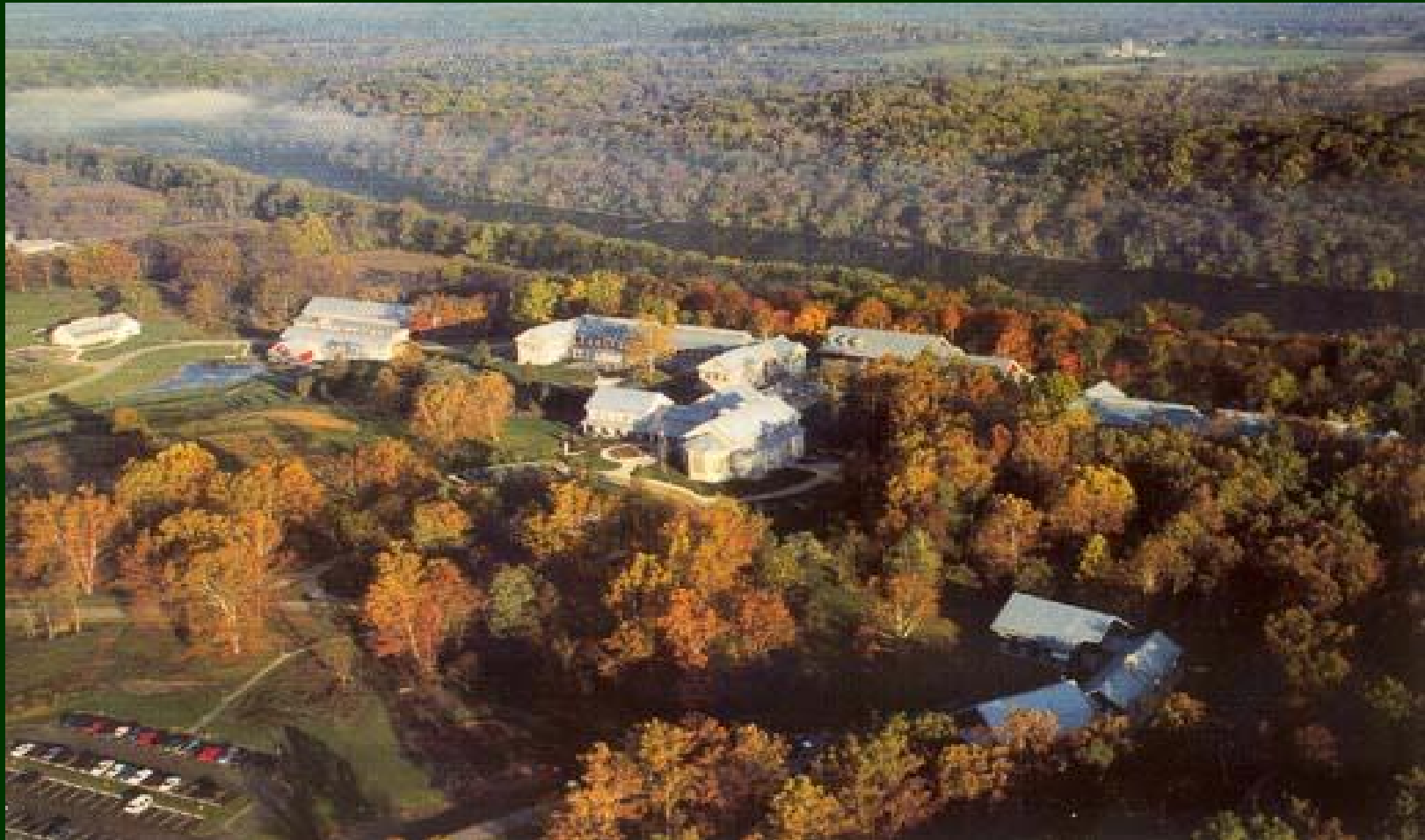


Green Infrastructure

A Strategic Approach for Planning and Conserving Colorado's Natural and Working Lands



National Conservation Training Center



Strategic Conservation Planning Using A Green Infrastructure Approach

What to accomplish today

- Introduction to concept of Green Infrastructure
- Relationship to Transportation Planning
- Developing your own workshop

For More Information

The Conservation Fund



- ü Green Infrastructure Website – www.greeninfrastructure.net



Strategic Conservation Planning Using A Green Infrastructure Approach

Northeast Douglas County, Colorado



Strategic Conservation Planning Using A Green Infrastructure Approach

Denver on a smoggy day

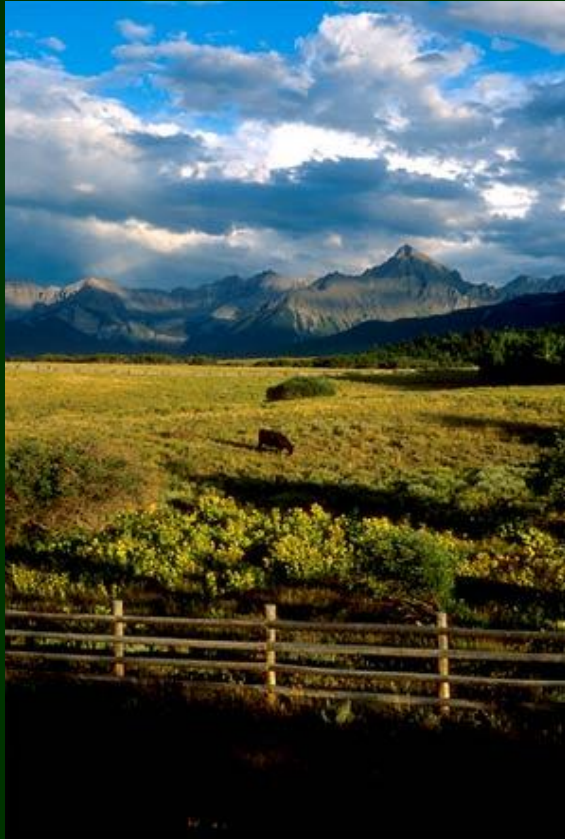


Strategic Conservation Planning Using A Green Infrastructure Approach

Denver on a clear day



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Open Space



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America's Land Use Crisis

- Accelerated Consumption & Fragmentation of Open Land
- Open Space Conversion
- Consumptive, Poorly Planned, Haphazard Development

Ecological & Social Consequences

q Ecological Impacts

- ü Loss of Natural Areas
- ü Fragmentation of Habitat
- ü Disruption of Natural Landscape Processes
- ü Degradation of Water & Air Resources
- ü Decreased Ability for Nature to Respond to Change



Ecological & Social Consequences

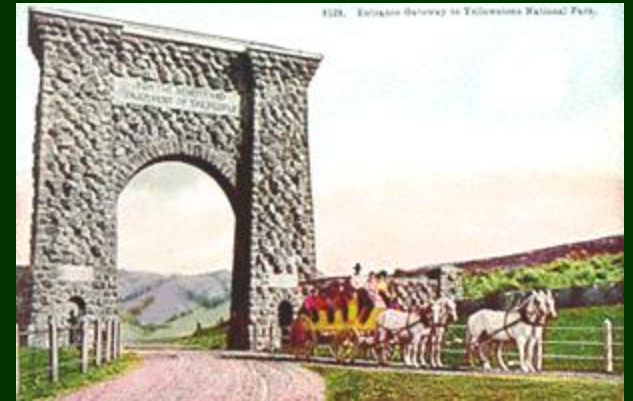
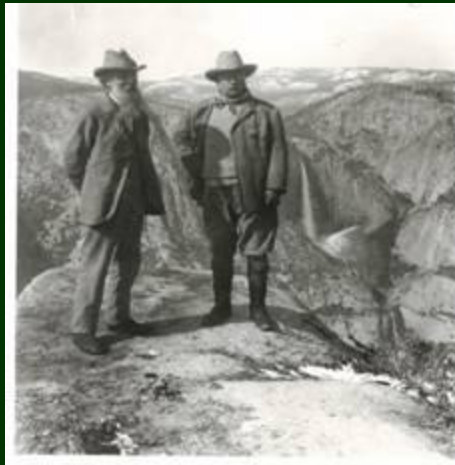
q Social Impacts

