choices - visit or play game

AREA	SETTING	ACTIVITIES	RANK	ILLUSTRATED SIGNAGE	VIDEO PRESENTATION
Part I: Introductory Presentation	Theater	Short presentation introducing visitors to the major themes of the exhibit			
Part II: Logging In: The Networked Guides	Open Space	People will be given a bar-coded card and asked to pick their Network Guide - a video talking head who will appear at each interactive station throughout the exhibit.			
Part III: The Networked City	(Varies according to Areas)	Different settings (application areas) showing different network applications, how they work, and their impact		(Varies according to Areas)	(Varies according to Areas)
The Telephone System: It's a computer network!	Telephone Network Control Room	*Beyond Dial Tone: Enhanced Services* How a phone call goes through the telephone network.		• Different levels of phone lines and services.	• History/ evolution of the phone network . • The "Information Superhighway" concept.
The Networked Office	Office Space	*Collaborative Medicine* Multi-visitor activity where visitors use shared screens to complete a medical activity. *Email Follies* Multi-visitor activity where visitors work together on emails		• Image showing how an email message from one person reaches multiple people. This will show different network types and structures .	• How people use email and the impact it has on the way they communicate. • Does your employer have the right to read your office email?
The Networked Home	Home Space	*Two-Way TV?* Different applications of interactive television *Bandwidth: Picture* Visitors try different bandwidth *A "smart" doll house* Visitors control a smart house		• Image showing how a person using a PC uses a modem to make the connection to remote computers. Details how a modem works.	• Telecommuting: Visitors will listen as people talk about the ups and downs of working at home thanks to the networked computer: less travel time, less transportation pollution, more time for parenting, less peer interactions and collegial community

game as way to pull you through

Retail	Retail Store	*One action, many reactions: Shopping in the Networked Society* Visitors make a purchase and see how many networks are impacted		• An integrated system: how retail is connected to manufacturing.	None
Manufacturing	Manufact-uring site	*Control a Manufacturing Plant* Visitors see the object they purchased in the retail section manufactured		•An overview of how manufacturing plants are controlled by networks: robot control, temperature control, etc.	•Computer Integrated Manufacturing (CIM)
Finance	Stock market	*24-Hour Global Speculator* Visitors buy and sell at different financial markets to see how networks are used *Collect Your Money: The Automatic Teller Machine* Visitors use an ATM to see how they work	———	• Banking networks (Cirrus, NYCE, etc.): how they work between banks and locations.	• The S.W.I.F.T. financial network. How it works, the amount of money flowing through it every second, how many banks are linked to it, security concerns, the importance of standardization, and how it was done before networks.
Impact Area: A World Run By Computers? Dependency, Vulnerability, Security, Crime, Mission and Safety Critical Applications, Fault-Tolerance	Location of network hub for Network Guides	*Where I live: The Network Guide's Home* How the Network Guide system works *Risky Business?* Visitors face issues about computer ethics	———	• Mission- and Safety-Critical Applications: How nuclear plant control centers use safety-critical networks and the use of fault-tolerance. This is contrasted to mission-critical applications: Office networks that break down, so no one has access to a critical customer database or the word processing software.	• Computer Network Horror Stories: a collection of actual news reports about system failures. Included would be the phone system going down, the Internet Worm, mistaken identities due to network failures, astronomical mistakes on bills (a $150,000 charge for electricity).
The Airlines	Air traffic control center	*Air Traffic Controller* Visitors view the FAA feed of airplane locations *Call Home* Visitors discover wireless networks through a call on a phone in an airplane	———	•The Advanced Automation System (AAS) air traffic control program: An illustration of how the next generation (slated for 1996) of the national air traffic control system will operate.	• The SABER System: What it is, how it came about, how it has changed (and how people can now gain access to it), and what is planned for the future (beyond the flight, digital video of different hotels, etc.).

talk w/ T. Malone

Utility Control: The Central Artery	Auto traffic control center	*Traffic Control Operations* Visitors use a distributed network to solve traffic problems GSP		• An overview of distributed networks: how they work, other examples of their use (oil refineries, manufacturing plants).	• The Central Artery: how it will be controlled by a computer network • The latest network technology used for traffic control: automatic toll collection, digital monitoring, Global Position Sensing.
Education	A net-worked classroom	~~The Alice Testbed Project Visitors access different educational networks~~		• None	The Internet: A history, how the academic world uses the system and novel information to be had.
Impact Area: Privacy	Transi-tional space between two core areas.	*Networked City Summary* Visitors get a summary of all their actions in the Networked City *Card Reader* visitors can have their credit cards read by a machine		• The Privacy Trail: How a few personal items can reveal a great deal about you	• Privacy under siege: how personal information is collected and used by mass marketers and others. • The Social Security number: a unique identifier and information unifier.
Part IV: World-Wide Connections	Open Space with four main sections	Visitors use this area to try real networks, including on-line services, bulletin boards, the Internet, and remotely connected networked video conferencing and virtual reality activities.			
Section 1: On-Line Services and Bulletin Boards	12 - 15 computers identified by on-line topics.	*On-Line Services by Topic* Visitors gain access to different on-line information *"Raw" On-Line Services* Visitors try standard on-line service front-ends *Bulletin Board* Visitors access local bulletin boards		• A description of how an on-line system is used and works. Visitors follow how a request for information is sent and received through interaction with a PC and modem in a home and the central computer managing the on-line service.	*The Global Community:* How is our definition of community changing with the advent of computer-based communications? Video of people who have met and married over computer networks and people talk about how they interact differently using networks.

Section 2: The Internet	10 computers identified by different Internet services	*The Internet by Services* Visitors try different computer stations highlighting the different services on the Internet: *Gopher, World-Wide Web, UseNet, WAIS, MUDs, Telnet & FTP, Email*		• The Internet: An image that shows its massive structure (see cover of Networked Nation book) and a description of what goes on (File Transfer, Telnet, E-mail, UseNet) and how this is done.	*Information Overload* How do we deal with the massive amounts of information being delivered to us? Also: The increased velocity of technology — having to do more in the same amount of time
Section 3: Networked Activities Linked to Remote Locations	Demon-stration area	*Remote Video Conferencing/ Networked Virtual Reality* Demonstration where visitors interact with remote locations using video conferencing and virtual reality			
Section 4: Resource Center	Visitor Assistant area where visitors can find out about getting on line — also is location of server that people can access remotely for Museum info	VA Station: Location where visitors can find out more about getting on-line, including the Museum's system. Server: System that contains Museum information that can be accessed via a bulletin board, commercial on-line services, and Internet services.	—		

The Networked Society: Exhibit Specifications 1.0
January 10, 1994

This document is the first version of an Exhibit Specification for The Networked Society exhibit. It goes through the exhibit in a linear manner, describing each area and activity in the exhibit. It begins by highlighting some of the thinking behind the different areas and elements of the exhibit, and raises questions that I and others have had.

The core of this document are descriptions of the <u>activities</u> within each area of the exhibit. This is, after all, the *primary experience* for the visitor. (I think that people come to museums to *do things*, not just find out about things). Each activity has educational goals listed, which include learning goals (tangible things we would like people to find out about), behavioral goals (what we want them to do), and emotional goals (what we would like visitors to feel). As an example of this, I've used this framework to think about the goals of the exhibit as a whole:

What do we want visitors to learn? (Learning goals)

first tier

- To gain a visual model in their minds of what a network is: something that connects together a broad range of objects that can communicate with each other.

- Discover uses of networks they use everyday that they didn't know about

- Find out how networks they use everyday actually works: the technology of networks

- About networks they can use on a daily basis (on-line services, Internet) and how to get on.

- All this technology comes with potential for danger: loss of privacy, division between people who know about it and those who don't, etc.: the impact of networks

2nd tier

networks impact ways we communicate, socialize

What do we want visitors to do? (Behavioral goals)

- Communicate, collaborate, compete: Interact with other humans, within the Museum and within the world

- Use real networks.

what are things we want visitors to say when they leave?

- Find something personally meaningful that they didn't think they would find in the Museum

- Have a different kind of experience than the kinds of experiences they are having elsewhere in the Museum.

- Feel free to interact with Visitor Assistants -- and get their questions answered from them.

What do we want visitors to feel? (Emotional goals)
- The sense of networks as bringing people closer together, breaking down barriers. A sense of the global quality of networks. How they make us view the world as one.

- That they can be part of a networked world. Demystify the topic. Give them hands-one experiences that they can accomplish.

What do you think of these goals? The main reason for this document is to get feedback. During the month of January, I'm going to pass this document around Museum staff, advisory boards, and other people who I think could provide helpful comments.

Here are some examples of the kind of feedback I'm looking for as you read through the spec.:
- Do you think the arrangement of the exhibit makes sense?
- What content is missing? What content can be cut out?
- Do you think the activities work? (know that the activities proposed are only starting points - they will evolve as they gets built and evaluated). Do they accomplish their intended educational goals? Are they missing certain goals? Do they sound impossible to implement? Do some of the activities seem silly, childish, incomprehensible? Can some of the activities be consolidated? Do you feel an activity is misleading? Do you have a different idea for an activity?

I want to hear anything and all you have to say. As I mentioned above, the goal is to develop this into a document that can be used as a working spec. for the exhibit so we can begin full implementation at the beginning of February.

Thanks for taking the time to read and comment this!

David

P.S. -- and this is the most important point: Right now there are more than twenty activities in this exhibit -- far too many and too costly. What activities do you think are essential? Which ones are less critical? At the end of this document is a summary sheet where you can rank the different activities -- this will help me greatly.

Part I: Introductory Presentation

The exhibit will begin with short presentation (video, slide show, audio show) that introduces visitors to the major themes of the exhibit.

Educational Goals:

What do we want visitors to learn? (Learning goals)
- *What is a network* - other examples of networks (post office, rivers, friends, railroads) -- and a model of a computer network
- *Examples* of computer networks (LANs, retail, finance, utility, telephone, transportation, education, military, manufacturing) and *possible future uses* of computer networks (500 channels, video phones, VR, PDAs)
- *People* who use computer networks and their *impact* (range of human faces with comments about telecommuting, privacy, fear of being run by computers, information overload, global village, lost of community, change since 100 years)

What do we want visitors to do? (Behavioral goals)
- Narrow their focus -- to move their thoughts from the rest of the Museum to the main ideas of the exhibit. The presentation can act as a "preamble" for the exhibit.
- Get a sense of what they will be able to do in the exhibit -- the presentation can act as a "contract" with the visitors.

