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# Bringing Global Thinking to Local Sustainability Efforts: A Collaborative Project for the Boston Metropolitan Region

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# Project Purpose

- Support sustainable regional planning by providing tools and methods that promote an integrated long-term systems approach.
  - Develop alternative scenarios for Boston region, including a normative scenario consistent with sustainability and global responsibility
  - Inform stakeholders about sustainability and alternative pathways for the region
  - Promote networking of existing planning efforts taking place at different scales in the region



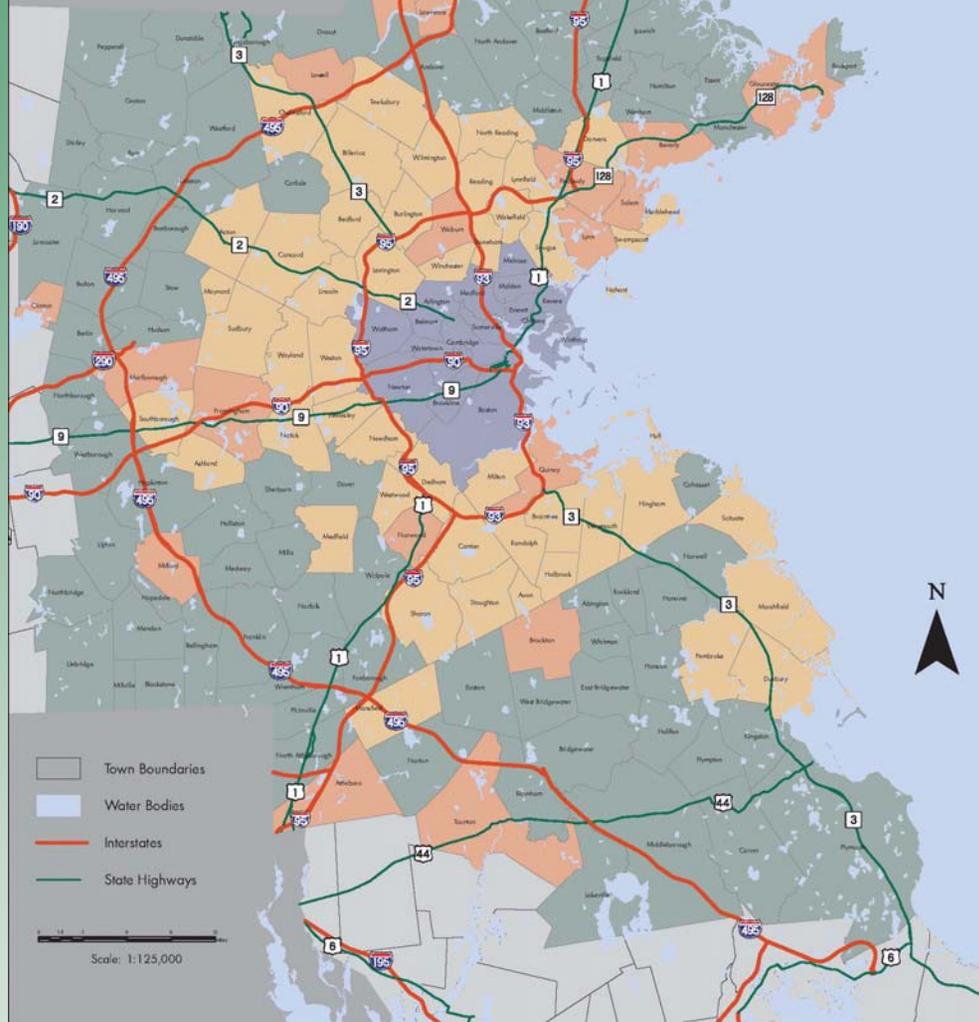
# Project Collaborators and Partners

- Tellus Institute
- Metropolitan Area Planning Council (MAPC)  
(convener of MetroFuture project)
- The Boston Foundation (Indicators Project)
- The Massachusetts State Sustainability Program
- Project Advisory Committee & Work Groups



