

Panel 3: Spatial Analytical Methods and Future Scenarios

James Goldstein & Anna Fleder
Tellus Institute
Boston, MA

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

October 18, 2005



Overview of Presentation

1. Project Background
2. The role and use of scenarios
3. Creating Scenarios for the Boston Region
4. Discussion

1. Project Background

- Increasing global interconnectedness has led to urgent large-scale problems -- clear need for preventative approaches & linking local with global
- Developing scenarios to support regional planning for sustainability by providing tools and methods
- Piloting this approach in Boston region

2. Role of Scenarios

- Scenarios=Future Images + Possible Pathways
- Stories, both qualitative and quantitative, about how the future *could* unfold
- Fire up imagination, inspire and motivate action
- Early warnings about imminent dangers based on current trends
- Generate knowledge to conceive and evaluate alternative pathways
- Provide social legitimacy for early action

Branch Points

← a time for choices →

Sources of Uncertainty

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

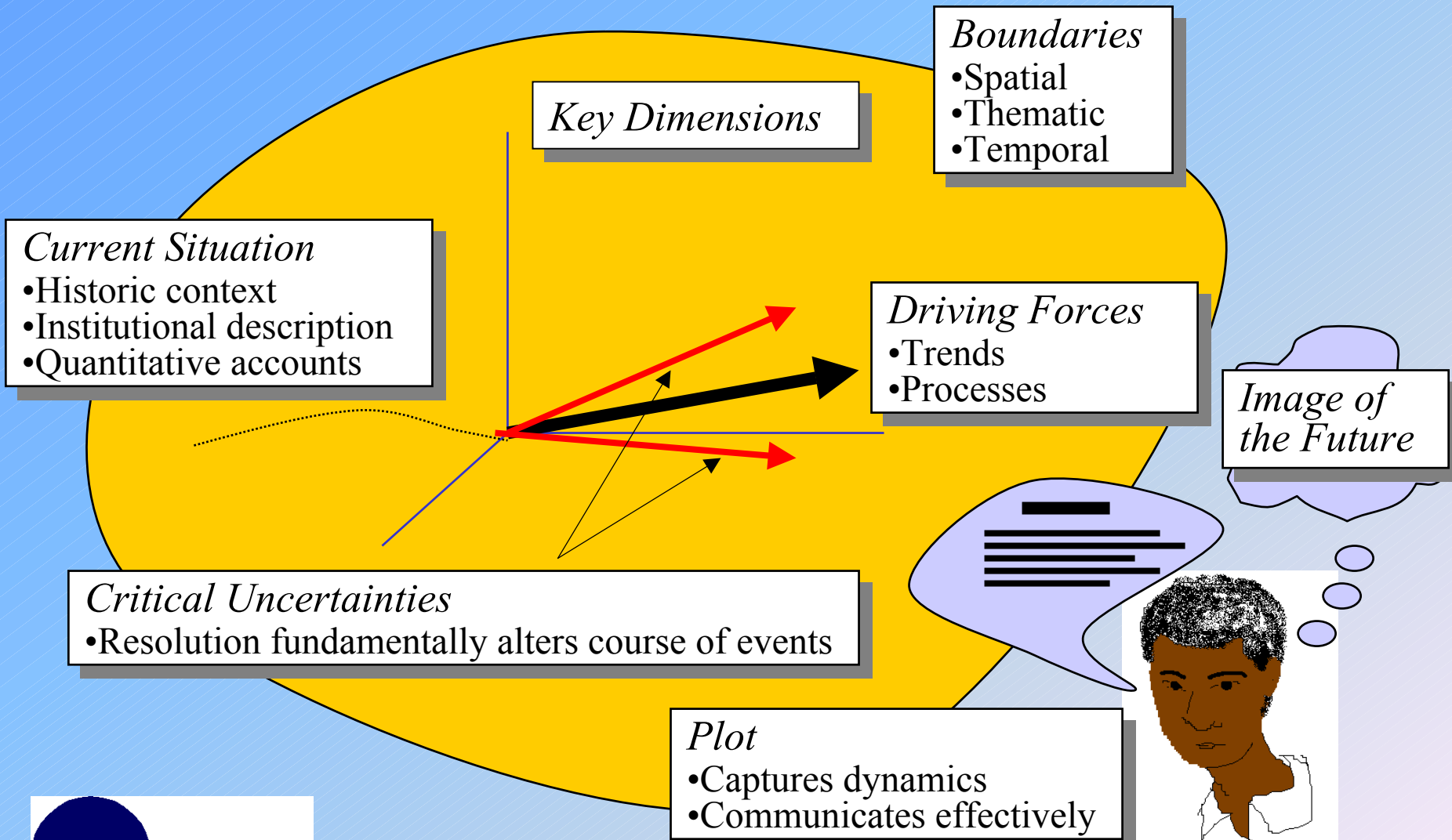
SCENARIOS



Components of Scenarios

- Where do we want to go?
 - *Images* of economy, politics, culture and society that suggest coherent and plausible futures
- How do we get there?
 - *Pathways* to bridge today's conditions with the images of the future
 - *Actions*: gathering resources, motivating people

Anatomy of Scenarios



Global Links: Implications for Local Scenarios

- Local scenarios may connect more tangibly to social change processes than global scenarios
- Enlarges and enriches stakeholder process
- Promotes linkage to initiatives around the world; builds global solidarity
- Introduces exogenous variables that condition local planning and decision-making
- Identifies new goals and indicators

Multi-Stakeholder Processes

- Normative visions and scenarios without broad stakeholder endorsement will never be realized
- On the other hand, stakeholders have difficulties thinking “out of the box”