- ü Loss of “Free” Services Provided by Natural Systems
- ü Decline of Productive Farms and Forestlands
- ü Decreased Sense of Community
- ü Loss of Connection Between People & Nature
- ü Erosion of the Community’s “Bottom Line



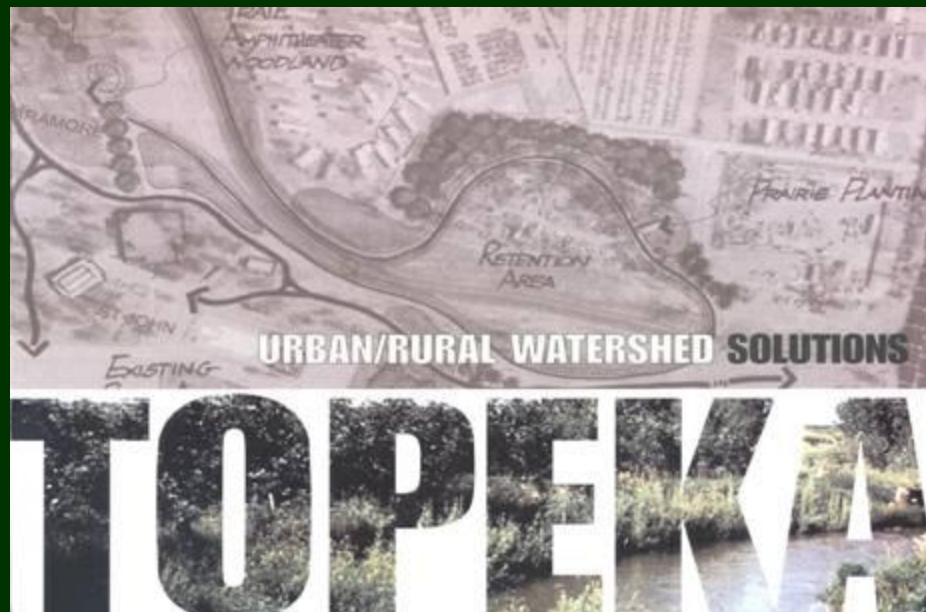
Strategic Conservation Planning Using A Green Infrastructure Approach

Public Lands and Growth



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The Response



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Today's Top Conservation Challenges

Haphazard Conservation

q Conservation activities that are:

- ü Reactive
- ü Site Specific
- ü Narrowly Focused
- ü Not Integrated



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Today's Top Conservation Challenges

Isolated Conservation Actions



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Today's Top Conservation Challenges

Economic Downturn

Open space, closed wallets

Land-buy programs reeling as economy hurts tax revenues

By Trent Seibert, Denver Post Staff Writer
Wednesday, October 09, 2002 -

The city of Boulder's open- space program, lauded as one of the nation's most innovative, has all but ground to a halt. The culprit is the souring economy.



Post / Lyn Alweis

Smart Growth and Strategic Conservation Planning

An Alternative to Haphazard Development

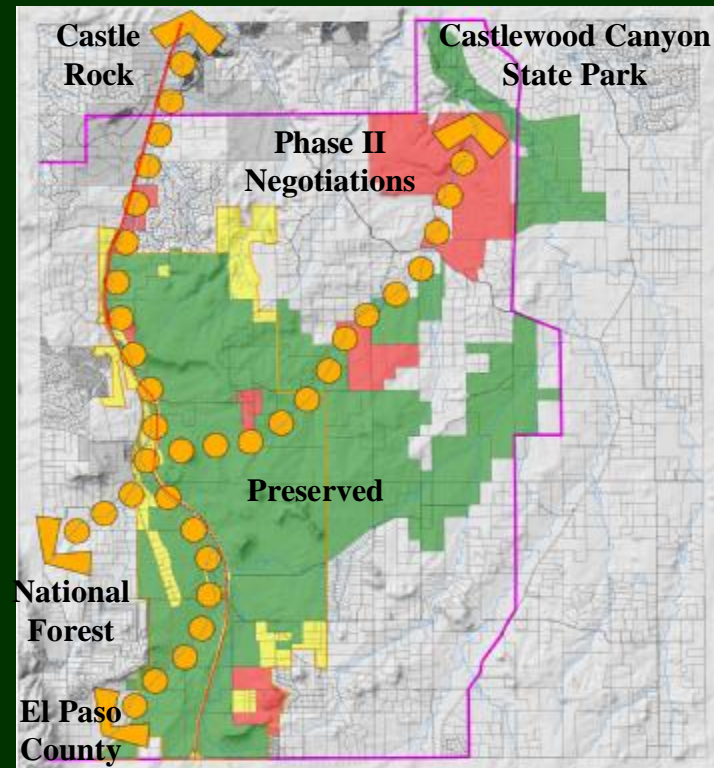
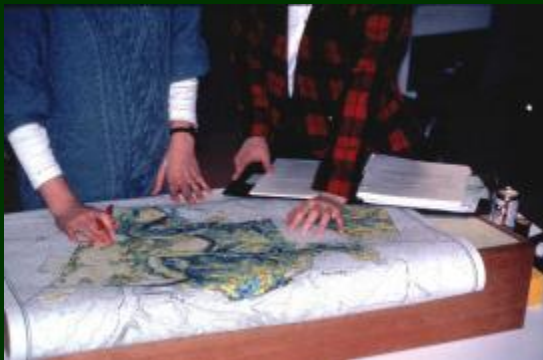
“The significant problems we face cannot be solved by the same level of thinking that created them”.

Albert Einstein



Strategic Conservation Planning Using A Green Infrastructure Approach

Introduction to Green Infrastructure Concepts and Values



Strategic Conservation Planning Using A Green Infrastructure Approach

Green Infrastructure – What Is It?



How do you define green infrastructure?



Strategic Conservation Planning Using A Green Infrastructure Approach

Green Infrastructure – What Is It?

“An interconnected network of green spaces that conserves natural ecosystem values and functions and provides associated benefits to human populations”



Strategic Conservation Planning Using A Green Infrastructure Approach

Green Infrastructure – What Is It?

An interconnected network composed of:

- ü Conserved Natural Areas & Features



Green Infrastructure – What Is It?

An interconnected network composed of:

- ü Conserved Natural Areas & Features
- ü Public & Private Conservation Lands



Green Infrastructure – What Is It?

An interconnected network composed of:

- ü Conserved Natural Areas & Features
- ü Public & Private Conservation Lands
- ü Working Lands of Conservation Value



Green Infrastructure – What Is It?

