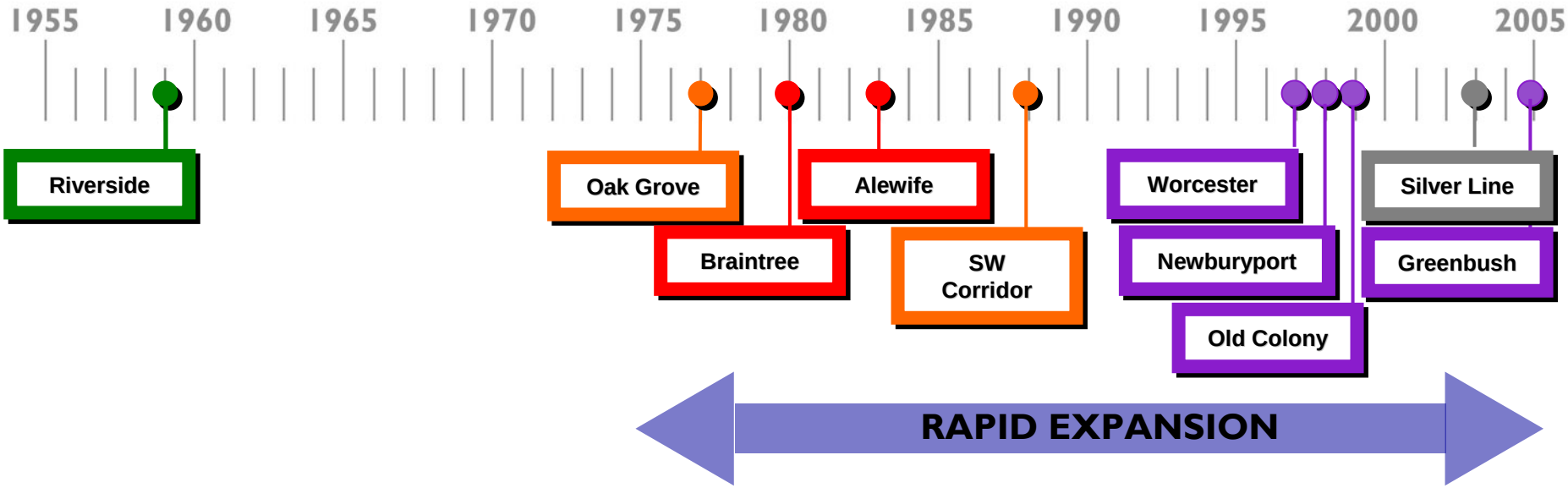
Capital Planning and Programming at the MBTA

Topics:

1. **Capital Planning and Programming at the MBTA[1]**
   - **Background**
   - **SGR Database Model**
   - **Capital Planning Analysis**
   - **MBTA Use of SGR**

[1] **Based on work by Steve Barrang, Director, MBTA Department of Capital Management, and Brian McCollom, McCollom Management**

