

The Natural Step City of Madison



What is Sustainability?

"Sustainable Development is development that meets the needs of the present without compromising the ability of future generations to meet their needs."



United Nations 1987 Brundtland Report - *Our Common Future*

A Sustainable City:

- Balances environment, economy and social good
- Recognizes a healthy environment underpins economic and social well-being



Madison's Impacts on the Environment

The City's domain:

- 750 miles of streets
- 3.7 million sq ft of office and buildings
- 54 million kWh of electricity and 1.3 million therms of natural gas
- 60,000 tons of garbage and recycling
- 6,000 acres of parks
- 2.3 million gallons of fuel for buses and fleet



City government -- as both consumer and steward of our environment and its resources -- must incorporate the principles of sustainability to ensure the needs of tomorrow can be met.

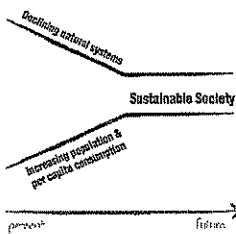
What is The Natural Step?

- Initially formulated in 1989 by Dr. Karl-Henrik Robèrt, The Natural Step (or TNS) identifies basic scientific principles that act as a framework to help us think about the environmental impact of City programs and projects.
- Provides a common language and systems thinking framework for analyzing the long-term impact of City facilities and operations, and will help us to make greater progress toward sustainability.
- Adopted by the City in 2005.
- Initial training for staff in 2006.

Key Elements of TNS

- Funnel metaphor
- Four System Conditions
- Strategic Planning Framework
- ABCD / Backcasting

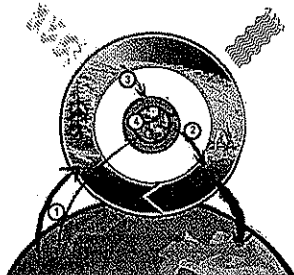
The Funnel as a Metaphor



- As time goes by, population growth and consumer habits increase the demand on natural resources and the environment.
- At the same time, the capacity of natural systems to accommodate that demand is shrinking.
- The convergence of these two realities will restrict our options.
- In a sustainable society, these two pressures are stabilized or even reversed.

TNS System Conditions for A Sustainable Society

In a sustainable society, nature is not subject to systematically increasing:




- ① concentrations of substances extracted from the earth's crust
- ② concentrations of substances produced by society
- ③ degradation by physical means and, in that society...
- ④ people are not subject to conditions that systematically undermine their capacity to meet their needs or the needs of future generations.

Slide provided by TNS Canada

Sustainability – a systems perspective

Matter & energy do not disappear

- Matter and energy can only be transformed. (Newton's 1st Law of Thermodynamics-Conservation of Matter and Energy)
- The earth is a closed system with respect to matter.
- Energy enters the system as solar energy, leaves as heat radiation.



i.e. *nothing disappears*

- Earth has same mass as 4.5 billion years ago
- carbon in your body in dinosaur
- fuel in your car doesn't disappear

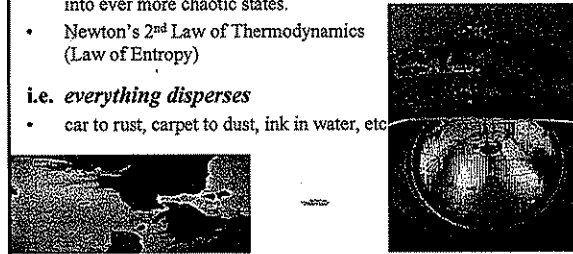
Sustainability – a systems perspective

Matter & energy tend to disperse

- All processes irreversibly disperse matter (and energy) into ever more chaotic states.
- Newton's 2nd Law of Thermodynamics (Law of Entropy)

i.e. *everything disperses*

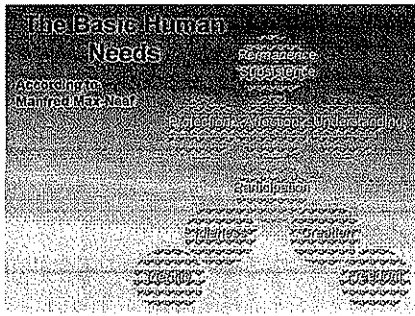
- car to rust, carpet to dust, ink in water, etc



