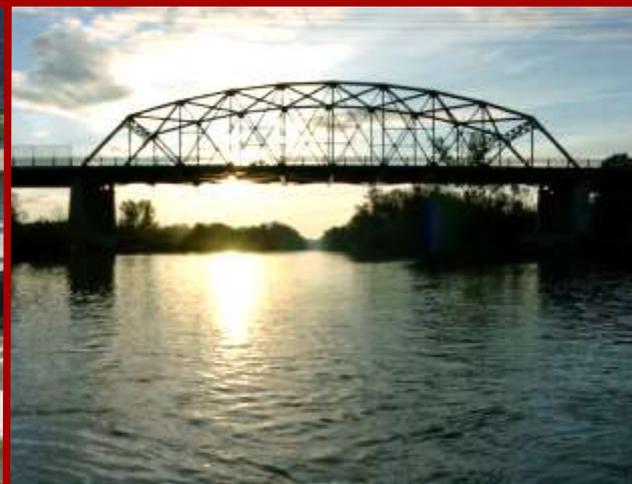
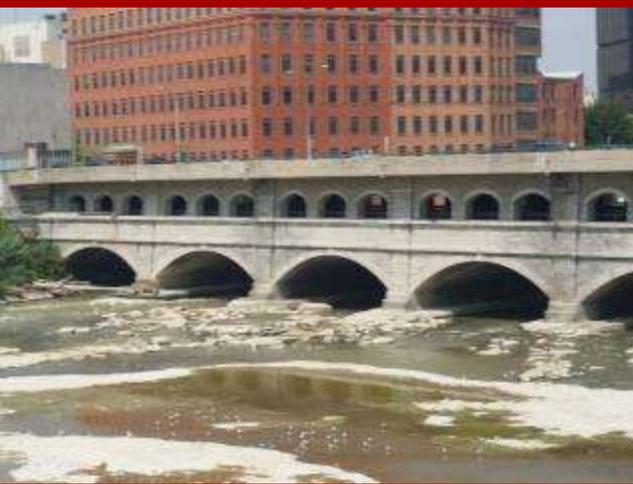


# Preparing to Make Difficult Decisions

Assessing a Regional Bridge Network  
and Creating Tools for Performance-Based Investments



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**2015 AMPO Annual Conference**

October 22, 2015

## Purpose

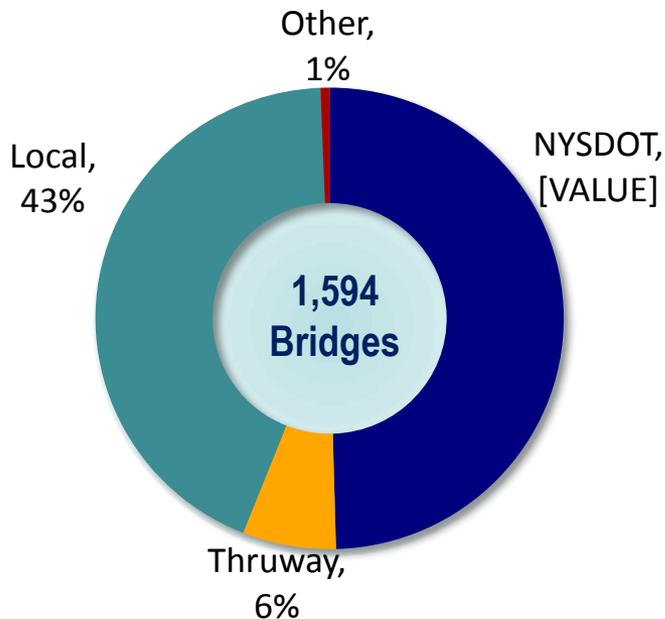
- Develop a regional strategy and associated guidance for agencies to consider when identifying requisite funding for bridges as part of their capital programs
  - What it **will** do
    - Quantify impacts of underinvestment and communicate related consequences
    - Provide tools to determine work types and develop priority lists of bridges
  - What it **won't** do
    - Commit Federal funds to specific bridges
    - Require agencies to repair specific bridges