What do we want visitors to feel? (Emotional goals)
- A sense of the enormity of the networks, and yet a feeling that they can grasp the concept of connectivity.
- They are part of the Networked Society -- this is an exhibit about them as well.
- They're going to walk away from the exhibit knowing something new about their daily lives, but will not be overwhelmed with too much information.
- They're going to get a balanced view of networks.
- They're going to have the opportunity to raise their concerns and fears about networks.
- They're going to have fun in the exhibit.
- We're glad to have them in the exhibit.

Perspective of presentation (Possible Alternatives):
- "Travel on a bit of data" (1st person) - move around different networks from the perspective of a piece of information. (allows for immersion, variety of technology, different kinds of people, global perspective). Could include Network Guides (see later description of this concept).
- Documenting (3rd person) what is out there - showing different networks, clips of people talking about what they do and how they are impacted by networks.

Setting
- Theater for 15 - 25 people.

[handwritten margin notes: technology? brief! examples of what it does + how these things were handled before computer networks]

- 5 - 7 minutes
- Immersive environment - either a two/three screen film or a picture show with 3-D sound.
- Runs every 15 mins...
- Visitors are introduced to Network Guides who will show up in the exhibit (see next section)
- At end of sequence, doors open and people are led into exhibit.

Development and Technology Requirements
- 2-3 large screens and 2-3 projection systems.
- Videodisc players (2-3)
- Computer to coordinate timing - staring every 15 mins.

(handwritten notes:) 12 - 5 groups /hr too much? 12 - 5 groups /hr

Part II: Logging In: The Networked Guides

People will be given a bar-coded card and asked to pick their Network Guide - a video talking head who will appear at each interactive station throughout the exhibit. Network Guides are like "knowbots" or "intelligent agents" that travel with the visitor though the exhibit's network. Visitors will also be asked to type in a name (either their real name, or a name they make up). The bar-coded card will be used as the unique identifier so that when they log into the different stations in the exhibit, the network can show the Network Guide they chose. The card will also be used as a way to gather information about the actions the visitors complete in the exhibit.

(With each encounter with their Guide, visitors will have the opportunity to change their choice of a Guide.)

[handwritten note in left margin: not necessary? lose track of purpose]

Educational Goals:

What do we want visitor to learn? (Learning goals)
   • Network Guides are a practical application of a network; visitors end up using a real network to interact in the exhibit.
   • They are an example of a distributed network; visitors get to see how networks can store, process and return information from one point to another.
   • They play the role of a narrator - they can tell visitors
      1) what the exhibit is about,
      2) how to use it,
      3) raise topical/social/ethical issue
      4) explain how something works (how a credit card is checked, etc..)
      5) track your actions - tell you where you've been and what you could still go see (*this also is a vivid demonstration of the privacy issues*)
      6) use information gathered in one area with interactions in another area (i.e., your "purchase" in the retail section could be the object that is manufactured in the manufacturing area).
      7) tell you stories about problems/solutions/enlightenments they had as a result of being in a networked society.

[handwritten note in left margin: do you think people will get this? how explained in privacy one]

   • They will provide a range of people from different backgrounds (ages, ethnic backgrounds, employment, perspectives in life) and languages (Spanish, French, German, Japanese) which helps our multiple language/signage problem.

What do we want visitors to do? (Behavioral goals)
   • To move around the exhibit, each time "logging in" so they can find out what their Network Guide has to say. By moving around, and expecting their character to show up wherever they go, visitors are having a physical experience (kinesthetic) of how networks work.
   • Share their Network Guide's experience with other visitors they're visiting the Museum with (family, friends).

What do we want visitors to feel? (Emotional goals)
   • That they can relate to their Network Guide.
   • That they are helping the Network Guide "navigate" through the Networked Society.

- That their Network Guide is on their side.

<u>Setting</u>
- Space filled with about 10 computers where visitors choose their Network Guides.
- A quiet space - not distracting.
- This area may be introduced by VAs; visitors are greeted after the introductory presentation ends.

<u>Development and Technology Requirements</u>
- People will need a unique identifier - a bar-code card, smart card, bar-code patch, active badge.
- Requires coordination with development of interactive components of exhibit since the Network Guides will show up in interactives.
- Requires a robust shared database that can handle tracking system. The computers will be linked to a main server (needs a redundant back-up system in case it goes down) with a database. The database and server will need maintenance software to control problems with the network.
- Requires video production.
- Requires video integration into interactives.
- Untested - needs to be tested before we implement. We need to figure out:
  1) How we would integrate Network Guides into interactives?
  2) How to make each Guide different. We need to talk to Theater Group about different approaches. (languages, stories, solving a puzzle).
  3) How tracking system would work - what would be the easiest way for people to carry around unique identifiers?
  4) Database network - what would we use? We need to determine the protocol for this before we spec. the rest of the exhibit so we can define what kinds of connections the other interactives will have.
- Introductory space will need around 10 computers where people pick their network guides.
- We need to think about platforms - do we want to remain on a single platform or cross platforms?

Part III: The Networked City

After choosing their Network Guides, visitors enter an area (one of two core areas in the exhibit) made up of different settings (*application areas*) showing different network applications and how they work. In addition, there are areas that focus on impacts of networks on society. Visitors move from one setting to another in a linear manner (a la *People & Computers*).

In each application area there are three main exhibit components:

1) *One or more interactive experiences* that convey through hands-on experience the educational goals of the area. These activities will give visitors access to real networks, simulations of real networks, and abstractions that embody the main ideas of the area. The Network Guides show up in these interactive experiences.

2) *1-2 minute video* that explains the main issues for each area, showing images of real networks in use. (i.e., use of networks in schools, in manufacturing sites, in banks, etc.)

3) *Illustrated signage* that explains how networks are used in each applications area (i.e., how the airlines reservation network works, how the Internet works). These illustrations also show other examples of uses that are similar to the area being highlighted (i.e., distributed control networks in the Auto Traffic Control area is similar to network control in oil refineries). These illustrations will also be used in a book that can serve as a supplement to the exhibit.

Considerations for choosing the different application areas (developing educational goals for each area):

There are far too many network applications in the world to show them all. What follows are the standards that have been used to determine which application areas we've chose to highlight:

1) The application areas should reveal a variety of network technology; a mix of network types, and networks with different ranges (networks that span across the world, networks that operate within buildings, etc).

2) The application areas should show some everyday uses everyone knows about and some novel, curious uses visitors might never have thought about.

3) Highlight the most critical social/ethical/topic issues that the public are most concerned with.

4) The application needs be able to be turned into an interesting, compelling, interactive *experience*

Main issues to be raised in each application area:

1) How application works and is used

2) "Eye openers" -- things that you might not have known about the application being highlighted.

3) Network type: what kind of network it is?

4) History: how the application was done without networks

5) Impact: how does the applications change the way people work and play?

Issues to consider when developing the interactive experiences in each area:

1) *Different visitor perspectives.*

When possible, we would like visitors to use real networks. However, this is not always possible. In some cases we will need to simulate real networks, while in other cases we will have to develop a metaphor that gives them a feel for the application being highlighted. What follows are different perspectives visitors could have when using the interactive components:

- *First person*: Visitor uses an actual network
- *Second person*: Visitor plays the role of someone who uses a network (simulation)
- *Computer Perspective*: Visitors plays role of a computer on a network
- *Third person*: Visitors observes/is explained a network application (narrator)
- *Abstraction*: Visitor participates in an activity that is not an application, but an abstraction of an application (such as the Networked Puzzle).

2) *Different visitor interactions.*

As with all Computer Museum interactive experiences, we need to develop activities for visitors that will give them the opportunity to get engaged in the material being presented. What follows are different ways people could use networks in interactive experiences:

- *Collaboration* (1) - visitors work together to solve a problem, each having elements the others need (brains vs. brawn) (this is what the networked puzzle is about)
- *Collaboration* (2) - visitors work together to design/create something
- *Competitive* - visitors work against each other and computer (as seen with Silicon sailing, Franklin Institute's maze war)
- *Control* - visitors control something that is remote (this can be real or a simulation)
- *Intermediary* - work with another computer (networked to their computer) that will process information before passing it back to you or another visitor.
- *Retrieval* - get information over a network (on-line, Internet, etc..)
- *Big Picture* - view a shared network (many computers add to it) to get a big picture (as seen with the Alice network).
- *Additive* - add something to a body of information or change a system
- *Observer* - trigger and then watch one computer interact with one or more computers
- *Builder* - build or modify a network
- *Multiple interaction* - use a network a number of times and see how it stores and processes information (Network Guides)

3) *Different Network Structures & Scales*

Networks comes in many sizes and shapes. The exhibit should provide activities where people discover different kinds of network structures and scales. Some of these include:

- *Open-ended Network:* Nodes on network are all interconnected, often through a central server (i.e., office networks).
- *Integrated Network:* Nodes on network working in a coordinated way, going from one machine to another (i.e., retail networks).
- *Intemediary Network:* Nodes on network go through a central server that process information before passing it on to destination (i.e., finance networks, such as S.W.I.F.T.).

- *Distributed Network:* Multiple nodes that send information to a central server to provide a picture of a system. Other nodes are used to affect the system (i.e., Utility control).

Setting
- Each area would be around 15x15 feet.
- Environments would be hyper-real - not just recreations of reality but exciting, cartoon-like settings that are fun to be in.
- The surroundings have furniture and other objects that give queues to the type of application area visitors are in. This needs to all be robust - what we are designing here are living dioramas; because they are interactive settings, they will be heavily used.
- Sounds will be piped in to give people queues about where they are.
- We are trying to get away from the monitor on a box set up - we want to do large projections of computer screens, imbed them into furniture, etc.

with spacious plant

Development and Technology Requirements
- The Networked City will need about 25 computers; in some application areas we will only need one, in others we may need up to 5 for multiple visitor activities.
- The Networked City needs to be fully networked; all connected with a server.
- We will need an audio system for each area, and a robust way to play the sounds.
- For large projections, we will need large monitors and/or projection systems.