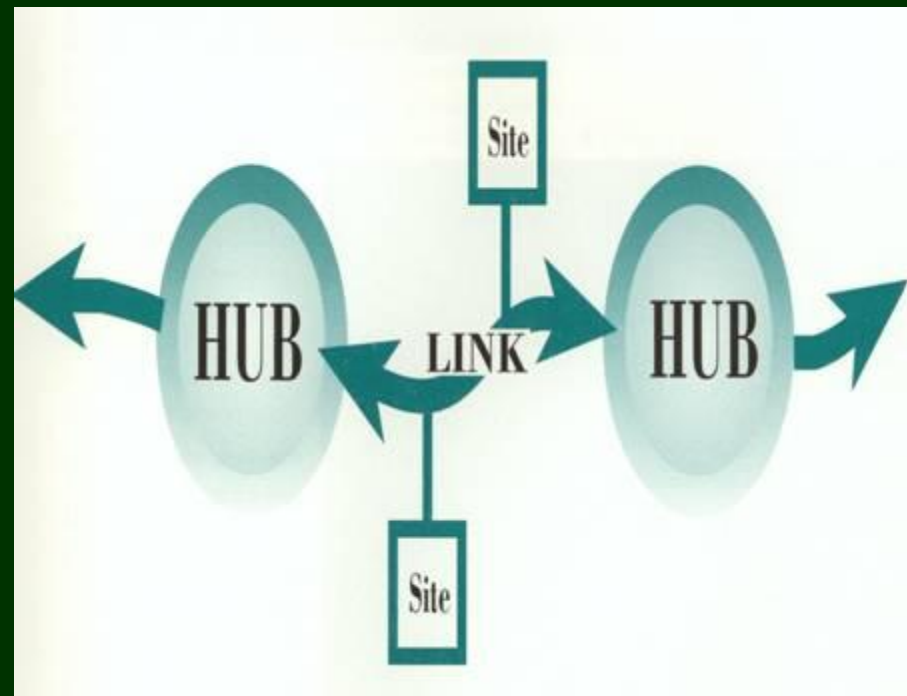
An interconnected network composed of:

- ü Conserved Natural Areas & Features
- ü Public & Private Conservation Lands
- ü Working Lands of Conservation Value
- ü Other Protected Open Spaces

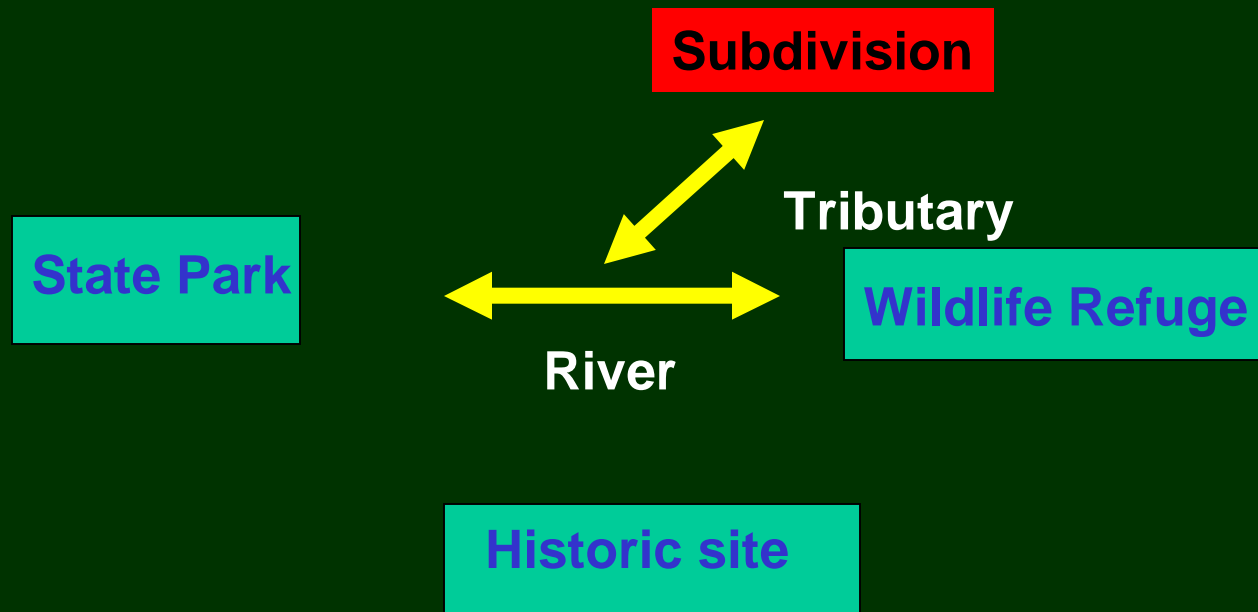


Green Infrastructure – What Does It Look Like?

- ü Hubs – anchor the system
- ü Links – tie the system together
- ü Sites – smaller areas, may not be attached
- ü Public, private and non-profit lands



Simple Example

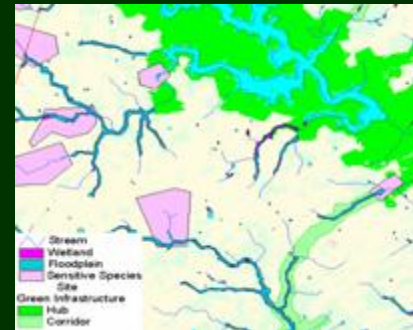


Strategic Conservation Planning Using A Green Infrastructure Approach

Green Infrastructure & Greenways

q Green Infrastructure:

- ü Emphasizes ecology not recreation
- ü Includes both ecologically important hubs as well as key landscape linkages
- ü Is designed to help shape urban form and provide a framework for growth that pre-identifies ecologically significant lands and suitable development areas



Strategic Conservation Planning Using A Green Infrastructure Approach

Green Infrastructure Benefits

Strategic Conservation Planning Using A Green Infrastructure Approach

Ecological Services

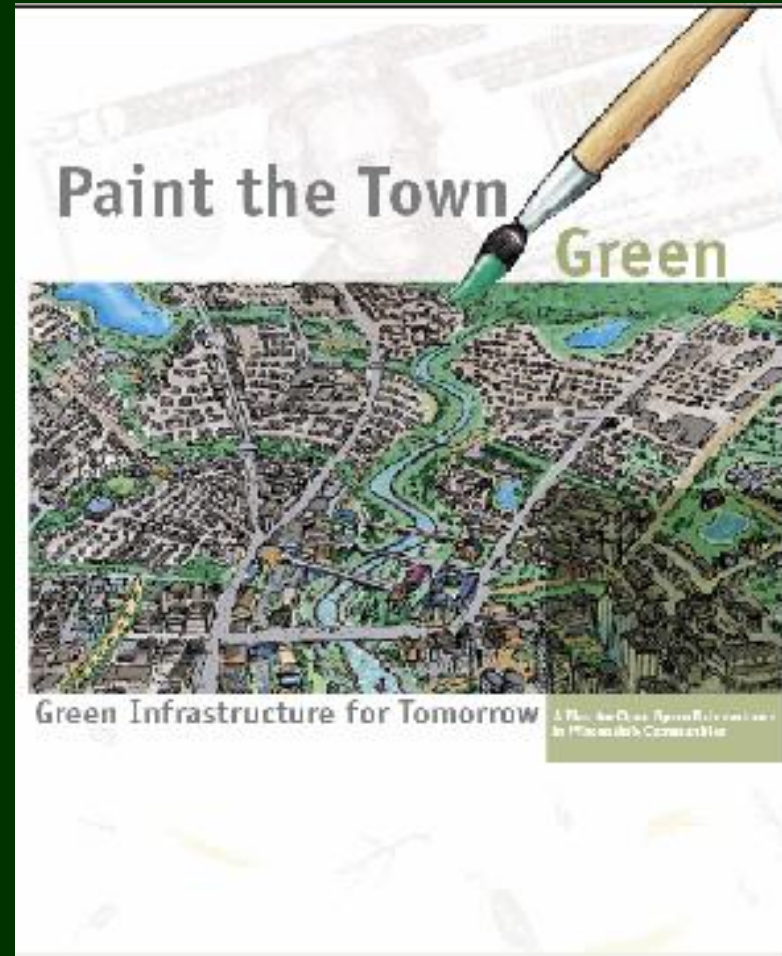
Green Infrastructure:

- q Protects and enhances critical water resources
- q Provides recreation, health and educational benefits
- q Enhances community appearance and provides a connection to nature
- q Increases property value & provides free/low cost natural services
- q Engages & excites diverse people/organizations
- q Contributes to the quality of life, and economic well-being of America's communities & people



Strategic Conservation Planning Using A Green Infrastructure Approach

Green Infrastructure Principles



Strategic Conservation Planning Using A Green Infrastructure Approach

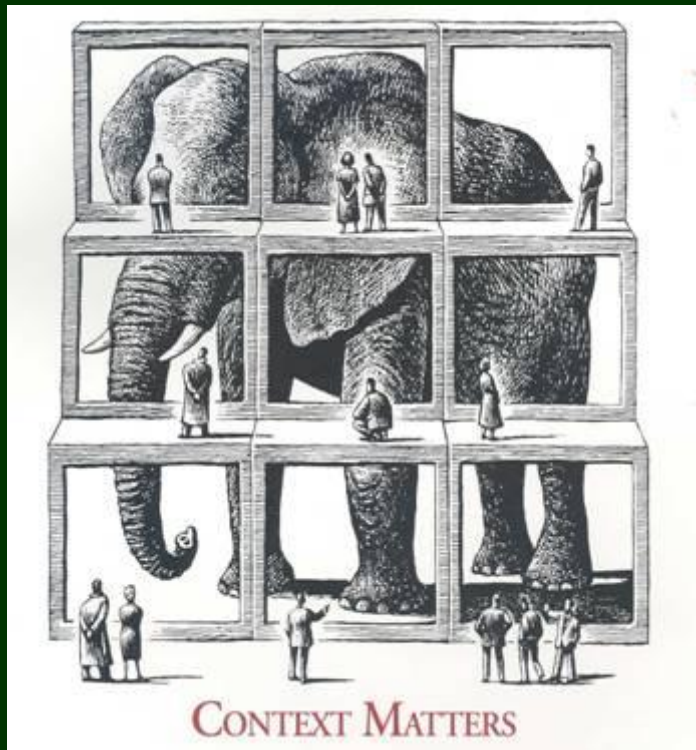
Guiding Principles

1. **CONNECTIVITY** is the key

- For linking natural areas and features to conserve ecological values and functions
- For linking people and programs to make the shared green infrastructure vision and design a reality

Guiding Principles

Principle 2 – **CONTEXT** matters!



From: Conservation in Practice,
Summer 2002



Strategic Conservation Planning Using A Green Infrastructure Approach

Guiding Principles

3. Green infrastructure is grounded in sound science and land-use planning theory and practice

Guiding Principles

- 3. Green infrastructure is grounded in sound science and land-use planning theory and practice
- 4. Green infrastructure can and should function as the framework for conservation and development

Guiding Principles

3. Green infrastructure is grounded in sound science and land-use planning theory and practice
4. Green infrastructure can and should function as the framework for conservation and development
5. Green infrastructure should be planned and protected *before* development

Guiding Principles

3. Green infrastructure is grounded in sound science and land-use planning theory and practice
4. Green infrastructure can and should function as the framework for conservation and development
5. Green infrastructure should be planned and protected *before* development
6. Green infrastructure is a critical public investment that should be funded up-front using the full range of available financing options

Guiding Principles

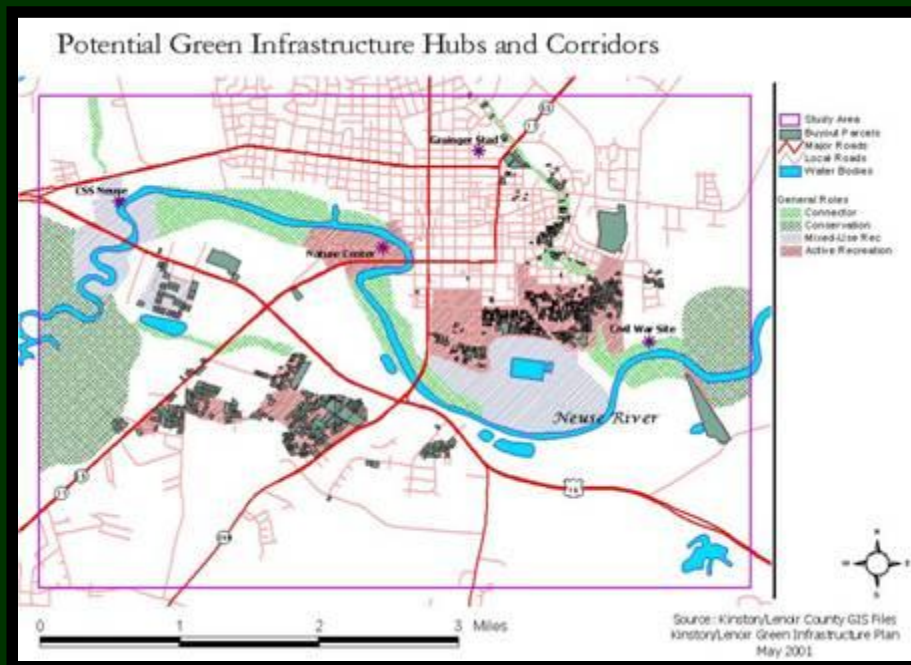
7. Green infrastructure affords benefits to both nature and people

Guiding Principles

- 7. Green infrastructure affords benefits to both nature and people
- 8. Green infrastructure respects the needs and desires of landowners & other stakeholders

Guiding Principles

Principle 9 – Green infrastructure requires making connections to other land planning and conservation activities within and beyond the community



- ü *Flood Mitigation Planning*
- ü *River Management & Use*
- ü *Environmental Education*
- ü *Historic / Cultural Heritage*
- ü *Outdoor Recreation Facilities*
- ü *Downtown Redevelopment*

Strategic Conservation Planning Using A Green Infrastructure Approach

Guiding Principles

9. Green infrastructure requires making connections to other land planning and conservation activities within and beyond the community

10. **Green infrastructure requires long-term commitment**

ü Modify and update your plan and design periodically they need to be “living documents” in order to remain relevant as your community and region continues to grow and evolve.

