

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

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U.S. EPA Collaborative Science and Technology Network for
Sustainability Progress Review Workshop

December 5-6, 2006



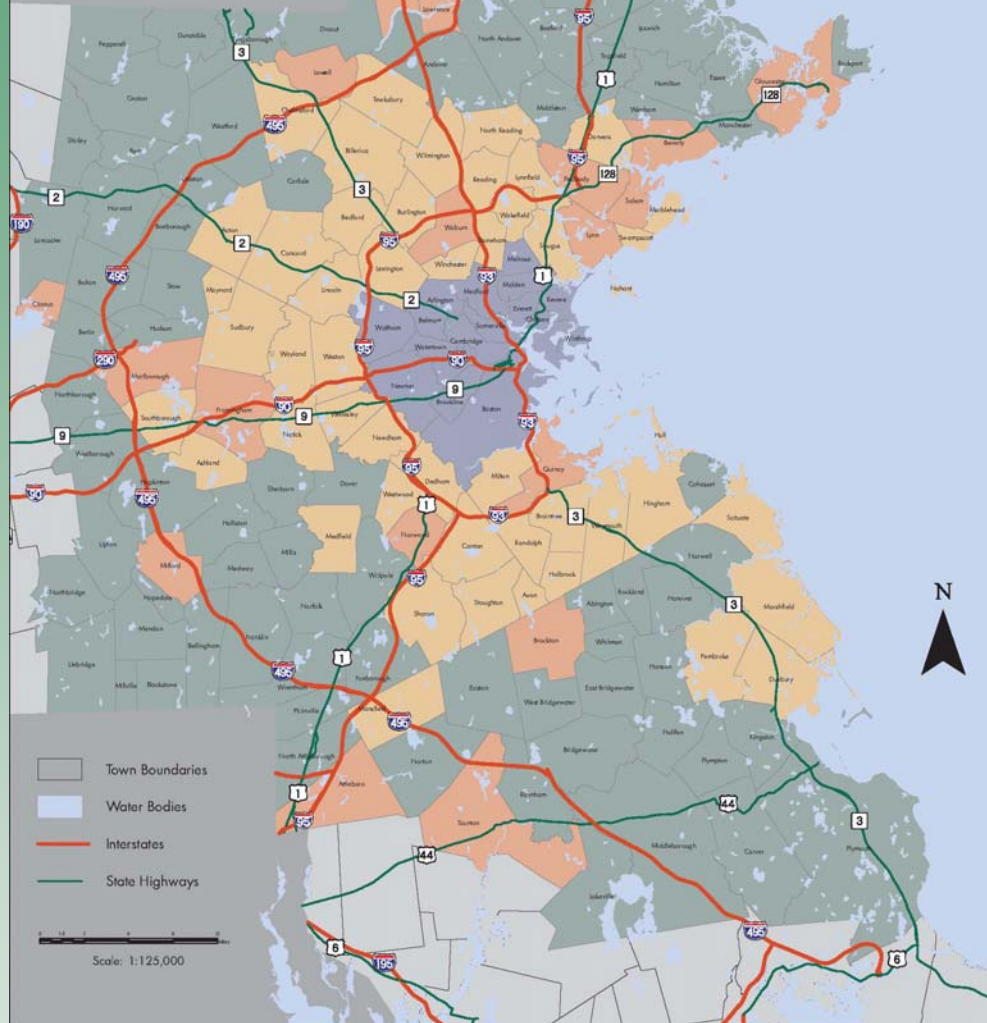
Project Collaborators and Partners

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



Metro Boston Region Community Types

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



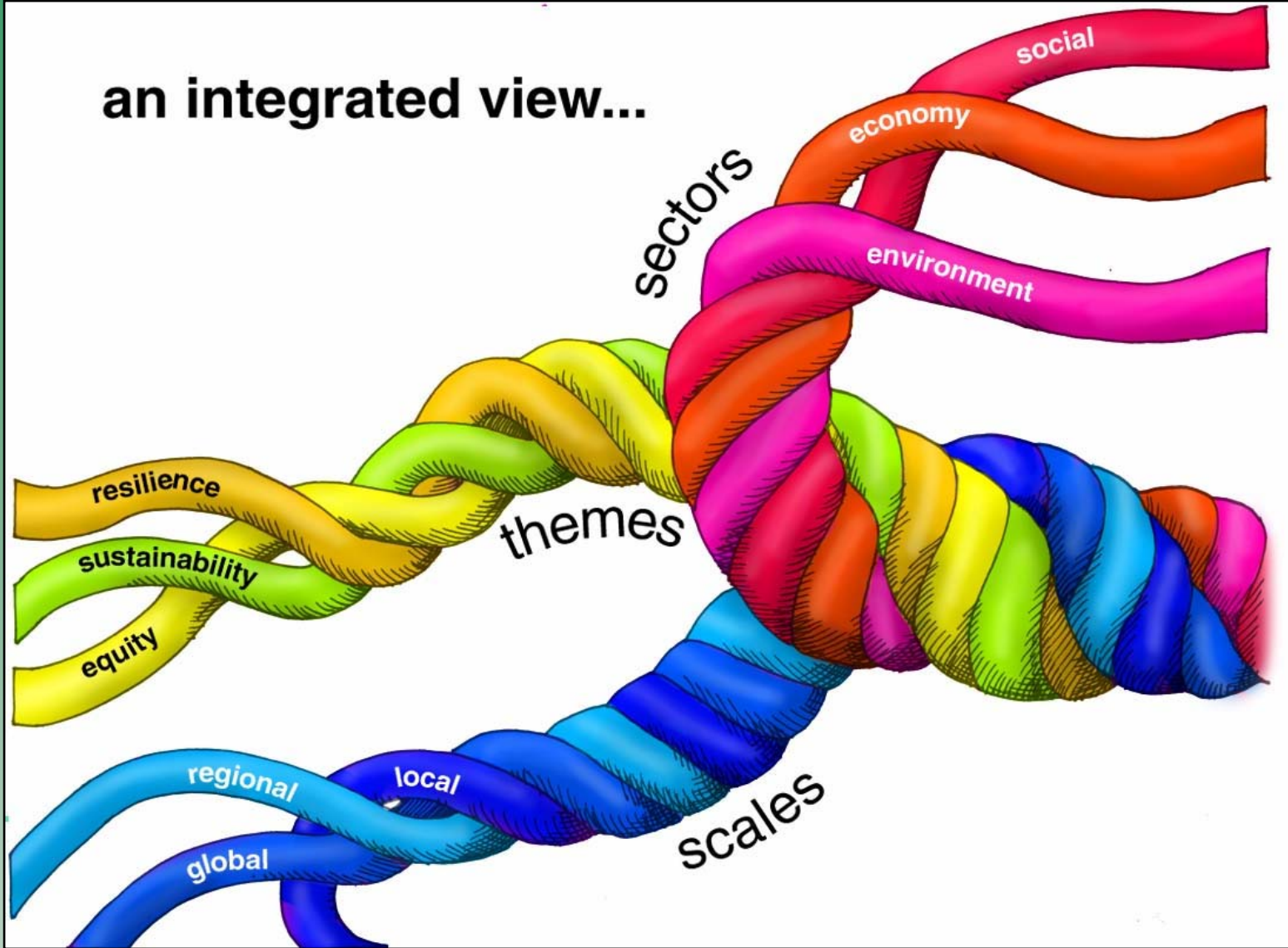
- Town Boundaries
- Water Bodies
- Interstates
- State Highways

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 and other implementation opportunities

an integrated view...



MetroFuture Planning Process

- Coordinated by MAPC, regional planning agency for 101 communities in Boston region (~ 3 mil pop), regional plan for 2030
- 3-phase process:
 - Stakeholder visioning (complete)
 - Data analysis and scenario development (ongoing)
 - Implementation strategies (next)
- Tellus coordinating closely with MAPC
 - Provide modeling assistance
 - Serve on MetroFuture Technical Advisory Group & Inter-Issue Task Force
 - MAPC participates in our project working group