Ecosystem Services are the processes by which the environment produces resources

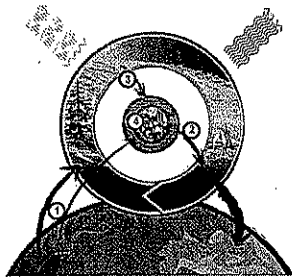
- Provisioning Resources
 - Foods (seafood/game)
 - Regulating Resources
 - Nutrient dispersal
 - Supporting Resources
 - Purifying air and water
 - Cultural Resources
 - Spiritual, intellectual, recreational inspiration
 - Preserving Resources
 - Biodiversity
- Ecosystems are threatened by many human activities- toxic runoff, non-native species, over-harvesting, erosion, sprawl, pollution
 - Ecosystem Services have financial value
 - Our future depends on wise eco-choices.

Sustainability – Human needs are Respected in a sustainable society



TNS System Conditions for A Sustainable Society

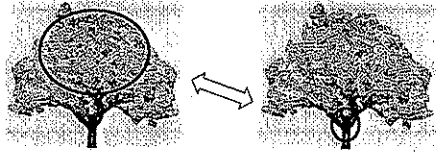
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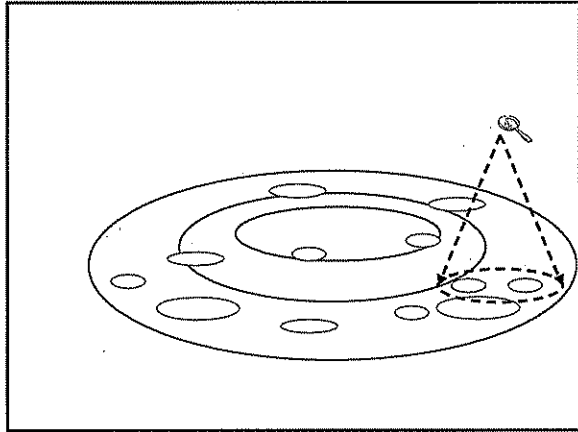
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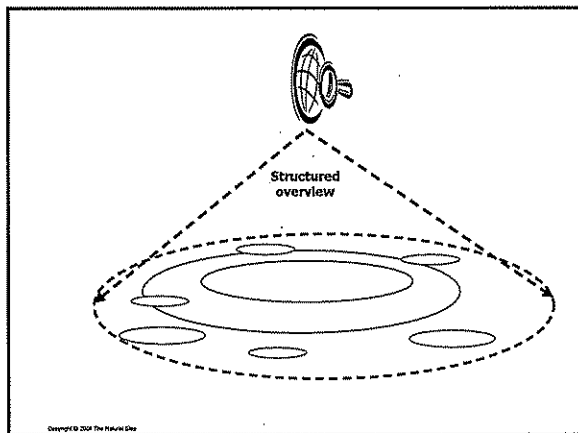
Unifying framework
for Sustainable Development

