What is Utility Planning?

**Process of evaluating the Spatial implications of Change on a utility system**

- Population Growth and Conservation
- Drought and Climate Change
- Sustainability and Resiliency
- Operational Efficiencies
- Increased Services Expectations
- Regulatory Requirements
- Political Pressures
- System Optimization
- Aging Infrastructure
Utility Master Plan

1. Basic Assumptions
   • Existing Flows/Demands
   • Flow/Demand Projections
   • Design Criteria/Assessment Criteria
   • Level of Service (LoS) goals

2. Existing System Description
   • Existing Infrastructure
   • Operational Data
   • Treatment
   • Supply
   • Capacity

Utility Master Plan

3. Hydraulic Model Update/Development
   • Software Selection
   • Calibration (Flow Monitoring/Flow Testing)

4. Hydraulic Analysis
   • Existing System Deficiencies
   • Future System Deficiencies

5. Capital Improvement Program (CIP)
   • Implementation Triggers
   • Project “Fact Sheets”
Utility Master Plan
“Extras”
- Risk Based Analysis (BRE)
- Prioritization
- Asset Management
- Condition Assessment
- Financial Analysis
- GIS Development/Reconciliation
- Staffing Studies
- Regulatory

Effective Utility Management (EUM) Aligns with the Utility Planning Process
- Product Quality
  - Regulatory/Reliability
- Customer Satisfaction
  - Level of Service (LoS)
- Employee and Leadership Development
- Financial Viability
  - Financial Analysis
- Infrastructure Strategy and Performance
  - Asset Management
- Resiliency
  - Risk Assessment
- Community Sustainability
- Water Resource Sustainability
- Stakeholder Support
Community Priorities Based on Stakeholder Engagement

**SOCIAL**
- Improve Public Health and Safety
- Improve Quality of Life

**ECONOMIC**
- Provide Sustainable Services for the Future

**ENVIRONMENTAL**
- Improve Water Quality
- Regulatory Compliance

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**What Technical Processes are Needed to Evaluate these Spatial Changes?**

1. **DEMAND FORECASTING**
2. **CAPITAL IMPROVEMENT PROGRAM DEVELOPMENT**
3. **HYDRAULIC MODELING ANALYSIS**
Modeling is a Useful Tool to Inform Key Utility Management Decisions

- Typical
  - Future Growth - What if’s?
  - Design/Resiliency Storms, Economy, Regulatory - What if’s?
- Operational
  - Maximizing excess basin capacity
  - Energy Analysis
  - One Water Considerations
  - SSO Evaluations/Response
- Criticality
  - Pipe/Pumps
  - Outages/Spills/Environmental
- Financial Analysis – Who Pays?

Utility System Forecasting - What Does this Mean for THE Future OF YOUR Utility?

- How do we explain this finding?
- Is it permanent from structural changes or is it behavioral or both?
- Will it continue and how do we quantify it?
- Going Forward - What is the New Normal?
Uncertainties in Climate Projections Provide a Picture of System Vulnerability

HDR’s Approach Assures that Models can be Updated from GIS

- GIS Data Cleanup will be Identified During Model Development
- Process Allows Model Development to Continue While Maintaining Coordination
- Updated Database is Provided to the Client
GIS Advantages

- GARR – a better way to evaluate rainfall events
- Improves model accuracy and assessment of analysis / design storms
- Data accessed and processed by HDR’s Hydro-Meteorologists Team
- Used to Incorporate High Resolution Rainfall Data in:
  - Sioux Falls, SD
  - Santa Monica, CA
  - Sacramento, CA
  - Delaware, OH

Forecasting Today - a Combination of Art and Science: Utilizing Gauge Adjusted Radar Rainfall (GARR) Data

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Spatial Demand Triggers Take the Guesswork Out of this Issue
Key Questions

- How much should we be investing?
- How do we prioritize those investments?
- How do we decide?

How Much Should We Be Investing

- Risk Based Integrated Planning Process

**Model Development and Calibration**

**Collect and Review Historical Information**

**Asset Attribute & Performance Compilation**

Define Level of Service

Expansion and Enhancement (E&E) Evaluation

Primary Criteria:
- System Development
- Future Regulations
- Energy efficiency
- Climate change

Asset Failure Evaluation

Major Failure Modes:
- Performance
- Condition
- Maintenance

E&E Need Identification

Options:
- Renewal project
- O&M Enhancement
- Monitoring

Asset Risk Prioritization

Risk Mitigation

Rate Analysis

Business Case Evaluation

Capital Project Prioritization

Affordability Analysis

CIP Development
Basic Asset Management Approach

1. CURRENT STATE OF ASSETS
2. LEVEL OF SERVICE
3. CRITICAL ASSETS
4. MINIMUM LIFE CYCLE COST
5. LONG-TERM FUNDING PLAN

Consequence of Failure

Likelihood of Failure

Aggressive Monitoring

Replacement / Rehabilitation Recommended

Sample Monitoring

Aggressive Monitoring

Rehabilitation/Renewal Plan

Consequence of Failure

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Rehabilitation/Renewal Plan
Finally - the Roadmap Concludes with an Implementation Focused Capital Improvement Program

- CIP = Client’s Primary Need!
- CIP provides answers to several key questions:
  - WHEN?
  - WHERE?
  - WHY?
  - HOW MUCH?
- Most difficult question:
  - WHEN and WHERE should we spend the money?

![Diagram showing Conventional CIP and Revenue Sensitive CIP]

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Project data sheets provide a brief overview of the drivers, extent, triggers, and cost of each project

- Provided for each project
- Brief project summary
- Description of project size
- Demand triggers
- Project Costs
Capacity, Management, Operation and Maintenance (CMOM)

Sewer System Management Plan
Gap Analysis

Reactive Versus Proactive

MAINTENANCE APPROACH COST COMPARISON