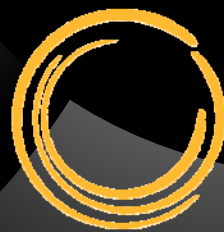


# Triple Bottom Line Model Workshop Breakout Session

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Thursday, February 6, 2014



CAPE COD  
COMMISSION



# Agenda

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- Today's goals
- Criteria selection process
- Discussion of Criteria
- Understanding the TBL Model's Outputs
- Q&A



# Today's Goals

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For Workshop participants to come to a common understanding of the **functionality** of the Triple Bottom Line decision support tool, with a focus on the **Criteria selected**, and **how to read the Model's outputs**.



# Scenario Evaluation Criteria

## Social

- System Resilience
- Allocation of Costs to Users
- Employment – Direct Investment
- Employment – Tourism
- Tax Revenues
- Property Values
- Growth Compatibility

## Environmental

- Habitat
- Climate
- Marine Water Quality
- Fresh Water Quality

## Financial

- Municipal Costs, Passed on to Ratepayers
- Costs, Incurred Directly by Property Owners





# Financial Category Utilizing Lifecycle Cost Analysis

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## Financial Category

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### *Impacts to average annual homeowner rates*

How much will each Scenario require increases to (or creation of) wastewater management fees to pay for the upgrades to the wastewater management system?

### *Impacts to other homeowner costs*

How much will each Scenario change the average homeowner's wastewater management costs, separate from any new or increased fees, such as costs to comply with installing an upgraded septic tank?

The TBL Model will present this information in such a way as to be comparable to the homeowner rates in the previous criterion.



# Social Category

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## Social Category

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### *Employment resulting from Scenario implementation*

How many jobs will be created from the construction/installation and ongoing O&M of each Scenario's collection of Technology Options?

This criterion will take into account the reduction in jobs that will result from reduced disposable income of Cape Cod households who will be paying more in wastewater management fees.

### *Tourism employment*

To what extent will each Scenario benefit the tourism economy on Cape Cod (or prevent damage to it)?

### *Property Values*

To what extent will each Scenario impact a watershed's aggregate property values? Different Technology Options will have different impacts on individual properties and on the overall watershed.



## Social Category

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### *Tax Revenues*

To what extent will each Scenario raise tax revenues, and how will changes affect the distribution of the tax burden by income group?

### *Allocation of Costs to System Users*

To what extent will each Scenario's financial burden be felt by year-round residents?

### *System Resilience*

To what extent will each Scenario improve the resilience and reduce the risk of failure of the wastewater management system and other important assets in the face of extreme natural events, such as sea level rise?

### *Growth Compatibility*

To what extent will each Scenario encourage growth in villages and town centers, versus the extent to which each Scenario may encourage growth in sparsely populated areas.





# Environmental Category

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## Environmental Category

### *Habitat*

To what extent will each Scenario enhance and protect habitat areas that have been deemed important to local ecosystems?

### *Climate*

To what extent will each Scenario increase or decrease greenhouse gas emissions? The Model will assess both generated emissions (by pumping stations and treatment plants), captured emissions (methane for fuel), and sequestered carbon (in plant life).

### *Marine Water Quality*

How quickly will each Scenario deliver improvements in marine water quality to the watershed, with an emphasis on improving the more severely degraded marine water habitats?

### *Fresh Water Quality*

To what extent will each Scenario deliver improvements to fresh water bodies (ponds, lakes) whose water quality is classified as impaired?