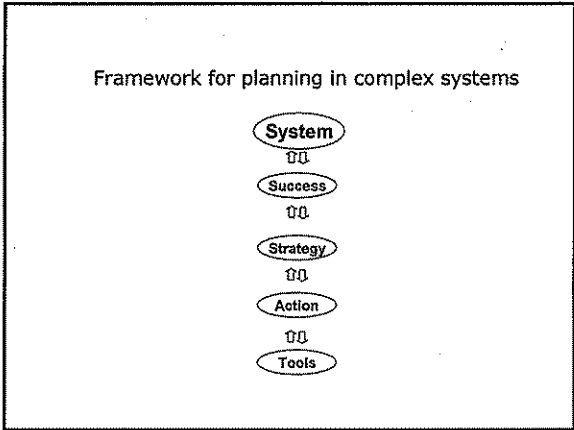


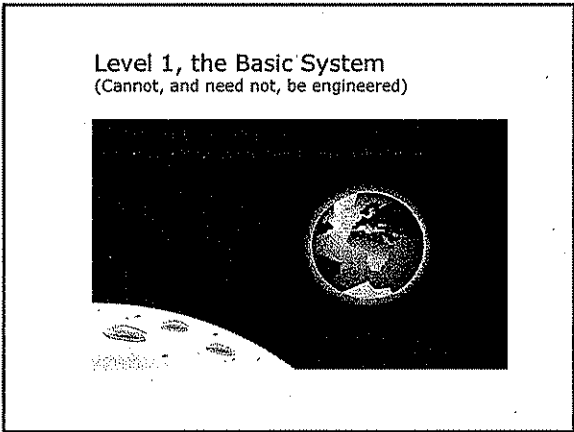
Empirical
Science

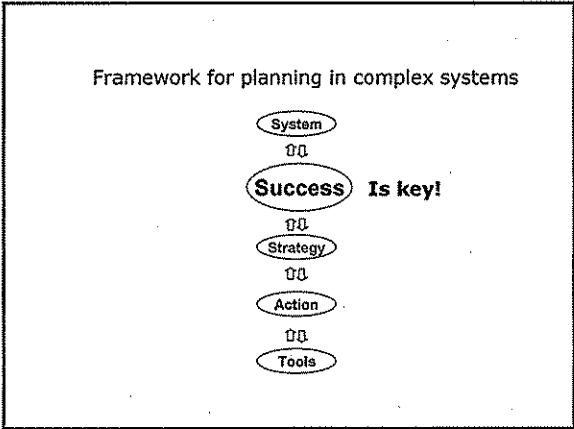
Theoretical
science

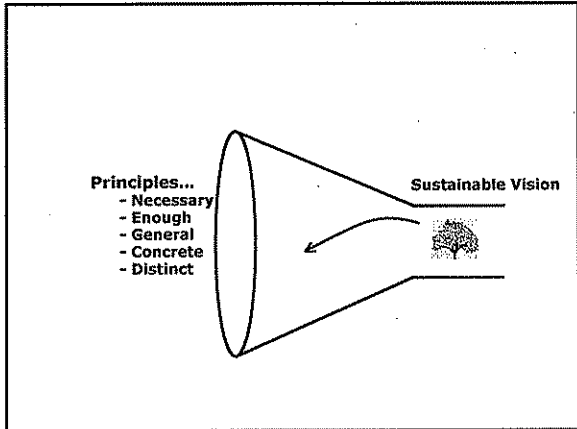












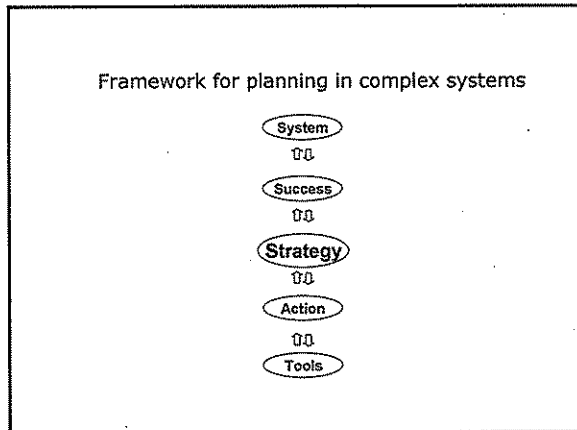
Level 2, basic sustainability principles

In the Sustainable Society, Nature is not subject to systematically increasing...

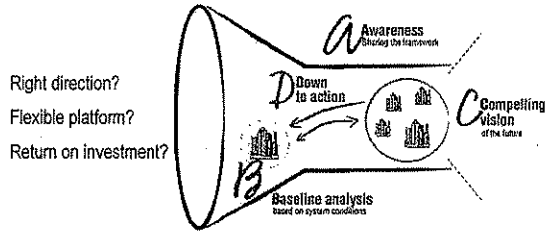
- 1 ...concentrations of substances from the Earth's crust.
- 2 ...concentrations of substances produced by society.
- 3 ...degradation by physical means.

and

- 4 ... people are not subject to conditions that systematically undermine their capacity to meet their needs or the needs of future generations.