Network City Area 1 -- The Telephone System: It's a computer network!

This area will highlight the present digital telecommunications system and the significant role it plays in providing an infrastructure for most of the other applications highlighted in the Network City.

Setting:

When visitors enter this application area, they are enveloped in a setting filled with furniture, images, and sounds that suggest the buzz of activity surrounding the telephone network. On the main wall they see a large projection of a global telephone network, with different routes flashing in a range of colors, each representing a different level of information traffic (this is simulated; it could switch between different days, such as Mother's Day and Thanksgiving and a typical Monday morning). Below the projection screen is a large control panel that visitors will use in activity 1 (described below). In the background visitors hear the sounds of people talking to each other over the telephone.

[handwritten note: how many control panels? 2 how many people can use this?]

Activity 1 : *Beyond Dial Tone: Enhanced Services*

The visitor begins by swiping her bar-coded card on a reader, set within a control panel. On a computer screen her Network Guides appears:

[handwritten note: needs to be emphasized not just connections + switching but enhanced b/c. of computers]

"There's a lot more you can do with a telephone these days. Much of the telephone system is now run over digital telephone lines, which makes it a <u>very</u> large computer network. This means you can use your telephone to do all sorts of things computers can do, from recognizing your voice to telling you who might be calling.

Try this yourself! Speak a telephone number into the microphone on the control desk. Watch how your voice is sent to a large computer that will understand what you've said, and dial the number for you. Then see how that number makes the telephone connection."

[handwritten note: like E-mail]

After the visitors speaks the number into the microphone, the large projection screen, now showing the overview of the New England Telephone network, adds an extra video window. In this window the Network Guide describes how the visitor's voice is sent to a computer at the central switching station, interprets the voice into a number, and then routes the call through the system. All this description is enhanced with a vivid animation from the point of view of the information passing through the network.

Once the call has been connected, the Network Guide appears once again on the computer monitor:

"Voice recognition is not the only thing that you can do with a digital telephone network. Caller I.D., where you can find out who's calling before you pick up the phone, and Conference Calling are both enhanced services that the telephone system can provide because it is a computer network. *[handwritten note: it is a connection of computers — controlled by computers.]*

Try it! Speak in another number, and see how both services work."

[handwritten note: can choose one or the other — or both — your choice]

Again the Network Guide shows up on the large projection screen, supported by a vivid animation, describing how the enhanced services work in the telephone network.

Activity 1's Educational Goals:
What do we want the visitor to learn? (Learning goals)
    1) The telephone system is a computer network. Every time you use a telephone, you are using a computer network.

    2) The telephone network provides the *infrastructure* for most of the network applications people will see in The *Network City*.

    3) How the telephone network works: switching and routing through the network.

    4) New uses of the telephone system as a result digital networks: enhanced services.

    5) There are different kinds of phone lines (copper, fiber).

What do we want the visitor to do? (Behavioral goal)
    1) Use a telephone in a new way and see the invisible part of the process.

What do we want the visitor to feel? (Emotional goals)
    1) A sense of the enormity of the telephone network, and yet the simplicity of its function.

    2) They use a computer network everyday. It's not hard to use.

    3) We are already all connected.

Development and Technology Requirements
- Large screen display needed.
- Research data about phone switching networks; and tie to phone numbers in the phone system
- Research phone traffic levels for different times of the year
- Research how enhanced services work
- Design an exciting control panel
- Compelling animation of network switching

Information generated for shared database (to be used in later interactive experiences):
- Telephone number dialed by visitor

Illustrated Signage:

*[Handwritten margin notes: "this computer aspect needs to be emphasized — what makes it special" "I did not get this from activity." "1 show telephone" "2 explain larger infrastructure" "3 connections to smaller computer networks systems" "how? where explained"]*

11

•Image of a link from the home through a phone switching station to an office. Show different levels of phone lines (copper, coaxial, fiber) and service (Switched 56, T1, Frame Relay, ISDN).
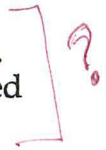
Area Video:
•Focus on the history/evolution of the phone network and how it is changing to be more than voice communications.
•Show how phone system is the infrastructure for most of the other applications highlighted in the Network City. Introduce the concept of an "Information Superhighway." (This could be where we have a video of Vice President Gore speaking).

this is good but putting too much on video - ie. people → computers I think video is good for illustration but not explanation → at least _not_ significant concepts premise educational goals

a lot going on - how will this be organized?

consistency

Network City Area 2 & 3 -- Office/Home Areas

This two areas are linked together with a visible network connection (an arch made up of network cables), highlighting how networks are used in the office and at home. This is done because there are some very strong links between the two areas (with many people working at home). In fact, one of the interactive experiences (a collaborative design activity) will have one station in the office and the other in the home setting.

The Office Area

Setting (*office setting*):
• An office set at the top of a skyscraper (life-sized photos looking out over a city from a tall glass building surrounds the space).
• Office furniture (based on designs for a networked office)
• PCs everywhere: network connecting PCs highlighted clearly.
• Sounds of people talking, typing, laughing in the background.

Activity 2: *Collaborative Medicine* — what is connection? why medecine? unless office is a Dr's office. I think this will confuse people

Visitors begin by swiping their bar-coded card into a reader placed next to the computer monitor and video screen. On the screen, the telephone number they "dialed" (using voice recognition) in the earlier activity shows up on the video screen: "Dialing 617-555-3537...connecting." They are now connected to the visitor in the other collaborative design station, and each visitor sees the other on the video monitors. On the computer monitor their Network Guides show up:

"Now that the telephone network *Because the is a computer network it It can* can do more than send just voice, but also include video and computer data, people will be working and communicating in new ways."

On the computer screen in the "office" setting the visitor is told:

"As a general practitioner, you'd like to get some advice on your latest patient who just broke his leg. Not only do you need it for the insurance requirement of a second opinion, but this break's just a little different than most. It won't hurt having the help of an orthopedic doctor."

On the computer screen in the "home" setting the visitor is told:

"As an orthopedic doctor, you're asked quite often to look at other doctor's patient's for a second opinion. This doctor would like your help to determine the best way to set a patient's broken leg."

Then both visitors are told:

"You'll be using a broad band connection in your interaction with the other doctor. This means you can talk to each other using video conferencing, tap into multimedia databases, and share all kinds of medical information.

The general practitioner has developed a three-dimensional model of the patient's broken leg based on a CAT scan. Each of you can take turns to move the bone within the image to determine how to set it correctly."

The main activity then begins. Both visitors use a mouse to manipulate a shared screen projecting the three-dimensional image. Their goal is to move the leg bone around until it is set correctly. But to do this right, they need to move the image at different angles, look up database images of correctly set leg bones, and discuss between themselves the best way to set the bone.

Once they set the bone correctly (both visitors get a "positive reinforcement" graphic and sound), the computer screen reads:

"Looks like the bone has been set correctly! "

The final computer screen for both "doctors" then reads:

"This is just one example of the kind of interaction that can take place with a broad band connection. Video conferencing is begin used by all kinds of people to cut down on travel, bring people from different locations together on a short notice, and, using the kind of shared computer screen you used to set the leg, work collaboratively."

Activity 2's Educational Goals:
What do we want visitors to learn? (Learning goals)
    1) PC network uses, at work and in the home.

    2) Bandwidth: the more you have, the more you can do.

    3) Cutting-edge uses of communication systems as a result of digital networks: video conferencing, communications with data beyond voice.

    4) Health care applications of broad band networks

What do we want visitors to do? (Behavioral goals)
    1) Collaborate -- work together, interact with family, friends, and fellow visitors.

    2) Problem solving.

What do we want visitors to feel? (Emotional goals)
    1) A sense of fellowship with other visitors.

    2) A sense of accomplishment, having set the patient's leg.

    3) A sense of amazement: the network knew the number they dialed in the earlier activity.

4) A feel for how they will communication in the not-so-distant future with video conferencing.

Development and Technology Requirements
• Need for video conferencing system (video cameras, connections)
• Need 2 fast PC computers
• Need to develop application where two visitors can see the same screen at the same time, and where one visitor's choice shows up on both screens.
• Need to develop fun and compelling car design elements that fit together.

Information generated for shared database (to be used in later interactive experiences):
• Snapshot of each visitor

[handwritten annotation: this is misleading; maybe need to show how images can be recorded; i.e. Driver's license, passport photos. This makes people feel like the postal system is haunting them down.]

Activity 3: *Email Follies* (located in office setting)
This is a multi-player game, allowing up to four visitors to participate at the same time. It is based on the "Exquisite Corps" game developed by the Surrealists in the 1920's and played by children around the world.

[handwritten annotation: but I thought this was set in an office. How does this work? Another area?]

The basic idea is that up to four visitors work together on separate PC stations, located in different parts of the world (the activity will be placed together, and all four visitors will be able to see each other somewhat, but they will be separated by representations surrounding their PC monitor of the cities they are in -- i.e., the Eiffel Tower for Paris, A layer roof for Bejing, a pyramid for Cairo, a Federal style building for Boston).

Each visitor begins by being told by their Network Guide that they're going to develop a simple presentation. They are give a choice of What they would like to the presentation to be about (the environment, etiquette, taxes, health care, friendship, work, etc..) and Who they are going to "send" the presentation to (their boss, a friend, a family member, the President, etc).

They are then asked to choose the first sentence of the email -- they are given five choices (they simply click on a choice to have it written into the email), or the option to write a line themselves.

The email is then passed to another visitor. This happens all at once, after all the players have made their choices. Part of this process is an animation that shows, for example, an email in "Paris" traveling over a LAN, then over a WAN, until it reaches a PC in "Bejing." Then the "Paris" visitors sees how an email from "Cairo" travels over a WAN, and enters the Paris LAN (each city could have a different type of network types -- token-ring, ARCnet, Ethernet), and arrives at the visitor's PC.

