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Asset Management: How to Get Started!

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GHD

PNWS IDAHO • OREGON • WASHINGTON
AMERICAN WATERWORKS ASSOCIATION
PACIFIC NORTHWEST SECTION

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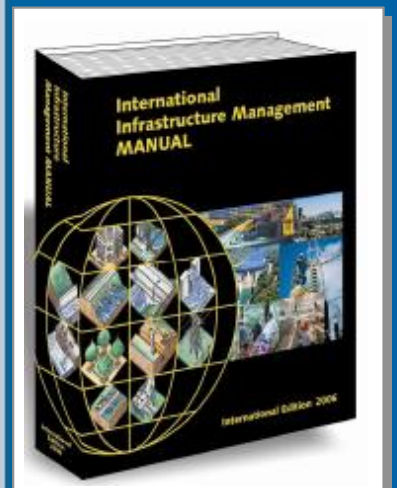
Agenda

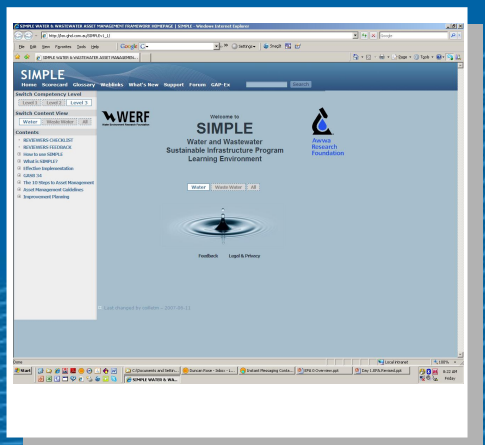
- AM Intro/Background
- How to Start an Asset Management Program For Your Utility
  - What Is the State of Your Physical Assets?
  - How are Levels of Service created?
  - How Will Assets be Managed?
  - How is Business Risk Determined?
  - How is the AMP Used in the Day-To-Day?
  - How and When will the AMP Be Improved/Updated?
- Questions

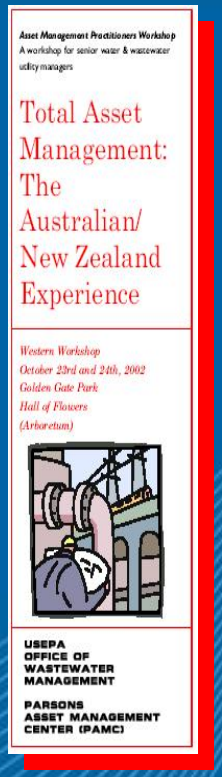
Who is GHD?



World's Best Practices

- *Australian-based international company with 100 offices worldwide*
- *6000+ management consultants, engineers, scientists, planners, architects*
- *Literally, "wrote the book" on Best Practices*
- *Hundreds of engagements over two decades*





GHD Asset and Facilities Management

- GHD has been consulting in Asset Management for 25 years
- GHD are considered one of the leading Asset Management consultants in the world
- GHD's Roger Byrne is an original principal author of the "International Infrastructure Management Manual"
  - Considered the 'must have' guide to AM
- GHD has over 50 manuals that cover the full range of Asset Management areas
- GHD have been chosen by the US EPA to conduct AM training workshops across the USA
- WERF / AwwaRF commissioned GHD to create 'SIMPLE' – a web-based tool that enables the user to learn step-by-step on how to sustainable implement AM techniques

How AM got started

- The Australia / New Zealand beginnings
- IIMM
- PAS55
- PSAB 3150
- GASB 34

Infrastructure is the foundation to sustained quality of life

Consequences of asset failure can be severe

Changing utility business environment

- Demand to do more with existing resources
- Need to make every dollar work – to better use capital and operating budgets
- Move from *reactive* to ***proactive*** work environment

A paradigm shift…

- Transition from *building and operating* to *managing* assets
  - Extending asset life
  - Optimizing maintenance and renewal
  - Developing accurate long-term funding strategies
  - *Sustain long term performance!*

GHD's Approach to Asset Management

- Mentoring and Guidance of Staff
- Step-by-Step Implementation Practices
- Knowledge Transfer
- Incorporating Change Management Practices
- Leverage Existing Organizational Knowledge
- Pilot Projects

The Definition of Advanced AM

Advanced Asset Management ("AAM") is

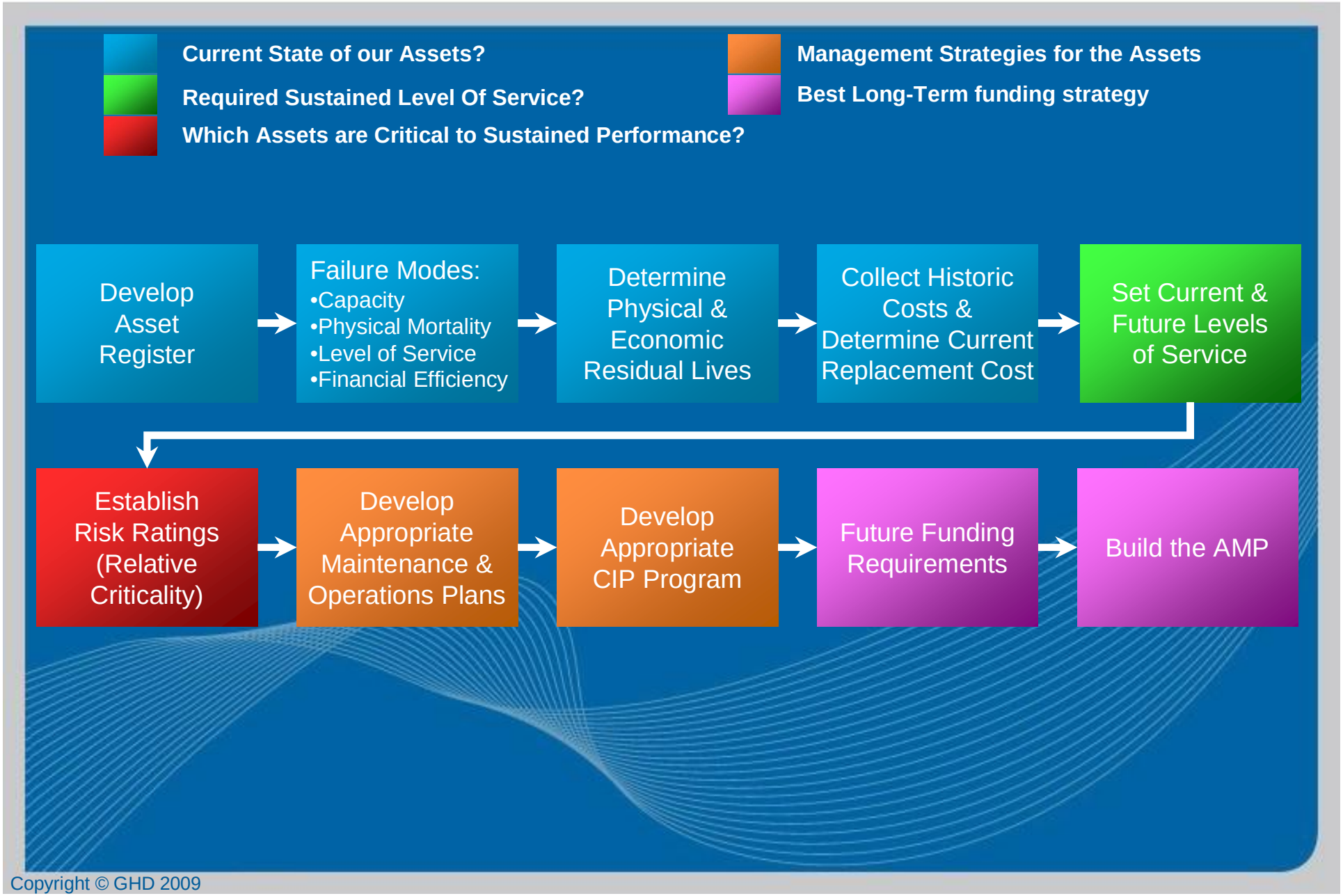
- a management paradigm and a body of management practices
- that is applied to the entire portfolio of infrastructure assets at all levels of the organization
- that seeks to minimize the total cost of acquiring, operating, maintaining and renewing the assets
- within an environment of limited resources
- while continuously delivering the service levels customers desire and regulators require
- at an acceptable level of business risk to the organization
- In a cultural environment that encourages maximum development and satisfaction of our human assets.

