Pittsburgh I-Net

Business Plan

October 18, 1999

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Pittsburgh I-Net

1.0 Executive Summary

The Pittsburgh I-Net is the result of a collaboration among the members of the Pittsburgh I-Net Working Group. The Working Group consists of representatives of the City of Pittsburgh, the Pittsburgh Public Schools, the Carnegie Library System, local foundations and local non-profit organizations. The Working Group wants to develop and operate an institutional network that would serve the Group's members. The Group has been promoting the negotiation of the requirement of an I-Net in the new cable franchise agreement for TCI of Pennsylvania, Inc.

The purpose of the I-Net is to make affordable, high bandwidth infrastructure available to government, school, library and non-profit facilities in all neighborhoods throughout the City of Pittsburgh. TCI is being asked to provide and dedicate several additional fibers throughout its commercial cable system as it installs fiber cable in the upcoming upgrade of its system.

City, School District and Library facilities will receive direct fiber connections to the I-Net. Community groups will connect to the I-Net through equipment rooms in the facilities of the City, School District and Library facilities.

The Working Group participants will raise funds to purchase electronic networking equipment and will fund the connection of non-profit organizations to the system. I-Net users will also fund the continuing operating and maintenance costs of the system.

Further, to address the community groups' immediate needs, TCI will provide 100 free cable modems and service to non-profit community groups.

1.1 Objectives

Programmatic: Affordable High-Bandwidth Infrastructure Distributed Throughout All City Neighborhoods

1. Install high-bandwidth building network to give tenants the opportunity to use advanced Internet and networking services.

2. Provide tenants with access to advanced Internet and networking services.

3. Introduce tenants to new applications of advanced Internet and networking services.

4. Research and develop improvements in networking technologies.

Financial: Sustainable Services

1. Subscribe at least 80 percent of tenants by year-end 2000.

2. Develop revenues sufficient to cover program costs

1.2   Mission

3RC and Info Ren will convert the Regional Enterprise Tower into a showcase of Internet and networking technology. The office building will be converted into a working display of the most advanced Internet and networking technologies applied to the civic agenda in the country. The joint venture will educate tenants on the use of the technologies, which tenants will use to achieve their common goals of regional economic development. The in-building staff also provides a familiar face to organizations that might otherwise tend to be intimidated by technology and forego using it.

The showcase will serve as an example to be emulated throughout the region, improving the region's information infrastructure and laying an improved foundation for economic development. The project will also conduct research and testing to continually create and deploy advances in such technologies.

1.3   Keys to Success

1.   Staff experienced in advanced Internet and networking technologies

2.   Two complementary organizations working together

3.   Bootstrap start of operation with Interim Services

4.   Grow business through education of user community

2.0   Project Summary

Smart Building is a non-profit joint venture being formed by 3 Rivers Connect (3RC) and Information Renaissance (Info Ren) to build and operate a technology showcase in the Regional Enterprise Tower at 425 Sixth Avenue, Pittsburgh PA. The joint venture will install a building-wide network infrastructure and provide innovative Internet and other network services to help the Building's tenants achieve their common goal of regional economic growth.

The joint venture will implement the Smart Building pursuant to an agreement with the building owner, Southwestern Pennsylvania Corporation. The agreement authorizes the joint venture to conduct its activities in the building and requires new tenants and tenants renewing leases to obtain a basic level of services (direct connections for Internet access and email) from the joint venture.

The central theme of the Smart Building approach is the achievement of economies of scale through shared networking infrastructure and shared in-building technical assistance. The economies of scale enable the joint venture to provide access to advanced services more effectively and efficiently.

The in-building staff also provides a familiar face to organizations that might otherwise tend to be intimidated by technology and forego using it. With the close and continuing relationship of an in-building resource, the user support staff can also provide educational and training programs geared to the shared interests of the building's tenants.

The physical part of the Smart Building entails the installation and operation of common building-wide network architecture. The network architecture includes a single, shared high-speed connection to the Internet for the entire building, a shared building hub, fiber optic lines to each wiring closet and Category 5 wiring from the wiring closets to all

offices. The shared infrastructure enables each tenant to gain access to high-speed Internet access (peak T1 speed and higher) and internal networking at less cost than through individual connections. Further, despite the shared infrastructure, the Project provides individual tenants with network security through the establishment of Virtual Local Area Networks (VLANs).

The operational part of the Smart Building includes a shared building support staff that provides each tenant with access to technical assistance. Since 65 percent of the tenants have staffs of less than six, most do not have an information technology consultant on staff. Since 85 percent of the tenants are non-profit organizations with tight budgets, they may also be unwilling to spend the resources required to get technology advice. The shared user support of the Smart Building Project makes technical assistance readily available at relatively low cost. The Project can also use quantity-buying agreements to obtain services and supplies at lower cost.

The Regional Enterprise Tower owner has made available to the tenants a gift from Microsoft of Office 2000 Professional licenses. These licenses are being distributed to the tenants in the following manner: one copy for each desktop to the first 450 desktops, at no charge, to those subscribing to the Internet access service.

2.1   Project Ownership

Partnership leverage: Working Group buildings as sources of power supply

Smart Building is a new non-profit joint venture being formed by 3RC and Info Ren.

3RC is a section 501(c)(3) organization formed to create for the Pittsburgh region a single, distributed Information Commons that will be used by every resident and visitor to learn, work, and interact. 3RC plans to accomplish this goal by the year 2003, by supporting and initiating projects that will be globally recognized for their innovation and effectiveness (see http://www.3rc.org/3rcinfo/).

Info Ren is a section 501(c)(3) organization that promotes the development of regional networking infrastructure in support of education, community development and economic revitalization. (see http://www.info-ren.org/).

These two organizations with complementary missions form a natural collaboration to create the Smart Building described in this plan.

2.2   Start-up Summary

In advance of funding for the installation of the full "Smart Building" network, Interim Services are being provided to the tenants. These services include high-speed Internet access and email. Monthly maintenance services, firewall security services and other services are available on an a la carte basis. These Interim Services are being provided via upstream connectivity purchased by Info Ren and linked to 425 Sixth Avenue via a high-speed point-to-point link driven with DSL technology. As tenants subscribe to this service and utilization of the network grows, higher speed lines will be installed directly to 425 Sixth Avenue. Information Renaissance is providing funding for Interim Services with the expectation that the expenses will be reimbursed via funding for the "Smart Building" program.

Table 2.2-1 lists the recurring and non-recurring costs to be incurred to provide the Interim Services.

Table 2.2-1: Start-up Costs – Interim Services

Item	One Time Cost	Monthly Cost
Upstream connectivity		$1400.00/month
High speed point-to-point link		$58.00/month
High speed point-to-point link installation	$670.00	
Cisco 4000M Router	$12,000.00	
2- Pairgain Campus-T1 HDSL Driver	$4,400.00	
Gateway2000 NS-8000 Server	$6000.00	
2-8 Port Ethernet Hubs	$200.00	
2-phone lines to 1824		$36.00/month
2-phone lines to 1824 – installation	$90.00	
2 line speakerphone w/caller id	$50.00	
Personnel – Sales		$3,250./month
- Technical		$7,775./month
- Administrative Costs		$2,756./month
Totals	**$23,410.**	**$13,781./month**

Smart Building will install common building network architecture and provide a full slate of Internet and networking services, including in-building user support, technical assistance and education for tenants. A Basic level of service will include Internet access and email. An Expanded level of service will include a la carte services, such as LAN maintenance, Help Desk user support, education and volume purchasing.

