The Model Sustainable Development Code Lives!!

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Rocky Piro, Colorado Center for Sustainable Urbanism
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Friday, 17 March 2017
10:15 a.m.
Rocky Mountain Land Use Institute 2017

Drake University Law School
Colorado Center for Sustainable Urbanism
University of Colorado Denver

The Model Sustainable Development Code Lives!!

Today's Presentation

- Introduction & Overview | Chris Duerksen
- Colorado Center for Sustainable Urbanism | CU Denver & Drake Partnership| What is the Code? | Rocky Piro
- Drake's Environmental & Sustainability Programs | Legal Aspects of Code Project | Example: Climate Section | Jonathan Rosenbloom
- Addressing Themes | The Code in the Classroom | Example: Green Infrastructure and Open Space Sections | Austin Troy
- Questions and Answers

What is the Code? What's in Store?

- What is the Colorado Center for Sustainable Urbanism?
- CU-Denver and Drake Partnership
- What's in the Model Sustainable Development Code?
- What's in Store with the Code Project?

Colorado Center for Sustainable Urbanism

collaborative for addressing issues related to urban planning, land use & sustainability of cities

- hub of academic & applied research projects
- source of technical assistance & services to professionals & decision makers
- repository & communicator of information & best practices related to planning & sustainability
- convener & facilitator on key planning issues

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Colorado Center for Sustainable Urbanism

What is Sustainable Urbanism?

In an urban context, sustainability means making decisions about development, the economy, and transportation in a manner that simultaneously –

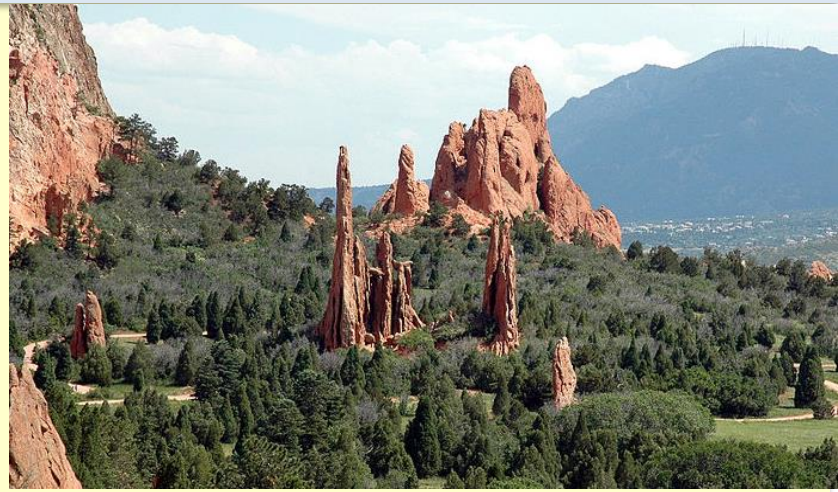
advances the well-being of people
AND creates economic vitality
AND is beneficial to the environment.

Colorado Center for Sustainable Urbanism

CCSU

We are proud to advance urban and environmental solutions, that are not business-as-usual, but are bold, pioneering, and make a difference for people here today and for future generations.

Colorado Center for Sustainable Urbanism



Projects and Initiatives

- Hazard Mitigation and Resiliency Guidebook | Colorado Department of Local Affairs
- Sustainable Community Development Code
- Creating Healthy places through Transformational Education and Design | Colorado Health Foundation
- Plan4Health Colorado | American Planning Association
- West Denver Renaissance Collaborative | Denver Housing Authority | CityCraft
- North Tahoe Preservation Alliance
- RINO Arts District

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CU-Denver and Drake Partnership

A New Beginning for the Code . . .

- Center for Sustainable Urbanism worked with Rocky Mountain Land Use Institute to migrate Code to CU-Denver website in 2016
- **Partnership – Center & Drake University Law School = wide collaboration among faculty, students, practitioners**
- Ongoing – maintenance, updating, refreshing & expanding Code
- **Support – advisory committee of land use, sustainability experts**

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What's in the Sustainable Development Code?

9 Chapters | 23 Category Groupings

- Environmental Health & Natural Resources
- Natural Hazards
- Land Use and Community Character
- Mobility and Transportation
- Community
- Healthy Neighborhoods, Housing, Food Security
- Energy
- Livability

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What's in the Sustainable Development Code?

23 Category Groupings | *at present*

- Natural Resources & Resource Conservation
- Natural Hazards – Steep Slopes
- Natural Hazards – Coastal
- Natural Hazards – Wildfires (Wildland-Urban Interface)
- Climate Change
- Livability – Noise
- Livability – Lighting
- Livability – Visual Elements

What's in the Sustainable Development Code?

23 Category Groupings *(continued)*

- Transit-Oriented Development
- Urban Form & Density
- Historic Preservation
- Community Health & Safety
- Food Production & Security
- Housing Diversity & Accessibility
- Affordable Housing
- Community Development

What's in the Sustainable Development Code?