Concentrated Service Expansion



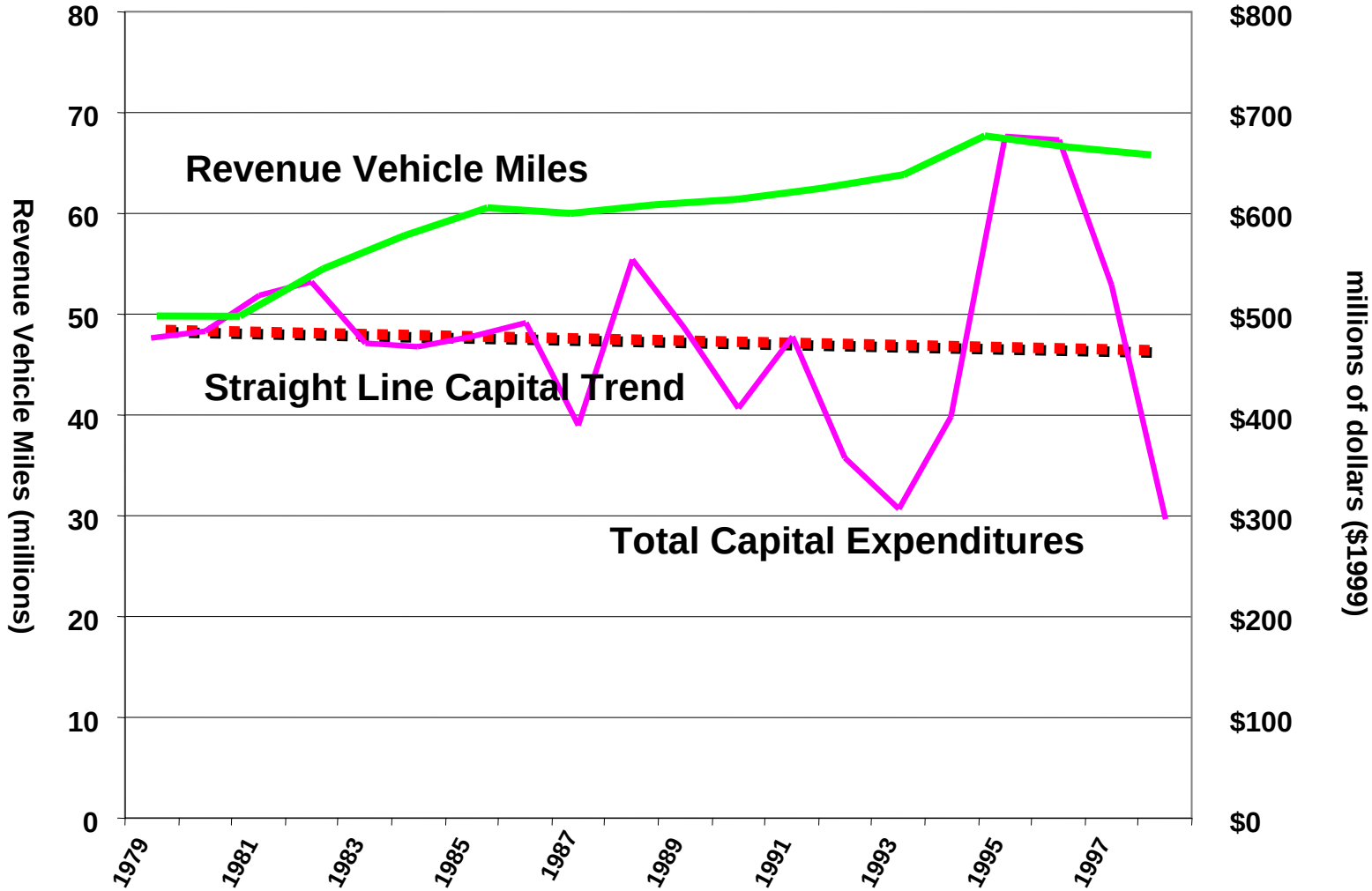
Increases in

Rail Route Miles,

Rail Ridership

Vehicle Miles

Service and Capital Spending Trends



The MBTA Capital Problem

- **System has *expanded***
- **Ongoing Capital Needs are *greater***

  -- system renewal
  -- system expansion
- **Spending on Ongoing Capital Needs is *decreasing***

