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# Chicago

## *Vision for the Future: Infused Nature*

### Charter *Revised: Sep 1, 2008*

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#### Background

Next year marks the Centennial of Daniel H. Burnham's and Edward H. Bennett's 1909 *Plan of Chicago*. Internationally celebrated then and now, what became known as the Burnham Plan redirected Chicago from an unplanned trail of disorganized industrial and commercial growth to a planned path toward the "city beautiful". Along the way, Chicago became a green city celebrating its fortunate location on Lake Michigan with a necklace of parks and boulevards recognized around the world for its beauty. The Burnham Plan challenged Chicago leaders to arrest uncontrolled development and tame the technological revolution that characterized the early 20th century. Galvanized into action by Burnham, Bennett and the Commercial Club of Chicago, the city committed its resources to creating an urban environment that could meet the challenges of the new vision, one that could be both functional and beautiful.

One hundred years later, Chicago and other major cities worldwide face different but equally portentous problems and opportunities. New and powerful forces, both negative and positive, confront cities and society. Global warming is changing climate and energizing unpredictably destructive weather. Population growth and movement to the cities is at an all-time high. Global economics are reshaping trade and disrupting established patterns of supply and demand, voracious energy needs are depleting traditional energy resources, forcing an increasingly urgent search for energy sustainability. High-tech materials, communications, computing, biological and engineering sciences are reshaping what is possible. Negative and positive, the agents of change have raised the stakes.

Cities like Chicago must evolve more quickly. Cities like China's Shenhzen, now springing up full-grown almost overnight, need to plan for change from the beginning. Both will need vision to weave new technologies into their urban fabric. Both will need wisdom to adapt their living cities to tomorrow's pressing changes. The famous dictum, "Make no small plans" is attributed to Daniel Burnham. Whether he actually said that is not certain, but in the Plan of Chicago, he came close enough:

"At no period in its history has the city looked far enough ahead. The mistakes of the past should be warnings for the future. There can be no reasonable fear lest any plans that may be adopted shall prove too broad and comprehensive. That idea may be dismissed as unworthy of a moment's consideration. Rather let it be understood that the broadest plans which the city can be brought to adopt to-day must prove inadequate and limited before the end of the next quarter of a century. The mind of man, at least as expressed in works he actually undertakes, finds itself unable to rise to the full comprehension of the needs of a city growing at the rate now assured for Chicago. Therefore, no one should hesitate to commit himself to the largest and most comprehensive undertaking; because before any particular plan can be carried out, a still larger conception will begin to dawn, and even greater necessities will develop."

Inspirational then, his words ring even more strongly true today.

## Relevant Trends

Trends initiated by emerging technologies, changing environmental conditions, and evolving social change will have real impact on urban evolution. Among such trends evident today are:

### **Water Resources**

Already in many parts of the world, water supplies are reaching levels of insufficiency. Complicated by agricultural needs for irrigation and the needs of urban centers becoming megacities, the fresh water resources of our lakes, rivers and subsurface aquifers are subsiding. In 2003, 9,500 children were dying daily from insufficient or contaminated water supplies. One-third of the world's population, by some experts' analysis, live in water-stressed countries now, with two-thirds of the world to share their dilemma by 2050. Chicago's great Lake Michigan water resource will very likely decline over the next century with impact for shipping, water supply, and even the flow of associated rivers, including the Chicago River.

### **Mineral Resources**

Mineral resources are approaching finite limits, exhausted in some locations, more difficult to extract in others. While supplies of some minerals are in no immediate danger, others are under severe pressure. Oil is a resource of vital concern, with production expected to peak in this decade or shortly thereafter. The Hubbert Curve, long-used as a predictive tool in the petroleum industry, when coupled with modern corrective tools, predicts that we are reaching worldwide peak production *now* and face a reduction in production of approximately 3% per year very soon. Not only will that oil production have to be replaced as an energy source, additional energy sources will have to be found to keep pace with the population curve.

### **Population Movement**

In an interesting paradox, the countryside is becoming less—not more—inhabited as we add to the population. The people are moving from the country to the cities. As of 2005, the world was more urban than rural for the first time. In the next twelve years 300 million rural Chinese will move to the cities. In 1950, only two cities in the world, Tokyo and New York City, were over 10 million in size. By 1975 there were 4 such megacities, and by 2003, there were 20. By 2015 there will be at least 22. In China alone there are between 100 and 160 cities with over 1 million inhabitants (America has 9, and Eastern and Western Europe together have 36). Cities are complex, sophisticated systems, but their managers will need all the skill they can command to deal with the great urban migration. The major changes will take place in the developing countries, but Chicago and cities of the developed world will feel the effects through immigration as well as local relocations.

### **Climate Change**

Climate and weather patterns are changing. Some regions are simply getting drier or wetter, but the great damage will come from sustained, severe droughts and intense, prolonged flooding. The problem is change: eco-systems confronted with (1) wetter or drier conditions for periods far longer than the environment or its inhabitants are prepared, and (2) sudden, short-term, intense weather events such as violent super tornadoes and hurricanes, cloud-bursts, blizzards and heat waves. Climate zones for cities will change; by the end of the century, Chicago will have summers similar to those now experienced by Mobile, Alabama and winters like those of today's northern Arkansas.

### **Increasing Expectations**

The growing availability and capabilities of communications such as cellular telephones, satellite and cable TV, and the Internet across the country (and the world) are providing people with daily knowledge of living conditions, problems, products, threats and services everywhere. The media are creating growing avenues for fast communication between protectors and populace. They are also educating the populace on the state of conditions and creating expectations that both fuel demand and create willingness to change.

### **Internet Penetration**

Computer use and Internet access grow exponentially every year. Information of encyclopedic detail can be obtained more and more easily, and complex, sophisticated processes can be used remotely. Access to high-quality communications and sophisticated computer tools are increasingly available to individuals and groups anywhere. In North America, Internet penetration reached 71% in 2007.

### **Emerging Technologies**

The pace of technological change continues to accelerate, bringing new science to commercial, institutional and industrial uses at an ever quickening pace. Most notable among many fields, major technological innovations can be expected in the new disciplines of molecular nanotechnology, robotics and the biosciences. Computing capacities continue to grow at the exponential pace predicted by Moore's Law, radically increasing power and decreasing size and cost—and dramatically increasing the usefulness of digital electronics in almost every aspect of business, institutional and personal life.

### **New Relationships**

Greater public mobility and access to information is changing the nature of association for many individuals and organizations. Organizations that once operated in isolation are now players in a common environment. Sometimes the emerging relationships are competitive, sometimes cooperative. New forms of relationship can be expected to be created as conditions evolve.

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### **Focal Point: *Infused Nature***

Children of today's wired generation are overwhelmed with artificial entertainment and time-filling stimulation. Even as we know that direct exposure to nature is essential for healthy development and emotional health, we see less and less connection to the natural world in our cities. How can access to nature be reconstructed to reform the connections and re-engage future generations?

### **Project Statement**

Using Structured Planning methodology, develop a vision for 21st century Chicago (and, by inference, other major world cities). Explore the changes to cityscape and urban living that could be implemented from an enlightened response to fast-changing social conditions and the application of such all-pervasive omni-technologies as bio-technology, information science, robotics and nanotechnology. In the spirit of the Centennial, use Burnham's *Plan of Chicago* as inspiration for a maximized "no small plans" approach to describing the city of the future. In particular, consider your proposal as a view toward the realization of the full potential of infused nature.

The proposal should:

1. consider governmental, institutional, commercial and professional uses as well as uses for individuals and the public.
2. collect, incorporate and refine best projections and concepts as they have been conceived by organizations, publications and planning experts throughout the futures community.
3. accommodate concepts developed by other project teams to extend and enhance the effectiveness and reach of infused nature.
4. integrate formats for report and presentation with those of other project teams to present a coherent, holistic set of concepts.

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**Goals**

*As general guidelines the proposal for infused nature should:*

- Explore a full range of possibilities, paying especial attention to the products of emerging technologies successfully advancing through research and development.
- Include ideas for any processes, tools, systems and products needed for services—including procedures, policies, events, activities, organizational concepts and any relevant relationships among them.
- Explore revolutionary as well as evolutionary ideas.
- Accommodate all users of the system, from implementation to adaptations and provide for them in the design. Thoroughness is a step toward system integrity.
- Consider potential costs thoughtfully; the proposal should not incorporate frivolous concepts, but it should not ignore potentially breakthrough ideas simply because they may be expensive.
- Treat the design problem as design from the inside out; users' needs come first, with every attempt possible made to satisfy them in some way, even when tough design decisions must be made.
- Conceive the properties and features of systems and their operations as means to build trust and cooperation with the community and its institutions.

*Overall, the solution should:*

- Assume that the proposal can be acted upon as it is conceived. Do not under-propose on the assumption that a concept might be politically difficult to achieve.
- Demonstrate what might be achieved. The value of the proposal is in its ideas, not its certain attainability. Ideas that might not be fully attainable under today' s conditions may be achieved tomorrow—if they are known.

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**Resources**

Resources for the project will be:

**Physical:**

- The facilities of the Institute of Design, including Room 514 as general meeting space at the beginning of each class session, and 2nd, 3rd and 5th floor for team activities.
- Computing support from the fifth floor computer facilities.
- Equipment as necessary from ID resources.

**Financial:**

- (to be determined)

**Human:****• Planning Team:**

<b>Ann Hintzman</b>	<b>Leonard Thomas McCue</b>
<b>Marisa Knopman</b>	<b>Nikki Pfarr</b>
<b>Ruth Schmidt</b>	

**• Project Advisors:**

<b>Charles L. Owen</b>	Distinguished Professor Emeritus
<b>John Pipino</b>	Adjunct Professor

## Schedule

The project will be conducted from August 26 to December 5, 2008.

Week	Phase	Activity	Product
1	Aug 26	Introduction	Introduce project, process & Charter (L)
	Aug 29	Project Definition	Issues and Defining Statements (L)
2	Sep 2		Develop Issues & Defining Statements
	Sep 5	<b>In-Progress Review</b>	Issues DefStates 1
3	Sep 9		Function Structure (L) Modes and Activities
	Sep 12	<b>In-Progress Review</b>	DefStates 2 Fn Struc 1
4	Sep 16	Information Development <i>Action Analysis 1</i>	Activity Analyses, Design Factors and Solution Elements (L)
	Sep 19		
5	Sep 23 Sep 26		
6	Sep 30		<b>In-Progress Review</b> DefStates complete Fn Struc 2 DesFacs 1 SolnEls 1
	Oct 3	Information Development <i>Action Analysis 2</i>	Complete Functions, Design Factors and Solution Elements
7	Oct 7		Interaction analysis; RELATN program (L)
	Oct 10		Interaction analysis; VTCON program (L) Fn Struc complete DesFacs complete SolnEls complete
8	Oct 14	Information Structuring <i>Interaction</i>	Score Soln Elements vs Functions
	Oct 17	<i>Structuring</i>	Structuring; RELATN input

Week	Phase	Activity	Product
9 Oct 21 Oct 24	Concept Development	Means/Ends Analysis (L)	Inf Structure
10 Oct 28 Oct 31		Ends/Means Synthesis (L) System Elements; System Element Interaction (L)	Inf Structure named
11 Nov 4 Nov 7			
12 Nov 11		<b>Presentation</b>	Initial System Elements
Nov 14	Communication	Plan, Report, Overview, Communication Structure (L); Refine final SysEIs; write report; complete illustrations	
13 Nov 18 Nov 21			
14 Nov 25 Nov 28	<i>Thanksgiving</i> vacation		
15 Dec 2 Dec 5		<b>Final Presentation</b>	Illustrated Report

## Methodology

The project will be conducted using Structured Planning (See articles on the subject by Charles Owen at <http://www.id.iit.edu> under the **Publications** section of **Our Research**.)

1. *Context for Creativity*, 1991.
2. *A Critical Role for Design Technology*, 1993.
3. *Design, Advanced Planning and Product Development*, 1998.

Also, see the book by Charles L. Owen. available at the Institute of Design: **Structured Planning. Advanced Planning for Business, Institutions and Government.** 2007),

## Issues

Consider the following topics as initial issues to be investigated. Supplement them with additional issues as information is developed during the first phase of the project.

**Technology.** What approach should be taken toward the incorporation of available and emerging technologies?

**Adaptivity.** How should elements of the system be prepared to respond to evolving social, political, technological and environmental conditions?

**Partnerships.** What approach should be taken toward partnering with other governmental organizations, institutional organizations, suppliers of funding, educational institutions, etc.?

**Disaster Contexts.** What provisions should be made for extreme environmental conditions and the changes that can be expected with climate change?

**Means of Introduction.** How should the system be introduced to facilitate acceptance and implementation?

**Inter-institutional Relationships .** How should relationships with potentially competing or cooperating governmental entities be developed?

**Cost.** How should costs and funding of system elements and their operations be approached?

**Geographic Focus.** How narrowly or broadly should the vision for the city be drawn—local, metropolitan, regional?

**Mission.** What balance should be sought among commercial, governmental, institutional, general public and private sector services?

**Sustainability.** How should elements of the system approach tradeoffs between functional effectiveness and sustainability?

# Defining Statement

Issue  
Geographic scope

1

## Project

Chicago: Vision for the Future | Infused Nature

## Originator

Ruth Schmidt                      Sept. 3, 2008

## Contributors

Ann Hintzman                      Sept. 28, 2008

## Sources

Group Discussions

Burnham, Daniel H. and Edward H. Bennett. 1909. *Plan of Chicago*. Ed. Charles Moore. Chicago: The Commercial Club. Reprint, New York: Princeton Architectural Press, 1993.

## Question at Issue

How narrowly (or broadly) should the vision for the city be drawn - local, metropolitan, regional?

## Position

- Constraint                      The new solution should extend to Chicago's greater sub-urban region.
- Objective
- Directive

## Alternative Position

- Constraint                      The new design should focus on the central metropolitan area of Chicago.
- Objective
- Directive
  
- Constraint                      The plan should take other regional cities outside the extended Chicago area into account in order to reflect society's increased reliance on non-physical connections and communications.
- Objective
- Directive

## Background and Arguments

While the focus of the Burnham plan of 1909 was primarily grounded in the concept of The City Beautiful, it also laid out plans for functionality that dealt with civic, individual, and commercial concerns extending beyond the downtown to far surrounding suburban areas.

A century later, the inter-connectedness of the Chicago region has exponentially increased, along with its population; this continued development and ever-growing connectivity that was not even conceivable until the late 20th century has blurred our perceptions of where Chicago actually ends.

It is tempting, therefore, to extend elements of the vision for a new plan beyond Chicago's immediate boundaries and incorporate other regional areas in order to accommodate this fuzzier edge. However, the scope of the new Vision for the Future must remain more localized to be truly effective. Enlarging the boundaries to this extent would increase development and maintenance costs, causing an enormous strain on underlying systems and resources. Extending scope would also risk watering down potential benefits that were intended to fit the more specific needs of Chicago area communities.

Inversely, too narrow a focus would also unnecessarily limit any positive effects. While the downtown area of Chicago, for example, is in many ways most lacking in terms of access to nature, and perhaps the most readily identifiable in terms of civic personality, it hardly contains the full scope of the city's activities. Chicago's network of public transportation extends far beyond the immediate borders of the city's commercial centers, regularly connecting many disparate individuals and activities on a daily basis. Similarly, the average Chicago citizen no longer lives and works within a single community; to emphasize solutions in one area while ignoring others would create an unsettling disjunction between the traditional domains of life and work, as well as resulting in a lack of integration between the great diversity of Chicago's neighborhoods.

Thus, in order to maintain a manageable scope while recognizing the reach of Chicago's resources—both economic and cultural—beyond the city center, the new plan should adopt a geographical focus similar to that of Burnham's plan. This would allow the plan to remain feasible on both human and planning scales, as well as sufficient in scope to directly benefit the vast majority those living in the greater Chicago area.

# Defining Statement

**Issue**  
Adherence to past plans

2

**Project**

Chicago: Vision for the Future | Infused Nature

**Question at Issue**

To what extent should the system honor past plans?

**Originator**

Ann Hintzman                      Sept. 8, 2008

**Position**

- Constraint
  - Objective
  - Directive
- The system should leverage the developed aspects of past 'Plan of Chicagos but should not perceive future development as constrained by prior, unimplemented plans.

**Contributors**

Ruth Schmidt                      Sept. 29, 2008

**Sources**

Group Discussions;

Smith, Carl. 2006. *The Plan of Chicago: Daniel Burnham and the Remaking of the American City*. Chicago: University of Chicago Press.

**Alternative Position**

- Constraint
  - Objective
  - Directive
- The system should work to complete elements of past 'Plan of Chicago's which have not yet been implemented to achieve the character and continuity originally intended for the city.
- Constraint
  - Objective
  - Directive
- The system should be given the flexibility to revise both the implemented and envisioned elements of past plans.

**Background and Arguments**

With the development of the first Plan of Chicago in 1909, Chicago was one of the first cities in America to understand that through a directive on how the city should be restructured and grown it could improve the lives of its citizens and make the city a desirable place to run a business. Central to this directive was the allocation and development of public green spaces. Green spaces provided places of tranquility for the citizens, and venues for public events, which in turn provided employees who were happy and invested in their communities. This vision is central to the design of Infused Nature within this system.

The work of the initial Plan of Chicago not only laid the foundation for an understanding of the vital role green space plays in urban development, but, more tangibly, has already provided the city with a vital parks system. Burnham and Montgomery Ward before him, protected and rezoned large swathes of lake front and river properties and developed these into a vibrant nature-center of Chicago life. This existing green infrastructure should be leveraged in the plan for the coming 100 years in order to capitalize on the money spent on restoration and development as well as the habits and culture of Chicago's citizens.

The question remains about how to treat Burnham's unimplemented plan elements. The original plan is in many

ways compatible with the Infused Nature position that the nature system should be interconnected and integrated into the lives of Chicagoans. However, adherence to the plan as written would not be the best way to achieve these shared goals. The city of Chicago has grown considerably since the original plan - both in geographic size, adding 47 square miles of city as well as population, with over one million new residents within the city boundaries. The new system must be allowed the flexibility to understand the needs of this larger population base as well as the environmental needs of cities in the 21st century.

There is a fundamental difference between a plan and a vision. Burnham's plan outlined the components of a city; his vision saw how the confluence of natural and urban planning could create a thriving metropolis. The system shares this vision and will use it to create a scalable plan for nature that addresses the needs of the people and city of Chicago for the next one-hundred years.

<b>Defining Statement</b>		<b>Issue</b> Education	3
<b>Project</b> Chicago: Vision for the Future   Infused Nature	<b>Question at Issue</b> What role should Chicago Public Schools play in community-wide acceptance and implementation of infused nature?		
<b>Originator</b> Thomas McCue                      Sept. 6, 2008			
<b>Contributors</b>	<b>Position</b>	<input type="checkbox"/> Constraint      The system should view the CPS as an avenue to creating city wide "hot-spots" of infused nature practice, operation, and education. <input checked="" type="checkbox"/> Objective <input type="checkbox"/> Directive	
<b>Sources</b>	<b>Alternative Position</b>	<input type="checkbox"/> Constraint      The system should integrate closely with CPS, and make specific curriculum recommendations. <input checked="" type="checkbox"/> Objective <input type="checkbox"/> Directive  <input type="checkbox"/> Constraint      The system ought to utilize community groups to engage with CPS to offer activity based educational opportunities to students. <input checked="" type="checkbox"/> Objective <input type="checkbox"/> Directive	

**Background and Arguments**

The Chicago Public school system is one of the largest in the country, and controls over 600 public elementary and high schools in the city. Chicago Public Schools is currently the third largest school district in the United States, with more than 400,000 students enrolled in the school district. The centralized administration of this vast, city-wide network of schools provides the opportunity to communicate to thousands of young people in a consistent manner. With potential avenues such as curriculum, extra-curricular programs, and student-community outreach, the ability to engage young people with infused nature is wide open. An enthusiastic youth could be the foundation for a greater community wide acceptance and implementation of an infused nature system.

At the same time, the adult population of the city may not automatically accept or understand the potential role of an infused nature system in their own lives. A vital aspect of the system will be to provide a context for the role of nature in people's lives, and an educational framework that will facilitate that understanding.

With it's existing infrastructure and position in communities throughout the city, the CPS is well positioned to serve not only as a communication channel to the city's young people, but also as a physical concentration of resources, activities, and other and system efforts.

# Defining Statement

Issue  
Measurement of success

4

## Project

Chicago: Vision for the Future | Infused Nature

## Originator

Ruth Schmidt                      Sept. 6, 2008

## Contributors

Charles Owen                      Sept. 15, 2008

## Sources

Group Discussions

Hofstetter P. 2002. The Value Debate: Ecodesign in a Global Context. *Int J LCA* 7, no. 2: 62–63.

Burnham, Daniel H. and Edward H. Bennett. 1909. *Plan of Chicago*. Ed. Charles Moore. Chicago: The Commercial Club. Reprint, New York: Princeton Architectural Press, 1993.

## Question at Issue

If measuring outcomes of the new plan is desirable, how should metrics be best applied to determine its relative success?

## Position

- Constraint
- Objective
- Directive

Individual and group behavior should be observed, measured, and analyzed qualitatively and quantitatively to provide in-progress feedback on the success of planning.

## Alternative Position

- Constraint
- Objective
- Directive

Where applicable, quantitative metrics should be regularly employed to verify planning expectations and validate phases of implementation.

## Background and Arguments

Burnham's Plan for Chicago was not very specific about measurements of success, besides stating a general emphasis on economic growth and stability:

"...the City should become a magnet, drawing those who wish to enjoy life. The change would mean prosperity, effective, certain, and forever continuous.

Therefore, if the plan is a good one, its adoption and realization will produce for us conditions in which business enterprises can be carried on with the utmost economy..." (Burnham and Bennett 1909, 124)

For today's designers, however, there are many metrics available to measure the efficacy of design and to guide progress toward a successful result. Wouldn't a rigorous system of measurement help future planners better identify what elements of the plan were successful, and in turn, which would create more value for subsequent urban designs?

The difficulty with quantitative metrics is that measuring human behavior and use with numerical methods alone rarely gives a full picture. Indications of size, number, and frequency can help provide general information about certain trends, but are only tangentially helpful in identifying intent or the

rationale behind human behavior. In many cases, reliance on numbers alone—whether scientifically measured or reported anecdotally—actually disguises more significant problems under a sense of certainty clearly unwarranted given a more nuanced human view (Hofstetter 2002, 62).

To preclude measurement, on the other hand, dismisses the kinds of valuable feedback that allow designers to identify naturally occurring behaviors and modify plans adaptively. This could compromise not only for future states of the plan, but the optimal development of plans already under implementation.

A qualitative, activity-based approach in which human activities and behaviors can be observed, measured, and analyzed will allow both current and future planners to understand how environments are actually used by people and organizations. Quantitative metrics should be used, but they should be supplemented substantially with qualitative ones. Doing so will provide the full range of feedback necessary to guide a successful infusion of nature.

# Defining Statement

Issue  
Funding sources

5

## Project

Chicago: Vision for the Future | Infused Natures

## Originator

Ann Hintzman                      Sept. 14, 2008

## Contributors

L. Thomas McCue                      Oct. 4, 2008

## Sources

Group Discussions

Benedict, Mark and Edward McMahon. 2006. Green Infrastructure: Linking Landscapes and Communities. Washington DC: Island Press.

2008 Chicago Parks District Budget Appropriation. <http://www.chicagoparkdistrict.com/index.cfm/fuseaction/departments.budget> (accessed Oct. 2008)

## Question at Issue

What funding sources should the system use?

## Position

- Constraint
  - Objective
  - Directive
- Funding for the system should be sourced as separate line-item and ballot initiatives to insure upfront funding and emphasize public commitment

## Alternative Position

- Constraint
  - Objective
  - Directive
- The system should be funded as part of larger initiatives to encourage alignment and participation within the whole of city planning.

## Background and Arguments

The development of nature suffers from its perception as a resource not as infrastructure. Nature is what was here before development, and while there may be support for conservation, nature, as a cost center is less intuitive. For this reason, the funding of greenspace initiatives is often included within larger development bills. This has the advantage of coupling nature with revenue generating proposals and aligning the development of greenspace with that of other city systems.

One problem with folding greenspaces into larger urban planning initiatives is that the priority is no longer on the greenspace. While intentions would be to develop the land according to original plans, cost overruns in other parts of the plan could cut into the intent of the greenspace. By funding green infrastructure as a separate line-item and/or budgeting initiative, green initiatives stay at the heart of the project and the implementation of the project would be unhindered.

While there is an interaction between green and gray infrastructure, solution elements prioritize the development of interconnected green spaces. Stand-alone funding would allow for the entirety of the green infrastructure to be funded and implemented in a cohesive manner instead of siloed within other projects.

For 2008, the Chicago Parks Department has earmarked \$130.8

mm for capital improvement of system elements and an additional \$61.0 mm for the parks improvement. The bulk of this spending is financed by property taxes, with smaller funding sources coming from grants, fee and permits. It is likely that the system will require development costs above the current projections for capital expenditure. Potential funding sources for these initiatives include bond referenda, direct appropriations, and an exploration of federal programs. These programs will require either tacit or direct voter approval to be implemented. This in turn will require voter education. Direct funding of green infrastructure initiatives would beget a public discussion necessary for understanding and internalization of the values surrounding green initiatives. This is not meant to belittle the challenges, which funding a long-term plan without an immediate pay-out, but progressing public awareness and discourse is a necessary solution element which should not be obscured through nested funding.

# Defining Statement

Issue  
Inter-institutional relations

6

## Project

Chicago: Vision for the Future | Infused Nature

## Originator

Marisa Knopman                      Sept. 6, 2008

## Contributors

## Question at Issue

To what extent should various institutional bodies of a city interact with the system?

## Position

- Constraint
- Objective
- Directive

The system should participate in ongoing dialogue with the various institutions that manage and determine land use, the distribution of resources, community development, etc.

## Sources

Benedict, Mark, and Edward McMahon. 2006. Green Infrastructure: Linking Landscapes and Communities. Washington DC: Island Press.

## Alternative Position

- Constraint
- Objective
- Directive

The system should engage other institutional bodies primarily when finances and budgets are being determined.

## Background and Arguments

Nature and the green infrastructure do not and cannot exist in a vacuum.

"A fundamental concept of landscape ecology is that the study of content alone (the study of flora, fauna, and processes within a single site or managed area) is not sufficient. Understanding and predicting change in native ecosystems and landscapes requires an analysis of the context in which these ecosystems exist- the biological and physical factors of the surrounding areas" (Benedict and McMahon 2006, 39).

To adequately infuse nature is to create a dynamic dialogue between city and nature where the two become inextricably linked; where the properties of one inform the other. Therefore, in addition to achieving the goals outlined in the Infused Nature charter, natural environments and green infrastructure should be used as a tool to strategically address seemingly inherent "city" problems such as overpopulation, congestion, natural disasters, etc.:

"By making green infrastructure the framework for conservation and development, communities can plan for green space systems that maintain essential ecological functions and provide a host of ecological services. Green infrastructure also provides a tool that helps communities develop a framework for shaping where growth will go and make better use of existing infrastructure to encourage more compact, walkable communities " (Benedict and McMahon 2006, 41).

It would be short-sighted to engage the system only when budgets and finances are being determined as infused nature solutions will most definitely impact the contexts in which other institutions of the city are working. For instance, institutions that manage city-wide transportation may be able to leverage system solutions to address issues of sprawl and population concentration. Treating the infused nature system as part of a larger city-wide system will undoubtedly offer valuable insight and opportunities for all.

# Defining Statement

Issue  
System sustainability

7

## Project

Chicago: Vision for the Future | Infused Nature

## Question at Issue

To what extent should the system be sustainable?

## Originator

Nikki Pfarr                      Sept. 3, 2008

## Position

- Constraint      Each solution element must be socially sustainable, and the overall system must be environmentally and economically sustainable.
- Objective
- Directive

## Contributors

Ruth Schmidt                      Sept. 29, 2008  
Charles Owen                      Sept. 5, 2008

## Sources

Group Discussions;

Agyeman, Julian, Roberty D Bullard, Bob Evans. 2003. Joined-up Thinking: Bringing Together Sustainability, Environmental Justice, and Equity. In Just Sustainabilities: Development in an Unequal World, 1-16. Cambridge: The MIT Press.

Senge, Peter et al. 2008. The Necessary Revolution: how individuals and organizations are working together to create a sustainable world. New York: Doubleday.

Thomas, Randall and Max Fordham. 2003. Sustainable Urban Design: An Environmental Approach. New York: Taylor & Francis.

## Alternative Position

- Constraint      Each solution element must be independently sustainable: environmentally, economically, and socially.
- Objective
- Directive

## Background and Arguments

Sustainability refers to "the need to ensure a better quality of life for all, now, and in the future, in a just and equitable manner, while living within the limits of supporting ecosystems" (Agyeman et al 2003, 2). If a process or activity is not sustainable, by definition it will eventually cease to exist.

Frequently, the term "sustainable" is interchanged with "green" and "environmentally friendly." We think about sustainability in terms of limiting our use of natural resources and minimizing our impact on the environment - and that *is* an important component of sustainability: failing to make a process environmentally sustainable has dire consequences. A lack of environmentally sustainable practices in the world today - including "the burning of fossil fuels... [which results in] increased CO<sub>2</sub>" (Thomas and Fordham 2003, 5) - has led to a massive climate crisis that threatens to change (if not end) life as we know it.

However, it is also important to consider social responsibility and economic performance when evaluating a system's sustainability: "A truly sustainable society is one where wider questions of social needs and welfare, and economic opportunity, are integrally connected to environmental concerns" (Agyeman et al. 2003, 2). Without social and economic equity, it is unlikely an environmentally sustainable

system will succeed (Agyeman et al. 2003, 2).

From a business perspective, there is an inherent risk associated with turning a blind eye to sustainability, in all of its respects: "While the short- and medium-term risks vary for each company and industry, the ultimate risks of ignoring sustainability issues are clear: ...business in the traditional sense will cease to exist" (Senge et al. 2008, 109).

It is clear, then, that the overall system must be environmentally, socially, and economically sustainable. "Sustainable urban design is vital for this century - it is not too much to say that our health, welfare, and future depend on it" (Thomas and Fordham 2003, 11).

From an environmental and economic perspective, this means that system-wide use of a given resource cannot exceed the rate at which the system replenishes that resource; individual system elements need not be environmentally and economically sustainable on their own as long as the system as a whole is environmentally and economically sustainable. However, all individual system elements, and therefore the system as a whole, must be socially sustainable (e.g. the use of products that involve slave or child labor in their manufacturing processes is never okay). While environmental and economic resources can be used and replenished at various points in the system, human resources (lives, integrity) are not similarly interchangeable.

# Defining Statement

Issue  
Culture

8

## Project

Chicago: Vision for the Future | Infused Nature

## Question at Issue

How should a cultural understanding of infused nature be fostered?

## Originator

Thomas McCue                      Sept. 8, 2008

## Contributors

Ruth Schmidt                      Sept. 25, 2008

## Position

- Constraint
- Objective
- Directive

There should be an active effort to understand the cultural implications of infusing nature into the urban landscape, and to foster a cultural acceptance based upon that understanding.

## Sources

Group Discussion  
Personal Observation

## Alternative Position

- Constraint
- Objective
- Directive
  
- Constraint
- Objective
- Directive

The system should integrate closely with CPS, and make specific curriculum recommendations.

A cultural acceptance of infusing nature into the urban landscape is an implied result due to inherent improvements upon the urban landscape

## Background and Arguments

A provision for context is vital in regards to the infusion of nature in an urban setting. To simply rearrange the landscape and expect people to appreciate and interact with their surroundings is not adequate. For nature to truly become a part of the fabric of daily life, for young and old, rich and poor, there are some cultural shifts that must take place. The cultural life of a city is informed to a great extent by its environs. The urban landscape, in it's architectural glory or its dilapidated blight has a profound effect on the psychology of its inhabitants. Our environment can present opportunities or constraints that serve to form the fabric of our daily lives in regards to work, recreation, transportation, how we eat, and how we interact with our community.

In an established community culture the perception of the environs, and the context that it provides cannot be presumed to have a readily accepted mutability. To alter the landscape that sets the backdrop in a community's life, is to ask a cultural change. Regardless of the intent of the designers, and the positive goals of an infusion of nature, acceptance is not a given. Therefore, provisions must be made to pave the way for the acceptance of infusion of nature into the fabric of a community's life.

This notion will come into play particularly where system solution elements part from the understood or conventional inter-

action paradigms for nature. Also, variance from community to community on how this manifests will also come into play. For example, one community may be accustomed to growing their own food, but the notion of spending the night in the woods as a recreational activity might be completely foreign. Another community might bear a high degree of resistance to sacrificing private space for public use.

The suggestion is not to force any individual or community into a cultural change, but to provide tools and understanding that would foster the acceptance of the system.

# Defining Statement

Issue  
Biology

9

## Project

Chicago: Vision for the Future | Infused Nature

## Originator

Ann Hintzman                      Sept. 1, 2008

## Contributors

Charles Owen                      Sept. 5, 2008  
Nikki Pfarr                          Sept. 29, 2008

## Sources

Group Discussions;  
Kellert, Stephen. 2002. Experiencing Nature: Affective, Cognitive, and Evaluative Development in Children. In Children and Nature, ed. P. Kahn and S. Kellert, 117-151. Cambridge: The MIT Press.

Trees for Cities. <http://www.treesforcities.org> (accessed Sept 8, 2008)

## Question at Issue

How should the solution address the interplay of “nature” and “technology”?

## Position

- Constraint
  - Objective
  - Directive
- Whenever possible the system should focus on a biologically based nature experience.

## Alternative Position

- Constraint
  - Objective
  - Directive
- System elements should be selected which improve community access to nature themes and are cost effective.
- Constraint
  - Objective
  - Directive
- Technology ought to be used to broaden the scope of the local environment and provide a novel experience.

## Background and Arguments

Technology and nature are arguably a continuum and not two distinct entities - there are highly architected gardens and technological portrayals of forests that introduce questions of what constitutes a natural experiences. While there are merits to the former - allowing access to environments people might not be able to actually experience coupled with a cutting-edge wow factor - it is important for the system to focus on biological nature as the heart of the experience. The infused nature system should be about experiencing nature not about experiencing representations of nature.

The goal of this system, as set for by the charter, is to infuse the benefits of nature into the lives of Chicagoans. Technological representations of nature are insufficient to supply the psychological or environmental benefits necessary to achieve the charter's goals. From a developmental standpoint, simulated nature is insufficient to reap many of the psychological and developmental benefits shown by children with direct nature experiences.

"...increases in children's indirect and vicarious contact with nature do not appear to offer an adequate substitute for diminished direct encounters in ordinary and accessible natural environments." (Kellert 2002, 147)

Nor does simulated nature offer something back to the community. Virtual nature offers no food, shade, air or water

improvement, or connection with the environment and planet. Biologically based nature, more specifically trees, on the other hand have a positive effect on incidence of asthma and skin cancer, can provide oxygen, decrease energy consumption through moderation of the climate, and increase the property value of the streets upon which they live (Trees for Cities).

Technology will undoubtedly play an important role in both the development and implementation of the solution as well as the lives of the users of the system. The system will embrace such technologies that increase access to nature and yield the benefits that nature has been shown to yield; however, technology should not be used as a means of replacing the biologically-based nature experience.

# Defining Statement

Issue

New and emerging technologies

10

## Project

Chicago: Vision for the Future | Infused Nature

## Originator

Nikki Pfarr

Sept. 3, 2008

## Contributors

Marisa Knopman

Sept. 28, 2008

## Sources

Group Discussions;

Mitchell, William J. 2003. *Me++: The cyborg self and the networked city*. Cambridge: The MIT Press.

Walters, Helen. 2007. *Driving Sustainable Design*. Business Week online. [http://www.businessweek.com/innovate/content/jul2007/id2007072\\_085897.htm](http://www.businessweek.com/innovate/content/jul2007/id2007072_085897.htm) (accessed Sept. 3, 2008)

Vella, Matt. 2008. *Rise of the Carbon-Neutral City*. Business Week online. [http://www.businessweek.com/innovate/content/feb2008/id20080211\\_503795.htm](http://www.businessweek.com/innovate/content/feb2008/id20080211_503795.htm) (accessed Sept. 3, 2008)

## Question at Issue

To what extent should the system incorporate new and emerging technologies?

