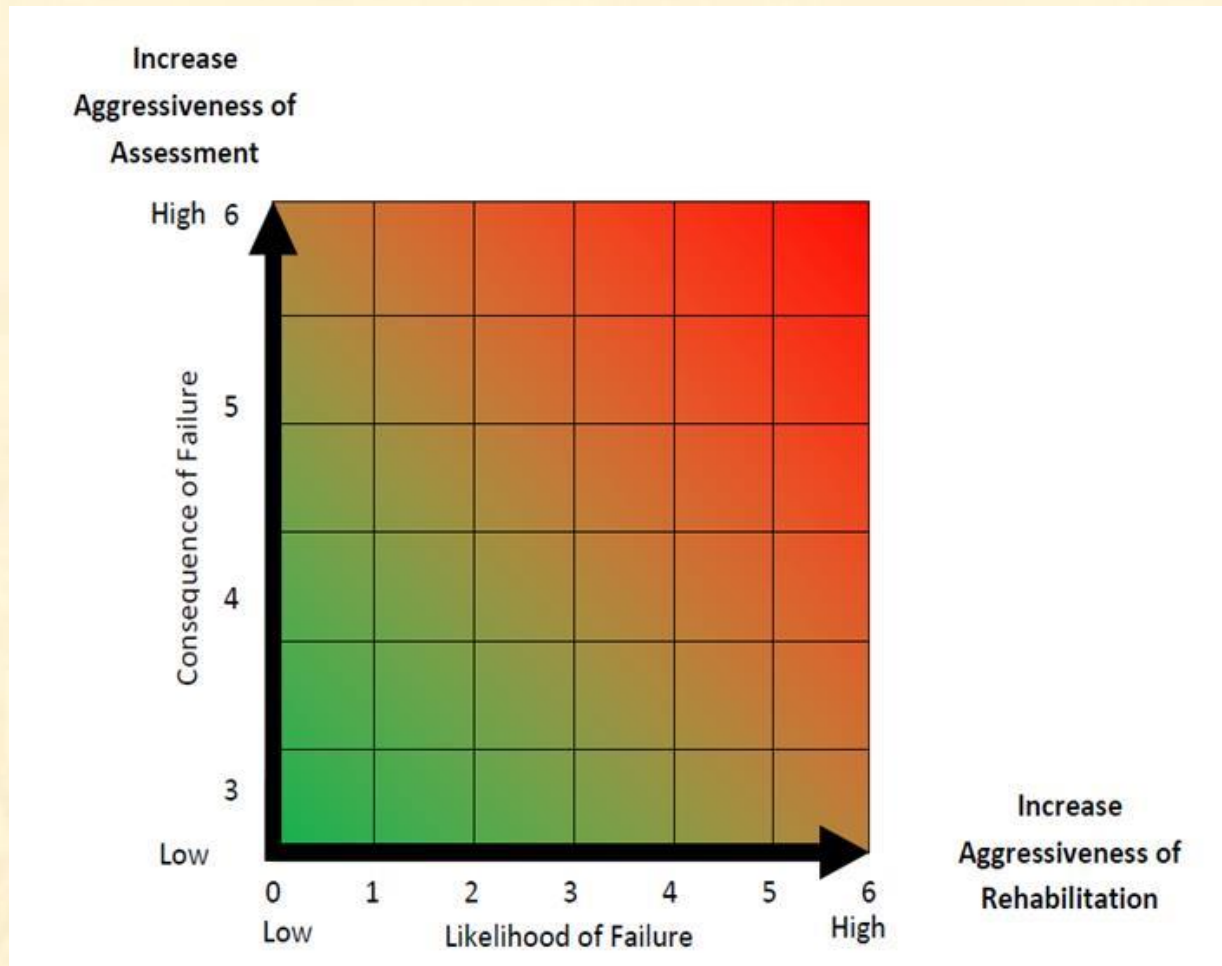
Likelihood (LOF)

- Condition grading systems different available
- NASSCO's PACP, MACP
- Structural, O&M grades
- Asset rating (PACP Quick Rating)
- Asset rating associating with LOF (Modified NASSCO Quick Rating)

Consequence (COF)

