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CHICAGO VISION FOR THE FUTURE

## *Featured Environment*

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## Preface

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### The Project

1909 marks the Centennial of Daniel H. Burnham's and Edward H. Bennett's 1909 Plan of Chicago. The Burnham Plan, as it became known, redirected Chicago's development from disorganized industrial and commercial growth to a planned movement toward the "city beautiful". Along the way, Chicago became a green city with a necklace of parks and boulevards recognized around the world for its beauty. The Burnham Plan challenged Chicago's leaders to arrest the uncontrolled development that characterized the late 19th and early 20th centuries. Challenged by Burnham, Bennett and the Commercial Club of Chicago, the city committed to Burnham's vision, an environment that could be both functional and beautiful.

One hundred years later, Chicago and major cities worldwide face different but equally portentous problems and opportunities. New and powerful forces, both destructive and constructive, confront cities and society. Global warming is changing climate and energizing unpredictably destructive weather. Population growth and movement to the cities are 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 sciences along with communications, computing, biological and engineering sciences are reshaping what is possible. Negative and positive, the agents of change have raised the stakes.

Established cities like Chicago must evolve more quickly. Entirely new cities now springing up almost overnight in fast-developing countries, -- like China's Shenhzen -- 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 evolving structure to tomorrow's pressing changes. Daniel Burnham's famous dictum -- "Make no small plans" -- is most timely and appropriate in this year of centennial celebration.

*"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." --Daniel Burnham*

In keeping with Burnham's thinking, this project freely explores urban possibilities for the next century. Rather than a conventional "plan", however, as might be proposed in a blueprint for a cityscape, this study examines a variety of physical, procedural and organizational concepts now emerging or that soon could emerge from evolving technologies and changing social forces. Overall, the project is composed of four separate but integrated studies focusing on urban infrastructure, transport, environmental features (river and lake front), and the role of nature in the city.

The component covered in this report is Featured Environment: possible futures for the river and lake front, special environmental features of the city.

## Preface (continued)

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### The Course

The design concepts presented are results of a project-based course at IIT's Institute of Design. The semester-long Systems and Systematic Design course is a workshop in which teams of graduate students, deliberately of mixed international origins and different academic backgrounds, apply the computer-supported Structured Planning process to complex design planning problems. The goal for each project is to develop information thoroughly, propose innovative solutions that take maximum advantage of the information, and integrate those ideas into system concepts that can both be evaluated in their own right and (in a real situation) be the comprehensive project specifications for a follow-on detailed development project.

### Course Issues

*Complexity.* What is the nature of “systems” concepts where policy, products, processes, services and communications are organized to act together to achieve multiple goals? What can be done to assure that a system concept is as complete as possible, covering many functions and attaining a high degree of “wholeness” and organic reliability?

*Design planning methods.* What is Structured Planning and how can its tool-kit of methods be used to collect, structure and synthesize information in projects of greater complexity than can be comfortably dealt with intuitively? How can such methods be used by a team to extend the effectiveness of all?

*Teamwork.* How do individuals with different cultural origins and different academic backgrounds work together successfully on teams? What roles are there to be played and what difficulties must be overcome?

### The Project Team

Eighteen graduate students from the U.S. and abroad were assigned to four teams for study of Chicago's and other large cities' future. Background experience for team members included degrees in fine art, art history, painting, marketing, strategic management, business management, interior design, product design, graphic design, communication design, psychology, ethnic studies, Spanish and Latin American studies, teaching, economics, political science, cognitive science, comparative media studies and semiotics.

### Members of the Featured Environment team:

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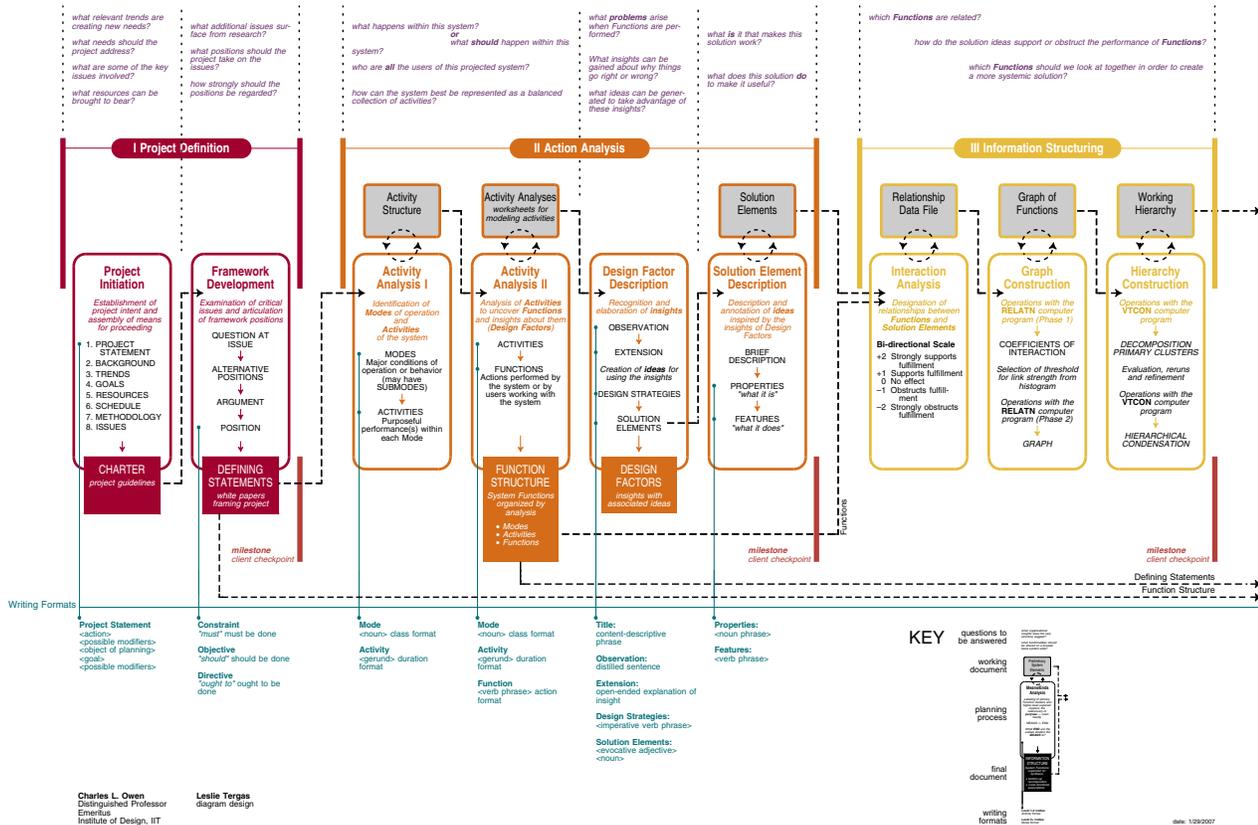
## Preface (continued)

The Planning Process: Structured Planning  
 Structured Planning, the systematic planning process taught in the course, is a process for finding, structuring, using and communicating the information necessary for planning. It is a front-end process for developing concepts thoroughly and cohesively. A number of projects have been undertaken with it and used to further its development. Among more than 100 of these, an early published project for Chicago's transit authority (CTA) was Getting Around: Making the City Accessible to Its Residents (1971). In 1983, the House of the Future project won the Grand Prize in the Japan Design Foundation's First International Design

Competition. In 1985, the design of a habitation module for Space Station was undertaken for NASA. In 1987, the Aquatecture project won the Grand Prize again in the Japan Design Foundation's Third International Design Competition. In 1991, Project Phoenix (on global warming) was honored as Environmental Category Grand Winner in Popular Science magazine's "100 Greatest Achievements in Science and Technology" for the year. In 1993, two award winning projects, NanoPlastics and Aerotecture, were widely publicized in Europe and Japan; in 1995, the National Parks project developed plans for the future of the U.S. National Park Service.

## The Structured Planning Process (Phases I - III)

Structured Planning is a front-end, concept development process for finding, and communicating the information necessary for advanced planning



The Structured Planning process: phases I through III.



## Preface (continued)

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### I Project Definition

The Structured Planning process begins with Project Initiation and the production of a Charter. This is a “brief” that serves as an initial communication vehicle between client and planners. It contains background, context, basic goals, a project statement that cuts to the heart of the planning task, resources to be used, a schedule and an initial set of issues to be investigated. Defining Statements are mini “white papers” produced in the Framework Development portion of Project Definition. They focus the project within the direction of the Charter, concentrating on the issues and arguing specific directions that the project should follow with regard to them. Together with the Charter, they frame the project.

### II Action Analysis

Any system can be viewed as a complex entity working with its users in different ways appropriate to its modes of operation. To plan effectively, a planning team must recognize these Modes, identify Activities that occur within them, and isolate the Functions that the users and system perform or are intended to perform within each Activity. The result of the Activity Analyses is a Function Structure.

Half of the purpose of Action Analysis is the enumeration of Functions. The other half is the development of information about them that reveals insight about what happens as they are performed. During Action Analysis, insights are sought about why things go wrong in performing some Functions, and how other Functions manage to be performed well. These insights are uncovered in the Design Factor Description procedure and developed in documents that become part of a qualitative knowledge base. Activity Analyses record information at the Activity level; Design Factors document insights and ideas associated with Functions.

To capture as fully as possible the ideas suggested on Design Factor documents, solution ideas are written up in the Solution Element Description portion of Action Analysis. This is done on simple one-page forms designed to capture enough detail about ideas to give them substance when they are

needed later. They have three important sections: “Description” -- a short explanation, “Properties” -- what the idea is, and Features -- what it does. The product of Action Analysis is three sets of critical information: a set of Functions (the Function Structure), a set of insights (Design Factors) and a set of preliminary ideas (Solution Elements).

### III Information Structuring

Paradoxically, as useful as the Function Structure is for establishing coverage, it is not the best form of organization for developing concepts. Reorganizing information for use in concept development is the job of two computer programs, RELATN and VTCON.

The controlling factor for whether two Functions are associated from the planning standpoint is not whether they are categorically “related” in some manner, but whether a significant number of their potential solutions are of concern to both. Which Solution Elements are of concern to each Function is established in an Interaction Analysis procedure. The RELATN program uses this information in a Graph Construction process to establish links between Functions.

Another program, VTCON, completes the information structuring process. In the Hierarchy Construction activity, VTCON finds clusters of highly interlinked Functions and organizes them into an Information Structure, a visually understandable, very general form of hierarchy most appropriate for planning.

### IV Synthesis

In its form from the VTCON program, the Information Structure is simply a hierarchical reorganization of Functions. Nodal points above the Function level do not have names. The task of Means/Ends Analysis is to create labels for all nodes in the hierarchy. Moving bottom-up from the known Functions in the bottom level clusters, names are found to label nodes as “ends” for which lower-level nodes are “means”. The process continues to a completely labeled Information Structure.

## Preface (continued)

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The process is then reversed as a top-down, structured brainstorming procedure: Ends/Means Synthesis. In this process, the planning team asks of high level nodes, “what means do we need to meet this end?” As means are established, they are treated in turn as new ends for which means must be found, until the means become concrete enough to be described as final elements of the system (System Elements). Existing Solution Elements are reviewed as potentially usable directly; others are modified or combined to make them usable, and new ideas are added to fill unmet needs newly recognized.

System Element Interaction compares System Element with System Element in a search for additional synergies that can contribute to systemic qualities. More than simply recognizing relationships, the planning team proactively seeks out inventive new ways for System Elements to work together -- the invention and design of relationships. Changes and additions are incorporated in the properties and features of the individual System Elements.

The last Synthesis task, System Element Description, completes the specification of System Elements, including a succinct description, all relevant -- now essential -- properties and features, and extensive Discussion and Scenario sections that contain detailed expositions of the ideas in both conceptual and operational terms.

### V Communication

Because the result of the Structured Planning process is a complex system, usually with a number of System Elements, a Communication Structure is frequently included as an aid to understanding. This is created during Concept Organization by the VTCON program from an assessment of how important the System Elements are to each other’s operation. Using this structure, the reader can understand the system more easily and navigate its concepts with efficiency.

The product of the Structured Planning process, assembled in the Project Completion section, is

a Conceptual Plan, made up of an Overview that provides background and introduces the system, the System Elements that describe the ideas and their relationships, and Appendices that contain all relevant support information, including the Defining Statements, Design Factors, Function Structure and Information Structure.

### VI Evaluation

Structured Planning incorporates evaluation among the steps of the process, most notably during Synthesis. It also offers an optional full-system evaluation technique that can be employed to evaluate final results against policy-level and/or function-level criteria. Used for this, it provides merit values hierarchically for the system, its component parts and individual system elements. It can also create similar hierarchical evaluations for the assessment of functional performance and policy performance. Used to compare systems, it can provide system, functional and policy assessments for multiple competitive candidates measured against common function and system structure frameworks.

## Introduction

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### Background

Chicago pioneers settled in the city's location largely due to the natural features of the environment. The land is relatively flat and in close proximity to both Lake Michigan and the river, two tremendous assets for a city. By the 1830s, urban settlers began arriving and the city's population and economy swelled. The river and lake afforded Chicago both a bountiful drinking water supply and desirable shipping routes for commerce. Chicagoans were able to utilize the river for agriculture, transportation, and shipping purposes, which resulted in rapid city growth.

The land offered substantial natural features that served the needs of the pioneers. This relationship of nature serving people evolved into Chicagoans drastically modifying the environment to meet their needs. For instance, in 1885, a severe rainstorm forced sewage-filled river water into Lake Michigan, contaminating the city's drinking water and leading to a cholera and typhoid outbreak that killed over 90,000 in a few days. The decision to reverse the river was made shortly thereafter so that the city's sewage and toxins would flow away from the city and not back into the lake, contaminating the drinking water supply. Then, in 1929, Chicago straightened a portion of the river on the south side. Both of these manipulations were incredible engineering feats and over 100 years later, still define Chicago's water system. Yet, as industrial and technological advancements have immensely lessened Chicago's reliance on the water system, it begs the question, what is the role of the river and the lake in Chicago today? Since settlers arrived, the river has been reversed, dredged, straightened, and deepened, but it has yet to be featured.