- Need concrete small steps that can be realized in the short term to demonstrate success
- Visioning and backcasting together with stakeholders can facilitate social learning

3. Developing Scenarios for the Boston Region

- Three archetype scenarios being developed:
 - **Business-As-Usual (BAU)**: little change in production and consumption patterns; GHG emissions and ecological footprints grow; 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 technological innovations) to achieve sustainability with global responsibility

Scenario 1: Business-As-Usual

Boston in 2050 stays the course of Boston in 2005:

- Dominant values (“the American dream”) and consumerism persist
- Income and health inequalities become deeper
- Dependence on imported raw materials increases
- Urban sprawl and car dependence grows
- Increased CO2 emissions and footprints leads to climate change with global as well as local impacts

Scenario 2: Policy Reform

Boston in 2050 has seen government-led policies and technological change to address many of the problems of the BAU scenario:

- CO2 emissions have decreased somewhat
- Income and social inequalities reduced
- Resources are used more efficiently
- Sprawl mitigated to a degree
- Global resource depletion continues
- Climate change and global inequality persist

Scenario 3: Deep Change

By 2050, Boston has seen political engagement towards transformation of values and lifestyles:

- Growing awareness of global connectedness and responsibility
- Deep changes in lifestyles, behavior, and institutions have led to huge reductions in CO2 emissions and footprint
- Quality-of-life (clean environment, sense of community, social equity) replaces economic growth and material consumption as key driver

Business-As-Usual Transportation & Land Use

- Most growth seen in communities outside Rte. 128
- Private car use and VMT greater than in 2005; GHG emissions continue to grow
- Congestion and commuting times worsen
- Large inefficient vehicles continue to dominate
- Modest improvements in public transportation, but transit ridership low