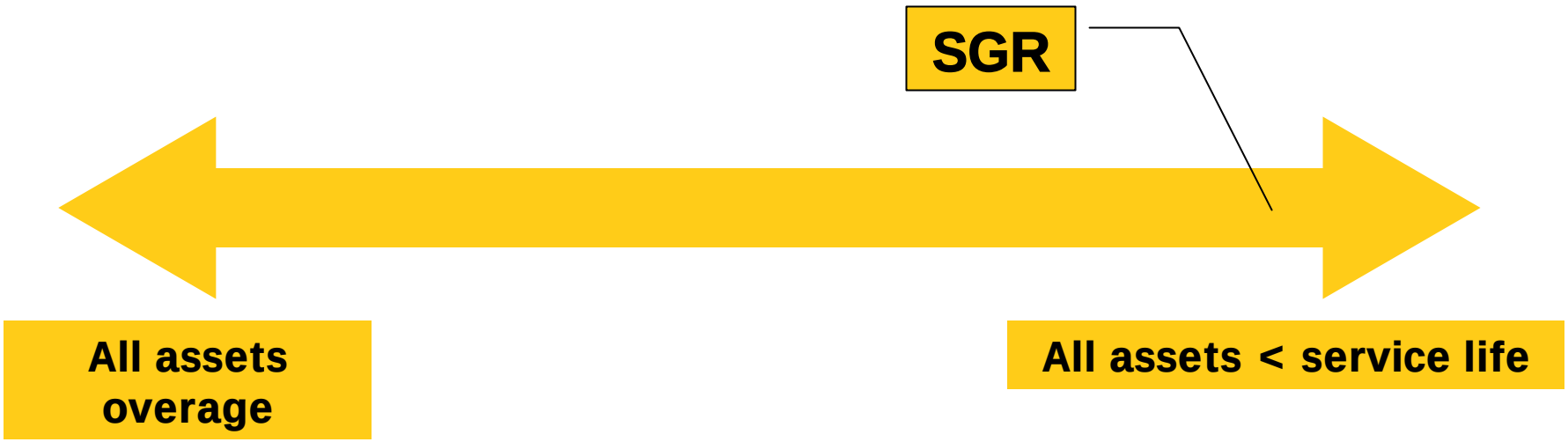
MBTA Approach

- **MBTA focus is first on developing State of Good Repair (SGR) Database**
- **Two Project Objectives**
  - **Legislative: Demonstrate Ongoing Funding Needs**
    - **-- Engineering assessment of current assets**
  - **Management: Develop long range capital planning model**
    - **-- Project programming under constrained funding**

State of Good Repair

SGR: The ideal operating condition

- **A "perfect" capital replacement policy**



What is SGR?

- ***State-of-Good Repair* — Replace/Renew when needed**
- **Assets are:**
  - **Renewed at critical midlife points**
    - **e.g., Engine replacements, bridge re-deckings, roof replacements**
  - **Replaced at the end of their useful lives**
    - **e.g., Buses 15 years**
      Rail cars 35 years
      Bridges 50 years

SGR Database (Model) Requirements

- **Focus on high-cost MBTA assets**
  - **Not a maintenance database of all assets**
- **Permit periodic data updates**
  - **Staff and resources limited**
- **Support objective analysis**
  - **Uniform criteria and process**
  - **Reports consequences**
- **Run scenarios in reasonable time frame**
  - **Less than 5 minutes**

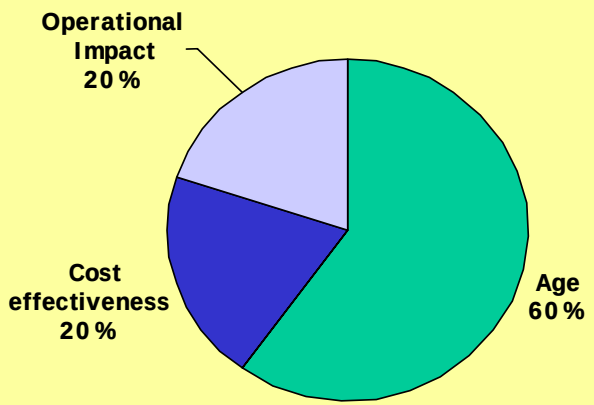
SGR Database — Assets Table

- **Stores information about all key MBTA assets**
  - **Vehicles**
  - **Facilities**
  - **Systems**

Asset Table Attributes

- "Condition" Measures
  - Age
  - Life
- Project "Action" Costs
  - Replacement/Renewal
  - Cash flow years
- Ranking Measures
  - Condition measures
  - Operational importance
  - Affected ridership

Scoring Candidate Actions



- **Age**
  - Age as % of Service Life
- **Operational Impact**
  - Yes/No
  - Selected assets are essential to system operations
- **Cost-Effectiveness**
  - Ridership/Cost of Action
  - Reflects customer service impacts