# Metro Boston Region Community Types

- Inner Core
- Regional Urban Centers
- Maturing Suburbs
- Developing Suburbs



- Town Boundaries
- Water Bodies
- Interstates
- State Highways

Scale: 1:125,000

# Scope of Work

- Review and coordinate with MetroFuture process
- Stakeholder consultation
- Data collection, review and synthesis
- Enhance PoleStar scenario building tool
- Develop scenarios: BAU, Policy Reform, Deep Change
- Identify policy & other engagement opportunities



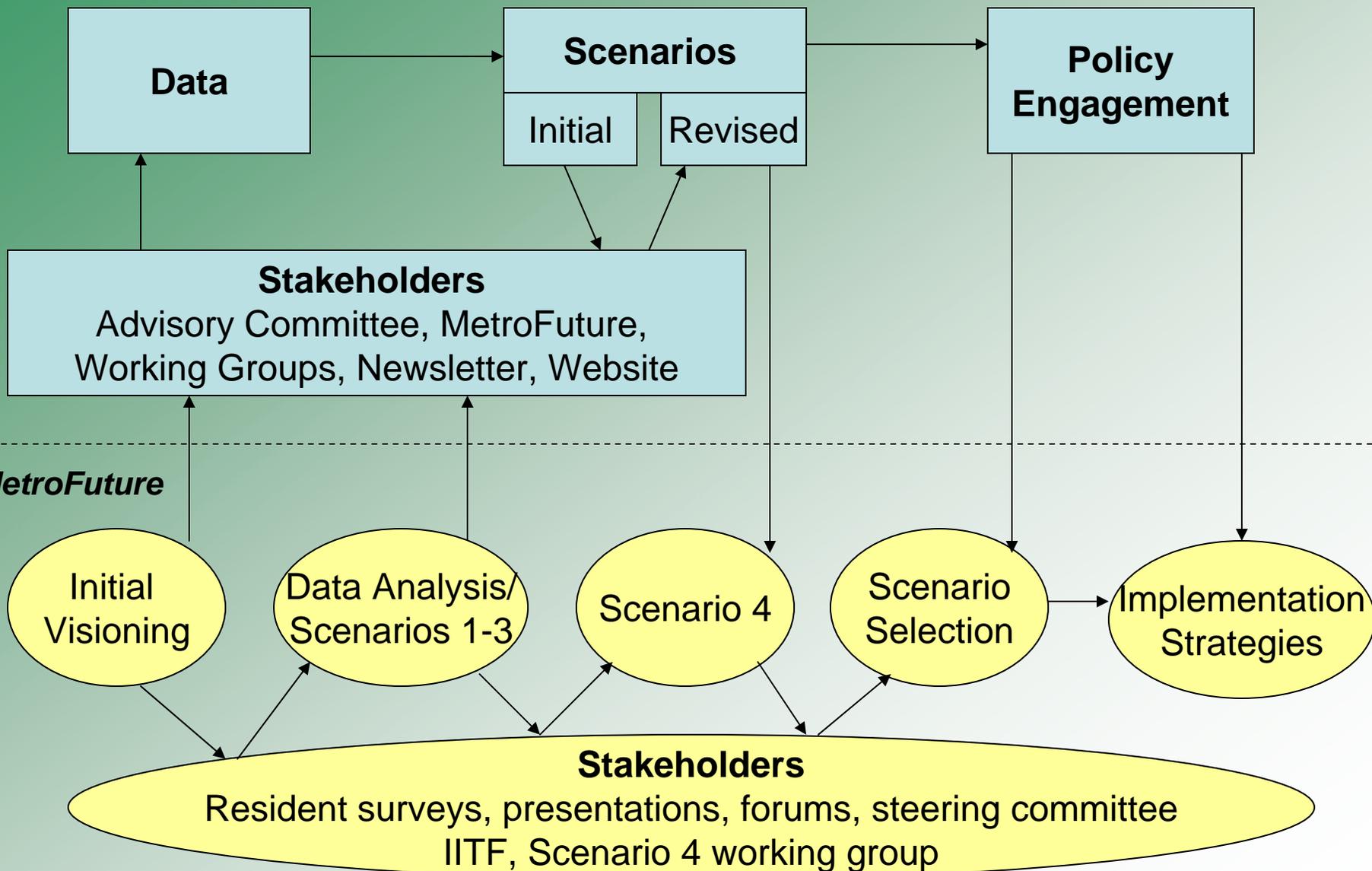
# MetroFuture Planning Process

- Coordinated by MAPC, regional planning agency
- 3-phase process:
  - Stakeholder visioning
  - Data analysis and scenario development
  - Implementation strategies
- Tellus coordinating closely with MAPC
  - Provide modeling assistance
  - Serve on MetroFuture Steering Committee, Technical Advisory Group & Inter-Issue Task Force
  - MAPC participates in our project advisory group