Policy Reform

Transportation & Land Use

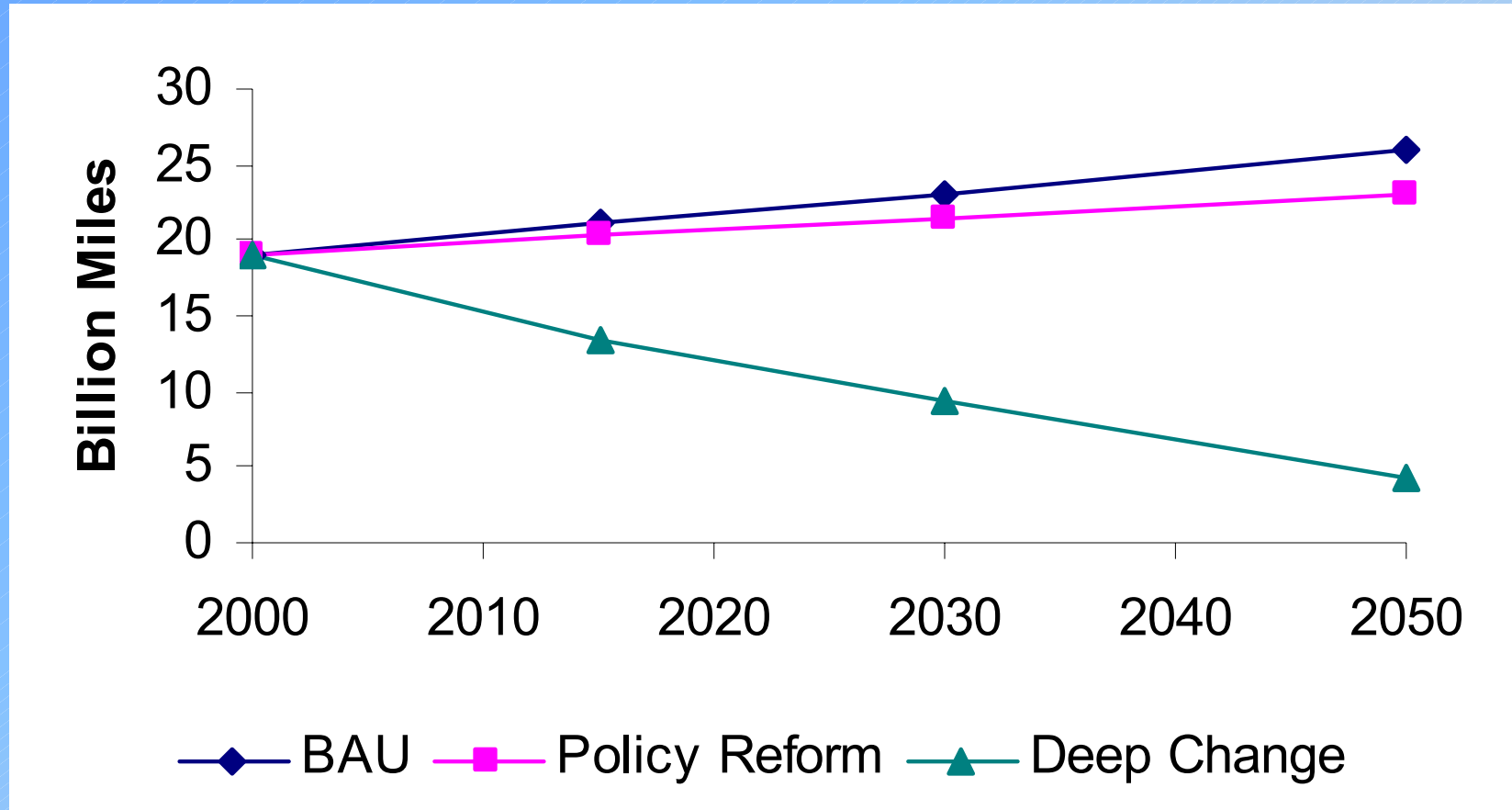
- High fuel and vehicle taxes curtail private vehicle use; VMT reduced modestly
- Congestion and commuting time stabilized at 2005 levels
- Transport-related GHGs reduced moderately through efficiency improvements
- Improved rail and transit links (e.g., North & South Stations)
- TOD popular in much of the inner core communities
- Lack of regionally coordinated land-use planning; sprawling development in outer ring