SGR Programming Process is Sequential (Year-by-Year)

- **Identify candidate projects**
  - **Actions come due**
  - **Delayed projects from prior years**
- **Score and rank projects**
- **Fund projects in rank order until:**

  Cost (project i) > Funds remaining
- **Mark unfunded projects as candidates for next year**
- **Carryover remaining funds to next year**

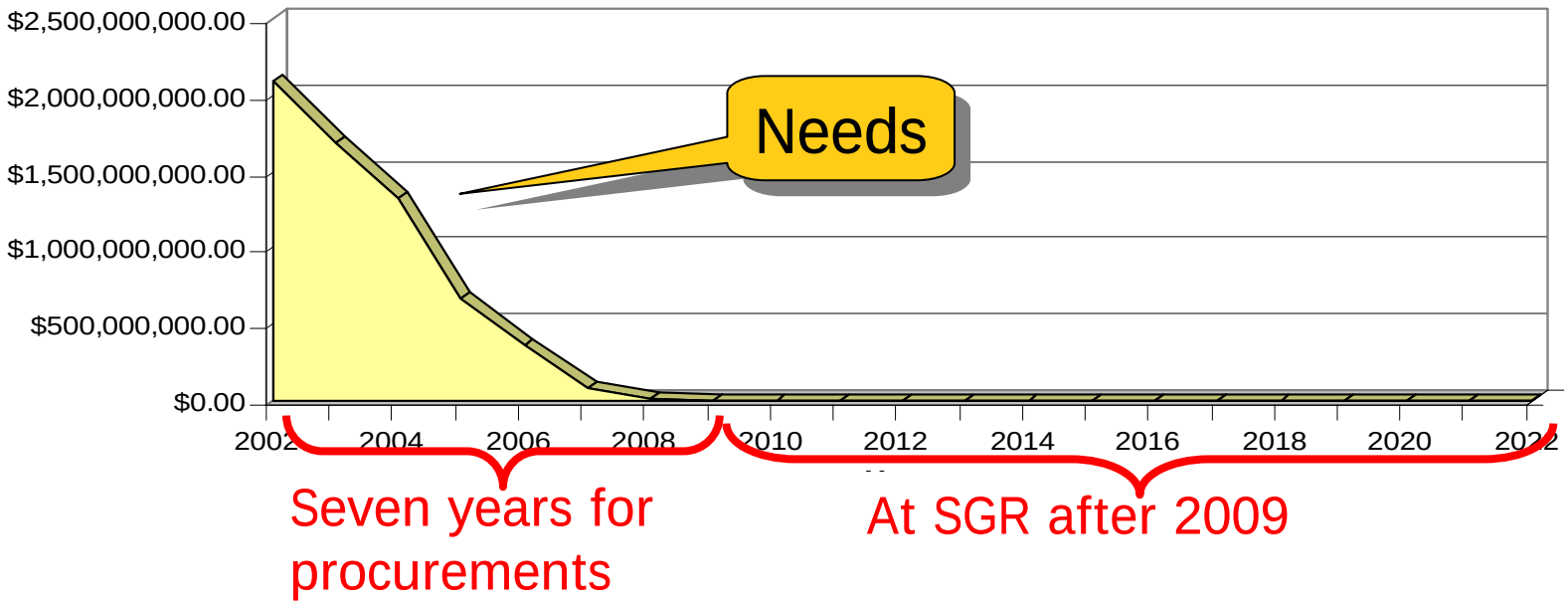
What are the system's needs?