Table 2.2-2 estimates the initial and recurring costs of the full Smart Building network and services. Funding sought by 3RC is intended to cover the installation costs of the Smart Building network and the first year of Smart Building operations.

Joint venture staff will perform design, oversight of installation and system operation and maintenance. Installation and component services, such as upstream Internet connectivity, will be subcontracted as appropriate.

Table 2.2-2: Start-up Costs – Smart Building

Item	One Time Cost	Monthly Cost
Building Infrastructure		
Building hub (18th floor)		
Upstream Router	$40,000.	
Downstream switch	$73,000.	
Caching Servers	$25,000.	
Rack, power conditioning, patch cables	$6,000.	
Riser wiring		
12 strands of fiber to each satellite closet 10 runs with average length of 225' 4500' of 6-strand fiber (installed)	$25,000.	
Satellite wiring closets (every 3rd floor)		
10 10-port switch/routers @10,000	$100,000.	
30 16-port managed hubs @1,500*	$45,000.	
Rack, power conditioning, patch cables	$34,000.	
Horizontal runs – funded by building owner and tenants		
Design and management	$74,550	
Total Building Infrastructure	**$348,000.**	
Network Operations Center		
Design	$7,000	
Remodeling	$40,000	
Furniture	$7,000	
Staff computers	$15,000	
Network monitoring hardware/software	$15,000	
Total NOC	**$84,000**	
External Connectivity		
10 Mbps SMDS		$2,667.
Internet connection		$4,583.
Total External Connectivity		**$7,250.**
Personnel		
Salaries		
User consultant (1.0 FTE)		$3,333.
Network manager (0.5 FTE)		$3,000.
Project manager (1.0 FTE)		$6,000.
Program manager (0.2 FTE)		$1,500.
Office support (0.5 FTE)		$1,250.
Total Salaries		$15,083.
Benefits @ 30%		$4,524.90
Administrative costs		$6,803.95
Project Development	$54,300.	
Total Personnel		**$26,411.85**
Materials and Supplies		$2,000.
Smart Building Cost Summary		
One Time Costs		
Infrastructure	$348,000.	
Network Operation Center	$84,000	
Installation of External Connectivity	$2,000.	
Design and management	$74,550	
Project Development	$54,300.	
Total One Time Costs	**$562,850.**	
Continuing Costs		
External Connectivity		$7,250./month
Personnel		$26,412 /month

Materials and Supplies		$2,000./month
Total Continuing Costs		**$35,662 /month**
Subtotal	**$562,850**	
* Major tenants have/are purchasing their own hubs for various reasons		
Total First Year Project Cost including 1st year cont. costs	**$990,794**	

2.3   Locations and Facilities of 3RC and Info Ren

Smart Building maintains offices in the Regional Enterprise Tower, 425 Sixth Avenue, Suites 1310, Pittsburgh PA, and at 600 Grant Street, Suite 2980, Pittsburgh PA. Customer service operations maintains office space in Suite 1824 of the Regional Enterprise Tower, the building in which the tenants are being serviced.

3.0   Building Network and Services

Smart Building entails, initially, an initial set of Interim Services prior to the receipt of funding for the design and installation of common building-wide network architecture. When sufficient funding is secured, the joint venture will install the building network and start offering a full scope of Internet and networking services. The joint venture will also deploy a dedicated in-building support staff to operate and maintain the network and to provide user support, education and technical assistance to tenants.

3.1   Building Network Design and Installation

The joint venture will design and install a common building-wide network architecture that relies upon economies of scale to provide tenants with high bandwidth and technical support. The network architecture includes a single, shared high-speed connection to the Internet for the entire building, a shared building hub, fiber optic lines to each wiring closet and Category 5 wiring from the wiring closets to all offices. The shared infrastructure enables each tenant to gain access to high-speed Internet access and internal networking at less cost than through individual connections. Additionally, the Project provides individual tenants with network security through the establishment of Virtual Local Area Networks (VLANs). The shared building support staff will provide tenants with access to technical assistance, such as Local Area Network planning, implementation, and servicing, and tenant education to create a more fully communicative regional resource.

3.2   Service Description

The project will start with Interim Services prior to the installation of the Smart Building Network. The Interim Services will consist of Internet Access and Email.

With the installation of the Smart Building network, the joint venture will provide a full slate of Internet and networking services. Two levels of service will be offered – Basic Service and Expanded Services. The Basic level of services consists of direct connections for Internet access and email accounts. New and renewing tenants will be required to subscribe to the Basic level of services as the Smart Building is built. The Expanded level of services consists of a variety of network services, which tenants can purchase on an a la carte basis.

Basic Services:
1. Internet Access: Internet Access is provided as an Interim Service and as a Smart Building service. Under the Interim Services program, we are providing connectivity

to the Internet at T1 peak speed (1.5Mbps) on a per-desktop basis ($40.00 / month / desktop); we are also providing bandwidth tiers of service for larger organizations where the per-desktop pricing model does not scale well. These bandwidth tiers are in 100Kbps increments ($100.00 / month / 100Kbps) with the bandwidth utilization being measured and the tier subscription being adjusted if bandwidth utilization is routinely exceeded. These bandwidth tiers also provide T1 peak speeds to the desktop. It is expected that this two-tier approach will continue under the "Smart Building" program.

2. Email service: Email service is provided as an Interim Service and as a Smart Building Service. Email service is Included as part of the per-desktop service and is an incremental billable ($5.00 / month / desktop) service for the bandwidth tier service. The current email server is housed at Information Renaissance. The "Smart Building" email service will be housed in Suite 1824 and will offer Microsoft Exchange Mail service ($10.00 / month / desktop) with all the accompanying options for communication between the tenants.

Expanded Services:

1. LAN Maintenance: Maintenance of a tenant's Local Area Network is fairly independent of the bandwidth utilization and more directly related to the number of desktops on the network since this means more connections, more network cards, more OS networking glitches, etc. Therefore the pricing strategy for this service is at the per-desktop level ($5.00 / month / desktop), which covers the presence and integrity of the physical LAN connection as well as the desktop network configuration. This service is highly recommended for those tenants with no in-house staff to manage this resource since it can be the source of problems with no Internet access as the result.

2. Help Desk: The Smart Building will provide desktop support, a service not normally provided by commercial ISPs, to tenants. This Help Desk will have two levels of support, telephone support and on-site / at-your-desktop support. Telephone support will be priced at $25.00 / month / desktop. On-site service will be prices at a per call rate of $70.00 / hour billed in quarter hour increments. Since we are in the same building there are no travel time charges involved. Smart Building is standardizing on the Microsoft Operating Systems of Windows 95/98, Windows NT Workstation, Windows NT Server, and the Microsoft BackOffice Server suite. We will offer desktop support for these operating systems to include installation, troubleshooting, and version upgrading (to Windows 2000, for example). Applications to be supported include Office 2000, and Symantec and McAfee virus software products. Monthly virus updates will be part of this service as well, assuming the desktop has a virus protection license. Macintosh OS can also be supported along with Office 98, as well as various UNIX flavors and cross platform file exchange.