### Current Dynamics

Water is speculated to quickly become the world's most valuable resource. According to the Southern Lake Michigan Regional Water Supply Consortium, twenty percent of earth's fresh water is on deposit in the Great Lakes, which constitutes ninety-five percent of the United States' fresh water supply, making

Chicago's proximity to Lake Michigan an increasingly valuable asset.

Additional factors such as rising temperatures, drastic climate shifts from global warming, and increasing populations will place heavy demands on cities and water supplies across the world. Simply put, there is no excuse for any city to take fresh water consumption for granted. Like all cities, Chicago needs to establish a more sustainable model for the water system in the future. And with Chicago's great privilege to Lake Michigan, comes the great responsibility to be a pioneer in the creation of new and progressive models. Chicago has an exceptional opportunity to redefine the role of its water system and serve as an example for many other port cities across the world.

Daniel Burnham also saw an opportunity for Chicago in his 1909 plan for the city. He said, "The people of Chicago have ceased to be impressed by rapid growth or the great size of the city. What they insist on asking now is, How are we living?" This sentiment is even more relevant today with shift of the Chicago culture and economy. Whereas once Chicagoans exploited the water system for economics, in the future they will treasure it for the experience.

## Introduction (continued)

### Project Intent

The Featured Environment project aims to redefine the role of Chicago’s river and lake system to feature it as a treasured asset and leverage it to enhance quality of life. Three main principles have been identified for guiding the design to accomplish this mission:

1. Vitalize urban life
2. Unify elements of the city
3. Celebrate natural and human values

Vitalize urban life explores how to juxtapose the natural and urban environments in a harmonious way. The natural environment was quickly covered by cement in the name of progress, forcing many to become disconnected with the simple pleasures that a natural environment affords. The system strives to create solutions that strike a balance between celebrating the coexistence of the natural and urban environments and celebrating them each distinctly to represent a more complete relationship between the two.

Unifying elements of the city also creates a dramatic impact on the city. The river has long been used for unifying distant locations, but always from a transportation point of view. This system aims to reframe how the city views the river by harnessing and expanding the river’s footprint. This allows the river the unique opportunity to play a role in a variety of aspects of city life. At a more abstract level, the river can be a constant thread unifying vast elements of Chicago’s culture.

Lastly, as a user-centered system, the featured environment appreciates people’s values. The system strives to co-celebrate human values and natural values, to show how they overlap, converge, and ultimately enhance each other, thereby more closely linking Chicagoans to their local environment.

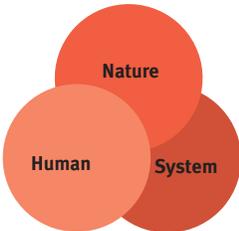
### System Elements

In order to achieve these goals, the featured environment system has developed a purposeful set of 15 system elements that when woven together create a strong cultural fabric with the river and lake featured as essential characteristics of Chicago.

The success of the system ultimately depends on its comprehensive coverage and component interrelation.

#### Comprehensive coverage

Each system element was designed to take into consideration the needs of people, the environment, and the system itself. Covering the 3 different vantage points guarantees that each element will address celebration of the environment, creation of meaningful human interactions, and generation of an adaptable system.



#### Component interrelation

The 15 system elements can be distilled into a marriage of 3 components: the largest focusing on promoting the presence of the water in Chicago with an ancillary component covering the supporting needs of the system and a supplementary component focusing on ways to augment the system.





# RiverWalk

A set of features that transforms the downtown riverwalk into a clean, serene, and more natural destination for leisure, retail, and culture in the heart of the bustling downtown.

**Related System Elements:**

- Canals
- weMonitor
- Barge Fleet
- Sidewalk Stage
- Virtual Guide

**Superset Elements:**

NA

**Subset Elements:**

- Koolhaalf Tubes
- Mobi-Mods
- Framed Entrances
- Lookout Point
- Pool Filters
- Zoning

## Fulfilled Functions

- 05 Offer reasons for detour
- 06 Enhance commuters interaction with the FEP
- 07 Encourage spontaneous excursions
- 08 Create opportunities for rituals
- 09 Blur the boundary between work and play
- 10 Infuse urban nature
- 11 Build on current habits of users
- 13 Make visually appealing
- 23 Signal Environmental transition
- 29 Establish focal points
- 34 Refresh offerings/activities
- 67 Clean public spaces
- 68 Maintain water quality
- 84 Promote unique character and diversity
- 89 Offer water transit
- 91 Optimize zoning and pace

## Properties

- A clean stretch of river
- A path to walk east and west along the river
- An adaptable and modular set of structures for providers
- A place for leisure, retail, and culture
- An area to take a break from the city above
- A destination for tourists and residents
- A place of variety
- A new Chicago cultural phenomenon

## Features

- Offers variety along zones in riverwalk
- Provides quiet from bridges and city noise
- Provides sufficient space for crowds to walk
- Easily transports and replaces modular stores
- Offers adaptable space to retail and food providers
- Provides cultural space
- Continuously cleans the river
- Separates river from city, visually and sonically
- Offers great variety in small footprint
- Provides a new tourist attraction
- Provides large scale civic gesture
- Provides a vibrant culture
- Accommodates disabled persons

## Associated Design Factors

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- 17 Can't see underwater (monitoring)
- 18 Accessing riverwalk in emergency situations
- 22 Recognizing Significant Social Trends
- 26 User Damage Reporting

## Discussion

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The Riverwalk set combines to create a truly special Chicago cultural experience. It builds on the current downtown riverwalk, which is framed by Lake Street to the west and Lake Shore Drive to the east. The current riverwalk offers private dining on the north side and various spots to sit and perhaps enjoy nice weather on the south side. However, the riverwalk fails to draw in visitors because it offers little more than a concrete place to sit and watch the polluted river flow by. In contrast, the riverwalk will be a place for busy Chicago workers to escape to, where they will be surrounded by landscaping in the heart of the city while sitting leisurely and enjoying lunch, coffee, or any number of artistic or cultural offerings. Tourists will use the expanded paths as a passageway to walk along Chicago's famed architecture which will lead them to the Magnificent Mile and the revamped lake front. It will be a crowning destination in the city.

In order to fulfill this vision, various elements will be implemented. To start with, river pollution will be remedied. The Pool Filters accomplish this by collecting all the floating trash that builds up. The filters behave the same way as in swimming pools; gentle waves from passing boats or water traffic push the floating debris to spots along the riverbank. At the debris build-up spots, filters are placed that allow water to pass through and be recycled back into the river by a pumping mechanism. The floating pieces of trash collect in the filters, which are covered so as to be hidden from view, and then are emptied on a regular basis by the cleaning boats. The cleaning boats offer additional river cleaning by employing nets that skim the water surface and collect debris that did not make it into the filters. The cleaning helps improve the river cleanliness and aesthetic while minimizing costly and arduous manual labor.

In addition to the trash polluting the river, there is a lot of noise polluting the riverwalk. Much of the noise stems from the clanking of the steel bridges overhead. There are multiple bridges stretching over the downtown river that carry regular traffic. The ambient noise created by the traffic makes it difficult to carry on a conversation below, never mind the idea of enjoying peace and tranquility. Fortunately, the Koolhaas Tubes greatly reduce the noise level. The tubes are inspired by the Rem Koolhaas' elevated train-platform structure on the south-side campus of the Illinois Institute of Technology. The Koolhaas tubes are u-shaped structures that wrap around the underside of the riverwalk bridges. They preserve the rich Chicago bridge history by leaving the bridges in tact, but add a modern architectural twist. The tubes will shield people from the noise created by the bridge traffic in two ways: by using the tube material to dampen bridge noise and by employing noise-cancelling technology. The noise-cancelling technology emits an

## Discussion (continued)

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equal but opposite sonic signature that in effect cancels out the noise produced by the bridge to create a near silent experience. Special speakers project sound much like a spotlight projects light to target and neutralize noise from the bridge. In all, the tubes will allow for a peaceful experience at the riverwalk without inhibiting the traffic above.

Framed Entrances further add to the riverwalk experience by providing a natural barrier between bustling urban life above and the serene riverwalk below. A wall of landscaping shields upper Wacker Drive from the river and replaces the current concrete divider. At points of entry and exit, the landscaping will frame the riverwalk view to allow passersby a glimpse into the scenic riverwalk. From the riverwalk perspective, the landscaping ensconces people in a natural environment with urban skyline juxtaposed behind. The landscaping will also provide a tremendous view from the buildings above, which will look over a beautiful stretch of nature and water running through the middle of the city. This natural buffer will help create a mental transition for people seeking respite from busy city life.

Beyond merely offering a quiet place of respite, the riverwalk will provide culture, dining, and retail through Mobi-Mods. Mobi-Mods are mobile and modular architectural elements that can be modified to house small cafes, food vendors, galleries, and light retail shops depending on which riverwalk zone they are located. They function like pop-up stores and are roughly the size of shipping containers, which allows them to operate efficiently considering the narrow river width. Their size makes them ideal to transport up and down the river when not in use or to dock in different locations to offer services. For instance, the Mobi-Mods can ride on existing river barges and pull up next to the riverwalk to offer food during lunchtime and then relocate when the space needs to be used for a nighttime performance barge. The structures can combine to provide larger, multi-level spaces, or be used individually for smaller operations, like take-away coffee stores. Their adaptability makes it easy to refresh offerings

at the riverwalk, which will provide exciting and fresh experiences for people who frequent the riverwalk.

Barge Fleets will assist Mobi-Mod transportation and provide the platform for exciting river elements. The current river barges can be modified to transport Mobi-Mods around the river and act as a floating foundation for the stores. Specialized barges will be outfitted to assist with riverwalk maintenance, transport Mobi-Mods, and provide space for activities, like a swimming pool and a stage for performance. The highly adaptable barge platform allows multiple activities to occur at the river without overloading the narrow river width and valuable walking and sitting spots along the riverbank.

Additionally, Lookout Point will anchor the riverwalk by providing an observation post where the north and south river branches come together to peer easterly down the river. The observation area will be bridged to land, but still allow boat traffic to pass on either side. The placement in the river will create one of the most scenic views in the city and invite people to take in the scenic juxtaposition of the river and skyline.

## Scenario

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William is a consultant that works downtown in the loop area. It is Friday and his parents are in town from San Francisco for the weekend. It is their first time visiting Chicago, so William wants to make sure they see Chicago's highlights. Unfortunately, William is busy at work and can't entertain his parents, so makes plans to meet them at his favorite lunch spot. William suggests that his parents take the morning to explore the riverwalk and he will join them for lunch at a restaurant next to the water.

William's parents are staying in the loop, so they decide to stroll over to the riverwalk and see what William has been raving about. As they walk down Wacker, they comment on the Entrance Framing and how nice it is to have greenery in the middle of the city. The landscaping breaks to reveal the entrance to the riverwalk below, which is scattered with people sitting and leisurely enjoying their morning coffee. They notice one of the Mobi-Mods anchored adjacent to the riverwalk and decide to stop to get a cup of coffee and morning pastry. They decide to grab one of the open tables on the riverwalk while they eat. As they take in the pleasant morning, they notice the series of renowned Koolhaas Tubes that they read about. As commuter trains continue to pass overhead, William's father is impressed with how the tubes quiet the noise and barely notices any disturbance.

After seeing the iconic image of Chicago looking down the river so many times, William's parents decide to head to Lookout Point to experience it firsthand and get some pictures. From the observation deck, they can see clear down the river. The riverwalk and greenery look like an oasis in the middle of the city.

After taking in the view, they notice the time and decide to walk down the riverwalk so they can meet William in time for lunch. As they start heading east, they stop to look at the sculptural work adorning the walkway. The collection of artwork represents local Chicago artists and William's parents are particularly interested in this month's collection. They stop in the gallery space adjacent to the walkway and chat with

the owner about the work while they browse through some prints. In an effort to stay on schedule, they exit the gallery and continue walking east along the river. As they walk they notice the barges carrying additional Mobi-Mods in interesting configurations and wonder what is inside each one.

Meanwhile, William continues to work back at the office. Unfortunately, his conference call was rescheduled for lunchtime, when he is supposed to meet his parents. Intent on not missing lunch, he realizes he can bring his phone and computer to lunch and jump on the public wireless network to take the meeting. He packs up his things and starts to head out the riverwalk to meet his parents for lunch.

William intercepts his parents at the riverwalk and they pass by a couple seating areas before deciding where to eat. They stop at one of Chicago's famed restaurants, which is serving take-away through one of the Mobi-Mods. As they begin to eat by the river, William's conference call comes through. He excuses himself and relocates to another Mobi-Mod which has been reconfigured to provide personal workstations and internet connection.

William rejoins his parents after the brief call. They decide to continue down the riverwalk to take in the beautiful day and do some light shopping. They come across a few pop-up stores housed along the Market District and divide up to look for different things. William's parents look for various gift items to bring back home while William decides to sit in the sun and read the news.

William notices some of the barges are setting up for a performance. He inquires and finds out that there is a musical performance happening later that afternoon. He decides to reserve seats for his parents and also makes dinner reservations at a nearby restaurant so they can walk directly from the concert to the restaurant, completing a great day at the riverwalk.



# RiverHaven

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RiverHavens are zones along the Chicago River that are designated to give people complete immersion in nature. With the rapid development of downtown Chicago, RiverHavens are a effort to allow people to have a pure experience with nature to balance the urban and natural presence in Chicagoans lives.