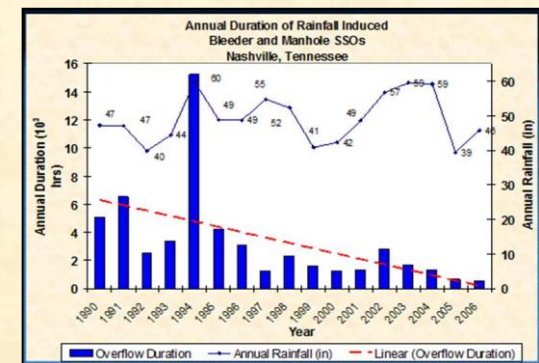
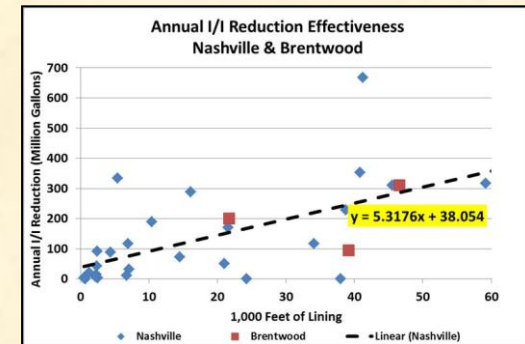
- Combination of direct and indirect impact of asset failure on vicinity, community
- COF ranking based on pipe position in network, road type, road surface, safety, proximity to environ. sensitive areas, accessibility for rehab, etc.
- Scoring
 - Simple subjective approach
 - Calculate using parameters and weighing factors

Developing Risk Matrix



I/I Related Cost and Priority Issues

- Cost related to the adverse effects of I/I
 - Lost capacity
 - SSO/CSO issues
 - Enforcement concerns
 - Rehab to remove I/I
- How much I/I can be removed?
 - Rehab considerations
 - Comprehensive
 - Consider migration
 - What is considered effective rehab
 - Peak I/I reduction
 - Annual I/I volume reduction 25-50%
 - Restores pipe condition
- Case Study Nashville I/I Abatement



CTAM 400

FINANCING ASSET MANAGEMENT PROGRAMS

CTAM 400 Contents

- Accounting Principles
- Infrastructure Stewardship
- Strategic Financial Tools
- Contracting Methods
- Case Study

Accounting Principles for Local Governments

- Generally Accepted Accounting Principles (GAAP) for Local Governments reviewed
- GASB 34 Reporting Guidelines for State and Local Governments:
 - Allows two methods for reporting the value of infrastructure: the depreciation approach and the modified approach. Can be combined.
- Asset Management Plan under GASB 34 discussed

CTAM & GASB 34 are geared to fuel and encourage the strategic, proactive management of infrastructure.



Infrastructure Stewardship

- Level of Service (LOS)
 - LOS defined as quality of given service against which performance of AMP can be measured. Operational and Maintenance LOS. LOS that suits community.
- Capital Improvement Plan (CIP)
 - Planning and fiscal management tool for capital improvements, usually 4 to 10 years. Qualifying projects.
 - Developing CIP: Components of CIP. Project evaluation and prioritization processes and best practices. Capital planning and rates.
- Asset Life-Cycle Management - Key benefits, activities
- Revenues
 - Rate setting – The two phases: technical/math analysis of needs, adopting a budget ordinance. Rate Shock.
- Public Communication and Outreach