Why Start an Asset Mangement Program?

- Benefits of AMP:
  - Identify assets where rehabilitation or replacement will be cost effective.
  - Understand and manage critical assets.
  - Focus maintenance efforts using risk.
  - Optimize its maintenance and capital needs to reduce the life cycle cost of ownership.
  - Understand the long-term future renewal, rehabilitation and replacement expenditure requirements of the organization and assist in the development of plans to mitigate the various expenditure peaks.

Creating an Asset Management Plan

Investment Decision Making Process



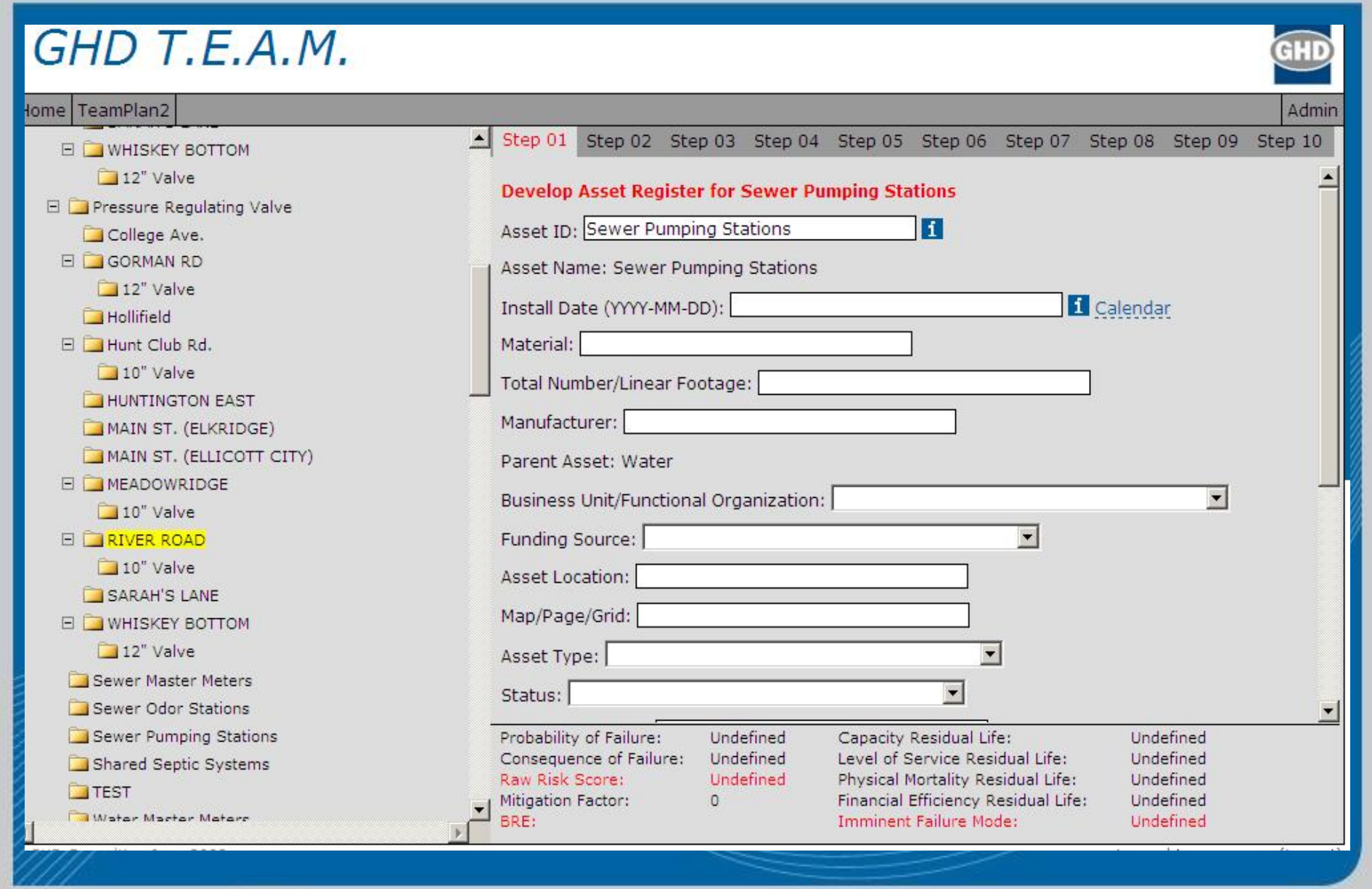
How to Get Started?

- Using your available data, whether on paper or spreadsheet or database you can develop an asset management plan (AMP)
- When starting, just focus on a small asset group as a pilot project.
- The AMP will need to eventually include incorporate existing and projected operational efforts and capital projects, prioritized based on condition, level of service, and risk.

Step 1 -Develop Asset Register

- Need to establish an asset hierarchy, a definition of the maintenance managed item (MMI) and the data attributes required to support the asset management decision-making process.
- Develop an asset register for a pilot asset group, consolidating all inventories available. The asset register will contain an asset hierarchy and asset attributes, defined by a data framework specifying data attributes required to support asset management decisions.
- Confirm asset data gaps based on the agreed asset hierarchy structure by reviewing existing asset information held in asset registers. Gaps of missing or incomplete data can then be identified.