**Related System Elements:**

Canals  
Greenways  
Virtual Guides  
FEP Network

**Superset Elements:**

NA

**Subset Elements:**

Living Briges  
Outdoor classes  
Pebble Path  
Terraced Land  
Framed Entrance  
Peaceful soundtrack  
Natural Jungle gym

## Fulfilled Functions

- 3 Promote system image/ experience
- 5 Offer reasons for detour
- 7 Encourage spontaneous excursions
- 8 Create opportunities for rituals
- 10 Infuse urban nature
- 11 Build on the current habits of users
- 12 Engage auditory senses
- 13 Make visually appealing
- 14 Engage tactile senses
- 14 Engage olfactory senses
- 22 Signal environmental transition
- 25 Signal arrival
- 28 Establish focal points
- 29 Establish curiosity
- 35 Stimulate the senses
- 36 Evoke emotional response
- 37 Activate the body
- 38 Provide respite
- 64 Tend to the landscaping
- 79 Encourage performance
- 83 Promote unique character and diversity

## Properties

- Multi-level paths
- Wishing well fountains
- Tree houses
- Path of pebbles
- Digital tags
- Terraced land
- Clover for grass
- Shelter from the sun and wind
- Inclosures that abscond the view of the city
- Fragrant floral landscaping
- Places to hold classes
- Places to hide
- Noise cancellation
- Road screens
- White water rapids
- Natural jungle gym
- Zone and pace regulations

## Features

- Allows users to relax in a meditative environment
- Allows people to take classes outside e.g.: yoga, tai chi, painting
- Allows residents to teach their own classes
- Enables people to create meaningful rituals
- Helps instill an appreciation of nature in youth
- Allows people to see the difference between the urban world and the natural world.
- Allows people to take a time away from the hustle and bustle of their regular life

## Associated Design Factors

- 5 Infusing urban nature
- 7 Making both open and closed
- 10 (Over) Stimulating the mind
- 11 Maintaining the innocence
- 14 Zoning over time
- 15 Obstructing the river view
- 20 Loud mowers
- 27 People aren't sure where to be active
- 32 Grass is time consuming and costly to upkeep

## Discussion

The RiverHavens vitalize urban life by allowing people to take a break from the stresses of the city and refresh their spirit. Many people seek this break from their busy life by leaving the city. The RiverHavens enable this escape within the boundaries of the city and in this way strengthen the unity between the residents and the city of Chicago. Additionally the importance of water in the local escape of the RiverHavens reinforces the natural and human value of refreshment.

The importance of a city focusing on satisfying the softer aspects of quality of life are strengthened by the Chicago Metropolis's plan. The Chicago Metropolis 2020 is a nonprofit organization that focuses on regional planning. They have studied urban planning around the world and have made recommendations for Chicago. One important fact they state is that "a region that is better designed for its residents will also have a stronger economy".

The river and lake play a strong role in the identity of the city of Chicago but they are rarely experienced without the backdrop of high rises. Additionally, the urban aspects of the city are often experienced in complete isolation from nature. The RiverHavens aim to reset the equilibrium between urbanism and nature, by allowing for fully immersive experiences in nature and celebrating the city as something distinct.

The immersion of the RiverHavens is largely due to a set of multilevel pathways, Living Bridges, that cross each other and the river. They allow people to access both sides of the river in multiple ways. From within the RiverHaven, they obscure the view of the city, but from the top of the bridges they celebrate the city by leveraging their height to offer rarely seen views. They reinforce the human desire to explore and also extend park land by building up and over the lake. Building on the desire to explore and interact with nature the RiverHavens will feature Natural Jungle Gyms with trees with sturdy low hanging branches and strong, fast growing vines. The Natural Jungle Gym encourages young children to engage more closely with nature. These also create a natural family zone within the Haven allowing people to choose to sit away from loud children if they wish to have a quieter experience.

The trees from the Natural Jungle Gyms will be augmented with other large trees to build up walls of trees around the haven. Vertical gardens featuring native plants will also add to the trees and Living Trees to make up the natural skyline of Chicago.

Many of the RiverHaven locations are very close to Lake Shore Drive or other busy roads, in these areas, a noise reducing Natural Screen covered in moss and ivy will extend up from the river and curve towards

## Discussion (continued)

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the road. This will allow people looking out from the RiverHaven to see only vegetation between the ground and sky. Like in the Koolhaalf tubes on the RiverWalk, noise cancelation speakers will complement arched structures, cancelling and bouncing sound away from the river. Vegetation will also add to the sound insulation.

Taking away noise is only one aspect of creating a sense of respite in the RiverHaven, they will also highlight the sound of moving water. Small rapids and fountains will be built into the river to create a natural Peaceful Soundtrack for the RiverHaven while also cleaning the river by encouraging faster water recycling.

To reinforce the sense of cleansing the RiverHavens will offer elements to enable people to create rituals. Wishing well fountains and walking Pebble Paths filled with smooth stones will play a prominent role. The paths of smooth stones encourage people to remove their shoes and walk on the pebbles, feeling the contours of the rocks under their feet.

To build on the tactile nature of the pebble paths and to encourage a closer connection to the water, the river bed would be very accessible and entice people to place their feet in the river. Scalloped pavement would gradually descend into the river, allowing water to be captured in the lower scallops and offering different depths of water. On warm days people could relax on the lower scallops resting their feet in the water and kids could safely play in the water. Patterned pavement and sitting areas increase visual interest and encourage social interaction. In times of flooding the scalloped pavement would also protect the riverbanks from erosion and damage.

In addition to physical elements, rituals would also be encouraged through an area of undefined open space, Terraced Land. This terraced land would be covered in clover fields. Clover is much easier to upkeep in comparison to grass turf, but it is still very pleasant to look at and sit on. This terraced land enables ritual by allowing for multiple uses at once, each terrace acts as a natural boundary

creating many areas of use. Each terrace would be wide enough for several people to gather and the system would encourage people to conduct Outdoor Classes. Outdoor painting, tai-chi and yoga classes would be offered to give the RiverHaven a feeling of destination and highlighting the local talent of Chicago. The terraced land creates natural boundaries allowing other terraces to be used for families or individuals looking to nap or rest by the river. In the summer they provide an area for kids to roll down the hills and in the winter an area for sledding.

The RiverHaven creates an intimate atmosphere by isolating a part of the river. Each RiverHaven also pays close attention to the feeling of the transition into the RiverHaven. People enter the RiverHavens through Framed Entrances from the greenways that canvas the city. A archway made of trees, wood or and ivy covered structure would create a gateway. While people could easily walk on to the terraced land adjacent to the gateway, it acts as a welcoming symbol of the RiverHaven. Fragrant flowers will surround the archway enticing passersby with seasonal scents.

Individuals will be able to escape to a small nook in the maze of pathways, lie on the clover, and walk on the massaging pebble pathways. Friends can come and laugh with their feet in the water, reconnect during a yoga class. Families can come and roll down the terraced land and swing on the natural jungle gym trees to instill the values of nature in their children.

The RiverHavens will be protected by a Zoning and Pace Regulation established by the FEP Network that reserves a specific amount of riverfront land and also protects the pace at which the surrounding areas can be developed, protecting the character of the RiverHavens over time.

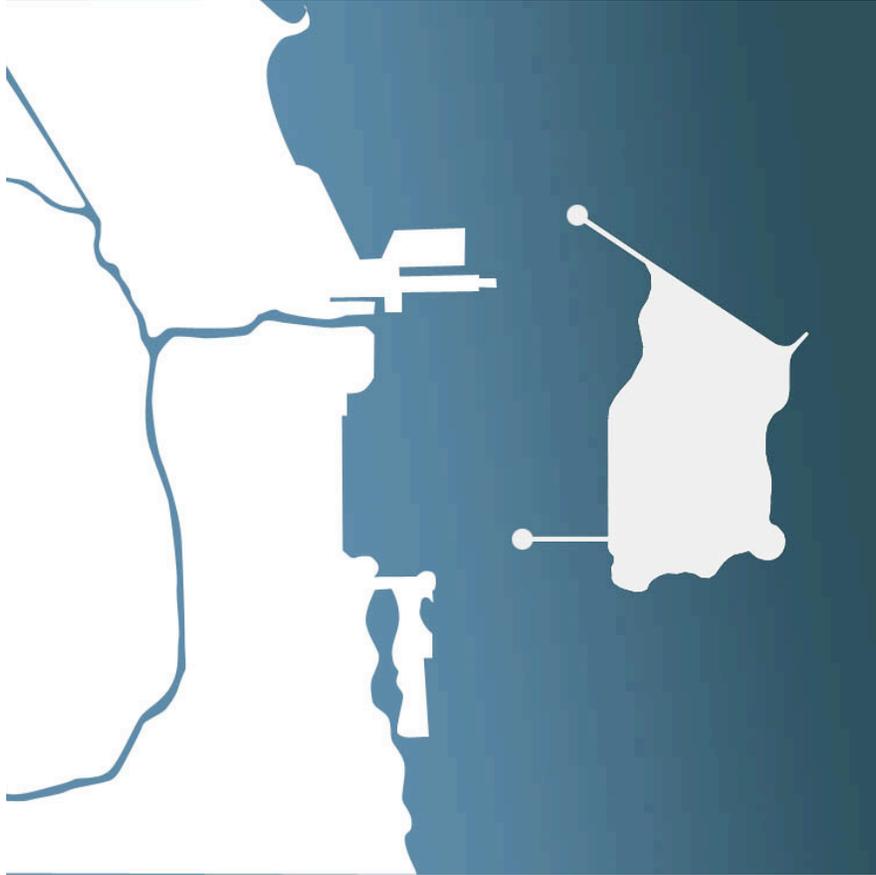
## Scenario

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Molly has been working long hours as a paralegal downtown and finally has a Sunday off. She has recently moved to Chicago from Manhattan. In Manhattan she often took road trips to help her relax and recharge after hard projects at work. Her job requires her to be in a city and while she loves her profession the intensity of cities wears on her over time. Her road trips in NY were always wonderful but required so much planning that they never happened as often as she wished. Her move to Chicago was largely driven by her interest in Chicago's strong embracement of nature within the city. This Sunday instead of a road trip Molly heads down to the South Lagoon RiverHaven that's walking distance from her Lincoln Park apartment. She hits the Greenway and immediately begins to relax, she sees the archway and starts to smell the hyacinth and her breathes get a little deeper. Even though it's not necessary she walks under the archway, it reminds her of the archway in the park in NYC, it was also not connected to anything, but she also always walked under that. She grabs a mat and heads to the bottom terrace, picks a spot by the rapids, thinks about the 2016 Olympic river surfing event that was held here just 8 years ago, lies down opens her book. Her eyes drift from the pages and she looks up at the grass covered pathways the vertical gardens the sky and immediately falls asleep.

A few feet away Julia has just finished a yoga class and is heading down the terraces towards the natural jungle gym at the entrance to one of the bridge pathways. Her son, Felix, is upside down on one of the low hanging branches and her husband, Timothy is cheering him on from the shade of the pathway. Felix sees her and jumps down from the tree branch. Though sad to leave, Felix is excited for their stick racing competition which has become a family ritual when leaving the RiverHaven. They gather small sticks from the ground and enter one of the low crossing bridges. They cross the bridge until they are half way over the river and on the count of 3 drop their sticks into the river and watch to see which one gets picked up in the current,

making its way down the river first. Julia's wins today and they walk the rest of the way across the bridge to finish their walk home.



# Islands

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Burnham Island and the beach islands establish a new recreational and cultural coast on Lake Michigan

**Related System Elements:**

Membership  
Virtual Guide  
Barge Fleet  
weMonitor

**Superset Elements:**

NA

**Subset Elements:**

Integrated Museum  
Submerged Beach  
Levelator Pier  
Beach Islands

## Fulfilled Functions

- 8 Create opportunities for rituals
- 13 Make visually appealing
- 14 Make tactfully enjoyable
- 29 Establish focal points
- 30 Establish curiosity
- 31 Encourage/motivate action
- 33 Reward effort
- 34 Refresh offerings/activities
- 35 Stimulate the mind
- 36 Stimulate the senses
- 38 Activate the body
- 39 Provide respite
- 84 Promote unique character and diversity
- 88 Connect with public transit
- 89 Define desired character
- 90 Optimize zoning and pace

## Properties

- A levelator pier that will provide access to different sizes of boats
- A visitor center
- Integrated museum which has underwater parts, and which also has focus on exhibitions about nature and Chicago
- Walking path
- Wi-fi access and working places
- Beaches & submerged beaches
- Beach cabanas
- Areas designated for sailing
- Restaurants and cafes on different locations
- Wavebreakers that will protect beaches from the erosion of waves
- An area for festivities, celebrations or festivals

## Features

- Creates totally new lands for recreational purposes, just next to downtown Chicago
- Offers a new wide area for celebrations, for big events in the city
- Creates new coasts and new beaches
- Offers visitors a beautiful cityscape of Chicago
- Enables working, having a rest or doing sports far from city noises
- Creates a utility for the landfill that is obtained while digging for Deep Tunnel

## Associated Design Factors

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- 11 Maintaining the Innocence
- 14 Zoning over Time
- 42 The lake front is transient and not a destination

## Discussion

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Within Featured Environment Project, two types of islands are envisioned. First one, is a small island: Numerous instances of this type will serve as new beaches across already present beaches. They will accommodate limited features of the islands project, only the ones that are explicitly related to beaches: Submerged beaches, cabanas, swimming areas. Second type is a large island of 1 square mile. There will be only one island of that type, but all the features listed will be present on it. It will be located on east of downtown, around half a mile away from mainland. Throughout this discussion, we will refer to it as “The Island”

The access to The Island is provided by boats. Public transportation is carried on with large boats. On the other hand, personal or small scale public transit is also enabled.

