



Rehabilitation as a Strategy for Increasing the Sustainability of the Built Environment

Annie R. Pearce

School of Civil and Environmental
Engineering

Georgia Institute of Technology

Overview



- ◆ What is Sustainability?
 - In General
 - With Respect to Built Facilities
- ◆ How can Rehabilitation Contribute to Sustainability?
- ◆ Case Study:
 - 50 Green Street, San Francisco
- ◆ Conclusions

What is Sustainability?



- ◆ Sustainable Development:
 - “Development which meets the needs of current generations without compromising the ability of future generations to meet their own needs” (World Council on Environment and Development 1987)
- ◆ Meeting Human Needs

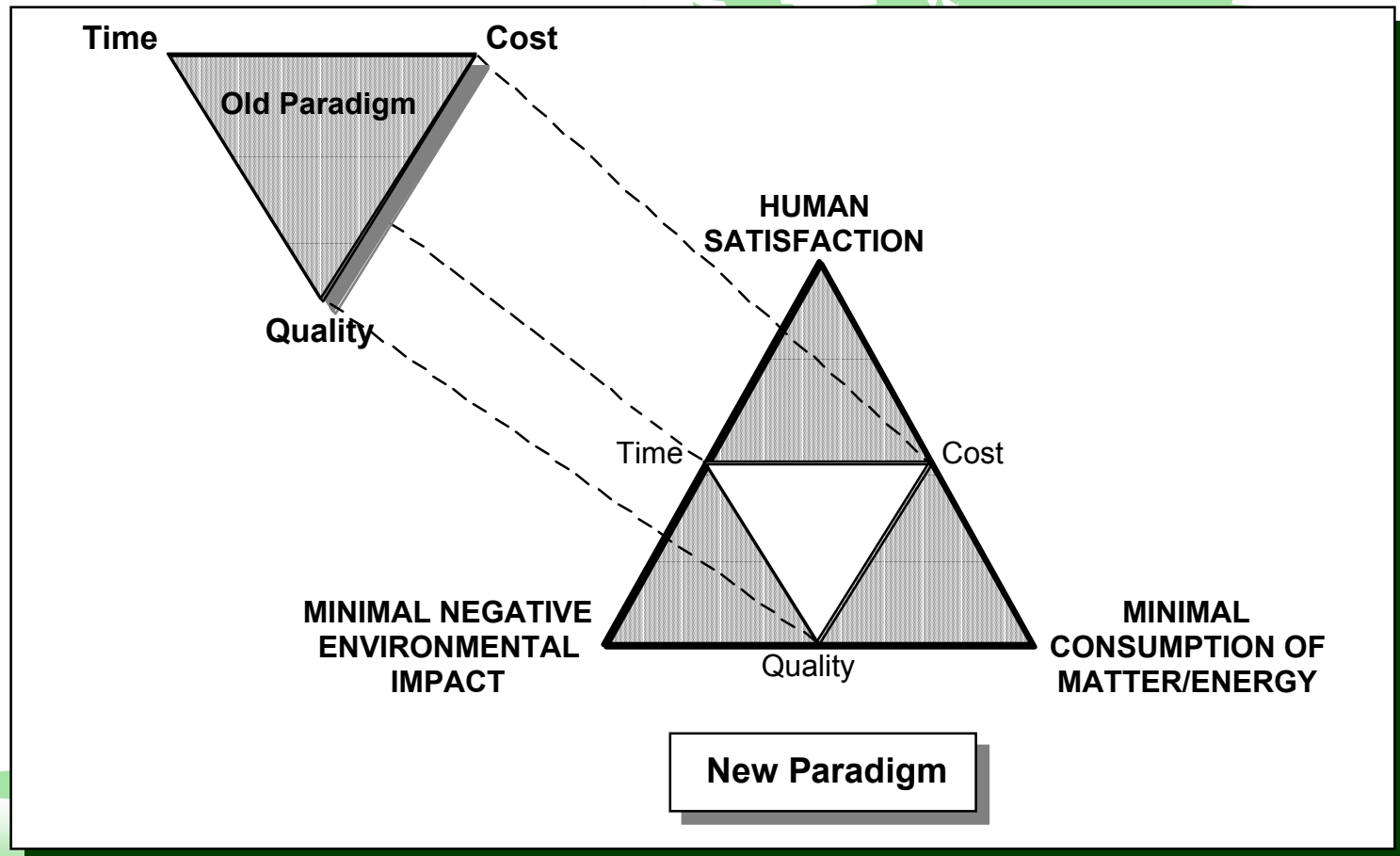
What is Sustainability?