Develop Asset Register



Step 2 - Establish Condition

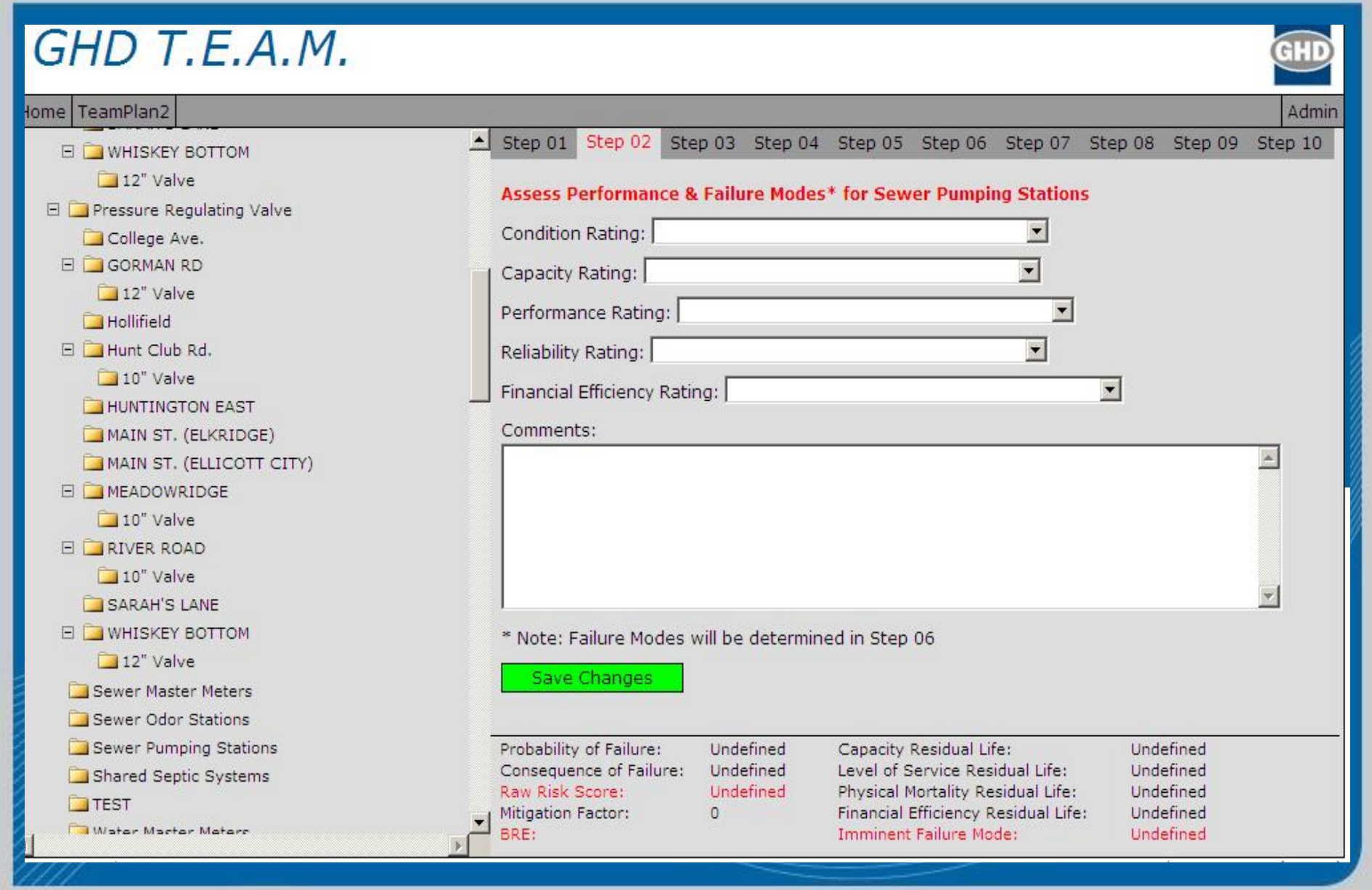
- Estimate install date, rehabilitation dates, remaining useful life, and projected replacement dates for major equipment, if data is not already available.
- Review the existing asset condition assessment protocols and make recommendations for improvement.
- Finalize the condition assessments for the pilot asset group. Condition ratings for all assets can be loaded into TeamPlan2™.

Condition Assessment

- *You can't judge a book by its cover.*

- *It's what's on the inside that counts.*

Condition Assessment



Step 3 - Residual Life Estimates

- Need to estimate the residual life for all assets. The residual life estimates will be based on identifying the four failure modes and selecting the imminent failure mode.
- If good data is not available, the residual life will default to the remaining original design life using the original installation date.

How Much Residual Life is Left?

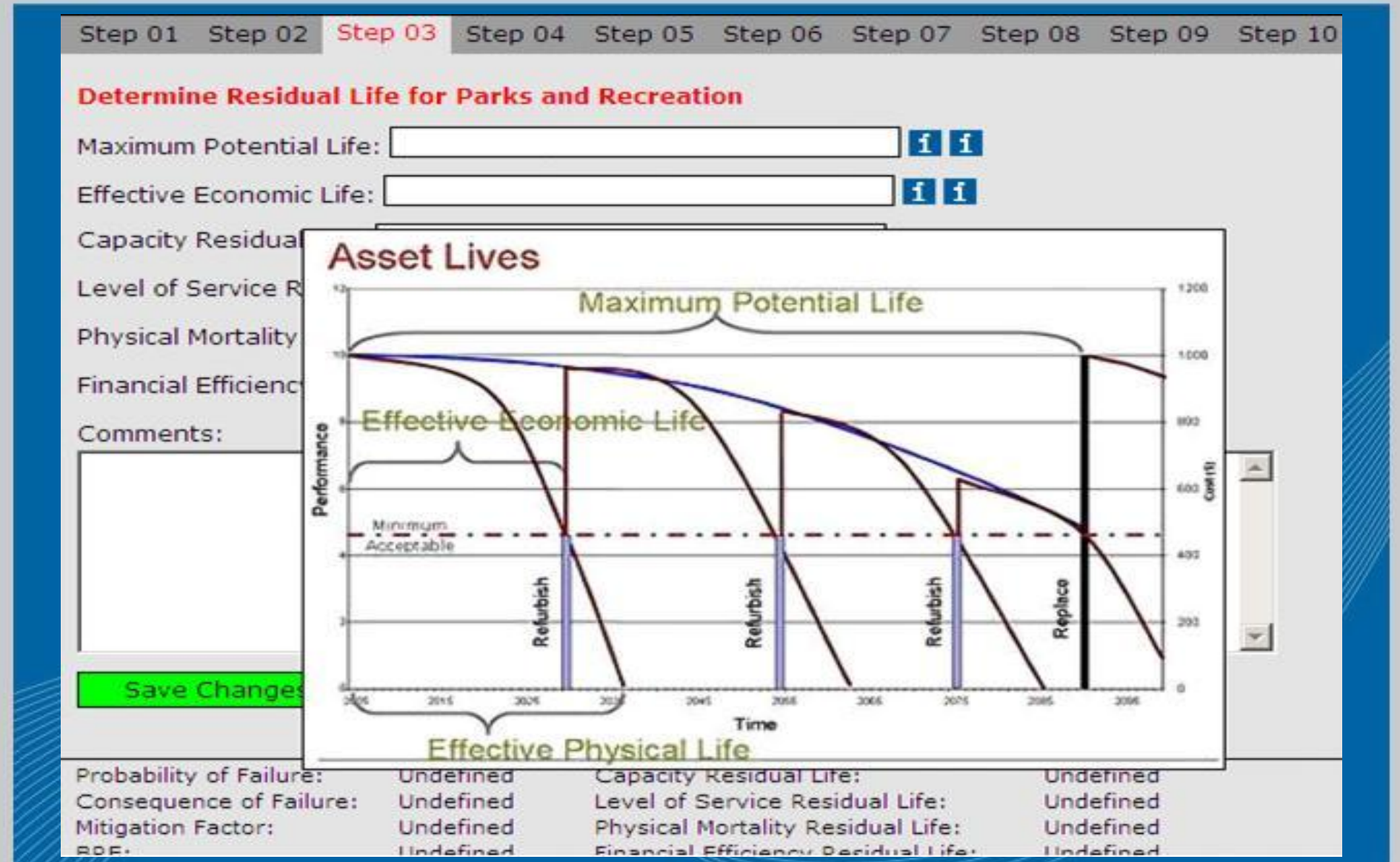
Name the Movie:

Planes, Trains and Automobiles (a Hughes Entertainment Production)

Name the Year:

1987

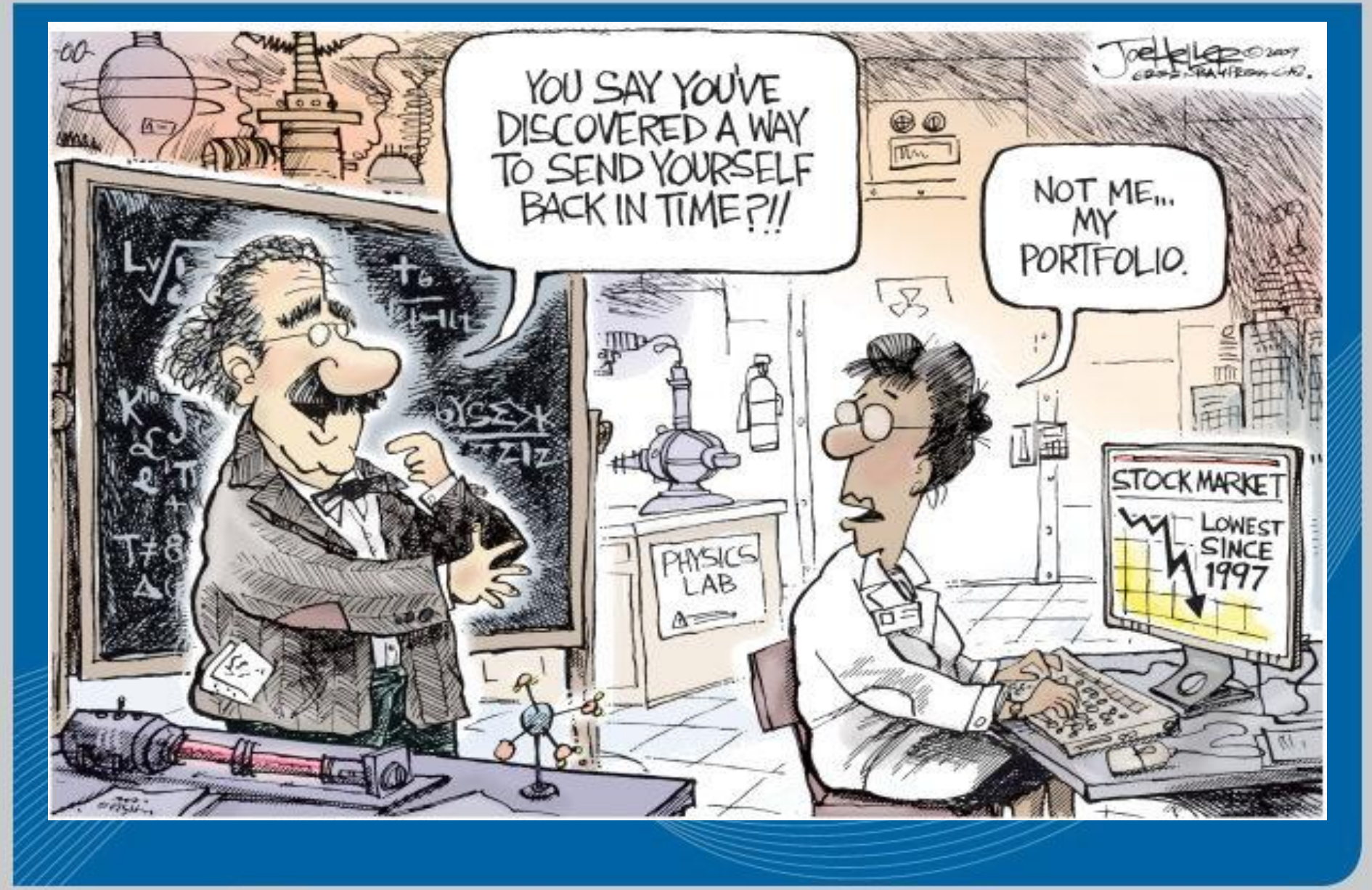
Residual Life Estimates



Step 4 - Replacement Cost Valuation

- Develop protocols for estimating replacement costs for all asset types.
- Enables valuing assets based on current replacement cost (rather than a historical cost) basis.
- Protocols will identify both top down and bottom up approaches to determining replacement costs.

Step 4 - Replacement Cost Valuation



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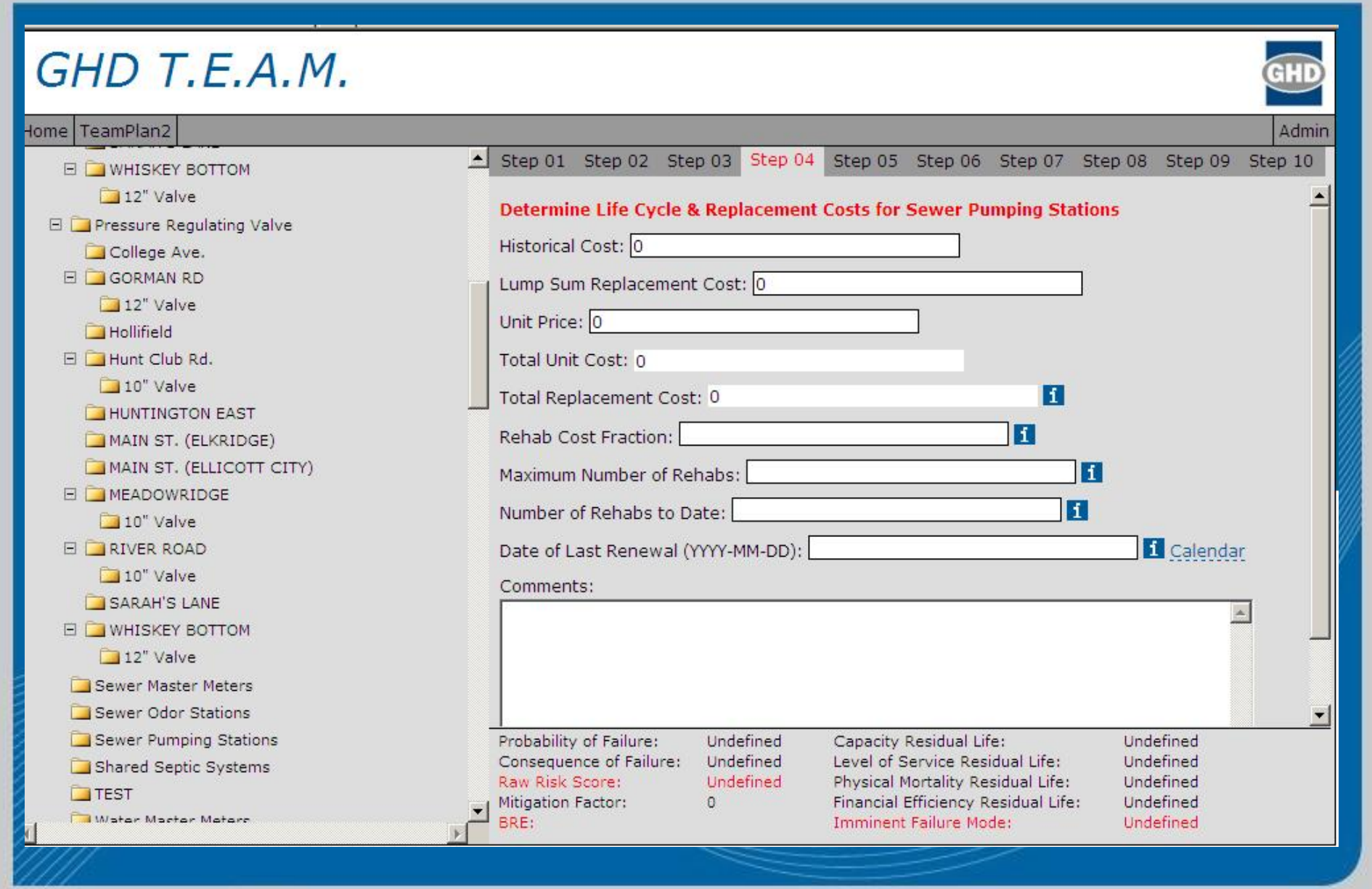