The point of entry to The Island is the levelator pier. Covered passages with walking platforms provide comfortable and fast transfer from boat to island. Besides providing access to the island, levelator pier houses some facilities that offer various activities to the visitors. A cafe & bar offers refreshment to visitors while enjoying a great view.

First facility that a visitor finds on The Island is the visitor center. Visitor center informs the visitors about the activities on the island, while offering navigation. It serves as a hub between Integrated Museum, Park and the levelator pier. By keeping the track of the flow of visitors, it plays a critical role during emergency situations. Also, it houses services like Wi-Fi access, administration offices etc.

One of the main attraction on The Island is the Integrated Museum. Museum focuses on natural exhibitions, shows the relationship between Chicago and its environment through history. Having the entrance on the surface of The Island, it has subterranean and underwater parts. Underwater passages offer views of what is lying under Lake Michigan through glass windows, which remind Chicago citizens their responsibility to environment, to the lake which holds 90% of the drinking water of America. As the museum is not enclosed in urban areas of Chicago but founded right next to the water, it will accommodate ecological researches.

Observation towers on the island provides a good view of Chicago, on days and nights.

## Discussion (continued)

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Being 75% of the size of The Central Park of New York, The Island will be a big park. A big open green space only a couple of minutes away from downtown Chicago, but far from its noise and chaos. Walking paths, open areas provide many sport activities to Chicago residents, individual or in group. Communication pathway can help people to keep track of their activities, help them to design a course according to their available time, to their physical capacity and need. Several open areas are able to accommodate big events like concerts, festivals, farmers market or celebrations. Some areas reserved for ice skating keep the island attractive even during winters.

Calmness that is present on The Island makes it a perfect place to study or work. Several working places of different sizes provides productive working environment for individuals or groups.

Beaches are found along the coasts of The Island. Submerged beaches complement regular beaches. On submerged beaches, lake water of 1 foot deep covers the surface of smooth pebbles. Constant stream refreshes water all the time and keeps it clean. As they are highly accessible and far from being dangerous, they connect water with everyone. While people can walk bare their feet in water, they can also sit and enjoy the scenery while getting refreshed. Cabanas and cafes along the beaches and even on submerged beaches make them even more attractive and make them focal points on sunny days. When necessary, these beaches will be protected by wavebreakers so that they don't get washed away with waves.

Wavebreakers create areas protected from waves, but wind is still present. These areas will be suitable for activities like sailing, rowing, diving and so forth.

## Scenario

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Margeret, a 65 year old Chicago citizens decides to take her two grandchildren, Alice and Steve to The Island on a friday morning. She makes sure that they take their swimming suits for the trip. She left her house with them, takes a bus and arrives right at the boat pier to get to The Island. They together take a comfy-boat, which travels to the island frequently. They go upstairs and take their seats on the terrace, where they can have some fresh air, look at the scenery, and have enough room to put Alice's bike.

When the boat arrives at The Island after a 5 minute travel, they set foot on the levelator pier. As it will be a long day with full of activities, Margeret decides to save some energy, and tooks the wlking platform, while Alice rides her bike right next to her on solid pier, under the tent that provide some shadow on this sunny day. While moving towards the visitor center ahead of them, they look around. They see a series of sailing boats, all with red sails. Foloowing each other, they slowly sail on calm waters, an area that is allocated to water sports training, clearly designated by wavebreakers and buoys. On their right side, they see a cafe, right next to where people can tie their yatchs and enter the island.

When they arrive to the visitor center, Steve sees the sign that lets him know that he can connect to The Island Companion Bluetooth network with his cell phone. He does so immediately, and is notified of the shark exhibition that is just opened in the Integrated Museum of Nature. He tells her grandmother and Alice that he wants to go there, and Margeret agrees to do so, as she wanted to see the history section for a long time. But tells him that they will first visit the observation tower and see Chicago cityscape from the best possible location.

The museum building seems smaller than they imagined. But the brochure they get from the visitor center shows aquariums that can not possibly fit that building. But huge lobby that greets them hints how big is the museum as it continues to expand towards underground. The collection around them has two themes: First one is about how Chicago and the environment, especially Lake Michigan

and Chicago River effected each other through the history, in terms of growth, pollution, natural life, water quality etc. Second theme is ecientific, it is about water and life. As the Integrated Museum is in a close collaboration with some of the most renowned researchers on large scale projects, it became an attraction for tourists from outside of Chicago and even US. Margeret thought she'd be better spending another day for a detailed visit to the museum, and go to shark exhibition as soon as she can, as Steve becomes very impatient with time. Following the signs, they suddenly find themselves in a large underwater corridor (hall?). The view of the lake alone impresses them, But the aquaria that lies ahead hold sharks and that is the first thing that Steve wants to see.

After visiting the exhibition, instead of going back, they left the museum from the second gate, that opens to the park. Alice configured her cell phone so that it works with the wireless connection to act as a personal track designer/record holder. She followed the pathway reserved for bikes. She passed along other poeple running, walkin, reading, fying kites etc. Some people were studying away from the city noise in areas specifically reserved to them. There were even some rentable places reserved and fully equipped for group meetings in distant quiet areas of the park. She passed by the fountain/pool where children were playing under the misters. She used to come here during winters, as it becomes a big ice-skating area. A couple hundred yards away from the misters, she noticed a festival going on.

After meeting with her grandmother and brother, they decided to have a lunch as it was already noon. They went to the shore on the west side of the island. There, they had a good meal while enjoying Chicago cityscape. They noiced most of the customers of the restaurant were people who quly got to the island during lunh break. As the island was close to downtown, it quickly became a quiet haven where people went during the day.

After lunch, they went to the beach. They rented a cabana.

## Scenario (continued)

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They preferred the sunken beach as it is also refreshing for Margeret. She preferred to just walk bare feet on the water While Alice and Steve were further away.



# Canals

A network of canals throughout the city connecting the North and South branches of the Chicago river with the East / West branch in the Loop. The canals will extend the footprint of the river throughout the city, providing a pleasant natural experience for residents as well as additional storm water management.

**Related System Elements:**

- Whitewater Tributaries
- RiverWalk
- RiverHaven
- Sidewalk Stage
- Barge Fleets

**Superset Elements:**

NA

**Subset Elements:**

- Sidewalk Stage
- Stop locks
- Brooks
- Watercourses

## Fulfilled Functions

- 5 Offer reasons for detour
- 6 Enhance commuters interaction with the featured environment
- 7 Encourage spontaneous excursions
- 10 Infuse urban nature
- 13 Make visually appealing
- 38 Provide respite
- 67 Clean public spaces
- 79 Encouraging performance
- 84 Manage storm water

## Properties

- Concrete lined canal bed and banks
- Landscaped areas on each side of canal
- Stairs/Ramps for access from street level
- A few slightly elevated stages throughout network
- Land graded to (depth of canal) below the level of the river
- Drainage system from surrounding streets and buildings
- Circulating waterfalls
- Stone steps
- Cleaning/Isolating stop locks

## Features

- Allows water to flow from river in the north and south branches and reconnect in the East/West branch of the river
- Facilitates storm water management by collecting and channeling storm run off from surrounding buildings and streets
- Provides elevated stage areas for informal performances
- Engages users with river
- Allows “Loop” for boats on the river
- Provides pathway for ice-skating and/or cross country skiing during the winter months

## Associated Design Factors

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- 18 Accessing riverwalk in emergency situations
- 46 Not enough river
- 47 No extreme elevation change
- 48 Can't zone sound
- 50 Stormwater is a wasted resource

## Discussion

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The canals will be created by grading the ground along the desired path approximately 10 ft below the level of the river at the connection points along the north and south branches of the river. The river bed and banks will be constructed with cement and there will be locks at the connection points to allow for the periodic draining and cleaning of the canals.

The canal system will follow the path of current streets in the downtown and surrounding Chicago area. As the current utility infrastructure for the city runs below the streets this would require relocations of the utility components along the path of the canal. As the infrastructure group is planning on consolidating all utility cables and piping into one utility corridor. This process will be much less difficult. The current plan is for the utility corridor to be placed just below the surface of the street. As the canals will be significantly below street level this will require a bit of redirection of the corridor along the path of the canal. The sewage tunnels will have to be relocated as well. However, a system of drains and pipes channeling rainwater from surrounding streets and buildings into the canals will greatly reduce the require size of the sewage piping as it will no longer have to accommodate for both rainwater and sewage. This will not only make the sewage relocation easier but also eliminate the need to treat the water that is mixed with the sewage.

The will be two different types of canals in the canal system, Brooks and Watercourses. Brooks will feature narrow, shallow bodies of water. This will create potential for more intimate interaction with the river and an alternative pathway on which to travel through the city. There will be periodic stairwells and ramps leading from street level down the canals. The area around the banks of the canals will be landscaped and include periodic waterfalls, fountains, benches, and elevated areas to facilitate street performers. As the Brooks will have a relatively low volume of water flow diversion and elevation changes will be used to create variations in the speed of the flow and ultimately the characteristics of the Brook. There will be sets of stone steps running across the canals enabling users to cross the canal.

The other type of canal, Watercourses, will be wider, deeper channels of water. The Watercourses will act as an extension of the Chicago river for boat traffic. The Watercourses will not however, accommodate barge traffic, catering instead to recreation and transportation. They will provide a significantly larger number of routes for water taxis and HydroConnect river shuttles. The Watercourses will also be ideal for touring the city in a private boat and will accommodate canoeing and kayaking. In the winter months the stop locks can be used to isolate sections of the Watercourse which can be used for ice skating or cross country skiing when they freeze.

## Scenario

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Steve is on riding the El on his way to work. He exits the train station downtown and walks one block north and proceeds down two flights of stairs to edge of the canal, away from the hustle and bustle of the street level traffic. He continues along the canal for another six blocks enjoying the sound of the water as is rushes through stones in the canal. As he walks he passes by a group of musicians performing on the sidewalk stage. A block before a gets to his office building he crosses the canal using the stone steps running through the middle of the water. When he reaches the other side he walks up the ramp back to street level and enters his building.



# Whitewater Tributaries

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A Whitewater tributary is essentially a section of the canal system that features significant drop in elevation in relatively short stretch of land creating a white water effect. This section would feature walkways alongside the water as well as green walls, native gardens, and shallow pools just outside the river banks.

**Related System Elements:**

NA

**Superset Elements:**

Canals

**Subset Elements:**

Poolscaping  
Native gardens  
Green walls

## Fulfilled Functions

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- 6 Enhance commuters interaction with the featured environment
- 7 Encourage spontaneous excursions
- 9 Blur boundary between work and play
- 11 Build on current habits of users
- 24 Ease access to system
- 87 Connect with public transit
- 88 Offer water transit

## Properties

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- Pump system
- Boulder lined sloped concrete channel
- Green walls extending from level of channel to street level
- Native plant landscaping along banks of channel and on Green wall
- Small pools on banks of channel
- Large stones surrounding pools
- Declining walkways alongside the channel
- Bridge connecting street level sidewalks that are disconnected by ww tributaries
- Bridge connecting walkway along canal
- Railings at street level along top of the Green Walls

## Features

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- Provides respite from urban environment
- Engages user's sense of smell, touch, hearing, and sight
- Encourages users to take alternative pathways
- Increases circulation of water in canal
- Provides pools for users to wade or soak feet in

## Associated Design Factors

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47 No extreme elevation change

## Discussion

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The Whitewater Tributary will pump water from the canal system and empty into a channel at street level. Like the canal, the channel bed would be constructed out of concrete but the banks would be a soil base. The banks will lined with large boulders and native grasses will fill in the area between the boulders. The bed will feature a variety of mid size boulders for the water to rush over and around.

Just outside the banks will be several shallow pools encircled with large boulders, similar to those along the banks. These Poolscape pools will serve as areas for people to sit with their feet in the water and observe the sound of the water, the smell of the vegetation, and the sight of an environment that feels drastically removed from the urban setting.

Tributaries will leverage the elevation difference between street level and the canal level throughout the city. This elevation difference will allow for water to experience a dramatic drop in elevation in a short period of time and result in the ability to create a boisterous white water stream.

As the channel will experience a constant decline from the street level to the canal there will be a wall on each side of the environment that will increase in height as one travels from street level to canal. These walls will feature Green Walls. These wall could be a combination of climbing plants in some areas and pre-vegetated panels in other areas. The tops of these walls, at street level, would be lined with railings to warn street walkers of the drop off. There will also be a bridge, or bridges, depending on the length of the tributary, that will connect street level sidewalks that are disconnected as a result of the Whitewater Tributary. These bridges will not only maintain normal traffic flow but also provide an alternative viewpoint from which to enjoy the Whitewater Tributary. Small bridges will also be used to connect the walkways along the canal that are interrupted by the tributary emptying into the canal.

## Scenario

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David works in downtown Chicago and is on his lunch break. His office building is a few blocks away from a Whitewater Tributary. As he is approaching the tributary he looks over the railing and surveys the area around the water from street level. He quickly realizes that there is no one else there and he will have the place all to himself. He reaches the entrance and starts down the pathway along the boisterous white water stream. As he descends the Green Walls on each side of him grow taller revealing progressively more indigenous plants. About halfway down the walkway he stops and sits down on a boulder at the wading pool and removes his shoes and socks. He swings his feet around to the inside of the circle of stones and places them in the pool of water. Refreshed by the cool water he begins eating his lunch. Over the next few minutes the sound of the water rushing over the rocks and the Green Walls surrounding him make David feel like he is not in the city. When he finishes his lunch he returns to his office, energized and ready for the afternoon's work.



# Sidewalk Stage

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The sidewalk stage adds destination appeal to the river and celebrates the local talent of Chicago. The sidewalk stage is an area designated to encourage ad hoc performances, build a community of local performers as well as vitalize the urban life of Chicago through music.