## Position

- Constraint
- Objective
- Directive

The system should evaluate and utilize new technologies as appropriate, but should also consider use of existing technologies or low-tech solutions on a per-project basis.

## Alternative Position

- Constraint
  - Objective
  - Directive
- 
- Constraint
  - Objective
  - Directive

The system should utilize new technologies whenever possible, and should strive to remain on the cutting edge of innovation.

The system should refrain from utilizing new technologies until they have undergone extensive real-world use and have a proven track-record.

## Background and Arguments

While many new technologies promise better, faster, and more efficient solutions, potential benefits should be carefully measured against potential negative effects and system-wide impact. In such analyses, it is important to consider the scope and specific usage of a new technology. As Helen Walters points out, new technologies often have unintended effects, that, if not dealt with, can have damaging consequences:

while "the Internet is a very powerful way to organize the distribution of information and goods... it has been used to send things very long distances at a huge environmental cost. That same infrastructure can be used for small distances as well as large. We just have to change the question that we ask of it" (Walters 2007).

If potential misuse can be foreseen, it may be avoided. Thus, engagement with new technologies should be well-informed and thoroughly planned.

Solutions should utilize new technologies as appropriate, but should also give careful consideration to the possible benefits of using existing technologies and/or primarily low-tech approaches. Sometimes low-tech solutions may be most effective: for example, "according to the U.S. Green Building Council, energy inefficiencies in buildings account for some

33% of worldwide carbon dioxide emissions" (Vella 2008) which can be addressed by "things as simple as better insulation" (Vella 2008).

Additionally, while solutions need not directly incorporate new technologies, spatial solutions should accommodate the use of new technologies whenever possible. As many coffee shops and libraries are now, natural spaces have the potential to become the "third place;" thus there is an opportunity for green / open spaces to be adaptive environments that support the nomadic, hyper-connected lifestyle. These may be "more versatile, hospitable, accommodating spaces that simply attract occupation and can serve diverse purposes as required" (Mitchell 2003, 159). After all, "if you have your wireless connections, a seat under a tree in spring beats an interior office cubicle" (Mitchell 2003, 154).

# Defining Statement

Issue  
Climate change response

11

## Project

Chicago: Vision for the Future | Infused Nature

## Originator

Ruth Schmidt                      Sept. 6, 2008

## Contributors

## Question at Issue

To what extent should the potential for significant climate change be incorporated into the design of green spaces and the natural environment?

## Position

- Constraint      The system should focus on developing green spaces that can serve beneficial secondary causes to reduce the impact of climate change, such as green roofs.
- Objective
- Directive

## Sources

Group Discussions  
U.S. Environmental Protection Agency. 1997. Climate Change and New York. EPA 230-F-97-008ff: 1-4.  
  
Raza, S.H. 1995. Plant Life Forms in Thermal Regulation and Self Purification of Urban Housing Environments. Indoor and Built Environment 4, no. 1: 58-61.

## Alternative Position

- Constraint      The system should emphasize natural environments that are most likely to thrive under more extreme conditions with minimal intervention.
  - Objective
  - Directive
- 
- Constraint      Affirming Chicago's position as a world-class city, the plan should maintain a full range of flora and fauna.
  - Objective
  - Directive

## Background and Arguments

Climate change is already affecting the flora and fauna of the Chicago region, and will continue to do so even more dramatically over the next century. Increased temperatures, heat waves, and more intense, sporadic rains are projected to affect the viability of plant and wildlife (U.S. Environmental Protection Agency 1997, 3). In order to define an optimal solution to maintaining the city's green spaces and natural environment, an approach that incorporates sustainability as an element of planning is critical.

Despite Chicago's history as a prairie, this "city in a garden" currently supports a wide range of flora and fauna throughout its public green spaces. However, climate change will bring new weather conditions in which this diversity of plant life may no longer thrive, or require significant resources to do so. As our water supply declines and situations of use—such as agriculture, corporate and personal needs, and public spaces—need to be prioritized, it will be increasingly more difficult to champion a plan that requires using precious water resources to maintain the environment.

A preferable plan might focus on plants that are likely to thrive naturally in the future environment with minimal intervention, allowing a wide range of plant- and wild-life without an

excessive use of natural resources. Prairie grasses and similar plants, which have historically thrived in the Chicagoland area under such conditions, would provide green spaces with a minimum of maintenance requirements that also support long-term growth.

An ideal plan, however, would look beyond current uses for green spaces and find ways to incorporate potential secondary benefits, specific to the urban environment, that plants can provide. Green roofs and phanerophytic (high-branching leafy) trees, shrubs, and herbs reduce energy use by providing a cooling effect to their immediate surroundings in summer and an insulating role in the winter (Raza 1995, 59). Similarly, certain succulent plants that thrive both indoors and outdoors have been shown to reduce levels of carbon dioxide in the environment (Raza 1995, 60), providing new opportunities to bring green spaces into traditionally indoor spaces. By looking towards plants that provide both the psychological and social benefits one expects of nature, while also actively combatting the conditions severe climate change is likely to bring, Chicago can benefit doubly.

# Defining Statement

**Issue**  
Space use allocation

12

**Project**

Chicago: Vision for the Future | Infused Nature

**Question at Issue**

How should solutions prioritize the uses of natural spaces for recreation, education, ecology, and agriculture?

**Originator**

Nikki Pfarr                      Sept. 1, 2008

**Position**

Constraint            Solutions should prioritize specific use-cases based on the needs of the local community, incorporating elements vital to the city's sustainable infrastructure whenever possible (ecology, agriculture).  
 Objective  
 Directive

**Contributors**

Ann Hintzman                      Sept. 28, 2008

**Sources**

Group Discussions;

Francis, Mark. 1989. Control as a Dimension of Public-Space Quality. In *Public Places and Spaces: Human Behavior and Environment, Advances in Theory and Research*, vol 10, ed. Irwin Altman and Ervin H Zube, 147-172. New York: Plenum Press.

Hayward, Jeff. 1989. Urban Parks: Research, Planning, and Social Change. In *Public Places and Spaces: Human Behavior and Environment, Advances in Theory and Research*, vol 10, ed. Irwin Altman and Ervin H Zube, 193-216. New York: Plenum Press.

Kellert, Stephen. 2002. Experiencing Nature: Affective, Cognitive, and Evaluative Development in Children. In *Children and Nature*, ed. P. Kahn and S. Kellert, 117-151. Cambridge: The MIT Press.

Study: Loss Of Genetic Diversity Threatens Species Diversity. Environmental News Network. <http://www.enn.com/wildlife/article/23391> (accessed Oct. 4, 2008)

**Alternative Position**

Constraint            Solutions should prioritize use-cases vital to the city's sustainable infrastructure (ecology, agriculture), followed by education and recreation/leisure.  
 Objective  
 Directive

Constraint            Solutions should devote equal resources to all use-cases.  
 Objective  
 Directive

**Background and Arguments**

In urban environments, spaces that feature nature serve a variety of purposes. Consider the varied usage of parks, school yards, walking trails, communal gardens, nature conservatories, and burial grounds. These varied use-cases offer different, and often unique benefits to the surrounding community; should certain uses be prioritized over others?

Existing models for the design of urban parks and green space distinguish between "nature in the city" and "active recreation" (Hayward 1989, 195). Nature in the city, which "emphasizes passive experience and the park as a visual/aesthetic resource" (Hayward 1989, 195), is known to have positive mental and emotional benefits (Kellert 2002, 146). Active recreation, which "accommodate[s] recreational needs through [sports facilities]" (Hayward 1989, 195), offers health benefits through exercise. In both scenarios, the natural environment becomes a context for leisure and recreation activities.

There is also value in "interpretive environments" which are "places that combine a leisure setting with an educational or cultural experience" (Hayward 1989, 198). These types of environments, which could include self-guided nature walks or more formalized exhibits, may improve peoples' understanding of, and thereby their appreciation

for, the natural environment. In interpretive environments, experiencing nature itself becomes a featured activity.

Uses of nature that are vital to the city's sustainable infrastructure are also important. Gardens or crops used to produce food or biomass for biofuel require space, as do semi-natural habitats aimed at fostering biodiversity amongst plants and wildlife - a lack of which would threaten our "rich and robust assemblage of foods, medicines, industrial materials and recreation activities" (Study: Loss Of Genetic Diversity Threatens Species Diversity).

Given the value of these varied use-cases, the strength of our solution will be in creating integrated, multi-purpose environments, while also recognizing that their ongoing sustainability will depend on buy-in from and involvement by the local community: "direct involvement of users in the construction and maintenance of a place also may enhance meaning or attachment to a public place" (Francis 1989, 156). Thus, use-case priority should be primarily determined by local community needs; whenever possible, those solutions should also incorporate elements vital to the city's sustainable infrastructure.

# Defining Statement

Issue  
Meaning of place

13

## Project

Chicago: Vision for the Future | Infused Nature

## Originator

Marisa Knopman                      Sept. 5, 2008

## Contributors

## Question at Issue

How should the system address the ever-changing meaning of place, particularly as it applies to work, home and play?

## Position

- Constraint
- Objective
- Directive

The system should consider the emerging knowledge economy to provide solutions that support the blurring lines separating domains.

## Sources

Dempsey, Nicola and Mike Jenks. 2005. Future Forms and Design for Sustainable Cities. Oxford, UK: Elsevier (Architectural Press).

## Alternative Position

- Constraint
- Objective
- Directive

The system should act as a kind of backdrop or passive landscape, merely supporting city happenings.

## Background and Arguments

The once immediately-apparent lines dividing work, life, and play are growing increasingly more blurry with the advent of new technologies and subsequent economic trends. The ability to simultaneously function in all realms (professional and private) anywhere, anytime begs the question, *where?*

The emerging knowledge economy, a system dependent on the transfer of information and the formation of an integrated world economy, is redefining the meaning of place. Whereas at one point, home and "the office" comprised the primary identity and usage for place, this is no longer the case. Quality of space, and more specifically, the notion of the third place, a space outside the home that fosters community, informal gathering, and social interaction, is not only replacing conventional work environments, but is also demonstrating the ability to attract and retain the human capital necessary for supporting and enriching the growing knowledge economy.

"The increasing dispersal of economic functions, the ability to work anywhere and at anytime, provides a renewed emphasis on the quality of place as a primary factor in locational choice" (Dempsey and Jenks 2005, 42).

Therefore the system should leverage the shifting economic and social values to articulate the meaning of place and attract and retain thought-leaders of the growing knowledge economy.

# Defining Statement

Issue  
Transportation and nature

14

## Project

Chicago: Vision for the Future | Infused Nature

## Originator

Ruth Schmidt                      Sept. 6, 2008

## Contributors

## Question at Issue

To what extent should infused nature inform transportation solutions?

## Position

- Constraint                      The system should leverage infused nature to increase work and life options that naturally decrease the reliance on cars and other ground transportation.
- Objective
- Directive

## Sources

Group Discussions

Demirela, H., E. Sertel, S. Kaya, and D. Z. Seker. 2006. Exploring impacts of road transportation on environment: a spatial approach. *Desalination* 226: 279-288.

Frumppkin, H. 2002. Urban Sprawl and Public Health. *Public Health Reports* 117, no. 3: 201-217.

## Alternative Position

- Constraint                      The system should emphasize access and availability of natural spaces by expanding the existing transportation system.
  - Objective
  - Directive
- 
- Constraint                      The system should strive to integrate nature and transportation where possible by better supporting activities like biking and walking .
  - Objective
  - Directive

## Background and Arguments

It is generally accepted that reduced reliance on car-related transportation is environmentally beneficial; at the same time, the elimination of cars altogether is very unlikely in a city as large as Chicago. Finding a balance between nature and transportation infrastructure is therefore critical to a successful plan.

One approach for incorporating nature and the transportation system could focus on access to existing or proposed natural areas, such as forest preserves and parks. While this is undeniably a boon in terms of increasing availability of nature to those who may not have local access, it also runs the risk of making the existing transport structure even larger and more unwieldy than it already is. Even if natural areas were brought into the city center or evenly distributed to be more immediately accessible to more people, the sheer amount of additional road or track required to create full access would be expensive and disruptive to the environment as a whole.

Increased incorporation of nature and transportation through emphasis on modes of transportation that are better integrated with the natural environment, such as walking and biking, is an alternate approach. Chicago makes substantial use of the lakefront to this end, and the boulevard system already

partially in place could serve as infrastructure for additional pedestrian-centric options. Encouraging more physical modes of transportation would also provide health benefits. However, a realistic appraisal of the Chicago climate recognizes that limited access and ease of use during the winter months would lead to a part-time win at best. In addition, the city's current economic structure still demands a certain level of easy access to and from the city center that may not be helped by more local solutions.

A reframing of the issue, however, would focus on creating environments that decrease the current need for a high level of intra-city transportation, thus reducing the overall reliance on transport overhead. Linking residential and commercial activities has been found to influence a variety of travel behaviors (Demirela et al. 2006, 280). Through improved incorporation of work and life needs by restructuring communities around central areas that facilitate social and business interactions, and incorporating technical solutions into the overall environment that encourage technological connectivity, a fully integrated system could naturally reduce reliance on transportation and its polluting side effects.

# Defining Statement

Issue Physical connection of green space	15
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**Project**  
Chicago: Vision for the Future | Infused Nature

**Question at Issue**  
How should solutions address connectivity of open/green space?

**Originator**  
Nikki Pfarr                      Sept. 1, 2008

**Contributors**  
Ruth Schmidt                      Sept. 29, 2008

**Position**

Constraint      Solutions should connect open/green space whenever possible.

Objective

Directive

**Sources**  
Group Discussions;  
  
Erickson, Donna. 2006. MetroGreen: Connecting Open Space in North American Cities. Washington DC: Island Press

**Alternative Position**

Constraint      Solutions should separate open/green spaces, keeping them as distinct entities.

Objective

Directive

## Background and Arguments

There are a variety of ways to connect open/green space in an urban community; frequently this involves the use of greenbelts (spaces that function as green "buffers" beside urban areas), parkways (scenic roads or streets weaving through green space), and greenways (extended green space corridors) that function as linear connections between larger parks or open spaces (Erickson 2006, 29).

Connection of open/green spaces improves biodiversity of plants and animals, allowing them to move safely between habitats and ecosystems without venturing into unsuitable habitat (Erickson 2006, 19, 22). Connected spaces can also provide "alternative refuges from large disturbances such as fire" (Erickson 2006, 23), by allowing animals to quickly leave an endangered area.

In addition to positive effects on animals and plant life, the connection of open/green space offers benefits to the city's human inhabitants: "ample literature supports the idea that an urban landscape with high connectivity is more accessible, more humane, and indeed more democratic" (Erickson 2006, 24). Human-accessible connectivity may take the form of trails or walkways that encourage people to travel between larger spaces.

It is important to note, however, that connectivity does present negative effects, including those resulting from increased immigration rates of plant and animal species, and from "facilitat[ing] the spread of fire and other disturbances" (Erickson 2006, 23).

However, the positive effects are generally seen to outweigh the negative effects; high connectivity of open/green spaces is largely considered beneficial to urban communities (Erickson 2006, 23).

# Defining Statement

Issue  
Seasonal access

16

## Project

Chicago: Vision for the Future | Infused Nature

## Originator

Ann Hintzman                      Sept. 8, 2008

## Contributors

### Sources

Group Discussions

Bisgrove, R. and P. Hadley. 2002. Gardening in the Global Greenhouse: The Impacts of Climate Change on Gardens in the UK. Technical Report. UK Climate Impacts Programme, Oxford.

Nihiser A.J., S.M. Lee, H. Wechsler, M. McKenna, E. Odom, C. Reinold, D. Thompson, and L. Grummer-Strawn. 2007. Body Mass Index Measurement in Schools. *Journal of School Health* 10: 651–671.

Youfa W., L. Huifang, L. Tussing, C. Braunschweig, B. Caballero, and B. Flay. 2007. Obesity and Related Risk Factors Among Low Socio-Economic Status Minority Students in Chicago. *Public Health Nutrition* 10: 927-938

## Question at Issue

To what extent should the system address year-round access?

## Position

- Constraint
- Objective
- Directive

The system should integrate indoor system elements within outdoor spaces to promote and enhance year-round usage.

## Alternative Position

- Constraint
  - Objective
  - Directive
- 
- Constraint
  - Objective
  - Directive

The system should provide indoor nature destinations to provide a year-round learning center as well as a bad weather destination

The system should exist only in natural environments, and encourage through activities and promotions an appreciation of seasonality.

## Background and Arguments

Part of the allure of nature is its wildness, and although the cold of winter, and the hot of summer limit the range of outdoor activities that can be partaken in, seasonality is part of the infused nature experience. Acknowledging the power of the seasons, though, should not prevent the system from providing viable access to the entire community year-round. Indoor system elements should be used to enhance and protect the vitality of the outdoor elements, by preserving plant-life from weather events predicted with global warming, and providing a growing stock for the rest of the system. Additionally, weather-sheltered spaces that are co-located with outdoor spaces would build a destination habit that would encourage both indoor and outdoor exploration on a year-round basis.

Indoor green space provides indigenous species protection from the environmental elements. While the increased carbon dioxide and warmer temperatures expected to come in the next 100 years will be good for plants, the longer periods of higher temperature weather will also be good for pests, disease, mildew and algae. Plants will also be taxed by volatile weather, and nitrate loses which will challenge the maintenance of soil fertility. Providing indoor greenspace would protect plants from pests and disease and allow for the preservation of biodiversity, by sheltering species which might otherwise fall prey to blight. Additionally, indoor greenspaces could be used for year round composting to provide nutrient rich soil for other parts of the system.

Indoor greenspace can offer an alternative to sedentary activities people often turned to when the weather is bad and build a habit of nature-experiences necessary for year-round appreciation. Obesity is on the rise in American children and adolescents, more than doubling in the last 24 years. (Nihiser et al. 2007, 651) This effect is especially pronounced in urban youths of lower socioeconomic means. A survey of 498 students in 4 Chicago Public Schools, found that 39.8% had a BMI over the 85th percentile. (Youfa et al. 2007, 927). While many factors contribute to childhood obesity, one issue highlighted by each of these reports is a lack of physical activity and an increase in time spent in front of a screen (tv or computer). By including system elements that children can access throughout the year, an alternative destination can be established when the outdoor weather does not allow for exploration. By integrating the indoor system elements with the outdoor system elements, the consistency of destination would build a habit that encourages kids to engage in outdoors activities when the weather is better.

Including indoor spaces as an integrated part of the system, not only will increase accessibility, but will also build stronger ties between users and their nature destinations. Year round access will enhance the outdoors nature experience by providing elements necessary for the whole of the Chicago environment to thrive as well as a habit of nature experiences necessary for the outdoor elements to be used.

# Defining Statement

Issue  
Indigenous species

17

## Project

Chicago: Vision for the Future | Infused Nature

## Originator

Marisa Knopman                      Sept. 4, 2008

## Contributors

Nikki Pfarr                              Sept. 25, 2008

## Question at Issue

To what extent should local, indigenous elements be prioritized?

## Position

- Constraint
  - Objective
  - Directive
- The system should prioritize species that will require the least work of adaptation, implying a certain level of "fitness."

## Sources

McHarg, Ian L. 2006. The Essential Ian McHarg Writings on Design and Nature. Washington DC: Island Press.

## Alternative Position

- Constraint
  - Objective
  - Directive
- Species selection should be based on aesthetic value.

## Background and Arguments

According to Ian McHarg:

"The theory for human ecological planning can now be summarized: all systems aspire to survival and success.... To achieve [this] requires systems to find the fittest environment, adapt it and themselves. Fitness of an environment for a system is defined as that requiring the minimum work of adaptation" (McHarg 2006, 94).

It follows, then, that the system should be comprised of elements for which the Chicago region is already an ideal environment, such as local and indigenous plant and animal species. A bias toward local and indigenous species is further supported by the system's prioritization of sustainability: local species will require less maintenance and "output" and therefore be more sustainable over time. Occasionally, solution elements may be put in place to explicitly support or feature exotic species - take, for example, a zoo. Following McHarg's theory, the zoo environment should include a replica of the African Serengeti for the zoo's lions, ensuring the lions don't have to adapt to the actual Chicago climate. However, while this may be in the best interest of the lions, such a solution may put stress on the larger system. On the other hand, the system should support non-indigenous environments in the cases where the benefits of the solution outweigh adaptation costs, think vertical farming techniques.

In cases where supporting exotic species in the system will require unreasonable adaptation costs on behalf of both the system and the species, implementation should be minimized. Supporting and housing

exotic species should not be done at the expense of the overall system's sustainability.

# Defining Statement

Issue  
Animals

18

## Project

Chicago: Vision for the Future | Infused Nature

## Originator

Nikki Pfarr Sept. 9, 2008

## Contributors

Marisa Knopman Sept. 28, 2008

## Sources

Buckley, Ralf. 2005. Impacts of Ecotourism on Terrestrial Wildlife. In Environmental Impacts of Ecotourism 2, ed. Ralf Buckley, 211-228. Cambridge: CABI Publishing.

Price, E. 1999. Behavioral development in animals undergoing domestication. In Applied Animal Behaviour Science 65, no. 3: 245 - 271.

U.S. Environmental Protection Agency. Ecosystems and Biodiversity: Climate Change - Health and Environmental Effects. <http://www.epa.gov/climatechange/effects/eco.html> (accessed Oct. 4, 2008)

Kahn, Peter H. 1999. The human relationship with nature: development and culture. Cambridge: The MIT Press.

Shepard, P. 1996. The others: How animals made us human. Washington DC: Island Press.

## Question at Issue

To what extent should the system address animal life?

## Position

- Constraint
- Objective
- Directive

The system should accommodate interaction with domestic animals (pets), facilitate the observation of wildlife in natural settings, and protect local animal habitats.

## Alternative Position

- Constraint
  - Objective
  - Directive
- 
- Constraint
  - Objective
  - Directive

The system should accommodate interactions with domestic animals (pets), but should not incorporate exposure to, nor interfere with the lives of, local and exotic wildlife.

The system should focus primarily on the use of semi-natural habitats to moderate observation of local and exotic wildlife (e.g. zoos, aquariums).

## Background and Arguments

Animals play an integral role in a healthy, natural ecosystem:

"an ecosystem is an interdependent, functioning system of plants, animals and microorganisms... Without the support of the other organisms within their own ecosystem, life forms would not survive, much less thrive" (Ecosystems and Biodiversity).

Thus, to promote the health and resilience of local ecosystems, care should be taken to ensure that animals within the city and surrounding areas are able to thrive. This will involve protecting and limiting human exposure to natural animal habitats, as well as addressing causes of climate change - a phenomenon which is damaging natural animal habitats at startling rates (Ecosystems and Biodiversity).

Beyond their involvement in local ecosystems, animals play important roles in human lives: human contact with animals, both domestic and wild, provides documented physiological and psychological benefits (Kahn 1999, 15). Domestic animals, in particular, "can provide affection, act as a confidants, and offer social contact... interactions with pets can promote the physical and psychological health of people who are healthy or sick, young or old" (Kahn 1999, 169). However, as Shepard postulates, "[domestic animals] are not a glorious bonus on life; rather they are compensations for something desperately missing" (Shepard 1969, 151). In Shepard's opinion, what's missing is exposure to and a deeper respect for animals in their natural habitats.

But encouraging humans to make contact with wild animals in their natural habitats presents risks for both the humans and animals involved. Such interaction may result in destruction of habitats, introduction of diseases, and defensive attacks: "many injuries to

tourists by wildlife are from entirely herbivorous species acting defensively when approached" (Buckley 2005, 216).

Fortunately, the act of simply observing animals or fish has been found to reduce stress: "Katcher, et al. (1983) found that watching an aquarium resulted in significant decreases in blood pressure below the resting level in both hypertensive and normal subjects" (Kahn 1999, 15-16).

Superficially, zoos and aquariums offer such benefits by facilitating animal observation in a moderated setting. However, animal captivity has many known negative effects, including: "modified rates of behavioral and physical development," "reduced...sensitivity of animals to changes in their environment," "loss of certain behavior patterns," and "genetic changes" resulting from inbreeding (Price 1999, 245). Clearly, minimizing animal captivity is best for the animals.

The physiological, psychological, and educational benefits of zoos and aquariums should thus be carefully weighed against the potentially harmful effects they may have on the animals involved. Should captivity be deemed necessary (for example, in the case of caring for endangered species), preference should be given to innovative zoo and aquarium solutions which maintain natural habitats whenever possible.

If local wildlife can be observed in its natural habitat - provided the observation is done in a non-damaging way with respect to the environment, animals, and people involved - captivity should be unnecessary. Such observation not only offers the physiological and psychological benefits associated with animal exposure, but can offer added benefits associated with visiting local parks and forest preserves.

# Defining Statement

Issue  
Eminent domain

19

## Project

Chicago: Vision for the Future | Infused Nature

## Originator

Ruth Schmidt                      Sept. 12, 2008

## Contributors

## Question at Issue

To what extent should eminent domain be considered in the goal of infusing nature into the built environment?

## Position

- Constraint      Land reclamation of otherwise unused space should be considered, but only if there is no human displacement.
- Objective
- Directive

## Sources

Group Discussions

Benedict, M.A. and E.T.G. McMahon. 2006. *Infrastructure: Linking Landscapes and Communities*. Washington DC: Island Press.

Burnham, Daniel H. and Edward H. Bennett. 1909. *Plan of Chicago*. Ed. Charles Moore. Chicago: The Commercial Club. Reprint, New York: Princeton Architectural Press, 1993.

Chicago Metropolitan Agency for Planning. 2006. *Endorsed 2030 Forecasts*. [http://www.cmap.illinois.gov/2030\\_forecasts.aspx](http://www.cmap.illinois.gov/2030_forecasts.aspx) (accessed Oct. 2008)

## Alternative Position

- Constraint      Eminent domain should be allowed to ensure equitable access to greenspace for the city's entire population.
  - Objective
  - Directive
- 
- Constraint      Eminent domain must never be enacted.
  - Objective
  - Directive

## Background and Arguments

The original Burnham plan from 1909 considered moderate eminent domain a necessary part of creating access to parkland and natural preserves for the citizens of Chicago:

"...the state has also authorized cities, towns, and villages to grant park authorities the right to take and improve streets not more than a mile in length without the consent of the abutting property owners, and to construct surface and elevated ways and turn the same over to public park corporate authorities."  
(Burnham and Bennett 1909, 44)

Without the foresight to take land under civic control where deemed necessary, iconic Chicago landmarks like the boulevard system and Lake Michigan lakefront would not have been possible in their current form.

As the Chicago region has grown even larger—and threatens to increase by yet another half-million individuals in the next 20 years with no sign of slowing (Chicago Metropolitan Agency for Planning 2006)—it is perhaps tempting to use similar strategies to ensure access to green spaces throughout the city. However, use of reclamation plans like eminent domain for new green spaces bears an enormous development cost, in addition to the costs of human displacement and reimbursement for land in the

first place.

Experts conclude that "restoring natural systems is far more expensive than protecting undeveloped land." (Benedict and McMahon 2006, 41) in terms of costs related to tearing down existing structures, cleanup of chemical or structural elements affecting the soil, and rebuilding a natural environment from scratch. For these reasons, eminent domain could be considered an old-fashioned and unnecessarily expensive approach to the issue of creating parkland.

Yet while the increased ability to develop and maintain alternate forms of green spaces—from indoor hydroponics to vertical gardens—will reduce the need to rely on more traditional concepts of "green space" as large areas of continuous horizontal land, there are still cases where land is worthy of reclaiming for natural redevelopment. The Promenade Plantée in Paris, for example, has created a safe elevated walking environment and desirable economic venue below; Manhattan's High Line project promises comparable benefits for a similarly densely settled urban area. In both cases, the cities made use of abandoned rail lines that were otherwise blights on the urban landscape—in cases like these, where individual human and economic rights are not at question, reclamation can be a valuable strategy.

# Defining Statement

**Issue**  
Adding economic value

20

**Project**

Chicago: Vision for the Future | Infused Nature

**Question at Issue**

To what extent should the plan for infused nature impact the general Chicago economy?

**Originator**

Ruth Schmidt                      Sept. 8, 2008

**Position**

- Constraint            The plan should strive to support ways in which infused nature can generate additional economic value for the Chicago region.
- Objective
- Directive

**Sources**

Group Discussions  
Green Collar Chicago. <http://greencollarchicago.org/> (accessed Sept. 8, 2008)  
  
Sustainable South Bronx. <http://www.ssbx.org/best.html> (accessed Sept. 8, 2008)

**Alternative Position**

- Constraint            The plan should promote public access above all else, even if it means giving up opportunities to leverage natural environments for economic ends.
- Objective
- Directive
  
- Constraint            The plan should allow private entities to dictate how their immediate environment relates to the overall system, so long as those interests do not interfere with the overall public interest.
- Objective
- Directive

**Background and Arguments**

In any urban setting, the tension between natural environments and industry is, to a degree, unavoidable. Requirements of industry have historically taken advantage of existing natural resources—like waterfronts and rivers, as well as open spaces—and even today’s higher tech economy demands a certain degree of building density and infrastructure to support activities that generate wealth for the city. Chicago’s position as an international-level city, both economically and culturally, only exacerbates these issues.

It could be argued that allowing the public first dibs on existing green space should be the highest priority; preserving the lakefront from industrial applications and using it as a common outdoor element was one of the critical touchpoints of Burnham’s plan, and the overall benefits of shared natural space continue to support Chicago’s current position as a truly “green” urban area. Additionally, the changing demands of today’s more technologically-focused economy allow more flexibility regarding where people work and live, reducing the reliance on dense downtown districts to generate economic value for the city.

At the same time, one must recognize that individual private entities—whether business, individual, or civic—have specific interests that may drive some of their decisions about how

(or even whether) to incorporate nature into their immediate environments. In certain situations, what seems like public space is privately owned; is it really fair for the plan to dictate usage requirements, or mandate public access in all cases? This approach seems to run the risk of potentially overstepping the intent of Burnham’s plan.

While determining fair use is still an important consideration, an alternate approach to examining the relationship between nature and Chicago’s economy would focus less on use than on developing a symbiotic relationship between nature and economic development, cultivating both simultaneously where possible. There are already existing organizations that focus on training urban residents for “green collar” jobs like solar panel installation and performing energy audits, and these occupations will only become more critical and more in demand as the scope and sophistication of infused nature increases. At the same time, as new forms of consulting and knowledge related to nature are firmly established on a local level, Chicago’s position as a world center of expertise for nature-related innovation could generate additional intellectual capital. In this way, focusing on job creation and economic development in the service of natural environments will serve a longer-term, more beneficial need than one or the other alone.

# Defining Statement

Issue

Coordinating climate change actions

21

## Project

Chicago: Vision for the Future | Infused Nature

## Originator

Ruth Schmidt

Sept. 6, 2008

## Contributors

## Question at Issue

How should civic, corporate, and individual responses to climate change be encouraged and coordinated?

## Position

- Constraint
- Objective
- Directive

The plan should provide information and feedback that facilitates, but does not mandate, a centralized, coordinated strategy for climate change preparation and response.

## Sources

Group Discussions

White, Rodney R. 1994. Urban Environmental Management: Environmental Change and Urban Design. Hoboken: John Wiley & Sons.

## Alternative Position

- Constraint
- Objective
- Directive

Mandates should be created that provide specific requirements for all everyone, from individuals and communities to area corporations.

## Background and Arguments

Encouraging positive behavior that rewards the community at large as well oneself is frequently difficult, particularly as an urban environment gets larger and people feel more disconnected from the greater population. Nonetheless, a coordinated effort to combat effects of climate change are likely to be most effective long-term.

Mandated behavior, through rules and penalties, is a common strategy but it fails on a number of levels. First, punitive approaches toward behavior change punish "bad" behavior without supplying motivations for a positive change, with the result that individuals are more likely to adhere to the minimum mandated requirements. A rule-based solution is also unlikely to accommodate situational differences, in which various individuals, neighborhoods, or entities may have legitimately different needs or require alternate approaches. Similarly, rules-based approaches tend to be optimized for specific current situations; this tends to lead to known solutions that reduce the potential flexibility that would allow rules to extend beyond narrowly envisioned applications. Last, by applying a lowest-common denominator mandate, the system will reduce the motivation to learn about climate change strategies because there is no clearly defined individual end benefit to learning more or taking more vigorous action.

Incentives, particularly financial ones, can be valuable tools to encourage positive behaviors, but they frequently put the focus on attaining the incentive rather than the actual desired change. In the same way as mandates discourage actually learning about the underlying situation by focusing on adherence to rules, incentives become more about the secondary gain than the rationale behind it: individuals learn what to do without knowing why. For this reason, behavior changes tend to last only as long as the incentive continues.

Providing coordinated feedback that ties information to behavior avoids these pitfalls and yields longer-term results. Studies of energy usage have demonstrated that people who receive quantitative feedback about their personal energy and water usage are much more likely to both understand how their usage affects the community at large and modify their behavior to reduce that usage as a result (White 1994, 125). Using less water or getting in good habits about energy use to match suggested levels, for example, is more concrete and directly actionable when tied directly to an individual's consumption than when presented as a general guideline.

# Defining Statement

Issue  
Prioritization of needs

22

## Project

Chicago: Vision for the Future | Infused Nature

## Originator

Ann Hintzman                      Sept. 1, 2008

## Contributors

Nikki Pfarr                              Sept. 1, 2008  
Marisa Knopman                      Sept. 29, 2008

## Sources

Group Discussions

Sommer, Robert. *Farmers' Markets as Community Events*. In **Public Places and Spaces: Human Behavior and Environment, Advances in Theory and Research**, Volume 10, edited by Irwin Altman and Ervin H Zube, 57-79. New York, NY: Plenum Press, 1989.

Francis, Mark. *Control as a Dimension of Public-Space Quality*. In **Public Places and Spaces: Human Behavior and Environment, Advances in Theory and Research**, Volume 10, edited by Irwin Altman and Ervin H Zube, 147-172. New York, NY: Plenum Press, 1989

Linstead, C. Barker, T. Maltby, E. Kumar, P. Mortimer, M. Plater, A. & Wood, M. 2008. **Reviewing Targets and Indicators for the Ecosystem Approach**. Final Report. Defra Project Code NR0119.

## Question at Issue

How should the system prioritize top-down system needs with bottom up user needs?

## Position

- Constraint
- Objective
- Directive

Plans should be made which prioritize first the needs of the community, to insure usage and foster an ongoing relationship with nature.

## Alternative Position

- Constraint
- Objective
- Directive

Plans must be made according to the ecosystem approach, to insure preservation of biodiversity

## Background and Arguments

This is an issue of top-down planning versus bottom-up planning and how to prioritize between the two. The ecosystem approach, is a top-down approach where an integrated strategy of conservation and sustainability is devised, along with metrics to evaluate its success. There are many advantages to this approach including having measurable targets and benchmarks, facilitating central management, and providing a clear directive about how spaces should be used. Perhaps the key advantage of the ecosystem approach is that it prevents pet-projects from running rampant at the expense of system-wide objectives.

While there are strengths to the ecosystem approach, at the heart of this plan for Chicago is one, very specific pet project: getting people into nature. Finding ways to include sustainability initiatives and preserve biodiversity are important to the system; however, this system is anchored in the belief that people and society benefit from regular exposure to nature and prioritizes this objective above all others. This initial exposure and appreciation for nature is what leads to a dedication to preservation and sustainability down the road.

To get people in nature, the system must be designed with input from the community. There must be a significant bottom-up influence in the design of specific system elements to insure the system is used.

"Direct involvement of users in the construction and

maintenance of a place also may enhance meaning or attachment to a public place... An ingredient of meaning is the concept of control or people's ability to directly influence their own use and experience of a place." (Francis 1989, 156)

"The design and management of many urban public spaces have been criticized for failing to serve the needs of residents. Nonuse rather than overuse of parks and plazas is the problem" (Sommer 1989, 57)

Nonuse is above-all what our system seeks to avoid. Taking cues from the community to encourage system use does not mean that there cannot be top-down plans for the system as a whole, types of system elements which are more favored or means of measuring how the systems is faring versus goals. It does mean that a clean, prescribed system should not be favored over a well-used, perhaps less integrated system.