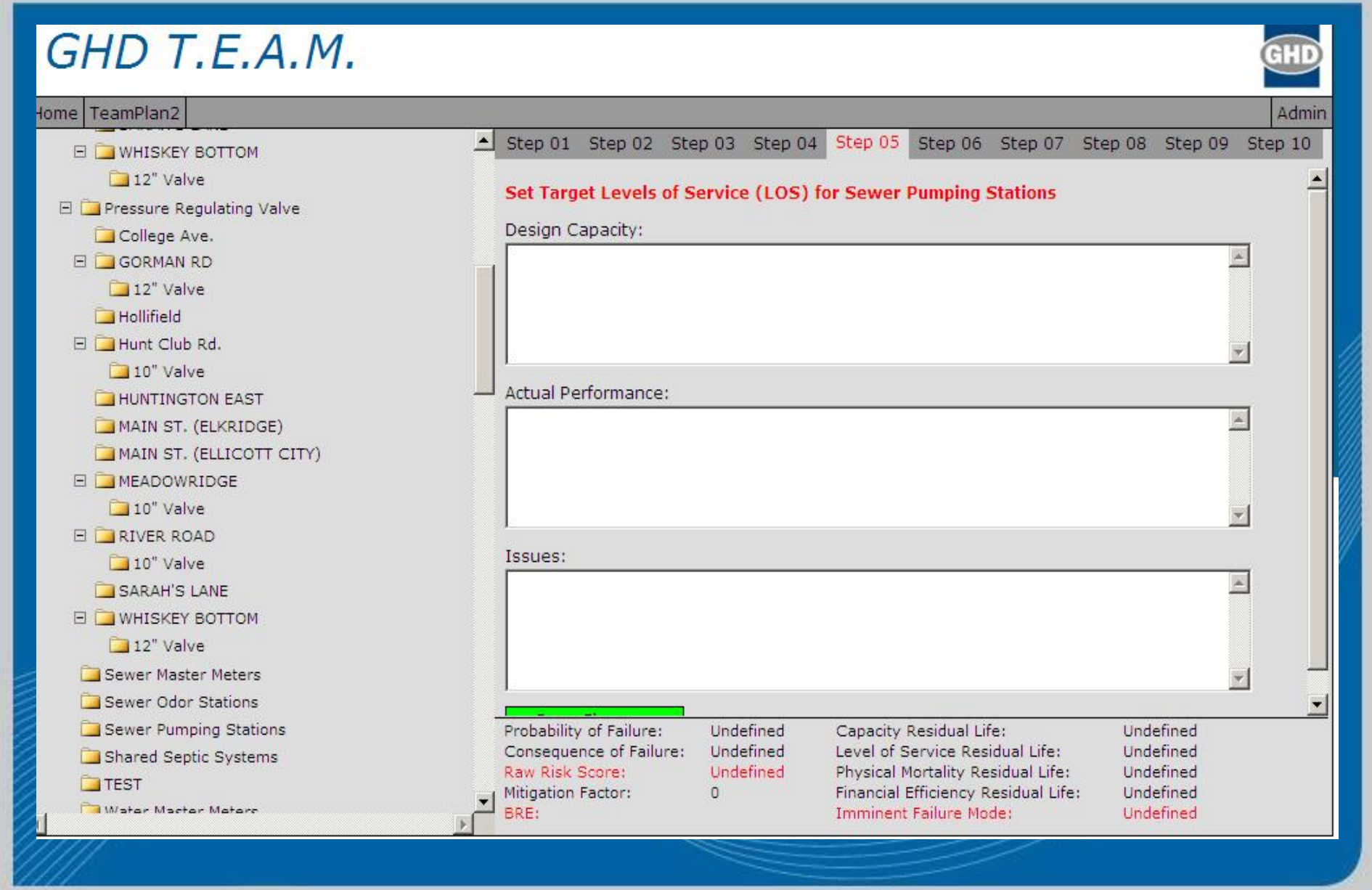
Step 5- Review of Levels of Service (LOS)

- Develop current and future LOS criteria for the assets
- LOS statements typically include measurable service levels, such as number of odor complaints or overflows per year.

Levels of Service (LOS)

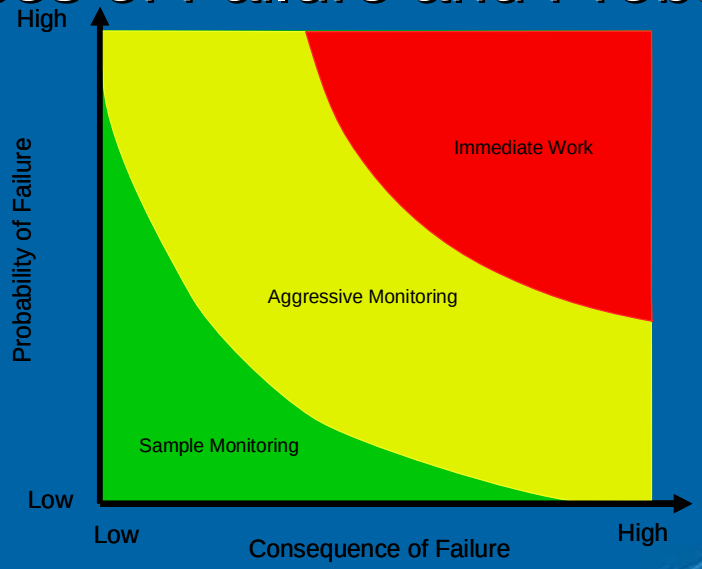
Community Outcome	Core Value	Activity Strategic Outcomes	Customer Levels of Service (CLOS)		Technical Levels of Service (TLOS)	
			Current Target (2008)	Proposed Target (2012)	Current Target (2008)	Proposed Target (2012)
Environmental						
Water sources are protected.	Water Quality	Protect water quality	Meet DOH requirements, and coordinate with local land use councils.	As per current	Well head program - time of travel zones are inspected biannually by staff looking for potential sources of contamination	As per current
The drinking water is safe.	Water Quality	Water quality is safe for drinking	75% of customers believe the drinking water is safe to drink 70% of customers believe the drinking water has a good taste	80% of customers believe the drinking water is safe to drink 75% of customers believe the drinking water has a good taste	Comply with 100% of DOH WAC 246.290 monitoring requirements. Maintain fluoride concentration between 0.8 – 1.3 mg/L in distribution system. Maintain pH concentration between 7.6 and 8.3 in distribution system.	As per current As per current As per current

Step 5 - Levels of Service (LOS)