# Systems Overview

## Boston Scenarios Project



# Stakeholder Consultation

- Established and met with 25-person Advisory Committee
- Developed project website and e-discussion group: [www.bostonscenarios.org](http://www.bostonscenarios.org)
- Build on input to MetroFuture process
  - Analyzed 3,000 visioning statements for elements of sustainability
  - Participated on Steering Committee and others, & public forums



# Data Collection, Review & Synthesis

- Gather recent and current data (iterative)
  - demographics
  - economic activity
  - industry
  - transportation
  - air quality
  - energy
  - employment and income
  - income
  - land use
  - water quantity and quality
  - solid waste
  - food and agriculture
- Rely on existing sources (MAPC, Indicators Project, state)
- Refine as appropriate as better data becomes available



## Branch Points

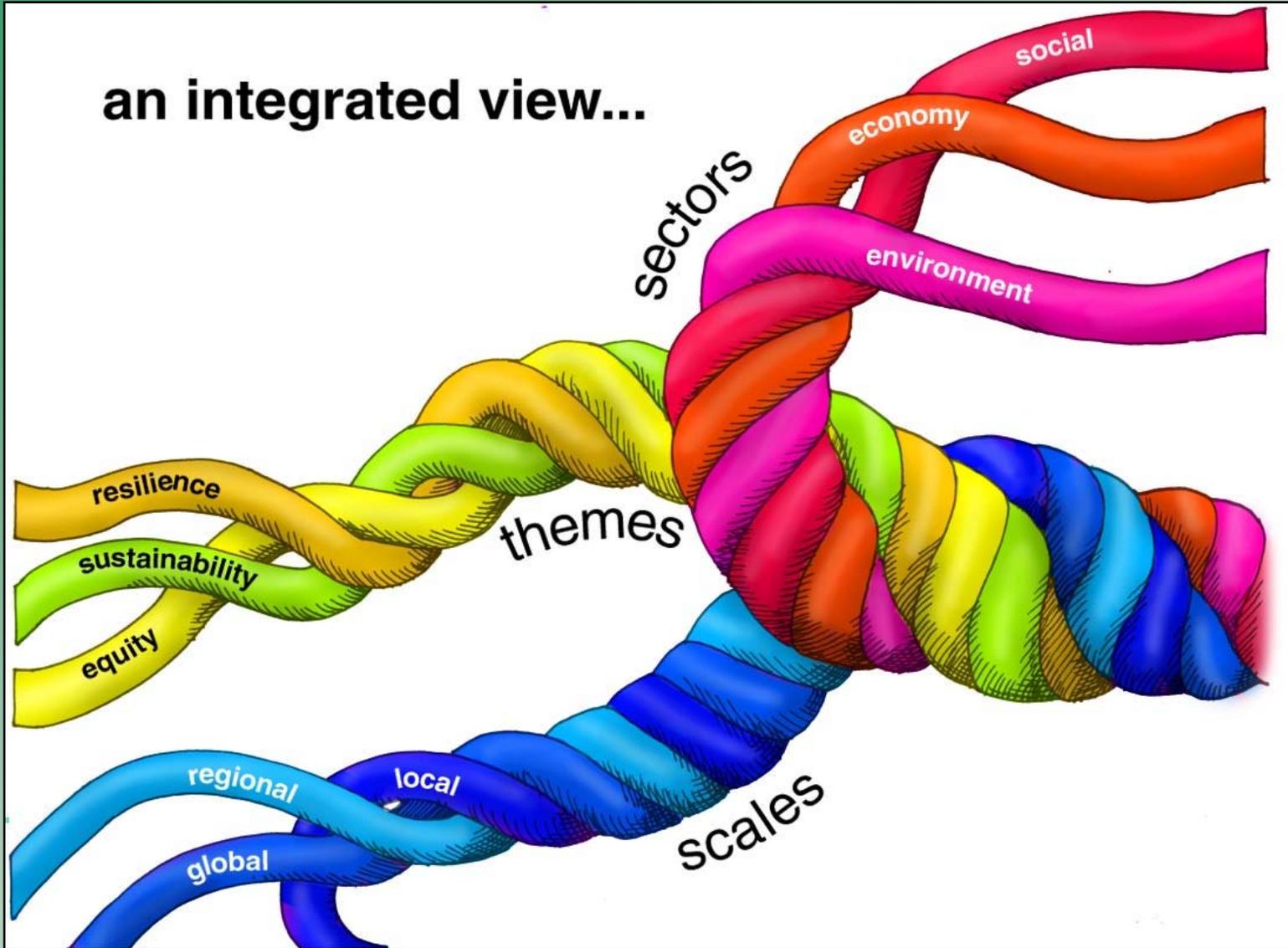
← a time for choices →

Sources of Uncertainty

- *Ignorance*
- *Surprise*
- *Volition*



an integrated view...





- Decision support system for sustainability studies, local to global
- Developed by Tellus in early 1990s
- Not a rigid model, but an open framework to build integrated scenarios plus a database
- Allows user to identify driving forces, address critical uncertainties and explore alternative futures



# Polestar Application

PS PoleStar: Boston Metro v.2.4

Application View Design Help