Stakeholder Consultation

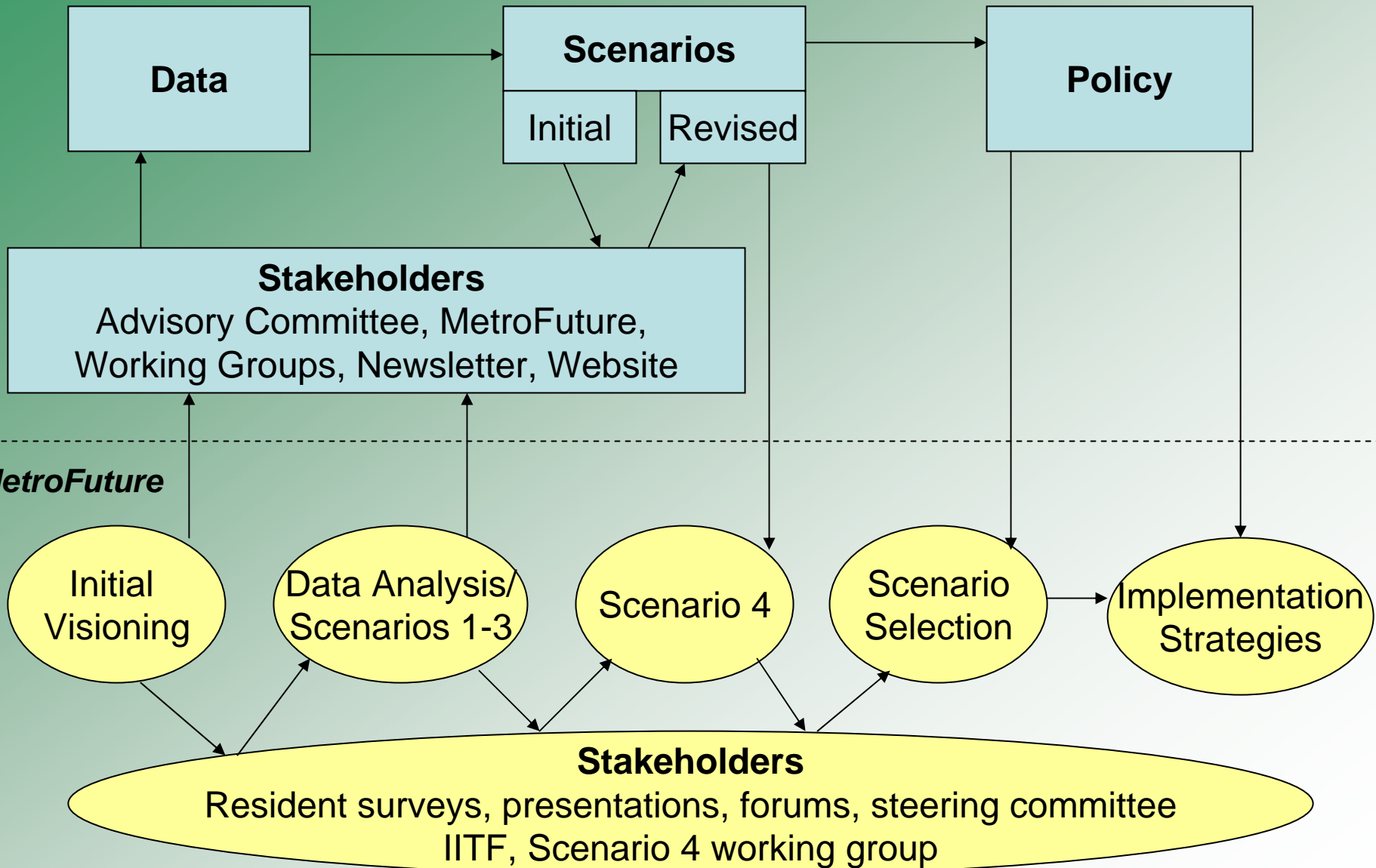
- Established and met with 25-person Advisory Committee
- Developed project website and e-discussion group: www.bostonscenarios.org
- Build on input to MetroFuture process
 - Analyzed 3,000 visioning statements for elements of sustainability
 - Participated in Technical Advisory Comm., Inter-Issue Task Force, Scenario 4 Work Group, & public forums

Data Collection, Review & Synthesis

- Gather recent and current data (iterative)
 - demographics
 - economic activity
 - industry
 - transportation
 - air quality
 - energy
 - health
 - 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