23 Category Groupings *(continued)*

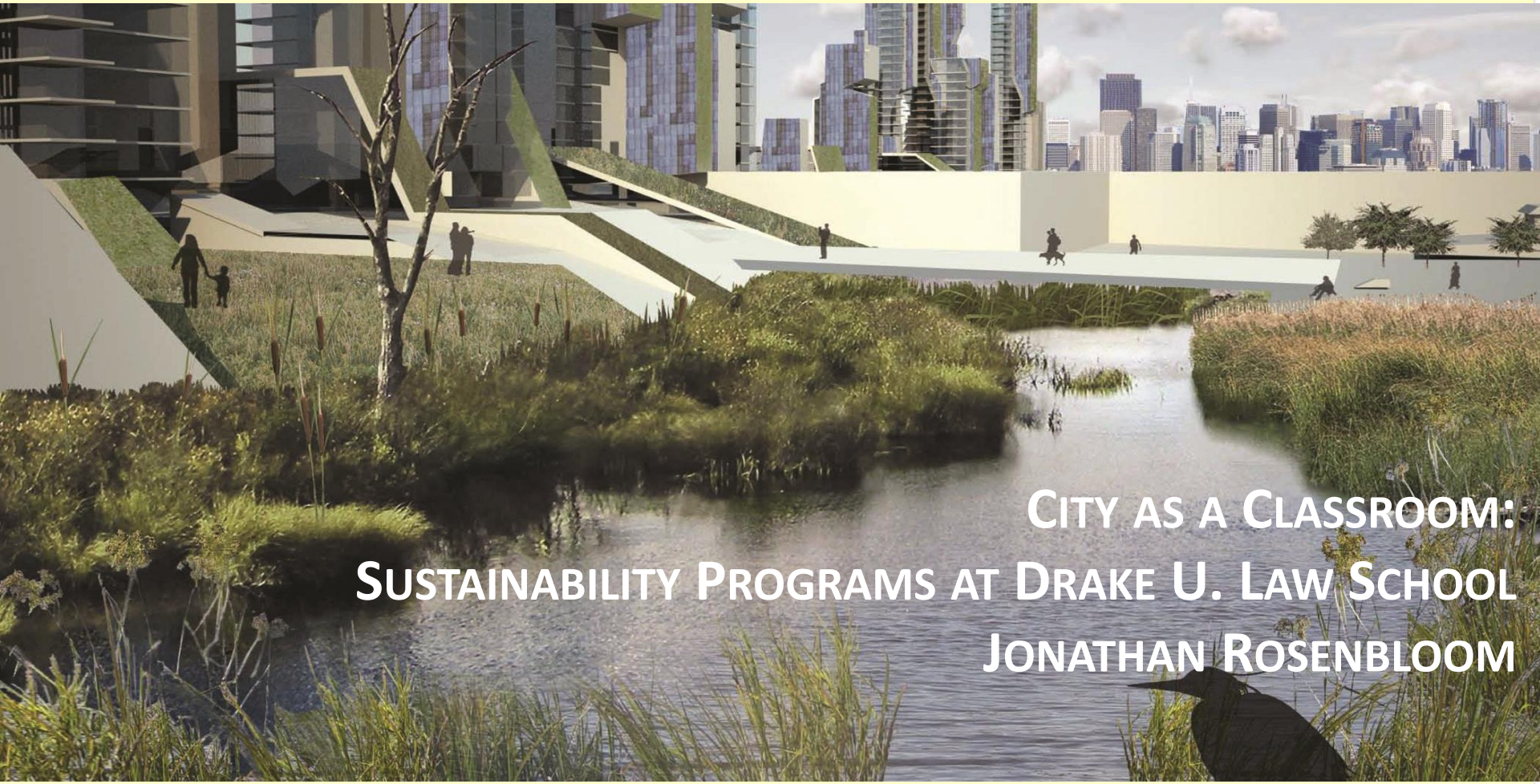
- Complete Streets
- Low Impact Development & Green Infrastructure
- Parking
- Solar Access
- Waste Management
- Wind Power
- Public Participation & Community Benefits

What's in Store for the Code Project?

Next Steps . . .

- Continue to update & refine existing information . . .
- Explore new categories . . .
- Reach out to new contributors . . .
- Work with student teams at both universities . . .
- Update the web format . . .

What's in Store for the Code Project?



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SUSTAINABILITY: ~~TWO~~ THREE! PRONG APPROACH

1. Classroom Component

2. Fellowship in Sustainability

Drake UNIVERSITY Law School

THE greater DES MOINES partnership

3. Sustainable Development Code

Drake UNIVERSITY Law School

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Classroom Component

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Classroom Component

Vet, Research, Develop, Repeat

- Identification of Local Challenges
  - Input / Feedback (ex. damage/costs from flooding)
- Review of Existing Local Laws
  - Input / Feedback (ex. reg. of parking lots or street design)
- Research Best Practices & Viability
  - Input / Feedback (ex. maximum v. minimum lot sizes)
- Multiple Presentations
  - Input / Feedback

EXAMPLE: MCDONALD'S & KFC, CLIVE, IOWA

- Code requires 15 parking spaces per 1,000 sq. ft. area.
- **4,000 square foot McDonald's would have to provide 60 parking spaces minimum.**
- Lot size could result at 16,000 square feet – four times size of restaurant.

Classroom Component

Vet, Research, Develop, Repeat

- Identification of Local Challenges
  - Input / Feedback (ex. damage/costs from flooding)
- Review of Existing Local Laws
  - Input / Feedback (ex. reg. of parking lots or street design)
- Research Best Practices & Viability
  - Input / Feedback (ex. maximum v. minimum lot sizes)
- Multiple Presentations
  - Input / Feedback

CLASSROOM COMPONENT

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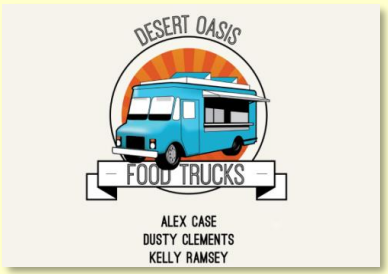
Most Recent Sustainability & the Law Course

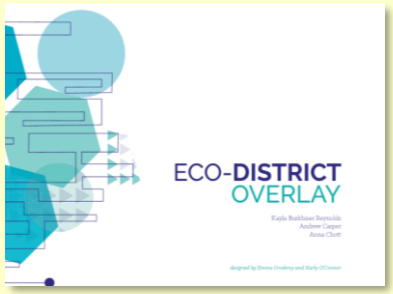
Incentivizing bike usage



Diversifying food options through food trucks

Enhancing park management standards

Encouraging sustainability with Eco-district Overlay



Enhancing low-income access to nutritious & local foods through school lunch

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Final Presentation before Policy Makers

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Drake Law Fellowship in Sustainability

- Refine, Improve, & Expand Ordinances
- Research Costs / Benefits
  - Input / Feedback
- Refine Initial Proposals & Further Research
  - Input / Feedback
- Finalize Proposals & Draft Model Ordinances
  - Input / Feedback
- Facilitate Adoption
  - Windsor Heights, Ankeny, Des Moines, Johnston, Carlisle, etc.