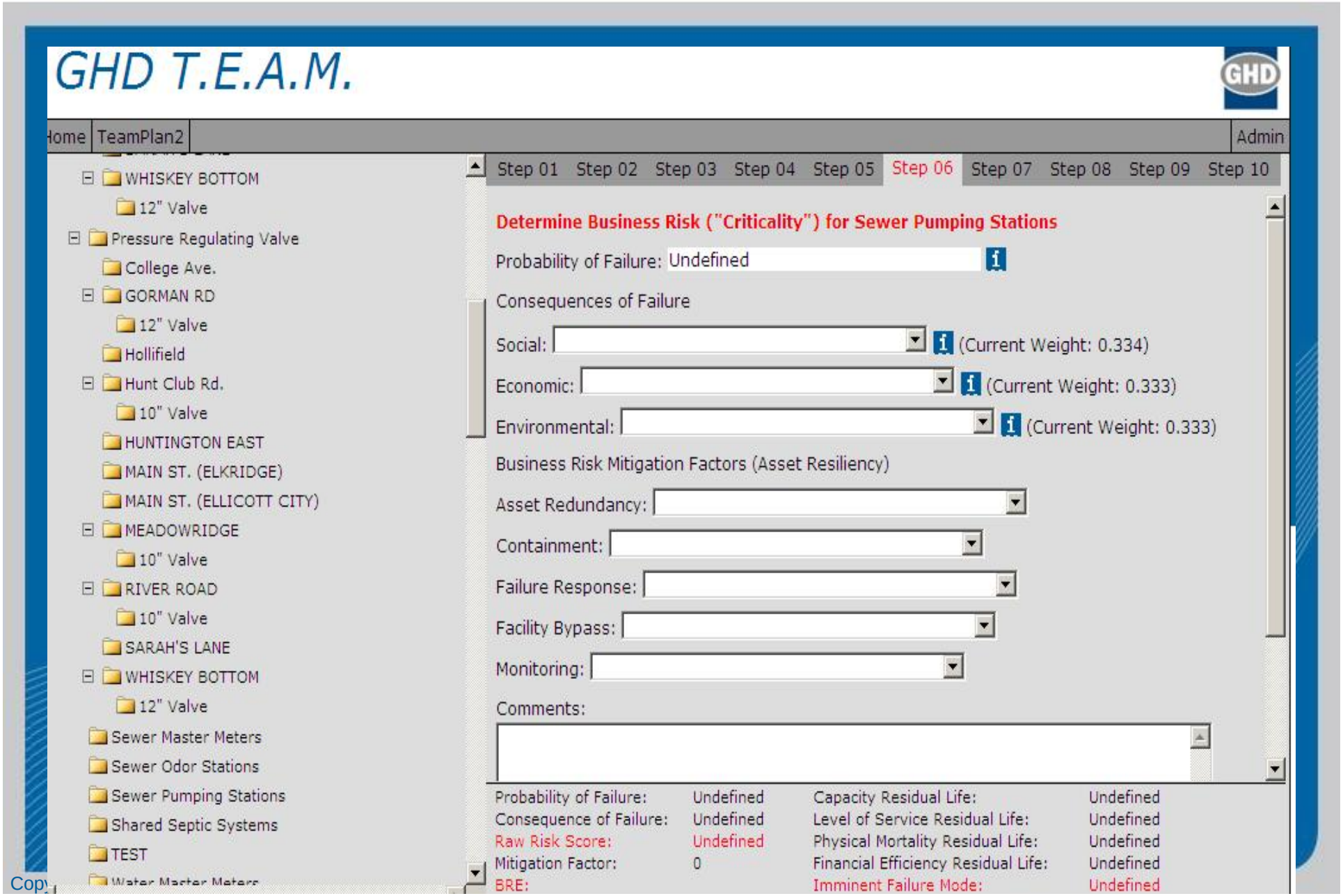
Step 6 - Evaluate Business Risk Exposure (BRE)

- Dust off Hazard Mitigation Plans!
- Review Consequences of Failure and Probability of Failure metrics.



- Develop BRE scores for all assets within a pilot asset group.
- BRE scores will serve as the basis for subsequent asset inspection prioritization and will be used for the renewal cost forecasting.

Business Risk Exposure (BRE) - Criticality



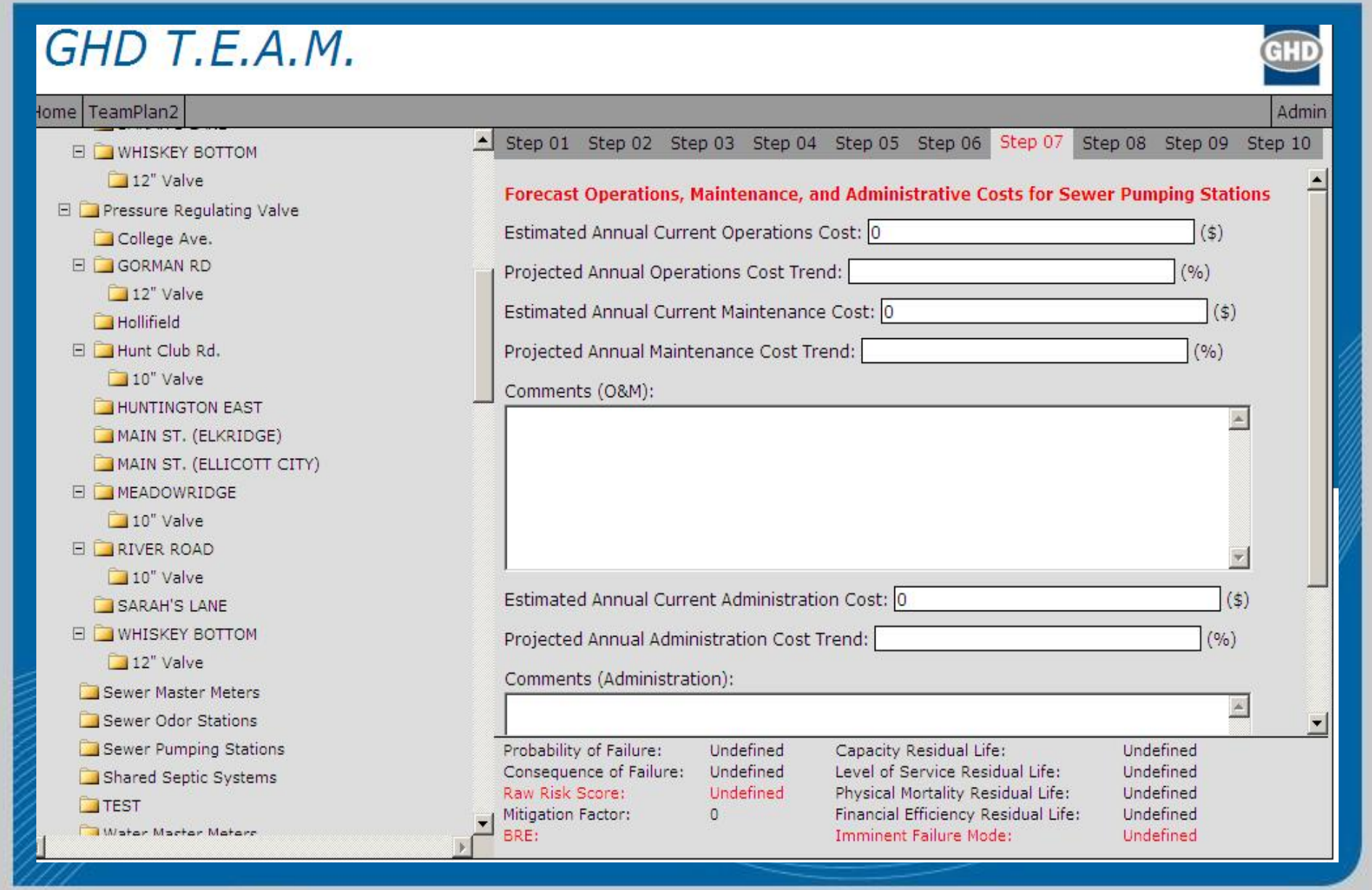
Step 7 - Management Strategies

- Need to review and document the current operation and maintenance practices. The information will then be used to make recommendations for updating current business processes to optimize asset management decisions.
- Standards can then be developed for:
  - Evaluating maintenance requirements, and tracking maintenance costs by individual asset
  - Recording time, materials, and plant costs associated with maintaining individual assets
  - Assigning maintenance costs to an individual asset
  - Developing and implementing consistent failure codes assigned to an asset every time a reactive maintenance visit is made