Systems Overview

Boston Scenarios Project



Polestar Application

PS PoleStar: Boston Metro v.2.4
 Application View Design Help

Automatic Calculations Disaggregation Structure Edit Model Show Totals

Modules

Data

Explore Scenarios

Boston Metro

- Society
 - Pop_and_GDP
 - Income_Dist_and_Pover
 - Work_Structure
 - Households
 - Energy
 - Air_Emissions
 - Water
 - Transport
 - Passenger
 - Energy
 - Air_Emissions
 - Freight
 - Energy
 - Air_Emissions
 - Air_travel
 - Energy
 - Air_Emissions
 - Services
 - Energy
 - Air_Emissions
 - Water
 - Industry
 - Energy
 - Air_Emissions
 - Water
 - Energy_Conversion
 - Electricity_Generation
 - Air_Emissions
 - Hydrogen
 - Food
 - Land_Use
 - Health
 - Pressures
 - Resource_Use
 - Land
 - Water
 - Energy
 - Pollution

Households

Number_Households Household_size Housing_stock_share

Scenario Region

Business as Usual 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

Path: \Society\Pop_and_GDP\Population / \Society\Households\Household_size

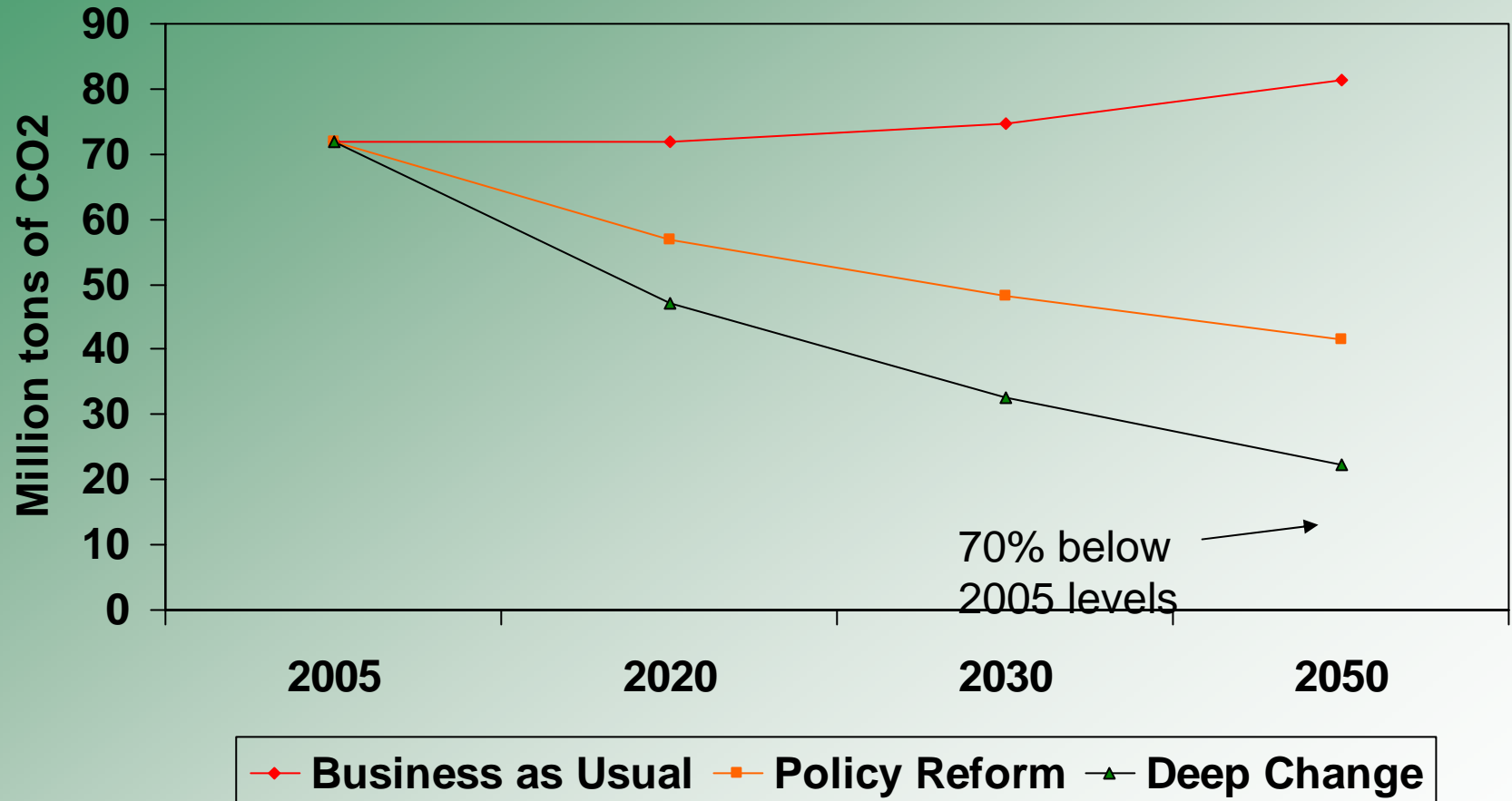
Number_Households
Scenario = Business as Usual