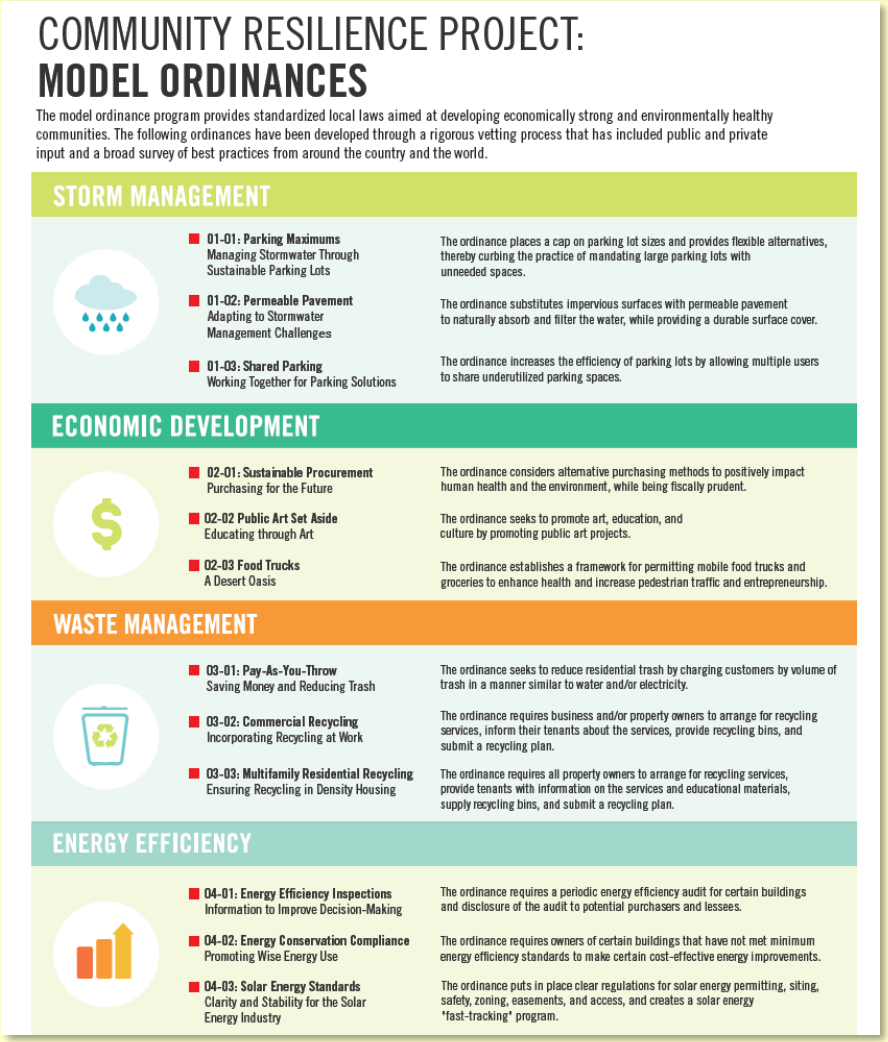
Model Ordinances

Storm Management

Economic Development

Waste Management

Energy Efficiency



COMMUNITY RESILIENCE PROJECT:
MODEL ORDINANCES

The model ordinance program provides standardized local laws aimed at developing economically strong and environmentally healthy communities. The following ordinances have been developed through a rigorous vetting process that has included public and private input and a broad survey of best practices from around the country and the world.

STORM MANAGEMENT

- **01-01: Parking Maximums** Managing Stormwater Through Sustainable Parking Lots — The ordinance places a cap on parking lot sizes and provides flexible alternatives, thereby curbing the practice of mandating large parking lots with unneeded spaces.
- **01-02: Permeable Pavement** Adapting to Stormwater Management Challenges — The ordinance substitutes impervious surfaces with permeable pavement to naturally absorb and filter the water, while providing a durable surface cover.
- **01-03: Shared Parking** Working Together for Parking Solutions — The ordinance increases the efficiency of parking lots by allowing multiple users to share underutilized parking spaces.

ECONOMIC DEVELOPMENT

- **02-01: Sustainable Procurement** Purchasing for the Future — The ordinance considers alternative purchasing methods to positively impact human health and the environment, while being fiscally prudent.
- **02-02 Public Art Set Aside** Educating through Art — The ordinance seeks to promote art, education, and culture by promoting public art projects.
- **02-03 Food Trucks** A Desert Oasis — The ordinance establishes a framework for permitting mobile food trucks and groceries to enhance health and increase pedestrian traffic and entrepreneurship.

WASTE MANAGEMENT

- **03-01: Pay-As-You-Throw** Saving Money and Reducing Trash — The ordinance seeks to reduce residential trash by charging customers by volume of trash in a manner similar to water and/or electricity.
- **03-02: Commercial Recycling** Incorporating Recycling at Work — The ordinance requires business and/or property owners to arrange for recycling services, inform their tenants about the services, provide recycling bins, and submit a recycling plan.
- **03-03: Multifamily Residential Recycling** Ensuring Recycling in Density Housing — The ordinance requires all property owners to arrange for recycling services, provide tenants with information on the services and educational materials, supply recycling bins, and submit a recycling plan.

ENERGY EFFICIENCY

- **04-01: Energy Efficiency Inspections** Information to Improve Decision-Making — The ordinance requires a periodic energy efficiency audit for certain buildings and disclosure of the audit to potential purchasers and lessees.
- **04-02: Energy Conservation Compliance** Promoting Wise Energy Use — The ordinance requires owners of certain buildings that have not met minimum energy efficiency standards to make certain cost-effective energy improvements.
- **04-03: Solar Energy Standards** Clarity and Stability for the Solar Energy Industry — The ordinance puts in place clear regulations for solar energy permitting, siting, safety, zoning, easements, and access, and creates a solar energy "fast-tracking" program.

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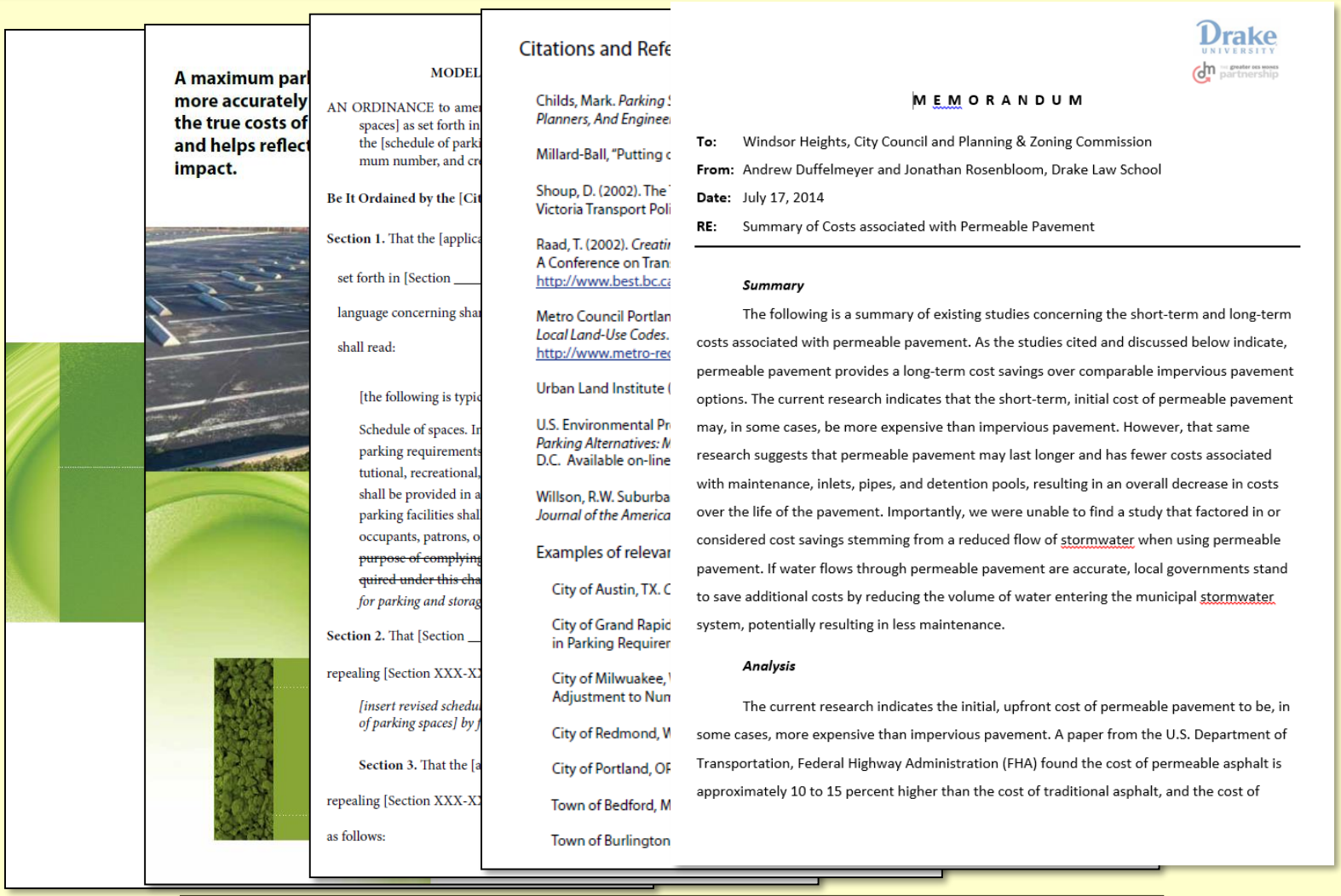
ABSTRACTS, ORDINANCES, & ANALYSES