- **Cost to bring and maintain existing assets to the "ideal" standards**
  - **Capital Renewals**
  - **Capital Replacements**

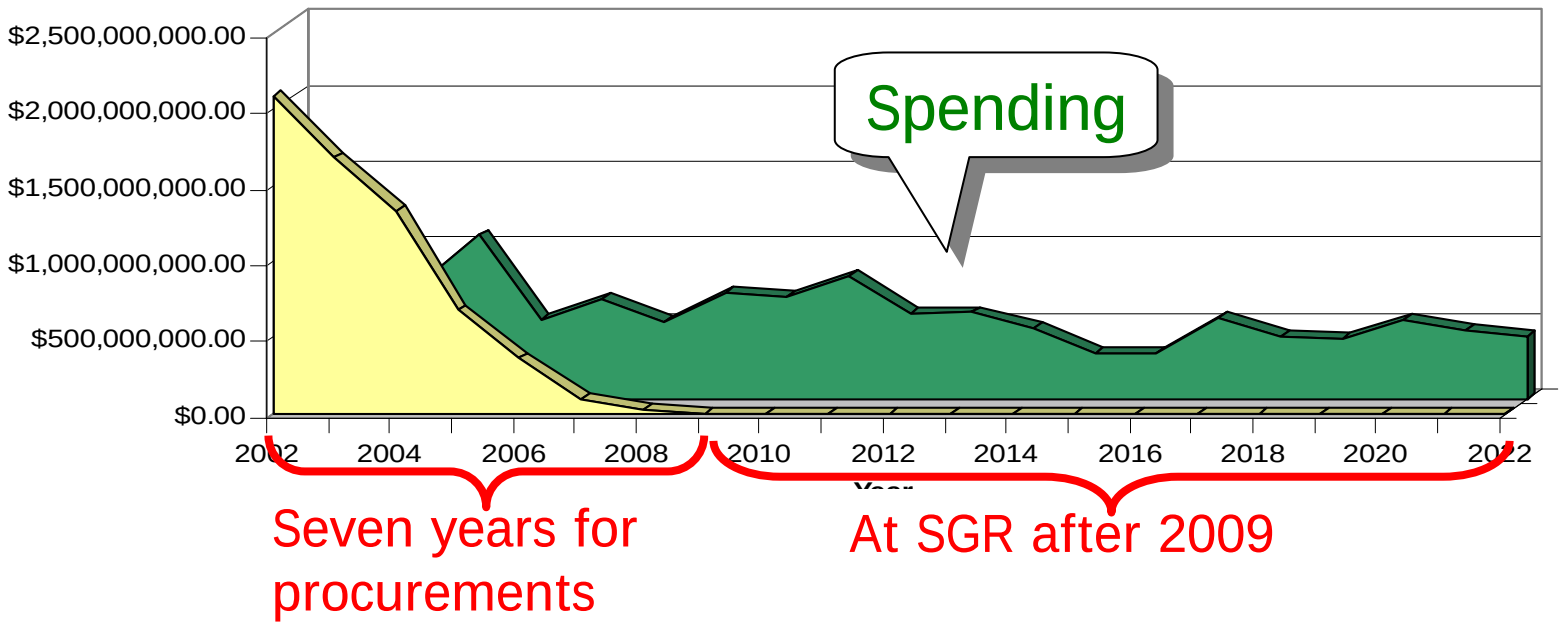
Unconstrained Funding

- **Baseline comparison for all scenarios**
- **Simulates effect of unlimited funds applied to capital needs**
- **Determines:**
  - **Minimum time and funds needed to achieve SGR**
    - **“Reduce the Backlog”**
  - **Funds required to maintain the system at SGR**