**Related System Elements:**

MobiMods

**Superset Elements:**

Canals

**Subset Elements:**

- Sidewalk stage
- Water tipping element
- Water token
- Water token receptacle
- Sidewalk stage manager

## Fulfilled Functions

- 3 Promote system image/ experience
- 4 Associate daily water usage with lake
- 5 Offer reasons for detour
- 7 Encourage spontaneous excursions
- 8 Create opportunity for rituals
- 12 Engage auditory senses
- 16 Engage gustatory sense
- 21 Support retention
- 23 Signal environmental transition
- 26 Signal arrival
- 29 Establish focal point
- 30 Establish curiosity
- 31 Encourage/motivate action
- 32 Support persistence
- 33 Reward effort
- 34 Refresh offerings
- 35 Stimulate the mind
- 36 Stimulate the senses
- 39 Provide respite
- 43 Enable personalization/ tagging of the system
- 45 Facilitate sharing
- 46 Enable community creation
- 48 Create community benefits
- 49 Attract members
- 50 Distribute member benefits
- 80 Encourage performance
- 84 Promote unique character and diversity

## Properties

- An open paved space along 1 city block of a watercourse canal
- A tipping system with water tokens and corresponding receptacles
- A place to relax, sit and eat
- A well managed system

## Features

- Celebrates local talent
- Allows for relaxation
- Creates entertainment focal point
- Makes tipping a enjoyable activity
- Engages local residents with the arts
- Provides a stage for up and coming artists
- Reinforces interaction with water
- Honors Chicago's heritage as a music city
- Supports local artists

## Associated Design Factors

- 2 Offer reasons for detour
- 4 Satisfying ritual adaptation
- 35 Ensure variety of performance
- 39 Reinforcing water
- 56 Lack of free time for spontaneous excursions

## Discussion

The Sidewalk stage is an open area that supports ad hoc performances. The open paved area will extend along one of the deeper canals, a Watercourse. It will be a large area extending a full city block to give ample space for the performers. The system will facilitate and encourage a variety of performers to vitalize the City of Chicago.

To build destination appeal, the Sidewalk Stage will feature benches, chairs, tables and light food/drink options through the use of MobiMods, thus allowing people to come and stay to enjoy the performers. The use of a full city block and both sides of the Watercourse allows for multiple modes of interaction. Those wishing to come and relax can do so, while others can choose to pass through merely enjoying music on their way. The sound of the music will also rise to the street level, enhancing the experience of those walking above. Its location on the Watercourse not only allows for barge cafe seating but also increases the amount of people that can enjoy the Sidewalk Stage as Watercourses are accessible to boats looping through the city.

The sidewalk stage will also vitalize the city by creating a downtown destination space at night. Currently the downtown Chicago loop is very quiet and empty in the evening, but if the sidewalk stage could mimic Prague's Charles Bridge it could be a vibrant evening destination of festive performers and crowds of onlookers.

The Sidewalk Stage would also strengthen the character of Chicago by honoring the city's strong musical history as a jazz city. This history makes the sidewalk stage a logical extension. The musical association of Chicago also draws many musicians to the city, which suggests that would be many interested musicians.

As a way to encourage performers to use this space, the system has developed a Water Tipping element to reward the performers for their contribution. The system encourages visitors to tip by making tipping an experience in itself. In the way petting zoos sell feed in bulk, the system will sell tokens in batches for people to distribute as they wish to the performers.

This system prioritizes tipping as a way to support the success of Chicago's local talent. The tipping element also functions as a way to keep the caliber of performers high, because those who are not picked by visitors to receive tokens are self selected off the sidewalk stage.

The system sees this as an opportunity to reinforce the river by incorporating water into the tipping system. The tipping tokens will be capsules of water: Water Tokens. Each performer will receive a Water

## Discussion (continued)

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Token Receptacle from the Sidewalk Stage Manager when they set up for the day or evening. As people place the water tokens into the receptacles, the tokens (capsules) break and the water is released into the receptacle. The water token receptacles will be air tight, eliminating evaporation so that when the performers leave, the water in the receptacles will be a measurement of tips earned. The sidewalk stage manager will measure and deliver the equivalent amount of money to the performer. The sidewalk stage manager is helpful to the system for monitoring the environment, providing the woken token receptacles gives the manager added purpose.

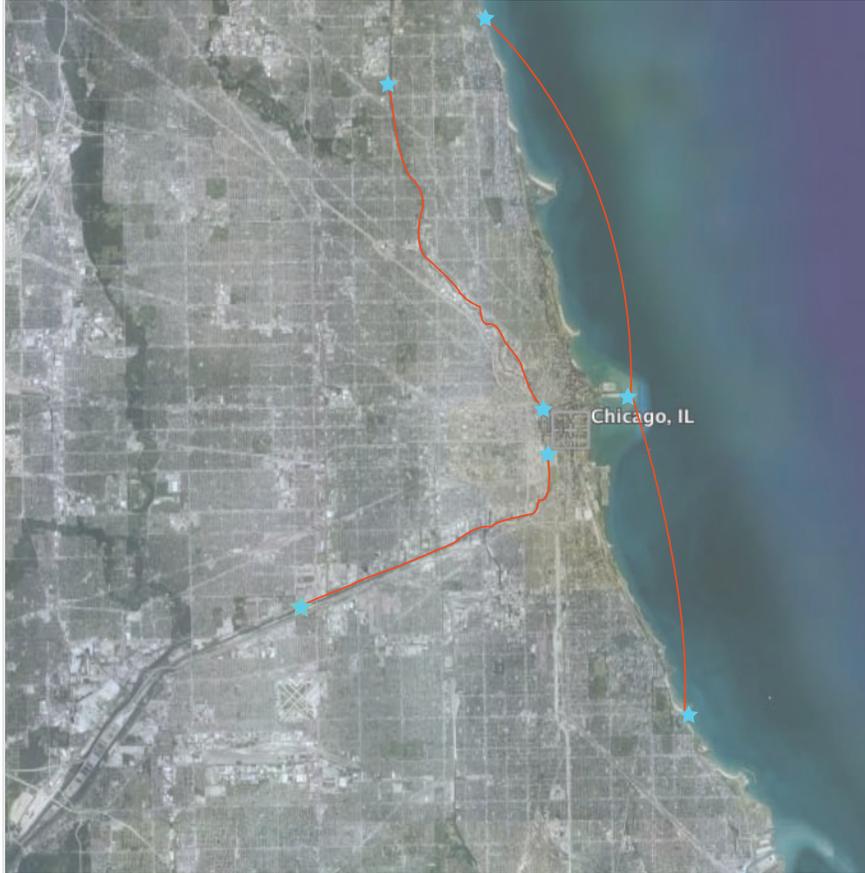
Aggregating performers in a central location not only gives a forum for performers but also enables Performer community. By giving performers a place to meet, connect and build a network of fellow musicians, the system is supporting and strengthening local artists by facilitating community formation.

## Scenario

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Alice picks up her daughter, Lily after Lily's piano lesson and they head downtown to the sidewalk stage. It was a saxophone player that Lily had seen at the sidewalk stage 3 years ago that initially gotten her excited about music. Now visiting the SideWalk stage was a family ritual for them. Lily was given \$8.00 in water tokens to distribute between her favorite musicians and she wandered up and down the block contemplating which her favorites artists were. Meanwhile Alice spotted her friend Laura, who was visiting from out of town drank and who had planned to meet Alice at the Sidewalk Stage. They drank a cappuccino while Alice described the sidewalk stage, "Its great, she said. Now there is a affordable and family friendly way to expose our daughter to the arts."

It began to get dark and Alice called to Lily to make her final decision so they could head home for dinner. Alice and Lily said farewell to Laura and headed home. Laura, who was originally in town to see her boyfriend, called him and suggested they stop and get a glass of wine at the wine barge at the sidewalk stage before dinner. She was really enjoying the sound of one of the Saxophone players and thought it might set the romantic tone she wanted for her rendezvous with Pablo.



# HydroConnect

HydroConnect is a system of transportation along the north and south branches of the Chicago river and among several places in and on the shore of Lake Michigan.

**Related System Elements:**

Barge Fleet  
Canals  
Islands

**Superset Elements:**

NA

**Subset Elements:**

Levelator Piers  
Hydroplane ferry  
River taxi  
You're in my seat  
Relax your way to work  
Company boat shuttle

## Fulfilled Functions

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- 6 Enhance commuters interaction with the featured environment
- 7 Encourage spontaneous excursions
- 9 Blur boundary between work and play
- 11 Build on current habits of users
- 24 Ease access to system
- 87 Connect with public transit
- 88 Offer water transit

## Properties

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- Fleet of hydroplane ferries and hydrofoils
- Fleet of river taxis
- Levelator Piers on island and lake shore
- Boarding terminals along river and canals

## Features

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- Provides alternative form of travel from city to northern and southwestern suburbs
- Provides alternative travel around downtown area
- Offers relaxing experience on water
- Provides access to island
- Facilitates storage of barge fleet
- Offers direct transit between locations along the lake shore

## Associated Design Factors

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- 41 Southern parks are far away
- 45 Water based transit is slower than mass transit

## Discussion

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HydroConnect will essentially be a water transit system. It will be active along the Chicago river and Lake Michigan. There will be boarding terminals along the north and south branches of the Chicago river and a fleet of boats will make scheduled stops at each station throughout the day. This will provide an alternative commuting option for anyone in the north or southwest suburbs. Additionally, the combination of the river and the watercourses within the canals will provide HydroConnect routes that will make water transit within the downtown area a practical alternative. In addition to offering a transit alternative these taxis will also provide a relaxing way to tour the city and another way in which to interact with the featured environment.

The HydroConnect system element will also have routes on Lake Michigan providing transit between lake front neighborhoods, the Islands, and park lands in the south. These routes will enable commuters or travelers to move between downtown Chicago and different points on the lake shore without having to take the congested and indirect land routes.

The boat fleets on each body of water will appropriately match the size and characteristics of each body of water. On the river the boats, or river taxis, will be longer, thinner boats that travel at lower speeds. They will also have a low profile in the water and provide passengers with and close encounter with the river. The boats travelling on the lake will be much bigger and much faster. As they will be travelling with less frequency and greater distances high speed Hydroplane ferries that can travel upwards of 50 mph while holding up to 300 people will be ideal for quickly transporting large amounts of people. Both types of boats will offer covered seating areas to protect against inclement weather and allow the routes to stay in service all year round.

To encourage people to incorporate water based transit into their routines, incentive systems will be put into place. You're in my seat is a feature that allows people to reserve a seat on a hydroplane ferry the evening before, guaranteeing them a seat the next morning and making their commute or trip more relaxed. Another feature, Relax your way to work would be present on all boats. Relax your way to work provides ample seating area, a cafe, and a viewing deck to make the boat atmosphere relaxing and enhancing the transit experience. A third feature is the company boat shuttle. Currently some companies offer shuttle services for their employees, the featured environment system sees this as an opportunity to greatly increase the number of commuters who interact with the environment. Companies would be able to lease hydroplane ferries or river taxis and use them exclusively for their employees. Since water transit often takes longer, the system

## Discussion (continued)

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sees this a a great way to make use of that time. Company boat shuttles would offer meeting space and the necessary amenities for working as well as the Relax your way to work features. This way the boat shuttle serves as a way for people to be more productive with their transit time as well as build and strengthen work relationships.

## Scenario

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Elaine walks to the Lincolnwood terminal and boards the river shuttle. After boarding she proceeded directly to her reserved seat. For the next 20 minutes Elaine forgets about her morning meeting schedule and enjoys the scenic view of the northern branch of the Chicago river. On her lunch break Elaine walks over to Navy Pier and takes a 15 minute lake ferry down to Jackson Park. After enjoying her lunch break she boards the ferry back to downtown.



# FEP Network

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The FEP Network provides the administrative support needed for the system. By combining elected provider representatives, a full time staff and partnering with city representatives the FEP Network can keep the system safe, provide variety and keep the system evolving to the changing needs of the city.

**Related System Elements:**

weMonitor  
Emergency Response Network  
Memberships

**Superset Elements:**

NA

**Subset Elements:**

FEP Town Council	Learning Exchange
Provider committee	workshop
Prototype space	Tech test environment
Media friends	Pace, Zoning, Sound
Event coordinator	regulations
SelfScore	

## Fulfilled Functions

- 2 Develop and maintain clear communication channels
- 57 Prepare protocols and recourse
- 59 Coordinate with response partners
- 61 Debrief personnel
- 63 Tend to landscaping
- 65 Maintain public safety
- 80 Manage the providers
- 81 Ensure brand consistency
- 85 Connect with public transit
- 86 Define desired character
- 87 Optimize zoning and pace
- 88 Choose development partners
- 89 Establish regulation
- 90 Enforce regulation
- 91 Engage with ombudsman
- 92 Reassess character

## Properties

- Elected council members to manage the system
- Monthly meetings to discuss new issues
- Elected committee with representatives from all partners and providers
- Partnerships with media outlets
- Partnerships with city officials
- Partnerships with law enforcement departments
- Partnerships with emergency departments

## Features

- Ensures safety of people within the system
- Manage offerings and themes within the system
- Encourages prototyping to evolve the system
- Encourages learning by enabling the different parts of the system to teach the others and learn from that
- Establishes zoning regulations
- Establishes development pacing regulations
- Establishes sound regulations  
Creates new offerings and festivals
- Encourages the close participation of the members of the system
- Encourages the use of new technology

## Associated Design Factors

- 1 Difficulty to frequent refresh offerings
- 4 Satisfying ritual adaptation
- 14 Zoning over time
- 24 Tacit knowledge
- 25 Technology updates

## Discussion

Success of an idea is based largely on its execution. The FEP Network is developed to ensure that the system is being well managed and that its good ideas are well executed. The FEP Network is a network of full time staff, partnership with city services, and a committee of elected representatives of the providers within the system. Responsibilities of the network include regulation, system improvement, promotion and safety. Transparency of decisions, flexibility and forward thinking are crucial to how the network works. The FEP Network relies heavily on information received through the weMonitor element to have real-time feedback always accessible.