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Success!

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SUSTAINABLE DEVELOPMENT CODE: CHAPTERS

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2. Environmental Health and Natural Resources
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    - 2.2. Green Infrastructure
    - 2.3. Natural Resource Conservation/Sensitive Lands Pro.
    - 2.4. Water Conservation
    - 2.5. Waste Management
3. Natural Hazards
    - 3.1. Floodplain Management
    - 3.2. Wildfires in the Wildland-Urban Interface
    - 3.3. Coastal Hazards (Code 1.5)
    - 3.4. Steep Slopes
4. Land Use and Community Character
    - 4.1. Character and Aesthetics
    - 4.2. Urban Form and Density
    - 4.3. Historic Preservation
5. Mobility & Transportation
    - 5.1. Transit Oriented Development
    - 5.2. Mobility Systems
        - 5.2.1. Complete Streets
        - 5.2.2. Bicycle Mobility Systems
        - 5.2.3. Pedestrian Mobility Sys.
    - 5.3. Public Transit
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    - 6.2. Public Participation and Community Benefits
7. Healthy Neighborhoods, Housing, Food Security
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    - 7.2. Affordable Housing
    - 7.3. Housing Diversity and Accessibility
    - 7.4. Food Production and Security
8. Energy
    - 8.1. Renewable Energy: Wind (small- and large-scale)
    - 8.2. Renewable Energy: Solar (including solar access)
    - 8.3. Energy Efficiency and Conservation
9. Livability
    - 9.1. Noise
    - 9.2. Lighting
    - 9.3. Visual Elements

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CHAPTER ORGANIZATION: 3 X 3 GRID

CLIMATE CHANGE & GREENHOUSE GAS REDUCTIONS

	ACHIEVEMENT LEVELS		
	Bronze (Good)	**Silver (Better)**	**Gold (Best)**
Remove Barriers	▪ Allow mixed-use development by right in selected zone districts (88) ▪ Permit solar and small wind turbines by right in selected zone districts (40, 41, 47) ▪ Allow accessory units and live/work units by right in residential zone districts ▪ Allow limited live-work units in most districts ▪ Permit small-scale recycling facilities in residential zone districts ▪ Reduce overly restrict height/setback requirements for small-scale wind turbines ▪ Create Safe Routes to school, work, and nature to make walking and biking more viable (65)	▪ Allow larger recycling facilities in appropriate industrial and commercial zone districts ▪ Reduce parking requirements across districts ▪ Tailor development standards (e.g., landscaping, open space, parking) to encourage infill and mixed-use development (e.g., alternative open space such as plazas, community gardens, green roofs; reduced landscaped buffers with enhanced ornamental fencing) (86) ▪ Allow for more compact living. ▪ Provide property tax exemptions for renewable energy systems such that the value of systems would not add to the taxable value of a property (51) ▪ Set back issues	▪ Require all single-family developments to include minimum % of accessory units ▪ Prohibit single-use developments/buildings in commercial zone districts (e.g., downtown) ▪ Prohibit urban level development (e.g., more than 1 unit/acre) outside defined urban service areas ▪ Establish maximum parking requirements (62) ▪ Create district heating and cooling zones
Adopt Incentives	▪ Incentivize the reuse existing infrastructure and buildings to reduce consumption and related GHGs emitted in building them. ▪ Offer density/height bonuses for green roofs ▪ Give bonus points for green/cool roofs in commercial design standard point systems	▪ Reduce transportation impact fees for mixed-use and infill projects to reflect lower traffic generation ▪ Create density bonus and expedited processing incentives for infill and mixed-use developments ▪ Allow green roofs to qualify for open space credits ▪ Offer height increases, density bonuses, and	▪ Encourage low-energy maintenance landscaping by giving additional landscaping credit. ▪ Encourage the maximizing of salvaged and reused materials to minimize waste and the need for new products (32)

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CHAPTER ORGANIZATION: 3 X 3 GRID

Fill Regulatory Gaps	▪ Require sidewalks in all developments and connections with adjacent sites ▪ Adopt historic preservation standards to protect existing structures (and energy they represent) (87) ▪ Require replacement of all trees removed during development on an inch/inch diameter basis or contribution to offsite tree fund ▪ Limit trees on southern sides of buildings in northern climates to preserve solar access ▪ Adopt regulations to protect larger trees ▪ Require provision of bicycle racks in all multifamily and commercial developments ▪ Require all new city construction to comply with minimum construction standards set forth by third party certification minimums, such as LEED Gold or Platinum, or Three Green Globes ▪ Place public accommodations, such as parks and schools close to each other so that people can easily walk, bike, use public transit, or drive shorter distances ▪ Require smart metering of energy and water for all building types (73)	▪ Require an small increase in canopy cover on-site ▪ Enact minimum density/intensity standards to encourage compact development ▪ Adopt pedestrian connectivity standards to reduce vehicle use ▪ Enact solar access ordinance (See Renewable Energy/solar access section.) ▪ Require bicycle fleets for all hotels, resorts ▪ Limit number of garages allowed on each residential lot (1-2 vs. 3-4) ▪ Limit impermeable surface areas and require use of permeable pavement in appropriate areas ▪ Adopt IPCC (green code) or California Green Building Standards (74) ▪ Require all new construction to comply with minimum construction standards set forth by third party certification minimums, such as LEED Gold or Platinum, or Three Green Globes (78) ▪ Require compliance with LEED for Existing Buildings (75) ▪ Require city parks to comply with The Sustainable Sites Initiative ▪ Require energy audits of commercial and/or multi-family buildings to be performed upon certain real estate events such as renovation rental or sale	▪ Require green roofs on all commercial and multifamily developments. ▪ Require low-energy landscaping. ▪ Enact limitations on house size ▪ Adopt minimum reforestation requirements for sites without vegetation. ▪ Establish mandatory carbon budgets/limits for new developments (emissions from added traffic, energy used in construction materials, future energy requirements) and offsets/impact fees ▪ Require minimum % of homes in subdivisions to be oriented for passive solar access (on an east/west axis) (See Renewable Energy/solar access section.) ▪ Require outdoor signage to be turned off when business is closed ▪ Require new developments to be carbon neutral ▪ Require on site-energy minimus ▪ Require minimum percentage of or all