## Function Structure

Communications		System Logistics			Event Response			Adaptation	
Function	Sub-function	Function	Sub-function	Function	Sub-function	Function	Sub-function	Function	Sub-function
26	Analyze resource use	31	Monitor system components	37	Aggregate system data	42	Assemble resources	46	Receive alert
27	Coordinate resource use	32	Tend to system components	38	Evaluate data	43	Act upon plan	47	Interpret alert
28	Manage resource schedules	32	Service components	39	Prioritize adaptation opportunities/needs	44	Survey progress	48	Establish response needs
29	Schedule maintenance	34	Repair/replace components	40	Evaluate resources	45	Accommodate feedback	49	Disseminate response
30	Locate/develop additional resources	35	Assess events	41	Determine action			50	Triage event
		36	Signal significant system changes					51	Evaluate data
								52	Plan long-term response (adapt v. restore)
								53	Archive knowledge

## System Logistics

Operations		Adaptation		Event Response	
Planning	Maintaining	Assessing	Enacting	Responding	Restoring
26. Analyze resource use	31. Monitor system components	37. Aggregate system data	42. Assemble resources	46. Receive alert	50. Triage event
27. Coordinate resource use	32. Tend to system components	38. Evaluate data	43. Act upon plan	47. Interpret alert	51. Evaluate data
28. Manage resource schedules	32. Service components	39. Prioritize adaptation opportunities/needs	44. Survey progress	48. Establish response needs	52. Plan long-term response (adapt v. restore)
29. Schedule maintenance	34. Repair/replace components	40. Evaluate resources	45. Accommodate feedback	49. Disseminate response	53. Archive knowledge
30. Locate/develop additional resources	35. Assess events	41. Determine action			
	36. Signal significant system changes				

## Function Structure

Event-Based Interactions		Event-Based Interactions			Event-Based Interactions			Event-Based Interactions																																			
Function	Sub-Function	Function	Sub-Function	Function	Sub-Function	Function	Sub-Function	Function	Sub-Function																																		
54. Determine location	55. Identify locale	56. Organize participants	57. Assemble materials	58. Transport to locale	59. Secure activity space	60. Gather participants	61. Establish activity parameters	62. Commence activity	63. Re-assemble materials	64. Restore space to initial state	65. Retire to post-activity	66. Document experience	67. Plan future activities	68. Communicate location offerings	69. Select destination	70. Plan route	71. Determine materials needs	72. Travel to destination	73. Provide transition	74. Provide wayfinding	75. Engage the senses	76. Accommodate multiple paths	77. Provides amenities	78. Facilitate sharing of experience	79. Archive experience	80. Provide physical take-aways	81. Encourage further exploration	82. Determine community goals	83. Gauge interest	84. Coordinate resources	85. Inform participants	86. Communicate goals	87. Delegate responsibilities	88. Provide materials	89. Encourage participation	90. Accommodate feedback	91. Assess progress	92. Archive experience	93. Share experience	94. Encourage ongoing involvement	95. Publicize outcome	96. Communicate participant impact	97. Assess success

## Event-Based Interactions

Recreation			Exploring			Civic Participation		
Preparing	Acting	Closing	Embarking	Discovering	Responding	Preparing	Engaging	Extending
54. Determine location	59. Secure activity space	63. Re-assemble materials	68. Communicate location offerings	73. Provide transition	78. Facilitate sharing of experience	82. Determine community goals	86. Communicate goals	92. Archive experience
55. Identify locale	60. Gather participants	64. Restore space to initial state	69. Select destination	74. Provide wayfinding	79. Archive experience	83. Gauge interest	87. Delegate responsibilities	93. Share experience
56. Organize participants	61. Establish activity parameters	65. Retire to post-activity	70. Plan route	75. Engage the senses	80. Provide physical take-aways	84. Coordinate resources	88. Provide materials	94. Encourage ongoing involvement
57. Assemble materials	62. Commence activity	66. Document experience	71. Determine materials needs	76. Accommodate multiple paths	81. Encourage further exploration	85. Inform participants	89. Encourage participation	95. Publicize outcome
58. Transport to locale		67. Plan future activities	72. Travel to destination	77. Provides amenities		90. Accommodate feedback	91. Assess progress	96. Communicate participant impact
								97. Assess success

## Function Structure

Business Process		Business Capabilities			Business Model Elements			Strategic Objectives
Business Process	Business Capabilities	Business Capabilities	Business Capabilities	Business Model Elements	Business Model Elements	Business Model Elements	Strategic Objectives	
1. Business Process	1. Business Capabilities	1. Business Capabilities	1. Business Capabilities	1. Business Model Elements	1. Business Model Elements	1. Business Model Elements	1. Strategic Objectives	
2. Business Process	2. Business Capabilities	2. Business Capabilities	2. Business Capabilities	2. Business Model Elements	2. Business Model Elements	2. Business Model Elements	2. Strategic Objectives	
3. Business Process	3. Business Capabilities	3. Business Capabilities	3. Business Capabilities	3. Business Model Elements	3. Business Model Elements	3. Business Model Elements	3. Strategic Objectives	
4. Business Process	4. Business Capabilities	4. Business Capabilities	4. Business Capabilities	4. Business Model Elements	4. Business Model Elements	4. Business Model Elements	4. Strategic Objectives	
5. Business Process	5. Business Capabilities	5. Business Capabilities	5. Business Capabilities	5. Business Model Elements	5. Business Model Elements	5. Business Model Elements	5. Strategic Objectives	
6. Business Process	6. Business Capabilities	6. Business Capabilities	6. Business Capabilities	6. Business Model Elements	6. Business Model Elements	6. Business Model Elements	6. Strategic Objectives	
7. Business Process	7. Business Capabilities	7. Business Capabilities	7. Business Capabilities	7. Business Model Elements	7. Business Model Elements	7. Business Model Elements	7. Strategic Objectives	
8. Business Process	8. Business Capabilities	8. Business Capabilities	8. Business Capabilities	8. Business Model Elements	8. Business Model Elements	8. Business Model Elements	8. Strategic Objectives	
9. Business Process	9. Business Capabilities	9. Business Capabilities	9. Business Capabilities	9. Business Model Elements	9. Business Model Elements	9. Business Model Elements	9. Strategic Objectives	
10. Business Process	10. Business Capabilities	10. Business Capabilities	10. Business Capabilities	10. Business Model Elements	10. Business Model Elements	10. Business Model Elements	10. Strategic Objectives	

## Informal Interactions

Infusing	Reacting
98. Maintain baseline status	104. Identify need
99. Sense presence	105. Procure element
100. Create experience	106. Integrate element
101. Sense reaction	107. Tend to element
102. Accommodate reaction	108. Assess value of interaction
103. Return to baseline	109. Recycle failed components

# Design Factor

Mixed learner group

1

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Communication | Education

## Activity

Preparing

## Originator

Ruth Schmidt Oct. 1, 2008

## Contributors

Entire Team Oct. 3, 2008  
Ruth Schmidt Nov. 21, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

1 Identify learners

## Observation

It is difficult to effectively plan to teach a group with a wide spread of learners levels.

## Extension

In order to effectively create a lesson plan, it is important to understand what your students' base of knowledge is. This allows teachers to mold the educational experience at the right level, with appropriate language, content, and interaction.

When student groups have wildly disparate knowledge bases or abilities, the teacher is required to accommodate the varying capabilities. This results in extra time and work upfront, and can also result in a patched-together curriculum in which some students are either confused or bored at any given time. At its worst, it can result in such a watered-down educational experience that it deals a severe blow to a student's nascent interest in the material. Covering material in such a way that it appeals to varying levels of interest and engagement ensures that each member of the learning audience gets the appropriate experience.

## Design Strategies

Use advanced students as mentors  
Group by skills, not age

## Solution Elements

**M** Student Mentors  
**M** Age-Agnostic Classes

# Design Factor

## Uneven learner/teacher ratio

2

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Preparing

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

1 Identify learners

### Observation

Having to cater to many students can derail a teacher's effectiveness.

### Extension

Teachers are often in a position of having to accommodate many different learners styles, even within a small group; this can range from students who prefer hands-on interaction to lectures, to a range of backgrounds or capabilities. This issue is compounded when many students are involved, since each interaction either requires a certain amount of refocusing direction repeatedly or a genericizing of the material. In very extreme cases, where students vastly outnumber the teacher, the learning experience is almost guaranteed to suffer.

Designing for this situation requires finding ways for teachers to better juggle the varied needs of their students in formal situations, or methods to better disseminate useful information in the case of self-directed or informal learning. Allowing students to do some work off-line can be used as a strategy for the former, as can collaborative approaches where teachers are supplemented by either external expertise or "junior teachers." For the latter issue, the internet is a valuable source that can be leveraged to allow students at any stage to find and digest the appropriate level of information that best suits their needs.

### Design Strategies

Focus on individual projects with group support

Supplement formal education with informal opportunities

### Solution Elements

- E** Self-directed Learning Groups
- M** EnviroInternships

# Design Factor

## Mixed educational goals

3

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Preparing

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

2 Identify instructional goals

### Observation

Differing educational goals within a group can make it difficult for an educator to satisfy all student needs.

### Extension

It is probably the rule, rather than the exception, that students within a group do not share the same goals for learning. In some cases, motivation is essentially externally enforced; others students only want to know a base level of information, while still others who are deeply interested and engaged by the subject matter want any levels of detail. Teachers must take this ongoing process of discovery and realization into account when preparing materials and lessons plans to sufficiently support the variety of learning goals represented by the group.

Students typically do not articulate their needs and end goals sufficiently, even to themselves, in part because it may be difficult to understand the level of one's interest before diving into the material. This range of interests levels and educational goals can be overlooked when it comes to teaching strategies, since we are so accustomed to the typically rounded curriculum as it is presented in schools; instructors and parents alike may not encourage the idea that it is ok to show more or less interest in a topic area, and there is often little room for students in a traditional school to create a curriculum that accommodates their particular interests.

### Design Strategies

Encourage more self-directed learning opportunities

Allow teachers to share experiences regarding successful teaching outcomes

### Solution Elements

**M** Collaborative Learning Modules

**M** Apprentice Teachers

# Design Factor

Inexperienced teachers

4

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Communication | Education

## Activity

Preparing

## Originator

Ruth Schmidt Oct. 1, 2008

## Contributors

Entire Team Oct. 3, 2008  
Ruth Schmidt Nov. 21, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

3 Create learning plan

## Observation

Inexperienced instructors can create a sub-par learning experience.

## Extension

The ability to teach material is not only dependent on attaining a certain level of knowledge; there is real skill in being able to deliver that material in such a way that students can be engaged, even inspired.

This lack of pedagogical skill can manifest itself in a variety of ways. The ability to recognize what level is appropriate for students, both in terms of instruction and feedback, can take practice to internalize. Similarly, tasks and assignments that may initially seem like good ideas may suffer from a lack on connection to the big picture and therefore seem pointless or clumsy. Teachers may also fall into the trap of imagining themselves as proxy students, and fall into the trap of teaching at too high or theoretical a level without realizing students have no foundation for what they are being taught.

Inexperience can affect the learning experience in other ways as well; frequently, new teachers have yet to learn a balance between being flexible when necessary without being taken advantage of. Wanting to be liked, they can run the risk of not being firm enough with behavioral expectations and or scholarly accomplishments.

## Design Strategies

Increased teacher training opportunities

Supplemental means for learning pedagogical techniques

## Solution Elements

**M** Fly On the Wall

**M** Apprentice Teachers

# Design Factor

## Policy-based constraints

5

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Preparing

### Originator

Ruth Schmidt Oct. 1, 2008

### Contributors

Entire Team Oct. 3, 2008  
Ruth Schmidt Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion  
U.S. Department of Education. No Child Left Behind. <http://www.ed.gov/nclb/landing.jhtml> (accessed Nov. 2008)

### Associated Functions

3 Create learning plan

### Observation

Policy set by government or educational bodies like the Board of Education can set constraints on learning plans.

### Extension

Accepted standards for education are not news; very few would question the prevalence of the typical Monday through Friday, 8am to 3pm day that covers the basics of language, math, science, and social studies for students from age 5 through 18. With the introduction of such policies as No Child Left Behind, however, the orthodoxies have become mandates, and as a result teachers and schools have significantly less flexibility in how structure their curricula.

The intent of this kind of legislation is positioned as a strategy to set minimum standards for education across many disciplines. The result, however, tends to be a focus on testing as a means of ensuring knowledge, rather than a more holistic measure of education that allows for flexibility within a teaching environment. In addition, because these schools' futures are attached to scores and test results, the schools themselves have little incentive to do anything that might jeopardize their students' scores. This "teach to the test" mentality also means that classes outside of the standard test format—such as foreign language, or art and music—are all too regularly reduced or cut altogether.

### Design Strategies

Find ways to incorporate nature into education  
Develop alternate testing techniques

### Solution Elements

**M** Snow Days  
**M** SimPlant

# Design Factor

## Difficulty Finding Resources

6

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Preparing

### Originator

Ruth Schmidt Oct. 1, 2008

### Contributors

Entire Team Oct. 3, 2008  
Ruth Schmidt Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

4 Construct resources

### Observation

It can be difficult for teachers to find the right kind of information or materials for classes.

### Extension

In order for educators, whether formal or informal, to assemble a viable learning plan, it is necessary for them to do a certain amount of research and preparation. Regardless of topic area, this initial phase ensures that the information being provided is up-to-date, comprehensive, and presented in a format that best suits the learners' needs.

The internet has made some aspects of this research easier; what could be easier than going online and downloading information? But this approach, while simple, is bound to have hidden difficulties. Subject matter, unless subject to a creative commons license, typically has copyright issues that must be accommodated. Information is not always vetted, so varying sources may not all have a similar level of legitimacy. Some content, especially if accessed through publications, costs money to access or download.

There are obviously non-internet ways to access information as well, but each has similar issues to those raised above, with the additional constraint of having to track down physical elements. Even basic materials can be difficult to purchase given education budgets; it is not uncommon for teachers to take it upon themselves to supply classrooms with books, displays, and other materials.

### Design Strategies

Access to vetted, approved material

Archives that allow teachers to store and save information to share with others

### Solution Elements

**M** Expert Db

**M** Archive Access

# Design Factor

## Conflicts of information

7

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Preparing

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Oppenheimer, M. 2008. Judgment  
Day. *New York Times*,  
September 19.  
Group Discussion

### Associated Functions

4 Construct resources

### Observation

Teachers must make difficult choices when primary material offers conflicting or incompatible views.

### Extension

Learning sometimes cannot avoid conflicts of information, and at times this tension of viewpoints can make education more interesting. Scientific theories and alternate viewpoints on methodologies or interpretations can make learning come alive in a way it never could as a static subject.

At times, though, this otherwise useful tension can create difficulties. The conflict between teaching evolution or creationism, for example, has escalated to an unforeseen degree—though in this case, the conflict arises from deeply held beliefs that have crept into an arena in which (according to the separation of church and state) they don't truly belong. In more extreme situations, the friction caused by a teachers' point of view can result in termination.

Last, conflicting sources of information can be confusing for students if not properly articulated and presented. Younger learners may be confused by a lack of clarity on what is considered "true;" the ability to differentiate between positions and choose one's own perspective is something that must itself be learned and developed through both formal and informal interactions.

### Design Strategies

Vetted resources to support coexisting viewpoints

### Solution Elements

**S** Community Show and Tell

# Design Factor

## Asynchronous learners

8

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Preparing

### Originator

Ruth Schmidt Oct. 1, 2008

### Contributors

Entire Team Oct. 3, 2008  
Ruth Schmidt Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion  
Google Docs.  
<http://docs.google.com>  
(accessed Nov. 2008)

### Associated Functions

5 Coordinate logistics

### Observation

Learners are not always available in the same location or on the same schedule.

### Extension

The ability to teach students asynchronously has been vastly simplified by the advent of the internet; rather than relying on video- or audio-conferencing for individual events, entire courses can be taught online with support by mentors and experts coming from afar. Technologies like email or GoogleDocs allow people to either simultaneously work on documents, or work according to different schedules.

The ability to accommodate multiple learners in different location and time-zones may be possible, but still has its difficulties. Asynchronous learning typically cannot support the same kind of collaborative efforts that in-place education does, since the availability of students is impossible to predict or control. There are also needs for non-time-specific information in informal settings, such as occasions when individuals want to seek knowledge about a potential location prior to visiting, or would like to follow-up post-visit. Ideally, the ability to keep track of information and learn remotely must also extend beyond single sessions, in order to better support an accumulation of knowledge rather than one-time requests.

### Design Strategies

Online learning modules  
Student learning groups

### Solution Elements

**M** eNature  
**M** Co-learning Clubs

# Design Factor

## Varied learner knowledge/needs

9

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Teaching

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

6 Appraise learner knowledge level  
9 Facilitate discussion

### Observation

It can be difficult for instructors to teach effectively when there is a wide range of knowledge levels represented.

### Extension

The fact that there are a variety of knowledge levels within any group is a given; even if they have the same basic level of knowledge in one domain, the rest of their educational history may flavor that information differently. Far from being a problem, this can actually spur more interesting discussions as different viewpoints and backgrounds shed light on the subject matter at hand.

At the same time, this causes difficulties for teachers or other education facilitators: what may seem like impossibly high-level discussion to one student may feel elementary to others, even within a narrow age range or level of experience. This can be a problem at any time during the educational process, from initial exploration of concepts to a more robust conversation at a higher level.

Individualized attention can only do so much, especially in a larger group. Similarly, one might be tempted to ignore more advanced learners on the basis that they can learn on their own, but this diminishes their ability to raise the level of discussion and may have the unintended side effect of reducing their potential level of engagement.

### Design Strategies

Provide access to non-traditional education

### Solution Elements

**M** MentorMe

# Design Factor

## Technical language comprehension

10

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Teaching

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

8 Articulate concepts  
10 Synthesize concepts

### Observation

Use of technical language in a content domain can interfere with beginning learners, but is important for learning more advanced concepts.

### Extension

Most disciplines use a certain degree of technical language. This is perhaps most evident in the sciences and medicine, which require a high degree of specificity due to their specialized subject matter, but it is true of non-technical fields as well. The development of this technical language use allows professionals or knowledgeable laypersons access to agreed-upon terminology and meanings as a means to facilitate communication of more complex thoughts.

However, the same language that helps experts can stymie beginners. Use of terminology that is at best hazy, and at worst completely opaque, can not only keep a beginner from learning the content, but also creates a barrier that might discourage further inquiry.

Problems can also arise when the language in questions has commonly meanings as well as the domain-specific ones used in any given discipline. Incorrect use or comprehension of this language can be misleading and affect true understanding of the material.

### Design Strategies

Automatic technical language translator

Plant- and wildlife-focused Wiki

### Solution Elements

**S** TechTranslator

**M** Nature Info Aggregator

# Design Factor

## Limited opportunities for learning

11

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Teaching

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

8 Articulate concepts  
9 Facilitate discussion

### Observation

Not all students have access to good or appropriate learning opportunities.

### Extension

Learning always has situational components; the learning takes place at a certain point in time, in a certain place, and through a specific experience. With the increasing amount of information available on the internet, we may feel that education can take place in a much more flexible manner, but really valuable knowledge still has certain constraints of appropriate delivery from a source of sufficient expertise. Internet-based can complement in-person education, but there is something critical about the ability to ask questions and respond to immediate, nuanced feedback that makes a more valuable and customized experience.

Some learners may simply have no other options, however, particularly if the existing education infrastructure they have access to is not all that good to begin with. There may not be local expertise or opportunities for classes of interest in their immediate area; even if they are, the best expert in the world might be terrible at answering questions at the right level, or simply be a poor teacher. In some cases, the ability to learn collaboratively is an important component, but is impossible due to a lack of critical mass of interested students. Location, awareness of alternatives, and availability (or lack thereof) of resources, mentors, and fellow students can all cause a dismal lack of opportunity for learning.

### Design Strategies

Create alternate learning opportunities

Bring education to learners

### Solution Elements

**S** Farm School

**M** Learning Xchange

# Design Factor

Format discourages questioning/discussion

12

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Communication | Education

## Activity

Teaching

## Originator

Ruth Schmidt Oct. 1, 2008

## Contributors

Entire Team Oct 3, 2008  
Ruth Schmidt Nov. 21, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

9 Facilitate discussion

## Observation

The format of a learning event can stymie the quality or amount of discussion that can occur.

## Extension

We have all been in situations in which we feel frustrated by a lack of information or exchange; this can occur in both educational environments, like school, or even in transactional situations like a customer service interaction. The causes of this disconnect are varied: among them, there are physical impediments (like wind that drowns out conversation), distortions due the channel of delivery (as with phone calls in which one cannot read the receiver's affect, making it harder to gauge their understanding, or online courses that are ), and complications due to format (a large lecture hall that prevents discussion due to the sheer number of bodies).

In the case of education, this need for a format that allows sufficient exchange of ideas is critical. Large lecture classes, for example, inevitably deteriorate into a one-sided delivery of information rather than a conversation; even an enthusiastic participant may check themselves due to the arrangement and imposition of anonymity due to such a format. In addition, the variable of time and duration can also throw kinks in the plan; educators, both formal and informal, cannot be available indefinitely to answer questions or continue conversations beyond an allotted time due to other constraints.

## Design Strategies

Create more customized learning opportunities

## Solution Elements

**E** One Room Schoolhouse

# Design Factor

## Lack of learner engagement

13

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Teaching

### Originator

Ruth Schmidt Oct. 1, 2008

### Contributors

Entire Team Oct. 3, 2008  
Ruth Schmidt Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

9 Facilitate discussion

### Observation

Unengaged learners are unlikely to learn effectively or pursue additional knowledge.

### Extension

Individuals may be unengaged in a learning experience for many reasons: lack of interest in the subject matter, distraction by other activities or environmental cues, an inability to see the long term value, or a poor educator who lacks the ability to inspire a connection to the material are among the most likely. Even learners who are theoretically interested in the subject can find themselves distracted or turned off by the presentation of information, and those who are predisposed to dismiss the value of the knowledge being presented are unlikely to change their minds. Various tactics can be used to alleviate this lack of engagement, but sadly they often take on characteristics of entertainment rather than an attempt to change the format or make the content feel more applicable to the audience at hand.

This lack of engagement has both short- and long-term effects: in the immediate situation, learners simply fail to pick up the information they are being given and miss the opportunity to ask questions, clarify content, and make connections to prior knowledge. In addition, unless content is truly digested and understood it is also less likely to effectively create "hooks" that allow people to make connections to other subject matter in the future.

### Design Strategies

Find ways to make everyday life an opportunity for learning

### Solution Elements

 Education As Life

# Design Factor

## Lack of access to resources

14

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Teaching

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

11 Direct to additional resources

### Observation

A lack of access to appropriate resources hinders opportunities for learning.

### Extension

Most people have had the experience of hearing or seeing something and telling themselves they will remember it and write it down when they have the chance. This method has the tendency to fail; short-term memory is notoriously poor at keeping more than a few thoughts at one time with real accuracy, and the effort required to memorize something minor for long-term storage is typically out of proportion to the importance of the information in question.

Not surprisingly, remembering bits of disconnected information gets more difficult as time goes by. This can be somewhat alleviated if one can connect the disparate bit of information to something already embedded in mind—such as remembering a new acquaintance's name by making a mental note that it's the same as a classmate's, for example—but for more detailed chunks of information or those that have no readily identifiable "tag" the importance of committing information in more permanent form with some degree of immediacy is a critical step to retaining it. The means by which this occurs can vary based on the medium in which the content appears, as obviously sounds can be best archived via an audio recording and textual content is better stored in written form, but the faster the archiving, the more likely it is to be correctly remembered.

### Design Strategies

Connect learners to facilitate informal information exchange

### Solution Elements

**S** Knowledge Swap

# Design Factor

Resource information is unrecorded/lost

15

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Communication | Education

## Activity

Teaching

## Originator

Ruth Schmidt                      Oct. 1, 2008

## Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

11 Direct to additional resources

## Observation

When there is no record of where resources were found or stored, learners and educators lose opportunities for further learning.

## Extension

The preparation of plans for use in educational settings requires a fair amount of time and effort; educators must find, assemble, and synthesize information from a variety of sources into a coherent whole. Once in place, the content can take on a life of its own as students respond to certain material and not others. A good teacher takes this into account and modifies the approaches to best suit the learner's needs.

The downside of this is that the original source material can become lost or difficult to track, making it harder to go back and dig out the original context for information that is being presented. This is even more of a problem when impromptu questions or discussions lead to a tangential conversation and additional references to resources; educators may not recall where appropriate information can be found, and even if they do learners may miss the specifics of how to find or access it. Too often these requests end up scribbled on a notebook page out of context, and when notes are discovered far after the fact it is difficult to track the chain of thinking that made it useful in the first place.

## Design Strategies

Create ongoing archive of information

## Solution Elements

 Archive Access

# Design Factor

## Knowledge is siloed

16

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Teaching

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

12 Archive knowledge

### Observation

Knowledge that is stored in isolation becomes harder to find and more difficult to connect to other meaningful content.

### Extension

Archiving information, regardless of the medium, helps to ensure that it will remain useful and accessible for other in the future. This helps not only with long-term institutional memory on a small or large scale, but also creates an ever-growing web of content that can help inform individuals across multiple domains. The internet has helped in this regard; where people may have been accustomed to reading individual books and articles, the ability jump from one subject area to another with such ease has changed our mental models of how to access information and essentially turned it into an expectation.

This expectation does cause some difficulties; although content on the internet is connected, it is only as good as the links to other information. It can also create the false assumption that the links that exist are somehow the only important ones, and valorizes these connections above other potential relationships. In doing so, archives can create a false sense of security about where the boundaries of content exist. This can take place on an individual level as well, of course; an individual who archives their information—either physically or mentally — in an isolated fashion runs the risk of losing value connections to other sources or other individuals' valuable contributions to a body of work.

### Design Strategies

Link knowledge across multiple sources and people

### Solution Elements

 MetaBrain

# Design Factor

## Archiving not done in timely basis

17

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Teaching

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

12 Archive knowledge

### Observation

If too much time goes by between learning and archiving, the material will likely be remembered incorrectly or lost altogether.

### Extension

Most people have had the experience of hearing or seeing something and telling themselves they will remember it and write it down when they have the chance. This method has the tendency to fail; short-term memory is notoriously poor at keeping more than a few thoughts at one time with real accuracy, and the effort required to memorize something minor for long-term storage is typically out of proportion to the importance of the information in question.

Not surprisingly, remembering bits of disconnected information gets more difficult as time goes by. This can be somewhat alleviated if one can connect the disparate bit of information to something already embedded in mind—such as remembering a new acquaintance's name by making a mental note that it's the same as a classmate's, for example—but for more detailed chunks of information or those that have no readily identifiable "tag" the importance of committing information in more permanent form with some degree of immediacy is a critical step to retaining it. The means by which this occurs can vary based on the medium in which the content appears, as obviously sounds can be best archived via an audio recording and textual content is better stored in written form, but the faster the archiving, the more likely it is to be correctly remembered.

### Design Strategies

Capture information in an immediate way

### Solution Elements

-  Nature Aggregator
-  PlantWiki

# Design Factor

## Assessment format ill-suited to content

18

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Assessing

### Originator

Ruth Schmidt Oct. 1, 2008

### Contributors

Entire Team Oct. 3, 2008  
Ruth Schmidt Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

13 Query learners

### Observation

The format of an assessment may not sufficiently capture what was supposed to be learned.

### Extension

Assessments are typically intended to test whether or not a specific chunk of subject matter was learned and internalized by a student. This is almost always required in formal learning situations, but there may also be times when it is useful or advisable to ensure some level of adequate learning in informal situations as well.

The difficulty is that assessments are frequently designed to make finding and correcting errors easy, not necessarily to measure how well material was learned. In very few cases can a multiple choice test, for example, truly cover the nuances and judgment required in real-life situations. Even essays, which require a student to thoughtfully lay out and articulate an argument, are fundamentally useless for anything but strictly theoretical content; oral exams satisfy some additional criteria by being conversational, and thus more like real-world situations. But in many learning experiences, the proof of knowledge is not something that can be described either verbally or textually—it must be essentially performed. The lack of ability to incorporate more qualitative, actionable measurements may continue to reduce the usefulness of traditional assessment methodologies.

### Design Strategies

Self-designed assessments

Activity-based curricula

### Solution Elements

 MeAssessments

 Suggestion Box

# Design Factor

## Insufficient incremental assessment

19

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Assessing

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

15 Identify misunderstandings

### Observation

Missed opportunities to ensure learning along the way can cause gross misunderstandings down the line.

### Extension

When going through a learning experience, our tendency to build a structure of knowledge based on what one already knows allows for great complexity of thought by providing a foundation and filling in the blanks. The trouble comes when it becomes clear that the foundation itself is wobbly, built on incorrect facts.

While it is likely that an over-reliance on testing throughout any given educational event would be overkill, there are frequently situations where the opposite occurs, and incorrect facts or misunderstandings are allowed to grow so firm that they throw subsequent learning out of whack. Sometimes this is due to a shortage of opportunities to practice using knowledge that would clearly indicate a lack of mastery. There are also situations where incremental testing can and does occur, yet feedback is not returned in a timely fashion and incorrect beliefs take hold in the meantime.

### Design Strategies

Means to measure progress throughout a learning experience

### Solution Elements

**E** Gradiated Assessments

# Design Factor

Feedback is disregarded

20

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Communication | Education

## Activity

Assessing

## Originator

Ruth Schmidt                      Oct. 1, 2008

## Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

16 Supply feedback

## Observation

Feedback can be dismissed if it is perceived as being not useful or relevant.

## Extension

Feedback can come in all sorts of forms; it need not be a formal assessment or from an expert to qualify. When it is timely and perceived as useful, it can be beneficial in not only correcting mistakes or misunderstandings, but serving as an entry into a more nuanced examination of a subject.

When feedback is disregarded, however, it loses its purpose. This can occur for various reasons: sometimes the feedback-giver is not thought of as sufficiently expert, or as being concerned with elements that the learner doesn't find important. At times, individuals may have an inflated sense of capability and genuinely think they know best—in situations like this, a fair amount of trust-building can eventually convince them that alternate opinions are not only valid but useful alternatives. In other situations, feedback is informal and goes unrecognized, as when two individuals at the same skill level critique one another. In each of these situations, whether intentionally or otherwise, the value of hearing an alternate opinion is lost to a degree.

## Design Strategies

Connect feedback to learner interests

## Solution Elements

**M** Study Group

**M** That's My Tree

# Design Factor

## Feedback requires additional information

21

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Assessing

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

16 Supply feedback

### Observation

Feedback sometimes requires additional resources or information to be fully useful.

### Extension

In both formal and informal situations, the most useful kinds of feedback sometimes require access to information that is either inconvenient to get or not locally available. This can occur for a variety of reasons: information can require synthesizing from multiple sources, demand a level of detail that available experts do not have, or rely on other information that is yet to be determined.

This remains true even today—despite the fact that most information is available with greater immediacy through the internet—as the sheer amount of information that is available actually makes this process harder. Information found online is typically plentiful, but unvetted; it can be extraordinarily difficult to differentiate which sources are valuable as true expert opinions and which are flawed with only a cursory exploration. For feedback to be most beneficial, this expertise in various domains requires a second layer of research to find reliable cited source material and documentation. Still, relying wholly on expert opinion can negate the value of crowd-sourced information that can actually be more useful in some circumstances, and yet is much more difficult to quantify or evaluate.

### Design Strategies

Link additional resources to feedback

Find experts at a distance

### Solution Elements

**M** Nature Reference Database

**M** ExpertLink

# Design Factor

## Feedback delays reduce comprehension

22

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Assessing

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

16 Supply feedback

### Observation

Feedback must be fairly immediate or risk reduced effectiveness.

### Extension

It should come as no surprise that feedback arriving far after an inquiry is less effective than that which is delivered at the time of need. To begin with, the question itself is likely to be fresher, as is the context in which the question was posed. Consider a situation in which an individual tries to identify a bird call heard in the woods; a lapse of even ten minutes between occurrence and answer is likely to render the memory of the call itself foggy, let alone a day or week.

For the same reason, feedback that arrives late is also more likely to be disconnected from the original question, and thus provides less of an opportunity to stick and build upon prior facts and learnings. The process of connecting one bit of information to another is tenuous enough, as humans in the information age are inundated with information from many sources, and the result tends to be a confluence of facts with no glue; it is this stickiness that makes learning truly take hold. Questions that are not answered fairly immediately, in the right context, run the risk of being forgotten altogether in the ongoing rush of even more information.

### Design Strategies

Provide immediate feedback at time of need

Archive learning experience

### Solution Elements

**S** Nature Goggles

**M** Name That Tune

# Design Factor

## Feedback is overwhelming

23

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Communication | Education

### Activity

Assessing

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

16 Supply feedback

### Observation

Too much feedback, or feedback at an inappropriate level of detail, can create difficulties in learning material.

### Extension

When asking a question about a subject of interest, learners and the individuals providing feedback typically have an unspoken expectation about the appropriate level and amount of feedback; this tends to be predicated on interest level, age, and level of existing expertise. An expert's answer to a new junior high school student and a layperson expert would vary in terms of the amount of information, as well as nuances based on underlying contextual assumptions about prior knowledge.

Misjudgments about the appropriate level of feedback are not always significant—often they merely provoke a rolling of eyes or additional questioning to arrive at the right level of information. At times, however, these expectations can be misinterpreted to a great extent, and feedback is sufficiently enormous or misplaced as to overwhelm the student. The end result of this situation is twofold: not only is the student incapable of digesting the feedback, but they are also likely to perceive themselves as either stupid for not understanding the deluge of information or bored by the extent of content, and may resist asking questions in the future. This creates both present-tense and future obstacles to learning, both of which are ultimately avoidable.

### Design Strategies

Provide correct level of feedback

Allow self-directed learning

### Solution Elements

**S** MeAssessments

**M** MyDocent

# Design Factor

Missed or unknown messaging opportunities

24

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Communication | Awareness

## Activity

Developing

## Originator

Nikki Pfarr Oct. 2, 2008

## Contributors

Entire Team Oct. 3, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

17 Assess messaging opportunities

## Observation

The system may be unaware of or overlook messaging opportunities; the most effective messaging opportunities may be unique to individuals or small communities, and may not be brought to the attention of the larger system.

## Extension

Individuals or small communities with unique messaging opportunities may not have a way to bring those opportunities to the attention of the system.

Informal messaging opportunities, in particular, may not be brought to the system's attention and will be more difficult for the system to discover on its own. For example, an apartment building may have a resident recreation room with a bulletin board where people can post community information. This might be a great opportunity to share information about local community gardens or nature-related volunteer opportunities. But the burden is placed on the apartment community to either procure the messaging themselves and post it up, or notify the system that it should maintain an ongoing message on the bulletin board.

New messaging opportunities may also develop as a result of advancing technologies; if the system is not continually evaluating new technologies and potential usage from a messaging perspective, new opportunities may be overlooked.

## Design Strategies

Make it easy for individuals or communities to share system-related messages in the format that is most meaningful to them

Provide a way for community members to suggest new messaging formats or channels

## Solution Elements

**S** Flexi-Messages

**S** Meaningful Messaging for Me

# Design Factor

Personalized messaging perceived as invasion of privacy

25

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Communication | Awareness

## Activity

Developing

## Originator

Nikki Pfarr

Nov. 19, 2008

## Contributors

## Sources

Personal Observation

Group Discussion

## Associated Functions

17 Assess messaging opportunities

22 Establish new touch points

## Observation

When messages reference an individual's name or personal details about his or her life it may be interpreted as an invasion of privacy.

## Extension

Personalized messages that reference an individual's name, preferences, and details about his or her life can easily be interpreted as an invasion of privacy - especially if the individual did not explicitly provide the system with that information to begin with, or if the information is used in unanticipated ways. Such messages may spark concerns about where the data was acquired, how it is being stored (for example, is it secure?), and who else has access to it. Additionally, the individual may wonder what other personal information the system has on file that he or she is not aware of.

When dealing with personalized messaging, careful consideration should be given to the context of use. Individuals may feel that some personalization of messages is appropriate and even desired in certain contexts (e.g. a message sent to my home computer or my cell phone). On the other hand, personalized messaging may be entirely inappropriate in public contexts (e.g. on a billboard while I'm walking down the street).

Simply giving people the option to opt-in to personalization and to control the amount of personal data in the system may not be enough: pressing concerns about how personal information is stored and utilized may deter individuals from providing the system with any personal information at all.