Examples of Strategic Conservation Using a Green Infrastructure Approach

Putting green infrastructure
concepts and principles into practice



Strategic Conservation Planning Using A Green Infrastructure Approach

Examples

- Florida Greenways System & Ecological Network
- Maryland Department of Natural Resources Green Infrastructure Assessments
- Metro Greenways – Twin Cities, Minneapolis
- Saginaw Bay Greenways Collaborative (MI)
- NW Michigan Greenways Plan - Conservation Resource Alliance Wild Link Program
- South Coast Missing Links Project (CA)
- Yellowstone to Yukon Conservation Initiative (Y2Y)
- Southern Rockies Ecosystem Project (SREP)

The Benefits of Taking a Green Infrastructure Approach to Strategic Conservation

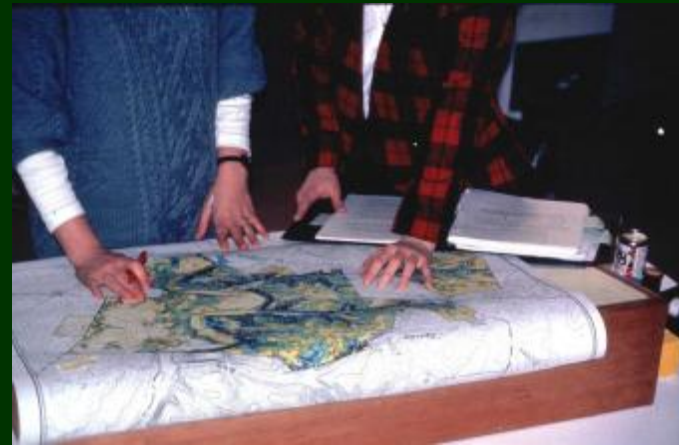
- q Promotes strategic land and water conservation that is proactive, holistic, systematic and well integrated.

The Benefits of Taking a Green Infrastructure Approach to Strategic Conservation

- q Promotes strategic land and water conservation that is proactive, holistic, systematic and well integrated.
- q Provides a mechanism for conservation action that is undertaken in concert with:
 - q Growth Management
 - q Land Development
 - q Built Infrastructure Planning
 - q Smart Growth Efforts

The Benefits of Taking a Green Infrastructure Approach to Strategic Conservation

- q Provides a process that brings diverse interests together to guide future land conservation and land development decisions



“Simply put, some places are better for development than others – the first principle of better development is determining where not to develop”. *Ed McMahon 2001*

Strategic Conservation Planning Using A Green Infrastructure Approach

The Benefits of Taking a Green Infrastructure Approach to Strategic Conservation

- q Promotes strategic land and water conservation that is proactive, holistic, systematic and well integrated.
- q Provides a mechanism for conservation action that is undertaken in concert with other planning efforts
- q Provides a process that brings diverse interests together to guide future land conservation and land development decisions
- q Results in a logical, systematic and scientifically based framework for integrating ongoing conservation actions

Relation to Transportation Planning

Relating Green Infrastructure to Gray Infrastructure



Strategic Conservation Planning Using A Green Infrastructure Approach

Relating Green to Gray Infrastructure



What is Gray Infrastructure ?



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Gray Infrastructure

Gray Infrastructure

The built environment's support system; a planned and maintained network of transportation, communication, and utility systems that supports the built environment.



Gray Infrastructure



What Systems are Considered as Gray Infrastructure ?



Strategic Conservation Planning Using A Green Infrastructure Approach

Gray Infrastructure

Gray Infrastructure Systems Include



- Transportation
 - Roads and Highways
 - Rail and Air Facilities
- Utilities
 - Power
 - Water Supply and Wastewater Disposal
 - Communications

Gray Infrastructure

Historically Transportation Has Been
a Major Factor in Development Patterns.

- Waterways
- Railways
- Roadways



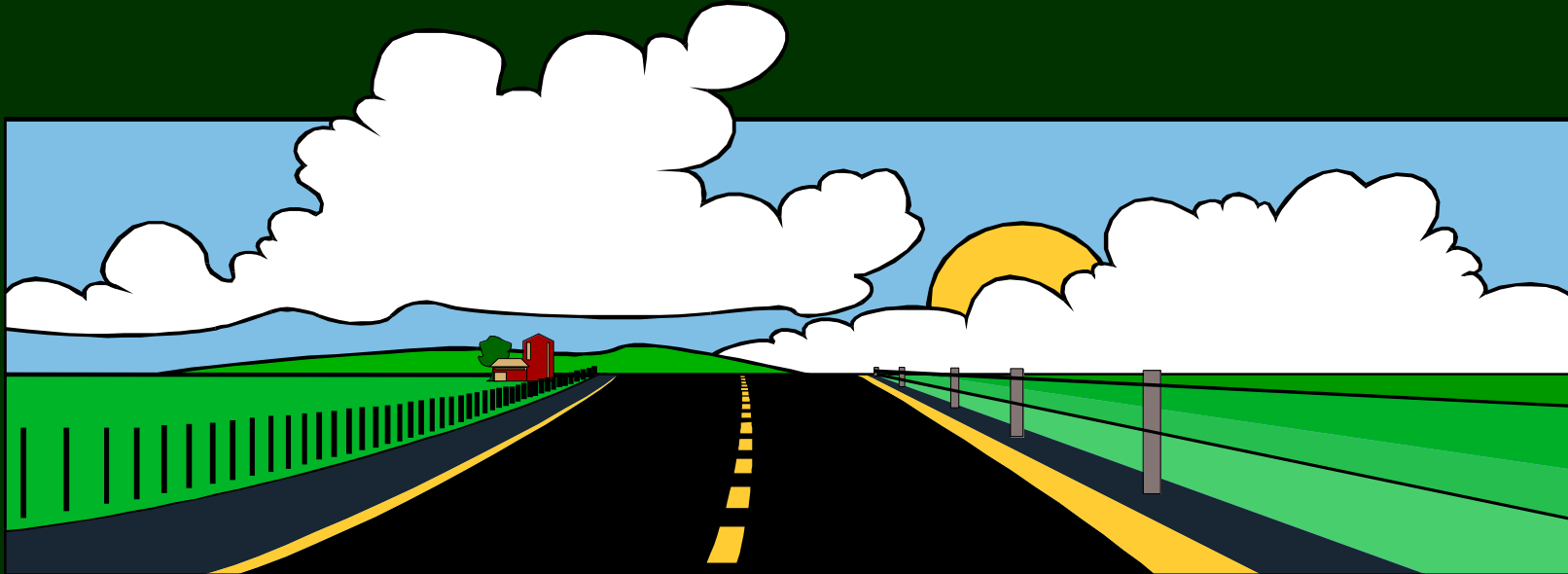
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Gray Infrastructure

The United States is highly dependent on roadway network for movement of goods and travel.

3,088,197,000,000 VMT
2005 estimate

Source: FHWA, 2006 website <http://www.fhwa.dot.gov/environment/vmttext.htm>



Strategic Conservation Planning Using A Green Infrastructure Approach

Gray Infrastructure

Transportation Affects Regional and Community Growth and Development



If You Build IT.... They Will Come!

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Relating Green to Gray Infrastructure



How is Gray Infrastructure Related to Green Infrastructure?