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EACH RECOMMENDATION

Commercial Energy Audits (Spring 2017)

Introduction

Commercial energy audits simultaneously help reduce energy costs and greenhouse gases (GHGs), while creating a more sustainable building stock. This recommendation would require owners of large commercial buildings to perform an energy audit at least once every five years or upon the occurrence of a specified real estate event, such as sale, major renovation, or lease. The energy audit option provides flexibility to local governments because local officials can craft the audit requirements to address only the criteria important to a specific jurisdiction. For example, standards in Phoenix, Arizona may focus more on energy used in cooling, as opposed to Grand Forks, North Dakota, which may focus on energy used in heating.

Once an audit is performed the building owner will receive a detailed report indicating whether the building is in compliance with the criteria. If the building is in compliance, the owner will receive a Certificate of Compliance, which is filed with the city clerk or similar city administrator. If the building fails to comply with the set standards, the audit will include a Certificate of Non-compliance - also filed with the city – and details on how to come into compliance. While there are no penalties for failing to comply with the audit criteria, failure to complete an energy audit when required does result in fines for building owners.

Why energy audits?

Energy is a significant cost in operating commercial buildings and can range between 20-

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EACH RECOMMENDATION

Cities also gain a more energy-efficient and sustainable building stock that often results in higher assessed values. For example, Energy Star labeled office buildings have not only higher occupancy and building valuations, but also higher rental rates and sale prices. [5] Energy efficiency policies can also "galvanize local economic development as new businesses take shape and energy dollars stay in the community."[6] Rather than paying utility companies, commercial property owners can invest additional monies into their properties or consume additional local services.

Below we list several local governments that have adopted commercial audit ordinances and we set forth a model ordinance drafted by the Drake Law School, Fellowship in Sustainability.

Examples:

- Burlington, Vermont, Municipal Code § 18-501.
- Berkeley, California, Municipal Code § 19.16.040.
- Austin, Texas, Municipal Code § 6-7-5.
- Minneapolis, Minnesota, Municipal Code § 47.190.

[4] *The Business Case for Energy Efficiency*, U.S. Environmental Protection Agency, http://www.energystar.gov/buildings/about-us/how-can-we-help-you/build-energy-program/business-case (last accessed June 12, 2014).

[5] Greg Kats, *Summary of the Financial Benefits of Energy Star Labeled Office Buildings* (February 2006), *available at* http://www.energystar.gov/ia/partners/publications/pubdocs/Summary_of_the_Financial_Benefits_23June06_FINAL.pdf?f627-23b4; Norm Miller, Jay Spivey and Andy Florance. *Does Green Pay Off?* (July 2008), *available at*

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Model Code

MODEL ORDINANCE NO. _____ (Energy Conservation, Inspection and Disclosure Ordinance)

AN ORDINANCE to amend [Section XXX-XXX] of the [City Code], by enacting a new [Section XXX-XXX] relating to energy conservation inspection and disclosure.

Be it Ordained by the [City Council]:

Section 1. That the [Applicable Section] set forth in [Section XXX-XXX] of the [City Code], be and the same is hereby amended by enacting one new [Section XXX-XXX] with language set forth as follows:

Section XXX-XXX. Energy Conservation Inspection and Disclosure.

(a) Purpose and Intent[i]

(1) The purpose of this Section is to promote the wise and efficient use of energy in certain buildings.

(2) The intent of this Section is to encourage efficient use of energy by requiring the following:

(a) A periodic energy Inspection for each Covered Building and Multifamily Complex; and

(b) Reporting and disclosure of inspection information.

(8) "Multifamily Complex" means a structure or any portion of a structure containing five or more dwelling units.[iv]

(9) "Warning Notice" means a document notifying a title holder of failure to abide by this Ordinance and indicating the title holder has forty-five (45) business days to abide by applicable requirements before being subject to penalties.[v]

(c) Inspection of Covered Buildings and Multifamily Complexes[vi]

(1) The title holder of a Covered Building or Multifamily Complex shall cause an Inspection to be performed on the building at least once every five years.

(2) An Inspection must be performed by an Inspector.

(3) The Inspector shall complete and sign an Inspection Report, which details the results of an audit that analyzes whether the building complies with the Minimum Energy Efficiency Standards.

(a) If an Inspection finds the Minimum Energy Efficiency Standards are met, the Inspector shall include a Certificate of Compliance with the Inspection Report.

(b) If an Inspection finds the Minimum Energy Efficiency Standards are not met, the Inspector shall:

Integrating graduate student class project work into the Sustainable Communities Development Code Framework

By Austin Troy
CU Denver

Drake University Law School

Colorado Center for Sustainable Urbanism
University of Colorado Denver

CLASS: ENVIRONMENTAL PLANNING & MANAGEMENT

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The Assignment

Five categories

- ❖ Water conservation
- ❖ Sensitive lands/open space
- ❖ Wildfire and Wildland Urban Interface planning
- ❖ Green infrastructure/ stormwater
- ❖ *Urban Forestry*

One group/ category

Deliverables:

1. Create/ update, organize best practice "blurbs" (group)
   - Each best practice must be adopted somewhere
2. Write up "one pagers" (individual)

THE "ONE-PAGERS"

- Description of use and implementation
- **Evidence for why it's a good approach, citing literature, best practice manuals, logic, etc.**
- Cite where implemented in past and give relevant outcomes
- **References and links**
- In some cases there is a "background page" that provides context for a number of linked best practices

EXAMPLE ONE-PAGER

Utilize Environmental Impact Bonds to reduce government spending and increase outcomes-based green infrastructure development

Utilize Environmental Impact Bonds to reduce government spending and increase outcomes-based green infrastructure development

By Katherine Prince

Adopted in Washington, D.C.

An Environmental Impact Bond (EIB) is a capital investment tool that enables private investors to fund a public GI project in lieu of the government paying for it. EIBs are ideal in scenarios when the cost to the government is so extensive that it would be irresponsible to both use government funds and to let the project go unfulfilled. For example, if a municipal government must take funds from a public health program to pay for stormwater infrastructure, or vice versa, the outcome will pose a risk to public health and safety. By pursuing an EIB, which is a pay-for-performance contract, governments are able to afford the necessary interventions and investors are able to make a return on their investment (Balboa, 2016).

The pay-for-performance nature of EIBs means that the bonds are repaid once all desired environmental outcomes are reached, thus removing risk associated with issuing the bond and placing it solely on the investor (Balboa, 2016). However, risk is already relatively low as the environmental interventions being funded are generally mandated by federal regulations under the Clean Water Act. Therefore, investors see this as an opportunity to fund mandatory, no-fail projects that will provide the public with essential ecosystem services.