- ◆ Sustainability:
 - “A system state in which changes to the system are constrained so as to maintain the stability of the system into the foreseeable future” (Pearce 1995)
- ◆ Importance of Context
- ◆ Time Frame

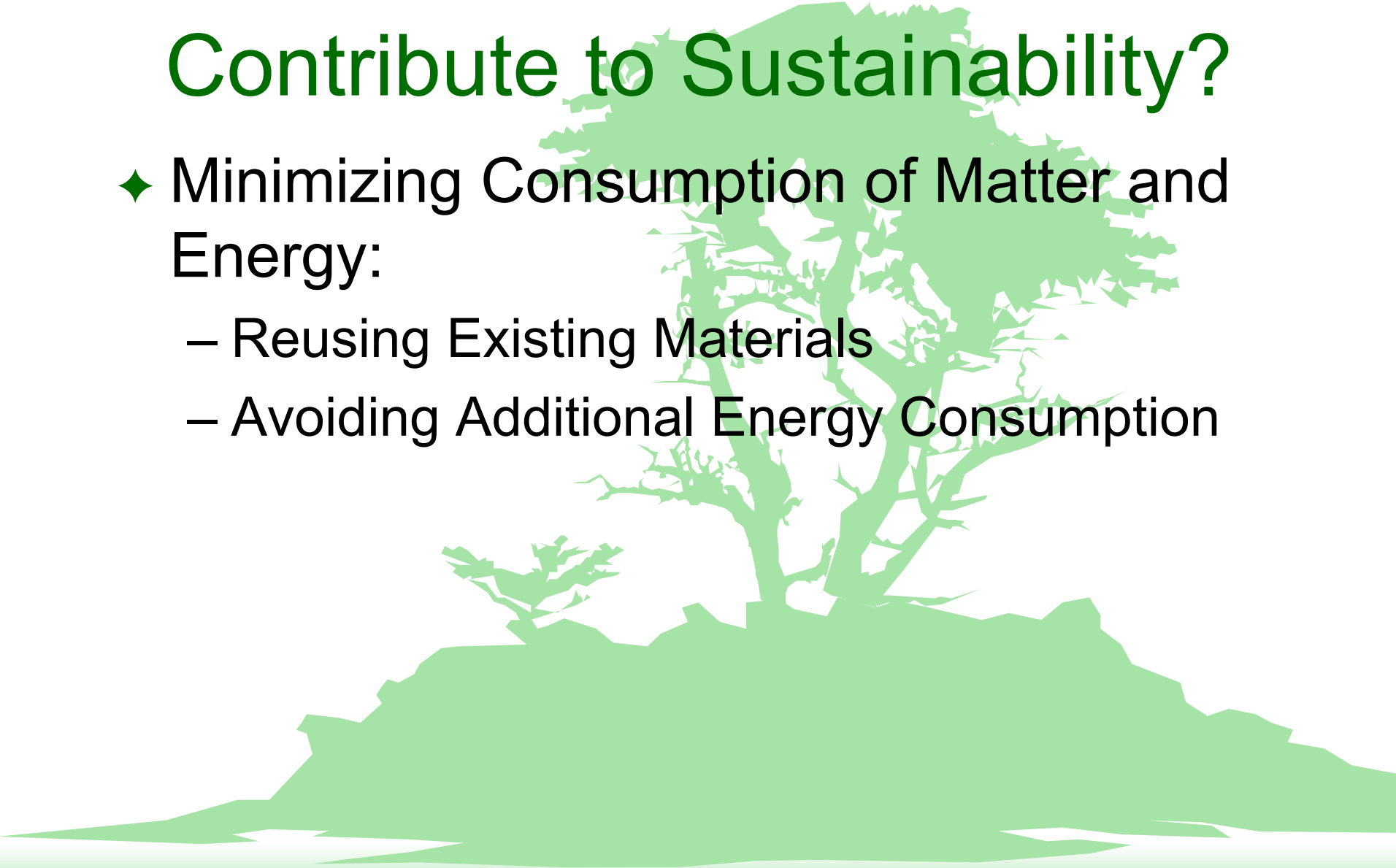
What is Sustainability?

◆ With Respect to Built Facilities:



How Can Rehabilitation Contribute to Sustainability?

- ◆ Minimizing Consumption of Matter and Energy:
 - Reusing Existing Materials
 - Avoiding Additional Energy Consumption



How Can Rehabilitation Contribute to Sustainability?

- ◆ Avoiding Negative Environmental Impacts:
 - Reusing Existing Sites
 - Reducing Construction and Demolition Waste



How Can Rehabilitation Contribute to Sustainability?



- ◆ Accomodating Human Needs and Aspirations:
 - Meeting Performance Requirements
 - Preserving Architectural History
 - Reviving Urban Areas

How Can Rehabilitation Contribute to Sustainability?

- ◆ Cost, Time, and Quality:
 - Creating Economic Advantage
 - Saving Time Needed for New Construction
 - Maintaining Traditional Quality Standards



Case Study: 50 Green Street, San Francisco



- ◆ Seismic Strengthening of an Unreinforced Masonry Structure
- ◆ Strengthening Systems:
 - Steel knee-braced frames
 - CenterCore wall strengthening

Case Study: 50 Green Street, San Francisco



◆ Considerations:

- Architectural Integrity
- Tenant Disruption
- Use of Existing Materials
- Meeting Performance Requirements

Conclusions



- ◆ Rehabilitation is More Sustainable than New Construction
- ◆ Always Consider System Context in Making Choices
- ◆ Sustainability as a Decision Criterion