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**Bandwidth+**  
**An Internet Business Plan**

by  
**Raymond Tenenbaum**

**A research paper submitted in fulfillment of the requirements for 3.0 credits,  
GRADUATE INDEPENDENT RESEARCH PAPER - Fall Term 1997  
Professor Andrew Lawlor, Faculty Supervisor**

### Faculty Comments

Bandwidth+ is one of the two business plan efforts that Ray Tenenbaum led in the Fall Term 1997.

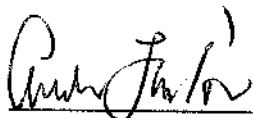
During the 1997 summer, Ray selected two of the countries most noted technology incubators: ideaLab headed by Bill Gross and TechFarm headed by Gordon Campbell as possible sources for CS 515/517 projects. He called and visited both locations and after a series of discussions to set ground rules, two projects were undertaken, both led by Ray and both having six-person teams.

The Bandwidth+ business plan project used the CS 750 Independent Study option as a vehicle for awarding three credits to Ray for his overall team leadership effort in the research of the industry and writing of the business plan.

The standard CS 515/517 syllabus was used to set the body of work and overall expectations for the CS 750 course deliverable and for the ideaLab organization.

The attached written document is an excellent example of what a dedicated six person team can accomplish. The written report, and the powerpoint presentation given at ideaLab on December 18, both exceeded the expectation of ideaLab, who will now continue to feed new projects to CS 515/517 each Fall.

The body of work and subsequent actions more than meet the requirements of the CS 750 study and warrant an Excellent grade (EX).



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Andrew Lawlor, Faculty Supervisor  
December 22, 1997

another  
idealab!  
company



*Technology to Double the Speed  
and the Bandwidth of the Internet*

BandWidth+ Demo

BandWidth Links

Customers

Licensing Info

Business Plan  
December 15, 1997

## Table of Contents

<b>1</b>	<b>EXECUTIVE SUMMARY</b> .....	<b>1</b>
1.1	MARKET OPPORTUNITY.....	1
1.2	PRODUCT OVERVIEW.....	1
1.3	SALES AND MARKETING.....	1
1.4	PRODUCT RESEARCH AND DEVELOPMENT.....	2
1.5	MANAGEMENT TEAM.....	3
1.6	FINANCIAL PROJECTIONS.....	4
<b>2</b>	<b>COMPANY OVERVIEW</b> .....	<b>5</b>
2.1	VISION.....	5
2.2	MISSION.....	5
<b>3</b>	<b>MARKET OPPORTUNITY</b> .....	<b>6</b>
3.1	MARKET GROWTH.....	6
3.1.1	<i>Growth in the U.S. Internet Market</i> .....	6
3.2	MARKET OPPORTUNITY.....	7
3.3	SEGMENTATION.....	7
3.4	COMPETITIVE ENVIRONMENT.....	9
<b>4</b>	<b>PRODUCT/MARKET STRATEGIES</b> .....	<b>11</b>
4.1	PRODUCT STRATEGY.....	11
4.2	SUSTAINABLE COMPETITIVE ADVANTAGE.....	11
4.3	INITIAL PRODUCTS AND SERVICES.....	13
4.4	PRODUCT DEVELOPMENT PLAN.....	14
4.5	TECHNICAL ISSUES AND ASSUMPTIONS.....	15
<b>5</b>	<b>SALES AND MARKETING PLAN</b> .....	<b>16</b>
5.1	MARKET RESEARCH HIGHLIGHTS.....	16
5.2	KEY RESEARCH FINDINGS:.....	16
5.3	RECOMMENDATIONS AND IMPLICATIONS.....	18
5.4	CUSTOMER USAGE AND BEHAVIOR.....	19
5.5	LAUNCH STRATEGY.....	20
5.5.1	<i>Advertising and Promotion Strategy</i> .....	20
5.5.2	<i>Pricing Strategy</i> .....	20
5.5.3	<i>Distribution Strategies for 1998</i> .....	21
5.5.4	<i>Distribution Strategies Long-Term</i> .....	22
5.5.5	<i>Future Research</i> .....	22
<b>6</b>	<b>MANAGEMENT TEAM AND ORGANIZATION STRUCTURE</b> .....	<b>24</b>
6.1	MANAGEMENT TEAM/STRUCTURE.....	24
6.2	INTELLECTUAL PROPERTY.....	25
6.3	COMPANY RISKS.....	25
<b>7</b>	<b>FINANCIAL ASSUMPTIONS AND SUMMARY PROJECTIONS</b> .....	<b>26</b>
7.1	BREAK-EVEN ANALYSIS.....	26
7.2	SOURCES AND USES OF CASH.....	27
7.3	EXIT STRATEGY.....	28
7.4	IRR/VALUATION.....	28
7.5	SUMMARY OF ASSUMPTIONS:.....	29
7.6	COST OF SALES.....	30
7.7	PERSONNEL ASSUMPTIONS.....	30
7.8	OPERATING EXPENSES.....	30
7.9	CURRENT ASSETS & LIABILITIES.....	31
7.10	CRYSTAL BALL FINANCIAL ANALYSIS.....	32

# 1 Executive Summary

Bandwidth+ is in the *Internet compression software* business. We create, make and market compression software and associated products packaged as high performance bandwidth solutions.