Example Management Strategies

- Example Management Strategies:
  - Pipe
    - PVC/HDPE/DI – 100 years
    - AC – 70 years
      - Small Diameter AC – 60 years
    - CI – 80 years
      - Small Diameter CI – 70 years
    - Note: No effective rehab for pressurized water mains.
  - Hydrants
    - Pre-1970 Hydrants not efficient to operate/rehab, so MS is 35 years of useful life.
    - Post -1970: Rehab every 10 years. Max Life = 50 years
  - Meters
    - Large Meters (>1”) – Minor PM every 2 years, Major PM every 20 years. Max Life = 60 years
    - Small Meters (1” and smaller) – 15 years, then toss.

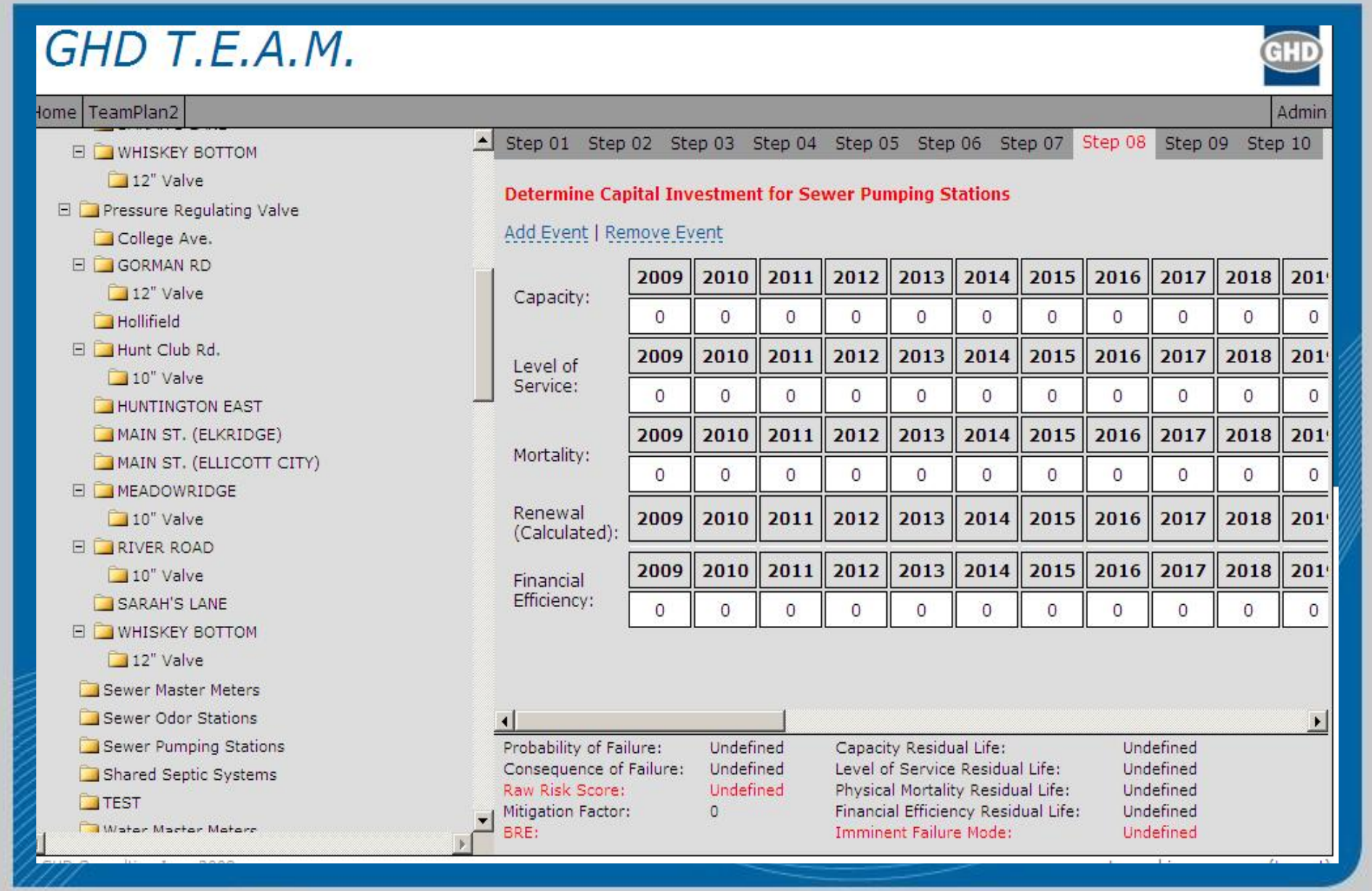
Management Strategies



Step 8 - Identification of CIP projects

- Need to recommend, prioritize and estimate costs for capital improvements of assets in the pilot asset group to provide any required asset life extensions.
- Then develop procedures where business cases are to be prepared for the CIP projects.
- The business cases require a Jurisdiction's staff to have an understanding of;
  - Current and future demands
  - Operational and maintenance requirements of the asset
  - Asset condition, imminent failure mode, and estimated residual life
  - Business risk exposure
  - Renewal cost and
  - Life cycle costs