3. Technical Consulting/LAN Design and Implementation: For tenants who have no internal staff to address technical issues, Smart Building will be able to act in this consulting role. This service will be contracted for on a tenant-by-tenant basis, depending on their needs and size. Pricing: $100 per hour.

4. Deploying Firewalls and Virtual Private Networks: Tenants who have the need for secure communications between their network in the Regional Enterprise Tower and another site can arrange for Smart Building to assist them to set a secure communication channel called a Virtual Private Network. The service of securing the tenant's LAN form the Internet, called Fire walling, is also available These are billed on a tenant-by-tenant basis. Pricing: $100 per hour.

5. File Serving: Building wide file servers will be available to tenants. This will be billed on a file storage requirement basis. Pricing will be based on a "GigabyteMonth".

6. Automated Data Backup: System Back-up services will be offered along with off-site storage of data, where requested by tenants. This sort of data security will address the early stages of a Disaster Recovery plan which some tenants are currently investigating.

7. Web Hosting: Smart Building will provide Web hosting services for tenants. Web site management backup services are part of this hosting plan along with Web site development expertise.

8. Services for Desktop Videoconferencing: The internal high-speed optical backbone will allow tenants to utilize video conferencing within the building. It is expected that this means of visual communication will extend to the Showcase area in the building lobby and outside the building to other agencies, as well. Info Ren will assist tenants in provisioning the equipment to conduct videoconferencing and will provide technical assistance to perform videoconference sessions.

9. Education and Seminars: Smart Building will focus on the education of the tenant population concerning the use of these networking services in order for them to more effectively use these technologies in their work. Seminars for tenants will be held to address the usage of various applications supported by Smart Building, tuning of operating systems, use of various building wide capabilities such as video conferencing and file servers, and other topics. It is expected that the cost for these one-day seminars will be $100.00 per attendee.

10. Volume Buying Agreements for software, hardware, and supplies: The Smart Building will negotiate volume buying agreements with software and hardware vendors, especially for Microsoft software products, to leverage the building's approximately 1400 desktop users. PC configuration services will be offered to those who take advantage of this PC buying arrangement. It is expected that Dell and Gateway will be the two dominant PC vendors. Pricing on the various models will be the vendor's prices at the time + 5% of the vendor's price. It is hoped that the software will be upgradeable and loadable from the building server. This will involve a per desktop subscription rate to be determined by Microsoft and the other software vendors.

3.3   Research and Development

The joint venture will complement the provision of Internet and networking services with the evaluation and implementation of new networking technologies, services and applications. The research will not interfere with existing services and will be funded by research grants. Potential topics include the following:

- Hi-fidelity desktop videoconferencing, which will provide the tenants participating with smooth, high-resolution desktop video and network based white boarding.
- Collaboration tools will provide the tenants with the capability to share web based calendars linking into resource databases which will allow them to do scheduling and planning on a building wide basis.
- Roaming connections will permit tenants who are extremely mobile to use their notebook/laptop computers in any room or on any floor of the building.

4.0 Market Analysis Summary

The building will, based upon current tenant patterns, house approximately 83 tenants and 1400 computer desktop users. The tenants will have a variety of staffing levels, expertise in networking technology and methods of accessing the Internet.

An inspection of the existing building wiring revealed severe limitations on the amount of bandwidth that can be delivered to each connection (1 Mbps maximum). The trays or conduits on each floor contain large abrasive cable inhibit installation of upgrades to support networks and higher bandwidth. The perimeter wiring architecture is also no longer conducive to office configurations of the '90s, characterized by fewer individual offices and more shared administrative areas. Each tenant is on their own in designing and installing new wiring. As is common in multi-tenant buildings, the building owner took a hands-off approach to telecommunications upgrades, offering little guidance or regulation. What resulted under this scenario is a patchwork infrastructure primarily driven by the Internet Service Providers (ISP) who offer tenants widely varied level, cost, and quality of bandwidth.

Based upon a door-to-door technology usage survey conducted by 3RC, 14 of 23 (61%) responding tenants have staffs of 1 to 5 employees, and 9 (39%) have staffs of 6 employees or more. We estimate that 20% will have staffs of 1 or 2, and 80% will have staffs of three or more. ("Three" is significant for market analysis, because staffs of three employees or more will, based upon the $40 per desktop pricing for Internet access, likely purchase Internet access at the "bandwidth" rate, which starts at $100 per month per 100 Kbps.)

Based upon our research, it also appears that networking expertise varies widely. Of the 23 respondents to the 3RC survey, 15 had no Local Area Network (LAN) administrator. Six had a part-time LAN administrator, and only 2 had a full-time LAN administrator. Market opportunities exist for all classes of tenants. We can provide technical expertise for tenants lacking staff expertise, providing their initial contact for such help and/or replacing or supplementing technical assistance they may be purchasing at higher prices. We can also supplement the staff expertise that tenants may have, supplying the additional specialized assistance they may need.

Nine percent had no Internet connection. Seventy-three percent had dial-up connections, and 18 percent had direct connections. Forty-four percent spent $20 per month for Internet access. Twenty-two percent spent between $20 and $200 per month. Thirty-three percent spent over $200 per month. Eighty-seven percent said they maintain a database.

5.0 Strategy and Implementation Summary

The overall implementation strategy is to offer an initial, limited slate of Interim Services and develop an initial customer base while seeking funds for the Smart Building network. If sufficient funds are received by the end of 1999 for the entire building network, we plan to proceed with the entire installation. If funds are received in lesser amounts, we will install the building network in feasible increments. We will start deploying Smart Building services as adequate facilities are built and will continue to provide Interim Services to other tenants.

As the project moves toward the Smart Building, it would anticipate establishing or connecting to an existing local network peering point. High-speed Internet connections, building wiring and any other outsourced capabilities will generally be put to bid. Smart Building reserves the right to choose the final vendor based on factors other than low bid, such as up-stream network performance and availability of timely service. Also Smart

Building will select routers, hubs and the like based on their fit into the overall Smart Building architecture to ensure maximum performance.

The Joint Venture expects ultimately to outsource and/or provide through subcontractors the following:

-- Installation of internal wiring
-- External connectivity
-- PC hardware setup and repair
-- Applications training

Interim Services will include a limited set of services such as Internet access and e-mail. Monthly maintenance agreements can also be accommodated as well as firewall systems and desktop OS and application installation services. Smart Building Services will include Internet access and email as a Basic required level of service and an Expanded a la carte service level, which will include the networking services offered as Interim Services plus Microsoft Exchange server services, Backup/Restore services, in-building video-conferencing, building wide facilities scheduling services, operating system and application training, and user productivity seminars based on the Smart Building standard set of software. Subscribers of both services will be offered the incentive of a free license to Microsoft Office 2000, as long as the supply lasts.

Tenant's use of bandwidth will be monitored to determine the appropriate Internet access service category (e.g., 100 Kbps, 200 Kbps, or greater). The joint venture will use a UNIX sampling platform for this purpose with transit traffic analysis, SNMP interface statistics, and RMON statistics.