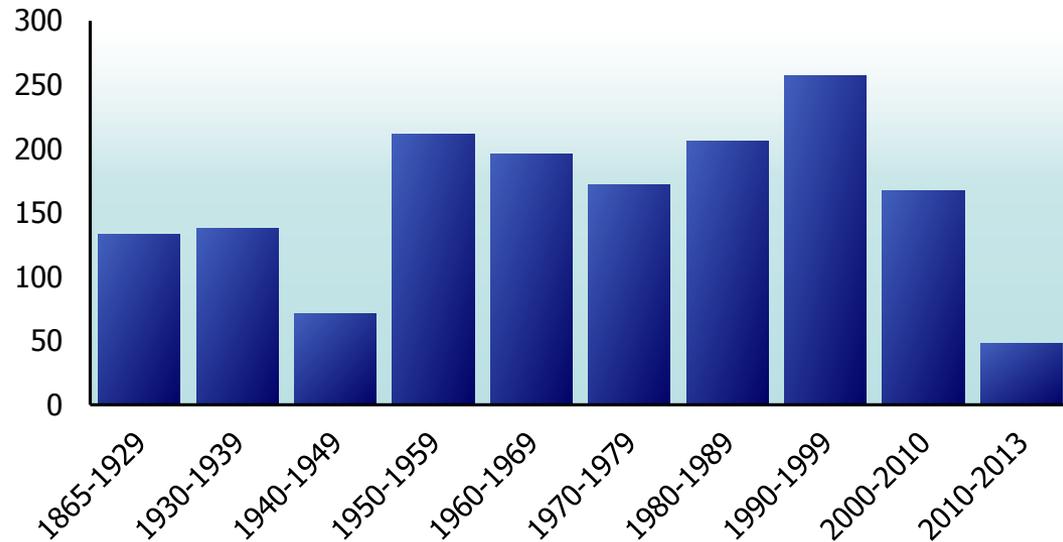
## Background

- GTC is the Metropolitan Planning Organization for the Genesee-Finger Lakes Region
- Population and employment larger than eight states

### Bridges by Owner



### Bridges in the Region by Year Built



## Background (continued)

- Our bridges are old...
  - 4 out of 10 are beyond their design life (50 years or older)
  - 1 out of 5 would be eligible for Medicare (65 years or older)
  - 19 were built before the Model T (Built before 1908)
- ...and they're showing their age
  - 1 out of 3 is structurally deficient or functionally obsolete