Automatic Calculations Disaggregation Structure Edit Model Show Totals

**Households**

Number\_Households Household\_size Housing\_stock\_share

Scenario: Business as Usual Region: ALL

Number of Households (million hh)

| Scenario          | Region             | 2005 | 2020 | 2030 | 2050 |
|-------------------|--------------------|------|------|------|------|
| Business as Usual | Inner Core         | 0.62 | 0.65 | 0.67 | 0.69 |
| Business as Usual | Regional Centers   | 0.36 | 0.39 | 0.40 | 0.43 |
| Business as Usual | Mature Suburbs     | 0.40 | 0.45 | 0.48 | 0.50 |
| Business as Usual | Developing Suburbs | 0.33 | 0.38 | 0.40 | 0.46 |

\Society\Pop\_and\_GDP\Population / \Society\Households\Household\_size

Number\_Households  
Scenario = Business as Usual

million hh

2005 2020 2030 2050

Data View Boston Metro\Society\Households\Number\_Households

# Scenarios for Boston Region

- Iterative process with collaborators and stakeholders:  
Three scenarios being developed:
  - **Business-As-Usual (BAU)**: little change in production and consumption patterns; equity not addressed
  - **Policy Reform**: technological and policy measures emphasized to moderate ecological destruction and social inequality
  - **Deep Change**: changes in values lead to changes in lifestyles and institutions (along with technology innovations) to achieve sustainability with global responsibility