A novel approach to more rapidly gaining the facilities to offer Smart Building Services is being tested. The process is to engage tenants who have current needs for the equipment planned for the Smart Building to help fund the equipment in the short term. This will allow the joint venture to share the use of the equipment with others, and the joint venture will use any Smart Building funding to repay a portion of the tenants' investments. Alternatively the funding tenants may take a credit for a portion of their monthly service fees.

An example of this would be a tenant who wants to use Microsoft Exchange server functionality today. The tenant would buy the server and software, assuming neither was currently available, and would subscribe to the service. The Interim Services staff could offer this service to other tenants. As Smart Building funding became available, the investing tenant could be reimbursed for a portion of its investment or take a service credit. There are currently two tenants thinking about this sort of arrangement.

5.1   Pricing Strategy

The Smart Building pricing strategy is to offer the services described herein at or below commercial market costs to the tenants, but with sufficient margins so as to be able to keep in-building technology at the current state-of-the-art levels. Since the Regional Enterprise Tower is to be a showcase to the region, the in-house equipment and technologies cannot be allowed to become antiquated. Clearly the burden is on the Smart Building staff to demonstrate the productivity side of these technologies to the tenants and to convince them that they should be used in their daily work schedules.

6.0   Organizational Structure and Management Summary

Smart Building will be managed initially in accordance with a Joint Venture agreement being negotiated by 3RC and Info Ren. Under the proposed agreement, 3RC will be responsible to secure project funding and lead the promotion of the project within the building and the region. Info Ren will be responsible for the design and installation of the building network and for the provision of services.

6.1   Management Team

3RC and Info Ren bring complementary technical and management skills to the Smart Building project.

3RC:

Ronald Gdovic Ph.D, Executive Director of 3RC, will handle 3RC's responsibilities. Guidance for the overriding Smart Building policies, funding, and procedural management will come from him and a project committee comprised of 3RC board members.

Dr. Gdovic graduated from the University of Pittsburgh in 1984 with a degree in economics and concentration in industrial engineering. He subsequently lived and worked in the Tidewater Area of Virginia managing capital improvement projects for Norfolk Naval Base, Portsmouth Naval Hospital, Langley Air Force Base, NASA, Yorktown Coast Guard Station, and other military installations. He later shifted into the private sector managing shopping center projects, aircraft facilities, and other commercial developments. He returned to the University of Pittsburgh in 1990 to receive his Masters Degree in Urban and Regional Planning. He later completed his doctorate at Pacific Western University in Urban Planning in 1998. Since his return to Southwestern Pennsylvania, he has worked as a consultant to various public and private agencies with a focus on economic development. His expertise in planning and administration has helped leverage public and private funds to create successful and distinguishable projects. He currently sits on the board of directors for two telecommunications firms in Virginia, is a founding board member of Development Strategies, a non-profit organization dedicated to recycling vacant industrial properties in the Northeastern US. He is the acting Executive Director of 3 Rivers Connect, a regional initiative resolved to establish Greater Pittsburgh as the leader in advancing social and economic development through information technology.

Info Ren:

Robert D. Carlitz, Executive Director of Info Ren, will manage a staff of technical and sales personnel, which, due to the lean staffing of the project will be responsible both for day-to-day management decisions and operations.

Dr. Carlitz is a graduate of Duke University and California Institute of Technology, with B.S. and Ph.D. degrees in physics. In addition to his work in theoretical physics, Bob has initiated a number of local, regional and national networking activities. Since starting the mailing list KIDSPHERE in 1989, Bob has moderated the group's discussions, which focus on school networking, issues and serve as an on-line resource for teachers who wish to learn about the Internet. He was also a founding member of the board of directors for the Consortium for School Networking. Bob has also published numerous papers and articles on networking.

Bob was the project director for Common Knowledge: Pittsburgh, the project responsible for bringing the Internet into the classrooms for the Pittsburgh Public Schools; and Bridging the Urban Landscape, the project which extended the work of Common Knowledge: Pittsburgh to include the Hill House Association and the Pennsylvania Room

of the Carnegie Library of Pittsburgh. In 1996, Bob founded Information Renaissance, a non-profit corporation that promotes the development of regional networking infrastructure in support of education, community development and economic revitalization.

Eugene Hastings is the Technical Director of Info Ren. Previously a Senior Member of Technical Staff at the Pittsburgh Supercomputing Center, he has been involved with telecommunications and networking for all of his professional life.

A graduate of Carnegie Mellon University in Electrical Engineering, he has been involved with the nurturing and husbandry of the Internet since 1982 -- first, within academic departments at CMU, and then moving to PSC after the inauguration of NSFNET.

He has been active in the Internet Engineering Task Force, having served as chair of several working groups in the Operations area. He has also been active in FARNET (Federation of American Research Networks) having served on its board and participated in numerous conferences fostering the use of Internetworking in many fields. He also assisted with the planning and engineering of PREPnet in the late 1980s.

Mr. Hastings' networking experience continued in the collaborative project Common Knowledge:Pittsburgh, where he was Network Architect. This project served as a test bed for school networking for the National Science Foundation. The project was unique in its development of a broad infrastructure in support of educational reform and its goal of institutionalizing the use of networking technology in a major urban school district. Mr. Hastings and Dr. Carlitz prepared the specifications for the school district's network and assisted in its installation. The work entailed research of the latest advances in networking equipment and applications and the preparation of Local Area Network (LAN) and Wide Area Network (WAN) designs; specifications for their procurement; installation and configuration of the network transmission and services equipment; and guidelines for the extension of the network to additional sites and for the deployment of new services.

Gil Brezler is the Smart Building Project Manager at Info Ren. Mr. Brezler is a graduate of The Pennsylvania State University with a BS in Electrical Engineering.

Prior to his association with Info Ren, Mr. Brezler spent 21 years at Digital Equipment Corporation in Sales, Sales Management, Account Management, Education Marketing, and most recently Corporate Research. In his role as Technology Program Manager in Corporate Research, Gil was responsible for Digital's funding of the Common Knowledge:Pittsburgh project cited above. He was also instrumental in various research grants to the Pittsburgh Supercomputing Center and to various departments at Carnegie Mellon University.

Mr. Brezler is also a Certified Microsoft Professional and a Certified Microsoft Trainer. He has completed his training for Microsoft Certified System Engineer.

6.2 Personnel Plan

The current management team consists of the personnel required to provide the Interim Services, to design and manage the installation of the building network and to provide Smart Building services for an initial set of tenants. Mr. Gdovic will secure the necessary financial resources. The Interim Services and Smart Building services require a presales/sales person and a technical engineering person. Mr. Hastings and Mr. Brezler will serve those roles. As program manager, Mr. Carlitz will also provide ongoing overall strategic and management guidance, at a rate of approximately ten hours per week. Mr. Carlitz, Mr. Hastings and Mr. Brezler will collaborate on the design of the building network and the specification of networking equipment. Mr. Gdovic will review and

approve the design and specifications. Mr. Hastings and Mr. Brezler will administer contracts for the installation of the network. Current Info Ren administrative staff will manage billing and collection.

Additional personnel may be hired as necessary to assist with educational programs and for desktop application support.

7.0 Financial Plan

The primary financial goal is to ensure that revenues are sufficient to cover the costs of the Smart Building Project. Accordingly, the following analyses examine the level of subscriber rate required to meet that goal.