Deep Change

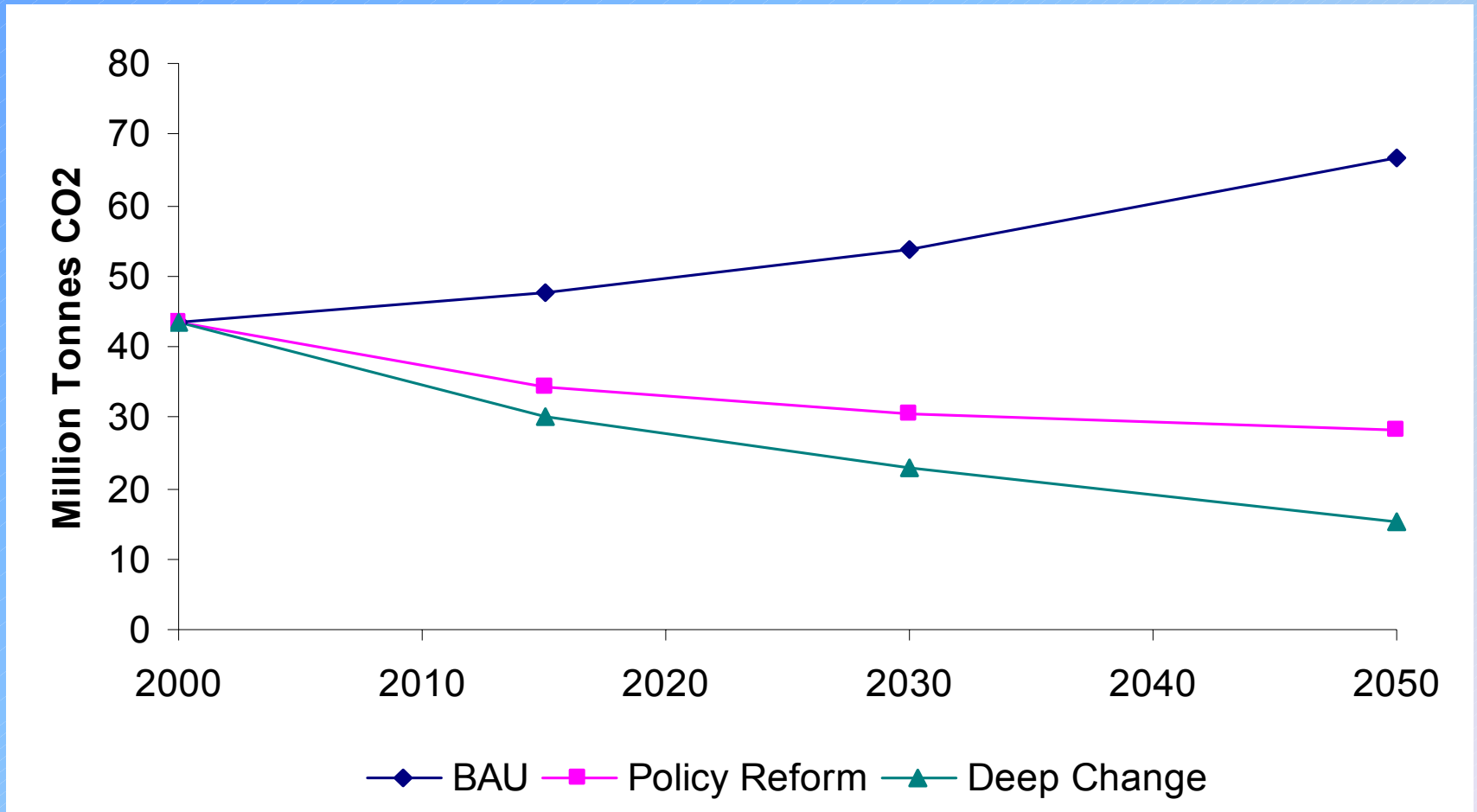
Transportation & Land Use

- GHG emissions from transportation reduced by 70%
- New regional governing body coordinates land-use decision-making; promotes density, transit, and healthy lifestyles and mixed use
- Private car use reduced significantly; transit and alternative modes dominate
- Major roadways redesigned to accommodate alternative modes
- Congestion and commuting time markedly reduced
- Parts of downtown Boston closed to private vehicles; served by free transit and other modes