Unconstrained Funding: Backlog

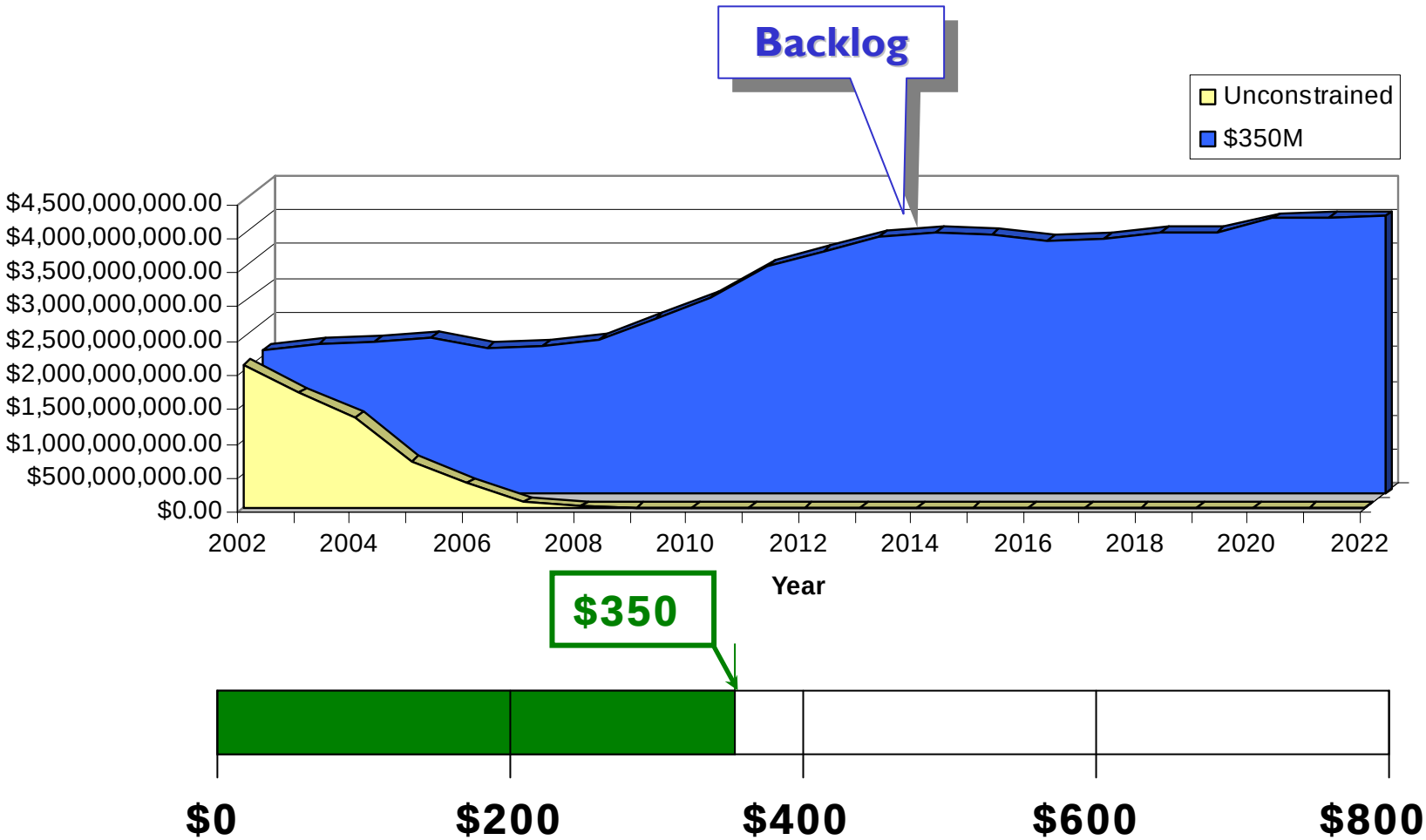


Unconstrained Funding: Backlog



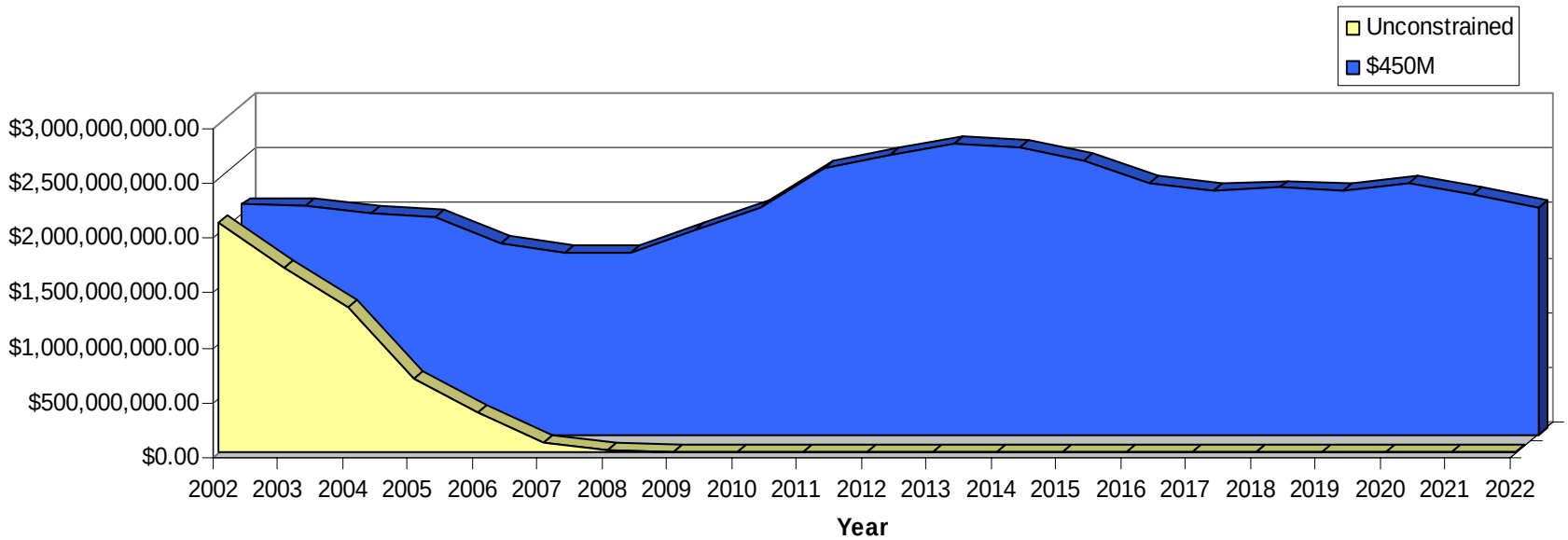
Annual Funding: $350M

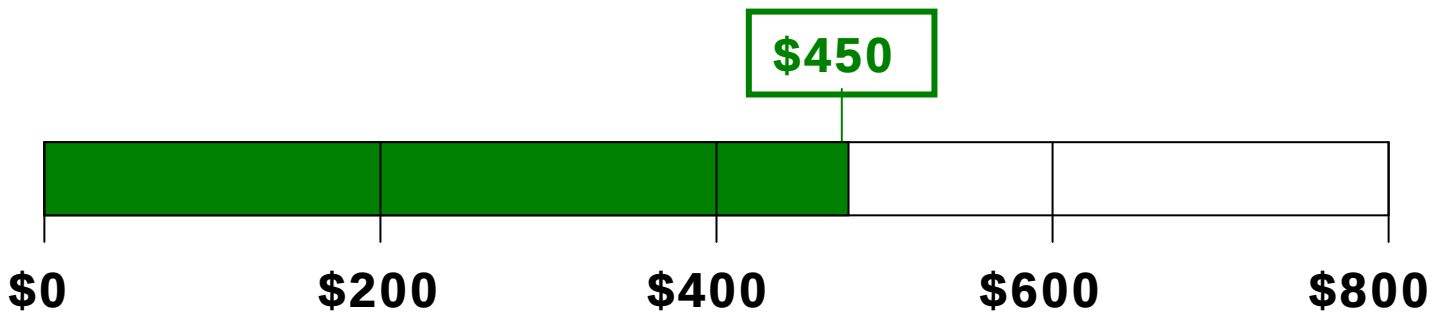
Current SGR Funding



Annual Funding: $450M

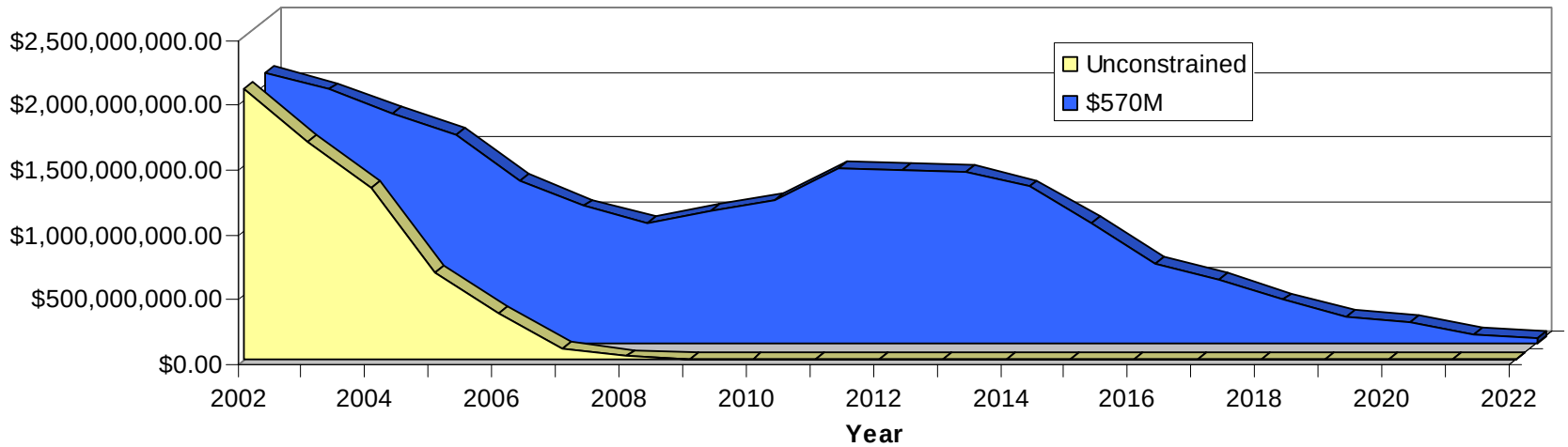
Hold Backlog at Present Level