The analyses show that break-even operations can be achieved for Interim Services at 71% subscriber rate and for the Smart Building Services at 68% subscriber rate.

Initial deficits incurred, as the joint venture ramps up to the desired subscriber rates will be financed with the initial funding sought by 3RC for installation and year one operating costs.

Please note, too, that the analyses are intended to be overly conservative, including revenues solely from Internet access, email and a limited number of customers for LAN maintenance and Help Desk support. Many other services will be made available, some of which are cited in earlier parts of this plan. Clearly, the revenue shown will be exceeded once these additional services are made available. The manpower forecasted earlier will be sufficient to cover these additional services for the early stages. As we exceed our forecasts we will hire additional manpower.

7.1 Important Assumptions

1. Each desktop will want an email account and will be willing to pay $5.00/mo. for it.

2. Each tenant will generate approximately $100 per month in Interim Service Internet access revenues and $200 per month in Smart Building Internet Access revenues, based upon the following:

    a. Each tenant with fewer than three employees will subscribe at the per-desktop tier at $40.00/mo./desktop, including email. Since nearly all tenants have at least two employees, the rate would be $80.00 minimum. This figure is rounded to $100.00 in the break-even analysis for Interim Services in part to adjust for the tenants who subscribe to bandwidth services at a rate higher than $100 per month. The per desktop revenues are rounded to $200 per month in the break-even analysis for Smart Building Services to account for the growing bandwidth consumption of tenants (and the increasing number of bandwidth customers subscribing at rates higher than $200 per month) by the time the Smart Building network is completed.

    b. Each tenant with three or more employees will subscribe at the lowest possible 100Kbps bandwidth segment ($100. / mo.) to start and will adjust as they find they have exceeded their subscription tier to an average of 200Kbps ($200. / mo.). 3. Ultimately the building will be filled with 83 tenants and 1400 desktops.

3. 90% of the tenants will ultimately subscribe.

4. Because of increased functionality, many desktops will pay $10.00/mo. for an email account using a Microsoft Exchange server. The email rate of $7.50 in the Smart Building cited below is based on the expectation that approximately half of the

desktops will want the added functionality the MS Exchange server will offer.

5. It is assumed that only 30% of the desktops will avail themselves of the desktop application service. This clearly provides a significant upside to revenues.

6. Expenses will be in accordance with the estimates in Tables 2.2-1 and 2.2-2 above.

7.2   Break-even Analysis for Interim Services
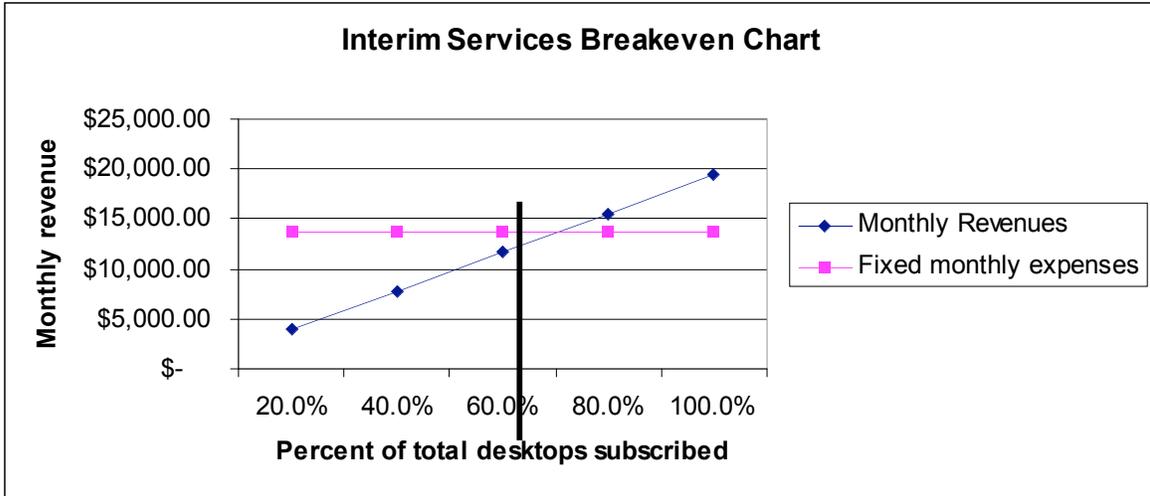
Notes: Maximum revenue assumptions (at 100% subscription):

*   83 tenants @ $100/ tenant ($8,300)
*   1400 desktops @ $5.00/ mail ($7,000)
*   41 tenants @ $100 /LAN maintenance ($4,100)

7.3   Break-even Analysis for Smart Building
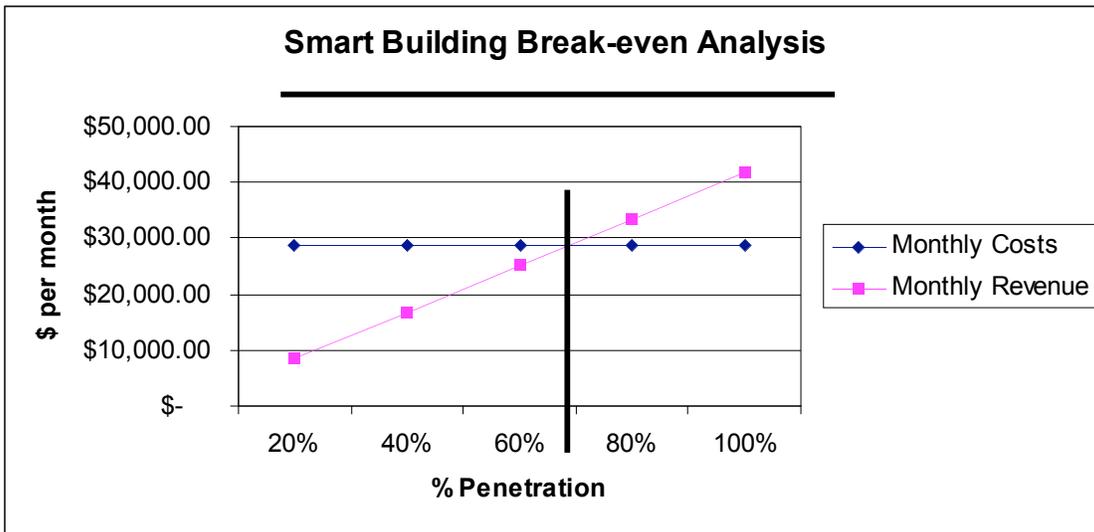
Notes: Maximum revenue assumptions (at 100% Subscription):

- 83 tenants @ $200/ tenant for 200Kbps ($16,600)
- 1,400 desktops @ $7.50 / mail – Exchange mail ($10,500)
- 41 tenants @ $100/ tenant for LAN maintenance ($4,100)
- 30% desktops @ $25/ for Help Desk support ($10,500)

7.4   Cash Flow for Smart Building

The following tables illustrate estimated cash flow over the first 24 months of Smart Building operations and succeeding years. The tables use worst, likely, and best-case scenarios for customer subscription, starting with an initial base of customers from the Interim Services operations and adding **two**, **four**, or **six** customers per month.