# TBL Model – Process and Outputs

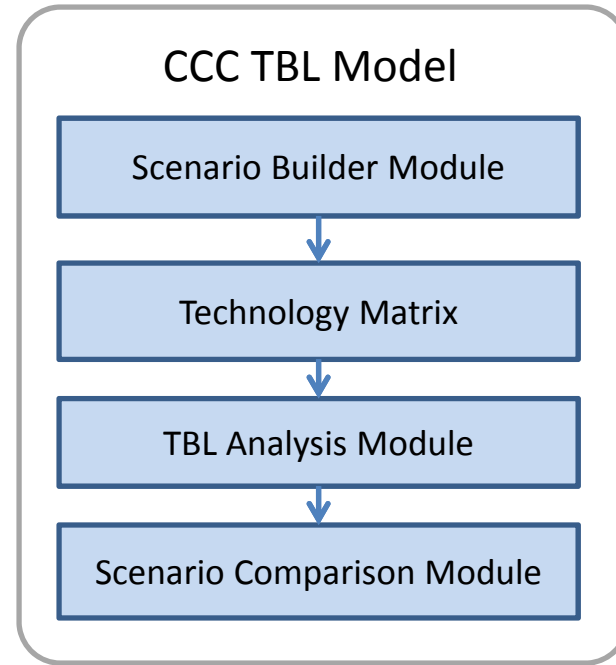
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# CCC TBL Model Workflow and Components

- 1 Select Watershed
- 2 Build New Scenario
- 3 Build Strategy Technology Stack
  - Select Strategy / Technology from Pull-down
  - Select Application Area on Map
  - OR fill-in parameters on Technology Input Form
  - View Technology Performance Screen
- 4 View Scenario Overview
- 5 Revise Technology Selections and Parameters
- 6 Save Scenario to Archive Database
- 7 Compare Scenarios
  - View TBL Outputs
  - Adjust Criterion Weightages
  - Flag favorable Scenario

Iterative Process





# Triple Bottom Line (TBL) Assessment Model

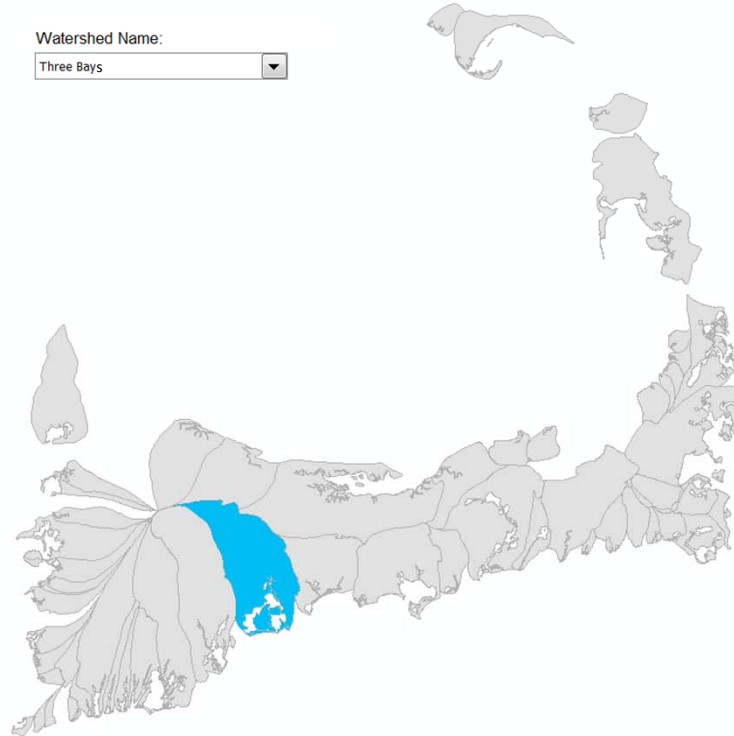
Environmental + Social + Financial Sustainability



HOME	<b>MODEL INPUTS</b>	CRITERIA EVALUATION	SCENARIO BUILDER	COMPARE SCENARIOS	TBL DATABASE
Select Watershed	Community Inputs	Key Inputs & Assumptions	Data Summary		

Please select a watershed to create a scenario

Watershed Name:





## Community Goals

Please set watershed-wide thresholds for the performance factors below. All scenarios for the watershed will be scored against these thresholds.