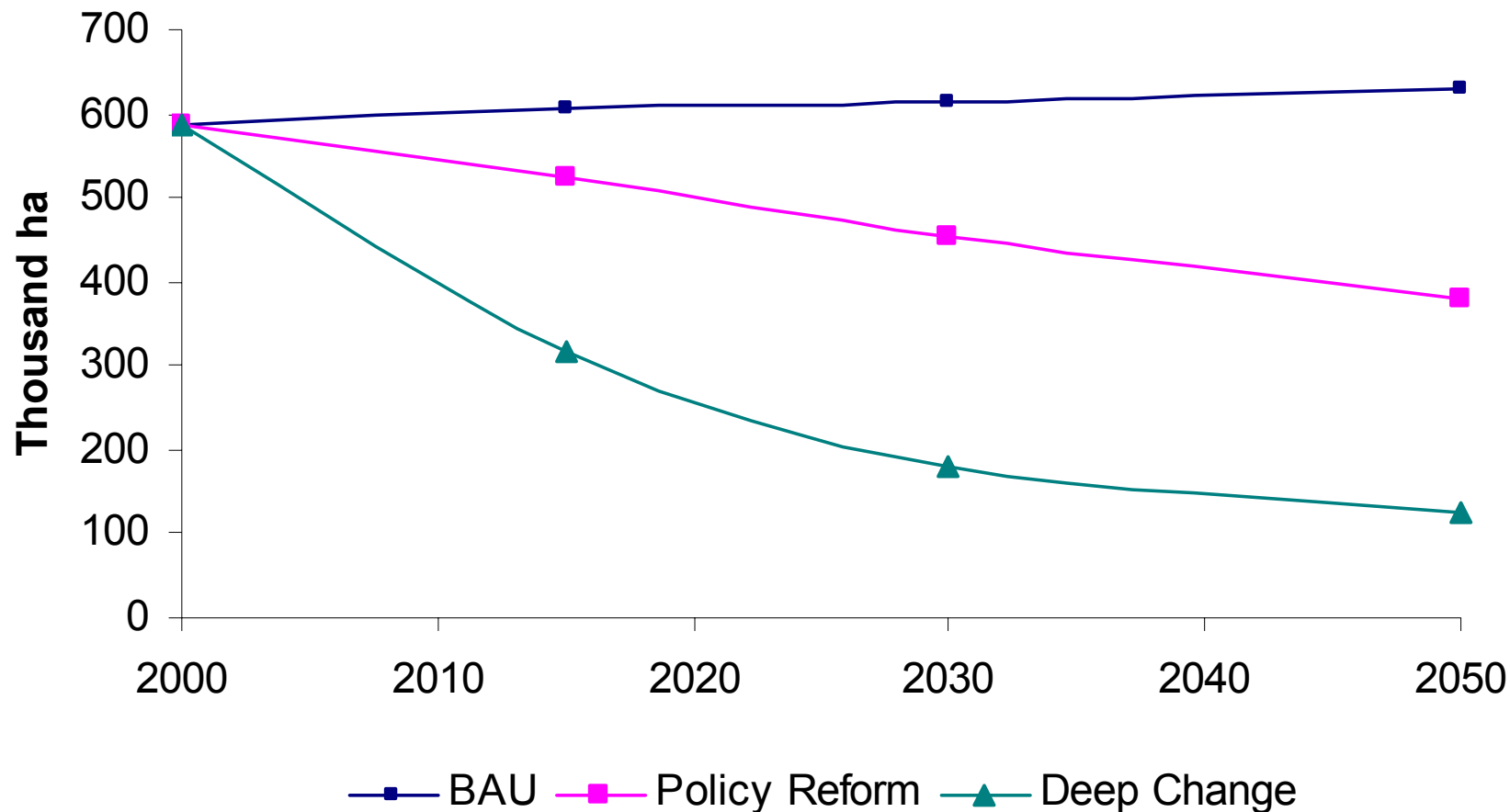
Annual Miles Traveled in Personal Vehicles



CO₂ Emissions



Land Area Required for Food



Business-As-Usual Poverty & Inequality

- New employment opportunities mostly outside inner core
- Little attention to poverty reduction; poverty rate persists
- Growing income gap between skilled and unskilled jobs
- Inequality continues to increase