In 2016, Goldman Sachs, the Calvert Foundation, and DC Water entered into the first EIB in the country, proving that the widely studied investment tool is no longer experimental. The bond will fund GI projects solely focused on enhancing the environment's natural ability to infiltrate stormwater and reduce sewer flooding. All three parties are technically investors in the arrangement, and the terms of the deal are subject to outcomes. If the projects outperform rainfall reduction expectations, DC Water will repay investors; should the projects underperform expectations, Goldman Sachs and the Calvert Foundation pay DC Water (DC Water, 2016).

As with any investment, costs and benefits must be weighed prior to making a decision. EIBs should be avoided as a financial GI BMP if the cost of privately sourced interventions are more expensive than the projected costs to the government should the issue be addressed when governmental funding becomes available (NatLab). It requires a thorough cost-benefit analysis of market and non-market goods, such as ecosystem services, to determine the true cost of the issue to the public and the environment. Although the outcomes of the DC Water EIB are still unknown, the EIB is a well-researched and fully implemented practice for GI implementation. It is recommended for use with moderate to large-scale stormwater management planning at the municipal or state level.

References:

Balboa, C.M. (2016). Accountability of Environmental Impact Bonds: The Future of Global Environmental Governance? *Global Environmental Politics* 16(2): 33-41.

District of Columbia Water and Sewer Authority. (2016). Fact Sheet: DC Water Environmental Impact Bond. Washington, D.C. Retrieved from https://www.dcwater.com/news/listings/documents/DC%20Water%20EIB%20Fact%20Sheet%20FINAL%2009-29-16.pdf.

NatLab. (2014). Creative Financing Solutions for Green Infrastructure. Beyond the Basics Seminar 2014 Presentations, The Conservation Foundation. Retrieved from http://www.theconservationfoundation.org/conservation/images/Keynote%201%20Natlab_Beyond_Basics_Chicago_2014(2).pdf.

Presenting and Evaluating

- 20 minute presentation per group
- One subject expert per category, plus Clarion
  - Denver Forestry
  - Denver Public Works
  - USGS
  - Denver Water
  - Wildfire Planning Int'l
- Written feedback from experts & instructor

EVALUATION

Group

Group portion:	Comments	Score
Quality and relevance of best practices chosen		/20
Quality of formatting and organization		/10
Total Group:		**/30**

Individual

Individual portion:		
Description of best practices		/20
Quality of justification		/20
Use of examples and references		/20
Writing		/10
Total Individual:		**/70**

Total Score Combined: /100

EXAMPLE 1: STORMWATER/ GREEN INFRASTRUCTURE

Green Infrastructure Best Management Practices | Organized Under Thematic Policy Headings and Recommended Level Rating

Enact Standards or Regulations	Level
Require that development infiltrate 91% of runoff though onsite management through Public Private Partnerships (PPP).	
Require private property owners to use natural drainage systems to minimize impervious surfaces and manage runoff.	
Educate and Disseminate	
Create, organize, and perform a Demonstration Project.	
Educate the public about stormwater green infrastructure though meetings, workshops, tours, school programing, art, and online.	
Capital Investments	
Create or join a green infrastructure coalition for investment and funding opportunities.	
Utilize Environmental Impact Bonds to reduce government spending and increase outcomes-based green infrastructure development	

Create Incentives and Market Mechanisms	
Implement a Green Permit Program for preferential treatment of GI permits.	
Assess stormwater fees and offer rebates, credits, incentive payments, or grants.	
Remove Obstacles	
Implement green roofs and walls policies to encourage citizens to pursue GI and raise community awareness of plant selection and opportunities.	
Require building amendments to ensure all buildings are able to handle future retrofitting.	
Utilize Technical Tools	
Install rain gardens as a bioretention/bioinfiltration measure that mimics natural hydrology.	
Adapt modeling tools to track and manage green infrastructure practices for hydrological purposes.	

Gold Silver Bronze

EXAMPLE 1: STORMWATER/ GREEN INFRASTRUCTURE

Capital Investments

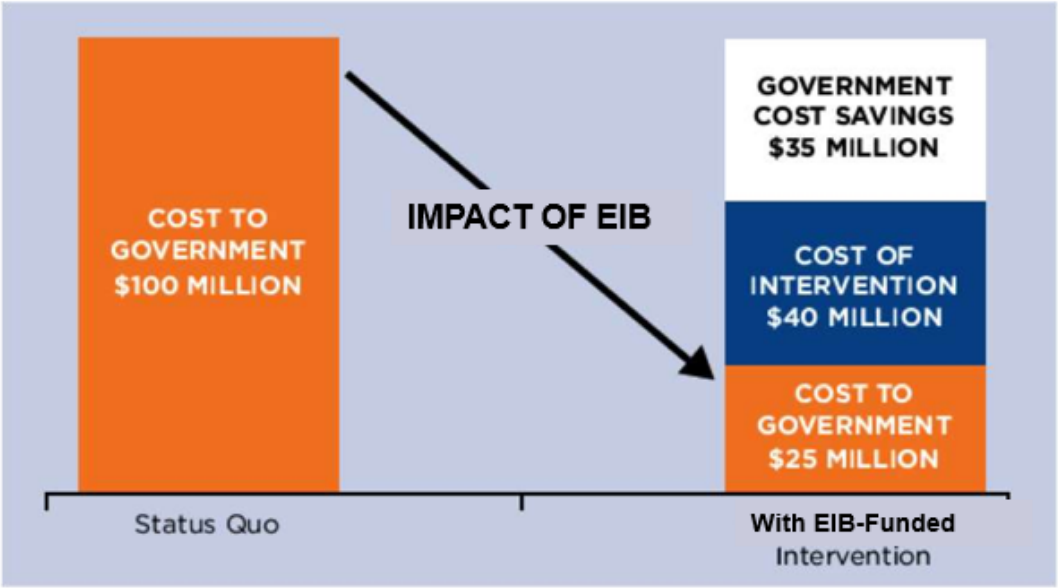
Utilize Environmental Impact Bonds (EIBs) to reduce government spending and increase outcomes-based green infrastructure development.

Implemented:

- Washington, D.C.

Justification:

- Reduced government spending
- Relatively low-risk
- Large-scale projects



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EXAMPLE 1: STORMWATER/ GREEN INFRASTRUCTURE

Create Incentives and Market Mechanisms

Implement a Green Permit Program for preferential treatment of GI permits.

Implemented:

- Chicago, IL
- Scottsdale, AZ
- Seattle, WA

Justification:

- *Flexible and customized*
- *Effective*
- *Work at any scale*

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EXAMPLE 1: STORMWATER/ GREEN INFRASTRUCTURE

Create Incentives and Market Mechanisms

Assess stormwater fees and offer rebates, credits, incentive payments, or grants.