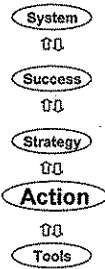


TNS Strategic Planning Framework

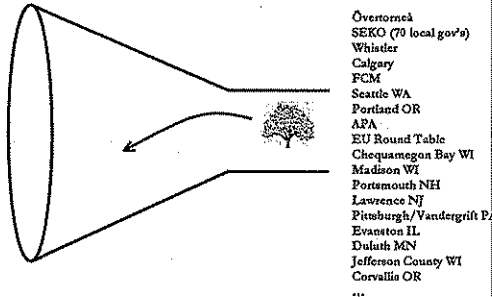


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Framework for planning in complex systems



Level 4, actions for government



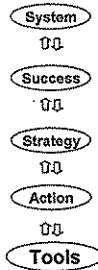
Top 10 List for 2007

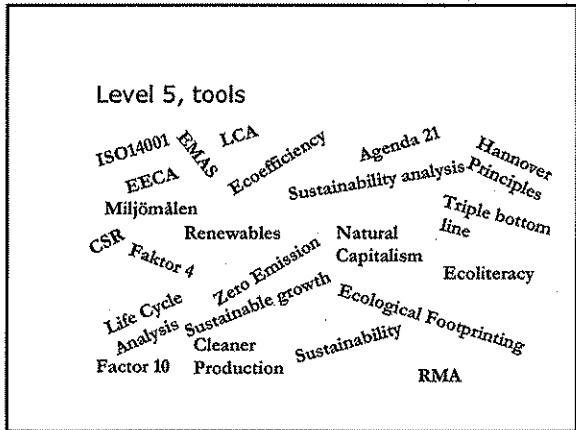
- | | |
|--|---|
| 1. Identifying Energy Wasters in City facilities. | 6. Reduce fuel consumption and emissions of fleet vehicles and Metro buses. |
| 2. Install solar and/or wind power at City facilities. | 7. Metro Garage door. |
| 3. Green cleaning supplies and services. | 8. Metro bus wash and vacuum. |
| 4. Zoning code rewrite (RFQ and RFQ). | 9. Commuting incentives for City employees. |
| 5. Bio-diesel pilot project for City Engineering vehicles. | 10. Energy saving strategies and policies for public housing in the City. |

Top 10 List for 2008

- | | |
|---|--|
| 1. Solar Energy for Madison | 6. Green Purchasing Policies: Green Electronics Initiative |
| 2. Zero Waste Initiative | 7. Green Fleet initiatives |
| 3. Olbrich Botanical Gardens Green Team | 8. Data Center Energy Reduction |
| 4. Paper Reduction Initiative: Planning Department | 9. Lower Impact Lawn Maintenance |
| 5. Green Purchasing Policies: Green Office Initiative | 10. Automated Work Order System for Forestry |

Framework for planning in complex systems





Level 5, tools

Conclusions:

- Many good tools and concepts
- Different strengths and gaps
- None can replace structured systems perspective
- A framework increases the value of concepts and tools
- Don't wait for tools – get going!
- Select tools as needed

Robert, K.-H., Schmidt-Bleek, B., Alstl de Lardere, J., Basile, G., Jansen, L., Kuehr, R., Pico Thomas, P., Suzuki, M., Hawken, P., and Wackernagel, M. 2001. Strategic sustainable development – selection, design and synergies of applied tools -. The Journal of Cleaner Production, 19 (2002) 197-214.

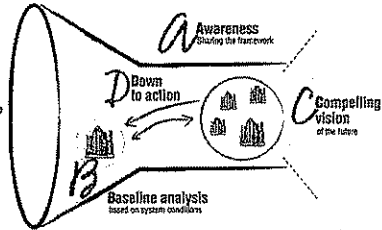
A Proposal: Review paper packets and determine if there is a better way to deliver information.

Will other options provide:
 The same quality of information for decision making
 Less energy consumption
 Lower per page and annual printing costs
 Less wasted paper
 More convenience for commissioners
 More time for staff to focus on issues

What are your thoughts?
 What exemptions should be made?

TNS Strategic Planning Framework

Right direction?
Flexible platform?
Return on investment?