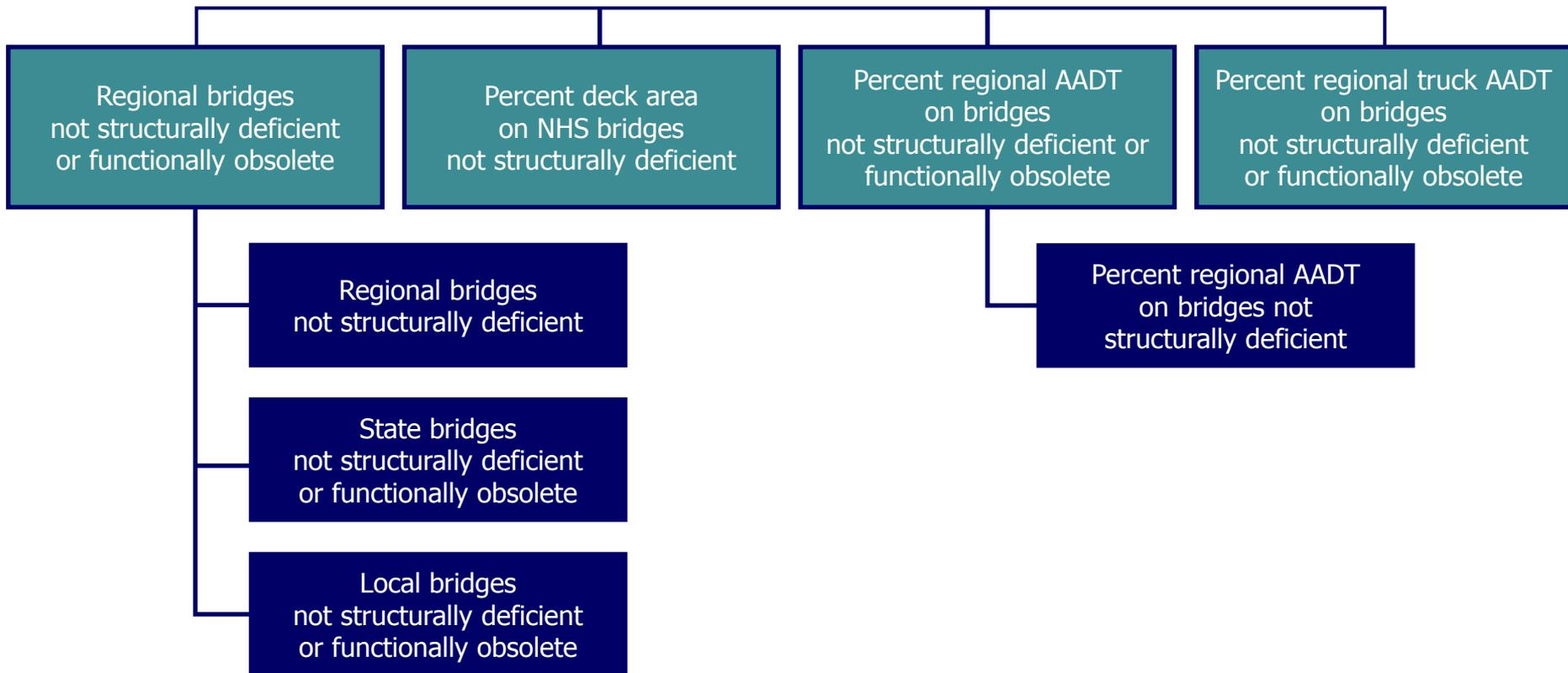
## Scenario Development

- Demonstrate consequences of underinvestment and what could be achieved
  - Identify performance measures
  - Develop and evaluate three scenarios
    - Maintain existing conditions
    - Achieve a state of good repair
    - Manage declining assets
  - Determine necessary funding over two timeframes
    - Horizon 2025 – 10-year, accelerated
    - Horizon 2040 – 25-year, gradual



# Scenario Development (continued)

## Performance Measures



# Scenario Development (continued)

## *Scenarios*

1

### **Maintain Existing Conditions**

Calculate the funding level needed to maintain the existing network condition in the most cost-effective manner

2

### **Achieve a State of Good Repair**

Calculate the maximum funding level at which the incremental cost is exceeded by the incremental benefit

3

### **Manage Declining Assets**

Calculate the maximum performance that could be achieved based on the projected funding expected to be available