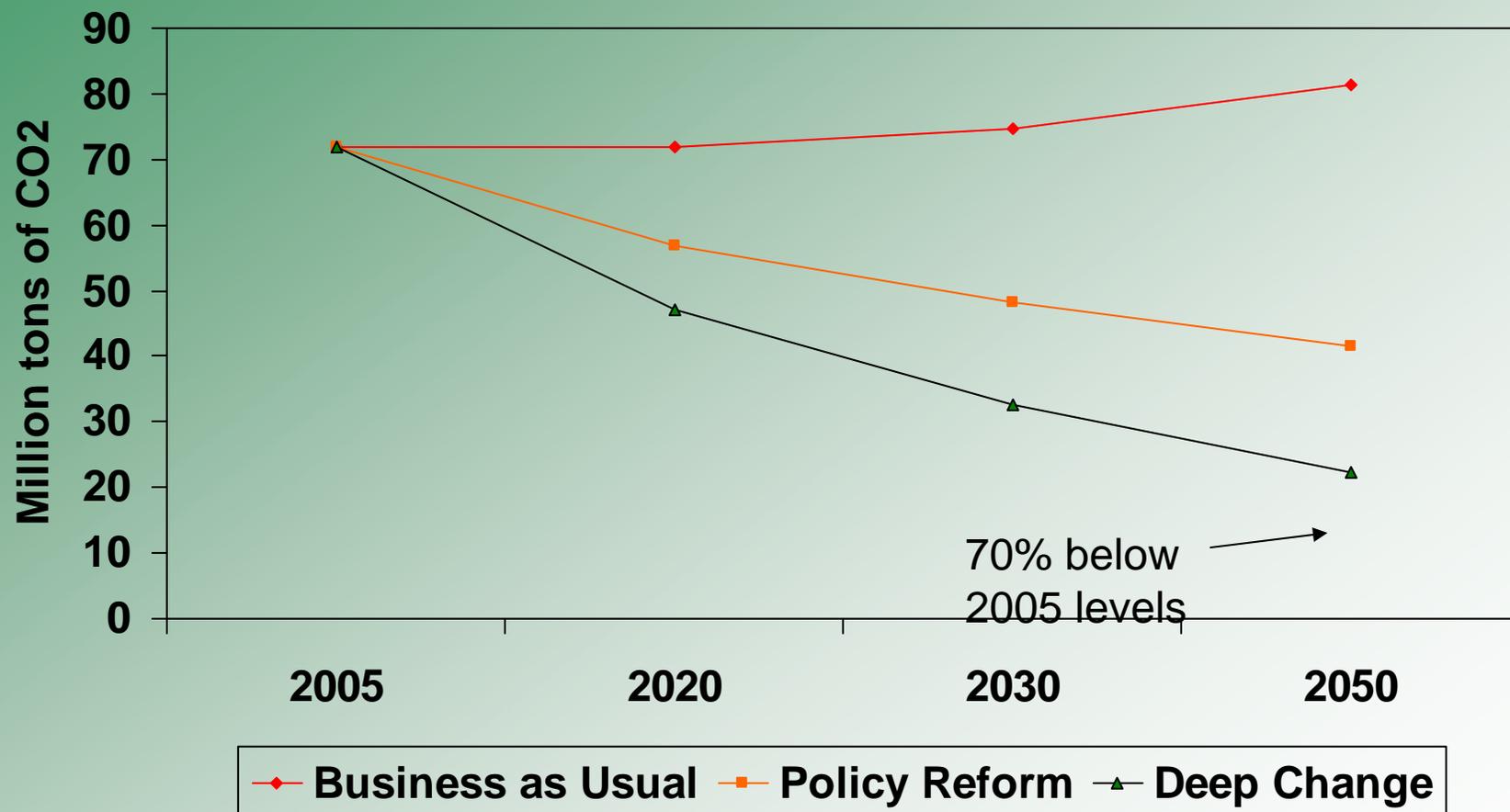


# Deep Change Endorsed

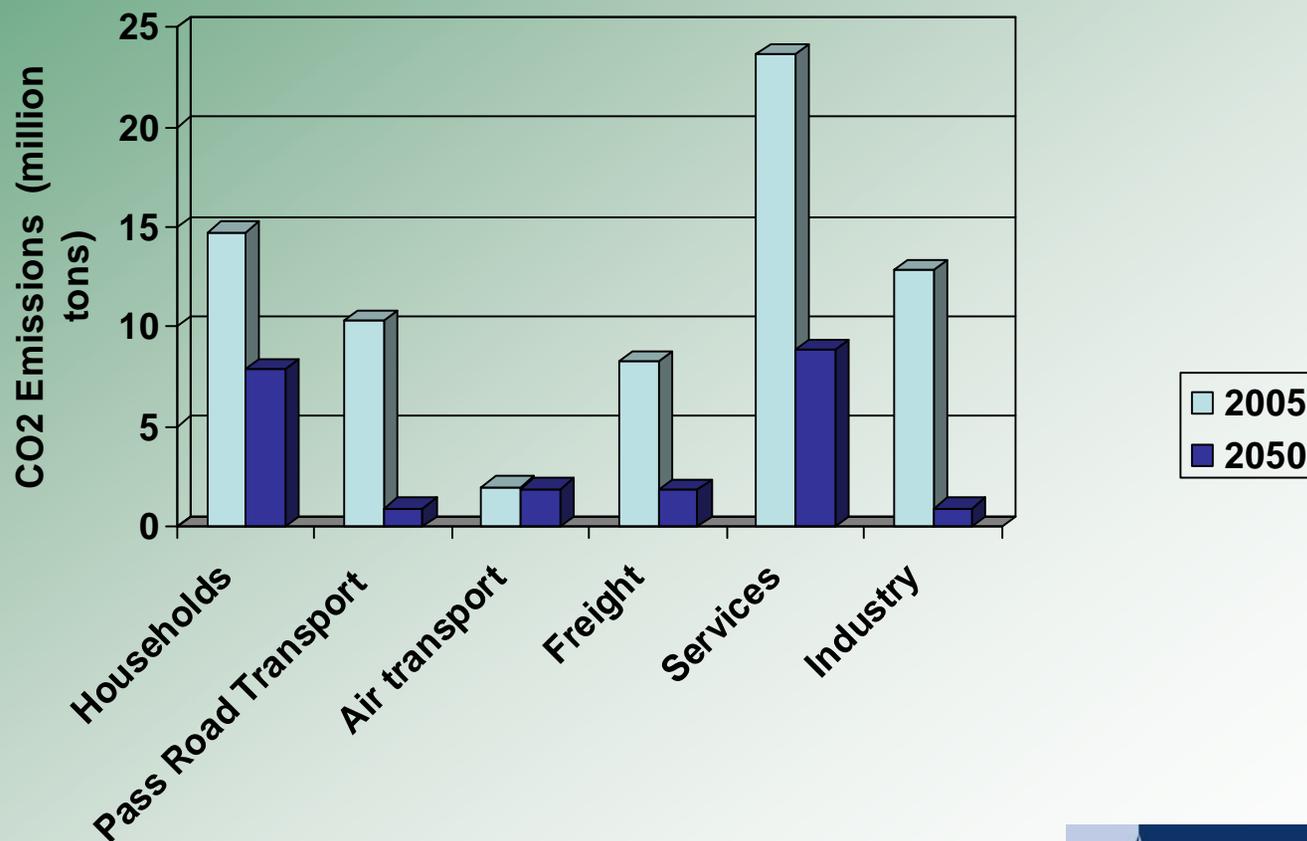
- Deep Change scenario strongly endorsed by Advisory Group, sectoral working groups, and project participants
- Consistent with the objective of sustainability with global responsibility
- Significant challenges acknowledged