Policy Reform

Poverty & Inequality

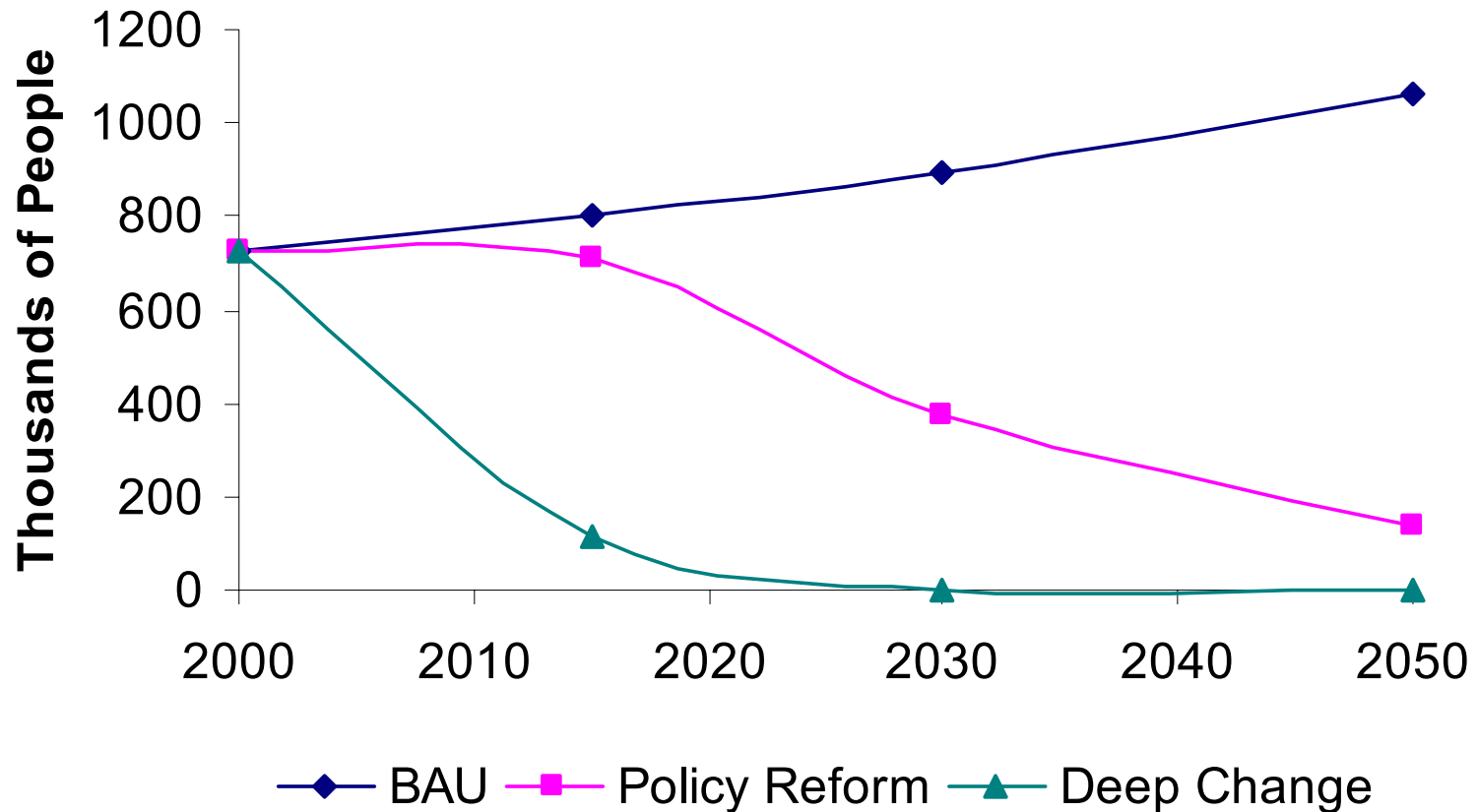
- Employment centers develop near transit nodes (diverse opportunities: from service to professional)
- Policy initiatives raise the minimum wage, increase job training opportunities
- Poverty stabilized but remains concentrated in inner core
- Inequality improves slightly