- 1** **Development Buildout Timeframe**  **2041**  
The estimated time when Development in the watershed will reach capacity as planned by current zoning
- 2** **Min. % of TMDL Goal achieved in 20 years**  **25%**  
The acceptable level of Nitrogen reduction for a viable scenario within a reasonable timeframe
- 3** **Max. % of MHI as 208 Plan Wastewater Management Fee**  **5%**  
The acceptable burden on households measured as a % of Median Household Income (MHI)
- 4** **Max. average Capital Cost of On-Site Improvement per HH**  **\$15,000**  
The acceptable burden on households investing in 208 plan related on-site improvements
- 5** **Min. % of Properties in Watershed improving in Value**  **5%**  
The minimum number of properties expected to gain in value due to 208 plan improvements
- 6** **Min. New Acres of High Quality Habitat Created**  **5 ac**  
The minimum acres of high quality habitat being added to the existing habitat areas with the watershed
- 7** **Min. % of GHG Emission Reduction from Wastewater sector**  **25%**  
The minimum % reduction of GHG compared to 2002 levels from wastewater sector
- 8** **Min. New Jobs Created from the Scenario**  **100**  
The minimum number of new jobs created in the construction, maintenance and rate-payer sectors



# Triple Bottom Line (TBL) Assessment Model

Environmental + Social + Financial Sustainability

AECOM



HOME

MODEL INPUTS

CRITERIA EVALUATION

**SCENARIO BUILDER**

COMPARE SCENARIOS

TBL DATABASE

Select to add/remove/edit a strategy/technology:



A4. I/A Systems



Select a Location (Watershed)

Three Bays Watershed

SCENARIO NAME:

Balanced Approach 2B



Current Application Stack: 7 Strategies/Technologies

+ Management Options

M1 Fertilizer Management

+ Watershed Options

W1 Permeable Reactive Barriers (PRBs)

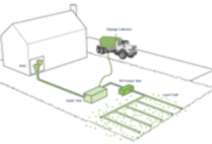
W3 Constructed Wetlands - Subsurface Flow

+ Alternative On-Site Options

A1 Toilets: Composting

→ A4 I/A Systems

IA



	from Selection
Total Number of Properties	900
Land Area (acres)	1157.6
Existing Nitrogen Load (Kg/yr)	7667.1
Future Nitrogen Load (Kg/yr)	8273.9
Properties Already Sewered	1
Application Suitability	899
% Selected	80%
Properties Impacted	719
Land Area Impacted	868.7
Future Nutrient Load Impacted	7,963.5 Kg/Yr

[Clear Selection](#)