System Partnerships are a crucial part of the networks responsibility to manage promotion of the system and keep the system safe. In both cases the specific details are determined by the system but the expertise is leveraged from outside partners. Together, as representatives of all aspects of the system, the network decides the best way to promote aspects of the system and a Media Partner as a full time staff member of the network is responsible for working directly with the media consultants to deliver on the goals. For safety, a similar method is used. A City Partner as another full time staff member is responsible for interfacing with the city services of fire, police, and EMT. The city partner communicates elements about the system that are unique to the rest of Chicago and works with the city officials to develop training protocols to combine the domain expertise of the city officials with the detailed system expertise of the FEP Network.

System Regulations are an important FEP Network responsibility. They are necessary to ensure that the system honors its founding principle. Domain areas are pollution regulations, which involve waste management within the system; noise regulations within the providers offerings and for boat traffic; zoning regulations, including the preserving greenspace; and pacing regulations, regarding the speed at which the development zones are allowed to develop. By delaying development this system is preserving its ability to develop in the future.

System improvement responsibilities cover content management and adaptation. It is important for content generation and brand management to be determined by a fully representative committee as the brand is defined by all of its components. Examples of content generation are the development of themed events and reoccurring festivals that feature the environment. To further extend the brand, an Event competition would be opened to the providers and the public. This will get people excited about events and festivals and strengthen the tie between those that use the system and those that run it.

## Discussion (continued)

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Adaptation is also crucial to the on going success of the system. To help the system adapt, the FEP Network, will focus on instilling a sense of flexibility, forward thinking and continual learning. As needs change and protocols need to adapt, the FEP Network will create a Learning Exchange Workshop. This workshop will leverage the thought that people retain information best when they teach it, so the workshop will require members of the system, providers or city partners to teach each other their learnings so that they themselves retain the info.

To keep the system on the cutting edge of technology, the FEP Network will offer a Tech Test Environment. This environment will be a interactive location that allow providers to experiment hands on with new technology. The technology will be demonstrated in relevant and provocative ways to push the thinking of the providers. This environment will also be connected to a Prototype Space. This is a physical space that is a way for the providers to temporarily rent out a space that is highly adaptable that will enable them to experiment with the application of new ideas to their offerings in a low risk way. This will also be interesting to system visitors, as people are always curious to see something new. There is a lot of benefit in giving providers a safe way to experiment while also providing variety to continually engage the system visitors.

Finally to really motivate the providers to take advantage of these adaptation support offerings, FEP Network members will be evaluated quarterly through a Self Score System. The Self score is a score card where members evaluate each other on their flexibility, forward thinking, ability to incorporate new ideas and to bring in new research. The self score also requires people to score themselves. In this way providers are motivated and almost as importantly reminded to constantly think of ways to improve the status quo.

To reinforce the FEP Network's mission of transparency, every other month there will be a FEP Town Council that is opened up to the public to share

issues and decisions made as well as to give the public a forum for communication with the system.

## Scenario

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Alice was concerned about rumors that a new Island was going to be built in the lake near her house on the south side. She had heard many conflicting stories and was looking forward to the upcoming FEP Town Council as a way to get the true story as well as share her concerns. She rarely went to the meetings but at times like this was very reassured that they exist. The last time she went to one was over 4 years ago when they opened up the tech test environment to the public. She was fascinated to see what was possible with water, the research showed ways to transfer sound across water and she and her daughter Lily had had so much fun sending animal sounds across large bodies of water. What was even more exciting was to see that the next year, alerts using the same technology were put in place.

Laura, Alice's close friend who was in town this week, also reminded Alice how progressive Chicago was. Laura lives in Manhattan, and yet Laura's comment the other day really drove home the value Chicago's environmental mind set. Laura said, "I always feel so centered in Chicago, its so nice to be in a city that's near water, it's so centering". It was as if Laura had completely forgotten about the water that surrounds the island of Manhattan! Laura was proud to have Lily grow up in a city that was so able to achieve the goals it set.



# Barge Fleet

The Barge Fleet is a crucial enabling element of the Featured Environment system. It better enables the system to maintain itself, adapt to future needs and preserve the character of the environment.

**Related System Elements:**

Canals  
RiverWalk  
MobiMods

**Superset Elements:**

NA

**Subset Elements:**

Plantar barge	Feature barges	Open topper
Fixer barge	Theater barge	TopperWarehouse
Mr. Fix-it crew	Floating market	
Foldable cranes	Modular Toppers	
Sweeper	Sunken topwper	

## Fulfilled Functions

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- 3 Promote system image/ experience
- 5 Offer reasons for detour
- 7 Encourage spontaneous excursions
- 8 Create opportunity for rituals
- 9 Blur the boundary between work and play
- 10 Infuse urban nature
- 63 Tend to landscaping
- 66 Clean public spaces
- 78 Modify affected elements

## Properties

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- Large entertainment barges with removable tops
- Series of barge toppers
- Foldable crane
- Large fixer barges
- Fixer crews
- MobiMod barges
- Sweeper attachments for barges
- Tugboats for barge movement

## Features

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- Allows for easy access to the system from the water
- Allows for speedy large scale landscape changes
- Allows for greener more natural zones by developing on barges on the water surface rather than on land
- Allows the system to prototype by investing in the significantly less expensive barge development
- Celebrate the city by encouraging people to spend time on barges that circle the city

## Associated Design Factors

- 1 Difficulty to frequently refresh offerings
- 2 Offering avenues for detour
- 4 Satisfying ritual adaptation
- 5 Infusing Urban Nature
- 10 (Over) Stimulating the mind
- 11 Maintaining the innocent
- 15 Obstructing the river view
- 22 Recognizing significant social trends
- 23 Slow repairs
- 39 Reinforcing water
- 40 There is limited space on the river walk
- 46 Not enough river

## Discussion

As a set of many multifunctional barges and tugboats, the barge fleet leverages the space provided by the river, canals and lake. Access is eased for maintenance changes and development can be pushed on to the surface of the water through the use of barges to keep undeveloped space along the water for green spaces.

Maintenance needs of the system are great. Landscaping needs tending and rotation in order to keep it both functional and seasonal in all seasons. One barge in the fleet is a PlanterBarge. The PlanterBarge allows a team of workers to loop through the canals, RiverWalk and non beach areas of the lake front to swap out plants and seasonal decorations. The plants would be taken off-site to the city’s vertical farming facilities to be tended to in the off season until it can be again placed in the system. This creates a seasonal and closed loop system for decorational landscape.

Landscape is not the only thing that would need to be maintained. For this purpose FixerBarges have been created to fix and repair the physical elements of the system. The crews on the barges will be outfitted with the necessary tools and expertises to address issues on the barge. The barges will be staffed with Mr. Fix-it crews. These crews are made up of multidisciplinary workers that represent a wide variety of skills. Multidisciplinary groups bring different view points to problem solving allowing things to be fixed better, more completely and systemically. This approach cuts down on ‘fixed just enough’ repairs and lowers the overall amount of repairs needed.

To facilitate the transition of landscape and hardscape to and from the barge, foldable cranes will be a part of the fixer barges. Foldable cranes fold into the surface of the barge, allowing the cranes to be hidden from view until they are needed and minimizing visual noise of the tall cranes on the barges. Maintenance needs also involve the water and FixerBarges would have Sweeper components on the back of them that would capture debris along the water surface as they made their travels along the river or canals to provide other maintenance solutions.

As seen with the MobiMods, some barges will serve entertainment purposes. These barges will bring cafes, work spaces and light retail opportunities to the system. These MobiMods allow for recreational development to occur on the surface of the water which promotes greening of the system. They also promote adaptability, as the system only has to invest in light infrastructure that makes it easy to change offerings to adapt to evolving needs.

Other entertainment focused barges are FeatureBarges. These barges offer a variety of different features through a system of Modular Toppers.

## Discussion (continued)

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Toppers include Sunken topper, which holds water for a swimming pool in the summer and then is frozen for ice skating in the winter. The pool feature allows people wary of swimming in the lake to still swim and enjoy the lake by swimming in a pool on a barge in the lake. These barges could tour out into the lake to also provide a view back to the city. In the winter the barges with rink features could loop through the city allowing people to ice-skate while touring through the city. Other toppers include Open Topper which is flat allowing for multiple uses, most notably a Floating Market and a Theater Barge. These open toppers would allow for modular pieces to be added to them. The weekly farmers market could make its rounds through the canals and along the river for people to more easily access local produce. The Theater barge allows concerts to be held in the center of the river or canal and open both sides of the banks for seating. This system of FeatureBarges also makes it easy for the system to quickly respond to trends. Creating a barge topper to respond to a specific trend requires little resources and allows the system to offer temporary offerings. Also by using the movable barges, no offerings are constants, allowing for variation of features which keeps peoples interests peaked. It also allows the system to offer many features without having to commit to them all at once.

To store the barges and the toppers, undeveloped space south of the city along the south branch of the river will be acquired and the TopperWarehouse would be build. By using toppers the system is able to vertically store the multiple toppers which takes less space than creating and storing a specific barge for each feature.

## Scenario

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Alice and her daughter Lily are planning a day with Alice's friend Laura. Laura, who lives in New York is visiting her boyfriend Pablo, who lives in Chicago. Alice really wants to show off Chicago to try and convince Laura to move here.

Alice decides they'll start their day off heading down to the RiverWalk to pick up the PoolBarge shuttle. Enjoying the sun by the pool out in the lake is one of her favorite summer activities. She feels so far from the hustle of the city and the view is always amazing out there. The PoolBarge shuttles run often so she knows they can stay only as long as they want. She hopes Laura will return in the winter too as skating on the barge that winds through the canals is such a great way to see the city. Alice never like ice skating before, it just felt like you went round and round and made no progress, but this way the moving barge gives you the impression you're actually skating somewhere!

Next they'll grab some groceries for their dinner. The local produce in Chicago is such a great asset and the floating market is so quaint with all of the farmers displaying their produce under the canopy of their tents. Lily loves it too, she runs from vendor to vendor trying all the free samples and Alice feel safe letting her roam since the barge gives the space set boundaries and Alice knows she can't go far.



# weMonitor

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A network of computers, system staff, and citizens that monitor changing conditions in the system in order to identify hazards and mitigate damages.

**Related System Elements:**

Canals  
RiverHavens  
RiverWalk  
FEP Network  
Emergency Response Network

**Superset Elements:**

NA

**Subset Elements:**

Eco-Model  
Embedded Sensors  
Patrol  
Surveillance Cameras

## Fulfilled Functions

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- 52 Track usage patterns
- 53 Monitor wildlife
- 54 Optimize flow
- 55 Coordinate flow
- 56 Identify potential hazards
- 57 Take preventative action
- 58 Prepare protocols & resources
- 59 Realize emergency
- 60 Coordinate with response partners
- 61 Alert endangered parties
- 63 Realize current status
- 70 Inspect for damages
- 71 Report the damages
- 76 Reassess environmental trends
- 77 Reassess social trends

## Properties

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- Fleet of patrol boats
- Collection of patrol staff
- Series of surveillance cameras
- Set of sensors built into infrastructure
- Computer hardware and database
- Smart eco-system simulation model
- Online forum for public

## Features

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- Monitor the waterfront for safety and regulation purposes
- Assist people and vessels in distress
- Provide video surveillance
- Wirelessly connect emergency response and patrollers
- Sense breaches to structural integrity of infrastructure
- Notify authorities of system breaches
- Run predictive statistical models on eco-system
- Provide public forum for input

## Associated Design Factors

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- 17 Can't see underwater (monitoring)
- 18 Accessing riverwalk in emergency situations
- 22 Recognizing Significant Social Trends
- 23 Slow Repairs
- 26 User Damage Reporting

## Discussion

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The weMonitor combines computers, staff, and citizens to help monitor the system to identify hazards, mitigate damages, and identify potential improvements. The patrol boats are equipped with on-board sensors to monitor and sample water quality and monitor and track marine life. Patrol boats regularly troll the water system to also inspect for visible damages and help regulate usage. They follow the river branches and certain canal ways. In cases of emergency, they can be notified on their communication devices by the city emergency services team. Since they are roaming, they can respond to and arrive at the scene of the emergency quickly.

The patrol boats also receive information from the sensors embedded in the system infrastructure. The system will likely eventually use nanotechnologies that monitor materials and are capable of self-healing. However, should the sensors detect damage to structural integrity in a bridge, for instance, or any other change in behavior, the sensors can notify the patrol for additional inspection.

The system can also be notified of changes in behavior from the surveillance cameras inconspicuously placed around the system. Beyond ensuring safety and deterring crime, the surveillance system helps track and understand flow so that the system can be optimized and the experience can be improved over time.

The information will be kept in the system data repository. Here, it will be combined with inputs from other services and tracking mechanisms. Multiple variables allows the system to create an algorithm to help predict usage patterns and environmental changes. The eco-simulator model will help planners optimize the system for weather conditions and usage.

Lastly, this information will be supplemented by input from users. People can go online to the system's site where they can answer surveys, post concerns, and offer feedback as to how to better design the system experience.

weMonitor also has a mechanism to capture information from people who are not necessarily motivated to self report. A feature called Voluntary researcher leverages the work residents are already doing by creating a vast network of resident partnerships. The system will target clubs that focus on a variety of hobbies. For example, photographers can be documenting information that is valuable for the system without even knowing it, birders will have a archive of migration patterns to more easily recognize anomalies than the system. All information captured by the weMonitor system will feed into the FEP Network to determine the necessary action needed.