# Meeting CO2 emissions target requires Deep Change



# Sources of emissions reductions in Deep Change

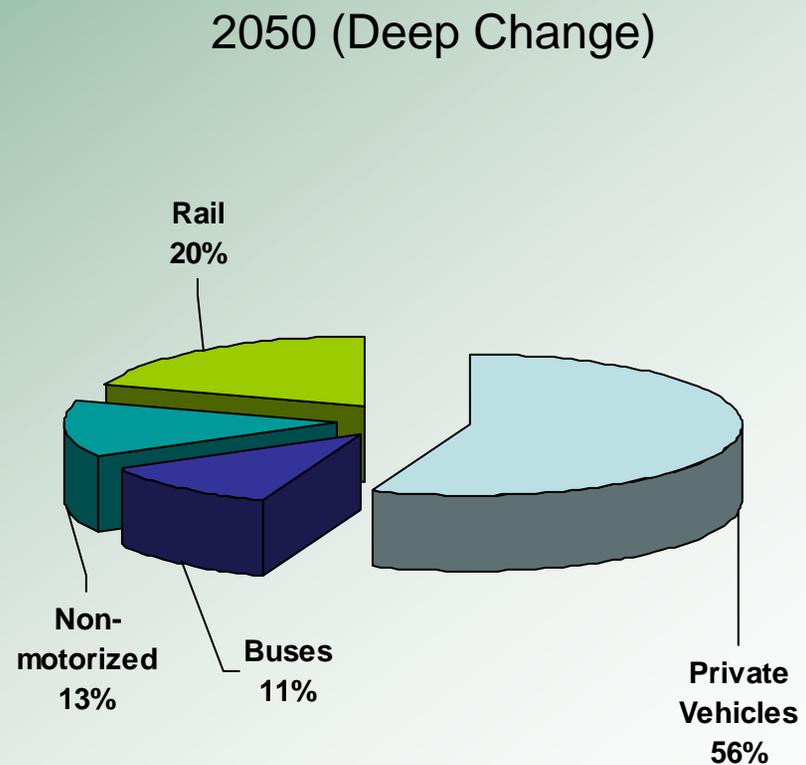
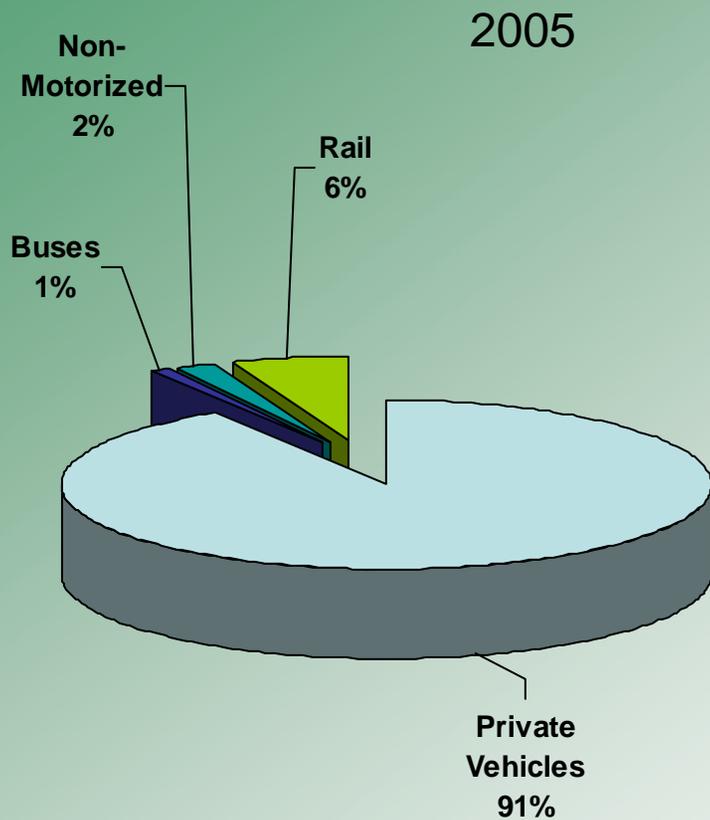