Strategic Conservation Planning Using A Green Infrastructure Approach

Relating Green to Gray Infrastructure

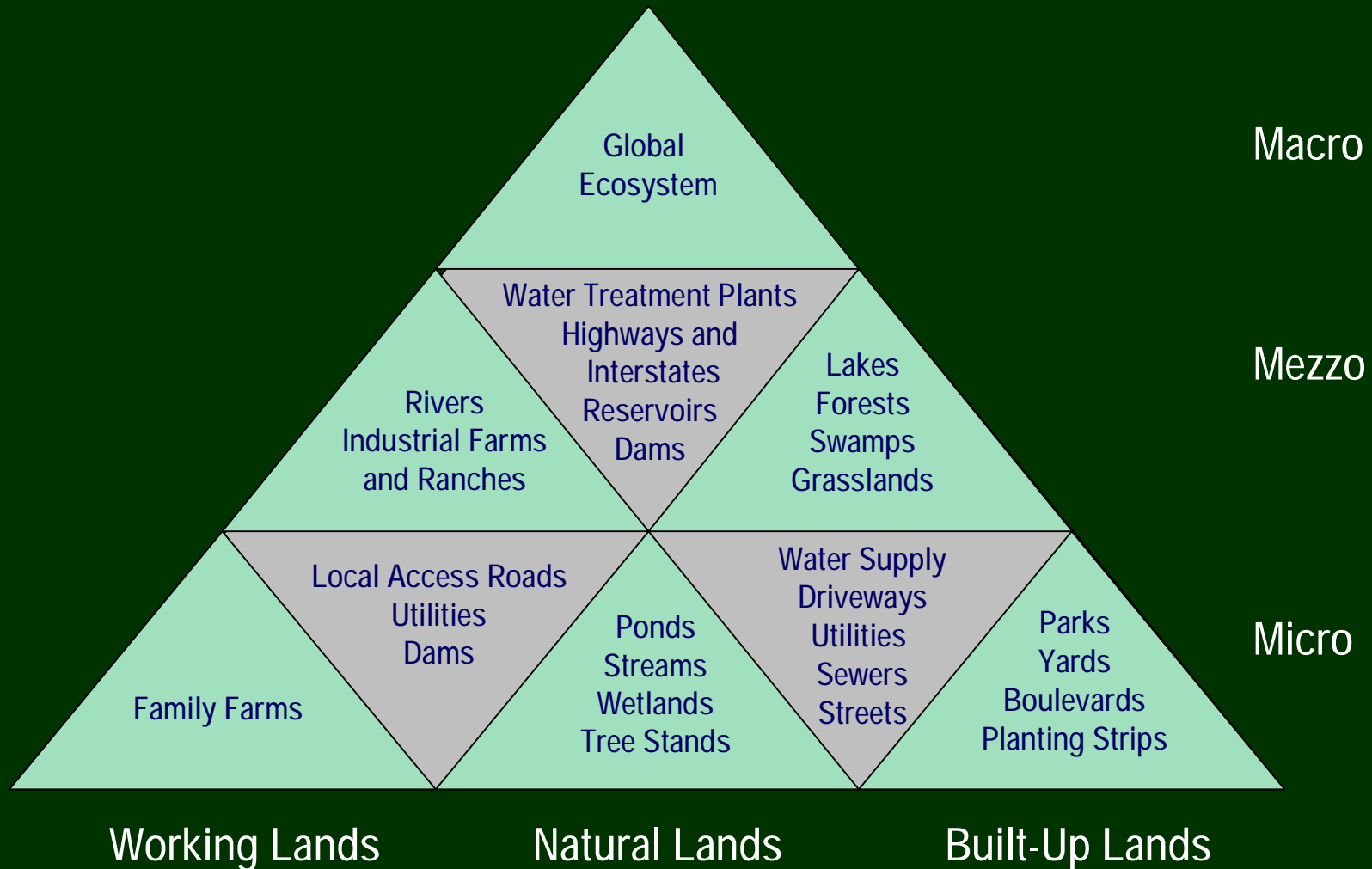
Green Infrastructure and Gray Infrastructure

Interact at spatial and functional levels as parts of the overall environment in which we live.



Strategic Conservation Planning Using A Green Infrastructure Approach

Relating Green to Gray Infrastructure



Strategic Conservation Planning Using A Green Infrastructure Approach

Relating Green to Gray Infrastructure

Green Infrastructure and Gray Infrastructure

Both Provide:

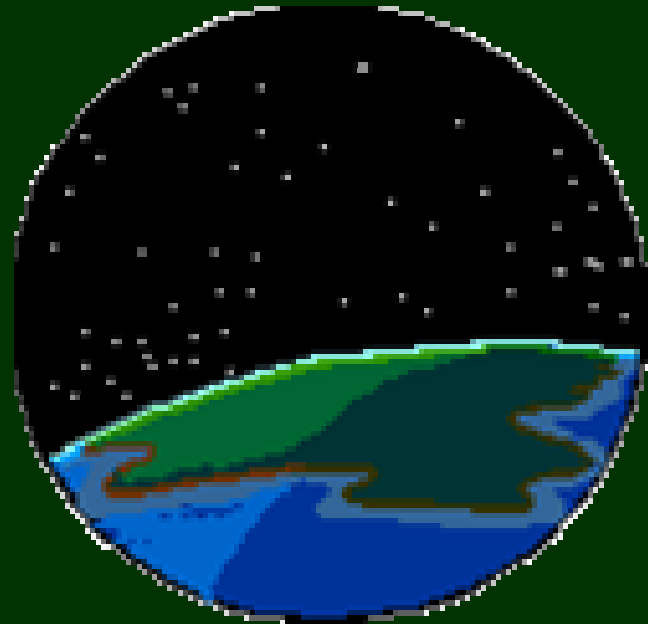
**ØEconomic Benefits by Enhancing
Commerce, and Providing Tax Revenue**

ØSocial Benefits by Improving Quality of Life

Relating Green to Gray Infrastructure

Consequences of Gray Infrastructure

- § Increased Impervious Surface Area
- § Increased Greenhouse Gasses
- § Decrease in and Fragmentation of Natural and Working Lands
- § Increased cost to build and maintain systems to replace natural system function



Planning for Green & Gray Infrastructure



What does green infrastructure planning have in common with the gray infrastructure planning processes?

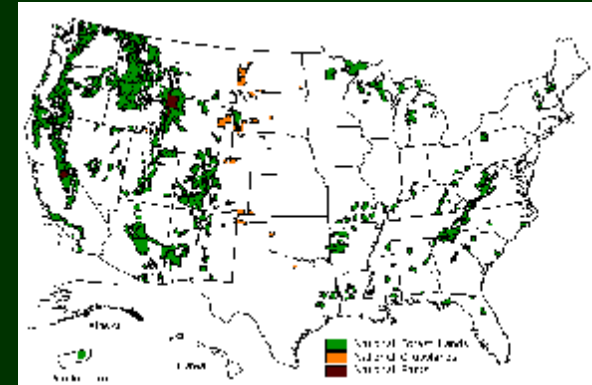


Planning for Green & Gray Infrastructure

Plan for Infrastructure at All Scales



- Project
- Neighborhood
- City
- County



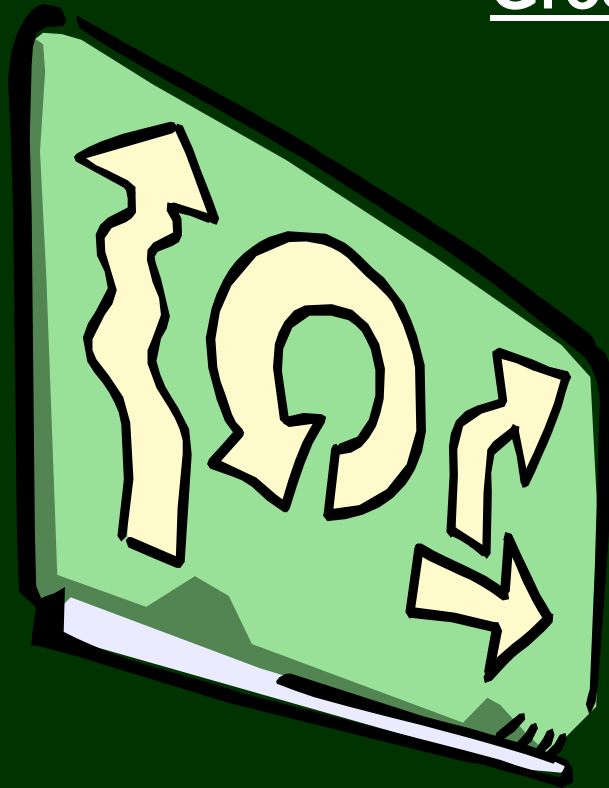
- Regional
- State
- Multi-State
- National