## Design Strategies

Allow individuals to opt-in to personalized messaging (it's not the default)

Allow individuals to control the amount of personal information the system has access to

Allow individuals to control the context in which personalized messages are displayed

## Solution Elements

**S** Meaningful Messages for Me

# Design Factor

Unknown or large audience

26

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Communication | Awareness

## Activity

Developing

## Originator

Nikki Pfarr Oct. 2, 2008

## Contributors

Entire Team Oct. 3, 2008  
Nikki Pfarr Nov. 21, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

18 Establish scope  
19 Identify audience

## Observation

When designing messaging and campaigns for unknown or extremely large audiences, it can be difficult to produce material that is aligned with the audience's knowledge and ability levels.

## Extension

Understanding an audience is an important component of designing effective messaging; designers should consider, among other things, an audience's knowledge level, native language, reading abilities, and physical capabilities. These factors will help inform the message's content, length, delivery method, and level of interactivity.

When designing messaging for an unknown delivery channel or context it becomes increasingly challenging to make *any* assumptions about the audience, as the audience will be largely unknown. Similarly, it is difficult to make predictions about the people who will see and interact with messaging intended for an extremely large audience.

In such scenarios, designers should strive to accommodate a wide range of potential audience members; designers must be wary of communicating with a particular audience segment at the expense of others. This is not to suggest messaging should be optimized for the average audience member, nor one who is the lowest common denominator - the challenge will be finding creative ways to design a single message or touch point that can resonate with a variety of people.

## Design Strategies

Provide varied levels of content and interactivity to appeal to different audience members

Allow audience members to select the level or content and information they find most useful

Allow the audience to customize the message so it becomes more relevant to their community and context

Allow audience members to control the channels through which they receive information

## Solution Elements

**S** Hook and Unfold Messages

**S** Flexi-Messages

**S** Digg-esque Billboards

**S** Meaningful Messages for Me

# Design Factor

Unaware of existing touch points

27

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Communication | Awareness

## Activity

Developing

## Originator

Nikki Pfarr Oct. 2, 2008

## Contributors

Entire Team Oct. 3, 2008  
Nikki Pfarr Nov. 21, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

18 Establish scope  
20 Develop content

## Observation

If message designers are unable to reference existing touch points, they run the risk of utilizing an over-saturated communication channel or repeating concepts that have already been conveyed in similar campaigns; as a result a newly designed messaging may have minimal impact.

## Extension

If message designers are unable reference existing touch points, they will not only fail to build upon existing content but will run the risk of introducing a new message into an over-saturated communication channel. It is likely that any messages introduced into an over-saturated channel will have minimal impact, as people will likely have grown apathetic toward messages coming through such a channel.

Additionally, if a particular audience has already been exposed to a messaging or concept through earlier campaigns, a new message in a similar vein will likely not stand out. The audience may not only tire of hearing a similar message again, but may actually take offense if it appears the system is underestimating their ability to grasp a concept.

## Design Strategies

Maintain an archive of previous and existing touch points

Notify designers when current projects appear to overlap or share similarities with existing touch points

Harness community feedback to determine if a message is ineffective or potentially in an over-saturated communication channel

## Solution Elements

**S** Messaging Reference Database

**S** People Check

# Design Factor

Existing material not in re-usable format

28

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Communication | Awareness

## Activity

Developing

## Originator

Nikki Pfarr Oct. 20, 2008

## Contributors

Nikki Pfarr Nov. 21, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

20 Develop content  
21 Leverage existing touch points

## Observation

Existing materials may be difficult to reuse. If previous materials have been damaged the content may no longer be accessible. Analog content may still be useful but would have to essentially be recreated (retyped, etc.) to be used again.

## Extension

To minimize replicating work, it is important that existing materials and content be archived in a reusable format. If the integrity of the materials has been compromised due to damage or age the content may not be accessible, and therefore the materials will no longer serve as a valuable reference.

If materials have been preserved well they may serve as useful references, but a lack of digital content introduces an additional layer of work: analog text or images may need to be essentially recreated (retyped or redrawn) to be used again.

Overall, if previous materials are not preserved in a usable format, writers and designers may become disenchanted and may be deterred from referencing past materials when designing new campaigns. As a result, institutional knowledge may be lost and unnecessary time may be spent recreating content that already exists in an archive.

## Design Strategies

Maintain a digital archive of accessible, reusable content from past messaging campaigns

## Solution Elements

 Messaging Reference Database

# Design Factor

Unable to predict audience reaction

29

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Communication | Awareness

## Activity

Developing

## Originator

Nikki Pfarr

Nov. 21, 2008

## Contributors

## Sources

Personal Observation  
Group Discussion

## Associated Functions

17 Assess messaging opportunities  
22 Establish new touch points

## Observation

In developing new messaging campaigns, particularly those that utilize new or novel touch points, it can be difficult to accurately predict how an audience may react or respond.

## Extension

It is extremely difficult to predict how people will react to a new offering, product, or service *without talking to those people in advance (i.e. conducting user research)*. When designing a messaging campaign this holds true, especially when the campaign utilizes new or unexpected touch points.

Likely an audience's interpretation of a messaging campaign or new touch point will vary based on context, level of knowledge, personal factors, etc. Audience reactions and pain points (moments of confusion, question, or failure) may be unanticipated and it is likely a designer will not be able to imagine all possible reactions on their own. However, if the designer can anticipate audience reaction, response, and pain points early on, these can be mitigated through thoughtful design.

Thus it is critical that user research be incorporated into messaging campaign development from an early stage; such user research may take the form of primary research (direct interaction with the community) or secondary research (reading supplementary materials, anecdotes).

## Design Strategies

Conduct early stage user research to better predict audience reaction to a new messaging campaign or touch point

## Solution Elements

**S** People Check

# Design Factor

Last minute change required

30

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Communication | Awareness

## Activity

Promulgating

## Originator

Nikki Pfarr

Nov. 21, 2008

## Contributors

## Sources

Personal Observation  
Group Discussion

## Associated Functions

23 Coordinate release

## Observation

If requirements for a messaging campaign change at the last minute it may delay the campaign's launch: at best resulting in a minor delay, or, if a large amount of production work has to be redone, a longer delay.

In the case of digital messages where content can be controlled in real-time, however, this delay can be minimized if not entirely avoided.

## Extension

In the case of more traditional messaging campaigns, such as those that include printed materials or television ads, changes to the campaign's content or requirements may require in significant additional work. If a change is requested a the last minute, the launch of the campaign may be delayed as a result.

With newer messaging mediums, including messages which (often digital) can be controlled remotely, making last minute changes is not a problem. In fact, with these mediums changes can be made after the message has already been distributed to users, without introducing any delay into the development cycle.

The challenge will be to combine the flexibility of digital messaging with some of the more traditional formats; emerging technologies, such as ePaper, suggest these hybrids may be in the near future.

## Design Strategies

Utilize messaging mediums that can be remotely updated and manipulated

## Solution Elements

 Refreshing Messages

# Design Factor

Messaging medium is damaged or vandalized

31

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Communication | Awareness

## Activity

Promulgating

## Originator

Nikki Pfarr

Oct. 2, 2008

## Contributors

Nikki Pfarr

Nov. 20, 2008

## Sources

Personal Observation

Group Discussion

## Associated Functions

24 Disseminate message

## Observation

Messaging medium is torn down, damaged, or vandalized and no longer able to present the message as originally intended.

## Extension

A messaging medium may be torn down or vandalized for a variety of reasons. For example, if the content is controversial or simply out of date, the message may be torn down or covered up by something more relevant. If the messaging medium is perceived to be more valuable than the message itself, portions of the medium or technology may be stolen and repurposed or resold.

Additionally, damage may occur over time due to natural causes and decay. If the medium is not weather-proof or able to withstand temperature extremes, it may be particularly susceptible to damage.

These problems are compounded when nobody takes responsibility for maintenance: it is possible that the messaging mediums will be seen as public domain, which means nobody in particular feels personally responsible for their upkeep. Thus, if an individual notices a portion of the medium is damaged or missing, he may not feel compelled to fix or report it - he may assume somebody else is taking care of it.

## Design Strategies

Make mediums modular so that if portions are damaged they can be removed and replaced without replacing the entire entity

Make mediums weather and season-proof to prevent nature-related damage

Detect vandalism or damage as early as possible so the medium can be quickly repaired

Allow users to become more involved in the way they receive messages, so they feel more ownership over the process and mediums

## Solution Elements

**S** Modular Messaging

**S** Year-Round Messaging

**S** Self-Reporting Messaging Status

**S** Meaningful Messages for Me

# Design Factor

Messaging medium requires maintenance

32

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Communication | Awareness

## Activity

Promulgating

## Originator

Nikki Pfarr Oct. 2, 2008

## Contributors

Entire Team Oct. 3, 2008  
Nikki Pfarr Nov. 21, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

24 Disseminate message

## Observation

Messaging medium requires ongoing or periodic maintenance to preserve its integrity and ability to communicate messages.

## Extension

Most non-digital messaging mediums require ongoing physical maintenance. This ranges from daily cleaning to remove accumulated dirt or debris (nooks and crannies may be particularly vulnerable to accumulating dirt), to larger adjustments in response to seasonal changes (e.g. adding a protective layer to prevent UV damage in the summer, or adding extra insulation to prevent freezing in the winter).

Additionally, periodic maintenance may be required for these mediums. Damaged parts - resulting from vandalism, weather exposure, or simply due to ongoing usage - may need to be replaced. Similarly, outdated technology may need to be updated so the medium can function more efficiently from information transmission, environmental impact, and energy usage perspectives.

Digital mediums often require maintenance to be compliant with the latest technical standards, or to take advantage of more efficient processing and storage solutions; this maintenance may involve updating code, file formats, or other technology behind-the-scenes.

## Design Strategies

Make it easy to replace or repair damaged components

Improve durability of mediums that will be exposed to the elements

Tend to maintenance as soon as damage or wear occurs

Integrate seasonal or ongoing maintenance into the design of the medium

## Solution Elements

**S** Modular Messaging

**S** Self-Reporting Status

**S** Year-Round Messaging

# Design Factor

Unable to locate content to keep it current

33

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Communication | Awareness

## Activity

Promulgating

## Originator

Nikki Pfarr                      Sept. 28, 2008

## Contributors

Nikki Pfarr                      Oct. 1, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

25 Keep content current

## Observation

Certain communication touch points, such as hand-outs and flyers, may end up dispersed throughout the city; when it comes time to update their content, it may be impossible to track them down. As a result, outdated information may be left in circulation, and potentially reusable artifacts end up being entirely replaced.

## Extension

Hand-outs, flyers, and brochures are all effective ways to communicate certain messages, but, because of their "take-away" nature, there's no way to tell where they're going to end up.

When it comes time to update the content in these types of communication pieces, we have to rely on giving people new flyers and brochures instead of simply updating the ones they already have. This is partially due to a technology restriction (at present there is no way to update the message on a piece of paper without reprinting it) and partially due to an inability to track down the location of those artifacts.

As a result, not only are we producing new artifacts instead of reusing existing ones, outdated content is left in circulation and may misinform the public about important system elements.

## Design Strategies

Ensure that expired messages are not publicly accessible

Control messaging content remotely

Keep track of all existing messaging artifacts

## Solution Elements

**S** Fade-out Flyers

**S** Refreshing Messages

# Design Factor

Resources can't be measured

34

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics | Operations

## Activity

Planning

## Originator

Ann Hintzman                      Oct. 2, 2008

## Contributors

Entire Team                              Oct. 3, 2008

## Sources

Group Discussion

## Associated Functions

26 Analyze resource levels  
27 Coordinate resource use

## Observation

It is not possible to have a steady-state picture of the current status of all parts of a large, organic system. Yet if you don't know where you are currently positioned, you can't make a best plan for tomorrow.

## Extension

Planning for a system requires an understanding of the current state of all system resources - people, finances, equipment and property to name a few. Knowing exactly what resources are available to a large system at any specific period in time is not possible; a comprehensive understanding of the quantifiable assets of a large corporation at a specific period in time can take as long as three months complete (as per SEC filing requirements). This uncertainty is compounded in an organic system, where many of your assets develop according to weather and environmental trends. It is not feasible for the system to know how many tomatoes are ripe right now. Planning must therefore not only make prediction about the future but also accept a degree of uncertainty about the present state of the system. This compounded variability means that near and medium term plans have a higher risk of being inappropriate or inactionable. Having to go back to the drawing board to adjust plans costs time and continues to rely upon incomplete information.

## Design Strategies

Accommodate a range of outcomes

## Solution Elements

**M** Contingency planning

# Design Factor

## Demand peaks for services

35

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

System Logistics | Operations

### Activity

Planning

### Originator

Ann Hintzman                      Oct. 2, 2008

### Contributors

Entire Team                              Oct. 3, 2008

### Sources

Team Discussions

### Associated Functions

26 Analyze resource use  
27 Coordinate resource  
28 Manage resource schedule

### Observation

Equipment use in response to events or seasons, sees periods where it is in high demand as long periods where it is not used and takes up storage space.

### Extension

Lawn mowers are not in demand in the winter and snow plows are not needed in the summer. Not only does seasonality drive overlapping demand for materials and equipment, events such as storms also require that repairs and servicing be performed in multiple locations. Materials and equipment not only cost money to procure, they take up storage space during the long periods of times when they are not in use, and require tools and expertise to maintain and repair.

The system administrator must have an understanding of the demand trends for seasonal or infrequent use materials and must make a decision whether to procure for the peak usage times or whether to procure for more generalized usage needs and develop a plan for how to handle the peak demand when it happens. Not anticipating these demand peaks would not be an acceptable option because it would mean that maintenance is not performed as needed and the system is more likely to require a more costly rehabilitation down the road.

### Design Strategies

Outsource storage

Change equipment function

### Solution Elements

**M** Green Reserves

**M** Modular tools.

# Design Factor

## Future resource needs unknown

36

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

System Logistics | Operations

### Activity

Planning

### Originator

Ann Hintzman Oct. 1, 2008

### Contributors

Entire Team Oct. 3, 2008

### Sources

Hayhoe, K., Wuebbles, D. et al. 2007. Chicago Climate Change and Chicago: Projections and Potential Impacts in Chicago Climate Action Plan. Chicago Climate Task Force. <http://www.chicagoclimateaction.org> (accessed November 25, 2008)

### Associated Functions

26 Analyze resource use  
27 Coordinate resource use  
30 Locate/develop additional resources

### Observation

The future is unknowable, so it's impossible to know exactly what resources you'll need.

### Extension

While the exact course of climate change is unknowable, it is accepted that the weather conditions of the future will show an increase in large scale events and weather variability. There will be more large storms and prolonged draught, for example, than has been experienced in the last hundred years. Planning for the future is always a challenge, but this increase in variability in future conditions makes the process of understanding what the future will hold harder.

If resources had no cost, this variability would not be a problem. The system would stockpile for every possible outcome and use these resources when needed. Unfortunately, this is not the case. There is not the budget to afford nor is there the space to store the resources necessary to respond to every conceivable scenario.

The system then must bound the range of outcomes that it will be prepared to deal with and secure resources for those eventualities and develop plans for how to address outcomes for which it does not have the resources to address.

### Design Strategies

Share risk

Plan nimbly to adjust quickly

### Solution Elements

**M** Midwestern Sharestock

**M** InvitroPlants

# Design Factor

## Resources must be prioritized

37

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

System Logistics | Operations

### Activity

Planning

### Originator

Ann Hintzman                      Oct. 1, 2008

### Contributors

Entire Team                              Oct. 3, 2008

### Sources

Group Discussion

### Associated Functions

26 Analyze resource use  
27 Coordinate resource use

### Observation

Given resources are scarce, resource allocation must be prioritized across many worthy uses.

### Extension

Within an organization there are resources that will be needed by multiple departments. Budget and capacity limit the administrators ability to accommodate all of these requests. The two most common approaches to solving these issues each leave something to be desired. A need-based decision uses an understanding of system objectives to determine how resources are allocated and can help maintain focus on the system's core mission. This approach is subject to favoring pet projects and putting too much of the decision in the hands of administrators not directly involved with the local system in question. In contrast to the need-based decision, a sequence-based solution has the advantage of clarity and lack of bias, but encourages people to make extraneous requests in order to insure they have resources when the really need it, while the bulk of system resources are stalled in local stockpiles.

Each of these solutions create a situation where departments are pitted against each other in a battle of resources and have little incentive to distinguish their vital initiatives from their desired initiatives. Additionally there is no incentive for the departments to encourage resources be allocated to other departments or work in conjunction with other departments to truly advance the system goals

### Design Strategies

Include flexibility in prioritization method

### Solution Elements

 ZipTools

# Design Factor

Resources are not Available

38

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics | Operations

## Activity

Planning

## Originator

Ann Hintzman Oct. 1, 2008

## Contributors

Entire Team Oct. 3, 2008

## Sources

Group Discussion

## Associated Functions

27 Coordinate resource use  
30 Locate/develop additional resources

## Observation

There are generally insufficient financial, physical and human resources necessary to undertake all desired system initiatives and account for foreseen system costs

## Extension

Most programs face limitations due to budget, staffing, space and available resources. These limitations often limits the scope and number of programs that can be undertaken. Specifically looking at the funding sources for green space initiatives such as parks management and environmental standards, these tend to be funded either as a cost to the user through permits and ticketing, which discourage green space use, or through general funds, which rely upon the city tax base and must compete with other city initiatives for funding. Access to general funds is both highly competitive and highly cumbersome, requiring strong lobbying to secure a lump-sum in the annual budget

Existing funding sources therefore either leaves the system fighting against its core mission of increasing green space use and awareness, or generally underfunded when it comes to addressing ongoing system needs and emergency funding. Until an alternate means of funding is identified that does not rely upon taxing users or fighting for scraps, the system is vulnerable to at best stagnation in scope and vision and at worse disrepair from which it lacks the funds to recover.

## Design Strategies

- Regenerate resources
- Lend/Lease materials
- Promote a community DIY mentality
- Maintain a resource reserve

## Solution Elements

- S** Seed Bank
- M** Neighborhood coop
- M** Free Samples
- S** Green to Green

# Design Factor

Tools aren't reported in need of service

39

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics | Operations

## Activity

Maintaining

## Originator

Ann Hintzman                      Oct. 1, 2008

## Contributors

Entire Team                              Oct. 3, 2008

## Sources

Group Discussion

## Associated Functions

32 Tend to system components  
33 Service components  
34 Repair/replace components

## Observation

Tools are discovered to be broken in the field because they have been put away without performance issues being reported

## Extension

Maintenance of system infrastructure requires operable tools and equipment that system administrators can use to maintain public spaces. These tools and equipment are centrally resourced and taken out into the field based on the type of work to be conducted. The assumption in this process is that the equipment taken into the field is operable. If, however, equipment has been brought back to the central facilities without being reported inoperable, the system administrator in the field can discover that the equipment she has brought with her doesn't work. This requires that she either find another, less efficient way to complete the task with the other tools at hand, or that she stop work on her task and locate another tool - a step that could require leaving the work site.

This single instance delays work and is a nuisance to system operators, but far worse can be compounded if equipment damages continue to be unreported for fear of accountability. If system operators fear recourse for reporting a damaged tool or piece of equipment, not only is field work going to be increasingly delayed but the system tool inventory will be invalid and future procurement plans will not reflect actual needs.

## Design Strategies

Eliminate need for repair reports

## Solution Elements

 Tool Scan

# Design Factor

Symptoms of larger problems span areas

40

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics | Operations

## Activity

Maintaining

## Originator

Ann Hintzman                      Oct. 1, 2008

## Contributors

Entire Team                              Oct. 3, 2008

## Sources

Group Discussion

## Associated Functions

31 Monitor system components

35 Assess events

## Observation

Often the indicators of serious system situations span different areas and domains and do not get aggregated until after a serious situation has arisen

## Extension

To understand the health of a park you must understand many things including the health of the plant life, the use patterns of the patrons, and the weather in the area. Each of these data sets requires a large amount of raw data be gathered and analyzed. Moreover, the best way to analyze each of these data sets is understood by different disciplines - botanists, anthropologists, meteorologists. As the amount of data increases within each data set and the number of relevant disciplines that can contribute to the understanding of park health increases, the complexity of the information to be understood leaps beyond the scope of the human brain to respond to. Yet while the multitude of data is a challenge to synthesize, it is across disciplines and across geographies that long term changes to the ecosystem will be detected and important warning signs can be identified.

## Design Strategies

Automate trend analysis

## Solution Elements

 Canary in Coal Mine

# Design Factor

Tools and materials need to be disposed of responsibly

41

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics | Operations

## Activity

Maintaining

## Originator

Ann Hintzman                      Oct. 1, 2008

## Contributors

Entire Team                              Oct. 3, 2008

## Sources

Group Discussion

## Associated Functions

30 Locate/develop additional resources

34 Repair/replace components

## Observation

When tools come to the end of their useful life they need to be replaced, yet adding material waste ultimately works against the goals of system sustainability

## Extension

In order for maintenance to be conducted most efficiently, the tools used in the field must reliably work. This will become increasingly important as manual work gets shifted more towards machines. Yet, machine life is finite and there reaches a point in a tool's life when the resources needed to sustain a tool become greater than the resources needed to procure a new tool and a replacement is sought. It would not be a viable solution to keep tools that no longer can be used, so old tools must be disposed of.

Our system and increasingly the world around us is concerned with sustaining the organic life on our planet. One of the challenges that nature faces is disposal of man-made, chemical and mechanical aggregates, that require space for storage and which leach poisons into the soil that surrounds it. In order to be compatible with its mission, the system must find a home for tools that are no longer usable within the context of system maintenance that does not increase the hazardous materials within the earth.

## Design Strategies

Find useful ways to use old materials

## Solution Elements

**M** Free to Fix

# Design Factor

Popular activities and grounds get over used and abused

42

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics | Operations

## Activity

Maintaining

## Originator

Ann Hintzman Oct. 1, 2008

## Contributors

Entire Team Oct. 3, 2008

## Sources

Group Discussion

## Associated Functions

30 Locate/develop additional resources  
34 Repair/replace components  
35 Assess Events

## Observation

Increased use of green space is at the heart of the system's mission, but too much traffic can damage the parks and trails and diminish the nature experience.

## Extension

It is the goal of the system to increase the use of green spaces by the communities around them. More people using parks and trails increases awareness of the space and safety on the trails, it also brings the psychological and physical benefits of nature to a wider population and increases traction for financial support of green initiatives.

Despite these benefits, the popularity of parks and trails can negatively impact the parks and trails themselves. Too many people or bikes can tear up trails and create grooves which water can gather in and cause flooding. Consumables, like berries, can draw people onto trails, but over-picking and too much handling can harm the plants themselves. While over-use seems like a high-class problem for the system to have, it can ultimately lead to the abandonment of the parks and trails and a reversal of all of the benefits listed above. This is especially a concern during the early stages of the green-push, when awareness and publicity precede a large-scale roll-out of new green spaces. Finding space for initial green space conversions will be a challenge and unless these can show sustainable use the expansion of this project, will be in jeopardy.

## Design Strategies

Make more robust paths

Prevent access when grounds are hurt

## Solution Elements

**E** Contour paths

**S** Heliotropic Veils

# Design Factor

Observed system needs aren't reported by users

43

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics | Operations

## Activity

Maintaining

## Originator

Ann Hintzman Oct. 1, 2008

## Contributors

Entire Team Oct. 3, 2008

## Sources

Group Discussion

## Associated Functions

31 Monitor system components  
33 Service system components  
34 Repair/Replace system components

## Observation

Users of the system often are the first to notice things that need repair but do not report it.

## Extension

Chicago has the 311 system in place to encourage people to report issues in their community that are not emergencies but should be addressed. Despite having this system in place, many events go unreported because of time delays between the user seeing the problem and getting to a place they can report the problem, a lack of familiarity with the system, the assumption that someone else has reported the problem, or the perceived inefficacy of the system.

Cell phones help mediate the latency between seeing the event and calling, but the heart of the problem is a lack of personal ownership of and involvement with the system. People find ways to promptly notify the city when a tree branch falls on their car, but are less likely to do so if it falls on their street or the neighboring street. Without people feeling compelled to look after their neighborhoods, situations that could be quick maintenance escalate into larger repair needs. Not only does this ultimately cost the system more to attend to the issue, it creates a vicious cycle where the neighborhood does not see issues getting attended to so does not feel that it is worthwhile to report additional issues.

While the future will offer new ways to monitor the system and understand maintenance needs, there will always be issues that go unseen and the need for personal involvement by the neighborhood with their local system.

## Design Strategies

Engage users in system well-being  
Supply localized means of reporting problem  
Provide alert feedback

## Solution Elements

**M** Sam the Tree  
**M** Talk box  
**M** Thank You Note

# Design Factor

## Maintenance gets off schedule

44

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

System Logistics | Operations

### Activity

Maintaining

### Originator

Ann Hintzman                      Oct.1, 2008

### Contributors

Entire Team                              Oct. 3, 2008

### Sources

Group Discussion

### Associated Functions

32 Tend to system components

### Observation

Maintenance schedules can not always account for unforeseen events that push back projects. This can cause a domino effect with future maintenance and render the schedule useless.

### Extension

Maintenance schedules must account for expected upkeep and repair needs as well as equipment and personnel availability. Because resources, such as equipment, are needed for different projects, there is a coordination necessary across projects. Resources are scarce, and system administrators want to schedule their use so as to accomplish as many projects as possible in order to achieve the maximum utility from each resource. This means that resources will be scheduled to a new project immediately after the current project is completed.

The schedule for each project is based upon the best estimates of how long it will take to be completed. By and large, project length can be estimated accurately, but unforeseen events can cause delays in maintenance. Because resources are scheduled across projects, a delay in one project can not only increase the length and cost of that project but can cause a domino effect, delaying other projects or eliminating their completion altogether. Scheduling to optimize efficiency creates a brittle structure, which can be deeply fractured at the smallest shift in project length.

### Design Strategies

Build in Buffer

Anticipate in schedule

### Solution Elements

**M** Heavy Days, Light Days

**M** Preemptive Strike

# Design Factor

Data too diffuse for quality aggregation/Incomplete data

45

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics | Adaptation

## Activity

Assessing

## Originator

L. Thomas McCue

## Contributors

Entire Team

## Sources

Personal Observation

## Associated Functions

37 Aggregate system data

38 Evaluate data

## Observation

There may be situations where data is unavailable, incomplete, or otherwise unavailable to system administrators .

## Extension

To properly assess the adaptation needs of the system, an accurate data picture of the system must be generated. While the system itself may have numerous data gathering mechanisms, it is possible that unexpected data needs will arise, and that the system's existing data gathering mechanisms are insufficient.

Also, raw data drawn from the system may not have any defining characteristics to aid the process of aggregation and evaluation.

## Design Strategies

Define data sources

Parse separate data channels into comprehensible format

Endeavor to centralize data collection and archiving

## Solution Elements

**S** NatureBase

**M** Professional Survey Teams

**M** Incidental Citizen Reporting  
"Nature 311"

**E** Regular Citizen Reporting  
"Nature Rangers"

# Design Factor

## Conflicting adaptation priorities

46

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

System Logistics | Adaptation

### Activity

Assessing

### Originator

L. Thomas McCue

### Contributors

Entire Team

### Sources

Personal Observation

### Associated Functions

- 38 Evaluate data
- 39 Prioritize adaptation opportunities/needs
- 40 Evaluate resources
- 41 Determine action

### Observation

In the process of establishing priorities for a course of action, conflicts and competitive interests may arise, where equally important, but distinct outcomes may result.

### Extension

The process of prioritizing possible courses of action can break down if there is not a clearly defined criteria by which the possible choices are judged. When multiple possible courses of action have equally desirable outcomes, but may determine an ideological or conceptual direction, how is priority determined? What factors into the criteria set? When resources are limited, who is the deciding authority between two equally desirable choices?

### Design Strategies

Establish conceptual road map and ultimate goals.

Develop authoritative criteria set for prioritizing.

### Solution Elements

- E** Statement of intent, goal identification
- S** Authoritative Body of Environmental Standards
- S** Quick Vote Referendum
- M** Community Hearings

# Design Factor

No clear course of action emerges

47

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics | Adaptation

## Activity

Assessing

## Originator

L. Thomas McCue

## Contributors

Entire Team

## Sources

Personal Observation

## Associated Functions

- 38 Evaluate data
- 39 Prioritize adaptation opportunities/needs
- 40 Evaluate resources
- 41 Determine action

## Observation

Situations may arise where data analysis and planning do not result in a clear course of action.

## Extension

To properly assess the adaptation needs of the system, an accurate data picture of the system must be generated. While the system itself may have numerous data gathering mechanisms, it is possible that unexpected data needs will arise, and that the system's existing data gathering mechanisms are insufficient.

Also, raw data drawn from the system may not have any defining characteristics to aid the process of aggregation and evaluation.

## Design Strategies

Define data sources

Parse separate data channels into comprehensible format

Endeavor to centralize data collection and archiving

## Solution Elements

- S** NatureBase
- M** Professional Survey Teams
- M** Incidental Citizen Reporting "Nature 311"
- E** Regular Citizen Reporting "Nature Rangers"

# Design Factor

## Inadequate Resources

48

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

System Logistics | Adaptation

### Activity

Enacting

### Originator

L. Thomas McCue

### Contributors

### Sources

Personal Observation

### Associated Functions

- 38 Evaluate data
- 39 Prioritize adaptation opportunities/needs
- 40 Evaluate resources
- 41 Determine action

### Observation

For a plan to be enacted, it must have adequate resources. It's success may depend on the availability of those resources.

### Extension

Inevitably, there will be cases where the desired adaptation plan will require more resources than are available at that time. Whether the lack is material, financial, or information based, the ideal solution does not have all of its components at hand. The planning must not be derailed by this event, and must allow for this possibility. In the case of a clear lack of resources, planners should not necessarily turn away from the ideal result, but should consider a progressive implementation as resources become available. This becomes particularly feasible in the case of nature, where growth and evolution are parts of the natural process already.

In fact, consideration of nature's own processes should figure significantly in the planning of adaptation solutions. Clearly, a half finished project is counterproductive. However, a plot of land that is cleaned by the use of wild plant growth versus mechanical means takes a different approach to resource use.

### Design Strategies

- Think creatively about resource use
- Consider natural processes in resource use
- Develop plans that can roll out progressively as resources become available.

### Solution Elements

- M** Fungal mats
- M** Future Growth
- S** ProSeed

# Design Factor

Action plan insufficient for desired result

49

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics | Adaptation

## Activity

Enacting

## Originator

L. Thomas McCue

## Contributors

Entire Team

## Sources

Personal Observation

## Associated Functions

43 Act upon plan  
44 Survey progress  
45 Accommodate feedback

## Observation

Problems are often fluid, and present changing circumstances. While the goal may remain, initial plans may prove insufficient during implementation.

## Extension

Agility and flexibility are key components for a system that is designed to adapt to changing circumstances. The importance of having contingency plans in place makes the resolution of unforeseen circumstances significantly easier. When the contingency is a matter of having underestimated the difficulty of resolving the matter, or a case of insufficient resources, then implementation and problem resolution can grind to a halt..

While anticipating the worst case scenario and trying to allocate to maximum amount of resources for every problem is not practical, a well thought out means of problem assessment is.

It becomes a question of both anticipatory and reactive agility. Can the system anticipate within reason and have contingency plans in place? In addition, can resources be allocated and deployed in a manner that is effective and timely without keeping them in a holding pattern, unavailable to other system elements ?

## Design Strategies

Make agility and flexibility priorities in event response.

Network resources for effective coordination.

Create intelligent database for rapid contingency planning based on present and past situations

## Solution Elements

**M** "ProSeed" A Database and intelligent system that holds past plans and can assist in rapid development of event response planning.

**S** Networked Resources: are tracked and coordinated relative to position and task.

# Design Factor

New condition alter adaptation needs

50

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics|Adaptation

## Activity

Enacting

## Originator

L. Thomas McCue

## Contributors

Entire Team

## Sources

Personal Observation

## Associated Functions

- 42 Assemble resources
- 43 Act upon plan
- 44 Survey progress
- 45 Accommodate feedback

## Observation

The circumstances under which a plan for a given adaptation is developed can change, giving rise to undesirable results.

## Extension

To be truly adaptable to the changing needs of usage, the system must take into consideration the possibility that mechanisms that assess situations and implement solutions must be flexible enough to adapt themselves to a dynamic situations.

Circumstances can arise over the course of a given system adaptation that may demand redressing the problem at hand. This may come into play particularly in light of impending dramatic climate change, and the potential social, political, and economic implications that may accompany climate change.

The ability to accommodate change and respond quickly to new circumstances will be vital to maintaining momentum in system efforts and ensuring their effectiveness.

## Design Strategies

Build flexibility into system processes

Create backup plans in parallel

Create stopgap measure to allow for system reconfiguration.

## Solution Elements

**M** Comprehensive and ongoing charting of climate change effects

**M** "Crisis fund"

**S** "On the Spot" Assessment and RePurpose Teams.

**S** Adaptation Effectiveness Standards Board

# Design Factor

## Unexpected outcome

51

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

System Logistics | Adaptation

### Activity

Enacting

### Originator

L. Thomas McCue

### Contributors

Entire Team

### Sources

Personal Observation

### Associated Functions

48 Establish response needs

44 Survey progress

45 Accommodate feedback

49 Disseminate response

### Observation

While implementation may be successful according to a plan, the desired effect may not result. One must account for unexpected results.

### Extension

Situations will arise where plans are well thought out, well executed, and seemingly desired or expected results occur. However, when dealing with nature and complicated environmental processes, unexpected results may arise from even the most seemingly successful plan. For example, a mosquito eradication plan may have a dramatic effect on bird populations. Or perhaps a genetically modified bacteria utilized for waste treatment could mutate outside of its intended scope and affect the larger environment. Nature has so many intertwined processes and chains of cause and effect that are often mysterious to science, that the unexpected must be accounted for.

### Design Strategies

Build flexibility into system processes

Maintain open channel for results feedback.

Create contingency mechanisms

Research and understand biological processes and consequences fully before implementation.

### Solution Elements

**M** ProSeed

**M** Nature's Feelers

**M** Professional Research Teams

**M** Nature 311

# Design Factor

Cannot receive alert

52

## Project

Chicago: Vision for the Future |Infused Nature

## Mode

System Logistics |Event Response

## Activity

Responding

## Originator

Marisa Knopman                      Sept. 28, 2008

## Contributors

## Sources

Personal Observation

## Associated Functions

46 Receive alert  
48 Establish response needs  
49 Disseminate response

## Observation

It is difficult to manage and monitor activity, emergent and non-emergent, in remote corners of greenspaces, particularly parks.

## Extension

Part of the wonder and allure of greenspace in cities lies in its remoteness. Parks, specifically, offer people the rare opportunity to wander freely off the beaten paths on which they walk every day. For many users, the concept of the remote path is intriguing, desirable and necessary. That being said, the system has the responsibility of managing and monitoring park activities to ensure safety and security.

Thus, the system is confronted with the challenge of overseeing park happenings without infringing on the freedoms and remoteness of exploration.

## Design Strategies

Transmit information  
Support event-response needs  
Support monitoring capabilities  
Maintain privacy of users

## Solution Elements

**M** Nature bluelight phone

# Design Factor

Insufficient access to tools

53

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics | Event Response

## Activity

Responding

## Originator

Marisa Knopman                      Sept. 28, 2008

## Contributors

Entire Team                              Nov. 18, 2008

## Sources

Personal Observation

## Associated Functions

48 Establish response needs

49 Disseminate response

## Observation

The ability to diagnose the state of the event is only as valuable as the system's ability to address/ treat the event. Limited tools or access to tools can impede treatment.

## Extension

Processes designed to monitor and call attention to system events and emergencies are only as valuable as the system's readiness and capacity to respond. Furthermore, event response teams must be adequately trained to perform tasks and use tools properly.

Like other sectors in the system, event response teams can benefit from sharing and transferring knowledge/ expertise internally and externally. Perhaps a particularly successful protocol executed in Michigan can inform processes in Chicago. Collaborating with other event response teams may offer not only proficiency and adaptability but also an added access point to tools and services.