[handwritten annotation: how long will this take? visitors will watch if only twice -- by third time will want it to move more quickly]

Each visitor now has another visitor's email. They know what it's about (the topic choices will be different for each visitor), they know who it's to, and they have a feeling for the tone of the message from the first sentence. They also

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know who originated it, since it will also contain the name they used when they first logged in with the Network Guides (this will be helpful for interaction with visitors who know each other)

Now they have the opportunity to pick the second sentence. They can choose to continue the tone of the letter, or shift it (the sentence choices will be designed to do both -- many will be opinionated). They will also have the opportunity to choose pictures to illustrate their point.

Once all the visitors have picked the second sentence, the emails are again sent to another "site." Again visitors see the passing of the data over the WANs and LANs (we could have a variety of links between the sites: T1 leased lines, microwave). Now they see an email with two sentence. They get to add the third sentence (again, from a choice of sentences or having the option to add their own), and if they want, a picture.

This process continues until the email gets back to the original author (if only two people use the activity, the email will get sent back and forth two times). At this point the visitor can choose to edit the message or leave it alone. They get to send the message and they see an animation of it traveling to the destination. A few seconds later they get a message on their screen:
"Email reply from <Destination>"

They click a button to read the letter:
"I have read your email and am considering your ideas. I'll contact you later on in the exhibit to discuss this further."

Activity 3's Educational Goals:
What do we want visitors to learn? (Learning goals)
1) PC network uses, at work and in the home.

2) Different types of PC network types (Ethernet, Token-ring) and structures (LAN, WAN).

3) The concept of leased telephone lines

4) Email: What is it, how does it impact the way people communicate?

What do we want visitors to do? (Behavioral goals)
1) Collaborate -- work together to complete a coherent email

2) Tap into their sense of humor -- write an email that is funny

What do we want visitors to feel? (Emotional goals)
1) A sense of collaboration, but also a sense of giving up control to others. (They are working on a joint project -- they will see their original intentions for the email change as others add to it)

2) The speed at which information travels over a network

Development and Technology Requirements
• 4 fast PCs, networked
• Design for activity where people are located close together, but still separated by shapes that evoke different cities (Paris, Cairo, Boston, Bejing).
• Need to develop application that passes documents around to the four PC's. Animation needed to show how "information" is traveling through the network.

Information generated for shared database (to be used in later interactive experiences):
• Collaboratively written email to <Destination>

Illustrated Signage (*office setting*):
• Image showing how an email message from one person reaches multiple people, some in the same office, some in other buildings in the same area, some in offices across the world. This will be an opportunity to show different network types (Ethernet, ARCnet, Token-ring) and structures (LAN, MAN, WAN).

Area Video (*office setting*):
• How people use email: text, video and collaboration in offices, and the impact it has on the way people communicate.
• Does your employer have the right to read your office email?

The Home Area:

Setting (Home):
Visitors enter a space filled with items the might find in the home: A table with a PC (used in the collaborative design activity described earlier), and a couch in front of a television (used in "Two-Way TV?" described below). Background sounds include a radio and television playing, plates being set for a meal, pots being stirred, and food being prepared.

Activity 4: *"Two-Way TV?"*
This activity introduces visitors to the idea that cable TV is another way to have two-way communications. It lets them try different prototype systems that have been developed around the concept of "interactive TV." (NOTE: the prototypes presented will be based on actual experiments in interactive TV).

Placed in a setting consisting of a couch, oversized remote, and a large-screen television set, visitors begin this activity by swiping their bar-coded card into a reader set into an oversized remote control. Their Network Guide shows up:

"Would you like to talk back to Television? With the cable that provides Cable television information can travel fast enough to not only provide full-motion video, but also the opportunity for people to interact with the television program.

[handwritten note: explanation of what this was to do w/ computer networks.]

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This is all at the beginning stages of development. Researchers are still trying trying to find out exactly what people want to do with their television. Do they want to pick their own movies? Better yet, do they want to choose how their movies turn out? Do they want to Shop? Play games? Do they really want to interact with their television -- or would they rather relax by having the TV do all the work?

Try the activities on the remote control and see what you like."

On the remote they can pick from three choices: Interactive shopping, interactive news, interactive movies. For each there is a short activity:

Interactive shopping: By moving a trackball in the remote that controls a cursor, visitors can move around a supermarket isle. They can turn right and left, and move up and down the isle. If they find something they want to buy (they have no dollar limit, but they are spending money that will be used later in the finance section), they click the trackball button on the item. If they want more information about the item, they can click on an "INFO" button on the screen (here they are pitched the product by a hard-selling salesperson -- one of the Network Guides).

Interactive News: Visitors can pick the kind of news they want to see. They can choose between local, national, or international stories. They can pick topics, such as entertainment, politics, or the arts.

Interactive Movies: Visitors create their own short movie (1.5 mins) by picking elements of the story: Will it be a romance, drama, or comedy? Will it have a happy or sad ending? (The movies star the Network Guides).

At the end of their interaction, the visitor's Network Guide appears:

"All this interaction has cost you some money. Your shopping and movie selections come to $145.50.

Not everyone can afford this, of course, and many people worry that as television becomes interactive, it's going to cost money to people, dividing people into those who have access to the technology and those who can't afford it.

Later you'll see the money deducted from your accounts in the finance area of this exhibit."

Activity 4's Educational Goals:
What do we want visitors to learn? (Learning goals)
    1) Alternatives to the telephone system for two-way interactions: Cable

    2) Bandwidth: the more you have, the more you can do.

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What do we want visitors to do? (Behavioral goals)
1) Try different home-based applications of broad band technology on television

2) Consider if they would really use such a system (i.e., would they really use interactive shopping?).

What do we want visitors to feel? (Emotional goals)
1) Comfortable, like they are in their home, yet at the same time things are just a little different.

Development and Technology Requirements
• 1 fast PC
• Design for large remote control with device for interacting on screen.
• Development of software for interactive shopping, interactive movie construction, and game choices.
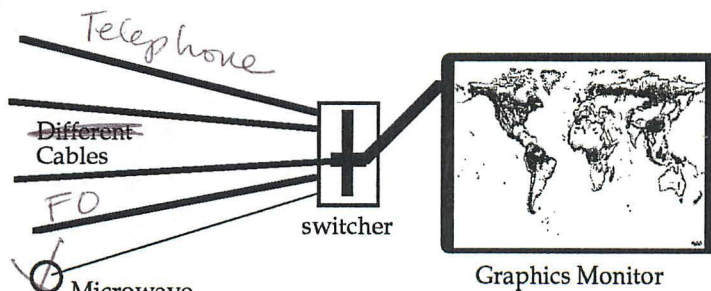
Information generated for shared database (to be used in later interactive experiences):
• Dollar amount for items purchased when shopping, movies and news selected.

Activity 5: *"Bandwidth: Picture it"*
This activity is intended to show the trade-off involved in choosing different types of network connections. It consists of four cables (Unshielded Twisted Pair, Shielded Twisted Pair, Coaxial, Fiber Optic) and a microwave connection arranged so that they meet at a central "switching" point. Here visitors can switch between the different connections and a large screen graphics monitor.

As visitors switch between the different alternatives, they see the throughput capability of each connection as seen through the display of a visually rich image slide show (24 bit) on a 21-inch monitor.

[Handwritten margin note, left side:] If this will be explained in the home I would eliminate from telecommunications area — too much

[Handwritten labels on diagram:] Telephone — Different Cables — FO — Microwave — switcher — Graphics Monitor — Medium ← bps → quality

[Handwritten note, right side:] Picture Tel — Desirability how many bits per second to get certain quality — bp pixel

For example, when they pick the unshielded twisted pair (copper), a single image slowly appears, line by line. When they try the shielded twisted pair, the same image appears much quicker, but the update between the different images in the slide show takes time. When they try the fiber optic cable, not only is the image

[Handwritten note, lower right:] ISDN T1 line

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[Handwritten note, bottom:] service not medium

brought to the screen almost instantaneously, the update between pictures is also very fast. (The 24-bit image slide show could be a short film).

With each choice, visitors are also told of common uses for each connection. For example, with the unshielded twisted-pair, they will be told that this is the most common cable used for telephones in the home (no wonder we don't all have video conferencing). With fiber optic, visitors will hear how it allows a great deal of information through, but that the cost is quite high (therefore, that's why most homes are do not have this type of wiring). Issues of distance -- how far information can travel with each cable -- and security will also be mentioned.

There would also be a "cut-away" of each cable so people could see how they are made.

<u>Activity 5's Educational Goals:</u>
What do we want visitors to learn? (Learning goals)
    1) Bandwidth: the more you have, the more you can do.

    2) Different types of media: Unshielded Twisted Pair, Shielded Twisted Pair, Coaxial, Fiber Optic, Microwave.

    3) The "last mile" problem: placing broad band connections up all the way to the home and office

What do we want visitors to do? (Behavioral goals)
    1) Experiment with different connections to see how much information can pass though.

What do we want visitors to feel? (Emotional goals)
    1) A sense of potential about broad bandwidth.

<u>Development and Technology Requirements</u>
• 1 fast PC
• Design for switcher between different connections, slide show graphics.

<u>Information generated for shared database (to be used in later interactive experiences):</u>
• None

Note: One problem I have with this activity is that it does not deal with processing power on the computer end: 300, 1200, 2400, 9600, 14.4 baud rates, different rates of Ethernet, etc. This is something that most people will face if they go out an buy a modem. How might we integrate this issue into the activity? Perhaps there could be a complementary activity where people switch between different baud rates and other data transfer systems (Frame Relay, X.25, ISDN...).

<u>Activity 6: *A "smart" doll house*</u>

Visitors come upon a large doll house (5 ft tall) transformed into a "smart house" which they can control on a central screen. They swipe their bar-coded card into a reader next to the screen and their Network Guide appears:

"There's more than one computer is most homes these days. Coffee makers, light switches, toasters, thermostats, TVs, VCRs, fire and burglar alarms, even the gas meter... they've all got computers in them that can be set to do many different things.
What if you could hook them all together on a computer network and control them from one location? That's the idea of a "smart" house: a building managed by a computer that can react to different situations because it controls a lot of things that usually are controlled by you and I. Here's your chance to see use -- and program -- a smart house yourself."