The scenarios are conservative, focusing on the primary services (Internet access, email, LAN maintenance and Help Desk support). Under all scenarios, the startup funding will provide sufficient cash to fund the installation of the building network and the first year of operations.

Important Assumptions:
- Interim Customers will roll into the Smart Building, establishing the initial customer base.
- $1,014,518 received in initial funding
- Bulk of building network installed during first two months; remainder expended as customers continue to enroll.
- Staffing changes reflect less program management and sales efforts in favor of increased network support personnel once about 60 tenants sign on.
- Costs of Interim Services will be reimbursed in first month
- $150 per month per tenant average for Internet access
- $7.50 per desktop per month for Microsoft Exchange Email
- $100 per tenant average per month for LAN maintenance
- $25 per desktop average per month for Help Desk assistance

Scenario 1: Sign two new tenants per month.

This proforma shows anticipated revenue and operating expenses at the conservative absorption rate of two new tenants signed on per month until saturation. Positive cash flow is realized in the 27th month of operation. Cash reserves are depleted in the 17th month, but recover beyond the third year of operation. This scenario is unlikely given the responses to date on the interim solutions with no formal marketing strategy. If this proves to be the case, however, aside from overhauling the marketing effort, we would reduce the project manager's time and concentrate on sales and network support. The accompanying spread sheets are included in the appendix.
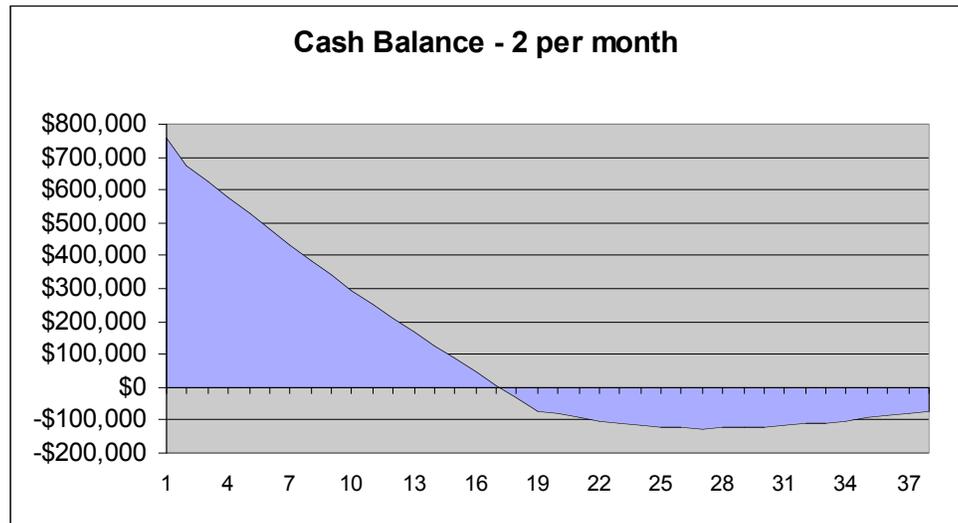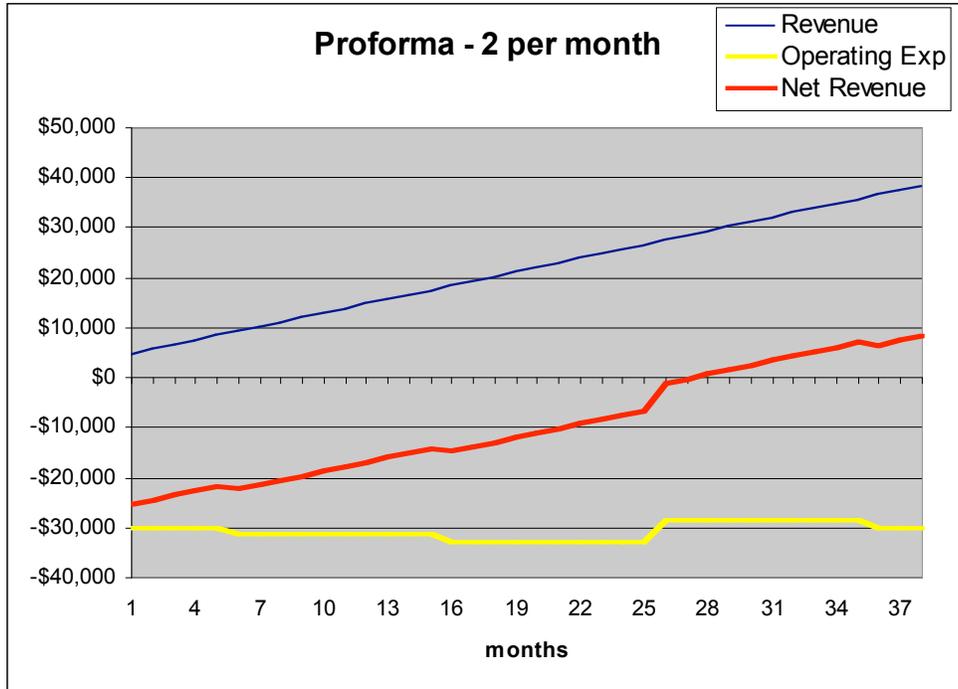
Proforma - 2 per month

Legend: Revenue, Operating Exp, Net Revenue

Cash Balance - 2 per month

Scenario 2: Sign four new tenants per month.