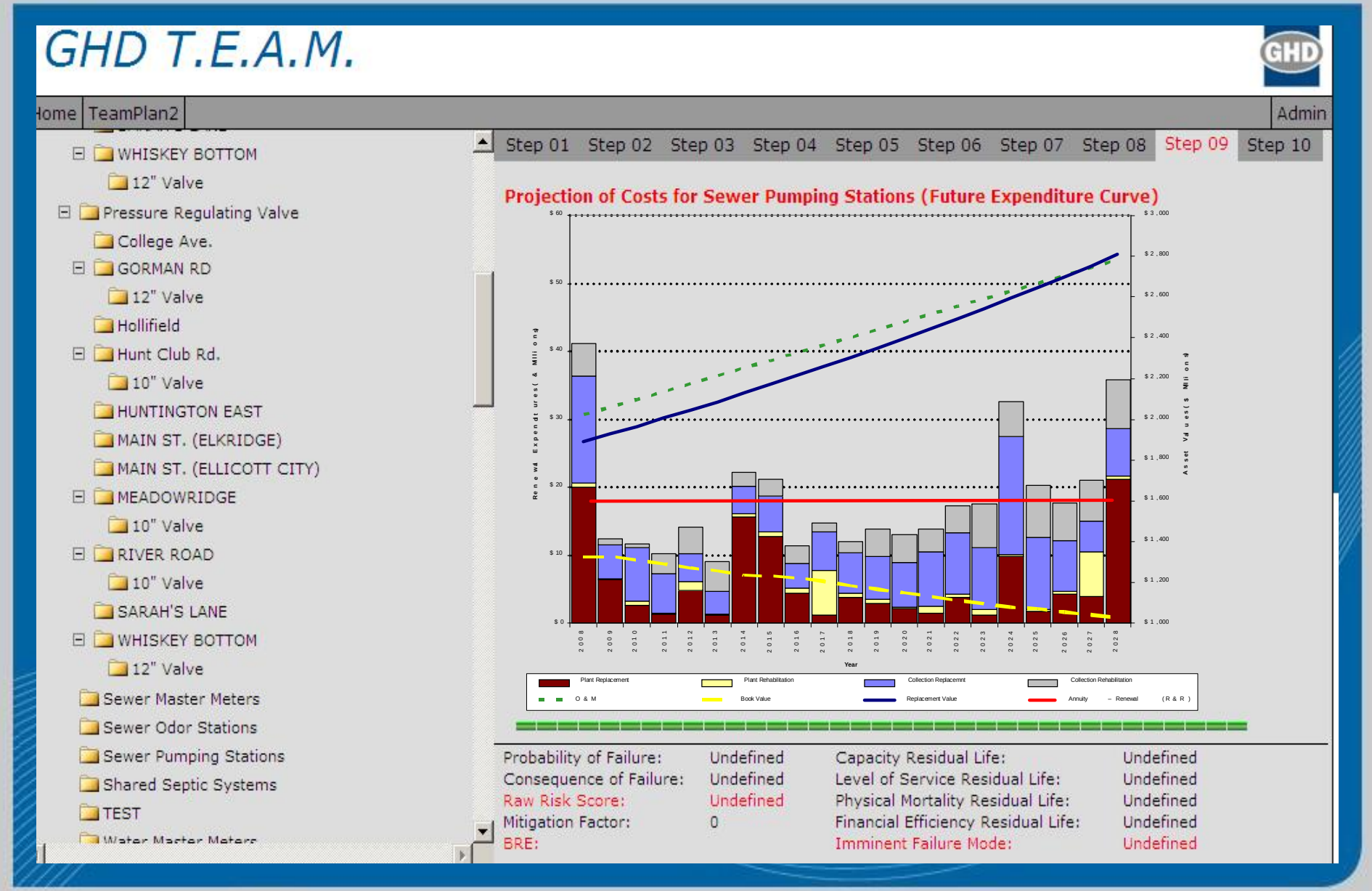
Identification of CIP projects



Step 9 - Life Cycle Cost Projections

- Determine the lowest life cycle cost for assets in the pilot asset group, based on the best time for renewal or replacement of assets.
  - A 100-year time period can be used for modeling to support replacement of all assets in the pilot asset group at least once during the planning period.
- Current valuation tables and graphs (not historic values) will be used to understand the current state of the assets.
  - These graphs provide details on the replacement, depreciated values, and asset counts detailed by key systems and major asset classes.
- Graphs are based on the current replacement cost, estimated book value, and the maximum potential life of assets and asset classifications.
  - The graphs present the District's future investment estimate. The graphs build the total predicted cash flow by summing the following:
    - Estimated rehabilitation and replacement cost
    - Cost estimates for new levels of service and growth
    - Operations and maintenance costs

Life Cycle Cost Projections

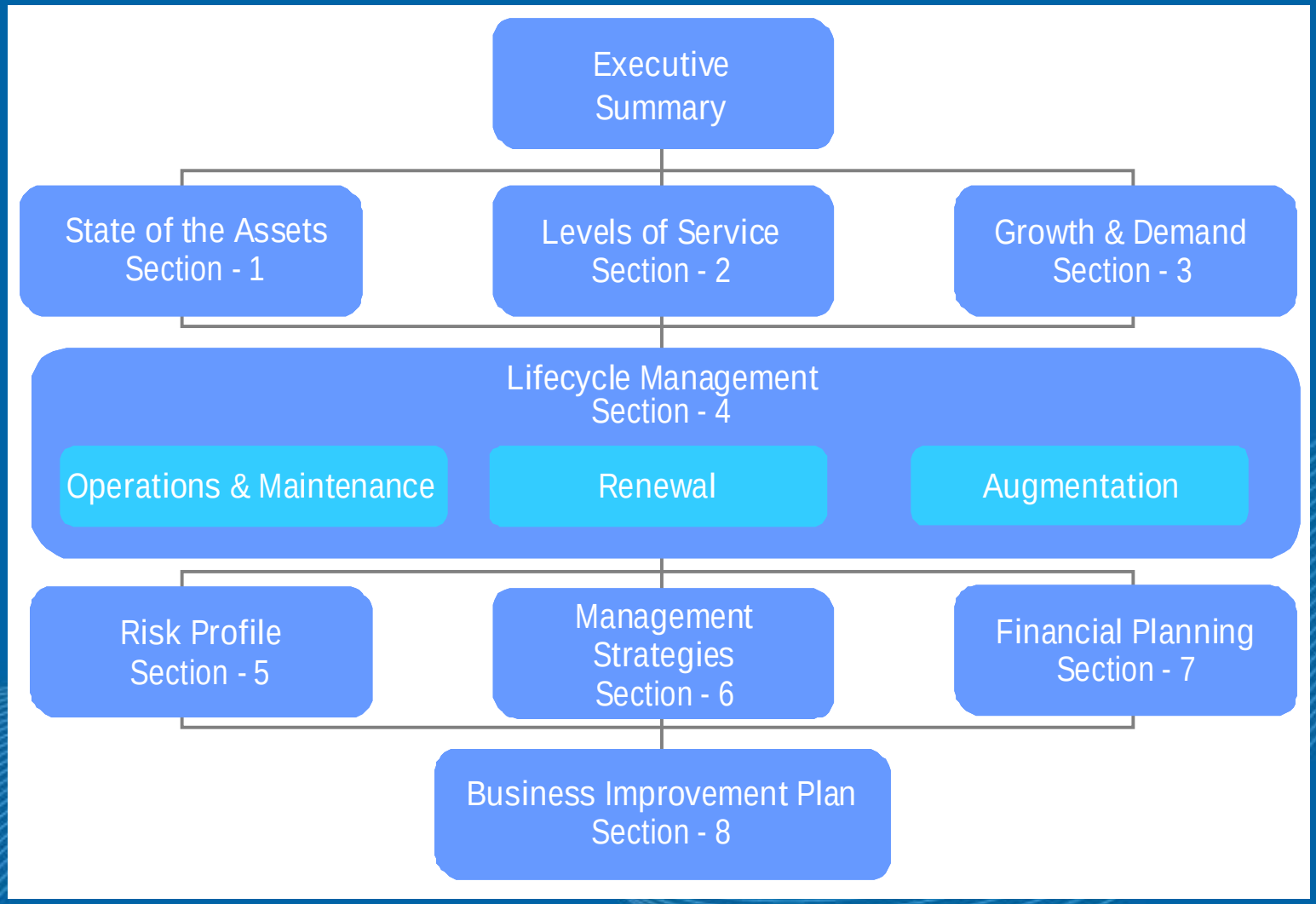


Last Step! - Asset Management Plan (AMP)

- Develop a detailed outline of the asset management plan (AMP) for the pilot asset group.
  - The asset management plan will be based on the current level of knowledge and information held by staff and information collected from the assessment process.

- A sample outline for an AMP is as follows:

Asset Management Plan (AMP)



Use of Asset Management Plan

- Sell and Tell Your System's Story!
- Determine Lowest Life-Cycle Cost to Operate Your System at the Lowest Acceptable Risk……
- While Meeting the Needs of Your:
  1. Customers
  2. Regulators
  3. Electeds
  4. Management
  5. Staff

Getting AM Program Started

Questions?