Visitors are then able to take control of the network controlling the house. They can directly control elements from the central screen that visually lays out the network: turn on and off lights, start a simulated fire and see how the fire detection system reacts, cause a break-in and watch the burglar alarm in action. After each interaction, they can see the changes taking place on the network, and get feedback from their Network Guide, who sometimes will appear on the central control screen and sometime on the TV and PC screens inside the doll house.

Visitors will also be able to program the smart house. They can decide how the house will react on a sunny winter day versus a sunny summer day (what degree should the shades be set at?), set a routine for when the inhabitants go on vacation, or determine when and what can be broadcast over the television (no TV violence, only from 6 - 8 PM).

Activity 6's Educational Goals:
What do we want visitors to learn? (Learning goals)
    1) The "smart house" concept: centralized control and coordination, security, energy savings, comfort issues.

    2) "Smart" houses get their smarts from how people program them.

    3) Raise question: Would the visitors want to live in a smart house?

What do we want visitors to do? (Behavioral goals)
    1) Control the house -- action causes physical reaction.

    2) To program the house -- to think and work through the rules needed to make the house smart, and then test the rules to see if they work.

What do we want visitors to feel? (Emotional goals)
    1) A doll house is a warm feeling -- they can relate to this.

    2) Networks are not all large machines and PCs used by business people -- they could use a network in their home.

3) Experience beyond the computer screen -- here is a three-dimensional object that they can walk around and control

Media Goal: This will make a great picture for the print media and television!

Development and Technology Requirements
• 1 fast PC
• A controller board to send messages to network and retrieve information
• Central control program with visualization of house network
• Construction of large doll house visible from at least three sides, yet protected from visitors' hands and kicking feet.

Information generated for shared database (to be used in later interactive experiences):
• None.

Illustrated Signage (home):
• Image showing how a person using a PC uses a modem to make the connection to remote computers. Details how a modem works, highlighting the "last mile" problem.

Area Video (home):
• Telecommuting: Visitors will listen as people talk candidly on video about the ups and downs of working at home thanks to the networked computer — less travel time, less transportation pollution, more flexible hours, more time for parenting, weight gain, less peer interactions and collegial community, etc.

Network City Area 4 & 5 -- Retail/ Manufacturing Areas

These two areas will show how integrated retail systems work. This includes inventory control, shipping systems, credit card verification, and direct links to the manufacturing process. It is divided into two areas:

1) A Retail area, where people make a purchase and see how this single action is coordinated by a series of networks.

2) A Manufacturing area, set up as a small-scale manufacturing plant (set in a 10 X 10 display) where people can watch the purchase they made in the Retail area be manufactured.

Retail Area:

Setting (Retail):

A toy store (the reason for this is that people will choose from a choice of toy houses which they will then see manufactured in the next area). There are different toys on display, all set within a large video screen. Playing on the screen is a speeded up video sequence of people shopping in a store. At the front of the screen is a counter that "juts out" from an image of a counter in the video sequence. At the front of the real counter is a cash register with a large computer monitor and a bar-code card reader.

Activity 7: *One action, many reactions: Shopping in the Networked Society*

Visitors begin the activity by swiping their bar-coded card through the reader at the cash register. Their Network Guide shows up on the computer monitor:

> "Time to go shopping! In the Networked Society what might seem a simple process -- shopping in a toy store -- turns out to have a lot more to do with networks than you might think. But more about that later. Let's start by picking the toy house you want to give your best friend."

The screen then shows a choice of five different color walls:

> "What kind of color would you like the walls of the toy house to be?"

The visitors is then asked about the height of the house (1 - 3 stories) and roof type. Once they have made their choices, their Network Guide shows up again:

> "Here's your toy house. And to buy it, we'll use the bar-code card you're holding. Swipe it though the reader again and we'll see how credit cards are checked."

The visitors swipes their card through the reader again. The screen on the monitor turns black and out of the cash register a line of light streams into the large video screen. On the large screen the visitor's Network Guide shows up and explains how their card is being checked. The narration explains, with the help of a "branching" image and animation how their card information goes through a series of networks to confirm the credit request. Visitors watch their information move through the different network branches, learning about the different credit networks, and how their credit card provider is connected to

these large-scale network systems. Once their credit is verified, the information goes down the branches, pops out of the screen, up through the lights connected to the cash register. On the computer screen their Network Guide appears once again:

"Credit verified!

But that's just the first step in the retail process. This toy house is for your best friend. And the store has offered to sent it to your friend directly, using overnight delivery."

Again, the request shoots through the cash register to the video screen. Here visitors discover through narration and video how their purchased is processed by the overnight delivery service (i.e., Fed Express). Once this is complete, the Network Guide again returns to the computer screen:

"The toy is on its way to your friend.

Now we want to make sure that the next customer can buy the same toy house. We'll use the network to check inventory."

Again, a request shoots through the cash register and to the video screen. Here visitors see how inventory control is linked to their request. They see that they've purchased the last toy house. The Network Guide scratches his/her head:

"I guessed you picked a popular toy. Looks like with your purchase, inventory is now completely out of the toy. We'll have to send a request to the manufacturing plant to build more. When you visit the manufacturing area in the exhibit, be sure to check that they're building the toy.

Oh, by the way, we've sold you and your friend's name, over another network, to a company that sends out toy catalogues. They figured that if you and your friend like toy houses, you might like other toys as well.

Thank you for your purchase."

Activity 7's Educational Goals:
What do we want visitors to learn? (Learning goals)
1) How an *integrated* system works: they see how a single purchase impacts a number of networks.

2) How credit verification works.

3) How inventory control works -- and its link to manufacturing.

4) How a large-scale shipping system (Fed Ex) uses networks and is often linked to stores (inventory sits in warehouses at airports near Fed Ex terminals).

5) How mass marketers get their name and interests.

What do we want visitors to do? (Behavioral goals)
1) To make one decision -- the choice of a toy house -- and then watch how much goes on as a result. This choice will also show up later as they get to watch the toy being build in the manufacturing area.

What do we want visitors to feel? (Emotional goals)
1) Surprised: they make purchases everyday -- did they know so much was involved?

2) Concerned: did they know some much of their personal information is being sent to some many people?

Development and Technology Requirements
• 1 fast PC with a large screen
• A large projection display
• lighting system linked to presentation on large presentation screen.
• Software where people can "build" their toy house from choices.

Information generated for shared database (to be used in later interactive experiences):
• Choice of toy house.

NOTE: I'm not completely happy with the choice of a toy house or a toy store. But here are my constrains. The store and object has to:
-- be able to be sent via a Fed Ex type sender (this takes out supermarkets)
-- be "manufacturable" (visitors get to manufacture their choice in the next area -- we have to be able to offer simple difference in the object, such as color and shape)
An alternative could be a clock shop -- visitors get to choose different colors, shapes, and faces.

Illustrated Signage (*Retail*):
• A review of the Retail/Manufacturing area. Image showing the links a store has to other networks (credit verification, inventory control, mass marketing, etc.). This is an overview of the activity in the section.

Manufacturing Area:

Setting (Manufacturing):

Visitors come upon a large 10x10 elevated platform holding a model of a working manufacturing plant. The plant is making the toy houses "purchased" in the retail area on an assembly line, run with robots. Surrounding the model are actual manufacturing robots (possible moving), with descriptions of the function they played in manufacturing. Sounds in the area are of a manufacturing plant: machines working and people talking over the machines.

Activity 8: *Control a Manufacturing Plant*
In this activity, visitors learn how networks play a critical role in manufacturing: Not only do networks control the manufacturing process, they also allow for quicker responses (the "Just-In-Time" approach) to changes in consumer demand.

Visitors approach a "control box" set into the side of the manufacturing plant model. Swiping their bar-coded card, their Network Guide appears on a graphics monitor:

> "Companies try hard to please their customers. With networks, companies can speed up requests so that customers can get what they want, and get it quickly.
>
> If all of a sudden there is a great demand for a certain type of dress, computer, or automobile, inventory control networks can automatically tell the manufacturing plant so that they can react quickly to the demand by making more of the popular item."

The visitor's toy house choice from the retail area then shows up on the screen:

> "When you purchased this toy house in the toy store, it turned out to be the last one in stock. The inventory control system alerted the manufacturing plant that more toy houses with the color, shape, and roof type you chose were needed.
>
> Now watch as this request is sent to the manufacturing plant, and see how the plant reacts."

Upon pushing a "Send Inventory Information" button, visitors watch as the robots in the manufacturing plant change their choices in the assembly line. Instead of the green walls for the toy house, they begin to put white walls on the line, as specified by the visitor's choice. Once they see this in operation, their Network Guide shows up on the screen again:

> "Inventory control networks only play a small role in manufacturing plants. The most common use of networks are to centrally control all the elements in the plant.
>
> Try this yourself. On the screen are controls for all the robots and choices for the different things they can do. Try building different toy homes."

Visitors see a floor plan of the manufacturing plant, with icons representing the different robots building each part of the toy house. Like a network layout, they can click on each icon and change the type of part (green walls instead of white walls, domed roof instead of one with eaves).

Activity 8's Educational Goals:
What do we want visitors to learn? (Learning goals)
    1) How an *integrated* system works: they see how a single purchase impacts a number of networks, including manufacturing.

    2) Control of manufacturing plants with networks

    3) "Just-In-Time" approach to manufacturing: how it is dependent on computer networks.

What do we want visitors to do? (Behavioral goals)
    1) To control the manufacturing plant with a network.

What do we want visitors to feel? (Emotional goals)
    1) They are viewing a spectacle: this is a busy area, things are happening.

    2) This is a 3-dimensional experience: they are controlling an actual set of computer controlled objects.

Development and Technology Requirements
• Develop model manufacturing plant (3-5 robots, ability to automatically reuse manufactured toy pieces, controllable by visitor).
• Software where people can control plant.

Information generated for shared database (to be used in later interactive experiences):
• None

Illustrated Signage (*Manufacturing*):
• An overview of how manufacturing plants are controlled by networks: robot control, temperature control, etc.