## **Data Assembly and Formatting**

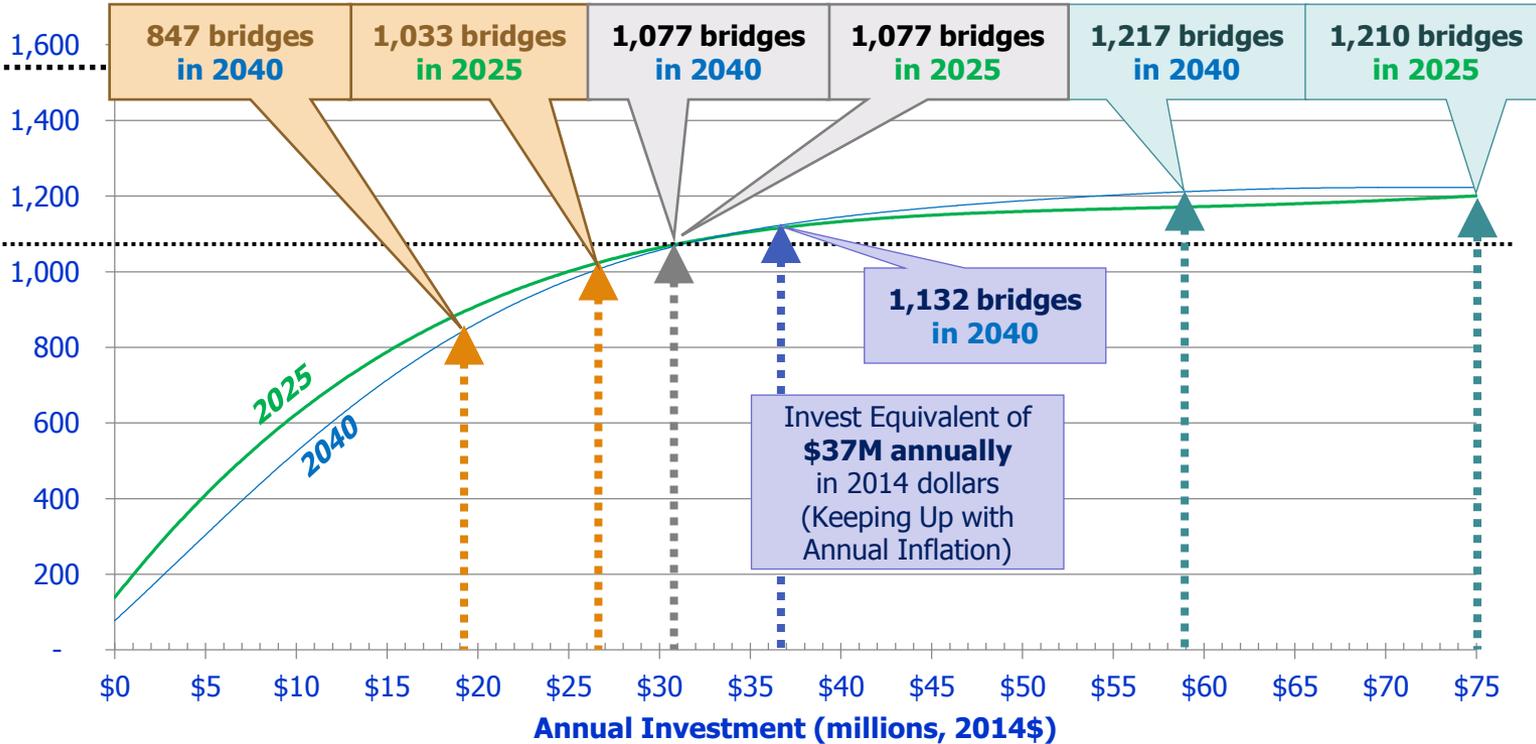
- 2013 National Bridge Inventory (NBI) Database
  - Data collected by New York State DOT and submitted to FHWA
- National Bridge Investment Analysis System (NBIAS)
  - Tool developed for the FHWA
  - State-specific improvement costs
  - Economic-optimization algorithms
- Pontis
  - Tool developed for AASHTO
  - Share the same analytical framework and economic forecasting tools as NBIAS
  - Used to model bridge culverts

## Regional Bridges NOT Structurally Deficient or Functionally Obsolete

<p><b>Manage Declining Assets</b> Assumes continuation of current annual investment, equivalent to: <b>\$27.6M annually through 2025</b> <b>\$19.6M annually through 2040</b> in 2014 dollars</p>	<p><b>Maintain Existing Condition</b> Requires investment equivalent to: <b>\$31M annually through 2025</b> <b>\$31M annually through 2040</b> in 2014 dollars</p>	<p><b>Achieve a State of Good Repair</b> Requires investment equivalent to: <b>\$75M annually through 2025</b> <b>\$59M annually through 2040</b> in 2014 dollars</p>
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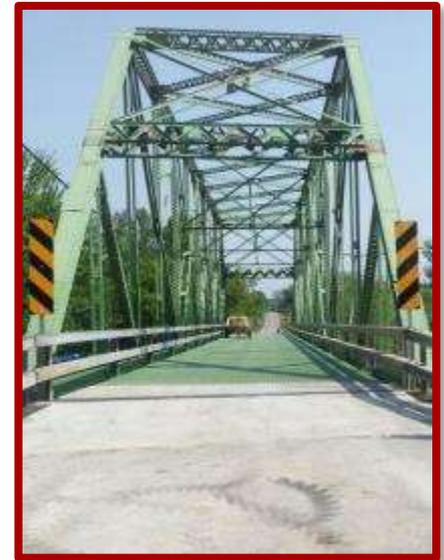
Total Bridges in Region:  
1,594 bridges