## Design Strategies

Access supply reserve

Share knowledge of use and know-how

## Solution Elements

**S** Midwest response contingency

**M** Event response task force

# Design Factor

Inadequate response teams

55

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics | Event Response

## Activity

Responding

## Originator

Marisa Knopman                      Sept. 28, 2008

## Contributors

Entire Team                              Nov. 15, 2008

## Sources

Personal Observation

## Associated Functions

- 46 Receive alert
- 47 Interpret alert
- 48 Establish response needs
- 49 Disseminate response

## Observation

Executing response plans for events that vary in nature requires experience, a refined knowledge-base, and a specially-designed strategy. Specially devised protocols and plans of action can mitigate or triage event when response team is deficient in manpower or resources.

## Extension

One size does not fit all when it comes to event response. The nature and details of a particular event inform the assembly of appropriate resources- manpower and technical support- which can vary widely from other events. In fact, even events sharing the same category fires, for example, may demand different needs and response teams.

However, automated responses or protocols can be vary effective in staging and managing an event. Having fixed protocols supplemented with highly-specialized strategies may offer a good balance between triage and response. As an event is being addressed, the system can get a good idea of future needs and demands that will undoubtedly determine resource needs and distribution.

## Design Strategies

- Balance predictability and flexibility
- Contain triage component
- Support ongoing dialogue between plans of action

## Solution Elements

- S** Community-organized task force (CEAS)
- M** Event-response call tree

# Design Factor

No means to determine best resources

54

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics | Event Response

## Activity

Responding

## Originator

Marisa Knopman                      Sept. 28, 2008

## Contributors

Entire Team                              Sept. 30, 2008

## Sources

Personal Observation

## Associated Functions

47 Interpret alert  
48 Establish response needs

## Observation

Small, manageable events left undiscovered have the potential to grow into complex and hairy problems.

## Extension

The goal of the event response system is not only to prevent devastating events from occurring, but also to discover and mitigate issues that grow more destructive with time. For example, brush fires which consume neighborhoods; paralyze cities; and interfere with the larger infrastructure, commonly can originate from the smallest spark. Given the right mix of wind power and dry heat, a small spark can rapidly grow into a devastating wildfire.

In this particular case, time is a key factor in event mitigation and control. Time may not be as influential in other instances; therefore the system must determine what kind of information is needed and when.

## Design Strategies

Provide insight- visual or otherwise- into the event in real time

Preserve city residents' privacy

Monitor events

## Solution Elements

**S** Real-time data feed and on-site response

**S** Network of event-activated cameras

# Design Factor

Insufficient resources: people and tools

56

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics | Event Response

## Activity

Restoring

## Originator

Marisa Knopman      Sept. 28, 2008

## Contributors

## Sources

Personal Observation

## Associated Functions

50 Triage event

## Observation

Restoration and/ or rebuilding plans require access to resources such as tools, equipment and shear manpower. Obtaining these necessary forces poses great challenges for cities nation-wide.

## Extension

After the immediate triage of an event, the city can begin devising rebuilding and/ or restoration plans based on access to resources and needs of the city. If access to tools, equipment and manpower is denied or strained, oftentimes, the needs of the city people are compromised.

The devastation in New Orleans caused by Hurricane Katrina in 2005 is a result of many factors, one being limited access to necessary resources for response and rebuilding purposes.

City officials and residents should have the means to sufficiently respond and rebuild after an event to both limit the effects of destruction and encourage rehabilitation.

## Design Strategies

Access tools

Manage tools and supplies during non-events

## Solution Elements

**S** CEAS- community-run maintenance organization

**S** Region-wide support group

**S** Community share-shed

# Design Factor

Uncertain of long-term plan

57

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System logistics | Event response

## Activity

Restoring

## Originator

Marisa Knopman      Sept. 28, 2008

## Contributors

## Sources

Personal Observation

## Associated Functions

- 50 Triage event
- 51 Evaluate data
- 52 Plan long-term response (adapt v. restore)
- 53 Archive knowledge

## Observation

The aftermath of a disaster or an event presents cities with redevelopment opportunities and issues. Determining how to proceed can be complicated.

## Extension

In the wake of destruction or disaster, a city is presented with the task of rebuilding both order and infrastructure. The restructuring process is complicated and requires a committed vision and clear communication of the goals. The nature of post-event solutions can range from restorative to reinvention.

The system should consider multiple factors such as availability of resources and community needs to determine the best way to proceed with rebuilding efforts. Furthermore, how can the system learn from and leverage the knowledge gained from past events? The system can refer to strategies executed both in its own history and those of other cities.

## Design Strategies

- Gauge community needs and interests
- Cull and gather past post-events solutions
- Determine available and necessary resources
- Compare post-event strategies

## Solution Elements

- S** Pro-seed

# Design Factor

Insufficient or misinterpretation of event data

58

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics | Event response

## Activity

Restoring

## Originator

Marisa Knopman                      Sept. 28, 2008

## Contributors

Entire Team                              Nov. 15, 2008

## Sources

Personal Observation

## Associated Functions

51 Evaluate data  
52 Plan long-term plan (adapt v. restore)

## Observation

Once the system returns to a baseline state after an event, the question of how to proceed can be handled in countless ways. The observable data surrounding the event may make all the difference in the success of the city's post-event recovery.

## Extension

Available data surrounding an event like a major flood, fire, hurricane, etc. can be difficult to uncover and to interpret. Causation is not always apparent in the traces of the aftermath, and the behavior of the forces related to the event can be only speculated without the insight of an eyewitness; and even then, there are issues regarding credibility and interpretation.

The most effective ways to objectively capture the nature and evolution of an event is to seize real-time data and information that may reveal cause and effects otherwise left to conjecture. The raw data can be analyzed and assessed.

## Design Strategies

Capture real-time data

Coordinate and support multiple interpretations to achieve quorum

## Solution Elements

**S** System event-activated cameras

**S** Event forensics committee

# Design Factor

No way to document findings/ knowledge

59

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

System Logistics | Event Response

## Activity

Restoring

## Originator

Marisa Knopman                      Sept. 28, 2008

## Contributors

Entire Team                              Nov. 11, 2008

## Sources

Personal Observation

## Associated Functions

51 Evaluate data  
53 Archive knowledge

## Observation

With disparate arms of the public and private sector involved in event response needs, important information may not receive the proper attention or documentation.

## Extension

The value of documenting and capturing the details of an event can be immense for the city in which the event occurred, and for national and international cities interested in gleaning lessons learned. However, it is difficult to organize and capture the necessary insights.

Moreover, the process of determining what information to document can be just as complicated as the actual inputting process. However, having easy access to accurate, comprehensive data and information regarding an event- large or small- can be highly influential in the design of future solutions and system protocols.

## Design Strategies

- Centralize data stream
- Maintain current and updated archive
- Provide comprehensive and accessible content

## Solution Elements

- S** Central event database

# Design Factor

## Conflict of site usage

60

### Project

Infused Nature

### Mode

Event Based Interaction | Recreation

### Activity

Acting

### Originator

L. Thomas McCue      Oct. 1, 2008

### Contributors

Entire team      Oct. 3, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

61 Establish activity parameters  
66 Document experience  
67 Plan future activity

### Observation

In a populous city, there will be instances of site usage conflicts, where multiple parties may want to use a given site at the same time.

### Extension

With millions of people and a limited number of recreation-usable sites, there will inevitably be conflicts. The system should strive to manage site usage in such a way where expectations are managed and conflicts are avoided. Enforcement of a sites' proscribed usage may be difficult, as human resources may not be abundant. However, efforts can be made to monitor park usage, schedule usage, and proscribe usage mode. As time goes on, and people are more familiar with park usage and sets of appropriate behaviors and attitudes become culturally embedded, this will be less of a concern.

### Design Strategies

Facilitate scheduling and reservation for sites.

Monitor and enforce park usage when necessary.

Indicate Park usage modes.

### Solution Elements

**S** MetaCalenar

**M** Nature Rangers

**S** Versatile Signage

# Design Factor

## Damaged resources

61

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Event Based Interaction | Recreation

### Activity

Acting

### Originator

L. Thomas McCue      Oct. 1, 2008

### Contributors

Entire Team      Oct. 3, 2008

### Sources

Group Discussion

### Associated Functions

59 Secure activity space  
60 Gather participants  
61 Establish activity parameters  
62 Commence activity closing

### Observation

Damaged or incomplete resources can diminish or ruin recreational activity.

### Extension

Most forms of recreation, particularly those involving organized groups require a certain amount of resources to take place. The site must be intact and have a reasonable amount of maintenance, tending, and structural elements. Equipment is usually supplied by the user (such as balls and bats for a softball game), but some equipment elements may need to be provided as well (bases, nets, flags, etc).

Part of the concern here is a matter of the site, (maintenance and structural integrity), and then there is the matter of equipment (organization, expectation management, and collective use). Both fall subject to wear and tear, weather, vandalism and other trials. Some damage is inevitable, and regular maintenance is to be expected. However, if there are ways to mitigate damage, significant cost savings can occur in terms of resources, and more recreational activities can take place unhindered.

### Design Strategies

Maintain regularly  
Mitigate damage with materials  
Create co-ownership of equipment

### Solution Elements

- S** Super Trails/Super Fields
- M** Ball and Bat Cooperatives
- S** Intelligent Equipment Cache
- S** Organic, or grown site structures

# Design Factor

## Inter-activity transition is difficult

62

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Event Based Interaction | Recreation

### Activity

Acting

### Originator

L. Thomas McCue      Oct. 1, 2008

### Contributors

Entire Team      Oct. 3, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

54 Determine location  
55 Identify locale  
56 Organize participants  
57 Assemble materials  
58 Transport to locale

### Observation

The ease or difficulty in transitioning from one activity to another, or from "non-activity" to activity (or vice versa) can be a determining factor in the decision to engage in an activity at all.

### Extension

The system strives to facilitate the engagement of city dwellers with nature and in any number of activities therein. Often, outdoor activities are done for their own sake, and are the centerpiece of a person's leisure time. There are many instances where it is the case that someone may desire to engage in an activity, but decides against it for convenience reasons. Whether it is a decision not to ride a bike because of sweat, simply needing a place to store belongings, or a lack of equipment, seemingly minor issues can be an activity deal-breaker.

### Design Strategies

Provide more robust amenities

### Solution Elements

-  Clean Hubs
-  Rental Stations
-  Storage Stations

# Design Factor

## Universal accessibility is problematic

63

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Event Based Interaction | Recreation

### Activity

Acting

### Originator

L. Thomas McCue      Sept. 30, 2008

### Contributors

Entire Team      Oct. 2, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

54 Determine location  
55 Identify locale  
56 Organize participants  
57 Assemble materials  
58 Transport to locale  
67 Plan future activities

### Observation

Making recreational activity to all people, regardless of ability but within reason, is problematic.

### Extension

While the American Disabilities Act mandated that public spaces be accessible to people with disabilities, accessibility is also a moral and ethical obligation in a just society. However, the question must be asked whether it is feasible, practical, or even desirable to work towards true "universal accessibility". While it is clear that every effort should be made to make green space accessible, what is not so clear is the extent to which accessibility can be achieved without compromising the integrity of the green space itself. In the case of green spaces, there is also the question of system based accommodations versus user based accommodations. For example, in the case of wild spaces, off-road wheelchairs could be made available. Ultimately, the goal is to make green spaces as accessible as possible, without compromising the integrity of the green space, or creating an access experience so particular for the user that they feel singled out and uncomfortable; essentially, the maximum amount of accessibility with the most fluid user experience.

### Design Strategies

Establish consistent design standards for wheelchair access.

Establish consistent braille and audio features for all information and signage.

Create means for fluid transfer of access from system to user.

### Solution Elements

**M** Access standards and guidelines for greenspaces

**M** Spongy Trails

**S** Versatile Signage

# Design Factor

Activity space is damaged

64

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event Based Interaction | Recreation

## Activity

Closing

## Originator

L. Thomas McCue      Oct. 4, 2008

## Contributors

Entire Team      Oct. 20, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

63 Re-assemble materials  
64 Restore space to initial state

## Observation

There are occasions where an activity space may be damaged as a result of the activity.

## Extension

Green space intended for vigorous activity is subject to some harsh treatment. Certain conditions, such as extreme rain or drought, can exacerbate a particular space's vulnerability to damage. Some of the same spaces are often used for events that have high volumes of human traffic, which can take a severe toll on a green space. The goal is to create, maintain, and repair areas with a minimal cost of resources. However, it is also important to maintain the "greenness" of an intensive use area, and not succumb to the urge to pave things over for the sake of durability.

## Design Strategies

- Identify basic site needs
- Establish maintenance protocol
- Utilize new materials
- Explore bioengineering options
- Designate space for certain activities
- Engage users in maintenance responsibility

## Solution Elements

- M** Spongey Trails
- M** Pro-Seed
- S** Novel Nature Parks
- M** Natural Area Restoration Organizations

# Design Factor

Activity did not meet user expectations

65

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event Based Interaction | Recreation

## Activity

Closing

## Originator

L. Thomas McCue      Oct. 5, 2008

## Contributors

Entire Team      Oct. 13, 2008

## Sources

Personal Observations  
Group Discussion

## Associated Functions

65 Retire to post-activity  
66 Document experience  
67 Plan future activities

## Observation

Recreation is inherently a pleasurable experience, but one that can be tainted, or even ruined by circumstance. The system should strive to optimize the experience and mitigate any factors that could compromise the recreation experience.

## Extension

There are many factors that can make for a sub-par recreation experience that fall outside the scope of the system. Rain, for example, can ruin the prospects of a day of hiking, or a softball game. However, the environmental, organizational, and material factors will fall under jurisdiction of the system, and should lend themselves to the best possible recreation experience. This may go beyond merely the proper tending of play fields or provision of reliable equipment. Do the facilities or sites in question have adequate rest rooms or water supplies? Are play fields situated enough distance from automobile traffic? Do play fields or multi-use green space overlap, creating cross activity conflict?

An unsatisfactory or unpleasant experience, especially for someone new to an activity can be enough to turn them away from nature oriented activities altogether.

## Design Strategies

Identify basic site needs  
  
Set tending standards  
  
Offer alternate activity options

## Solution Elements

- M** Recreation festivals or exhibitions
- M** Creation of a usage grid, coordinated with scheduling.
- S** Natural feature recreation sites
- S** Inspiration kiosks

# Design Factor

Lack of entry/exit transactions occasionally confusing

66

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event Based Interaction | Recreation

## Activity

Closing

## Originator

L. Thomas McCue      Oct. 4, 2008

## Contributors

Entire Team      Oct. 12, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

59 Secure activity space  
60 Gather participants  
65 Retire to post-activity  
66 Document experience  
67 Plan future activities

## Observation

People may expect transactions in the form of entry and/or exit when using a space, resulting in possible confusion.

## Extension

In the case of some events or programs held in green spaces, people may expect some kind of transaction as requisite for exit or entry. Very few, if any, programs held in city parks will actually cost anything, and are designed to draw all comers. To avoid any confusion, clear signage at points of entry are required, as well as ongoing communications programs designed to increase awareness of events and programs and their gestures.

## Design Strategies

Create awareness campaign  
Establish consistent on-site communication  
Create engaging optional transaction

## Solution Elements

**M** Versatile Signage  
**M** Community Scrapbook  
**S** Publicity Campaign

# Design Factor

## Inadequate amenities

67

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Event Based Interaction | Recreation

### Activity

Closing

### Originator

L. Thomas McCue      Oct. 1, 2008

### Contributors

Entire Team      Oct. 3, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

63 Re-assemble materials  
64 Restore space to initial state  
65 Retire to post-activity

### Observation

The lack of adequate amenities can detract from the overall enjoyability of an activity.

### Extension

With the exception of forest preserve or wild green space, multi purpose green space is viewed with certain expectations. One of those is that basic amenities will be available. A water source of some kind and toilets are perhaps the most basic amenities that could be expected. The question is how to provide comprehensive basic amenities without overreaching the maintenance capability of the system? In addition, more robust amenities can facilitate a higher degree and frequency of engagement by users of the system, resulting in the potential for over-use and additional maintenance requirements.

### Design Strategies

Identify basic site needs

Establish clear maintenance standards

Automated maintenance tasks

Distribute maintenance tasks across system

Identify where more robust facilities are called for, and provide them.

### Solution Elements

**M** Maintenance Schedule

**M** Clean Hubs

**M** Auto Sweep

**S** Garbage Roomba

# Design Factor

## Safety as a concern

68

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Event Based Interaction | Recreation

### Activity

Closing

### Originator

L. Thomas McCue      Oct. 3, 2008

### Contributors

Entire Team      Oct. 12, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

61 Establish activity parameters  
64 Restore space to initial state

### Observation

As with all physical endeavors, there is an element of risk, and potential safety concerns.

### Extension

The well being and safety of users is paramount in the system design, and there are significant liability risks surrounding safety related issues as well. One concern, however, is that while safety is an important consideration, the integrity of green space must not be compromised by excessive safety precautions. Balance is key, and a culture of personal responsibility must be fostered. High risk areas, such as swimming areas would have clear demarcation and posted lifeguards. In many cases, it will be left up to users to act responsibly and to understand the risks. That being the case, it is important to provide some degree of emergency notification.

Another safety concern is that in most large American cities, parks are generally considered off limits at night. Green space is not solely for daytime usage, and the system should strive to ameliorate the notion (and often reality) that parks are dangerous at night.

### Design Strategies

Determine threshold for physical safety precautions.

Continue existing lifeguard programs

Expand non-police monitoring

Provide emergency notification channel.

Explore park design considerations for night use

### Solution Elements

**S** Versatile Signage

**M** Nature 311

**M** Green Rangers

**S** Billie Jean Road

# Design Factor

## Inadequate information for future plan

69

### Project

Infused Nature

### Mode

Event Based Interaction | Recreation

### Activity

Closing

### Originator

L. Thomas McCue      Oct. 3, 2008

### Contributors

Entire Team      Oct. 11, 2008

### Sources

Personal Observation

### Associated Functions

55 Identify locale  
56 Organize participants  
65 Retire to post-activity  
66 Document experience  
67 Plan future activities

### Observation

Continuation of user involvement with system programs requires that they have information for the purposes of making future plans.

### Extension

Getting people more engaged with nature and outdoor activities is a primary goal of the system. To ensure that positive experiences are not isolated, but a point along a continuum and the beginning of a behavior change, tools and information for the creation of future plans should be as easy and accessible as possible. Whether it is a matter of coordinating participants or securing a space for the next game, or identifying a site for the next nature walk, making plans should be painless. Encouraging and facilitating plan-making helps to ensure future involvement, as well as provide a sense of control for the user.

### Design Strategies

Make information available online and on-site.

Provide dynamic planning tools

### Solution Elements

 Versatile Signage

 MetaCalendar

 Parks Preview

# Design Factor

## Poor awareness of events in the future

70

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Event Based Interaction | Recreation

### Activity

Closing

### Originator

L. Thomas McCue      Oct. 3, 2008

### Contributors

Entire Team      Oct. 11, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

65 Retire to post-activity  
66 Document experience  
67 Plan future activities

### Observation

In order to foster a culture where outdoor recreation is highly valued and enjoyed, the system will need to create awareness of ongoing events.

### Extension

One of the system's goals is to foster a culture where regular and meaningful recreation based engagement with nature is commonplace. An important aspect of initiating that regular engagement is creating awareness of events and ongoing programs. One time interactions and activities can be meaningful and enjoyable, but regular and repeated engagement can take things into the realm of lifestyle.

### Design Strategies

Facilitate scheduling and reservation for sites.

Create ongoing publicity campaigns

Provide on site event reminders

### Solution Elements

**S** MetaCalenar

**M** Green Publicity

**S** Versatile Signage

# Design Factor

Don't know what to do or where to go

71

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event Based Interaction | Exploration

## Activity

Embarking

## Originator

Ann Hintzman Oct. 1, 2008

## Contributors

Entire Team Oct. 3, 2008

## Sources

Group Discussion

## Associated Functions

68 Communicate Location Offerings

69 Select Destination

71 Determine Materials Needed

## Observation

Often people want to do something but aren't sure of the array of activities that could be done or where they can go.

## Extension

On any given weekend, there are a multitude of activities and places that people can go. Yet because of the size and abundance of activities, people often miss events and places that they would enjoy. It's not for a want of disclosure that things get missed, go to a website like citysearch, and over 500 events are listed for the coming Saturday. Filters can help sort this, but require a knowledge of what to filter for and often eliminate events that might be an enjoyable but new experience. This combination of being overwhelmed with options but at the same time having nothing to do is especially pronounced for the new resident who has not established a base understanding of what types of events occur and what locations are nearby.

When word of mouth succeeds and you know about an event, the information available is often at a very high level - where it is and hours of operation - so details about what can be brought (e.g pets, food) and things that would make the experience more pleasant (e.g bug spray, blankets, frisbees) aren't known until a person has already gone to a place.

## Design Strategies

Suggest things to do

Provide local information

Encourage exploration

Provide amenities

## Solution Elements

**M** Tivo Calendar

**M** New Neighbor Info

**M** Scavenger Hunt

**M** Share Shed

# Design Factor

## Limited transportation options

72

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Event Based Interaction | Exploration

### Activity

Embarking

### Originator

Ann Hintzman Oct. 1, 2008

### Contributors

Entire Team Oct. 3, 2008

### Sources

Group Discussion

Chicago Tribune, "Cook County Forest Preserve: Cook County Forest Preserve news and Photos". <http://www.chicagotribune.com/topic/environmental-issues/nature/forests/cook-county-forest-preserve-PLREC000057.topic> (accessed November 16, 2008).

### Associated Functions

70 Plan route  
72 Travel to destination  
75 Engage the senses

### Observation

Large park destinations are located outside of the city center making them hard for many people to get to.

### Extension

The nature experience is often viewed of as a destination. While the notions of being treasured and memorable are ones that should be preserved, to increase the physical and psychological benefits of nature it must be less of an event and more of a daily occurrence. The Cook County Forest Preserve contains 67,800 acres of forest preserve or roughly 11% of Cook County ([chicagotribune.com](http://chicagotribune.com)), however these acres are largely located on the outskirts of town and in the best case accessible to public transportation, though a good amount of the forest preserve requires private transportation to access.

The goal of a trip to the forest is to escape and unwind. By requiring at best a series of rail and bus transfers and at worst a lengthy car trip, navigating stop and go urban traffic, people are required to increase their stress level in order to access to blood-pressure lowering benefits of the forest. It is questionable how much of the positive benefits of nature remain after the commute back to the home. To infuse nature we must provide a way for people in all neighborhoods to reap the benefits of the infused nature experience.

### Design Strategies

Offer local solutions

Create accessible entry points

### Solution Elements

**M** Escape Garden

**S** Elevated Gateway Paths

# Design Factor

Got lost en route

73

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event Based Interaction | Exploration

## Activity

Embarking

## Originator

Ann Hintzman                      Oct. 1, 2008

## Contributors

Entire Team                              Oct. 3, 2008

## Sources

Group Discussions

## Associated Functions

72 Travel to destination

## Observation

You don't know when you're near a green space destination.

## Extension

While GPS can go a long way to helping you plan your route, it is by no means ubiquitous, and even having GPS does not ensure that you can find a park. To use GPS you need to have an address. Parks and forests tend to be named after local heroes or landmarks and do not indicate exact coordinates for entry. Even if you manage to get near to the forest by selecting one corner or landmark within the multiple-acre plot, finding sanctioned areas to park and enter can require driving around the periphery and frustrating speculation.

This circling frustration is perhaps a best-case situation because in order to reach this level you already know there is a park to go to and its rough coordinates. Many of people's best green space memories are unplanned events, where parks are stumbled up on or walked through on the way to somewhere else and the benefits of nature can be reaped without the frustration of orienteering. Parks and forests by their nature do not have roads running through them, making them generally off the beaten track. While this provides a desirable seclusion once you find it, it means that it is unlikely that you happen upon the space in the first place.

## Design Strategies

Help direct

Provide alternatives

## Solution Elements

**M** Park Signs

**S** Plan B

# Design Factor

Got separated on the trail

74

## Project

Chicago - Vision for the Future | Infused Nature

## Mode

Event-based Interaction | Exploration

## Activity

Discovering

## Originator

Ann Hintzman                      Oct. 1, 2008

## Contributors

Entire Team                              Oct. 3, 2008

## Sources

Group Discussions

## Associated Functions

74 Provide wayfinding

75 Engage the senses

76 Accommodate multiple paths

## Observation

Wayfinding isn't just about finding your way around, it's also about finding people and things you came with.

## Extension

Good trail systems create branching paths to facilitate individual exploration. This allows people to create their own experiences and memories and to feel free of routine. It is this act of wandering which defines the exploration process. When embarking with other people, it is often the case that different parties will want to explore different paths. Conducting these separate explorations can create a quiet, personal relationship with the surrounding nature. It can also make reconnecting with the people you came with and the means of transportation that brought you a challenge.

Often when you split from your wandering partner, it is without a deliberate intent. One party heads down one path while the other continues on the current route. After a bit of time, it becomes clear that the first party is not returning to the main path and a decision about whether to follow down their path or hope to reconnect at some point in the future must be made. Concern about how to reconnect then becomes the focus of the wandering instead of enjoying the nature.

## Design Strategies

Provide means of reconnecting

## Solution Elements

**M** Touch Tag

**M** Trail Buddy

# Design Factor

## Limited time to wander

75

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Event Based Interaction | Exploration

### Activity

Discovering

### Originator

Ann Hintzman                      Oct. 1, 2008

### Contributors

Entire Team                              Oct. 3, 2008

### Sources

Group Discussion

### Associated Functions

73 Provide transition  
75 Engage the senses  
76 Accommodate multiple paths

### Observation

People don't have time to get lost in nature for a whole day.

### Extension

When you walk into a natural setting, one of its virtues is it is stripped of many of the auspices of the constructed world. This includes clocks. While this quiet remoteness is part of the benefit of the nature experience, it does not eliminate the real world need to do other things with your day - go to work, pick up your kids, run errands. For most people this means that they have a limited amount of time to dedicate to wandering and exploration.

If you know you only have an hour to spend in nature, the inclination is to sniff around the edges of the space so that when the desired departure time arrives you're able to slip out. This isn't the richest experience you could've had with your time but it's the only experience you could have without the stress of worrying you'll be caught a mile away from the car when Timmy's cello lesson is over. Even when trail routes are marked, they are generally done so with miles. For most people, the conversion between miles of exploration and time to spend is not known, so at best people will chose a route they know they can accomplish in the time at hand at the expense of their experience.

### Design Strategies

Create trails based on time/activity use

Allow for advanced planning

### Solution Elements

**M** Wander Rings

**M** Planning Kiosk

# Design Factor

Whose park is it?

76

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event Based Interaction | Exploration

## Activity

Discovering

## Originator

Ann Hintzman                      Oct. 1, 2008

## Contributors

Entire Team                              Oct. 3, 2008

## Sources

Group Discussions

## Associated Functions

68 Communicate Location Offerings

74. Provide wayfinding

76 Accommodate multiple paths

## Observation

Open spaces lend themselves to multiple activities, which often can be in conflict with each other.

## Extension

A recent trip to Cook county's forest preserve witnessed various activities - families exploring, walking with pets, riding bikes, and fishing on a nearby river. Each of these are the types of activities are ones our plan should encourage, but combined they can be sources of conflict. Right of way between bikers and walkers is unknown, dogs are questionable guests, the amount of space and volume of voice that should be used are all ambiguities that users of the space encounter. Even when there are official rules, such as those concerning whether dogs are allowed off leash, this rule is often broken not out of willful disregard for the rules but rather because the rules are unknown and contrary to the expectations users have of public spaces. This particular infraction led to an uncomfortable confrontation between one user of the space, who attempted to inform the other that dogs are not allowed off leash and was met with a hostile, "I've been coming here for 10 years" from the other user. This event underscores the need for public green spaces to support many activities to be vital in the lives of its users, while at the same time, preempting different use-cases from encroaching on the experiences of other users.

## Design Strategies

Make rules apparent

Separate use

## Solution Elements

**E** Trail Codes

**E** Contour Paths

# Design Factor

## Trash goes in holes

77

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Event Based Interaction | Exploration

### Activity

Discovering

### Originator

Ann Hintzman Oct. 1, 2008

### Contributors

Entire Team Oct.3, 2008

### Sources

Group Discussion

### Associated Functions

77 Provide amenities

### Observation

If there is no visible or expected trash bin, people will throw trash into any vessel in a public space that has a hole near the top.

### Extension

Waste is a problem in any shared space. People want to do the right thing and not litter, but do not want to carry waste with them for an unforeseeable amount of time. To avoid littering people opt for a gray area. While if asked, people know the difference between a trash or recycling bin and a flower pot, or streetlight base. Yet within a one block radius of this school, trash can be found in each of these places. A recent trip to the forest preserve showed that where there are no man-made holes to dispose of waste, people dropped trash under bushes to the side of the main path or between the roots of large trees.

Two issues are pitted against each other when it comes to trash: personal responsibility and convenience. The first is a problem that people generally deal with trash differently in public spaces than they would in their own home. In a person's home, trash that is not immediately disposed of is held in a visible, intermediate storage place until it can be disposed of. In public spaces, trash that's not immediately disposed of is hidden with no intention of proper disposal in the future. This results in trash not only being inappropriately disposed of, but also not visible to administrators in charge of keeping a space clean. Why waste is not properly disposed of is an issue of convenience. In the public space this is generally because there is no trash can in sight or the trash can is full. When forced to choose between littering and carrying their own trash, some people opt for convenience.

### Design Strategies

Eliminate Trash Receptacles

Ensure Trash Receptacles always available

Make disposing of waste fun

### Solution Elements

**M** Garbage Sorting Roomba

**S** Trail Buddy

**M** Worm Tank

# Design Factor

## When you've got to go

78

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Event Based Interaction | Exploration

### Activity

Discovering

### Originator

Ann Hintzman                      Oct. 1, 2008

### Contributors

Entire Team                              Oct. 3, 2008

### Sources

Group Discussions

### Associated Functions

77 Provide amenities

### Observation

Sometimes you have to go to the bathroom when there is none in sight.

### Extension

Exploration of nature involves wandering and discovery, immersing yourself in the natural world. This experience can occur in the walk home from work, or as part of a day-long hike in the forest. The system must support the needs of these longer excursions, including the eventual need to go to the bathroom. Many larger parks and preserves do already contain facilities; however, these are often located at points of entry. This allows for pre-planning before embarking on a longer hike but does not provide a solution for the need to go to the bathroom while on the trail

There are two general solutions to the need to go to the bathroom on the trail: hold it and go in the bushes. The hold it solution effectively terminates the experience. Upon having the urge to go to the bathroom, the user reverses course on the trail to return to the nearest facility, and becomes focused on the task at hand rather than the nature around him or herself. The go in the bushes solution, while it does allow for the continuation of the experience, causes anxiety about the need for privacy. This is especially pronounced in those who are exploring on their own and therefore lack a look out, and women, who are less discretely able to relieve themselves.

### Design Strategies

Provide cover

Provide more periodic, natural facilities

### Solution Elements

**M** Modesty shrubs

**S** Compost outhouse

# Design Factor

No way to capture moment

79

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event Based Interaction | Exploration

## Activity

Responding

## Originator

Ann Hintzman Oct. 1, 2008

## Contributors

Entire Team Oct. 3, 2008

## Sources

Group Discussion

## Associated Functions

78 Facilitate sharing of experience

80 Provide physical take-aways

## Observation

Events occur when you're without a means of recording them.

## Extension

Some of the best moments and memories in life are the ones that weren't planned for. These spontaneous events, because they are often so evocative of places and people in your life, are the ones that you think back to and want to remember. Yet because they were unplanned, there is often not a means of capturing the experience so our archives come to represent staged moments- posing with Mickey- instead of the core experience- riding on the tea cups. When dealing with largely unstructured nature experiences, like a hike through the woods, where there are few staged photo opportunities and many moments of quiet reflection and camaraderie, capturing the heart of the experience to illicit a clear memory in the future is challenging.

Even the expected moments and photo opportunities can be hard to record when you forget your camera. Although cell-phones are making image capturing more ubiquitous, these too are often forgotten and one is left with a sense of sadness at coming home from a great day and having insufficient means to tell others about the experiences or remember in the future.

## Design Strategies

Provide means of recreating memory

Provide means of recording memories

## Solution Elements

**M** e-sketch artist

**S** Trail Buddy

**S** Web-o-graph

# Design Factor

Forgot where you were before

80

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event Based Interaction | Exploration

## Activity

Responding

## Originator

Ann Hintzman

## Contributors

Marisa Knopman	Oct 3, 2008
Thomas McCue	Oct 3, 2008
Nikki Pfarr	Oct 3, 2008
Ruth Schmidt	Oct 3, 2008

## Sources

Group Discussion

## Associated Functions

78 Facilitate sharing of experience  
80 Provide physical take-aways

## Observation

Park names aren't often intuitive and unless you planned and recorded where you went, you might not remember where you were

## Extension

In the Forest Preserve system of Cook county, if you want to hike or cross country ski, you could go to Catherine Chevalier Woods, which is due south of Damn No. 4 Woods - East. If you wanted to hike or cross country ski, this information would not be very helpful, but being resourceful you might look on line. This will require that you know to look either in region 3 on the general map or to look with in the Indian Creek division map in order to locate Catherine Chevalier Woods and learn what other amenities it offers.

More often than not, people only know what they want to do and chose their location based on recommendations or prior experience. You might remember being told of a good hiking path off of highway 190 near O'hare, or going skiing with friends near Franklin Park. Yet even these pretty specific directions at best narrow your choice down to three parks.

Word of mouth and repeat experiences are a vital way of building traction and involvement in surrounding communities. The ability relay and recall these experiences is impaired if names aren't intuitive and specific coordinates aren't remembered.

## Design Strategies

Remind you were you were

## Solution Elements

**M** Visitor's Log

# Design Factor

## Stuff adds clutter

81

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Event Based Interaction | Exploration

### Activity

Responding

### Originator

Ann Hintzman                      Oct. 1, 2008

### Contributors

Entire Team                              Oct. 3, 2008

### Sources

Group Discussion

### Associated Functions

78 Facilitate sharing of experience

79 Archive experience

### Observation

As much as you want to remember a place, adding another memento to your already full shelves or albums just creates more archiving noise and clutter.

### Extension

There are trips, excursions and times with friends, that we often would like to be able to remember and share with others down the road. Mementos, from pictures to scrapbooks to souvenirs serve this purpose. Yet as life goes on, and mementos are collected, the ability to store and access these physical memory cues becomes increasingly challenging. Even in their virtual form, photoalbums are hard to navigate without a specific intent and well-tagged archive. Mementos spend the bulk of their time in storage, and require that the user remember to look for them in order to access their memory of the event, thereby negating the cueing function they were procured for.

Beyond the issue of whether mementos fail in their purpose to the user of reminding him or her of experiences, there is a larger system question of whether creating physical items that need to be manufactured, stored, and eventually disposed of supports the mission of increasing green space. Although the manufacturing facility or landfill may not be located within Chicago, a wider view of the system's mission would require that the resources used to support materials produced for the system be included in the green footprint of the system.

### Design Strategies

Provide non-physical memories

### Solution Elements

**S** Nature Smells

# Design Factor

Varied community goals

82

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event-Based Interactions | Civic Participation

## Activity

Preparing

## Originator

Nikki Pfarr Oct. 2, 2008

## Contributors

Entire Team Oct. 3, 2008  
Nikki Pfarr Nov. 21, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

82 Determine community goals

## Observation

Different segments of the community may lend support and resources toward civic participation activities that are aligned with their unique goals; as a result it can be difficult to get multiple groups to support a common goal.

## Extension

Various segments of the community (schools, private businesses, non-profits, neighborhoods) have different needs, and therefore different goals. When it comes time to determine where the city should put its resources and which type of civic participation activities the city should coordinate, these community segments may lean toward options that are relevant to their unique interests. As a result, it can be difficult to get multiple groups to support a common activity or event.

Fortunately, it is possible that an individual activity or event could support a range of community goals of relevance to several community segments; however, if this is not accurately and clearly communicated, the community segments may not understand or appreciate that fact.

## Design Strategies

Clearly communicate how each event relates to known community goals

Allow community members to vote on activities and events that most closely correlate with their own goals and interests

## Solution Elements

 Vote and Volunteer

# Design Factor

Lack of time or resources required to gauge interest

83

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event-Based Interactions | Civic Participation

## Activity

Preparing

## Originator

Nikki Pfarr Oct. 2, 2008

## Contributors

Entire Team Oct. 3, 2008  
Nikki Pfarr Nov. 21, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

82 Determined community goals  
83 Gauge interest

## Observation

A comprehensive assessment of community interest prior to an event or activity may not be feasible due to limited time, human resources, and access to the community.