Year	Inner Core	Regional Centers	Mature Suburbs	Developing Suburbs
2005	0.62	0.36	0.40	0.33
2020	0.65	0.39	0.45	0.38
2030	0.67	0.40	0.48	0.40
2050	0.69	0.43	0.50	0.46

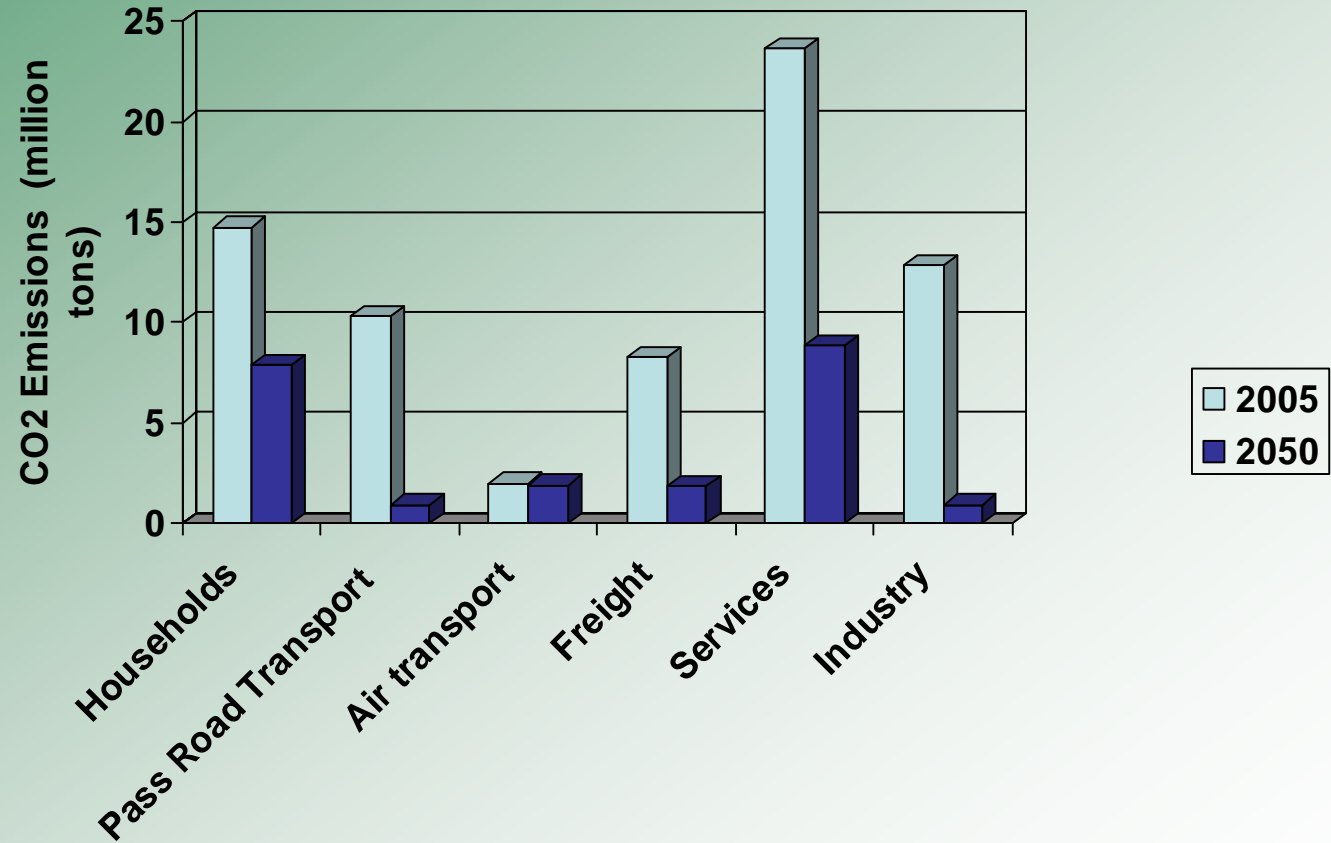
Scenarios for Boston Region

- Iterative process with collaborators and stakeholders: refined scenarios complete and under review
- 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