+ Sewering Options

S1 High-Density Areas Sewering

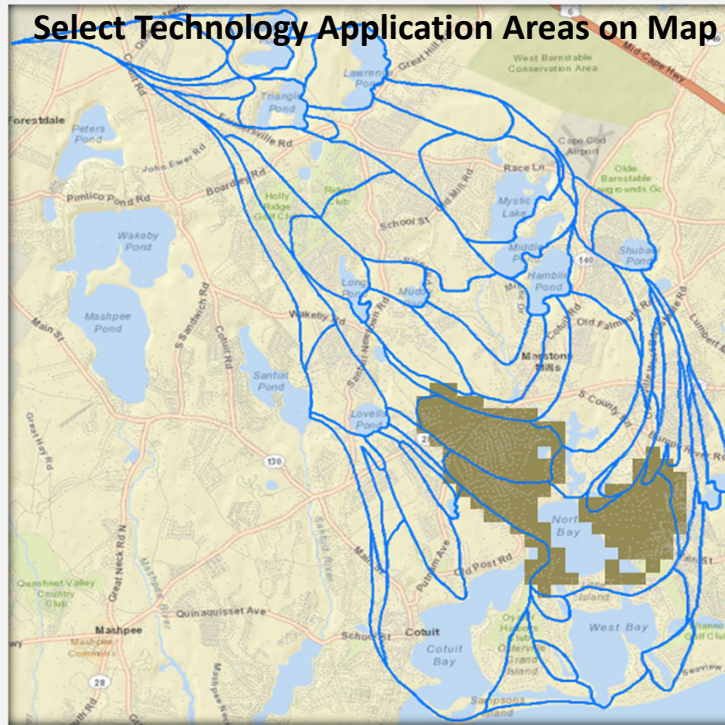
S2 Supplemental Sewering

View Scenario Overview

**View Technology Performance**

Compare Technologies

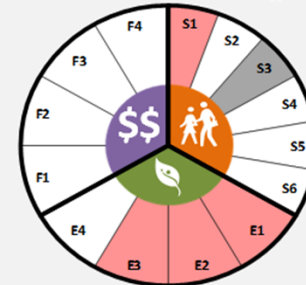
## Select Technology Application Areas on Map



STRATEGY/TECHNOLOGY:

A4. I/A Systems

TBL Assessment for Technology



Technology Applied to:

719 Properties 869 Acres

Technology Metrics

Applied Nitrogen 2,451 Kg/yr

Avg. Project 16,106K

Avg. O&M 989K

Avg Cost Per kg N 11,599 \$/Kg N/yr



# Triple Bottom Line (TBL) Assessment Model

Environmental + Social + Financial Sustainability



- HOME
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- COMPARE SCENARIOS
- TBL DATABASE

Select to add/remove/edit a strategy/technology:

A4. I/A Systems + 🗑️ ↺

Select a Location (Watershed)

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### Current Application Stack: 7 Strategies/Technologies

- Management Options**
  - M1 Fertilizer Management
- Watershed Options**
  - W1 Permeable Reactive Barriers (PRBs)
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- Alternative On-Site Options**
  - A1 Toilets: Composting
  - A4 I/A Systems



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[Clear Selection](#)

- Sewering Options**
  - S1 High-Density Areas Sewering
  - S2 Supplemental Sewering

View Scenario Overview
View Technology Performance
Compare Technologies

Impacted **3,954** Acres    **2,976** Properties    **2,975** Septic Systems

#### SCENARIO PERFORMANCE

Existing N Load: 34,447 Kg/yr    Future N Load: 17,731 Kg/yr

MVP Future N Load: 38,297 Kg/yr  
Target: 17,731 Kg/yr  
Total N Reduction: 20,566 Kg/yr

#### SCENARIO COSTS

Avg Project Cost: \$102,681K    Avg O&M Cost: \$4,181K  
Avg Cost Per Kg/yr N Removed: \$7,808 Kg/yr

#### TECHNOLOGY APPLICATION MAP

#### COMMUNITY IMPACTS SUMMARY

Quality Habitat Created	acres
New Open Space Added	acres
GHG Reduced	MT CO2e
Avg. Increase in Property Value	\$/Property
New Employment added	jobs
Additional Cost per Household	\$/HH/Yr





# Triple Bottom Line (TBL) Assessment Model

Environmental + Social + Financial Sustainability



- HOME
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Select to add/remove/edit a strategy/technology:

A4. IA Systems + - ↺

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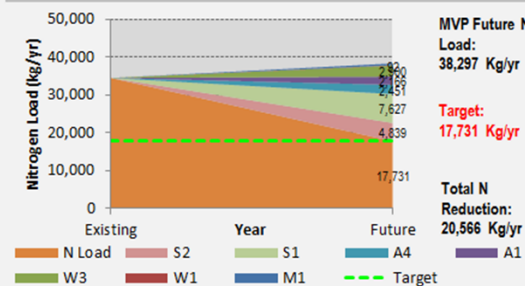
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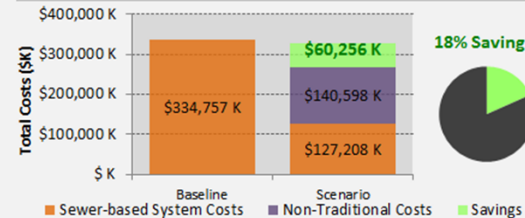
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### SCENARIO PERFORMANCE



### SCENARIO COSTS



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### TRIPLE BOTTOM LINE ASSESSMENT