Slide provided by TNS Canada

A is for Awareness sharing the framework

Printer Project

- Sustainability a priority for City
- Staff who identified this problem had been trained in The Natural Step
- Offices using many small printers or all different makes and models, needing different accessories
- Lots of printing being done, much of it on one side of the paper

Commission Packets

- Identify the problem; packets often contain over 100 pages
- Staff initiative to study the problem, project team identified, charter written
- 4/30/08 introduce the project and the survey to Plan Commission
- 5/19/08 training for Plan Commission members in The Natural Step framework for analyzing the problem

B is for Baseline Analysis using the system conditions

Printer Project

- Over \$100,000 per year spent on toner and cartridges of many types
- Desktop cost/page is triple the cost on networked printer
- Desktop printers are slow
- Paper is only 1/10th the total cost of printing, copying, etc
- Information Services staff servicing many different models of printers

Commission Packets

- Who gets them, in what form?
- What do other commissions do?
- How do commissioners use the materials in their packets (survey)?
- Cost of producing each packet (printer, paper, time)
- Cost of delivering packets

C is for Compelling Vision of the future we desire

Printer Project

- Reduce number and types of printers
- Use only energy efficient printers, and ones that can be re-cycled at the end of their useful life
- Make more efficient use of printers
- Ensure staff needs are met

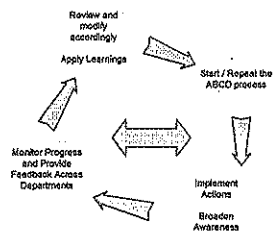
Commission Packets

- Provide the highest quality information to support decision-making requirements of Plan Commission
- Provide quality information in the most efficient format
- Reduce energy, time and resource costs of providing this information

D is for Deployment getting "down to action"

- Analyze Baseline information and identify alternatives
- Analyze which alternatives move us toward sustainability by testing each using The Natural Step system conditions
- Analyze which alternatives provide a flexible platform for future choices
- Analyze the return on investment of each alternative
 - Environmental
 - Financial
 - Social
- Test alternatives
- Change the procedure when a suitable alternative is chosen

ABCD is not Linear



Discussion

- Survey Responses
- Members' Ideas
- Next Steps

**To ensure we are moving toward sustainability,
the City will take the following steps to improve
on these system conditions:**

1. Because resources like fossil fuels, metals and minerals are finite and damage our environment if allowed to accumulate, the City will reduce its consumption of materials extracted from the Earth's crust.
2. Because the accumulation of pesticides, fertilizers and other persistent chemicals are harmful to people and the environment, the City will reduce its dependence on these kinds of synthetic chemicals.

**To ensure we are moving toward sustainability,
the City will take the following steps:**

3. Because ecosystems take a long time to recover from physical destruction (if they can at all), the City will mitigate its impact through wise land use policies, low-impact maintenance practices and environmentally friendly design.
4. Because our community will not be truly sustainable unless our residents are healthy, safe and prospering, the City will continue to pursue policies and actions that minimize the barriers that get in the way of residents ability to meet their basic needs.

Using many of the basic principles of TNS, the City will use a strategic planning framework to:

- A) Work to increase awareness of sustainability among its staff and management. This will provide us with a common language and keep all of us thinking about the impact we have during the course of our daily tasks.
- B) Take an inventory of current efforts that make progress toward sustainability and be frank about areas that need improvement. We will enhance our current efforts and identify additional improvements.
- C) Formulate vision of what sustainability means for the City and identify long-term goals necessary to achieve that vision.

Using many of the basic principles of TNS, the City will:

- D) Incorporate the awareness and terminology of sustainability into our budget decisions, program administration and project development. To achieve this, we will ask questions of relevant projects or policies like:
 - Does this help move the City toward sustainability (even if incrementally)?
 - Will elements of this project serve as a potential stepping stone toward other changes or initiatives?
 - Will increased implementation costs yield savings in the long-run or provide a social or environmental return on investment?

Three Magic Questions

- Does your organization have a definition of Sustainability?
- What is, with reference to this definition, your gap to Sustainability?
- What are you doing, at the strategic level of the organization, to bridge that gap?

Some Additional Resources

- Mayor's website
<http://www.cityofmadison.com/mayor/Natural.html>
- Karl van Lith 266-9037 kvanlith@cityofmadison.com
- Jeanne Hoffman 266-4091 jhoffman@cityofmadison.com

NATURAL STEP & SUSTAINABILITY RESOURCES

The Natural Step, international website is www.tns.org and links to country-based organizations. See www.naturalstep.ca (Canada) and www.ortns.org (Oregon).