## Scenario

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Craig has been working for the city water patrol for nearly a decade. It is seven in the morning and he boards his patrol boat to set out on the river just like every other morning. Craig's first task every morning is to complete a loop around the rivers, canals and lake front to inspect for damages, identify errant boats, and assist any water travelers in need. As his boat trolls the waterways, the on-board sensors collect data on the water quality and marine life. Craig looks at the color-coded display on his dashboard to see how the water quality looks. As usual, the screen is lit blue, which means the water quality is high and no foreign contaminants are detected. Craig also checks the radar, which picks up fish activity in the area. The fish are particularly active in this stretch of river, and have been ever since the water quality increased and the city installed the underwater fish habitats. All looks normal, Craig notes, but there is nothing for him to record since the sensors wirelessly stream the data on water quality and wildlife back to the system. The system aggregates the data and continually updates various models to be abreast of any changing characteristics.

As Craig nearly completes his first loop, he gets a message that a sensor in the bridge in the south branch went off. That most likely means there was mild structural damage to the bridge. However, since the advent of self-healing nanotechnology, there is nothing to be concerned about. Still, Craig has to inspect the bridge and ensure that it is not at risk.

On the way to the bridge, Craig passes some of the barges housing Mobi-Mods which have started to create a bottleneck in the river. There are a lot of customers out on the riverwalk this morning, and the barges are lining up to serve them. Not wanting to let the barges obstruct flow, Craig signals to them to keep moving and anchor down river at an open riverwalk slot. That should alleviate the bottleneck and also get some pedestrian traffic down the river.

Craig reaches the bridge and identifies the particular sensor that went off. He can see the slight fissure in the material that has already started to restore

itself. Still, as a matter of protocol, Craig contacts the system authorities to let them know he can visually confirm the healing. He recommends that technicians check the bridge later in the day and to keep video surveillance on it to make sure it heals correctly.

As the morning wears on, Craig checks his dashboard for a weather update. The eco-model simulator indicates that there is a slight chance of water levels rising due to a large storm moving in. Craig requests various scenarios to be run to determine what the effect would be on different sections of the river as well as the wildlife. The model confirms that, except for some heavy rain, the system has plenty of capacity to weather the storm.

On his way back to the boat dock, Craig remembers the fish he saw on the radar. It would be pretty nice to allow fishing during dusk on the south branch, Craig thought. He decides to jump online and fill out a system comment form urging them to allow fishing. After submitting the proposal, Craig receives a message thanking him for his input and offering him a free coffee at one of the riverwalk coffee providers. Craig pulls into the barbor and docks the boat. Another good morning.



# Emergency Response Network

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A system that alerts and helps evacuate users during emergency situations and coordinates with response partners to mitigate severity of damages.

**Related System Elements:**

Virtual Guide  
FEP Network  
weMonitor

**Superset Elements:**

NA

**Subset Elements:**

Information Terminals  
CEC HQ  
Press Room

## Fulfilled Functions

---

- 52 Track usage patterns
- 54 Optimize flow
- 55 Coordinate flow
- 56 Identify potential hazards
- 57 Take preventative action
- 58 Prepare protocols & resources
- 59 Realize emergency
- 60 Coordinate with response partners
- 61 Alert endangered parties
- 62 Debrief personnel
- 66 Maintain public safety

## Properties

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- Wireless network for informing users about latest situation and escape routes
- Escape route and response coordination calculator that provides fastest evacuation and optimum intervention
- Featured Environment Project (FEP) Central Emergency Communication Headquarters (CEC HQ)
- Visual indications
- Coordination with press to provide a healthy working environment for media

## Features

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- Coordinates with emergency partners to ensure a fast response
- Keeps users informed about latest situation and prevents panic
- Provides users with the best personal escape routes according to their location
- Uses present system elements like information terminals as visual indications to alert and direct users
- Ensures healthy working environment for reporters

## Associated Design Factors

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- 28 Efficacy of alerts
- 52 Constant sense of danger created by precautions

## Discussion

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The system organizes public areas to provide a pleasant urban experience to Chicago residents and tourists. But any unfortunate event may occur, be it natural or man-made. These events may threaten human lives as well as system elements and have to be addressed immediately. Managing these emergency situations is an important responsibility of system organizations.

When an emergency situation arises, the first step is to identify the threat. The location and the nature of the event is important, and FEP Central Communication HQ will always be collecting data from different sources. Predictions (about weather, contaminations, etc) are crucial, and HQ will be in constant touch with local authorities to stay on top of the situation.

Emergency situations may or may not be foreseeable. Regardless, the first responsibility of FEP is the lives of the users. Virtual Guide provides constant wireless communication with users, through their portable devices. Once an emergency arises, HQ monitors users' locations through the system. HQ gathers data about exact location and progress of the incident. Finally, response partners send their data to HQ. HQ combines and organizes this data to provide an optimum plan to all parties. The best route is calculated for emergency partners to intervene in the hazardous incident, with minimum obstruction from other users.

Meanwhile, HQ calculates evacuation routes for each user according to their location. Each user receives his personal evacuation route through his mobile device, which gets updated in real time.

HQ utilizes other elements like information terminals as visual indicators. They serve as checkpoints and signs by blinking. This also enables people who are not connected wirelessly to evacuate the system in a secure way.

Users' relatives and nearby residents are also affected by the event and will want to know more about the situation. In order to prevent misinformation, HQ coordinates information with the press and ensures they can work effectively to disseminate information.

## Scenario

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It is a normal day for John, who works in FEP Central Communication HQ. He keeps an eye on the news feed on his computer to see if there is any evidence of approaching winds or floods, but outside resources give no such indication.

Suddenly the sound of the alarm interrupts his work. The red light means that there is a fire on northern part of Burnham Island. Cameras and sensors calibrate automatically to give more detailed information about the fire, such as location, strength, and trajectory. The direction and progression of the fire is calculated according to wind data. John relays this information immediately to emergency partners, including the Chicago Fire Department, hospitals, and local police. He also calls in available barges from the fleet to provide assistance and operating space on the water.

John checks his computer to see the location of the citizens at the park. Unfortunately, there are many people around the fire. He immediately sends this information to HQ Secure Route software, which synchronizes escape routes for users and access ways for the emergency teams.

Once all the paths are calculated, John dispatches personal escape routes to users, along with the information that help is on the way and that they should remain calm. John activates the evacuation mode for the information terminals. They start to blink in different colors, to help users easily follow the paths to safety.

As the emergency partners arrive on the island by air and water, they understand the best path to the fire and get to work with haste. Meanwhile, the ferries are docked on the levelator piers, which quickly carry people to the end of the pier to board and make a quick getaway.



# Stormwater Management

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A combination of systems that capture, clean, and recycle stormwater.

**Related System Elements:**

Canals

**Superset Elements:**

NA

**Subset Elements:**

Permeable Sidewalks  
Eco-Tributaries  
Green Roofs

## Fulfilled Functions

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- 10 Infuse urban nature
- 68 Maintain water quality
- 69 Regulate pollution
- 85 Manage stormwater
- 86 Manage wastewater

## Properties

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- Permeable Sidewalks for capturing water on parking lots and alleys
- Green Roofs to enable buildings to capture rainwater
- Mini-refineries that help buildings manage water reserves
- EcoTributaries to capture and filter water using living organisms and plants
- Deployable water collectors to help capture excess stormwater
- Water-bladders to act as a buffer storage for excess of wastewater (during floods)

## Features

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- Prevents stormwater from mixing with wastewater
- Feeds subterranean water reserves and Lake Michigan with clean water
- Provides potable water to residences
- Helps to maintain the natural balance by ensuring sustainability to water reserves of Chicago
- Decreases expenditures on water cleaning, retention, and drainage

## Associated Design Factors

- 5 Infusing Urban Nature
- 30 People take the value of fresh water for granted
- 31 Flood water systems are not adaptable
- 50 Stormwater is a wasted resource

## Discussion

Stormwater is a potentially valuable source of potable water. Currently, stormwater mixes with wastewater in a combined sewage system. This increases amount of water that needs to be physically and chemically purified in order to provide drinking water to city residents. Furthermore, city hard-scaping creates an impermeable layer over the ground, which prevents the natural filtration process whereby soil absorbs and collects water to contribute to groundwater reserves. Additionally, the hard-scaping contributes to toxic run-off as rain water washes toxic residue and materials from the ground into the sewage system.

Stormwater management brings together systems that enable to capture water on 3 main surfaces that cover the city:

1. Alleys, parking lots, sidewalks
2. Roofs of buildings
3. River

Permeable Sidewalks uses new material technology that enables concrete to absorb and filter water by making it porous. These tiny pores provide a quick physical filtration. Stormwater that is distilled through this concrete surface gets drained by the ground or underground water capture systems. Easily applicable to the parking lots, sidewalks and alleys, permeable sidewalks it transforms 25% of Chicago lands into a surfaces that absorbs water before it get polluted.

Another considerably large surface that stormwater contacts when it reaches the ground is the roofs of the buildings. Green roof is a system that captures water for future usage, instead of letting it go through sewers. Water collected on roofs can be stored and filtered in mini-refineries that serve to a limited amount of area, like a single bulding. Stormwater captured in this way can be used to fulfill residents' daily needs, or to feed vertical gardens that embellish the facades of buildings. Mini-refineries also provide these buildings with the ability to recycle their own water, which increases the efficiency of the usage of water in cities.

No matter how much drainage system we build on the surface, the amount of rainwater that falls can be bigger than the amount of water that can be drained by these capture systems. To increase the efficiency of stormwater management, instead of letting rainwater that remain on surface flow and mix with wastewater in drainage systems, it will be directed to areas called eco-tributaries. These areas that are mainly built around Chicago River, supports natural filtration of water by using soil, plants and living organisms.

## Discussion (continued)

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Another system that helps to deal with excess of stormwater is deployable water collectors. These collectors can be transported by trucks. Once deployed on surfaces, they can capture and filter the stormwater that flows on the surface. They can be connected to nearby mini-refineries which are in the buildings around. In the absence of such mini-refineries, these collectors can be collected, transported back by trucks and water inside it can be transferred to reservoirs that hold water supplies for Chicago.

In case of heavy rain, Deep Tunnel can not accommodate stormwater, and it pours out huge amounts of wastewater to Lake Michigan. To encounter this sanitary problem, water bladders will temporarily store wastewater that is coming from Deep Tunnel. Water bladders are huge expandable and impenetrable balloons that are connected to it, and can hold huge amounts of wastewater as they inflate. When full, these bladders can be moved by tugboats or the water inside can be pumped back to Deep Tunnel when it is possible.

## Scenario

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Heavy rain is predicted in Chicago tomorrow. As the weather turns to gray slowly the city begins its preparations' by deploying water collectors around key locations. If there is a building nearby, necessary connections are made between mini-refineries and deployable collectors, to distribute water collectors capture to these buildings, in order to help them to refresh their reserves with fresh water.

Rain starts as expected around afternoon. People on the streets open their umbrellas but shoes remain almost dry, as the raindrops that hit the ground don't form puddles so fast. The color of the sidewalks and alleys turn darker as they absorb the water on the surface and filter them. Water that gets absorbed is transferred to underground water capture systems, that feed the Chicago's potable water supplies.

Meanwhile, the meters attached to mini-refineries show that they are slowly filling with rainwater. Besides connected deployed water collectors, they are fed by the rain that falls to the roof. With the permeable. Mini-refinery starts to filter the water that is just flowing into its reservoirs, as this water will be used by the residents. Even though vertical gardens are being irrigated by the rain right now, water in the refinery will be used for that purpose in future.

As puddles start to appear as the rain falls faster than it is absorbed, water collectors divert water to mini-refineries. Chicago dispatches some collector trucks to replace collectors that are full with new ones. Full collectors are transported to the nearest water reservoirs and emptied.

Water that still flows on the surface is directed to Eco-tributaries. These areas act like natural tiny lakes that filter water with micro-organisms and plants before it reaches Michigan Lake, which is the main drinkable water supply of Chicago.

When the rain gets really heavy, it fills the Deep Tunnel and forces it to overflow. All the water that does not fit, flows into water bladders where it is stored temporarily.



# Memberships

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A membership system that offers enrichment and customization for frequent users.

**Related System Elements:**

Virtual Guide

**Superset Elements:**

NA

**Subset Elements:**

NA

## Fulfilled Functions

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- 1 Inform visitors of available offerings
- 2 Develop and maintain clear communication channels
- 33 Reward effort
- 46 Enable community creation
- 47 Provide networking opportunities
- 48 Create community benefits
- 49 Attract members
- 50 Distribute/provide member benefits
- 51 Recommend related activities

## Properties

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- Personal Activity Cards that store user activities and preferences
- Activity Genius that prepares personal recommendations according to interests.
- Newsletter that informs members of current activities and interests
- Exclusive benefits program

## Features

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- Recognizes a member's interest via the Personal Activity Card
- Recommends new activities of interest to the user based on activity history
- Notifies the user about current and future events and activities in FEP
- Informs users about activities in and around Chicago
- Plays an active role in FEP Town Counsel Network decisions
- Rewards members with exclusive benefits like discounts and pre-sale
- Provides support to encourage members to form and run clubs and communities

## Associated Design Factors

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- 2 Offering Avenues for Detour
- 4 Satisfying Ritual Adaptation
- 9 Encourage Coordinated Action
- 19 Identifying social trends
- 22 Recognizing Significant Social Trends
- 27 People aren't sure where to be active
- 36 People may want artifacts to be private
- 51 General recommendations don't meet personal needs

## Discussion

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Memberships exist to increase the appreciation of water among Chicagoans. The first step is creating opportunities that bring people close to water. Maintaining this relationship and ensuring its permanence is the ultimate goal.