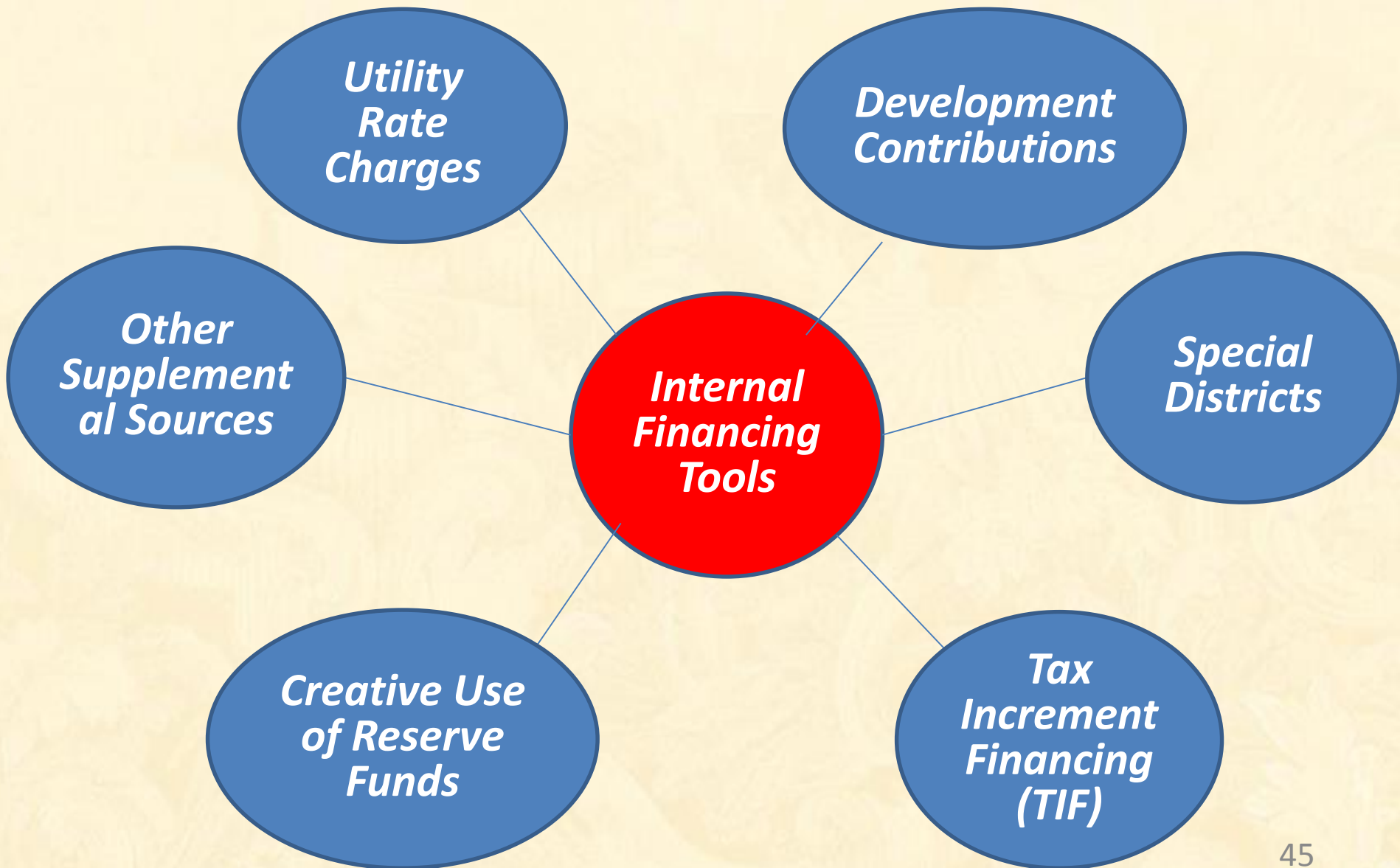
Financing Tools

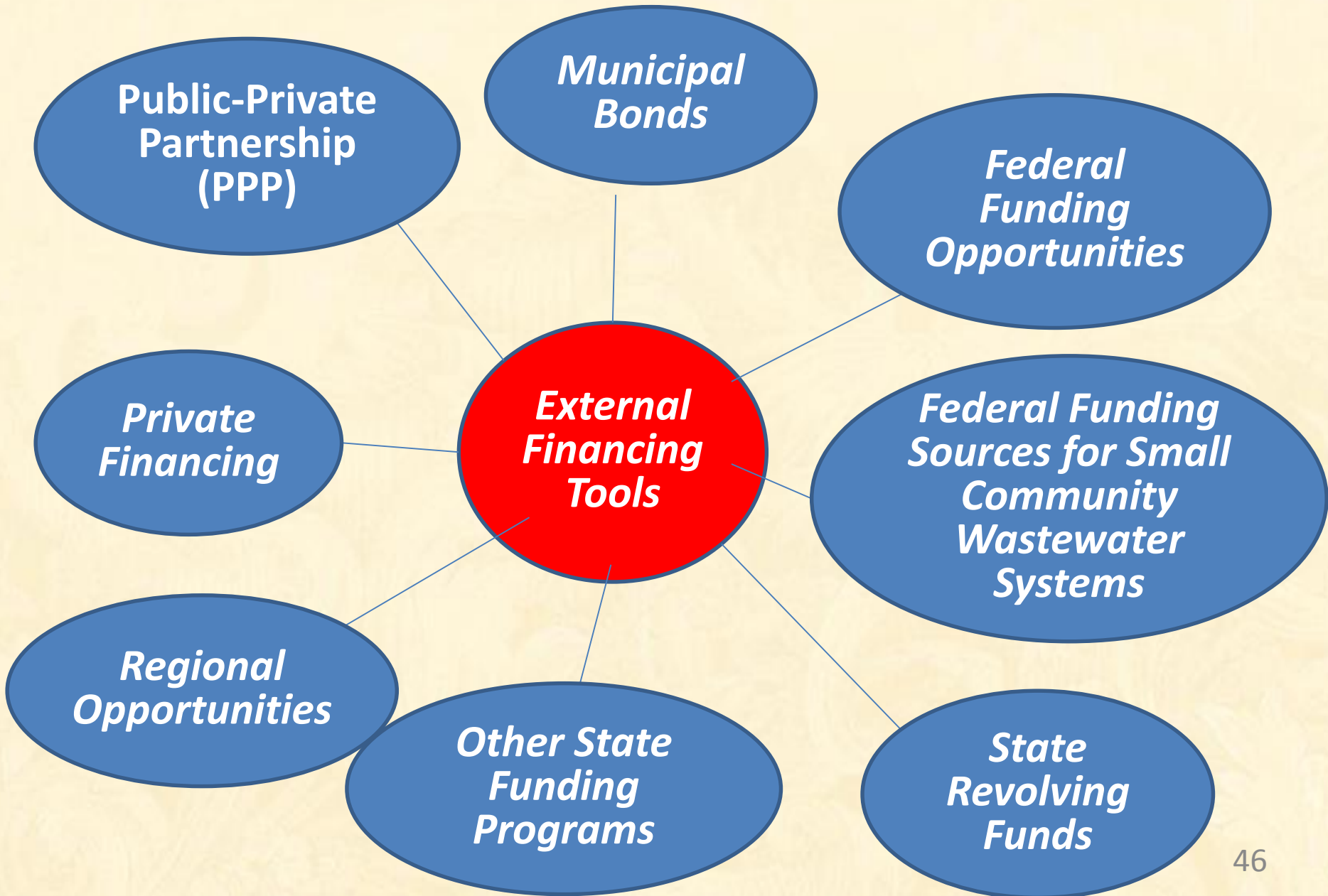
Internal

- Utility Rate Charges
- Development Contributions
- Special Districts
- Tax Increment Financing (TIF)
- Creative Use of Reserve Funds
- Other Supplemental Sources

External

- Federal Funding Opportunities
- Federal Funding Sources for Small Community Wastewater Systems
- State Revolving Funds
- Other State Funding Programs
- Regional Opportunities
- Private Financing
- Public-Private Partnership (PPP)
- Municipal Bonds





Contracting Methods

- Design-Bid-Build (Low Bid)
- Public Private Partnerships (PPP)
- Design-Build (DB)
- Energy Performance Contracting (EPC)

Case Study: Town of Spindale AM Plan

- Background
 - Population 4,300; mill closures in 1990's, pressure to maintain and rehab the same infrastructure
- Initiation of AM Plan
 - In 2011, applied to State of NC for Clean Water State Revolving Funds (CWSRF) to finance sewer rehab project.
- Implementation – The AM plan combines:
 - Available Retained Earnings,
 - A balanced mix of Capital Project scheduling
 - A 4-year plan of rate increase, ceiling of local Median Household Income levels
- Fiscal Year 2014-15:
 - WWTP rehab project moving forward using NC CWSRF
 - \$6.9 million project: 20-year interest free loan + \$1 million in principal forgiveness



Thanks for your attention!

Questions?

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