Implemented:

- Philadelphia, PA
- Champaign, IL
- Palm Bay, FL

Justification:

- Participatory
- Flexible
- Localized results

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EXAMPLE 1: STORMWATER/ GREEN INFRASTRUCTURE

Capital Investments

Create or join a green infrastructure coalition for investment and funding opportunities.

Implemented:

- US EPA
- COP21
- Washington, D.C.

Justification:

- Build partnerships
- Affordable financing options
- Encourage innovation

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EXAMPLE 2: OPEN SPACE

Remove Obstacles		
Gold	**Silver**	**Bronze**
Implement a Comprehensive Plan		Allow conservations subdivisions in environmentally sensitive and urban/rural transition areas by right.
	Adopt rural zoning of at least 20 acres per dwelling unit, (and ideally 80+ acres) in sensitive wildlife habitat areas	Adopt Creative Open Space Fees and Taxes
		Reduce sprawl and protect open space and habitat by allowing mixed-use development districts that encourage denser development by-right

Create Incentives and Market Mechanisms		
Gold	**Silver**	**Bronze**
Offer density bonuses for provision of large blocks of contiguous open space	Allow conservation subdivisions in environmentally sensitive and urban/rural transition areas by right and provide density bonuses, low or no minimum lot sizes, and an expedited review process.	Implement an Urban Growth Boundary
		Offer density bonuses for provision of large blocks of contiguous open space

Enact Standards		
Gold	**Silver**	**Bronze**
Require the use of conservation subdivisions and prohibit or limit conventional subdivisions in environmentally sensitive and urban/rural transition areas.	Protect + Grow an Ecological Corridor in the Public Realm Using Native Plants	
		Require use of native plants in landscaping plans

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Example 2: Open Space

Educate and Disseminate		
Gold	**Silver**	**Bronze**
	Create strong volunteer programs that give the public opportunities to participate in protecting and maintaining open space and environmentally sensitive lands.	Identify and map critical ecological areas where development should be discouraged.

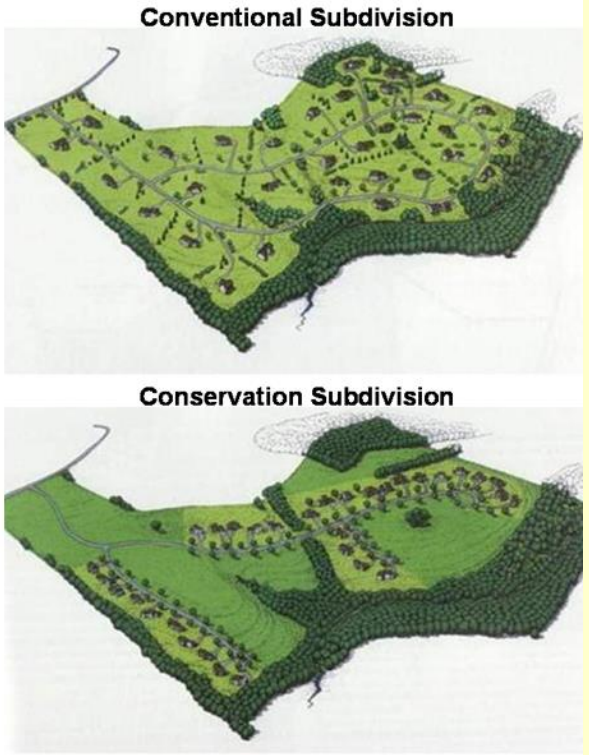
Capital Investments		
Gold	**Silver**	**Bronze**
Develop a comprehensive green infrastructure plan and dedicate a significant and recurring funding source for the acquisition of land.	Acquire Land in Sensitive Areas	
	Use conservation easements to permanently protect areas of open space.	

EXAMPLE 2: OPEN SPACE

Enact Standards | Gold

Require the use of conservation subdivisions and prohibit or limit conventional subdivisions in environmentally sensitive and urban/rural transition areas.

- Saratoga Springs:
  - Required in Rural Residential and Suburban Residential 1 districts
  - 50% minimum open space in RR; 35% minimum open space in SR-1
  - Exception: no reasonable basis for conservation subdivision on property



Source: City of Saratoga Springs. Municipal Code, Chapter 241, Article IV.

Image Source: Seacoast Watershed Information Manager

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EXAMPLE 2: OPEN SPACE

Educate and Disseminate | Bronze

Identify and map critical ecological areas where development should be discouraged.

- Enlist local experts in biology, conservation, ecology
- Remote sensing and GIS
- Site- and species-specific studies
- California Essential Habitat Connectivity Network

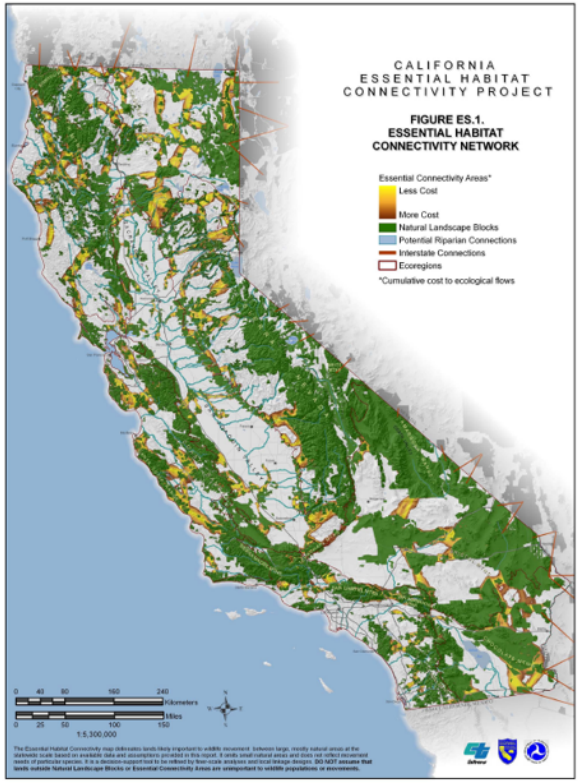

Image Source: California Essential Habitat Connectivity Project

Sources: Environmental Law Institute. (2003). Conservation Thresholds for Land Use Planners. Washington, DC: Environmental Law Institute.
Spencer, W.D., Beier, P., Penrod, K., Winters K., Paulman, C., Rustigian-Romsos, H., Strittholt, J., Parisi, M., & Pettler, A. 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration.

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EXAMPLE 2: OPEN SPACE

Capital Investments | Gold

Develop a comprehensive green infrastructure plan and dedicate a significant and recurring funding source for the acquisition of land.