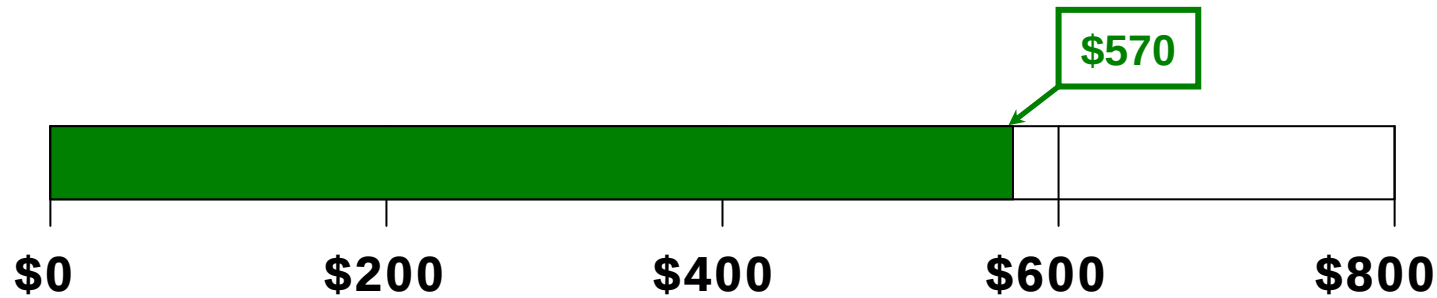




Annual Funding: $570M

Eliminate Backlog in 20 years





Other Scenario Measures

- **Beginning/Ending Period Comparisons**
  - **Backlog by Asset Type**
  - **Percent of Assets > Service Life by Asset Type**
- **20-Year Totals**
  - **Spending by Asset Type**
  - **SGR Needs Funded On-time, Late, Not at All**

MBTA Use of SGR Database

- **Desired change in legislative capital funding**
- **Discussions with MBTA Board**
- **Potential use in the internal development of the Capital Improvement Program**

Conclusion

- **No transit system can meet the "ideal" system condition**
  - **We can make more effective decisions**
  - **We can optimize our investments**