Strategic Conservation Planning Using A Green Infrastructure Approach

Planning for Green & Gray Infrastructure

Capitalizing on Opportunities for Green Infrastructure



ØTransportation Planning

ØWater Resource and Flood Protection

ØPark and Greenway Projects

ØProtection of Working Lands

ØCommunity Revitalization Projects

ØPre-Development and Re-Development
Projects

ØRetrofitting Gray Infrastructure

Strategic Conservation Planning Using A Green Infrastructure Approach

Green Infrastructure Economic Values

Economic Benefits of Protecting Green Infrastructure

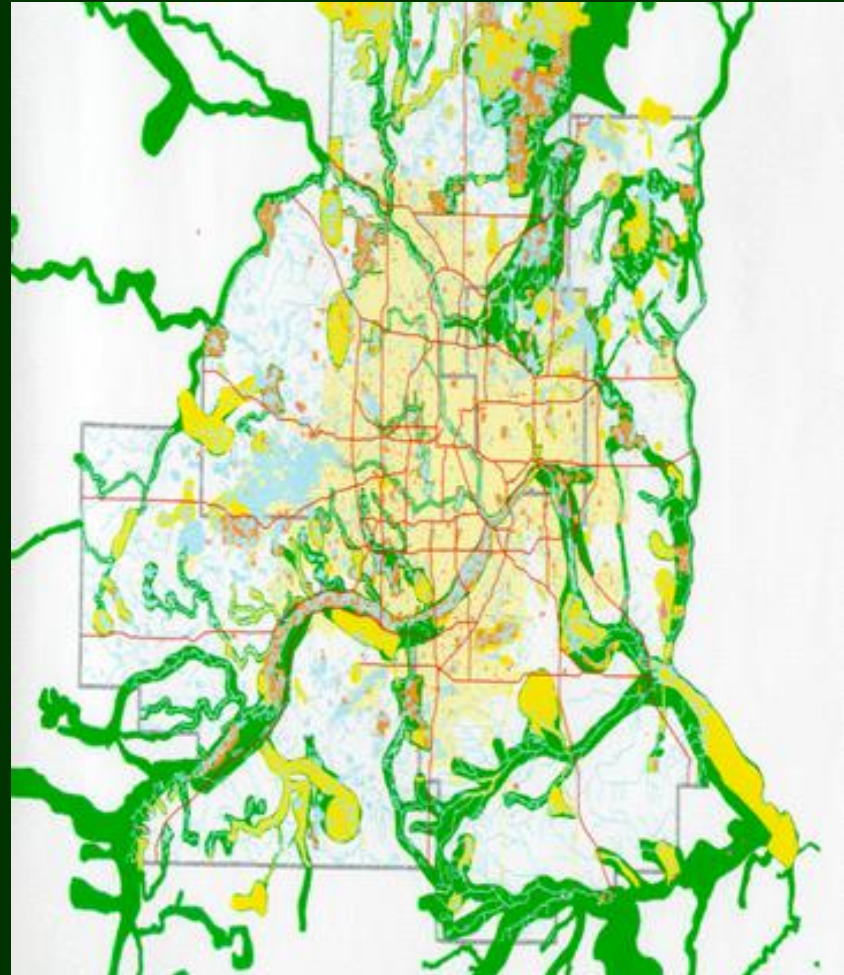
- Natural Systems
- Working Lands
- Nature – Based Tourism
- Real Estate
- Cost of Community Services
- Quality of Life – Existence Value



Strategic Conservation Planning Using A Green Infrastructure Approach

The Green Infrastructure Approach

The green infrastructure approach is based on the identification, protection and long-term management of interconnected networks of conserved lands and other open spaces that cross political boundaries and span diverse landscapes and regions.



Strategic Conservation Planning Using A Green Infrastructure Approach

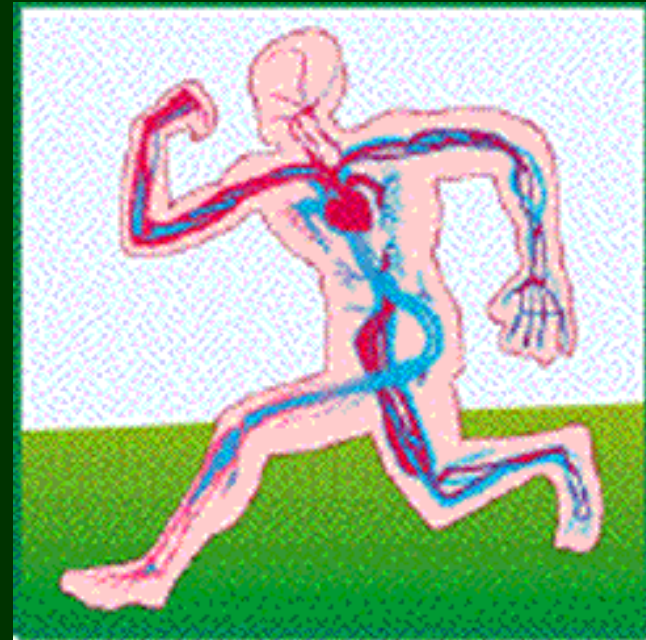
The Green Infrastructure Approach

It makes the rational argument that the conservation and maintenance of functional natural systems not only protect ecosystems values and functions . . .



Strategic Conservation Planning Using A Green Infrastructure Approach

The Green Infrastructure Approach



... but also provides diverse recreational, social, economic and health benefits to human populations.