This proforma shows anticipated revenue and operating expenses at the likely absorption rate of four new tenants signed on per month until saturation. Positive cash flow is realized in the 13th month of operation. Cash reserves decline until the 19th month to a still comfortable low of $120,000 then steadily recover in the future. This is target scenario and will be the metric for successful deployment of the Smart Building services.
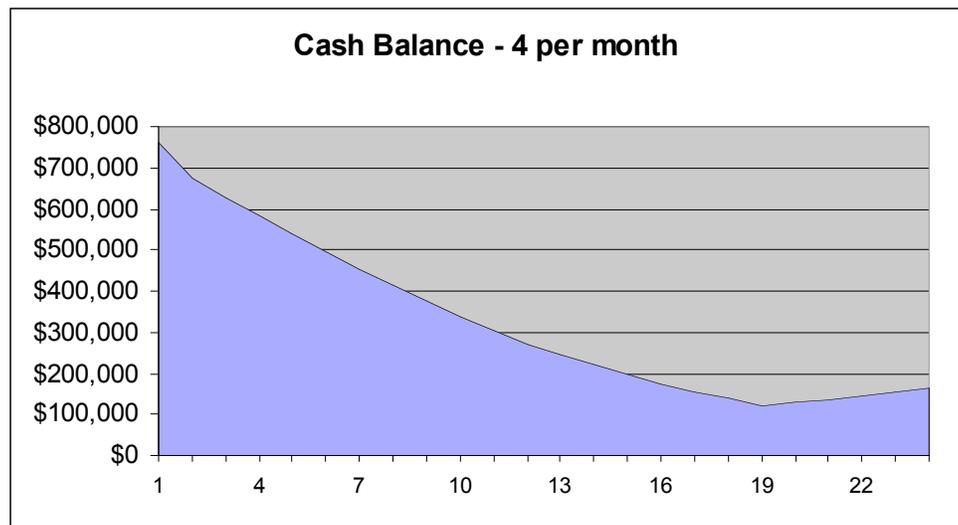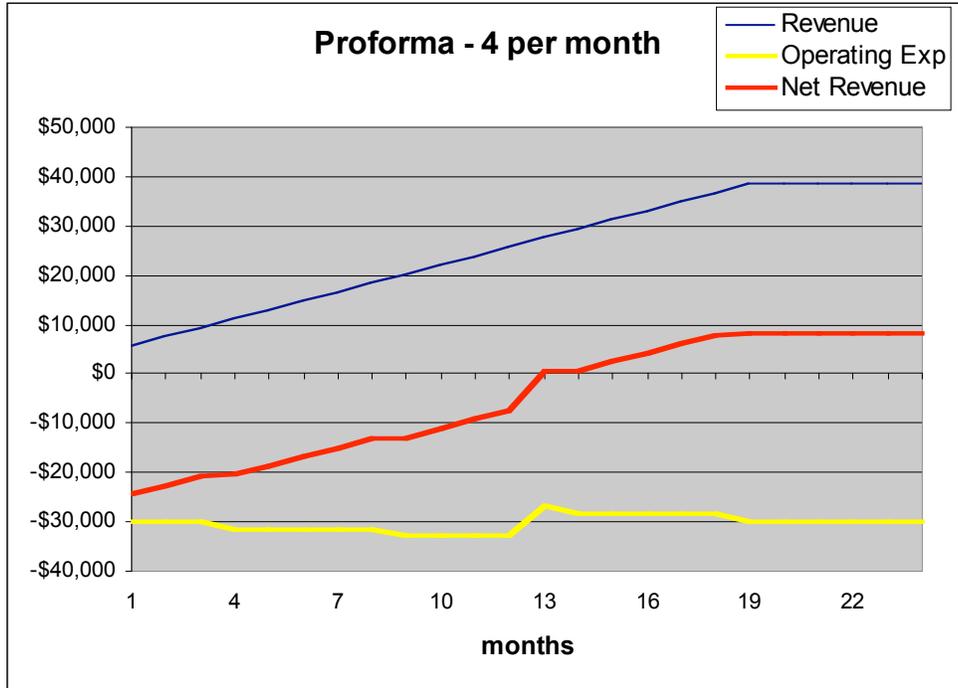

Proforma - 4 per month

Cash Balance - 4 per month

Scenario 3: Sign six new tenants per month.

This proforma shows anticipated revenue and operating expenses at the aggressive absorption rate of six new tenants signed on per month until saturation. Positive cash flow is realized in the 9th month of operation. Cash reserves decline until the 13th month to a very comfortable low of $180,000 then steadily recover in the future.

Proforma - 6 per month

Legend: Revenue, Operating Exp, Net Revenue

Cash Balance - 6 per month
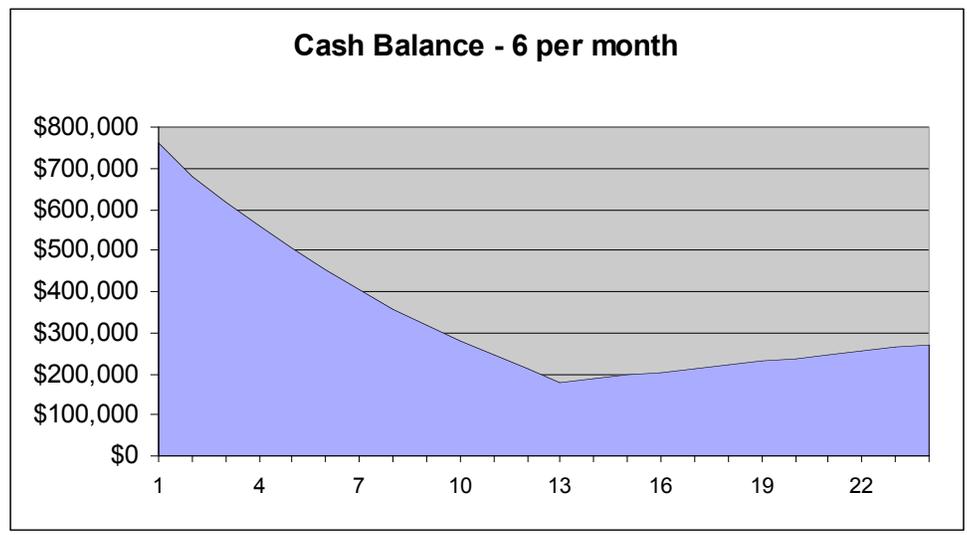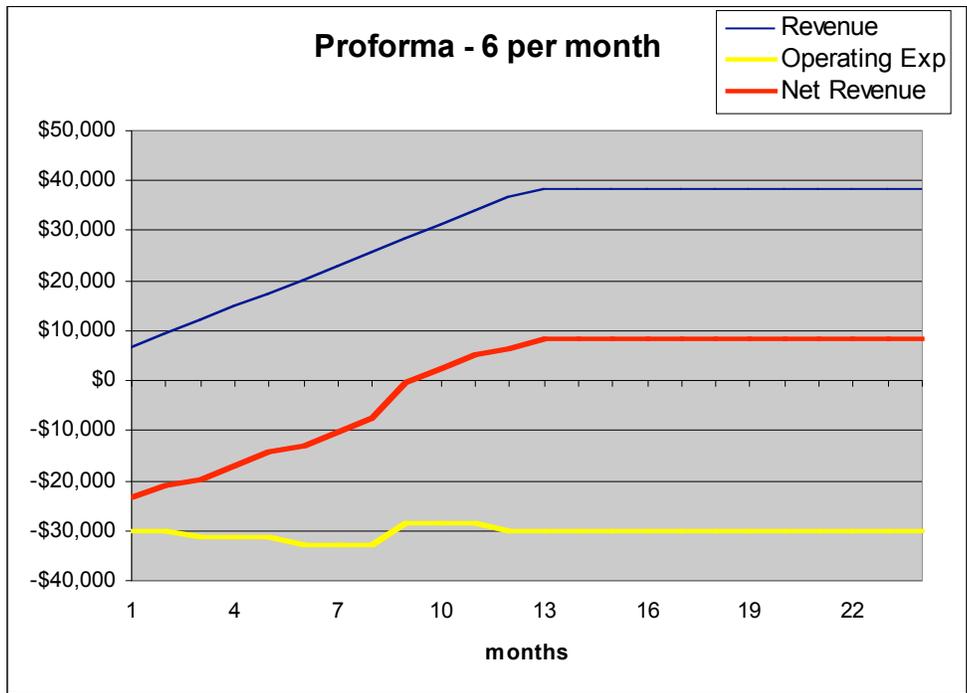
8.0   Appendix