Area Video (*Manufacturing*):
• Computer Integrated Manufacturing (CIM): An introduction to how the auto industry uses networks to practice "Just-In-Time" manufacturing by being more responsive to customer demand, while at the same time cutting down on inventory.

<u>Network City Area 6 -- Finance Area</u>
In this area, visitors discover how the financial world uses computer networks are used to process monetary, stock, and commodity trading. It has two main activities: A stock exchange environment where visitors assume the role of speculators, and a bank setting where people discover how automatic teller machines work.

<u>Setting:</u>
A stock market environment, with an image of the world projected on the main wall. Above the image are a series of clocks with different times and locations around the world: Boston, Rio de Janeiro, London, Zurich, Moscow, Cairo, Beijing, Tokyo, Sydney. Under each is a large monitor showing images from the cities (these monitors will be used in the main activity in the area). Surrounding this are LED screens with stock quotes streaming by, screens with the latest financial information (through a connection to an on-line service), and in the background are sound of stockbrokers screaming out purchase and sales requests.

<u>Activity 9: "24-Hour Global Speculator"</u>
Set within the stock market environment, this activity has visitors assume the role of speculators buying and selling in the global market. This is a multi-visitor activity, where up to four visitors compete against each other and the market to make a profit.

Visitors approach four trading stations (touch screen monitors set within a standing block 3 feet off the ground). Once one visitor "logs in" with their bar-coded card, an up to thirty second wait time takes place so that up to four people to join the activity (their Network Guide appears: "This activity can done by one person, but it's more fun with more than one person. Ask some other visitors to play along.")

The activity begins: The visitor's Network Guide tells them that they are now speculators in the currency, stock and commodities markets, where they'll be able to use networks to buy and sell. In front of the visitors, set at the center of the world map, is a large projection screen. On this screen is a new Guide, the Broker. She'll be leading them though the different financial markets in different cities, telling them what they can buy or sell. Under the broker is a spreadsheet with two columns: how much money the visitor has, and the value of their non-cash assets. All the visitors start with $100,000 in the money column, minus the amount they spent in the Two-Way TV activity for shopping, movie and news selection.

The Broker describes what visitors can do:

"We'll be traveling the world, buying currency, stocks and commodities in different financial markets all around the world.

" You're all starting with one hundred thousand dollars (the list on the screen lights up with each visitor's starting amount). The money is sitting in your bank account. Your goal is to make as much money as possible. If you make a profit, you'll get discount to The Computer Museum's store. And if you make over a million dollars, you'll get a free entrance for your next visit to the Museum.

Let's start at home at the Boston stock exchange. There's a company that looks very interesting. It's called "The Toy Shop," a branch of toy stores that sell everything from toy cars to dolls to toy houses. You may have heard about them.

The stock is selling for $36 a share. I think that's a good deal. They're a company that uses the latest network technology. Everything is integrated, from the selling to the manufacturing.

Would you like to buy some? Use the screen to make a purchase, or pass. When you've all decided, I'll be back to take you to a new market. Bring your bathing suit: We're going to Rio next!"

On the trading station screens in front of them, visitors see the following screen:

Do you want to buy the stock?	
YES	NO
Speculation Summary	
Amount in bank:	$100,000
Pruchases:	
Total Assets:	$100,000
Sales Record:	

If they choose to buy the stock, they are asked how many they would like, and the result are marked on their Speculation Summary:

The Toy Store Stock Purchased: 1000 shares at $36 each		
Speculation Summary		
Amount in bank:		$ 64,000
Pruchases: The Toy Shop Stock (1000 @ $36)		$ 36,000
Total Assets:		$100,000
Sales Record:		

The numbers are also updated on the large screen. The Broker returns to the screen:

> "I see some of you have purchased stock. Let's see how the network was used to transfer money from your account to make the purchase."

Supported by an animation, the Broker explains a simple money transfer from their bank account to purchase the stock.

> "Now let's move on. We're now going to access the Rio Commodities exchange. There's a great deal going on copper. 120 pesos per kilo. Usually it costs around 150 pesos. Would you like to buy some?"

Again, visitors use their trading screens to make a decision: if they want to buy and how much they want. When they've all made their decision, the Broker returns to the large screen:

> "Again, I've seen some of you have made purchases. This time, since we're buying from outside the country, it won't be as simple to make the transfer from your bank to the commodity owners. We're going to have to use an intermediary, the S.W.I.F.T. banking network, to deal the different currencies and measurements. It also turns out that the commodity owner's bank and your bank don't have a formal relationship."

The Broker goes on to explain how the S.W.I.F.T. network can act as an intermediary. With an animation, she illustrates how the money is deducted from the visitor's account. She then continues:

> "Now that we've settled that, let's move on to London.
>
> Oh wait. I've just heard that The Toy Store stock has gone up by 7 dollars. If you bought some, would you like to sell them? Who knows if it will still go up?"

The visitors who bought the stock now have the choice to sell. If they do, the transaction appears on their Speculation Summary:

The Toy Store Stock Purchased: 1000 shares at $36 each	
Speculation Summary	
Amount in bank:	$97,000
Pruchases: Copper (1000 lbs @ $10)	$10,000
Total Assets:	$107,000
Sales Record: The Toy Shop Stock (1000 @ $43)	$43,000

This type of interaction continues though 4 different cities. Sometimes visitors are offered things to buy, sometime offers come in to sell. They have the opportunity to buy currency (Swiss Francs in the Zurich exchange), and art objects (A statue from an artist in Cairo). Each time the network transaction is illustrated and narrated by the Broker.

At the end of the "world tour," the Broker announces:

> "Enough speculating for the day. This 24-hour market is making me tired. It's time to cash out. The network is going to calculate how much you're worth. If you made over a million dollars, be sure to visit the automatic teller machine in the room to get your free pass to the Museum. And even if you haven't got a million, you can still get a discount at the Museum's store. Give the machine a try."

Activity 9's Educational Goals:
What do we want visitors to learn? (Learning goals)
    1) How the financial system is impacted by networks: the use of network in global financial transactions.

    2) How electronic financial transfers work: how banks reconcile at the end of the day.

    3) How the S.W.I.F.T. global banking network works.

What do we want visitors to do? (Behavioral goals)
    1) Assume the role of a speculator. Think about how much "money" they have to risk and are willing to spend.

2) Compete with other visitors.

What do we want visitors to feel? (Emotional goals)
    1) A sense of urgency: the need to make quick decisions, trade-offs.

    2) That the financial market is a global one: a sense of how networks are making the world "smaller."

    3) The urge to get as much money as possible, and to get more than the other visitors.

Development and Technology Requirements
- 4 PCs that record visitors' buying and selling, plus one server.
- Software that keeps tabs of all the visitors' actions.

Information generated for shared database (to be used in later interactive experiences):
- How much money they end up with.

Activity 10: *"Collect Your Money: The Automatic Teller Machine"*
In this short activity, visitors approach an ATM machine set behind a marble counter. They place their bar-coded card into the machine. Their Network Guide appears and says:

> "Congratulations! You made over 1 million dollars from your speculation (this is if in the previous activity they made over 1 million dollars from the original $100,000. The comment will change based on how much they made or whether they took a loss). I assume you'd like to withdraw it. Let's watch as the banking network goes out and checks your account."

The Network Guide then narrates an animation describing how the request (the exact amount they made during the speculation) goes though different banking networks until it reaches a database that confirms that the visitor's "account" holds that much money. The information then returns through the network, back to the ATM. The ATM prints out a slip with the "amount" they won, plus their award (5% off the Museum Store if they lost or broke even, 10% if they made a profit up to 1 million dollars, a free complementary ticket to the Museum if they made a profit over 1 million dollars).

Activity 10's Educational Goals:
What do we want visitors to learn? (Learning goals)
    1) How ATMs work. The link to banking networks

    2) The reliance on ATMs: how they have changed our daily lives (this would be stated by the Network Guides, tapping their fingers as they wait for the

confirmation to happen: "You know, I once when to visit a friend in a small town with only one ATM. When I was low on cash, I went to the machine but it wasn't working. I was stuck. I has assumed that there would be a machine, and I would be able to get cash at any hour of the day. I ended up having to borrow from my friend.").

What do we want visitors to do? (Behavioral goals)
> 1) Use an ATM, but this time they see how it works.
>
> 2) Collect their "winnings" from the previous activity.

What do we want visitors to feel? (Emotional goals)
> 1) Surprised, challenged: is that how they thought ATM's worked?

Development and Technology Requirements
- 1 PC set within an ATM
- Software has ATM print discount to Museum store or complementary ticket to Museum.
- Printer in ATM machine for discount and free passes.

Information generated for shared database (to be used in later interactive experiences):
- None.

Illustrated Signage:
- Banking networks (Cirrus, NYCE, etc.): how they work between banks and locations.

Area Video:
- The S.W.I.F.T. financial network. How it works, the amount of money flowing through it every second, how many banks are linked to it, security concerns, the importance of standardization, and how it was done before networks.

Network City Area 7 -- Impact Area: A World Run By Computers?
Dependency, Vulnerability, Security, Computer Crime, Mission and Safety
Critical Applications, Fault-Tolerance

This area of the exhibit raises the question of how much control do we want to
give over to computers. Large-scale applications are becoming more and more
controlled by computer networks. What are the benefits and what are the
potential dangers of this trend? What parts of the dangers are real and what are
myths? What can be done about these dangers?

Setting:
This area will contain the system that runs the Network Guides. This system will
be used as an actual example of a mission-critical application. It is located within a
glass booth where signs, descriptions by Network Guides, and demonstrations
by Visitor Assistants will highlight the system.

Activity 11: *"Where I live: The Network Guide's Home"*
This activity is a quick demonstration by the Network Guide of the network
running the Network Guides system. Visitors interact by watching a screen that
is set in front of the network system. The visitor begins by swiping their bar-
coded card through the reader. His guide appears:

> "This is where I live. Well, actually, it's where you live too, or at least the
> information and decisions you've generated in this exhibit so far.
>
> This is the system that runs the network that lets all us Network Guides
> know who you are so we can follow you through the exhibit."