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Session 8

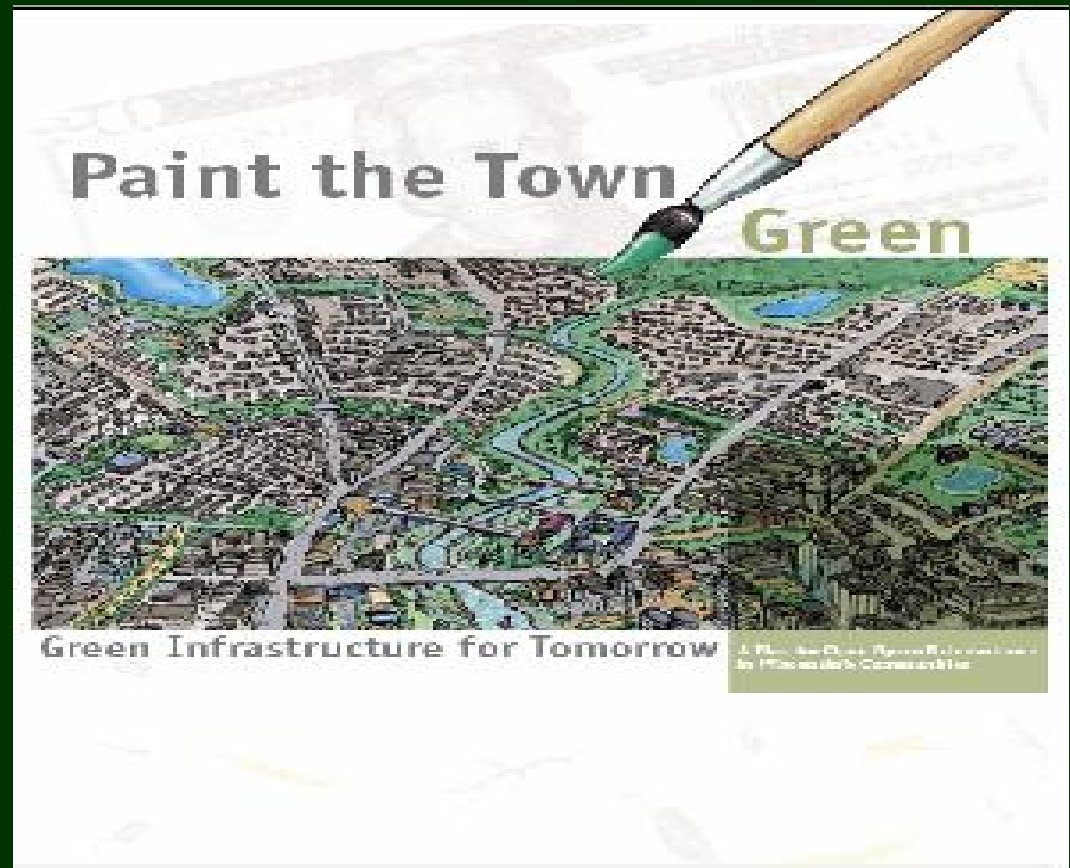
Keys to Success



Strategic Conservation Planning Using A Green Infrastructure Approach

Keys to Success

Steps for Undertaking A Green Infrastructure – Based Strategic Conservation Initiative In Your Community / Region



From: Community Open Space Partnership (WI), 2004

Strategic Conservation Planning Using A Green Infrastructure Approach

Keys to Success

1. Create a “Leadership Forum” for your green infrastructure initiative



Strategic Conservation Planning Using A Green Infrastructure Approach

Keys to Success

1. Create a Leadership Forum for your green infrastructure initiative – **Agencies represented here?**
2. Design a green infrastructure network to link green space components across scales & political boundaries
3. Develop an “implementation quilt” to make your network design a reality – **Matching available resources to network needs**

Keys to Success

4. Prepare a stewardship plan to monitor, restore and maintain your green infrastructure network over time
5. Inform and seek input from the public on your green infrastructure network design and plan
6. Adopt and use your green infrastructure network design and plan

Workshop

Develop a Workshop

Strategic Conservation Planning Using A Green Infrastructure Approach

Purpose of Workshop

1. Introduce the concept of Green Infrastructure
2. Describe examples of Green Infrastructure projects
3. Provide practical “how-to” information

Desired Outcomes

1. Provide the tools needed to stimulate interest of individuals, non-governmental organizations, and local governments
2. By emphasizing how it would provide economic and ecological benefits

Desired Outcomes

3. A series of one day workshops for public officials and communities throughout the Northern Colorado Front Range Area.
4. Application to on-going processes
 - STEP UP
 - US 50
 - Other examples??

Questions Answered by Workshop

1. What is Green Infrastructure?
2. What values does Green Infrastructure provide?
3. What are some examples of Green infrastructure at the local and regional level?
4. How can you connect Green Infrastructure efforts to current comprehensive planning processes?

Questions Answered by Workshop

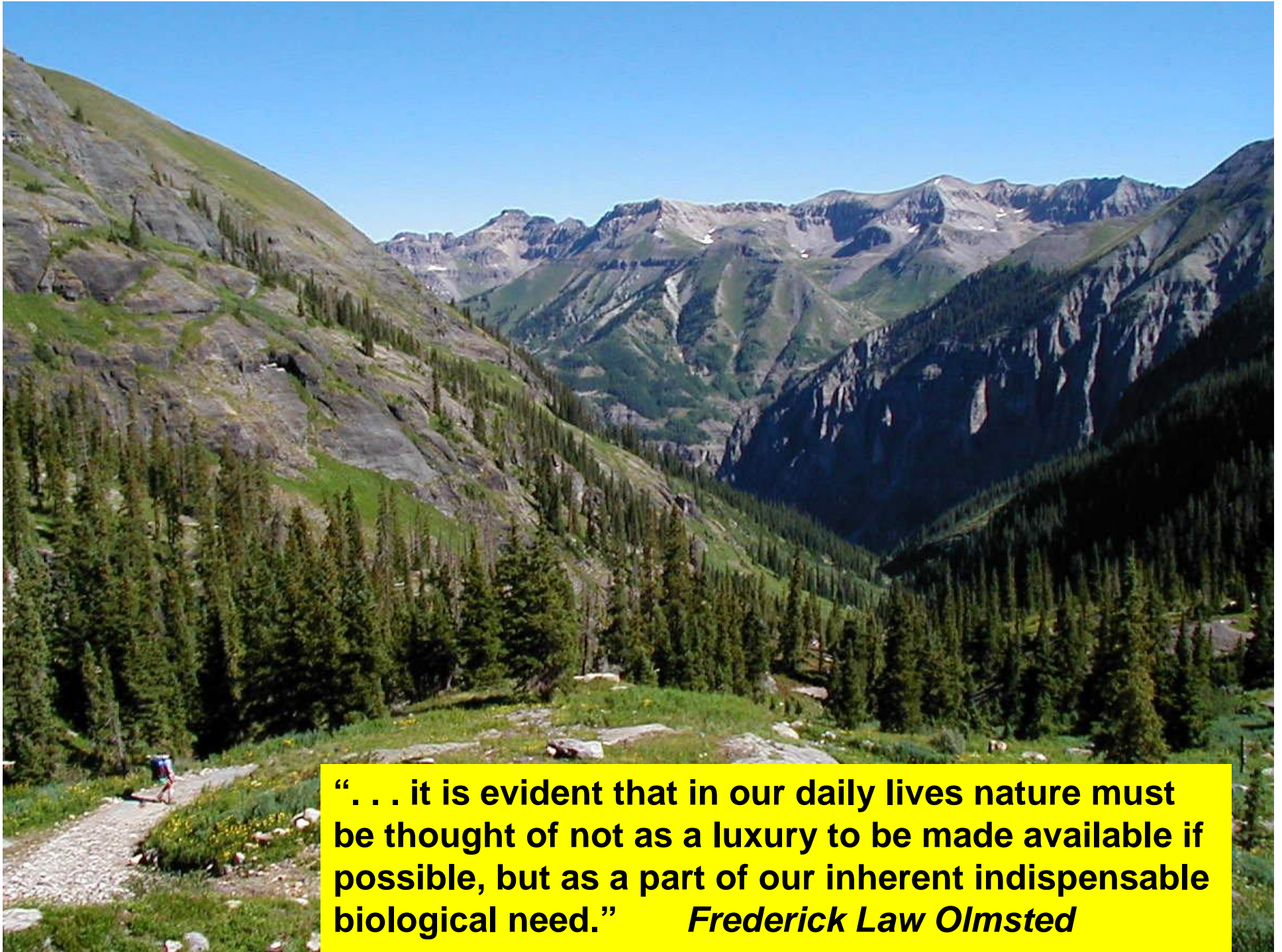
5. How can these efforts be connected into the overall statewide planning process?
6. What information and help is available in order to plan and implement a Green Infrastructure project?

What you need for Initial Workshop

- AUDIENCE
- WHERE
- WHEN
- INSTRUCTORS
- GUEST SPEAKERS
- AGENDA
- COSTS

For More Information

- ü Visit the Website – www.greeninfrastructure.net
- ü Read the Book: **Green Infrastructure: Linking Landscapes and Communities**
- ü Take the Course – **NCTC, June 12-16, 2006**
- ü Attend the workshop – **Fall 2006???**



“... it is evident that in our daily lives nature must be thought of not as a luxury to be made available if possible, but as a part of our inherent indispensable biological need.” *Frederick Law Olmsted*