Meeting CO2 emissions target requires Deep Change



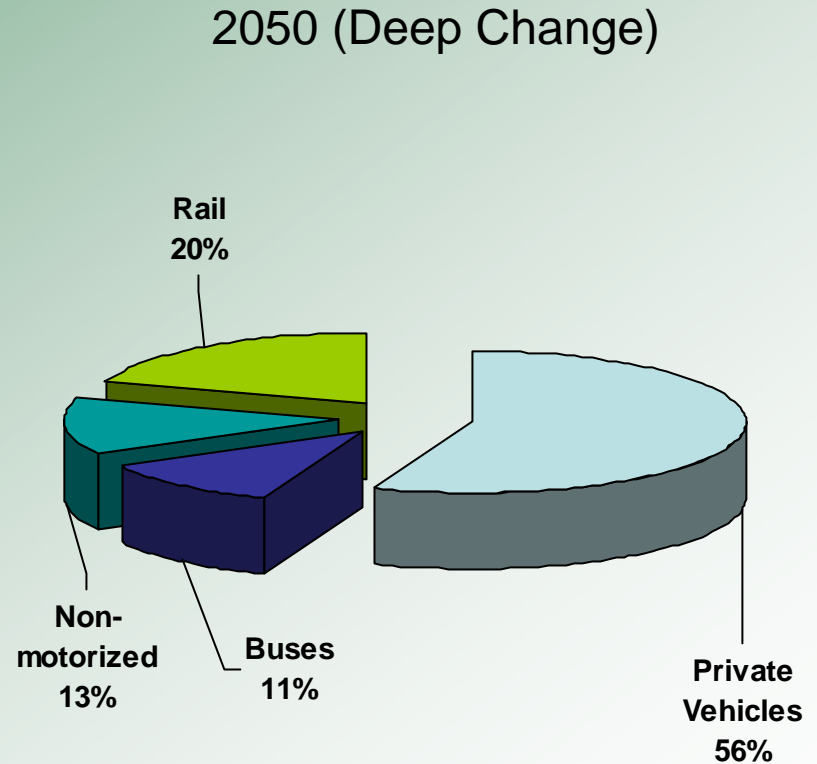
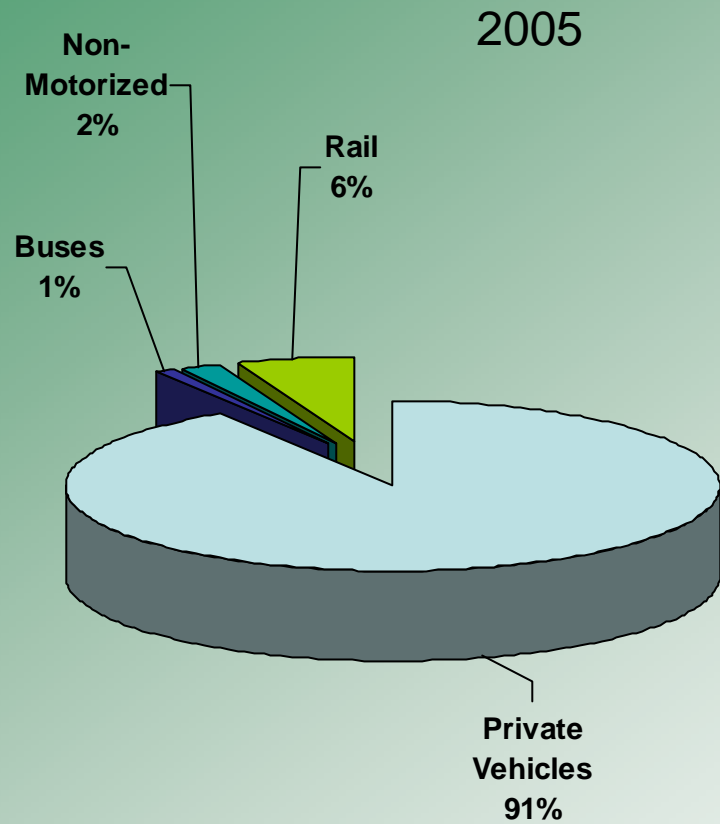
Sources of emissions reductions in Deep Change