Existing Network Condition:  
1,077 bridges NOT  
Structurally Deficient or  
Functionally Obsolete



## Strategy Tool Creation

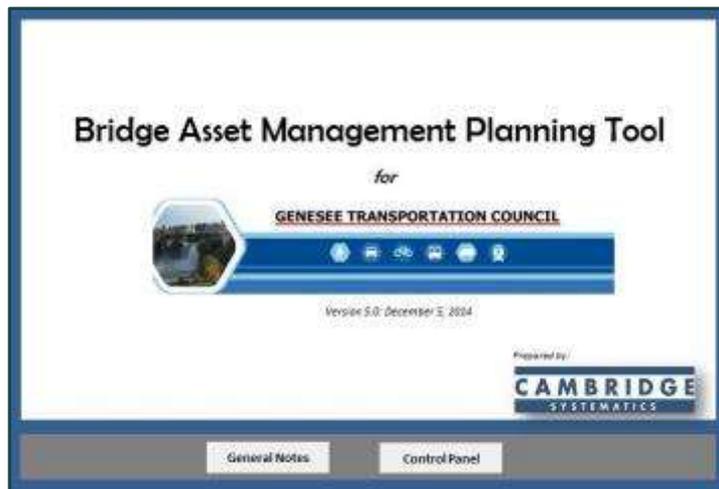
- Address the most challenging and, based on current circumstances, the most likely scenario
  - Manage declining assets
- Asset Management Planning Tool
  - Recommends investment by work type based on available funding
- Prioritization Screening Tool
  - Allows for weighting of key factors to create rankings and identify candidates for decommissioning



# Strategy Tool Creation (continued)

## *Asset Management Planning Tool*

- Recommends investment by work type based on available funding
- Performance-based trade-off tool for network analysis
- Based on 2013 data and scenario results
- Covers all performance measures for 2025 and 2040



# Strategy Tool Creation (continued)

## *Prioritization Screening Tool*

Allows for weighting of key factors to create rankings and identify candidates for decommissioning

The image shows the cover of a report titled "Bridge Prioritization Screening Tool" for the "Genesee-Finger Lakes Region". The report was prepared for the Genesee Transportation Council. The cover features a background image of a large stone bridge with multiple arches over a river. At the bottom of the cover, there is a horizontal flowchart with seven steps: "Import New York State NBI File", "Select County/Countries", "Filter Bridges for selected counties", "Filter Bridges Based on Detour Length", "Calculate Bridge Scores", "Select Screening Factors", and "Rank and Identify Bridge Clusters". In the bottom right corner, it says "Developed by: Cambridge Systematics, Inc."

# Strategy Tool Creation (continued)

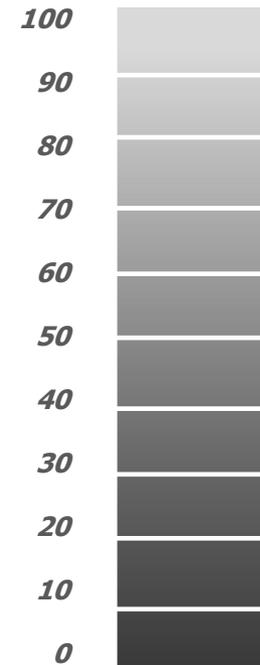
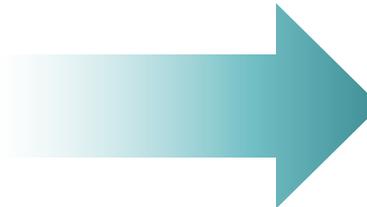
## Prioritization Screening Tool

**1**

Rank bridges based on user-defined criteria from most recent NBI data

**2**

Identify bridges that could be candidates for decommissioning and specific bridges to which their traffic could be diverted



## Key Findings

- Insufficient funding has consequences
- We're making the right investments
- Immediate action is needed





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