The Network Guide continues. He describes the different elements of the system
(the hub, network maintenance system, servers all light up as they are
mentioned), talks why the system is mission-critical (the entire exhibit would
shut down!), and discusses what measures are being used to assure that the
system remain in operation at all times (fault-tolerant hardware and software).
At any point in the presentation visitors can push buttons that will tell them
further about any point that has been raised.

Activity 11's Educational Goals:
What do we want visitors to learn? (Learning goals)
    1) That the exhibit itself is being run on a network like all others.

    2) The critical nature of most networks. Without the network in operation,
    most of the exhibit would shut down.

What do we want visitors to do? (Behavioral goals)
    1) Observe a demonstration of the Network Guides network. They can dig
    deeper into the demonstration at any point.

\

What do we want visitors to feel? (Emotional goals)
1) That they've just had a glimpse behind the scenes of the exhibit.

Development and Technology Requirements
• 1 PC
• Database of video clips.
• Software that allows people to choose their own direction in the video presentation.

Information generated for shared database (to be used in later interactive experiences):
• Any of the in-depth information they asked to see during the presentation.

Activity 12: *"Risky Business?"*
This activity is in form of a questionnaire (about 8 questions) where visitors face situations and "vote" how they would react or solve them. Their answers are then compared to other visitors' responses and descriptions of the actual situation. For example:

"Would you fly a plane if you knew it was being flown solely by a computer?"

The reply to their answer would be:

"You said you would not fly a play if it was being flown by a computer. 65% of the Museum's visitors also said No.

Many airplane operations, both in the air and in the air traffic control rooms, are controlled by computer. The term "auto-pilot" means the airplane is being directed by a computer."

(This could be phrased another way: "What percentage of the average airplane flight is controlled solely by computer? 10% -- 30% -- or over 50%?")

Another example:

Visitors watch short sequences from movies where a computer controls a range of the major large-scale network applications and massive system failures ensues (could be any number of movies: War Games, Sneakers, Terminator, 1984, Brazil). Visitors are then asked if they think that such a situation could actually happen.

After viewing the percentage of visitors who feel the same way they do, they would get an explanation of the type of security measures (such as decentralization) that have been used to protect against the type of situation shown in the movie clips. They will also be told of times when these security measures have broken down.

Another example:

> Your friend gives you the number and a password to a top secret computer network you can get in with your modem. You log in and look around, reading files and trying different programs. Are you breaking the law?

Activity 12's Educational Goals:

What do we want visitors to learn? (Learning goals)
1) To face the myths and realities about network dependency, vulnerability, security, and crime.

2) This is NOT intended as a multiple choice test. The idea is to have visitors think about their beliefs, compare their beliefs to other visitors' beliefs, and then, if appropriate, become more informed about issue being raised.

What do we want visitors to do? (Behavioral goals)
1) To test their assumptions about networks, and compare them to other visitors' assumptions and facts about the situation.

What do we want visitors to feel? (Emotional goals)
1) That they are gaining a new perspective on assumptions they have about networks.

Development and Technology Requirements
• 1 PC
• Simple database that records visitors' choices

Information generated for shared database (to be used in later interactive experiences):
• Visitors' answers to the questions they were asked.

Illustrated Signage:
• Mission- and Safety-Critical Applications: An explanation of how nuclear plant control centers use safety-critical networks and the type of fault-tolerance systems they have in place to avoid failure. This is contrasted to mission-critical applications: Office networks that break down, so no one has access to a critical customer database or the word processing software.

Area Video:
• Network Horror Stories: a collection of actual news reports about system failures. Included would be the phone system going down, the Internet Worm, mistaken identities due to network failures, astronomical mistakes on bills (a $150,000 charge for electricity), mechanical systems controlled by networks going out of control, etc.

Network City Area 8 -- The Airlines

This area will highlight the different novel ways networks are used in the airlines industry, from the present and future FAA airplane control system to the vast SABER airline reservation network. A technical highlight will be the use of wireless technology, and how it is extending the reach of networks where physical connections are not possible (such as in airplanes).

Setting:
Visitors enter the area and they see, projected on the wall, a feed from the FAA's airplane control system (this will be used in the "Air Traffic Controller" activity). On the other wall is a series of airplane seats against a wall with airplane windows (to be used in the "Call home" activity). The windows are projecting video taken from up in the sky. Background sounds include air traffic controllers directing traffic and the occasional announcement from an pilot.

Activity 13: *"Air Traffic Controller"*
Visitors sits down at a simulated air traffic control panel, situated below the large-screen projection of a feed from the FAA's air traffic control system. They swipe their bar-coded card into the reader, and on the screen their Network Guide appears:

> "Not all networks use wires. The Federal Aviation Administration uses a wireless network to keep track of the airplanes in the air.
>
> What you are seeing is the FAA's air traffic control system in action. Each airplane in the air is transmitting information about itself, including its location, over a wireless network to a central computer. The computer turns this information into a image that lets air traffic controllers see where all the airplanes are in the sky. This image keeps being updated as the airplanes transmit their new locations. This helps the air traffic controllers when they work with the pilots to land the plane.
>
> How important is this image? Use the control panel to see what happens under different situation, and see how dramatically the image changes."

Visitors then get to push different buttons that offer different scenarios:

1) Major Snow Storm in the Midwest: O'Hare Airport Shuts Down

2) The Day before Thanksgiving

They also can sort the information:

1) All International Flights

2) All Flights from the South

When they push each button, they get a description of the scenario, and an explanation of how and why the traffic flow is a certain way.

Activity 13's Educational Goals:
What do we want visitors to learn? (Learning goals)
    1) How airplane traffic control takes place using wireless network technology.

    2) The concept of wireless technology: how data is transmitted over the air. Not all networks need wires.

What do we want visitors to do? (Behavioral goals)
    1) Try different scenarios (normal conditions, bad weather, holiday traffic) and sort the traffic according to different characteristics, to see how the traffic flow changes.

What do we want visitors to feel? (Emotional goals)
    1) The complexity of air traffic control, and how it is managed with the help of computer networks.

Development and Technology Requirements
- 1 PC controlling a videodisk
- 1 Large screen display.
- Software that plays different segments of the videodisk based on choices selected by the visitor.

Information generated for shared database (to be used in later interactive experiences):
- None.

Activity 14: *"Call Home"*
In this short activity, visitors use a telephone again, only this time from "30,000 feet" in the sky, and learn how wireless telephone networks work.

The visitor begins by sitting in an airplane seat (There are two rows of single seats. The back seat has a "window" showing video taken from an airplane). This triggers a telephone, mounted on the seat in front of them, to start ringing. The visitor pick it up and is prompted to swipe his bar-coded car through a reader next to the phone. His Network Guides shows up on a screen located where normally the fold-down tray is placed:

    " When you make a call from an airplane, you're using a computer network. Let's use the same number you used when you made the call on the phone system earlier in the exhibit. But this time, let's see how the call is made from 30,000 feet up in the sky."

The visitor then sees a visualization of how the information is sent to a wireless carrier, which then transfers it to the regular telephone system. However, once the call reaches the destination, it turns out that the person for whom the call was intended is away from her desk. She has set her phone to redirect the call to her mobile phone. The visitor then sees how the call is sent once again over a wireless carrier to reach its destination.

Activity 14's Educational Goals:
What do we want visitors to learn? (Learning goals)
    1) The concept of wireless technology: how data is transmitted over the air. Not all networks need wires.

    2) Digital wireless phone calls: how calls are made from airplanes.

What do we want visitors to do? (Behavioral goals)
    1) Watch how the call is routed.

What do we want visitors to feel? (Emotional goals)
    1) A sense of the complexity of different type of phone systems working together to make a connection.

Development and Technology Requirements
• 1 PC
• Software that animates the calling process.

Information generated for shared database (to be used in later interactive experiences):
• None.

Illustrated Signage:
• The Advanced Automation System (ASS) air traffic control program. An illustration of how the next generation (slated for 1996) of the national air traffic control system will operate.

Area Video:
• The SABER System: What it is, how it came about, how it has changed (and how people can now gain access to it), and what is planned for the future (beyond the flight, digital video of different hotels, etc.).

Network City Area 9 -- Utility Control: The Central Artery

The Central Artery area in the exhibit will show how distributed control networks gather and synthesize data by providing visitors with the opportunity to discover the workings of a traffic control center. The Central Artery project plans a network that will gather and synthesize data about traffic flow. A variety of sensors positioned at key points in the city will count cars to document traffic flow and monitor air quality in tunnels. This data will be relayed back to a central control center where operators will use the network to alter traffic lights and digital speed limit signs, and activate air pumps in tunnels to improve traffic conditions.

Setting: A Traffic Control Center

Positioned next to a window overlooking the actual Central Artery, the focus of this area will be a large projection screen showing Artery traffic, framed by monitors showing moving images from the Central Artery's traffic monitoring cameras. Below the projection screen is a control panel where visitors will assume the role of a traffic control operator. Background sounds include recordings of state police reports and other traffic monitors.

Activity 15: *"Traffic Control Operations"*

In this activity, visitors use a simulation of the Central Artery's traffic control network to manage different traffic scenarios. Above a large control panel, visitors see a large-screen graphic representation of the Central Artery's roadways. The representation is showing normal traffic flow, and includes where sensors (movement sensor, video cameras) and dynamic control elements (variable speed limit signs, variable message signs, land use signal, emergency vehicles) are located.

A visitor begins by swiping their bar-coded card through a reader set into the control panel. Their Network Guide appears in a video window on the screen:

> "Boston's traffic can sure get congested some times! But when the Central Artery project is completed, they'll be using a computer network to help traffic flow.
>
> At the Operations Control Center traffic controllers will be watching over and controlling the Artery with a computer network. The screen in front of you represents the traffic flow of the artery. This representation is created by car sensors that have been placed in the ground. The controllers will also be helped by cameras that will give them a up-to-the-moment picture of what is going on.
>
> Try this yourself and take on the role of a traffic controller. Choose a scenario by touching one of the choices on the screen in the control panel."