## Extension

Determining community interest typically involves conducting surveys, phone calls, and personal interviews. These techniques require time, access to and cooperation from the community, and human resources to conduct and manage the research.

Specifically, human resources are needed to design the materials or protocols themselves so that the results are either entirely comprehensive or adequately representative. Additionally, human resources are needed to aggregate the findings and identify relevant trends. The trends and findings then need to be communicated to the system in a meaningful way. It should be noted that some of these tasks can likely be automated, although human resources will initially need to be invested in the creation of such an automated system.

If a group or system cannot afford the resources required to gauge community interest in these formal ways, they may give up on the idea entirely.

## Design Strategies

Provide low-cost ways for community members to make suggestions and indicate interest

Utilize people in the community to help determine latent community needs

Automate much of the research process to minimize the need for additional human resources

## Solution Elements

**S** Vote and Volunteer

**S** Notes from the Field

# Design Factor

Lack of community interest

84

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event-Based Interactions | Civic Participation

## Activity

Preparing

## Originator

Nikki Pfarr

Oct. 15, 2008

## Contributors

Nikki Pfarr

Nov. 19, 2008

## Sources

Personal Observation

Group Discussion

## Associated Functions

83 Gauge interest

## Observation

Lack of community interest may make it difficult to recruit participants for an event; further, community apathy may manifest as in lack of support for civic participation overall.

Lack of community interest may be the result of misaligned goals or a misunderstanding of the purpose and value of the activity.

## Extension

If the planned activity or event is not perceived to be aligned with community interests or goals, it may not be seen as a meaningful use of time and resources. A misunderstanding about importance of the activity may result in community apathy. As a result, it may be difficult to recruit participants and ask community members to donate or lend tools and resources.

If it is unclear how an individual or group can contribute to the final outcome of an event or activity, they may not feel motivated to contribute at all. Community members not only have to be on board with the purpose of the event, but they have to feel that their own contribution will be meaningful toward achieving the desired outcome.

What is perceived as lack of community interest may actually be an inability to participate - due to scheduling conflicts, perceived skill or material requirements, etc. If an event coordinator suspects lack of community interest is the cause of limited participation, they should take care to rule out other factors that may cause similar results.

## Design Strategies

Make sure activity goals are aligned with community interests and goals

Communicate purpose of activity and intended outcome in a clear manner, highlighting congruency with community interests and goals

## Solution Elements

**S** Vote and Volunteer

**S** Notes from the Field

# Design Factor

Damaged or missing materials/tools

85

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event-Based Interaction | Civic Participation

## Activity

Preparing, Engaging

## Originator

Nikki Pfarr Oct. 3, 2008

## Contributors

Entire Team Oct. 3, 2008  
Nikki Pfarr Nov. 19, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

84 Coordinate resources  
88 Provide materials

## Observation

During an activity or event materials and tools may be damaged or lost; if participants aren't sure who's responsible for the materials, they may not think to collect them at the end of the event or assess them for damage.

When planning for an event and attempting to prepare the necessary resources, missing or damaged materials and tools may delay the event, if not entirely prevent it from occurring.

## Extension

During a volunteer activity or event, it can be difficult to keep track of participants let alone the materials and tools in use. When the event wraps up, participants may not think to collect materials and bring them to a central location (especially if they have not been assigned that responsibility explicitly). As a result, materials may be lost or left behind.

Likely participants will not damage tools maliciously; more likely, they don't feel a sense of ownership toward the tools and therefore may not treat them with as much care as they would their own personal tools. As these tools and materials accrue wear and tear, participants may not think to assess the damage nor bring it to the attention of a coordinator (unless the tool is entirely broken). As a result the materials and tools may become more damaged over time, and may eventually reach a point where they cannot be fixed (whereas, with early damage detection, they could possibly have been repaired).

When planning an event, if materials or tools are missing it may result in the cancellation of the event. Worse, if materials or tools are damaged but the damage is not noticed until the event has commenced, volunteers planning to use the tools may be unable to complete their tasks, which impacts the success of the overall event.

## Design Strategies

Keep track of tools prior to and during the activity

Allow participants to personally check out specific materials and tools, so they feel a sense of ownership and responsibility

Make sure all tools that were brought to the activity are there when it concludes

## Solution Elements

 Open Tool Library

 RFID Tool Bins

 Tool Tracker

# Design Factor

Unable to identify participants beforehand

86

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event-Based Interactions | Civic Participation

## Activity

Preparing

## Originator

Nikki Pfarr

Oct. 2008

## Contributors

Nikki Pfarr

Nov. 19, 2008

## Sources

Personal Observation

Group Discussion

## Associated Functions

85 Inform participants

## Observation

Large, open events may draw a variety of participants from potentially unanticipated segments of the community. An inability to identify participants beforehand makes it difficult to plan tasks, assess resource needs, and establish reasonable metrics for success.

## Extension

Open events may draw an unanticipated set of participants. In particular, free events that take place in public spaces may draw a large crowd of participants from unanticipated segments of the community. While high numbers of participants are generally positive and contribute to the success of an event, an inability to identify participants beforehand can be a burden for event planners.

It is particularly difficult to plan tasks for unknown numbers of participants with unknown experience and skill levels. Similarly, it is difficult to estimate the necessary resources and tools that will be needed for an unknown group of participants. An event coordinator may be able to estimate supply needs, but if demand outweighs supplies, she may have to turn eager volunteers away.

## Design Strategies

Allow people to check out tools and materials on their own and bring them to an event, so that supplies arrive with the participants

Promote events and assess interest in advance to gain a better sense of who might participate

## Solution Elements

 Open Tool Library

 Vote and Volunteer

# Design Factor

Individual goals and tasks unclear

87

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event-Based Interactions | Civic Participation

## Activity

Engaging

## Originator

Nikki Pfarr

Nov. 19, 2008

## Contributors

Nikki Pfarr

Nov. 21, 2008

## Sources

Personal Observation

Group Discussion

## Associated Functions

86 Communicate goals

87 Delegate responsibilities

## Observation

Individuals may not understand what their specific task or goals should be for a portion of the event.

## Extension

When an event coordinator is managing a large number of participants, it can be difficult to give each participant one-on-one time to make sure they understand their assigned task and goals for the duration of the event. Further, if a participant completes their task before the event has ended, they may not know what to do next. If the coordinator is not accessible, or a list of additional tasks is not available, the participant may become bored or leave the event early.

## Design Strategies

Publicize goals and potential tasks prior to event

Provide a list of secondary tasks that participants can work on if they complete their assigned tasks

Assign participants specific duties and monitor their progress throughout the event

Establish communication channel between coordinator and participants during entire event in case questions or problems arise

## Solution Elements

 Vote and Volunteer

 Park Service Wish Lists

 Interactive Name Tags

 Bite Sized Contributions

# Design Factor

Lack of incentive to take responsibility

88

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event-Based Interactions | Civic Participation

## Activity

Engaging

## Originator

Nikki Pfarr Oct. 2, 2008

## Contributors

Entire Team Oct. 3, 2008  
Nikki Pfarr Nov. 21, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

87 Delegate responsibilities

## Observation

Event participants lack incentive to take on specific responsibilities; if anything, added responsibility is perceived as added personal risk.

## Extension

Event participants may be wary of taking on responsibility due to perceived personal risk; participants may be concerned that they will be held liable if anything goes wrong during that portion of the activity, which carries personal and financial burdens.

Some participants may feel motivated to take on responsibility because they wish to contribute to the event, or feel passionate about the task at hand. However, others may simply shy away - to those participants who don't feel motivated by a personal incentive, taking on additional responsibilities is simply akin to taking on extra work.

While simple incentives, such as public recognition, may encourage some participants to step into leadership roles, larger incentives may entice participants into those roles for the wrong reasons. It is important to make sure the incentives do not become the primary reason why someone is involved in a civic participation event or activity.

## Design Strategies

Provide public recognition of participants who take on added responsibility

Clear up any misconceptions about skills or experience required to take on certain responsibilities, and associated liabilities

## Solution Elements

 Vivacious Volunteers!

# Design Factor

Unable to participate in planned activity

89

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event-Based Interactions | Civic Participation

## Activity

Engaging

## Originator

Nikki Pfarr

Nov. 21, 2008

## Contributors

## Sources

Personal Observation  
Group Discussion

## Associated Functions

89 Encourage participation

## Observation

Some volunteers may be unable to participate in certain activities due to physical limitations, special needs, etc. External factors, such as weather, may also make it difficult to participate in the originally planned activity.

## Extension

There are a variety of scenarios in which an originally planned activity or task cannot be completed. In some cases, participants may not have the physical capabilities or skills required to complete a task. In others, external factors such as weather may make it impossible to complete the originally planned activity.

While it is difficult to predict the later, the former can be planned for if knowledge about participants is available beforehand. Accurate knowledge of participant capabilities and special needs can allow event coordinators to adjust the originally planned activity, or plan supplementary activities.

When external factors, such as weather, become a problem, it is important to have a backup activity scheduled; volunteers have donated their time toward making an impact, and should still be given the opportunity to do so.

## Design Strategies

Understand participant needs and capabilities prior to an event or activity

Prepare supplementary or secondary activities that can be completed in place of the originally-planned activity

## Solution Elements

 Helping Hands Database

 Secondary Service

# Design Factor

Difficult to collect feedback/monitor progress during event

90

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event-Based Interactions | Civic Participation

## Activity

Engaging

## Originator

Nikki Pfarr Oct. 20, 2008

## Contributors

Nikki Pfarr Nov. 19, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

90 Accommodate feedback  
91 Assess progress

## Observation

Collecting feedback during the event may distract participants from actual participation, therefore decreasing their productivity and enjoyment. Feedback collection may be seen as time-consuming and invasive.

## Extension

Feedback collection that requires participants to pause from an ongoing activity (e.g. verbal or text-based surveys) may interrupt the participant's situational awareness and disrupt the task at hand. As a result, the feedback collection may be seen as a burden and may eventually be resented. Additionally, participants may not be motivated to provide quality, thoughtful feedback but instead may simply rush to get it done as quickly as possible so they can return to their task at hand.

Ongoing feedback may not tease out important insights: it's possible some of the most valuable insights will arise when participants are able to reflect upon and establish a perspective on their overall experience, which may not happen while they are focused on a specific activity in the midst of the experience.

## Design Strategies

Utilize in-context feedback collection that won't disrupt the participants' tasks

Allow participants to give feedback when they reach an appropriate stopping point

Provide opportunities for participants to supplement ongoing feedback with feedback after the event or activity has ended

## Solution Elements

 Interactive Name Tags

 Punch-out Feedback

# Design Factor

No place to archive

91

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event-Based Interactions | Civic Participation

## Activity

Extending

## Originator

Nikki Pfarr

Nov. 19, 2008

## Contributors

Nikki Pfarr

Nov. 21, 2008

## Sources

Personal Observation

Group Discussion

## Associated Functions

92 Archive Experience

## Observation

Lack of centralized archive system or space makes it difficult to maintain a comprehensive and accurate archive.

## Extension

A centralized archive system is important for creating and maintaining a comprehensive history of an activity or event.

People may be motivated to archive on their own, but without a centralized archive system they end up keeping their photos and notes in their own personal space or devices. This results in disparate and incomplete documentation of an event or activity distributed throughout a community.

Some people may not see the value in archiving for their own personal records, but could see the benefit of archiving for the community's sake - but without a centralized archive system or location, they may not be motivated to do so.

## Design Strategies

Provide a centralized archive with distributed access points (access from multiple channels) to mimic convenience of archiving on a personal level

Communicate importance of contributing to central archive, in addition to a personal archive

## Solution Elements

 Community Scrapbook

# Design Factor

Nobody documented the experience at the time

92

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event-Based Interactions: Civic Participation

## Activity

Extending

## Originator

Nikki Pfarr

Sept. 28, 2008

## Contributors

## Sources

Personal Observation

Group Discussion

## Associated Functions

92 Archive experience

93 Share experience

95 Publicize outcome

96 Communicate participant impact

97 Assess success

## Observation

Documenting an experience while it's taking place may be tedious, present physical challenges, or ultimately may be forgotten until the experience has ended.

Further, documenting an experience while it's taking place may take away from actually enjoying or participating in the experience.

## Extension

It is often difficult to document an experience while it's taking place without consciously making an effort and removing oneself from the experience. This shift from participant to observer may be accompanied by a shift in gaze and perspective (suddenly more aware of the larger "picture" or context).

If the experience itself is extremely engaging, it may be additionally difficult, if not burdensome, to switch from participant to observer. An appointed observer or recording secretary may feel as though they are missing out on participating in the experience, and may come to resent their role.

Physical conditions (weather, location) may limit the type of documentation tools used; for example, a camera or computer may be damaged if used in the rain, while paper notes may be entirely ruined if used in the rain.

Certain forms of documenting, like forcing people to pose for pictures, may feel staged and may interfere with the actual experience. Interviewing participants while they're attempting to work may slow down their productivity.

## Design Strategies

Assign a non-participant to be the documentor

Integrate the documentation process into the activity

Utilize non-invasive, non-interruptive documentation techniques

Provide ways to create meaningful documentation after the fact if it was overlooked during the event

Incorporate informal documentation (eg cell phone photos)

## Solution Elements

**S** Robot Documentor (BotDoc)

**S** Photo Collector

**S** Stick-on Evaluators

**M** Big Brother Nature

# Design Factor

Inability to commit to ongoing involvement

93

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event-Based Interactions | Civic Participation

## Activity

Extending

## Originator

Nikki Pfarr

Oct. 20, 2008

## Contributors

Nikki Pfarr

Nov. 19, 2008

## Sources

Personal Observation

Group Discussion

## Associated Functions

94 Encourage ongoing involvement

## Observation

A lack of available time, personal incentive, and personal interest may deter participants from making a long-term commitment to a volunteer activity.

## Extension

*Participants may be unable to commit the time.*

To make a commitment to an ongoing volunteer activity, a participant must have blocks of time available, and advanced knowledge of that availability. Unpredictable schedules, due to family obligations and employment schedules, may make it impossible for a participant to commit to ongoing involvement.

*Ongoing participation may be personally detrimental.*

Ongoing involvement may not only be difficult to schedule, but it may actually have negative impacts on the participants: it may result in a loss of time for personal recreation, lack of time to tend to family obligations, or even loss of money (if the participants are taking time off work). What's worse is that these effects may translate into resentment toward the volunteer activity.

*Participants may be deterred by a lack of interest or understanding.*

If participants are not personally interested in the activity or topic, they may be less inclined to commit to ongoing involvement. Additionally, if participants do not understand the value of their contribution (e.g. how their contribution helps achieve a certain goal), they may not understand why an ongoing commitment would be valuable.

## Design Strategies

Provide incentives for involvement which are delivered over time based on recurring participation

Provide ongoing participation options that don't require large blocks of continuous time or advanced knowledge of schedules

Integrate ongoing involvement with existing activities (e.g. work, school)

## Solution Elements

**S** Vivacious Volunteers!

**S** Bite-Sized Contributions

**S** Paid Service Days

# Design Factor

Difficult to establish metrics for success

94

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event-Based Interactions | Civic Participation

## Activity

Extending

## Originator

Nikki Pfarr Nov. 19, 2008

## Contributors

Nikki Pfarr Nov. 21, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

95 Publicize Outcome  
97 Assess Success

## Observation

It can be difficult to establish near-term metrics for success for an activity or event when the outcome is not immediately measurable.

## Extension

Often, nature-related projects, such as planting seeds for a garden, may not produce immediately visible results. In such cases it can be especially difficult to establish metrics for success that have meaning in the short-term (if I can't see the plant growing, how do I know if it's actually growing?); nonetheless, short-term metrics are beneficial because they help event participants understand and appreciate the positive impact of their actions, which can motivate ongoing participation.

It is important to manage participants' and the community's expectations about what qualifies as success for a certain activity - and what is reasonable to expect for a given time period. Participants can then return to the site in a week, a month, a year, and know what to expect in terms of visible progress.

## Design Strategies

Manage participant and community expectations about what qualifies as success, and when it will be reasonable to see or experience the positive impact of an activity

Enable participants to measure success of non-visible elements on their own

## Solution Elements

-  Expecting Success
-  Stick-on Evaluators

# Design Factor

Difficult to collect participant feedback

95

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event-Based Interactions | Civic Participation

## Activity

Extending

## Originator

Nikki Pfarr

Nov. 19, 2008

## Contributors

## Sources

Personal Observation

Group Discussion

## Associated Functions

95 Publicize outcome

96 Communicate participant impact

97 Assess success

## Observation

After an activity has concluded, it can be difficult to collect valuable participant feedback: participants may need to be tracked down and given adequate incentive. Additionally, if significant time has elapsed since the experience occurred, participants may have forgotten important details or insights.

## Extension

Collecting feedback after an activity has occurred can be challenging. If participants are still at the activity site, they may be preparing to leave and not focused on providing thoughtful feedback. If participants have left the activity site and gone their separate ways, they will have to be tracked down and contacted - which means the coordinator must have knowledge of who the participants were and how to contact them.

In either case, participants may need incentive to provide thoughtful feedback; simply "to better the experience for future participants" may not be enough incentive. If participants don't feel their feedback will be taken seriously or responded to, they may not put much thought into it.

It should be noted that, if feedback is being collected days or weeks after an event has occurred, participants may have trouble recalling specific details or insights.

## Design Strategies

Build in feedback/evaluation into the end of the activity itself

Help individuals understand how their feedback and contribution have had an effect on the overall activity or goal

Collect feedback as close to the conclusion of the event as possible

Make sure the type of feedback collection is appropriate (e.g. multiple choice responses versus paragraph responses)

## Solution Elements

 Punch-out feedback

 Interactive Name Tags

 Expecting Success

# Design Factor

Difficult to measure individual participant impact

96

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event-Based Interactions | Civic Participation

## Activity

Extending

## Originator

Nikki Pfarr

Oct. 15, 2008

## Contributors

Nikki Pfarr

Nov. 19, 2008

## Sources

Personal Observation

Group Discussion

## Associated Functions

96 Communicate Participant Impact

97 Assess Success

## Observation

It can be difficult to measure and track individual participant impact during a large-scale activity or event.

If an individual's contribution is not perceived to be valuable (by the individual or the event coordinators), the individual may feel unappreciated and may not be motivated to participate in the future.

## Extension

In large-scale events with many participants, it can be difficult to assign duties to and track progress done by individuals. Assigning the task of tracking individual contributions to one or more coordinators takes time away from other valuable tasks. Asking individuals to track their own impact may be more effective, but may be invasive and disruptive to the actual tasks at hand.

If event coordinators are unable to understand and appreciate individual contributions, they may not value participants' contributions appropriately; and thus they may not be able to accurately thank participants for their contributions.

If an individual feels his or her personal contribution is not resulting in a significant impact, he or she may not feel personally invested in the activity. This sense of "my contribution doesn't matter" may lead to apathy, and a lack of feeling ownership over the outcome of the activity. As a result, the individual may be less willing to participate in a similar activity in the future.

## Design Strategies

Allow participants to measure their own impact during an event

Provide tools to measure how initial contribution or impact by an individual manifests over time

## Solution Elements

 Interactive Name Tags

 Stick on Evaluators

# Design Factor

No follow up after individual event or engagement

97

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Event-Based Interactions | Civic Participation

## Activity

Extending

## Originator

Nikki Pfarr

Nov. 21, 2008

## Contributors

## Sources

Personal Observation  
Group Discussion

## Associated Functions

94 Encourage ongoing involvement

## Observation

A failure to follow-up with participants after an event or engagement may leave participants with a lack of understanding about their own impact, and as a result participants may feel discouraged; additionally, without follow-up an event exists as a single, disconnected occurrence as opposed to part of a larger, ongoing system of activities.

## Extension

A lack of follow-up after an event or activity may leave participants with a feeling of dissatisfaction: participants may not understand the impact or value of their contribution, and may not feel that any feedback they provided was taken seriously. Such feelings may deter participants from volunteering again in the future.

Follow up may be difficult if the event coordinator or system does not know who the participants were and/or how to get in touch with participants after the event has ended.

## Design Strategies

Provide ways for participants to track their own impact

Keep track of participants that have contributed to a certain event

Establish touch points to connect with participants after an event has concluded

## Solution Elements

 Stick-on Evaluators

 Vote and Volunteer

 Helping Hands Database

# Design Factor

No need identified

98

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Informal Interactions

## Activity

Infusing

## Originator

Ruth Schmidt Oct. 1, 2008

## Contributors

Entire Team Oct. 3, 2008  
Ruth Schmidt Nov. 21, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

104 Identify Need

## Observation

It can be difficult to identify needs and/or opportunities for infused nature.

## Extension

It may be easily agreed that, in theory, incorporating nature into the urban environment is beneficial emotionally, physically, and psychologically; there is no shortage of research saying the humans are hard-wired for interaction with the outdoors, outdoor play combats the tendency towards obesity, and citizens of typical American cities are Vitamin D deprived, among others. That said, the actual process and mechanism for infusing nature is vastly more difficult to nail down as disparate interests, financial requirements, and end needs come into play.

How can this process be simplified in such a way that Chicago's inhabitants can more quickly benefit from their natural surroundings? Difficulties are introduced in many ways, from the process of selecting the appropriate natural elements, to allowing for individual flexibility and a sense of personal choice and individual investment, which are critical to long-term maintenance. There is also the matter of prior habits and expectations, where citizens maintain a black and white view of nature in contrast to, instead of in simpatico with, the built environment. Only through intentional and empathetic planning can a system support the maximization and appropriateness of nature in the urban setting with a minimum of difficulty or fuss.

## Design Strategies

Increased education about what options are available and/or do well in particular settings

See plants in situ before decision-making

## Solution Elements

**S** Sample Solutions

**S** Adopt-a-Garden

**E** Nature Depot

**Project**

Chicago: Vision for the Future | Infused Nature

**Mode**

Informal Interactions

**Activity**

Infusing

**Originator**

Ruth Schmidt                      Oct. 1, 2008

**Contributors**

Entire Team                      Oct. 3, 2008  
 Ruth Schmidt                      Nov. 21, 2008

**Sources**

Personal Observation  
 Group Discussion

**Associated Functions**

104 Identify Need

**Observation**

Identifying and comparing options for what to plant and where to plant it can be difficult to ascertain without external input.

**Extension**

Even in situations where infused nature is a desired outcome, there is a fair amount of research and decision-making that must occur prior to putting the plan in action; this can be the case even without the added consideration of long-term issues like global warming and how that might affect selection of indigenous plants over less appropriate options.

Frequently, the process of deciding on a plan of action get mired in details, particularly in the planning stages where too many options result in indecision and spinning of wheels. Choosing "green" elements for inclusion in a natural environment is expensive and time-consuming, so this kind of decision-making can be tricky without input from more knowledgeable experts. Similarly, simple needs may change over time, as criteria that were sufficient in the past no longer apply as well at a later date. This is most obvious in situations where individuals must make long-term comparisons based on little information: how can one know whether a choice made today will be equally desired later, especially when care and tending of living elements is at stake?

**Design Strategies**

See plants in situ before purchase

Provide access to info about what plants will thrive in identified environments, including climate change implications

**Solution Elements**

-  PlantOps
-  Nature Loan

# Design Factor

## Element availability

100

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Informal Interactions

### Activity

Infusing

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

105 Procure element

### Observation

Even after making the decision to infuse nature into the built environment, finding the element one has settled on can stymie the best laid plans.

### Extension

In the city environment, one is typically at the whim of green availability. Surrounded by construction, buildings, and parking lots, most elements need to be imported in, whether from neighboring towns or further afield.

This can cause challenges for a proper infusion of nature once plans have been set. Increasing ones' extra carbon footprint by trucking in green elements hardly seems appropriate, yet few alternatives exist within the city environs. At the same time, weather-related variability in the Chicago restricts the ability to grow greenery out of doors, even in adequate conditions or during the summer. The inability to move ahead on plans for attaining, growing, or planting green elements for logistical reasons is very real. Countering this obstacle requires juggling multiple issues: Are plants available outside of the local environment, or not at all? Are there acceptable substitutes that are hardier or more appropriate for a city environment? How can we plan for loss of plants due to extreme weather conditions or poor care?

### Design Strategies

Provide backup stock of ready-to-grow plants  
  
Increase awareness of alternatives for first choice

### Solution Elements

 ReadyMade Plants  
  
 Second Nature

# Design Factor

## Responsibility a turn-off

101

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Informal Interactions

### Activity

Infusing

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

105 Procure element  
106 Integrate element  
107 Tend to element

### Observation

Integrating nature into the environment requires a level of personal/organizational responsibility that raises the barrier to entry.

### Extension

Natural elements requires a degree of tending that man-made artifacts do not; this alone can create enough of an incentive, both for individuals and larger organizations, to choose a more traditional, non-infused approach.

However, the level of responsibility necessary for smart selection and continued upkeep of an integrated natural element need not be a deal-breaker; a true systemic integration of structure and nature will remove some degree of maintenance that is currently built into the expectation of care-taking. This can take many forms: in some cases, the sheer thought of responsibility for plant ownership and care is too much, whereas with other individuals there is simply a desire to enjoy or care for nature on a more episodic or short-term basis for convenience sake. Allowing system users to choose appropriate interaction levels according to their personal wants can help alleviate tension surrounding care-taking and allow people to get involved to the level of green-ownership of their choosing.

### Design Strategies

Ways to ease in to ownership  
  
Leasing programs for nature  
  
Recycling programs for plants

### Solution Elements

 Adopt-a-garden  
  
 Nature Savings and Loan  
  
 RePlant

# Design Factor

## Infrastructure mismatch

102

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Informal Interactions

### Activity

Infusing

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

106 Integrate element

### Observation

Building/environment infrastructure may not support integration efforts on a technical level.

### Extension

As with any shift in infrastructure, there will be situations where current systems do not sufficiently support nature as it is integrated into new environments. This may come in different forms, like a lack of structural support for vertical and roof gardens, irrigation systems, or energy-harnessing mechanisms. This lack of infrastructure alone may be a disincentive to actively infuse nature into existing structures, since retrofitting buildings is easy to dismiss as too costly or complex to take on.

To truly achieve the goal of infusing nature into the urban environment these infrastructural issues must be solved with both short- and long-term approaches to deal with current constraints as well as planning for the future. To work most effectively, this must occur from both incentive and structural directions; when policies that accelerate buy-in are matched with infrastructural support, adoption is more likely to take hold at a faster pace.

### Design Strategies

Incentives for green building

Revise building infrastructure to recycle water usage

Temporary armatures for pre-existing buildings to support nature-based additions

### Solution Elements

**S** WEEDS Certification

**S** PlantOps

**S** EcoSkeletons

# Design Factor

## Unsettling/annoying behavior adjustments

103

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Informal Interactions

### Activity

Infusing

### Originator

Ruth Schmidt Oct. 1, 2008

### Contributors

Entire Team Oct. 3, 2008  
Ruth Schmidt Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

106 Integrate element

### Observation

Once green elements are incorporated into the environment, they may cause annoyance or unease more than pleasure.

### Extension

The motivation behind infusing nature into the built environment is intended as demonstrably a good thing; the positive effects of greenery in an otherwise built urban setting underlie the goal. There are ways, however, in which this very process may backfire to cause more distress than enjoyment, and thus sabotage the effort.

Allergies caused by pollen are already rampant, and may grow worse as the amount of greenery grows. This increased amount of nature where it was previously not present may also heighten previous requirements of time and attention for proper care, causing a certain degree of behavior modification at best and, at worst, flat-out resentment.

Even seemingly benign inclusions of nature may interfere somewhat with interactions, some of which may be more unsettling than initially expected. As plants and greenspaces are embedded into the environment in the future, they are more likely to be supported by sensors that cause previously "dumb" plants to seemingly respond or act on their own volition. This new capability must be tempered by cultivating new human expectations to avoid unnecessary problems.

### Design Strategies

Create new strategies to combat allergies

Encourage thorough understanding of infused plants and mechanisms

### Solution Elements

**S** Nature Rx

**S** Environmental Ed

# Design Factor

## Lack of caretaking knowledge

104

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Informal Interactions

### Activity

Infusing

### Originator

Ruth Schmidt Oct. 1, 2008

### Contributors

Entire Team Oct. 3, 2008  
Ruth Schmidt Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

107 Tend to element

### Observation

Limited information about tending for plants may keep them from thriving.

### Extension

As a living thing, nature requires a certain amount of skill and knowledge to maintain; this is true for a variety of reasons, from a variability within plants species to the fact that individual plants are by nature somewhat unpredictable in their reaction to environment or care. A lack of knowledge with regard to basic care, therefore, is likely to cause short-term, long-term or even fatal results to plants under an individual's supervision.

The lack of necessary tending in a public setting is sometimes due to the perception of plants or green space as individually owned—it is easy to dismiss responsibility for nature if it is perceived as public, as illustrated by the concept of the 'tragedy of the commons'. Encouraging community care, oversight, and knowledge-sharing may help to alleviate this attitude by spreading a sense of responsibility to all individuals instead of centralized in the hands and behaviors of a few.

In addition, the lack of practice with tending to greenery may put undue pressure on individuals, as a lack of confidence may lead to the assumption that a plant left in one's hands is effectively a death sentence. Allowing community members to "practice" may alleviate the heavy burden of presumed planticide.

### Design Strategies

Create shared opportunities for caretaking

Encourage communal assessment of plants and greenspaces

### Solution Elements

**S** Nature Loan

**E** Nature Partners

# Design Factor

## Lack of assessment metrics

105

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Informal Interactions

### Activity

Infusing

### Originator

Ruth Schmidt Oct. 1, 2008

### Contributors

Entire Team Oct. 3, 2008  
Ruth Schmidt Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

108 Assess value of interaction

### Observation

New mechanisms for nature/human interactions will likely require rethinking how we measure or value them.

### Extension

Measuring experiences in nature may seem easy enough on first glance, but a closer look uncovers some unanticipated issues. The range of activities that occur in greenspaces is immensely broad, from fairly passive recreational activities through active exploration as well as goal-oriented tasks like agriculture. In addition, the experience often largely uncontrollable due to issues of seasonal variation or weather—especially in a northern climate like Chicago—making a finite set of criteria difficult and/or useless to establish.

At the same time, the very concept of a quantitative measure feels somewhat inappropriate, as it implies progress to an end goal that can be meaningfully ranked, and also assume a baseline experience that can be used as a benchmark. In addition, there are a confluence of planners, tenders, and users with regard to nature interaction, as well as a variety of short- and long-term standpoints to consider. Thus, new metrics that take into account more qualitative evaluation from a variety of perspectives will likely be more meaningful in greenspace measurement.

### Design Strategies

Means to measure human use of environmental elements and settings

Aggregation of viewpoints or perspectives for planning purposes.

### Solution Elements

**S** Solar Panel Plants

**S** Nature Policy Department

# Design Factor

## Availability of replacements

106

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Informal Interactions

### Activity

Infusing

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

109 Recycle failed components

### Observation

The decision to replace existing elements can be clouded by a lack of replacement availability or a lack of knowledge regarding appropriate new options.

### Extension

It is almost a given that nature elements will need to be replaced at one point or another, either due to situational circumstance such as storms and flooding or insufficient care. In the course of weighing issues like planning for future climate change, cost, and maintenance, one can easily be lulled into decision-making paralysis; this process of choosing a replacement can also be compounded by the availability of options, or lack thereof.

In many ways this is similar to the issue of finding the appropriate natural element in the first place, in that the constraints of local options and the ability to preview purchases can, to a large extent, dictate decision-making. Finding a replacement has the advantage of 'lessons learned,' however—issues with maintenance or appropriateness can, and should, be reviewed and used as fodder for selecting an alternate solution the next time around. Maintaining an individual or institutional memory helps remember what worked, while services that support browsing and selection of components creates a more streamlined process for find replacements.

### Design Strategies

Spread knowledge about sustainable nature options

Increase awareness of recycling opportunities and/or alternatives

### Solution Elements

 Recycling Partnerships

# Design Factor

## Recycling is difficult

107

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Informal Interactions

### Activity

Infusing

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

109 Recycle Failed Components

### Observation

The process for replacing used or worn-out components is mysterious, difficult to participate in, and/or non-existent.

### Extension

Recycling is a wonderful idea with a frequently shaky execution, typically an unwieldy process that requires extra effort and/or cost to follow and thus provides disincentives even for motivated individuals. Barriers are both logistical and behavioral: to participate, individuals must be aware of recycling options, have easy access to the service, and motivated through the process to ensure that these good behavioral habits stick.

Ideally, recycled materials could re-enter the cradle-to-cradle loop with no effort as all, but the current use of multiple types of materials by product companies makes this difficult to plan for without a mandate from above. This kind of collaborative agreement to action would be difficult to put into effect even in the long term, and nearly impossible in the current day. For a recycling system based on end-user actions to be successful, therefore, it must be either incentivized, impossibly easy—in other words, too difficult *not* to do—or reframed in such a way that people can thoughtfully make the right decision. By balancing these barriers to action, the threshold to effective recycling will be made considerably lower.

### Design Strategies

Make recycling personally meaningful  
  
Create partnerships to increase incentive

### Solution Elements

 RecycleBots  
  
 Recycling Partnerships

# Design Factor

## Failure of maintenance

108

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Informal Interactions

### Activity

Reacting

### Originator

Ruth Schmidt Oct. 1, 2008

### Contributors

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Ruth Schmidt Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

98 Maintain baseline status

### Observation

Reactive components may not work as intended due to a lack of caretaking.

### Extension

Maintenance is an unglamorous, yet necessary, component of caretaking. This is true of most elements, whether organic or mechanical; a car requires oil changes and rotated tires just as a human needs food and exercise to maintain peak condition.

Plant life is no different—if a plant is naturally acclimated to a certain environment, the level of explicit care may be reduced but the requirements of nutrients and water remain. Organic forms in less hospitable environments, like houseplants that rely on human care for sun and water, require more tending to function effectively. The lack of maintenance, in this case, can cause these elements to wither or even die.

This level of required maintenance is even more critical when elements are responsible for certain tasks. Consider an alarm system that must go off when water levels are too high. In this case, the alarm is only triggered by severe conditions, and it is unlikely that it will regularly be tested by natural events. It is only through regular, systemic maintenance that one can be certain that all elements are in working order and prepared to fire when needed.

### Design Strategies

Provide correct level of feedback

Allow self-directed learning

### Solution Elements

**S** MeAssessments

**M** MyDocent

# Design Factor

## Interference prevents sensory input

109

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Informal Interactions

### Activity

Reacting

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Group Discussion

### Associated Functions

99 Sense presence  
101 Sense reaction

### Observation

Mechanisms may not work if something prevents a signal from reaching required sensors.

### Extension

In order for mechanisms to react appropriately, there must be an unbroken signal between sensory and reactive elements. This signal can take many forms; words spoken on a subway platform can be misheard or misinterpreted if the noise of a train drowns them out, just as a blown fuse can keep a light from turning on.

Problems of interference can take many forms. In a sensory mechanism, a physical breakdown is a likely culprit, in which the signal simply can't pass through due to a broken connection. But the failure may also be due to an overload of information; voice-recognition may not be able to function when multiple simultaneous voices utter commands, even if each is individually distinct and clear. In this case, the missed signal is due to overwhelming inputs rather than the lack of a connection.

At other times, interference can be due to too low a level of input, in which the absence of a signal overrides the weak communication. In this case, the interference is due to too low a threshold level; resetting the minimum level of input may allow the element to perform as desired.

### Design Strategies

Ensure functional elements through preventative maintenance

### Solution Elements

**E** Proactive Maintenance

# Design Factor

## Mechanism displays unexpected behavior

110

### Project

Chicago: Vision for the Future | Infused Nature

### Mode

Informal Interactions

### Activity

Reacting

### Originator

Ruth Schmidt                      Oct. 1, 2008

### Contributors

Entire Team                      Oct. 3, 2008  
Ruth Schmidt                      Nov. 21, 2008

### Sources

Personal Observation  
Norman, Donald A. 1988. *The Psychology of Everyday Things*.  
New York: Basic Books.

### Associated Functions

100 Create experience  
102 Accommodate reaction

### Observation

Reactive devices may not work as intended.

### Extension

It is natural to have expectations for how ones surroundings behave; in fact, these "affordances," as Donald Norman dubs them, often provide valuable clues to appropriate behaviors in new situations. The more intuitive an action, the more likely people will act appropriately and thus have their expectations fulfilled.