Scenario 1: Sign two new tenants per month

Months	New Tenants Signed	Total Tenants signed	New Mon. Revenue	Total Mon Revenue	Monthly Net Rev.	Int. Ser Costs	Grants	Capital Expenses	Operating Expenses	Cash Balance
Jan	2	10	910	4550	-25362	-55124	990794	-151920	-29912	758388
Feb	2	12	910	5460	-24452			-61725	-29912	672211
Mar	2	14	910	6370	-23542			-25842	-29912	622827
Apr	2	16	910	7280	-22632			-25842	-29912	574353
May	2	18	910	8190	-21722			-25842	-29912	526789
Jun	2	20	910	9100	-22315			-25842	-31415	478632
Jul	2	22	910	10010	-21405			-25842	-31415	431385
Aug	2	24	910	10920	-20495			-25842	-31415	385048
Sep	2	26	910	11830	-19585			-25842	-31415	339621
Oct	2	28	910	12740	-18675			-25842	-31415	295104
Nov	2	30	910	13650	-17765			-25842	-31415	251497
Dec	2	32	910	14560	-16855			-25842	-31415	208800
Jan	2	34	910	15470	-15945			-25842	-31415	167013
Feb	2	36	910	16380	-15035			-25842	-31415	126136
Mar	2	38	910	17290	-14125			-25842	-31415	86169
Apr	2	40	910	18200	-14715			-25842	-32915	45612
May	2	42	910	19110	-13805			-25842	-32915	5965
Jun	2	44	910	20020	-12895			-25842	-32915	-32772
Jul	2	46	910	20930	-11985			-25842	-32915	-70599
Aug	2	48	910	21840	-11075			0	-32915	-81674
Sep	2	50	910	22750	-10165			0	-32915	-91839
Oct	2	52	910	23660	-9255			0	-32915	-101094
Nov	2	54	910	24570	-8345			0	-32915	-109439
Dec	2	56	910	25480	-7435			0	-32915	-116874
Jan	2	58	910	26390	-6525			0	-32915	-123399
Feb	2	60	910	27300	-1115		**Note 7.	0	-28415	-124514
Mar	2	62	910	28210	-205			0	-28415	-124719
Apr	2	64	910	29120	705			0	-28415	-124014
May	2	66	910	30030	1615			0	-28415	-122399
Jun	2	68	910	30940	2525			0	-28415	-119874
Jul	2	70	910	31850	3435			0	-28415	-116439
Aug	2	72	910	32760	4345			0	-28415	-112094
Sep	2	74	910	33670	5255			0	-28415	-106839
Oct	2	76	910	34580	6165			0	-28415	-100674
Nov	2	78	910	35490	7075			0	-28415	-93599
Dec	2	80	910	36400	6485			0	-29915	-87114
Jan	2	82	910	37310	7395			0	-29915	-79719
	2	84	910	38220	8305			0	-29915	-71414

Notes:

1. Jan. capital expenses includes Interim Services capital expenses

2. 17 desktops per tenant avg.

3. $150. Internet access / tenant signed

4. $7.50 per desktop per tenant for email

5. $100. Per tenant for monthly main. One-half subscribe

6. $25. Per desktop per tenant for Help Desk support. 30% subscribe

7 At the 60 tenant level, the program mgr. will go away, and the project manager will shift to half time

Scenario 2: Sign four new tenants per month

Months	New Tenants Signed	Total Tenants signed	New Mon. Revenue	Total Mon Revenue	Monthly Net Rev.	Int. Ser Costs	Grants	Capital Expenses	Operating Expenses	Cash Balance
Jan	4	12	1820	5460	-24452	-55124	990794	-151920	-29912	759298
Feb	4	16	1820	7280	-22632			-61725	-29912	674941
Mar	4	20	1820	9100	-20812			-25842	-29912	628287
Apr	4	24	1820	10920	-20495			-25842	-31415	581950
May	4	28	1820	12740	-18675			-25842	-31415	537433
Jun	4	32	1820	14560	-16855			-25842	-31415	494736
Jul	4	36	1820	16380	-15035			-25842	-31415	453859
Aug	4	40	1820	18200	-13215			-25842	-31415	414802
Sep	4	44	1820	20020	-12895			-25842	-32915	376065
Oct	4	48	1820	21840	-11075			-25842	-32915	339148
Nov	4	52	1820	23660	-9255			-25842	-32915	304051
Dec	4	56	1820	25480	-7435			-25842	-32915	270774
Jan	4	60	1820	27300	385	** Note 7.		-25842	-26915	245317
Feb	4	64	1820	29120	705			-25842	-28415	220180
Mar	4	68	1820	30940	2525			-25842	-28415	196863
Apr	4	72	1820	32760	4345			-25842	-28415	175366
May	4	76	1820	34580	6165			-25842	-28415	155689
Jun	4	80	1820	36400	7985			-25842	-28415	137832
Jul	4	84	1820	38220	8305			-25842	-29915	120295
Aug		84		38220	8305			0	-29915	128600
Sep		84		38220	8305			0	-29915	136905
Oct		84		38220	8305			0	-29915	145210
Nov		84		38220	8305			0	-29915	153515
Dec		84		38220	8305			0	-29915	161820

Notes:

1. Jan. capital expenses includes Interim Services capital expenses

2. 17 desktops per tenant avg.

3. $150. Internet access / tenant signed

4. $7.50 per desktop per tenant for email

5. $100. Per tenant for monthly main. One-half subscribe

6. $25. Per desktop per tenant for Help Desk support. 30% subscribe

7. At the 60 tenant level, the program mgr. will go away, and the project manager will shift to half time.

Scenario 3: Sign six new tenants per month

Months	New Tenants Signed	Total Tenants signed	New Mon. Revenue	Total Mon Revenue	Monthly Net Rev.	Int. Ser Costs	Grants	Capital Expenses	Operating Expenses	Cash Balance
Jan	6	14	2730	6370	-23542	-55124	990794	-151920	-29912	760208
Feb	6	20	2730	9100	-20812			-61725	-29912	677671
Mar	6	26	2730	11830	-19585			-39937	-31415	618149
Apr	6	32	2730	14560	-16855			-39937	-31415	561357
May	6	38	2730	17290	-14125			-39937	-31415	507295
Jun	6	44	2730	20020	-12895			-39937	-32915	454463
Jul	6	50	2730	22750	-10165			-39937	-32915	404361
Aug	6	56	2730	25480	-7435			-39937	-32915	356989
Sep	6	62	2730	28210	-205		** Note 7.	-39937	-28415	316847
Oct	6	68	2730	30940	2525			-39937	-28415	279435
Nov	6	74	2730	33670	5255			-39937	-28415	244753
Dec	6	80	2730	36400	6485			-39937	-29915	211301
Jan	4	84	1820	38220	8305			-39937	-29915	179669
Feb		84	0	38220	8305			0	-29915	187974
Mar		84	0	38220	8305			0	-29915	196279
Apr		84	0	38220	8305			0	-29915	204584
May		84	0	38220	8305			0	-29915	212889
Jun		84	0	38220	8305			0	-29915	221194
Jul		84	0	38220	8305			0	-29915	229499
Aug		84	0	38220	8305			0	-29915	237804
Sep		84	0	38220	8305			0	-29915	246109
Oct		84	0	38220	8305			0	-29915	254414
Nov		84	0	38220	8305			0	-29915	262719
Dec		84	0	38220	8305			0	-29915	271024

Notes:

1. Jan. capital expenses includes Interim Services capital expenses

2. 17 desktops per tenant avg.

3. $150. Internet access / tenant signed

4. $7.50 per desktop per tenant for email

5. $100. Per tenant for monthly main. One-half subscribe

6. $25. Per desktop per tenant for Help Desk support. 30% subscribe

7. At the 60 tenant level, the program mgr. will go away, and the project manager will shift to half time.