Membership cards will identify members. Additionally, they will serve as a database for members' activity history. The Personal Activity Cards are unique identifiers for members. Personalized information like current events, new facilities, or a new RiverHaven spot can be transmitted to the user based on this preferences and history.

Furthermore, when a member goes to a FEP facility, he will be notified of related activities of interest. The Activity Genius system will use the profile to make personalized suggestions about what to do on that day around certain locations. The user will be informed of calm spots to avoid crowds, for instance, if his card indicates that he enjoys relaxation more than excitement.

As a frequent user, a member also earns the right to shape the new offerings of the system by being a preferred prototype tester. In addition, his close relationship and active role in FEP Town Council Network decisions makes his opinions more significant to the system. As a result, members have an effective say and control over the evolution of the system.

Members are also encouraged to expand offerings with their own interests. For instance, members are encouraged to form new clubs and communities. The system will grant space, expertise, and logistic support for such projects. This kind of active involvement will not only make users increase the overall appreciation for water by broadening the audience, but also help the system evolve and grow organically, by responding to social trends, demands, and needs.

As frequenters are obviously people who enjoy nature and water, they will be rewarded by receiving some exclusive benefits. Benefits include discounts, pre-sale access to performances, invitations to special events, and access to special sections of the system.

## Scenario

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On a Thursday afternoon, Suzie leaves her office after work. She usually enjoys spending some time on the closest RiverHaven. As she enters the wireless network, her Personal Activity Card communicates with Activity Genius. Her data is transmitted and analyzed, and Activity Genius concludes that she enjoys that location on afternoons. But today, there is a sidewalk stage near her favorite spot and there will be music. The Activity Genius sends a message to her about the situation, and coordinates an alternative location nearby, where she can find some rest. She also receives a notification about the new exhibition in the Integrated Museum that will open on the weekend. As a frequenter, she receives a pair of free tickets to the private opening reception.

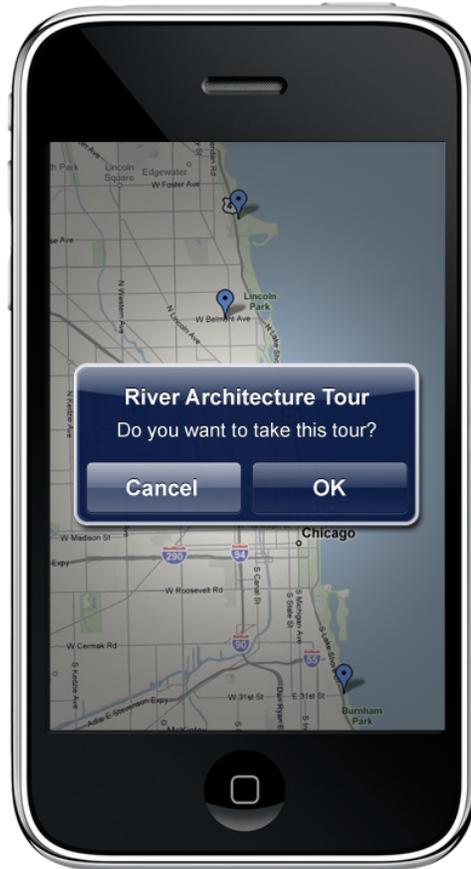
She settles in her tranquil spot and relaxes. Meanwhile, she is notified that a ferry may be convenient for the commute, as her new spot seems to be very close to a levelator pier. She also has a private seat by the window. She thinks that it may be a nice change to enjoy Chicago from the boat window while traveling back home. She decides to take the next ferry.

Joshua is a 21 year old college student. He is on the sailing team of his college. He spends many of his days by the lake with his team practicing.

During his college years, he also developed an interest for ship making. Lately, he is constantly crafting little boats and he dreams to build his own canoe one day.

As a member, he thought of opening this idea to the FEP Council. He wanted to bring together people with similar interests, share their knowledge, organize races of their model boats, and maybe even invite some experts to learn new techniques.

Using the forum, he contacts a few other people with similar interests. They together form a club endorsed by the system. They are afforded a studio in which they can meet and work. The Integrated Museum orders several books to help establish the new club.



# Virtual Guide

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Virtual Guide connects analog and digital elements in the system to offer users navigation support, schedule planning, and a rich interaction experience.

**Related System Elements:**

RiverWalk  
RiverHavens  
Canals  
weMonitor

**Superset Elements:**

NA

**Subset Elements:**

Activity Genius  
Art Walk  
Communication Pathways  
Digital Tags  
Mile-Markers  
Virtual Tour Guide  
Wireless Network

## Fulfilled Functions

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- 1 Inform visitors of available offerings
- 5 Offer reasons for detour
- 23 Signal Environmental transition
- 24 Support seamless transition between elements
- 27 Facilitate scheduling
- 28 Offer navigational support
- 35 Stimulate the mind
- 40 Recommend additional activities
- 42 Assist in artifact generation
- 43 Enable personalization / tagging of the system
- 44 Create themes
- 45 Facilitate sharing

## Properties

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- Set of routes through the system
- Themed tours of the system
- Virtual tour guide to the system
- Activity coordinator
- Wirelessly connected network
- A navigational support system
- Collection of public installation art
- Photo-tagging mechanisms
- Network for sharing photos

## Features

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- Offers navigational support through the system
- Provides activity recommendations based on preferences
- Keeps users aware of schedules and events
- Provides virtual tour guide to system
- Allows users to download themed tours
- Establishes different routes through system
- Utilizes landmarks to establish routes and control flow
- Assists photo and memory sharing
- Leverages GPS systems to create situational awareness

## Associated Design Factors

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- 2 Offering Avenues for Detour
- 27 People aren't sure where to be active
- 29 Artifacts need to add visual appeal
- 36 People may want artifacts to be private
- 49 People create their own walkways
- 51 General recommendations don't meet personal needs
- 57 Themes are "hit-or-miss"

## Discussion

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Virtual Guide connects analog and digital elements in the system to offer navigation support, schedule planning, and a rich interaction experience. Routes through the system are planned according to theme, such as history, art, entertainment, recreation, workout, shopping, and so forth. These pre-planned themed tours help guide users through the system and offer navigational support. The virtual tour guide streams information to wireless devices to offer a museum-like tour through the system. Different tour-casts can be downloaded from the system's site. For instance, a tourist may decide to download the Chicago river architectural tour-cast, whereas a local Chicago resident may download the nature tour-cast to learn about in season flora. Or art aficionados can download the art walk tour-cast that guides them through a narrated tour of Chicago's public art.

Additionally, Virtual Guide streams information to update users on current events and offerings, such as where and when performances are occurring, or which special floating markets are available and when. Based on the user's set of preferences, the Activity Genius can recommend related system activities that the user will likely enjoy.

By suggesting routes and activities, the system can regulate usage, flow, and assist navigation. Users may navigate the system based on the landmarks, both existing and new. The Lookout Point is an example of a landmark anchoring the river walk. As users navigate, they can decide whether take advantage of the system's GPS location awareness. For instance, users can navigate the system and request to see photos that others took from the spot they are in. Additionally, if a friend leaves a digital note or recommendation, the user's personal device will be alerted when they are in the geographic location and the note will appear. The system also creates digital information tags on items of interest. For instance, a digital tag can coincide with the art walk, so as a user stops to admire a piece of art, he can use his wireless device to read the digital information tag and learn more about it.

## Scenario

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Estelle is a 32 year old Chicago resident. She has lived in they city for years and has established a routine on Saturdays of going down to the river walk for morning coffee, and then, depending on how she feels, exploring the river, canals, and RiverHavens. She likes this routine because it always reveals something new to her. Plus, now that she has done this a few times, the Activity Genius has her figured out pretty well and has been recommending some great activities. Last week, for example, she wanted to take a walk along the lake front and enjoy the day. She jumped on her personal wireless device to look for an interesting few mile walking path from the river to the lake front. Based on her past interests and activities, the Activity Genius suggested that she take the flora path that detours by the nature conservancy. The daffodil garden was in bloom and Estelle wanted to pick up fresh flowers. It turned out to be a great walk and provided a path Estelle had never taken before.

Feeling adventurous, Estelle jumped on her wireless device again to see what was happening today. A message popped up alerting Estelle that there was an outdoor movie playing at the lake front amphitheatre this evening. The movie sounded really interesting, so Estelle purchased tickets for the early evening show. Sunset and a movie at the lake sounded great, but she had a long time before the movie started. She decided to make a day out of it, and looked online to plan some activities to fill the time. Knowing her predilection for sculpture, the Activity Genius recommended that she check out the sculpture exhibition along the canal featuring new Chicago artists. The exhibition was spread out over a few blocks, so Estelle could walk and enjoy the day and see the new artists that she had been hearing about.

On her walk over to he exhibition, Estelle put her earphones in and switched on the Chicago architecture virtual tour-cast. Based on her location, the tour picked up talking about the new and historic skyline along her walk.

Estelle arrived at the beginning of the exhibition after a brisk walk, which flew by as she listened to

the narrator talk about Chicago architecture. As she walked around the exhibition taking in different sculptures, she received a virtual note from her friend Jon. Jon left a message for her conditional on her coming to the exhibition. “I think you’ll really like this piece....” the note from Jon read as Estelle passed the sculpture.

Estelle spent a while walking the blocks and seeing the sprawling outdoor exhibit. After a while, she decided it was time to grab a late lunch and start walking over to the amphitheatre so she would make the movie. She jumped on her wireless device once again for food recommendations. The farmer’s market barge was docked riverside today, so she decide to walk over and grab food.

After some food, she wanted to walk off lunch, so she picked a route that would take her to the amphitheatre. On the way, Estelle switches on the digital tag reading preference on her wireless device. As she walks, information streams to her device about the surrounding flora. Estelle comes across a seemingly new section of landscaping. She wonders how long it has been there, so she pulls up all recent photos online taken from that spot and flicks through them. Turns out the area was installed last month. A drastic improvement.

The route takes just long enough and Estelle arrives at the amphitheatre just in time for the show to start.



# Meet the River

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Meet the River is a set of programs and services that aim to increase Chicagoans environmental awareness through interaction and education.

**Related System Elements:**

NA

**Superset Elements:**

NA

**Subset Elements:**

Bottle the Fountain  
Field Trips  
Nature TV

## Fulfilled Functions

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- 3 Promote system image/ experience
- 18 Prepare content
- 19 Impart knowledge
- 21 Encourage action
- 34 Stimulate the mind
- 40 Provide artifacts
- 41 Assist in artifact generation
- 43 Create themes

## Properties

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- Field trip guides educated in environmental science and the local environment
- Affiliation and coordination with schools, youth programs, and environmental groups
- Wide angle lens, high definition video cameras
- Aluminum water bottles
- Water bottle kiosks/refill stations

## Features

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- Provides refillable aluminum water bottles and stations to refill them
- Allows users to mark bottles after each refill to signify level of participation in “bottle the fountain” program
- Decreases amount of material related to bottled water or beverages within system
- Enables subscribers to watch a streaming high definition view of the river, lake, or skyline from the lake.
- Provides educational field trips along river and lake
- Educates users about the environmental issues relating to the river and lake

## Associated Design Factors

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- 12 Wasting water
- 49 People take the value of fresh water for granted

## Discussion

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Meet the River is a set of programs and services that aim to increase Chicagoans environmental awareness through interaction and education. Meet the River has three main components, Field Trips, Nature TV, and Bottle the Fountain.

The Field Trips component of the system element will consist of a series of educational field trips that visit different areas along the Chicago River and Lake Michigan. The content of these classes will include history, environmental science, conservation, and current issues involving Chicago and its featured environment. The content of these field trips will be constantly evolving in order to offer a mix of topics that will cater to a large audience. The Field Trips program will coordinate with Chicago area schools, youth programs, and environmental groups to ensure participation and relevance. The program will also coordinate with the integrated museum on the Islands. There it will be able to showcase exhibits that will provide a high level overview of program topics as well as promoting the program.

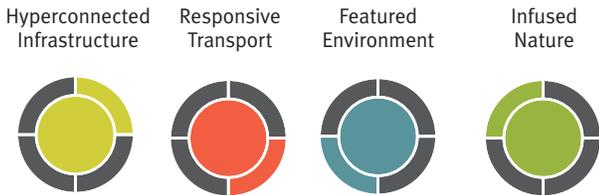
Nature TV will be a system of wide angle, high definition cameras along the river and lake. The image from these cameras will be sent to subscriber's televisions. Strategic placement of these cameras will provide subscribers with breathtaking views of the river and lake in the context of the city or in seclusion from the city. Nature TV will be an effective way to increase people's interaction with the featured environment on a daily basis.

Bottle the Fountain will be a program that aims to increase water conservation within the city. Currently the city uses 1 billion gallons of water a day from the lake. This program will sell refillable aluminum bottles. Participants in this program will be able to refill these bottles with filtered water for a minimal price fill stations throughout the system. The fill stations will also feature "bottle taggers". "Bottle taggers" are essentially mini engravers that are activated for a short period of time after a bottle has been refilled. The ability to engrave a bottle after each refill will not only allow users to record each refill but also to personalize their bottles while communicating their level of participation to others.

## Conclusion

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For a city to live up to its full potential it must maximize every asset available. The overall system outlined in the Chicago Vision for the Future plan identifies four topics that Chicago must explore: Hyperconnected Infrastructure, Responsive Transport, Featured Environment and Infused Nature.



The featured environment system provides a full plan for how Chicago can best take advantage of its physical location through the use of its associated natural assets. The featured environment's set of comprehensive and integrated solutions provides the blueprint for a stronger, more vibrant, and more cohesive Chicago.

If the city is bold enough to capitalize on the opportunity its natural assets afford, it will become a role model as a progressive, sustainable, and environmentally appropriate city.