# CO2 reductions in Deep Change

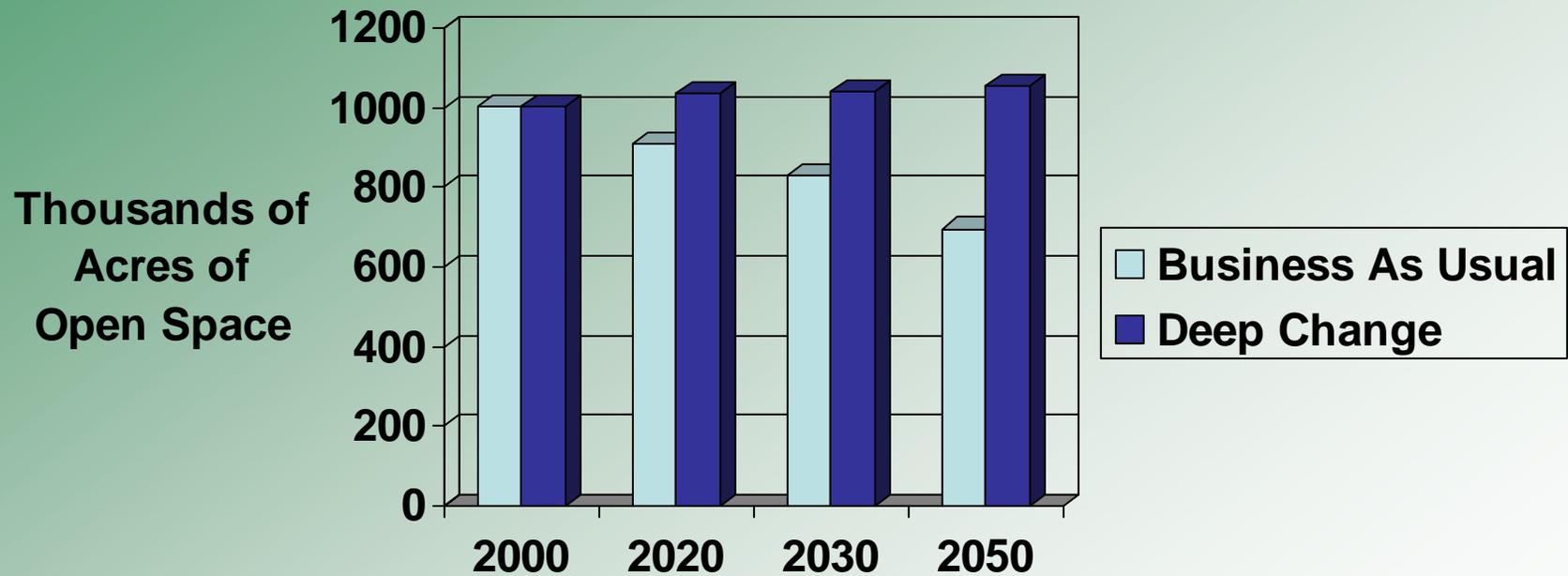
- **GDP:** Reduction in workweek → lower overall GDP by 25%
- **Households:** Smaller houses, more multi-family, reduced rate of appliance growth, increased efficiency & renewables
- **Passenger transport:** More compact communities → less driving & air travel, mode shifts, efficiency and renewables
- **Freight:** Reduced demand for goods, increased efficiency and renewables
- **Services:** Reduced consumption → reduced commercial floor space, increased efficiency and renewables
- **Industry:** Reduced output (less demand for “stuff”), increased efficiency, renewables
- **Electric generation (impacts all of the above):** Reduced consumption, increased efficiency, renewables



# Major Shift in Travel Mode Shares across the Region



# Deep Change Commitment to Preserving Open Space



# Engagement Opportunities

- MetroFuture
- Brief new administration (Gov. Patrick)
- Educational curriculum: BC, UEI, BU
- MA State Sustainability Program
- MPO Regional Transportation Plan
- MA Climate Action Plan & RGGI
- Boston Indicators Project
- MA Green Budget
- Other NGO initiatives



# Impact on Partners

- MetroFuture adopted sustainability as overall criterion for scenario evaluation
- Introduced new, more visionary scenario (“Imagine”) to MetroFuture process
- Though not selected, it altered the dialogue about desirable and possible futures
- Key elements added to preferred scenario (e.g., energy & CO<sub>2</sub>, more integrated approach)



# Contributions to Environmental Decision Making for Sustainability

- Infusion of science based systems approach, integrating sustainability and local & global concerns into a regional planning effort and stakeholder process
- Raised awareness among policymakers & citizens of the need to examine the role of values and lifestyle in social, environmental and economic elements of sustainability
- Promote integration of existing planning efforts in the region to incorporate long-term goals for sustainability and global responsibility



# Lessons Learned

- Need technology plus values/lifestyle changes for sustainability
- Long-range scenarios with normative visions have potential for significant impact
- Difficult to involve all relevant parties in stakeholder engagement process
- Data collection at metro regional level is challenging
- Relationships among sectors are complex to model
- Importance of local partners, knowledge and data



# EPA's CNS Support

- Improved tool (PoleStar) for long-range sustainability scenario development
- Enhanced our standing with:
  - MAPC
  - EPA
  - Boston Scenarios Project advisory committee
- Strengthened Tellus links with sustainability leaders in region (e.g., academics, local and state agencies, MA Smart Growth Alliance)



# Response to Feedback

- Advisory Committee input helped shape alternative scenarios, espec. Deep Change
- Accepted invitation to get deeply involved in MetroFuture
- Committee and sector working groups identified and prioritized policy engagement opportunities (education, transportation)



# Future Work

- PoleStar now being used to update global scenarios (11 regions)
- Assist other regions in creating long-term scenarios of alternative futures
- Disseminate scenario approach and Deep Change in educational materials
- Ongoing involvement in Boston region policy efforts (transportation, energy, etc.)