However, the world is filled with counter-examples of mechanisms that poorly telegraph their behaviors and/or uses. This lack of intuitiveness can manifest itself through incorrect signals—as in a door handle, indicating a pull action, that actually requires a push—or none at all, in which a triggered behavior is unexpected, or even alarming. These situations are frequently due to poor design; too often, designers fail to consider actual behaviors of use and instead tend towards attractive details. As reactive mechanisms become more prevalent, the necessity of accommodating human actions in as seamless and predictable a way as possible will become increasingly important. While we can all learn to use unintuitive devices—as the VCR remote control ably proved—ill-designed mechanisms will also begin with confusing behaviors and require a steep learning curve to understand or master.

### Design Strategies

Provide oversight of mechanisms

### Solution Elements

 PlantOps

# Design Factor

Behavior interferes with human goals

111

## Project

Chicago: Vision for the Future | Infused Nature

## Mode

Informal Interaction

## Activity

Reacting

## Originator

Ruth Schmidt Oct. 1, 2008

## Contributors

Entire Team Oct. 3, 2008  
Ruth Schmidt Nov. 21, 2008

## Sources

Personal Observation  
Group Discussion

## Associated Functions

100 Create experience  
102 Accommodate reaction

## Observation

Reactive behaviors may actively get in the way of human behaviors and goals.

## Extension

In today's world, where people tend to have dominance over most environmental situations, it can be disconcerting when one does not have control over one's immediate surroundings. Whether the loss of control is unexpected—as in a power outage—or all too common, as in frustration at slow-moving traffic, the fact that we have somehow lost authority over conditions that affect us in an immediate way can be at best annoying and at worst downright unsettling.

Ubiquitous computing is still in its infancy, and while we may eventually become accustomed to the idea that our environment is "smart" the level of comfort with being told what to do by non-human agents is still low. This tendency can be even more exaggerated when an uncharacteristic element acts in an unpredictable way; it is no surprise, for example, that cars that reminded you to wear your seatbelt never really took off. This is largely because reactive components don't have an ability to sense intent or volition, being capable only of responding in a way they have been programmed to do. This inability to understand or interpret the purpose behind human behavior can make create unnecessary workarounds that hinder, rather than facilitate, progress towards individuals particular goals.

## Design Strategies

Increased awareness of reactive mechanisms

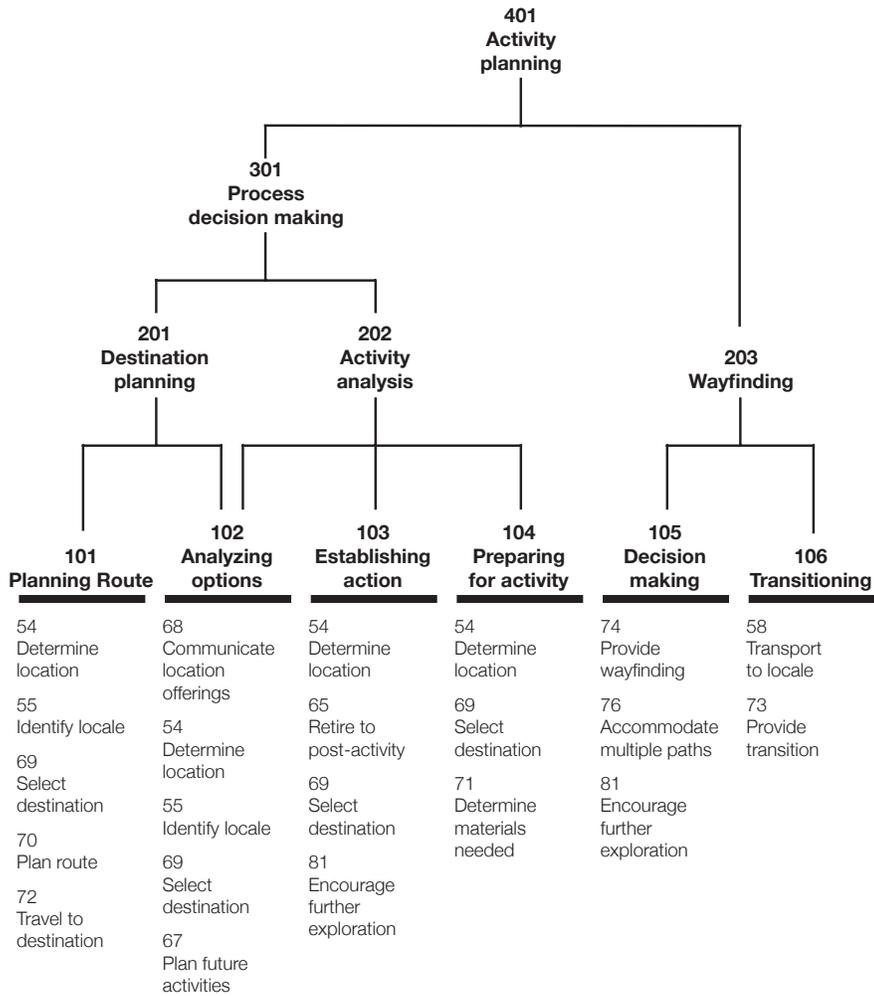
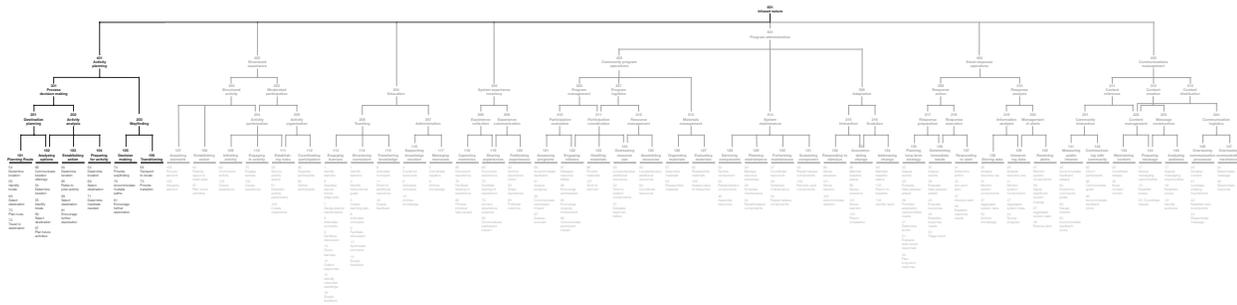
Plan for on/off controls or overrides

## Solution Elements

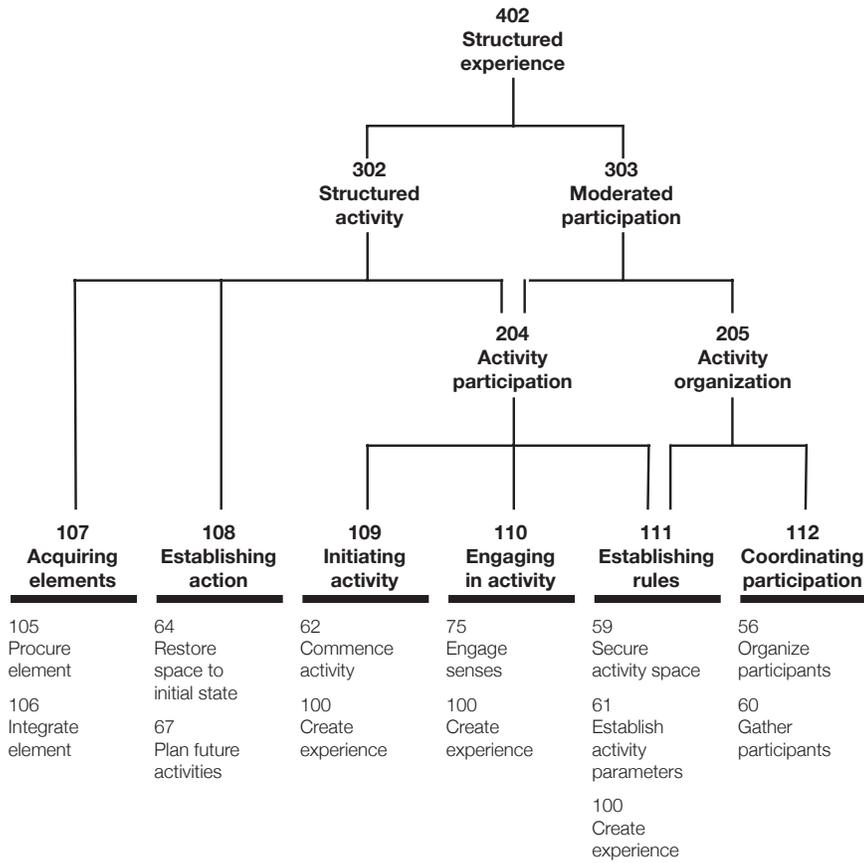
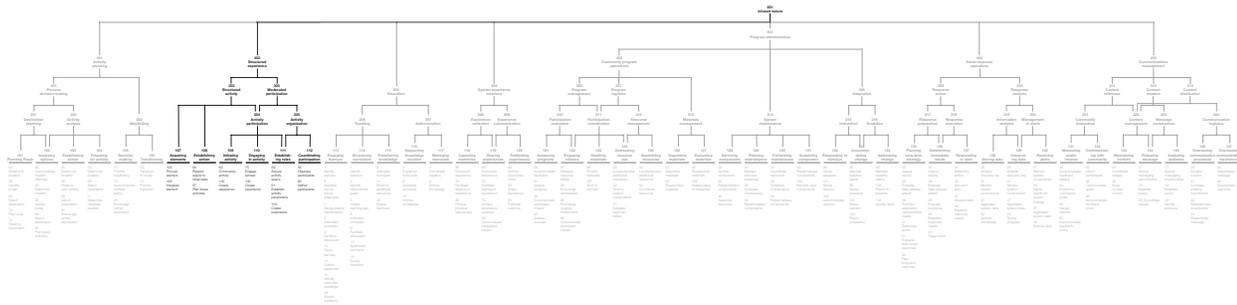
**S** Nature Manuals

**M** Override Switches

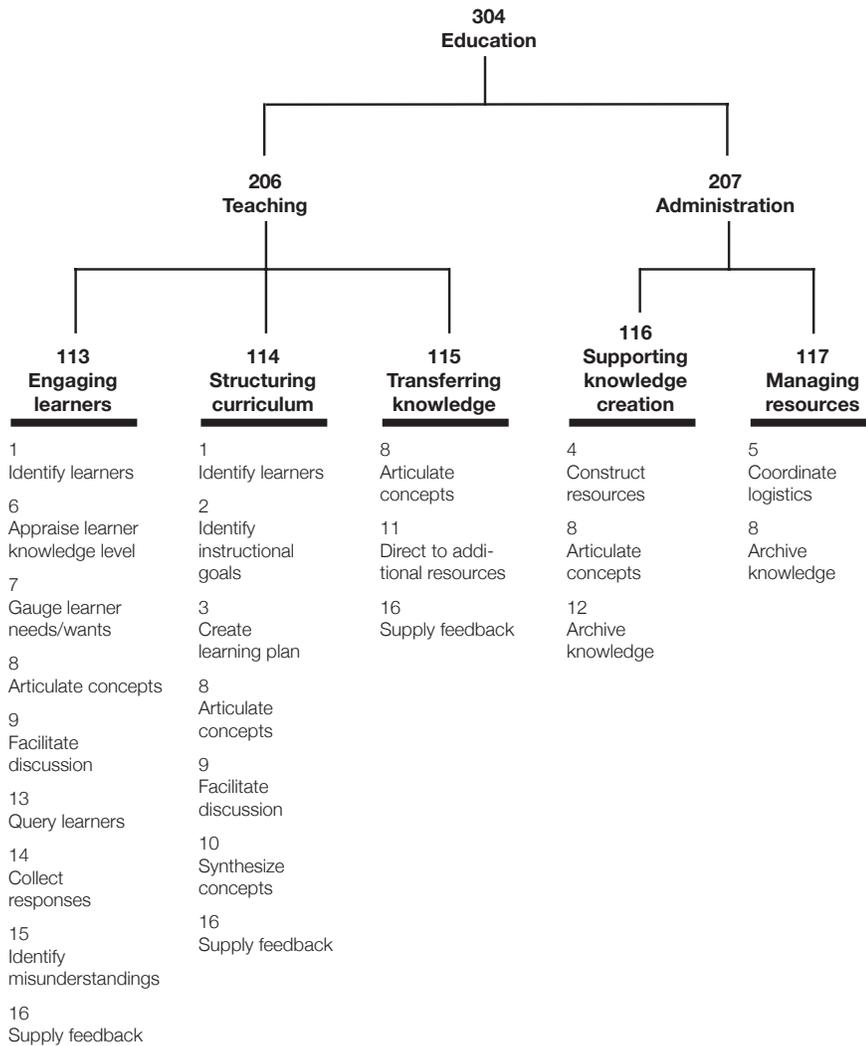
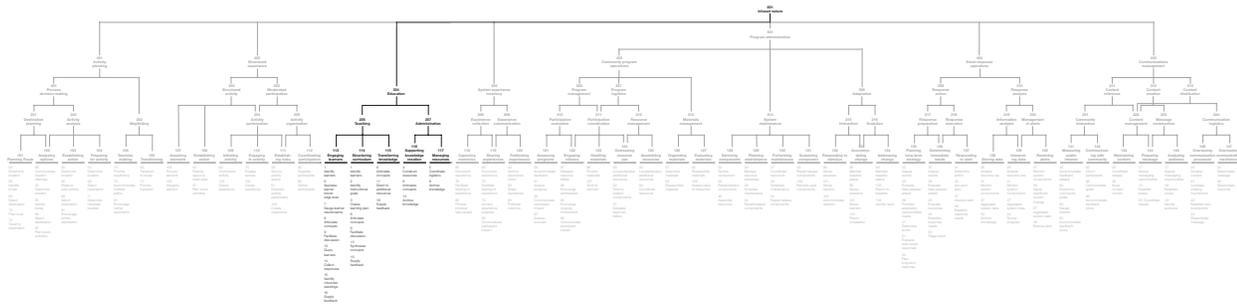
# Information Structure



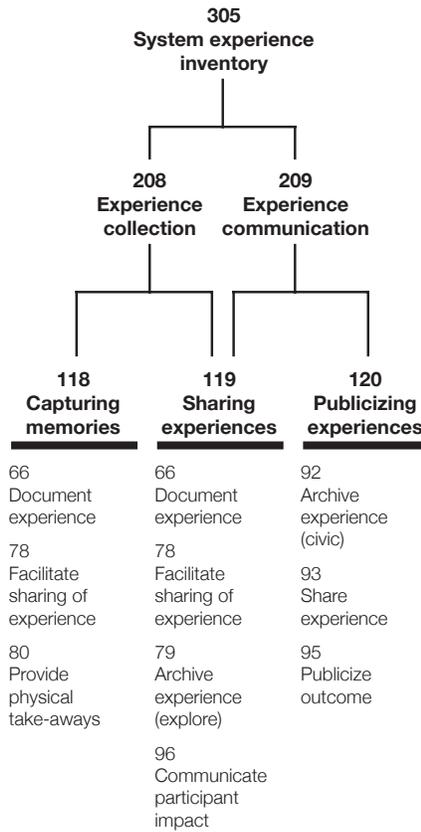
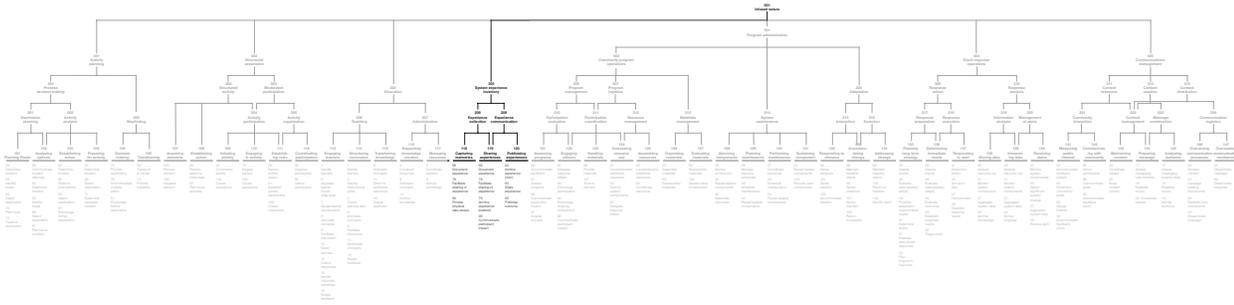
# Information Structure



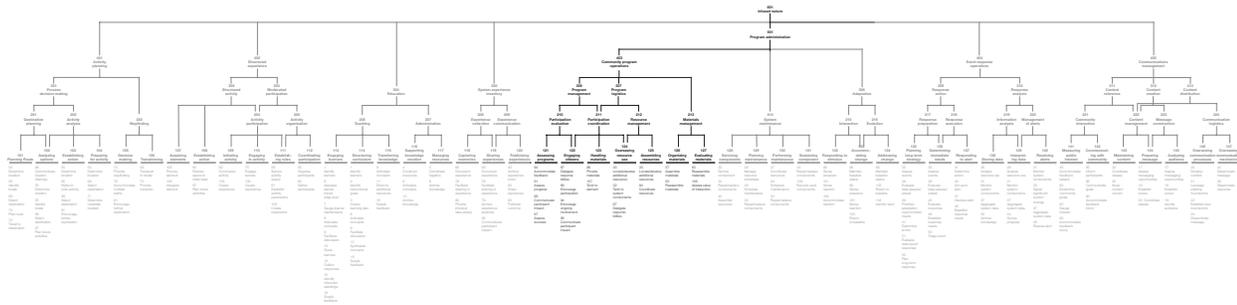
# Information Structure



# Information Structure



# Information Structure



**501  
Program administration**

**403  
Community program operations**

**306  
Program management**

**307  
Program logistics**

**210  
Participation evaluation**

**211  
Participation coordination**

**212  
Resource management**

**213  
Materials management**

**121  
Assessing programs**

**122  
Engaging citizens**

**123  
Handling materials**

**124  
Overseeing resource use**

**125  
Assembling resources**

**126  
Organizing materials**

**127  
Evaluating materials**

90 Accommodate feedback  
91 Assess progress  
96 Communicate participant impact  
97 Assess success

87 Delegate responsibilities  
89 Encourage participation  
94 Encourage ongoing involvement  
96 Communicate participant impact

88 Provide materials  
107 Tend to element

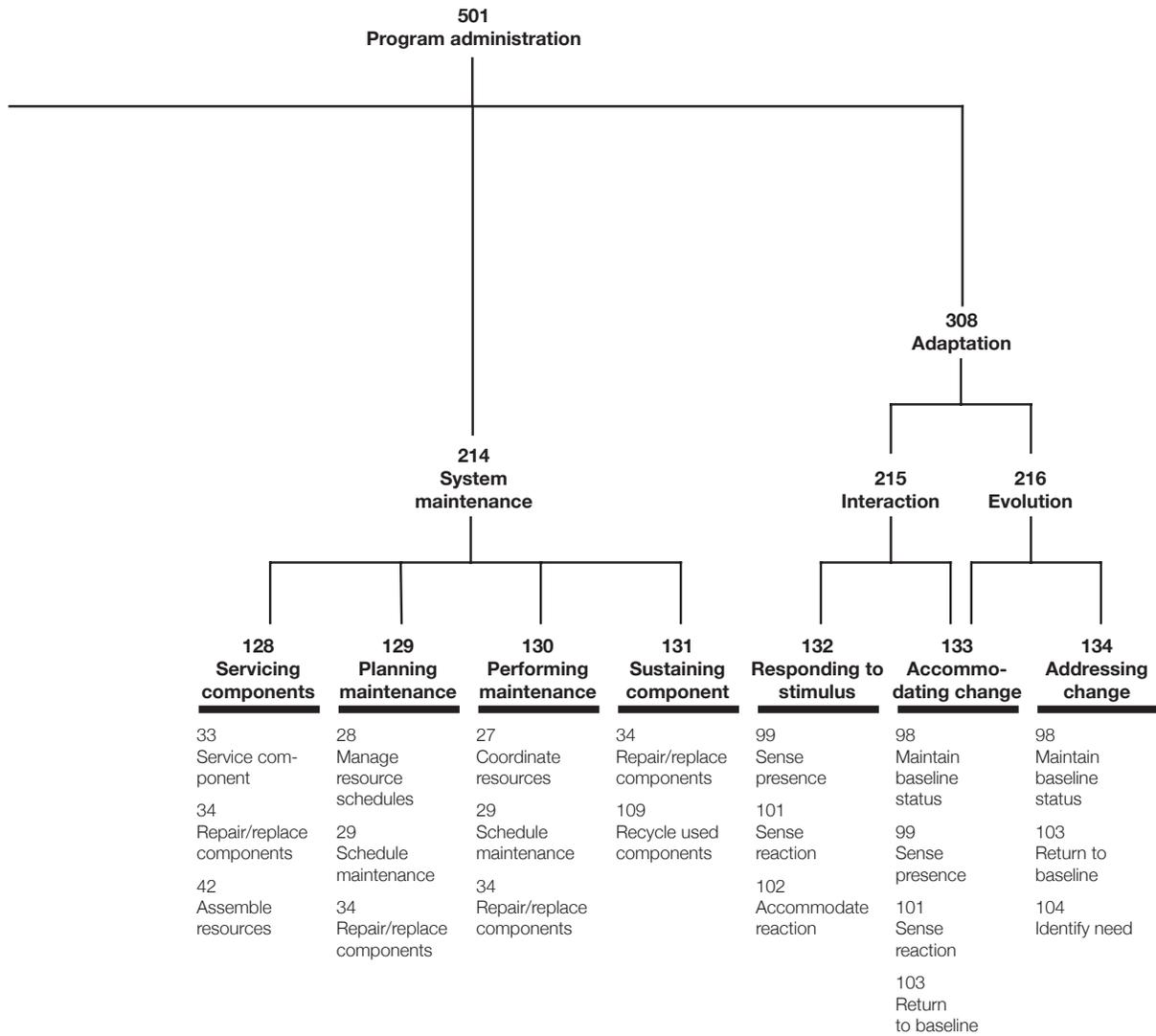
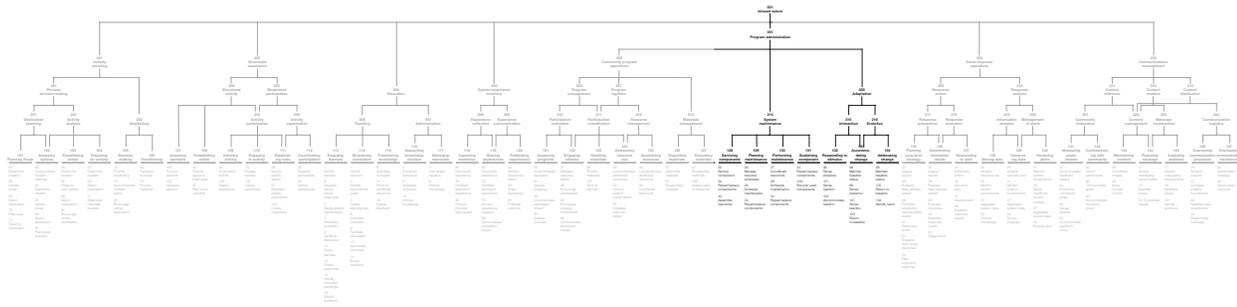
30 Locate/develop additional resources  
32 Tend to system components  
87 Delegate responsibilities

30 Locate/develop additional resources  
84 Coordinate resources

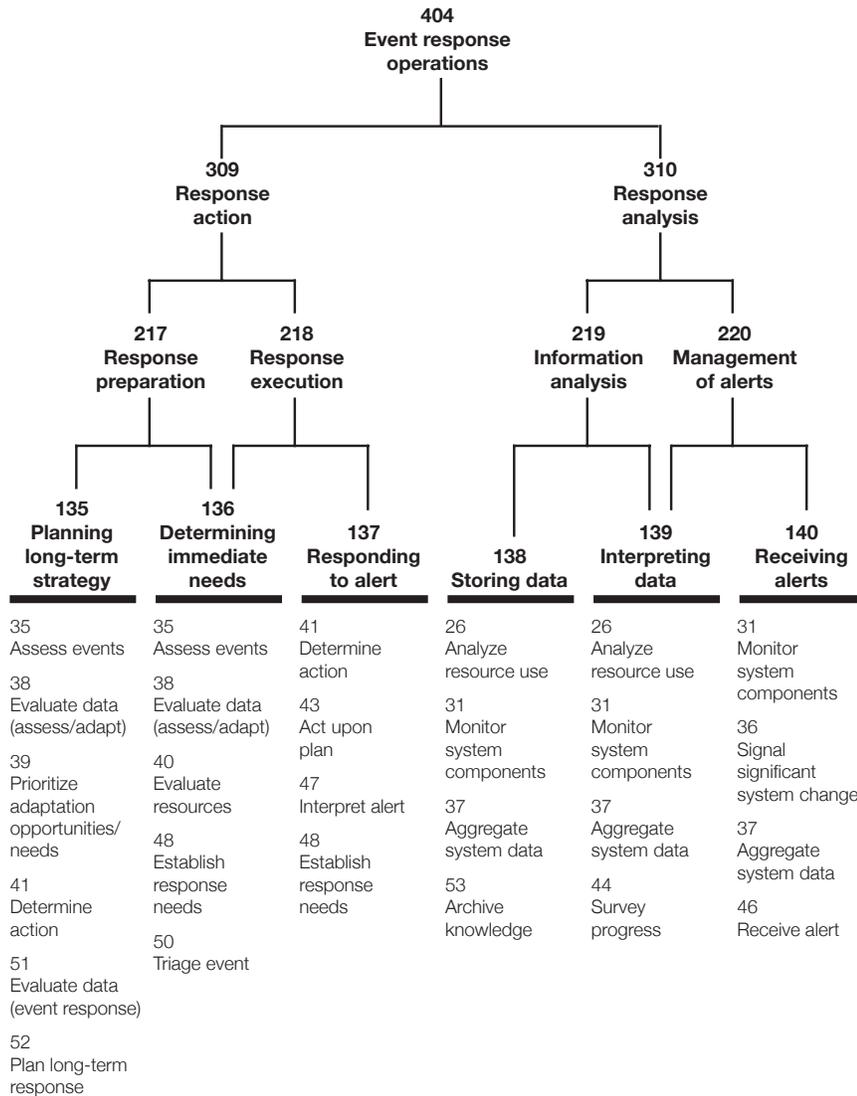
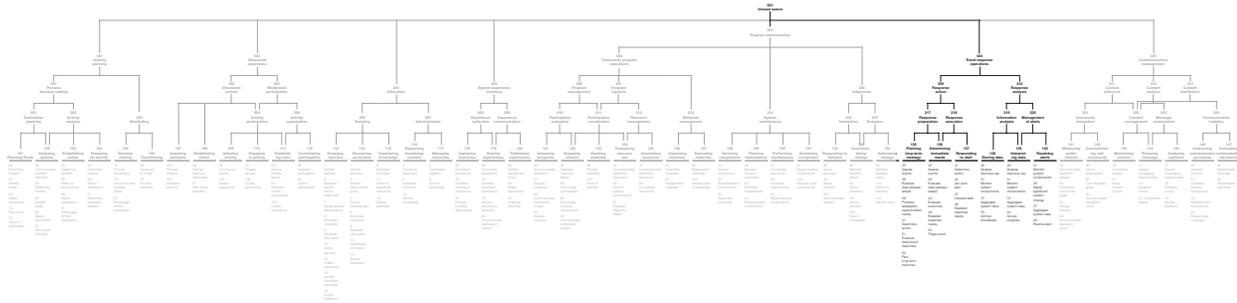
57 Assemble materials  
63 Reassemble materials

63 Reassemble materials  
108 Assess value of interaction

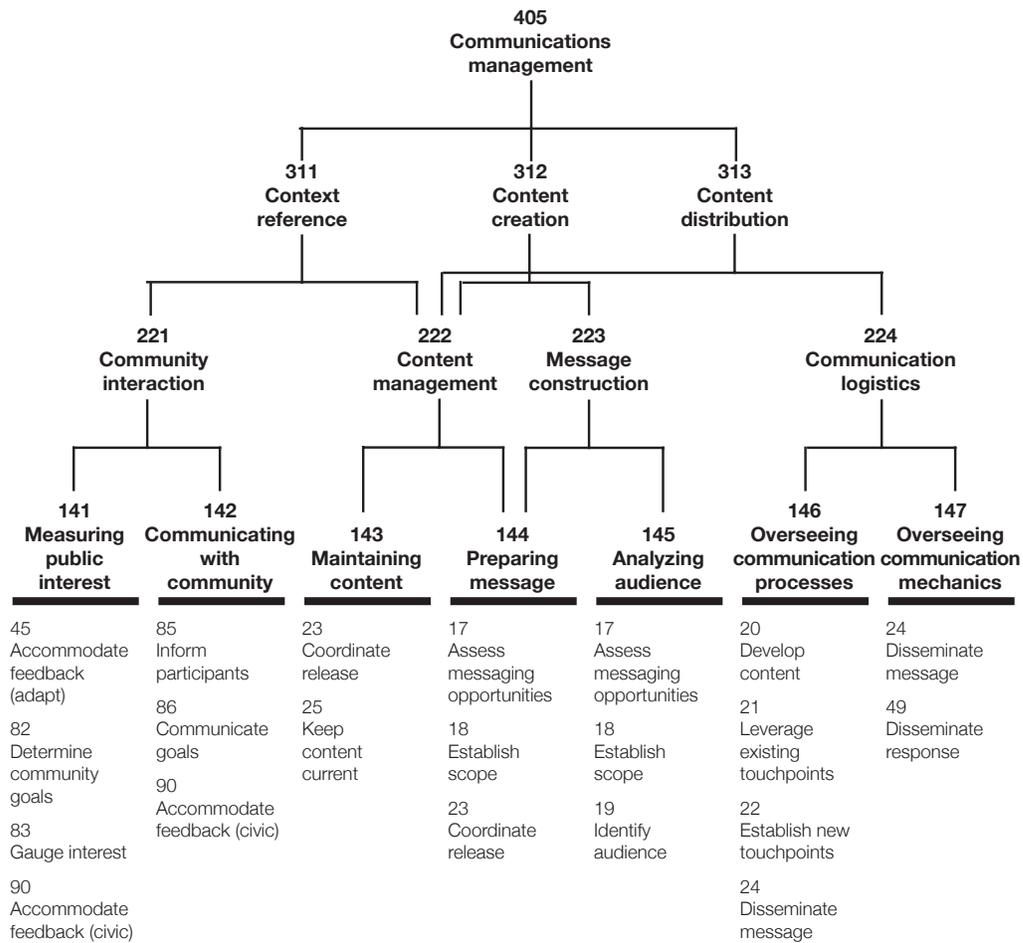
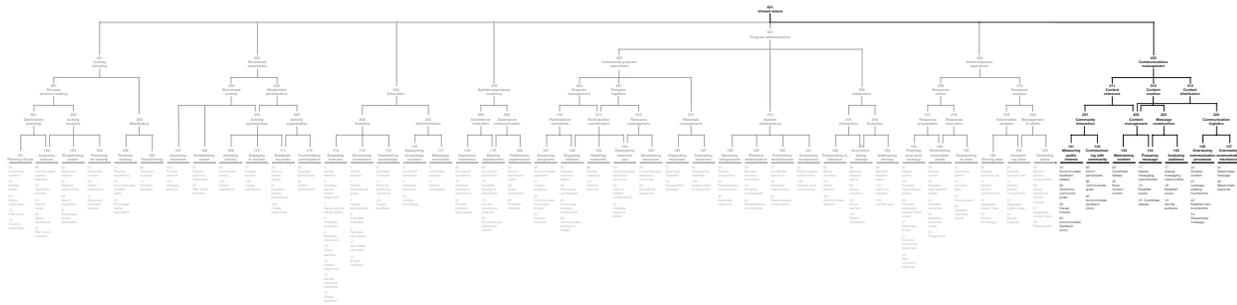
# Information Structure



# Information Structure



# Information Structure



# Activity Analysis

Activity  
Teaching

2

**Project**

Chicago: Vision for the Future | Infused Nature

**Mode**

Communication | Education

**Originator**

Ruth Schmidt                      Sept. 25, 2008

**Contributors**

Group Discussion

**Scenario**

An individual in a teaching role presents information to learners, singly or as a group. The setting is either informal/outdoors or in a structured classroom environment.

**Users**

Instructors  
Learners

**System Components**

Media  
Computers, mobile or desktop  
Prepared materials  
Subject of study (i.e. plants about which students are learning)

**Environmental Components**

Lighting  
Classroom  
Meeting space

**System Functions**

Appraise learner knowledge level  
Gauge learner needs/wants  
Articulate concepts  
Facilitate discussion  
Synthesize concepts  
Direct to additional resources  
Archive knowledge

**Associated Design Factors**

Varied Learner Knowledge/Needs  
Technical Language Comprehension  
Limited Opportunities for Learning  
Format Discourages Questioning/Discussion  
Lack of Learner Engagement  
Resource Information Unrecorded/Lost  
Knowledge Is Siloed  
Archiving Not Done In Timely Basis

# Solution Element

**E M S**

Farmer Jr.

4

**Project**

Chicago: Vision for the Future | Infused Nature

**Mode**

Communication

**Activity**

Educating

**Originator**

Ruth Schmidt                      Sept. 29, 2008

**Contributors****Description**

Produce kits at the store to grow at home in gardens or windowsills.