On a computer screen imbedded into the control panel, four scenarios show up:

> 1) Accident in the Artery Tunnel

2) Snow Storm

3) The Red Socks Win the World Series!

4) The President Comes to Boston

As one example, the visitors picks Accident in the Artery Tunnel. The Network Guide describes the situation:

"A large truck has just hit a car in the tunnel. This is slowing down traffic, as drivers are slowing to avoid the truck and the car. It's rush hour -- we've got to get the traffic flowing faster."

This information is reinforced by a change in the large screen display. In addition, a video window has appeared that shows the accident as viewed from the monitoring camera.

"The computer has registered the accident and is suggesting three alternatives. Pick on from the screen in the control panel."

On the computer screen in the control panel, three alternative solutions appear:

1) Reroute Traffic

2) Speed up Traffic

3) Leave as is

For each alternative, there is also a description of actions. For example, for the Reroute Traffic choice, visitors will see the following description:

Emergency Vehicles:	Send EV #5 against traffic to accident site
Variable Speed Limit Signs:	Slow down speeds around accident and near exit 5 off-ramp
Variable Message Signs:	Switch on routing sign to turn people off at exit 5. Switch on routing sign to route people on side road at exit 5 back on at exit 6.
Lane Use Signals:	Close lane 1 (lane where accident is happening)
Advisory Radio:	Broadcast warning about rerouting at exit 5 to side road

The visitor picks the alternative they think will best solve the problem. They then watch what happens on the large screen. If they pick the right alternative, they see the accident being cleared (this is reinforced by the video feed), and traffic moving smoothly. If their alternative was incorrect, they see the problems it

creates (more traffic congestion, slower access to accident). They then get the choice of seeing the correct alternative.

Activity 15's Educational Goals:
What do we want visitors to learn? (Learning goals)
    1) How a *distributed* network works: visitors learn how a series of indicators on a network can provide an overview of a situation (car traffic). As a result of this overview, other nodes on the network can be altered to change the situation (eliminate a traffic jam).

    2) The Central Artery project will use a distributed network to help control traffic movement.

    3) Basic rules of traffic control.

What do we want visitors to do? (Behavioral goals)
    1) To interact with a simulation of the Central Artery's control network: to try different alternatives (changing speed limits, road directions) to deal with a variety of traffic situations.

What do we want visitors to feel? (Emotional goals)
    1) A sense of the large-scale nature of the Central Artery project, and how networks help to make such projects possible.

    2) Visitors are familiar with the Central Artery project: they will be *surprised* to hear that network technology will play a critical role in its operation.

Development and Technology Requirements
• 1 PC that shows visitors the choices they have and controls a videodisk
• Software that controls the videodisk.
• A videodisk with images from the different scenarios and alternative solutions.

Information generated for shared database (to be used in later interactive experiences):
• Record of how many situations they dealt with and how many alternatives they tried before clearing the traffic.

Illustrated Signage:
An overview of distributed networks: how they work, other examples of their use (oil refineries, manufacturing plants).

Area Video: (2 sequences)
• A presentation on the plan for the Central Artery, how it will be controlled by a computer network, and a description of the Control Center that will be used to manage the system.
• The latest network technology used for traffic control: automatic toll collection, digital monitoring, Global Position Sensing.

Network City Area 10 -- Education Area

This area will show visitors how computer networks are being used by -- and are changing -- formal educational systems. Visitors will get to explore different network projects slated for K-12 ("The Alice Testbed Project" Activity) and find out how the academic world uses the Internet for sharing and quick dissemination of research (this will be highlighted in the illustrated signage and in the area video). Emphasis will also be placed on how technology is part of the reforms going on in education.

Setting:
A classroom that incorporates computers and networks as part of its design, and reflects the new types of learning that include technology as a fundamental part of its approach. For example, instead of desks in a row, they are placed in a circle for more collaboration. Instead of computers on top of the desk, they are placed within the surface. Background sounds include students and teachers talking and playing (but no bells ringing!).

Activity 16: *"The Alice Testbed Project"*
This activity takes place on the screens imbedded inside four desks placed in a circle. Visitors are introduced to the Alice Testbed, a wide range of educational network projects. Using a front end that makes it easy to access the different projects, they can explore between 3 - 8 educational networks, including:

> Kids Network -- soil and water analysis done by students around the world, creating a global picture of the state of the earth's soil and water.

> Global Lab -- a group of teachers, students, and scientists from around the world who are working on ecological issues.

> Creative Physics -- a course which uses satellite distance learning and computer-communications networks.

Upon choosing a network, they are introduced to its main features and the type of people who use it.

Activity 16's Educational Goals:
What do we want visitors to learn? (Learning goals)
> 1) How networks are used in educational environments.

> 2) How distributed networks can create a picture of a topic that is of greater value as a whole than the sum of its parts.

> 3) How distributed networks allow for quick sharing and dissemination of information.

> 4) How distributed networks can bring together people with common interests despite geographic, cultural, and language barriers.

5) To see how networks are changing the traditional modes of education: moving from insulated, theoretical teaching to global, real-time, and more informal types of learning.

What do we want visitors to do? (Behavioral goals)
1) To explore the different networks in the Alice Testbed and see the kind of information being developed.

What do we want visitors to feel? (Emotional goals)
1) A sense of the vast interaction taking place among students on a global scale.

2) This is real work: it is scientific exploration using real data.

Development and Technology Requirements
• Need to work with Alice Testbed Project and TERC
• Software that will link into Testbed networks and develop descriptions for each network

Information generated for shared database (to be used in later interactive experiences):
• None.

Illustrated Signage
• None.

Area Video
• The Internet: A history (using maps from TCM's collection), and how the academic world uses the system (sharing and rapid dissemination of information). Novel information that can be had on the Internet (such as the Coke machine at CMU).
(NOTE: The Internet will be featured much more predominantly in the second area of the exhibit, World-Wide Connections, where visitors will gain access to many of the services available on this vast network. It is mentioned in the Education Area because of the important role it is playing in K-12 and higher education).

Network City Area 11 -- Impact Area: Privacy

This area will focus on the issue of how computer networks are threatening people's personal privacy. It will show how networks <u>facilitate</u> the gathering of personal information. This gathering has always taken place, but networks make it easier and the information more precise. This has its advantages (more targeted marketing, better consumer information) and its disadvantages (loss of privacy, risk of information being used maliciously).

As the final section in the Networked City, it will be the last opportunity for visitors to use their bar-coded card, and will be the place where people will get a review of all their interactions in the exhibit.

Setting:
This is a transitional space, bridging the Networked City space with the World-Wide Connections area. Visitors approach the space by going though a device that looks like a metal detector (more of these will be used in the final bar-coded card activity where visitors get a read out of all their interactions in the Networked City). On the main wall of this space is a series of large projections, listing the read out from the last ten visitors in the space. Beyond this projection visitors see into the World-Wide Connections area.

Activity 17: *"Networked City Summary"*
Visitors approach this activity by walking through a metal detector-like device with a bar-code reader on its side (there are five of these stations). As visitors swipe their bar-coded card through the reader, their Network Guide appears on a screen in front of them:

> "It looks like our trip is over. I've enjoyed traveling with you in the Network City.
>
> The central network that linked me to you has been keeping track of all the things you've done in the Network City, from the phone number you called in the telephone network exhibit, to the type of toy you bought in the retail section. Would you like a record printed out for you to take home?"

On the screen they see the different information that has been recorded by the central network, including a list of all the interactive stations they visited, as well as the information they generated (telephone number dialed in the telephone network exhibit, image of them taken during video conferencing exhibit, letter written during E-mail Follies exhibit, type of interaction with interactive TV exhibit, choice of toy house from retail exhibit, how much money they ended up after speculating in the finance exhibit, answers they gave in the Risky Business questionnaire, in-depth questions they asked about the Network Guide system, and record of success with traffic control in Central Artery exhibit). If the visitor chooses to print the record, a fast printer next to the screen provides the print-out.

As the Network Guide bids the visitor farewell, they ask if they would like the record of their interactions to be public or private. If they choose for it to be public, the information is posted on a large projection screen that lists information from the last ten visitors to the area.

"Up to now you've been finding out how other people use networks.

In the second part of the exhibit -- the World-Wide Connections area -- you'll be able to use networks to connect to information and people from around the globe.

Say hello to them for me!"

Activity 17's Educational Goals:
What do we want visitors to learn? (Learning goals)
    1) To get a review of what they did in the exhibit.

    2) To see how computer networks can track and consolidate information generated at a variety of locations.

    3) To consider what it means to have their information be private or public.

What do we want visitors to do? (Behavioral goals)
    1) To get read their review and consider the Network City as a whole -- to make links between the different areas of the City. This review can serve as a souvenir of their visit to the exhibit.

What do we want visitors to feel? (Emotional goals)
    1) That their privacy has been slightly invaded by having a central network track their interactions in the exhibit.

    2) That they used a real network.

Development and Technology Requirements
• Software that will display summary of central database collecting visitor information.
• 5 fast PCs.
• 5 fast Printer to print out summary of visitors' actions in exhibit.

Activity 18: *"Card Reader"*
In this short activity, visitors are encouraged to put their plastic cards into a card reader and see what kind of information is stored in the card. They see the information on a screen. For those visitors without their own cards, they can use samples provided at the activity.

<u>Activity 18's Educational Goals:</u>
What do we want visitors to learn? (Learning goals)
    1) That they carry a great deal of information about themselves within their plastic cards.

What do we want visitors to do? (Behavioral goals)
    1) To try different plastic cards they carry (credit cards, bank cards, T-passes, library cards) and see what kind of information is contained on them.

What do we want visitors to feel? (Emotional goals)
    1) Surprised at how much information resides on the cards -- or that the cards contain information in the first place.

<u>Development and Technology Requirements</u>
• A reader system that can interpret what is written on people's plastic cards.

<u>Illustrated Signage</u>
• The Privacy Trail: How a few personal items can reveal a great deal about you (see Boston Globe illustration).

<u>Area Video</u>
• Privacy under siege: how personal information is collected (credit bureaus, data banks), how it is used by mass marketers and others.
• The Social Security number: a unique identifier and information unifier.