Deep Change

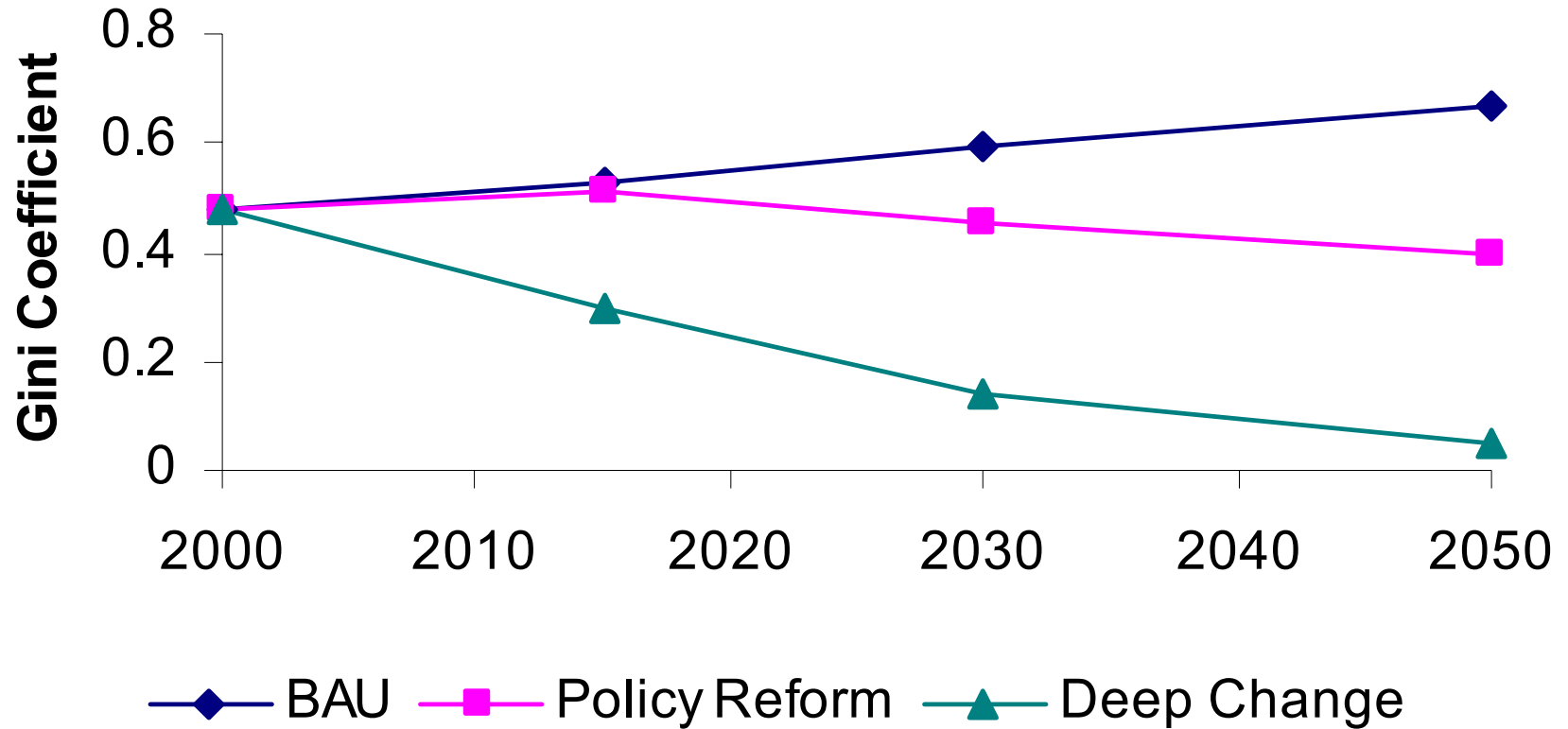
Poverty & Inequality

- Poverty reduction and equality among key values adopted and acted upon
- Shorter work week leads to reduction in unemployment
- Affordable housing and universal health care reduce the financial burden on poor households
- “Living wage” adopted and poverty significantly reduced
- Considerable improvement in income equality

Population Below the Poverty Line



Income Inequality



4. Discussion

- What does it mean for the Boston region to pursue a sustainable future when the rest of the country/world is not?
 - Boston could serve as a model for other regions
 - We could assume that similar deep changes are taking place throughout the country and beyond
- What role can scenario development processes play in informing planning and bringing about coherence and a sense of direction?

Contact Information

James Goldstein
Senior Fellow
jgold@tellus.org

Anna Fleder
Research Analyst
afleder@tellus.org

Tellus Institute
11 Arlington St.
Boston, MA 02116
(617) 266-5400