**Source**

New concept

**Properties**

- Produce kits for fruits, vegetables, legumes, and herbs
- Self-study information to encourage learning
- Seeds supplied by local farms
- Year-round options that allow seasonal growing

**Features**

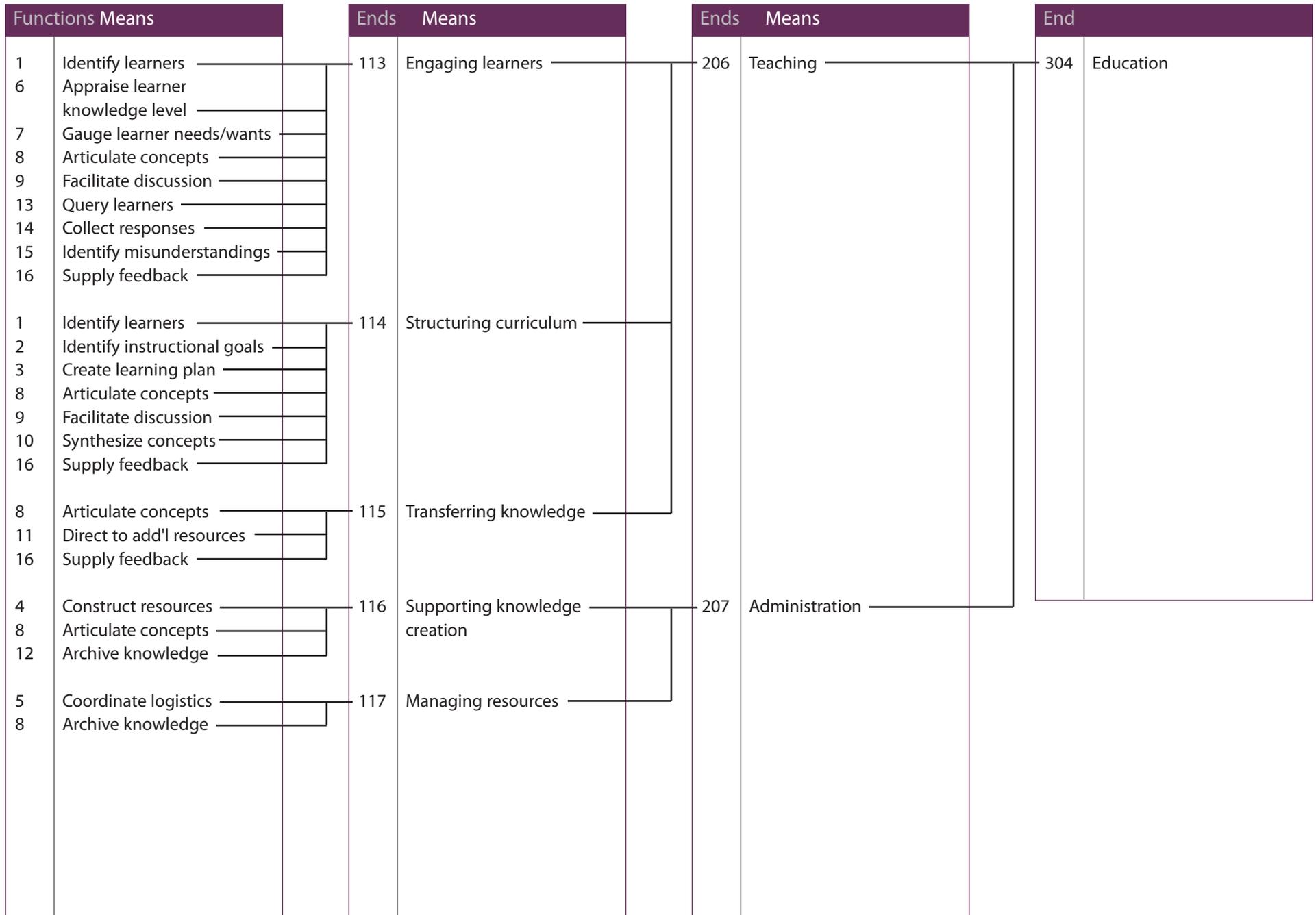
- Provides buyers with opportunity to understand produce process
- Allows users to experience the learning experience of growing organic matter from scratch
- Saves money for grower
- Provides raw ingredients for food
- Encourages development of plant care-taking techniques

**Associated Function/s**

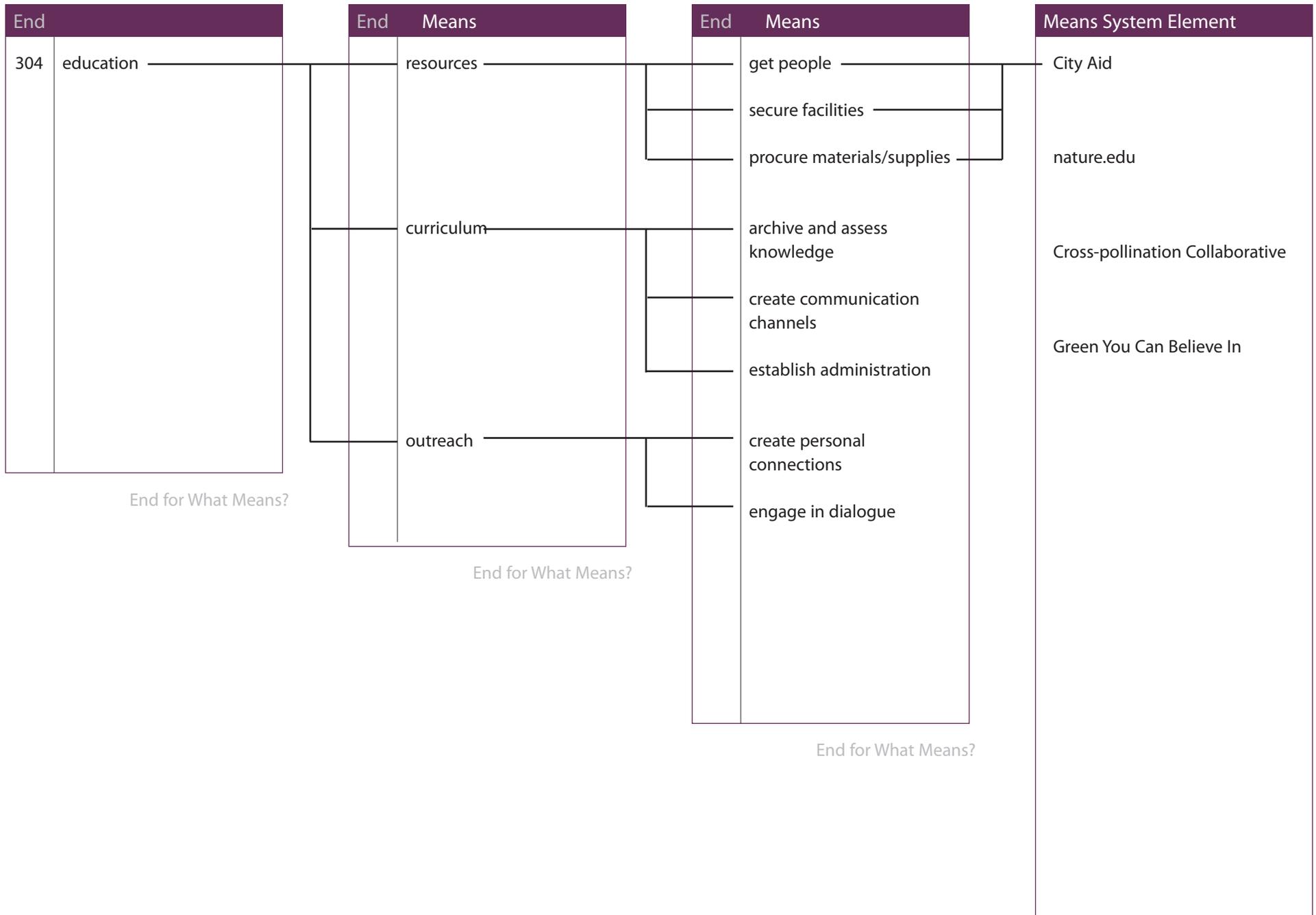
4	Construct resources	105	Procure element
8	Articulate concepts	106	Integrate element
104	Identify need	107	Tend to element

**Source Design Factor/s**

9	Varied Learner Knowledge/Needs	102	Responsibility a Turn-off
11	Limited Opportunities for Learning	105	Lack of Caretaking Knowledge
18	Assessment Format Ill-Suited to Content		



# Ends/Means Synthesis



# System Element Relationships

2 ParkLife	<p><b>ParkLife</b> metrics inform future adaptation via <b>Gather and Grow</b>; <b>ParkLife</b> adjusts based on <b>Gather and Grow</b> data</p>			
3 CEAS	<p><b>CEAS</b> Rangers contribute to <b>Gather and Grow</b> data; <b>Gather and Grow</b> requires <b>CEAS</b> for cultivation of stored seeds</p>	<p><b>YLI</b> members contribute to and participate in <b>CEAS</b> initiatives; <b>CEAS</b> rangers serve as mentors to <b>YLI</b> students</p>		
4 nature.edu	<p>Insights from <b>nature.edu</b> informs <b>Gather and Grow</b> future use; <b>Gather and Grow</b> contributes to <b>nature.edu</b> knowledge base</p>	<p><b>nature.edu</b> used by <b>YLI</b> participants as learning tool; <b>YLI</b> programming contributes to <b>nature.edu</b> knowledge base and learning modules</p>	<p><b>nature.edu</b> contains info for <b>Cultural Park Development</b> elements; <b>Cultural Park Development</b> users tag elements for <b>nature.edu</b></p>	

Scoring  
 3 Critical Relationship  
 2 Strong Relationship  
 1 Slight Relationship  
 0 No Relationship

13 Gather and Grow	14 Youth Leadership Initiative	15 Cultural Park Development	
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# System Element

**E M S**

nature.edu

5

**Originator**

Ruth Schmidt

**Contributors**

Ann Hintzman  
Marisa Knopman  
Thomas McCue  
Nikki Pfarr

**Sources**

Jonietz, E. "TR10: Augmented Reality," *Technology Review*, March 12, 2007  
[http://www.technologyreview.com/read\\_article.aspx?ch=specialsections&sc=emerging&id=18291](http://www.technologyreview.com/read_article.aspx?ch=specialsections&sc=emerging&id=18291)

**SuperSet Element(s)****Related Elements**

I Spy Nature  
CNIFER  
Youth Leadership Initiative  
myNature  
PlanIT

**SubSet Element(s)****Description**

**nature.edu** is a suite of tools to informally connect and educate individuals about nature. This platform is intended to support a wide range of activities and age groups through modular and free-form educational activities in which participants can plan, participate in, track, and save their experiences as part of a private archives or as a contribution to the **CNIFER** system database. This archive allows users to tap into an ever-growing knowledge base, individually or in groups, and provides mul-

iple access points such as public parks and forest preserves, neighborhoods, and the lakefront.

**Properties**

- Grade-independent and device-agnostic information
- Database to support aggregated information via user input/database output
- Suite of ergonomically-friendly devices for accessing information (glasses, handheld devices)
- High-resolution display projection to display information overlay
- GPS media capture and tagging
- Partnerships with existing organizations (like youth advisory board and CEAS) to structure activities
- Extension of formal education as defined by CPS
- Interface that allow users to search and transfer images and other archived media
- Access to downloadable expert commentary
- Planning database and interface to alert users of upcoming events of interest

**Features**

- Creates and facilitates plans for nature-related learning and interactions through organized activities and self-exploration
- Supports group activities and goals through shared information
- Aggregates and store data from multiple input sources
- Contains real-time updating capability to link simultaneous users
- Displays projected information overlay regarding surrounding environment and associated activities
- Supports translation/explanation of technical terminology
- within context
- Transmits newly captured data to central database (CNIFER)
- Accesses historical images and data
- Synchs with multiple existing device types
- Delivers appropriate level of information detail, according to user settings
- Tags GPS-positioned information to allow appropriate user access

**Fulfilled Functions**

1	Identify learners
2	Identify instructional goals
4	Construct resources
7	Gauge learner needs/wants
8	Articulate concepts
9	Facilitate discussion
10	Synthesize concepts
11	Direct to additional resources
12	Archive knowledge
16	Supply feedback
75	Engage the senses
76	Accommodate multiple paths
78	Facilitate sharing of experience
79	Archive experience
81	Encourage further exploration
99	Sense presence
100	Create experience

**Associated Design Factors**

1	Mixed Learner Group	104	No place to archive
2	Uneven Learner/Teacher Ratio	111	No Need Identified
3	Mixed Educational Goals	112	Comparison of Options
4	Inexperienced Teachers	113	Element Availability
8	Asynchronous Learners	114	Responsibility a Turn-off
9	Varied Learner Knowledge/Needs	115	Infrastructure Mismatch
10	Technical Language	119	Availability of Replacements
	Comprehension	121	Failure of Maintenance
11	Limited Opportunities for Learning	124	Behavior Interferes with Human Goals
13	Lack of Learner Engagement		
14	Resource Information Unrecorded/Lost		
15	Knowledge Is Siloed		
16	Archiving Not Done In Timely Basis		
44	Data too diffuse for quality aggregation/Incomplete data gathering		

**Discussion**

**nature.edu** provides a full suite of tools and capabilities to support informal learning. Recognizing that people learn in different ways and have a variety of preferences, this educational toolkit leverages point-of-need information with personal preferences to support, but not dictate, an individual's experience in nature.

This supporting role in an educational experience is paramount; now, as in the future, humans' experience in nature straddles a delicate balance between a desire for knowledge regarding the world around them and an equally strong need to treat the natural environment as a respite from technology, connectivity, and the need for efficiency that runs rampant through the rest of life in the present day. While technical advances are likely to continue at a rapid rate, this need for an unplugged experience grows along with it.

That said, the technical capabilities inherent in a more ubiquitous system of learning about the environment are not far off, and making use of that capacity may allow individuals to participate in and learn from nature in a way that is currently not possible. Taking care to design a system that allows for the capability, while also allowing it to be ignored, is a critical element of its design.

**Components of the system****NaturePrep**

Informal educational experiences in nature can be both planned and unplanned; in some cases there is some amount of research before setting off, while in others the desire for knowledge is spur-of-the-moment and very casual. **NaturePrep** supports the both modes of nature interaction, to the extent desired by the individual, with planning tools that allow people to find appropriate experiences ahead of time or in situ by providing information and 'heads-up' alerts based on user preferences, encouraging explora-

tion that might otherwise have been dismissed.

For ahead-of-time planning, **NaturePrep** can be used as an electronic guidebook that allows users to semantically search and gather information about specific locations prior to visiting in order to get up-to-date information about seasonal highlights, bird and animal activity, and status of flora and fauna.

This base set of features provides a means to search for activities or environments, but its power increases for users who input their own interests and preferences into the system. Through tracking and recording of prior experiences, **NaturePrep** can 'suggest' outings or experiences. The more the system is used, the more robust recommendations can be, while still allowing for free-form information access where desired.

For more impromptu use, **NaturePrep** can use this base of collected and customized information to alert individuals to opportunities for spontaneous exploration. Through access via mobile device, the system can unobtrusively send a message when a user is approaching a certain type of park or environment in which there have recently been butterfly sightings, for example, in which one had expressed interest. The use of crowd-sourced data to continuously gather individual bits of information to build a rigorous and comprehensive knowledge base allows individuals to tap into a vast source of constantly updated information.

Finally, **NaturePrep** can be used to track nature-related activities and events to provides users with advance notice for areas of potential interest.

**NatureGoggles**

Piggy-backing on **NaturePrep**'s data capabilities, **NatureGoggles** allow individuals to tap into this knowledge base at point-of-need for more specific information about elements in their environment

**Discussion, cont.**

as well as upload and record information themselves. Through a variety of mobile devices, people can make use of GPS positioning and create personalized information overlays to their immediate surroundings.

For an individual standing at the lakefront, for example, GPS positioning—combined with **NaturePrep**'s database of collected photo information—can allow a user to not only view information about what type of tree is in front of them, but also move to and view linked data that moves from an individual instance to a deeper body of knowledge about that tree species in general. This connection to the overall database also affords the ability to identify non-place specific content, such as bugs or birds that travel through a space but are not specific to it.

In addition, the growing archive of imagery collected by users over time delivers temporal tracking of information in conjunction with location-based content. This provides the possibility of viewing the development of a physical location in time as well as space through the simple act of choosing a past point in time.

**natu•recorder**

In the same way that **NatureGoggles** provide a means of accessing information about the world at a customized level while taking

advantage of the **NaturePrep** database, **natu•recorder** lets individuals accumulate and gain information through media capture in a way that suits their particular needs while contributing back to the archive maintained by collective contribution. **natu•recorder** functionality is device-independent and can be built into a variety of capture mechanisms, including **NatureGoggles**.

It is likely that the bulk of content supplied by participants is visual in nature, but the platform is capable of capturing, tagging, and archiving content from audio and textual sources as well as visual input. As a result, bird songs and sounds caused by environmental actions such as wind can also be incorporated into the overall database for use in identification or reference through **NatureGoggles** or through access from the central database of content. This capability also allows for annotation of experiences that can be stored individually or shared communally for broader access if desired.

Finally, **natu•recorder** allows for the possibility maintaining and using one's personal archive of content in ways that extend the natural environment beyond a single place or moment in time. The smell of an ocean, or the sound of wind rustling through trees, can be stored and replayed at a later date to recapture the essence of the experience.

**Scenario**

Jim was biking home when he got a familiar buzz from his phone. Pulling over briefly, he pulled out his mobile device and scanned for messages. He spied a recent memo with the subject "Heron!"—Jim, a waterbird enthusiast, had set up his **NaturePrep** account to alert him to bird-related events and unusual sightings. He'd been tracking heron progress throughout the early spring and was in touch informally with some CEAS Rangers he'd met over the summer, but this was the first he'd heard that they were back and nesting.

Diving into the memo, he saw it was from his friend Polly, a fellow Youth Leadership Initiative member. The two of them had hit it off the summer before at a working session for the Nature Museum in which they had planned a program aimed at teens that focused on hawks and wildlife who had found homes in nooks and crannies in city buildings. Too bad she had a boyfriend already...

Jim viewed the real-time video feed she had linked to the message and sure enough, two herons were perched on the embankment near the lagoon in Gompers Park. Gompers wasn't too far away; he set off on his bike.

Arriving at the Park, he stopped by the Visitor Center to say hello to Tony, the CEAS ranger who was the go-to guy in this neck of the woods. Jim had met him during a bird monitoring event in

Gompers and had appreciated Tony's long-term commitment to the community and his easy way with both people and animals. Swiping his phone at the entrance to get an instant update for any new park info, he swung by the open-air desk and gave a friendly wave. They chatted for a while about the state of the lagoon; the heavy downpours due to climate change had increased occasional flooding, and the wetland areas had been a boon for communities that weren't too keen on the foot of water that ended up in the their basements from time to time. Tony told him that the plan to convert some surrounding roads to greenways with more permeable ground-cover was kicking in this summer, and to feel free to come by to check out their progress in a few months.

But enough small talk; the herons were back? Tony had been tracking them, too, and mentioned he had taken a bunch of public **natu•recorder** footage already. He thought Polly was still around; Jim tapped into the video feed she'd already set up, and sure enough she was still by the lagoon. Jim headed out, with Tony suggesting that he take the long route to check out the reclaimed prairie area.

Jim walked his bike around the side of the center and headed out towards the tallgrass prairie. He spotted a section of plants that came up about waist-high with inch-wide prickly bulbs on the ends of the branches—what on earth were these? He turned on his **NatureGoggles** with a quick tap on the side of his glasses to find

**Scenario, cont.**

out more: this was Rattlesnake Master (*Eryngium yuccifolium*), apparently. He scrolled quickly through some high-level information, learning that the plant was native to Illinois and could live in a variety of habitats, before laughing at the fact that this was actually a member of the carrot family and that pioneers had mistakenly thought the plants was good for rattlesnake bites, hence the name.

Stepping back, he surveyed the landscape. The prairie was pretty magnificent, it was hard to believe that not long ago it had been lawns and cultivated plants; Jim was a firm believer in the power of letting nature do its thing, and he was proud to have participated in the process of letting prairie grasses and sedges reclaim the environment here. He suddenly got the urge to see how much the environment had changed, and adjusted his **NatureGoggles** timeline to a few years prior. Wow... he relived the transformation once again, seeing manicured green lawns, followed by dirt and scrubby grass, then saw them grow to their current height through season after season. He captured the scene, along with the sound of the wind through the grasses and stored it with **natu•recorder** for more contemplation later.

He snapped out of his reverie: gotta find Polly and get caught up on the heron activity. He flipped off the display and headed to the wetland area, checking his mobile device quickly to catch the most recent feed. As he got closer, he noticed Polly had annotated some footage for him personally, in addition to sending it up to the main database. "the smaller one looks like you" the note said, queued to a series of frames in which the herons searched for food.

She turned as he approached, noting that she knew he was here because she'd tagged him as a friend in the system, and had caught his recent prairie footage moments before. They focused again on the birds... it was nice to see these old friends.

# Activity Analysis

**Activity**  
Maintaining

6

**Project**

Chicago: Vision for the Future | Infused Nature

**Mode**

System Logistics | Operations

**Originator**

Ann Hintzman

Oct. 1, 2008

**Contributors**

**Scenario**

The system has been created but now needs to be kept up through regular maintenance and necessary repair. Maintenance must be scheduled and tools and equipment must be upkept and available for use.

**Users**

Maintenance staff  
System users  
Administrators who receive user feedback  
Administrator who schedules resources  
Machine repair personnel

**System Components**

Maintenance schedule  
Equipment and tools  
Upkeep monitoring system  
Financial resources

**Environmental Components**

System locations (forest, garden, etc)  
Repair facilities  
Equipment storage facility

**System Functions**

Monitor system components

Tend to system components

Service components

Repair/replace components

Assess events

Signal significant system changes

**Associated Design Factors**

Observed system needs aren't reported by users

Maintenance gets off schedule

Tools are not reported in need of service

Tools and materials need to be disposed of responsibly

Symptoms of larger problems exist in multiple domains

Grounds are overused

# Solution Element

**E M S**

Talk Box

4

**Project**

Chicago: Vision for the Future | Infused Nature

**Mode**

System Logistics | Operations

**Activity**

Maintaining

**Originator**

Ann Hintzman

Oct. 1, 2008

**Contributors****Description**

Embedded communication devices allow for the system to receive user feedback in the form of maintenance needs and answer user questions about the natural environment. Communication will be channeled to a voice recognition database to send messages to the relevant department and access system information to respond to user questions.

**Source****Properties**

- Voice recognition software
- Database of system information
- Embedded communication receivers
- Touch point integrated with natural element
- Output speaker
- Network connection

**Features**

- Distinguishes between ambient noise and directed comments
- Receives and understands comments from people in the environment
- Directs feedback to the appropriate department
- Searches system databases to answer user questions (e.g. "Where's the park")
- Thanks users for their feedback
- Blends with the natural environment

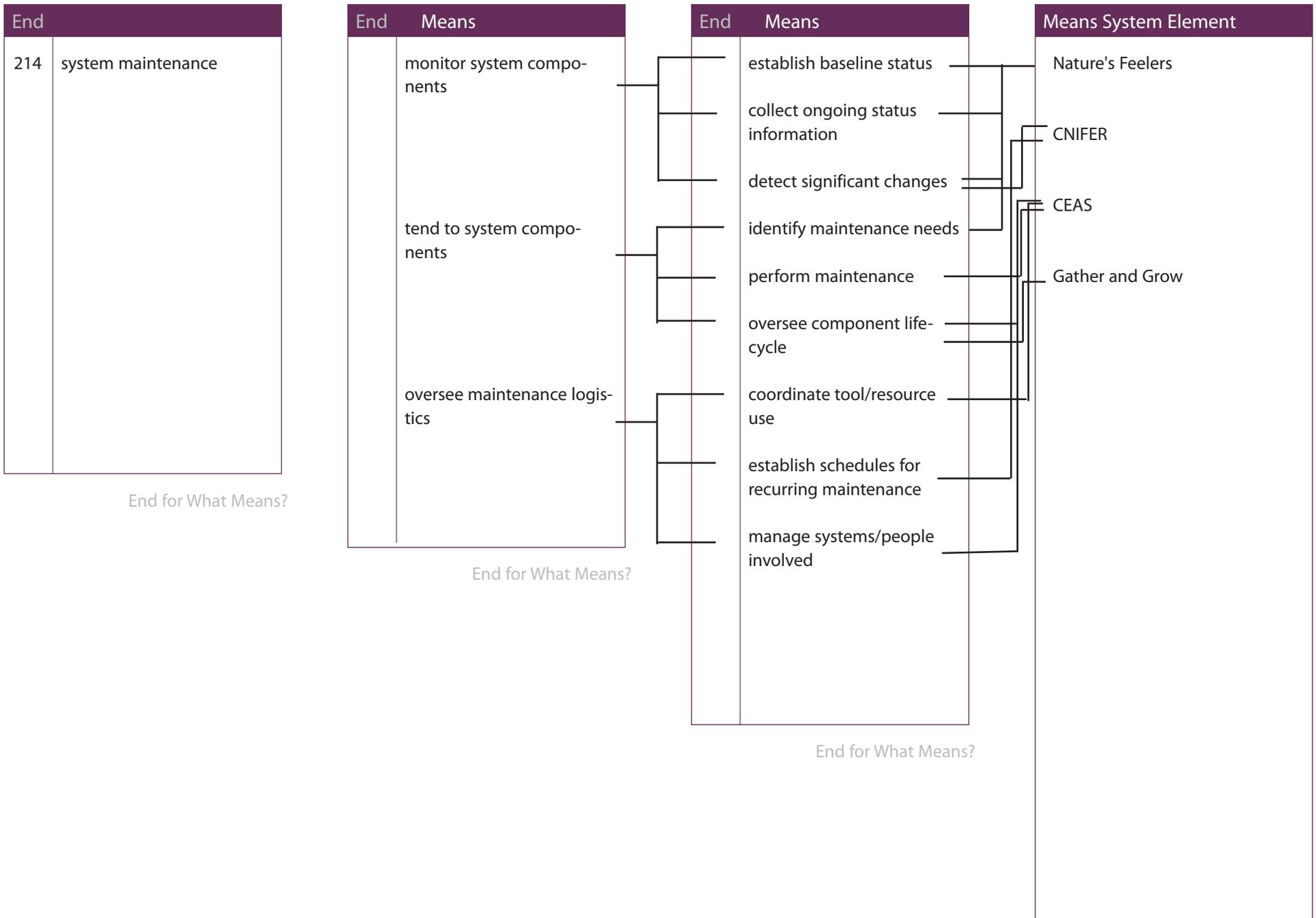
**Associated Function/s**

- 31. Monitor system components
- 33. Service components
- 34. Repair/replace system components

**Source Design Factor/s**

- 43. Observed system needs aren't reported by users







# System Element Relationships

2 ParkLife	ParkLife could implement things learned from NC <span style="float: right;">0</span>			
3. CEAS	CEAS sets up a communication system to contact and view other parks <span style="float: right;">0</span>	CEAS would maintain Make your Mark exhibit <span style="float: right;">1</span>		
4. newView nature	NC programs could be extension of newView programming to learn from others <span style="float: right;">1</span>	MyM would provide content that could be better understood by newView <span style="float: right;">1</span>	<span style="float: right;">0</span>	
	<span style="float: right;">3</span>	<span style="float: right;">0</span>	<span style="float: right;">0</span>	<span style="float: right;">0</span>

Scoring  
 3 Critical Relationship  
 2 Strong Relationship  
 1 Slight Relationship  
 0 No Relationship

9. Nature Connection	10 Make your Mark	11. Seed Bank Research Center	
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<b>System Element</b>		<b>E M S</b>	<b>CEAS - Community Environmental Action System</b>	<b>3</b>
<b>Originator</b> Ann Hintzman	<b>SuperSet Element(s)</b>		<b>Related Elements</b> CEAS Nature's Feelers CNIFER Youth Leadership Initiative Green Conversion Cross-Pollination	
<b>Contributors</b> Marisa Knopman Thomas McCue Nikki Pfarr Ruth Schmidt				
<b>Sources</b> Atlanta Tool Bank. <a href="http://www.atlanta.toolbank.org">www.atlanta.toolbank.org</a> Phinney Neighborhood Association: Well Home Program. <a href="http://www.phinneycenter.org/programs/Well_Home.shtml">www.phinneycenter.org/programs/Well_Home.shtml</a> Chicago Alternative Policing Strategy. <a href="https://portal.chicagopolice.org/portal/page/portal/ClearPath">https://portal.chicagopolice.org/portal/page/portal/ClearPath</a> Sustainable Every Day. <a href="http://www.sustainable-everyday.net/cases/">http://www.sustainable-everyday.net/cases/</a> (accessed November 1, 2008)	<b>SubSet Element(s)</b>			

**Description**

CEAS is a system of neighborhood staff and resources to attend to green space maintenance, offer short term leases of tools and equipment to residents, and serve as a hub for information and work sharing.

**Properties**

- Green space rangers staffed at neighborhood districts
- Local ranger station
- Tools and equipment for upkeep of local system
- Filter of CNIFER fact module that applies to neighborhood
- Prioritized daily work list to be conducted by the rangers
- Tools and equipment available for lease by local residents
- System of monitoring and tracking leased tools and equipment
- Transaction application to store information and image of neighbor renting equipment
- Reservation application to pre-book equipment
- Smart wall communication system for receiving feedback, contacting neighbors, and reserving resources
- List of long term projects, estimated project length, and tools needed for community service
- List of emergency assistance needed in other neighborhoods
- Archive of local experts, willing to answer questions
- Filter of CNIFER experience module that applies to neighborhood
- Communication system linking CEAS stations to each other

**Features**

- Monitor and conduct ongoing maintenance within the neighborhood
- Engage with community through both informal interactions and formalized information session
- Receive and respond to neighborhood suggestions
- Cumulate list of volunteer projects
- Mobilize staff and community to aid other neighborhoods
- Connect people with know-how to people with questions

## Fulfilled Functions

- 22. Establish new touch points
- 27. Coordinate resource use
- 28. Manage resource schedules
- 29. Schedule maintenance
- 31. Monitor system components
- 32. Tend to system components
- 33. Service components
- 34. Repair/replace components
- 35. Assess events
- 36. Signal significant system changes
- 42. Assemble resources
- 43. Act upon plan
- 45. Accommodate feedback
- 49. Disseminate response
- 50. Triage event
- 82. Determine community goals

- 83. Gauge interest
- 84. Coordinate resources
- 85. Inform participants
- 86. Communicate goals
- 87. Delegate responsibilities
- 88. Provide materials
- 90. Accommodate feedback
- 94. Encourage ongoing involvement

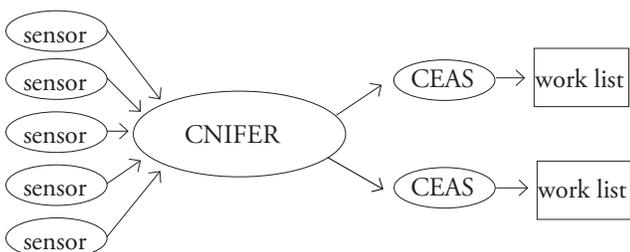
### Design factors

- 38. Observed system needs aren't reported by users
- 39. Normally scheduled service is missed
- 47. Inadequate resources
- 60. Insufficient human resources
- 68. Participants don't know how to get involved
- 69. Spontaneous activity isn't supported
- 70. Inadequate materials or facilities
- 94. Varied community goals
- 117. Lack of caretaking knowledge

## Discussion

As the city of Chicago gets bigger, successful maintenance and outreach will need to occur on a more localized basis to allow for prompt and appropriate response to community needs. **CEAS** takes a cue from the CAPS program and localizes maintenance personnel in neighborhoods. Each neighborhood is equipped with a **Ranger Station**, that serves as a combination home office for the **Green Space Rangers**, tool and equipment supply shed and community center, and a staff of trained Green Space Rangers who oversee maintenance and liaise with the community.

The **CEAS Ranger Stations** will access the **CNIFER** (described in document) fact module to understand the condition of area green spaces. These facts will be used to create a prioritized work list for the **Green Space Rangers**.



In addition to this work list, **Green Space Rangers** will receive information about local conditions and work needs from the community. Over the next 100 years, conducting maintenance will become increasingly automated. As automation reduces the manual-labor requirements of the **Green Space Ranger**, conducting maintenance within the neighborhood will shift from performing the required tasks to serving as a green presence available for answering questions, receiving information about the current system and ideas for future changes.

To encourage personal involvement in area green spaces and a commitment to increase the amount of nature within private spaces, **CEAS** offers resources to the community to remove some of the impediments that currently stand in the way of green involvement. One reason neighbors do not report damage and maintenance needs within their community green spaces is that they do not believe they will be acted upon. Community members currently must use the 311 system to alert the city to issues within their neighborhood. There is no way to monitor whether problems have already been reported, nor is there a way to monitor whether reported problems get acted upon.

**CEAS** counters these problems in two ways. First, the **Green Space Rangers** are available to personally receive and respond to system issues. The **Green Space Rangers** will have the ability to move these problems to the top of his or her work list. In this way the community members can report problems to the person in charge of addressing these problems and can be assured of the tasks completion.

Secondly, **CEAS** makes it easier for community members and organizations to get involved in public-works projects. Many people who have the time and inclination to put towards improving their neighborhood don't know how to start this process. **CEAS** aggregates information about longer term projects that can be performed, the time required to complete each stage and the tools necessary to encourage both spontaneous and planned volunteering opportunities. Volunteer opportunities in the neighborhood can be viewed and reserved remotely or from the communication wall at the ranger station.

Making improvements to public or private spaces requires tools and equipment to transition the space as well as for upkeep. The cost investment and long term storage needs of these tools

**Discussion (cont'd)**

often becomes a deterrent to completing a green space project. **CEAS** provides access to tools and equipment through a resource library at the **Ranger Station**. Like with volunteer opportunities, community members can reserve equipment either remotely or from the station. When the community member comes to the **Ranger Station** to pick up the reserved tool, information about him or her is stored and the tool is tagged to monitor where it is being operated. If the community member needs more than the reserved time, they can extend their reservation remotely if no one has booked the tool for the following time slot. If there is another reservation, the ranger can contact the next reservation to confirm the appointment and check for flexibility.

In addition to the physical resources necessary to undertake green conversions, **CEAS** helps community members figure

out what are the best green conversions to make and the steps needed to be taken to make these conversions. The public green spaces will offer inspiration for private conversions, with specific implementation information offered through classes at the **Ranger Station**. In addition to this more formalized instruction, Rangers will be trained in environmental science and available to answer or refer community members to resources to address specific questions. One of the additional resources that will be leveraged by **CEAS** is the knowledge held by other neighbors. This could run the gamut from neighbors who are trained botanists, to neighbors who have figured out a quick fix to rain barrel problems. Through the communication wall, Rangers can help connect neighbors with questions to neighbors with answers to not only problem-solve but deepen the community ties.

**Scenario**

Ken received his Masters in Environmental Science four years ago and has been working at the Bucktown **CEAS** ever since. He likes working at **CEAS** because it gives him a way to bring together his technical knowledge of environmental remediation and upkeep with his love of teaching. While completing his masters, Ken led a first-year undergraduate seminar on urban space renewal. While most of these students wouldn't go on to pursue environmental science, by the end of the semester they had all installed window-greenhouses in their dorm windows and were proselytizing to their friends to do the same. This experience was just as enriching for Ken, who realized that research was powerless if it didn't have a means of bringing about change.

Ken's always been a morning person, so opens the Ranger Station at 6am. He checks the communication wall to see if the neighbors have reported any issues to add to his maintenance list. Sally arrives to the station and launches up the reservation system. Ken pulls the daily work list and maintenance bots and heads out to Holstein Park to gather fallen tree branches after last night's storm. While he's leaving he says hello to Frank, a neighbor who's coming to pick up a bot in order to clear his yard before heading off to work.

Ken arrives to Holstein Park and programs the bot to pick up fallen branches. While the bot gathers the branches, Melinda walks through the park on her way to work. She tells Ken that she noticed a large branch across the bike-alley on Charleston. While she has him, Melinda mentions that her Green Walls were starting to look a little droopy. Did he have any suggestions? Ken messages her a nutrient mix that should help and suggests she stops by the ranger station because he remembers Kim, a neighbor on Hoyne, telling him that she had been having that problem but had discovered a solution. Melinda thanks him and heads off to work. Ken pauses the maintenance robot to head over to the bike alley. He wants to get that large branch cleared before the morning rush

hour and needs to investigate why the sensors didn't catch this.

When Ken gets to the bike alley, someone has already slid the branch to one side of the trail to allow for some bike access. The maintenance robot collects the large branch and transports it off the alley, and signals for an urban timber pick up. While the robot completes this process, Ken walks off the trail to check on the sensors. Several **Nature's Feelers** sensors have migrated to a nearby elm tree that is fighting an insect invasion. Ken plugs into the **CNIFER** database and is pleased to discover that the elm has taken a turn for the better after receiving a nutrient infusion last week. Ken redeploys one of the sensors to the bike alley to ensure that any other fallen branches will be detected.

After performing the morning maintenance, Ken returns to the Ranger Station. Sally is giving supplies to a girls scout troop who signed up for a native flower planting project in Senior Citizen's Park. She gives the tools, seeds and instruction to the troop leader and reminds her that there is a communication device in with the tools if she needs Sally for any questions. When Sally finishes up, Ken tells her that while there were many branches down, it looks like most people in the neighborhood fared pretty well after the storm. Sally tells him that it looks like the storm hit much harder further to the south. They check the **CEAS** network and notice that both Marquette Park and West Englewood have signaled that they required additional assistance. Sally responds to West Englewood that they would mobilize their community to respond later that afternoon.

Ken sends out a broadcast to the community that emergency assistance is needed in West Englewood and that a Bucktown **CEAS** relief squad will be leaving from the Ranger Station at 5pm and returning at 8pm. While Ken notifies the community, Sally freezes reservations for the day and pulls together the tools and equipment not needed to fill existing reservations. She contacts reserves

**Scenario (cont'd)**

transport that will pick them up at 5pm that will return people to their homes by 8pm.

Sally takes one of the robots and heads down to West Englewood to complete her shift helping them recover from the storm. Ken stays at the Ranger Station, leasing equipment to neighbors. The girlscoouts return from their planting and wonder if it was possible to stop the flower planting to go help down in West Englewood. Ken thanks them for their help and orders transportation to take them and their robots down to West Englewood. He contacts Sally to let her know that they would be coming in order for her to identify an achievable task for the scouts to perform.

At noon, the late shift rangers arrive. Ken updates them on the situation in West Englewood. The late-shift rangers access **CNIFER** data to better understand the situation in West Englewood and prepare for the deployment of the Bucktown **CEAS** relief squad later that day. While they prepare for action, Ken teaches the weekly "Homegrown Lunch" class that helps people understand what fruits and vegetables are best to grow, how to take care of them and when to harvest. Melinda has come to this class and afterwards Ken puts her in touch with Kim on the communication wall to get help with her droopy Green Walls.

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