#### FINANCIAL

Icons: \$\$

#### SOCIAL

Icon: People

#### ENVIRONMENTAL

Icon: Leaf

Score: 28/100

**Legend:**  
 S1 System Resilience, S2 Employment, S3 Ratepayer Distribution, S4 Tourism, S5 Property Values, S6 Tax Revenue, S7 Land Use Compatibility  
 E1 Marine Water Quality, E2 Fresh Water Quality, E3 Habitat, E4 Climate  
 F1 Municipal Costs, F2 Direct Costs to System Users

COMMUNITY IMPACTS SUMMARY		
Quality Habitat Created		acres
New Open Space Added		acres
GHG Reduced		MT CO2e
Avg. Increase in Property Value		\$/Property
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Additional Cost per Household		\$/HH/Yr



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AECOM



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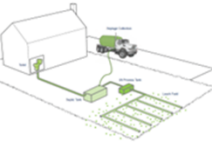
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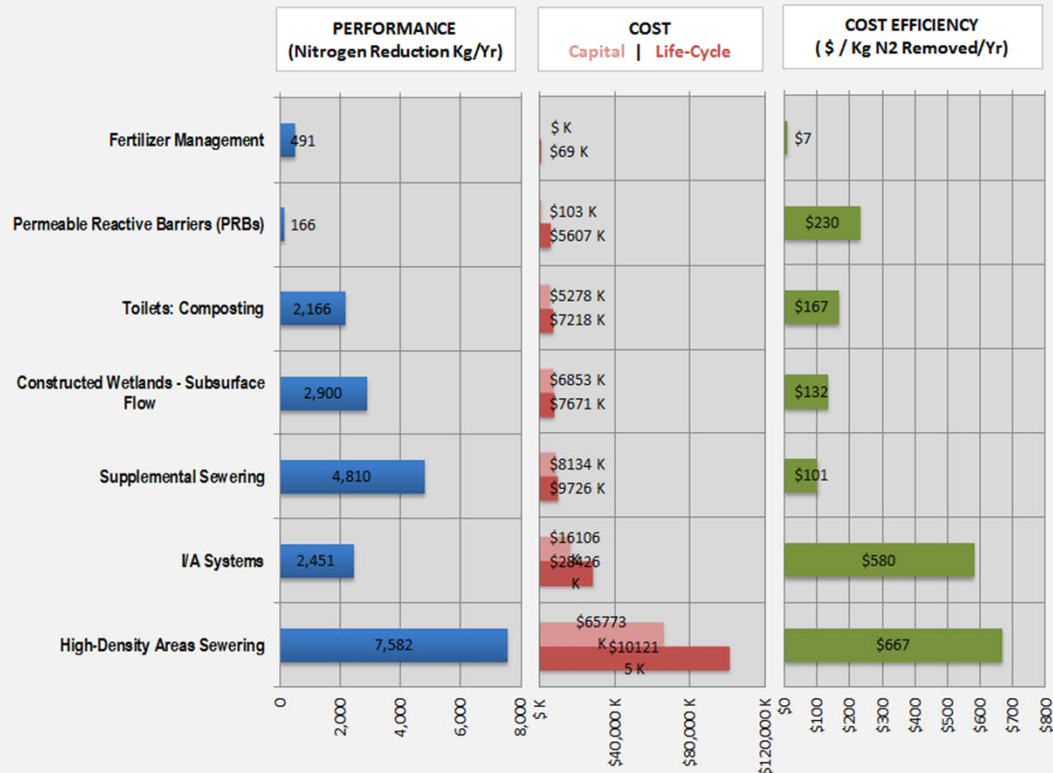
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**Compare Technologies**