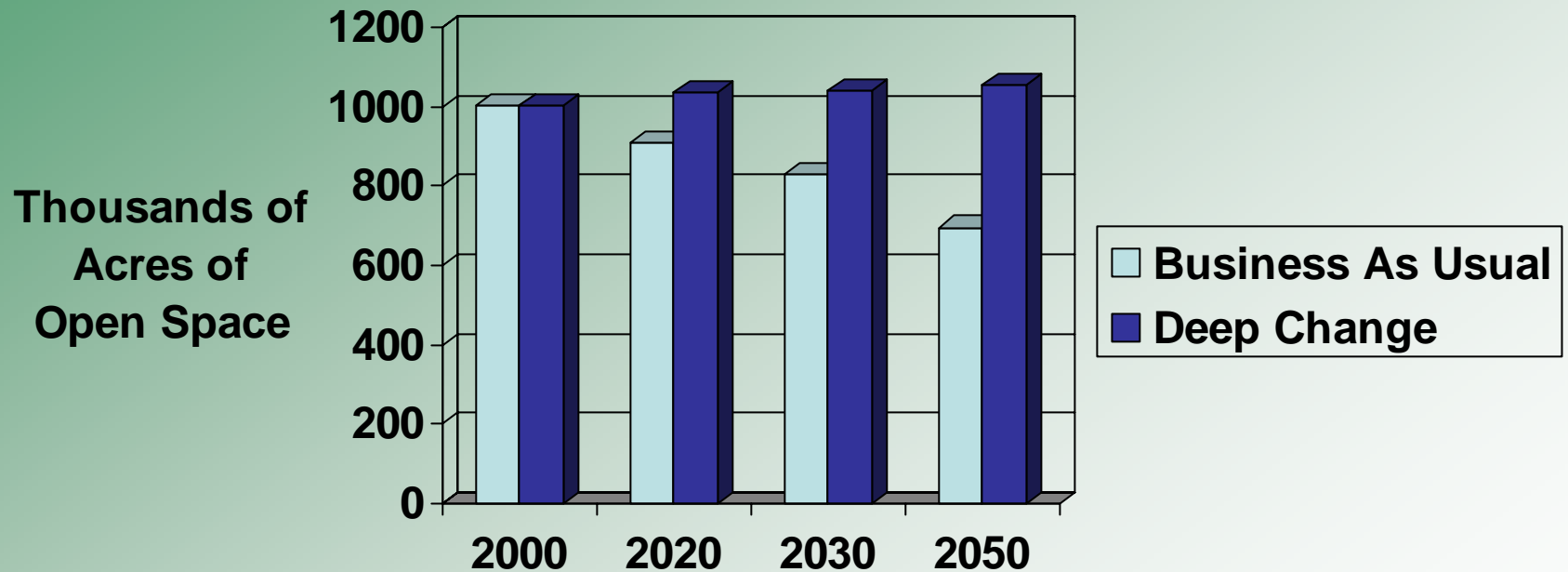
CO2 reductions in Deep Change

- **GDP:** Reduction in workweek → lower overall GDP by 25%
- **Households:** Smaller houses, more multi-family, reduced rate of appliance growth, increased efficiency and renewables
- **Passenger transport:** More compact communities → reduced driving and air travel, mode shifts to non-motorized and transit, increased 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



Implementation Opportunities

- Brief new administration (Gov. Deval Patrick)
- MetroFuture (preferred scenario selection)
- MA State Sustainability Program
- MPO Regional Transportation Plan
- MA Climate Action Plan & RGGI
- Boston Indicators Project
- MA Green Budget
- Other NGO initiatives

Contributions to Sustainability

- Infusion of science-based systems approach, integrating sustainability and local and global concerns, into a regional planning effort and stakeholder process
- Influence policy-making and citizen awareness regarding 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

- 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
- Need technology plus values/lifestyle changes for sustainability
- Long-range scenarios with normative visions have potential for significant impact
- 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 steering committee
- Strengthened Tellus links with sustainability leaders in region (e.g., academics, local and state agencies, MA Smart Growth Alliance)



Feedback and Questions

- How best to introduce value/lifestyle change in policy discussions
- Development of a “Well-Being Indicator”
- Stakeholder engagement in future stages of the project
- Other policy linkages
- Opportunities for dissemination of this approach