City of Madison website is www.cityofmadison.com

Click on Mayor's link for The Natural Step www.cityofmadison.com/mayor/Natural

In Wisconsin, see www.1kFriends.org (1000 Friends of Wisconsin), and www.sustaindane.org (Sustain Dane). The Sustainable Chequamegon Initiative can be found at www.AllianceforSustainability.org

For The Natural Step study circle information, see www.sustaindane.org

For individual sustainability discussion courses see The Northwest Earth Institute www.nwei.org (Voluntary Simplicity, Choices for Sustainable Living, Healthy Children Healthy Planet, Global Warming: Changing CO₂ course, etc.)

Toward a Sustainable Community: A Toolkit for Local Government

<http://www3.uwm.edu/Dept/shwec/publications/cabinet/reductionreuse/SustainabilityToolkit.pdf>

and its accompanying list of resources at

<http://www3.uwm.edu/Dept/shwec/publications/cabinet/reductionreuse/SustainabilityToolkit%20LiveLinks030607.pdf>

For a comprehensive plan of a sustainable community see Whistler, BC, Canada www.whistler2020.ca

For a look at how 14 Oregon business leaders are applying Natural Step principles, see <http://www.passionforsustainability.com/>

The Natural Step for Communities: How Cities and Towns can Change to Sustainable Practices, by Sarah James and Torbjörn Lahti, available at www.newsociety.com

The Natural Step for Business: Wealth, Ecology and the Evolutionary Corporation, by Brian Nattrass and Mary Altomare available at www.newsociety.com

Visit www.sustainablesweden.org for info on tours and sustainable projects in Sweden.

Visit http://www.hallbara.robertsfors.se/engelsk/engom_proj.html to learn more about the Sustainable Robertsfors project in Sweden.



CITY OF MADISON PROJECT CHARTER

Updated 4/21/2008 - Version 3.0

Project Name	Planning Division-staffed commission targeted paper reduction			
Executive Sponsor	Brad Murphy			
Project Coach/Facilitator	Nan Fey, Karl van Lith			
Project Manager	Michael Waidelich & Tim Parks, Planning Division			
Primary Stakeholder(s)	Plan Commission & Long Range Transportation Planning Commission. Other boards and commissions may be added later.			
Project Description / Statement of Work				
<p>The Planning Division would like to explore ways to reduce the amount of printed materials sent to the Plan Commission for its regular meetings twice a month and the Long Range Transportation Planning Commission once a month.</p> <p>Currently, both commissions receive paper copies of all of the materials submitted for its review. For the Plan Commission, this routinely includes rezoning applications, planned unit developments, conditional uses, demolition permits, subdivisions and neighborhood plans. The printed materials equal thousands of pages each meeting, given both the amount of material being provided and how that material is provided, as well as the number of copies required for the commissions, staff and others.</p>				
Business Case / Statement of Need (Why is this project important now?)				
<p>The reduction project provides the City with an opportunity to reduce its consumption of paper, printing materials and energy. One of the primary goals of the plan will be to reduce the quantity of printed materials in a very strategic fashion that will not result in a reduction in the quality of information being forwarded to the commissions for decision-making. Staff feels that the sheer amount of paper can be reduced while improving the flow of information to both commissions.</p>				
Customers		Customer Needs / Requirements		
Plan Commission		Information to allow the commissions to render decisions on land use and transportation issues throughout the City.		
Long Range Transportation Planning Commission		Reduce time needed to prepare and deliver packets		
City Staff-Planning		Reduce Amount of paper required, energy costs, postal costs, gas costs		
Purchasing Agents				
Project Definition				
Project Goals	To reduce the materials, energy cost and time being devoted to providing the Plan Commission and Long Range Transportation Planning Commission with their routine meeting materials. In the case of the LRTPC, the reduction may also translate into savings brought on by scaling back or eliminating the mailing of meeting materials to the commission.			
Project Scope	Initially, the Plan Commission and Long Range Transportation Planning Commission. Other boards and commissions may be added in future phases.			
Project Deliverables	Initially for the Plan Commission, reduced-sized packets containing approximately the same quality of information as currently in a more streamlined document. For the LRTPC, the same will be provided initially, with a more immediate long-term goal of directing members to the Legistar system to access meeting materials using personal computers.			
How will progress be measured?	Staff will track the size of the copies of materials being made following the changes and can compare the size of the revised, reduced copy sets with the sets that were previously prepared, using the number of agenda items as a baseline. (Oftentimes, the number of agenda items correlates to the size of a commission's printed materials.) Commissions and staff can also provide feedback on information received on a regular basis.			
Does this project move the City towards sustainability?				
	SYSTEM CONDITION 1. Reduces dependence upon fossil fuels, extracted underground metals and minerals?	SYSTEM CONDITION 2. Reduces dependence on chemicals and other manufactured substances that can accumulate in Nature?	SYSTEM CONDITION 3. Reduces dependence on activities that harm life-sustaining ecosystems?	SYSTEM CONDITION 4. Reduces dependence on activities that interfere with other people's abilities to meet their basic needs?
Specify how project moves City towards improving or achieving each system condition.	Reduces the City's dependence on paper for copying, which requires energy to either produce or recycle. LRTPC may eventually transition into online meeting materials only, reducing transport-related energy usage.	By reducing paper consumption, we are also reducing the corresponding printing chemicals used in the copying, such as ink and toner.	By reducing the amount of materials printed, we will be generating less waste and usage of environmentally unfriendly materials.	Save time of people involved in preparation, dissemination of material. Set example of green efficiency for others in community