# CCC TBL Model Scenario Comparison



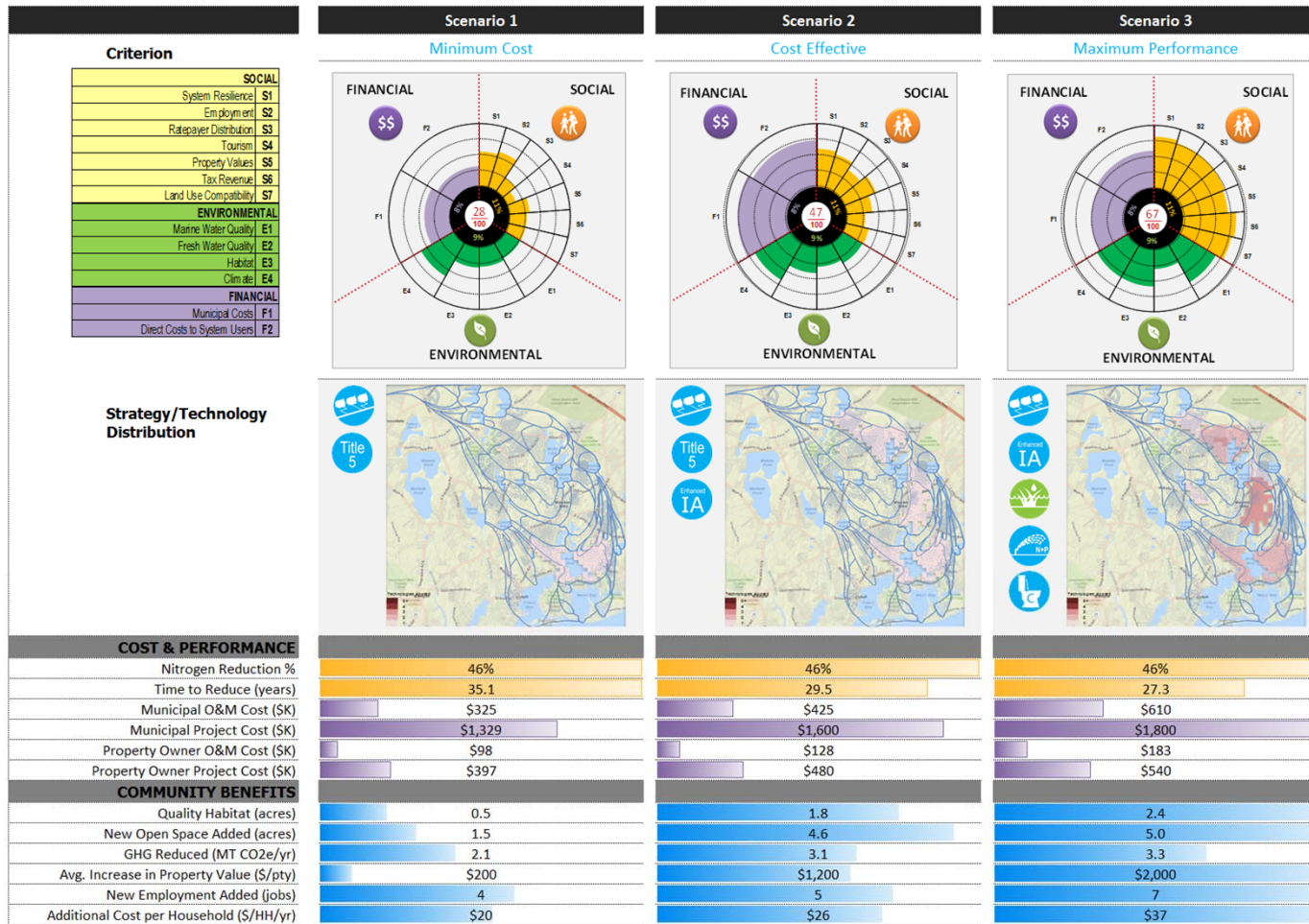
**Triple Bottom Line (TBL) Assessment Model**

Environmental + Social + Financial Sustainability

HOME
MODEL INPUTS
CRITERIA EVALUATION
SCENARIO BUILDER
COMPARE SCENARIOS
TBL DATABASE

Load Scenario
Scenario Results
Scenario Scoring Rules
Scoring/Ranking







Thank You . . .

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