- "an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations"
- Part of annual budget, like other infrastructure
- Development fees, real estate transfer taxes, and bond referenda
- Not all land must be publicly owned
- Maryland's GreenPrint Program
  - Anne Arundel Greenways Master Plan

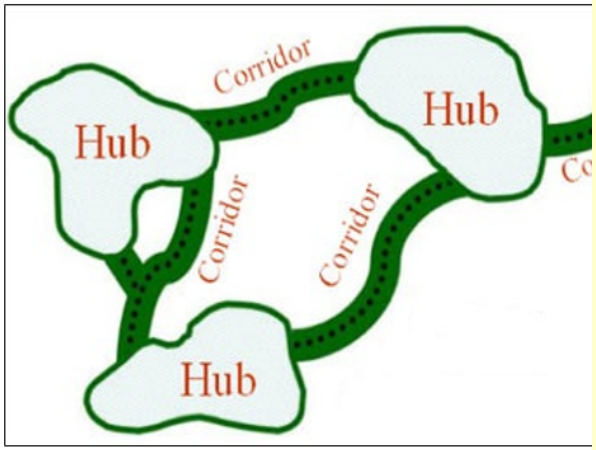

Image Source: MD Dept. of Natural Resources

Sources: Benedict, M.A. & McMahon, E.T. (2006). *Green Infrastructure: Smart Conservation for the 21st Century.* The Conservation Fund and Sprawl Watch Clearinghouse. Retrieved from www.sprawlwatch.org/greeninfrastructure.pdf

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EXAMPLE 2: OPEN SPACE

Remove Obstacles | Gold

Adopt Creative Open Space Fees and Taxes

- Park Impact Fees used by local governments to force developers to provide adequate compensation for any additional stress on a public facility caused by additional development.
  - Example: City of Santa Monica
- Open Space Taxes used by all different levels of government to collect public funds to acquire land or development rights for open space preservation
  - Example: Boulder County

Image Source: http://www.trbimg.com/

Sources: Boulder County. (2016). Open Space Funding Sources.
City of Los Angeles. (2016). Report on Park Fees Ordinance and Related Fees Strategies.
Nelson, E., Uwasu, M., & Polasky, S. (2007). Voting on open space: What explains the appearance and support of municipal-level open space conservation referenda in the United States? Nelson, A. C., & Duncan, J. B. (1995). *Growth management principles and practices*. Chicago, Ill:Washington D.C;: Planners Press, American Planning Association.

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EXAMPLE 3: URBAN FORESTRY

REMOVE OBSTACLES		
Gold	**Silver**	**Bronze**
Adopt and Implement Tree Management and Maintenance Plan	Enact an ordinance that ensures development conserves and plants trees	Create a tree board or arborist advisory committee
Develop a budget and identify funding to implement the tree management plan		

ENACT STANDARDS OR REGULATION		
Gold	**Silver**	**Bronze**
Ensure that tree ordinances are incorporated into the development code	Hire permanent urban forestry enforcement personnel in order to guarantee present and future maintenance	Create and adopt a basic street tree ordinance that regulates the planting, maintenance and removal of trees within public rights-of-way
Create a "Public Tree Work Permit" process within the tree ordinance to require all entities to submit a permit application and receive approval before pruning, removing, or planting trees	Require forests to be left in similar pre-development conditions after construction occurs with measurable benchmarks	Create and adopt a "tree protection ordinance" that expands on the general tree ordinance by providing protection for historic, native trees or trees of other relevant significance

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EXAMPLE 3: URBAN FORESTRY

CREATE INCENTIVES AND MARKET MECHANISMS		
Gold	**Silver**	**Bronze**
Fund a reimbursement program for homeowners to plant desired tree species	*Support a volunteer program to help with tree maintenance and planting*	*Establish an awards program for dedicated citizens and builders that recognizes their efforts to improve the local tree canopy*
Offer financial assistance for new development to improve streetscapes beyond minimum standards	*Offer tax reductions to land holders in return for not developing heavily forested land*	*Create a significant tree recognition program to increase awareness of urban canopy importance*

EDUCATE AND DISSEMINATE		
Gold	**Silver**	**Bronze**
Implement urban forest activities in middle school, high school, and college	*Public workshops should be held to talk about controversial urban forestry issues*	*Publicize testimonials given from well-known businesses that participated in projects*
Implement knowledge of native trees to be used in urban forests by teaching classes or holding workshops	*Send out letters residentially where upcoming projects will be held and any information they should know about*	*Release articles in the local newspapers about upcoming projects and what groups are participating*
Workshops should be given to businesses and the community on the relationship between tree canopy and lowering heating costs	*Use outreach programs to plant trees to create outdoor classrooms*	*Use multiple forms of social media to reach a wide range of individuals*

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EXAMPLE 3: URBAN FORESTRY

Enact Standards & Regulations

BRONZE:

Create and adopt a basic street tree ordinance that regulates the planting, maintenance and removal of trees within public rights-of-way.

- Establishes an official community policy and provides permanent procedures and legal authority
- Individualized for each community
- Helps establish new tree management programs
- Identifies standards and regulations for arboricultural practices
- Many small towns and most large cities have a tree ordinance

EXAMPLE 3: URBAN FORESTRY

Create Incentives & Market Mechanisms

GOLD:

Fund a reimbursement program for homeowners to plant desired tree species

- Private land accounts for much of the available tree habitat in a municipality
- Offering coupons or rebates on utility bills for residents and business owners is an effective way to encourage private landowners to plant more trees
- These incentive programs can also be tied to native tree species to ensure survivability
- Examples of communities with reimbursement programs:
  - Portland, OR: Treebate
  - Austin, TX: Community Trees Program
  - Denver, CO: Denver Digs Trees

EXAMPLE 3: URBAN FORESTRY

Create Incentives & Market Mechanisms

GOLD:

Offer financial assistance for new development to improve streetscapes beyond minimum standards

- Financial assistance can encourage developers to go beyond the bare minimum when designing new streetscapes
- Best for areas with high pedestrian activity
- Maintenance details will need to be established
- Examples of communities with reimbursement programs:
  - Austin, TX

EXAMPLE 3: URBAN FORESTRY

Create Incentives & Market Mechanisms

BRONZE:

- *Create an awards program for dedicated citizens and builders that recognizes their efforts to improve the local tree canopy*
- *Create a significant tree recognition program to increase awareness of urban canopy importance*
  - Awards programs foster interest and community involvement
  - Can be an easy and cost effective stepping stone for communities without many resources or prior history of urban forestry programs
  - Examples of communities with awards programs:
    - Maryland: People Loving And Nurturing Trees (PLANT)
    - Florida: Friends of Our Urban Forest Awards Program
    - Kentucky: Champion Tree Program

Next Steps, Questions and Lessons Learned

- What should be process for going "live" from student work to web, how many levels of vetting?
- Good learning experience for students? Appears to be "yes"
- As more best practices get added, organization & navigation are key
- One description with unique references per best practice works well
- One page good length for summary, but may offer chance to drill down further for complex best practices

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Thank you!

Discussion & Questions

for further information:

http://murp.cudenvercap.org/land-use-code/

Drake UNIVERSITY Law School

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