Identify trade offs involved as relates to each system condition	Shifting burden of cost and workload from City Staff to commissioners	Shifting burden of cost and workload from City Staff to commissioners	Shifting burden of cost and workload from City Staff to commissioners	Shifting burden of cost and workload from City Staff to commissioners
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Does this project provide a stepping stone towards sustainability?
 Yes—we can use the process from this project to assess other paper reduction efforts with other city commissions.

Does this project provide a sufficient return that the City could use to seed future investments? (Include fiscal, environmental and social returns)
 Yes. By reducing our paper usage and printing costs, we will save the City money and make the provision of these materials more environmentally responsible over time.

Project Constraints / Risks / Key Inputs (Elements that may restrict or place control over a project, project team, or project action, results from other projects or input from other sources needed for project to be successful)
 Staff will need to discuss changes to the commission materials with the Plan Commission and Long Range Transportation Commission as well as any other related City agencies, such as those providing review comments for Plan Commission matters.

Implementation Plan / Milestones (Due dates and durations)
 To be determined. Staff is currently brainstorming on possible changes and would like to begin getting input from constituent commissions by the end of the first quarter or early second quarter of 2008. Actual implementation will depend on constituent feedback.

 Tentative schedule; March—First team meeting; April—team develops and distributes survey; May—training of Plan Commission in TNS, survey responses

Communication Plan (What needs to be communicated? When is communication needed? To whom? How?)
 Staff will schedule discussions with both commissions to gather their input and use that information to develop betas of new materials to both groups providing them options for how the material can be conveyed differently. Team needs to also schedule and communicate TNS training for PC in May and communicate regarding survey process.

Change Management / Issue Management (What is process for addressing concerns of those impacted? How decisions will be made? How changes will be made?)
 Item on agenda of commissions at each meeting to check-in on accessibility and effectiveness of materials.

Project Team Roles and Responsibilities

Team Members	Roles	Responsibilities
Michael Waidelich, Principal Planner	Co-project Manager	Supervises Plan Commission staff
Tim Parks	Co-project Manager, Staff to Plan Comm.	Solicit input and feedback from PC, revise materials
Kevin Firchow	Team Member, Staff to Plan Commission	Solicit input and feedback from PC, revise materials
David Trowbridge	Team Member, Staff to LRTPC	Solicit input and feedback from LRTPC, revise materials

Stakeholder Roles and Responsibilities

Stakeholders	Roles	Responsibilities
Brad Murphy	Executive Sponsor	Promote overall program
Plan Commission	Constituent Commission	Provide input and feedback on materials, improvements
Long Range Transportation PC	Constituent Commission	Provide input and feedback on materials, improvements

Sponsor Sign-Off

 SIGNATURE

Date: _____