## 1.1 Market Opportunity

### Problem:

The Internet is too slow, and servers are bogged down with bandwidth problems due to the explosive increase in demand by users and the increased volume of information supplied by Internet content providers.

### Solution:

Develop Internet-based software solutions that convert existing content of the Internet into a more efficient form—adaptable to multiple operating systems and browsers—that will reduce the bandwidth required for transmission of the original content. Web Express, Bandwidth+'s initial product, will dramatically increase the speed of web page displays, which will allow Internet users to access web pages more quickly and will reduce network overload problems.

## 1.2 Product Overview

Web Express software increases the transmission rate to and from the Internet by up to two times the average speed of current web page access. This provides the typical Internet user with a large performance boost in comparison to what is available today. This boost is accomplished by shrinking the graphics files (i.e., GIF, JPEG) from the web page into compressed files which are sent much faster over the Internet due to the reduction in the volume of data transmitted.

One component of the software must be installed on the host computer where the web page data resides, and the other software component operates on the user's personal computer. Once the software is installed on both sides of the connection, Web Express can compress the data, send it over the Internet, and display the data without the user noticing any difference (except for increased transmission speed). Web Site Administrators would thus install the Web Express compression software on their systems. Individual users would install the plug-in software on their personal computers. It is a seamless approach to speed enhancement.

## 1.3 Sales and Marketing

As the Internet grows in popularity and becomes an essential component to operating many global organizations, more and more businesses have established a presence on the World Wide Web. Many of these businesses and their consumers have been limited by the Internet's existing bandwidth constraints which prohibit the ability of web developers to provide more compelling web content with acceptable performance. The goal is to have Web Express become the de facto standard for graphic compression. Given Web Express' product composition (a writer and reader product) vis a vis the competition (software products that work automatically



and do not require the user to download a plug-in), and the vast number of competitors that currently exist, we believe there are many obstacles to overcome in order to become the standard. However, it is to Web Express' advantage that there is no graphic compression standard today, giving Web Express the window of opportunity to out-market and out-sell its competitors. Once Web Express has an installed base, it can then leverage that base to sell-in future products (such as video compression).

In order to achieve our goal of becoming the de facto standard, Web Express must: 1) gain credibility as a well performing, if not superior, product, 2) appeal to the mass web users, 3) be priced competitively, 4) gain awareness and trial quickly, and 5) solve a recognized problem. Ideally, Web Express will be adopted by large web sites which tend to set the Internet standards (e.g. ESPN). Our marketing plan recommends that we first market to web developers for large, high hit rate web sites in order to speed up the adoption rate. Our preferred strategy, which has been verified by our market research, is to obtain a small following of high profile web sites. By doing so, the "house of cards" will take effect. As a result, the marketing of the product will turn to a pull strategy as consumers will come to expect faster downloading of web pages, and thus drive demand for Web Express. In addition, the mass base of web sites will want to copy the leaders in the technological advances and will quickly adopt our product. Unlike most competitive products, our marketing efforts will focus on establishing key partnerships with these high profile web sites. Our research indicates such partnerships will provide the necessary leverage to form relationships with key Internet software producers of browsers and web authoring tools to help evangelize Web Express. Should the "house of cards" effect *not* take place, we have developed a marketing plan which includes marketing to web sites with a smaller hit rate to generate demand for our product from the ground up.

Our marketing plan is divided into several phases, the first centered on the launch of Web Express 1.0, our graphics compression software. We explored the option to avoid the graphics product entirely and focus solely on developing a video product and decided against this alternative. We believe launching Web Express 1.0 will provide several key benefits to the overall company which can be leveraged for future products. These benefits include:

- Web Express is expected to be financially attractive as a stand alone product
- Bandwidth+ brand recognition and creation of an installed base of key web developers/content providers/end-consumers
- Key organizational learnings in developing and marketing Internet compression software

## **1.4 Product Research and Development**

### **Initial Product – Graphics Compression**

Our initial product, Web Express 1.0, will require four additional months to fully develop the software compatibility for all target browsers and operating systems. Additionally, extensive beta-site testing will be employed with this product to ensure a successful initial product launch. Much of this beta testing can occur concurrently with Web Express 1.0 development and therefore, our target launch date of six months will be achievable.

Our plan is to apply key learnings from the Release 1.0 development, including active market and customer analysis, to define the exact parameters of Release 2.0. This will require additional market research. There are several features that would be natural extensions of our initial product design, and which meet a known market need. These include:

- Compression of animated GIF files
- Bundling of multiple files (on an individual web page)
- Compression of other image file types

Release 2.0 is projected to be released eight months after Release 1.0. Because it is not based upon any unknown technology and requires no industry developments, the projected target release date is reasonable.

### Second Product – Video Streaming

Our second product is anticipated to be released 12 months following our initial product launch of Web Express 1.0 in July of 1998. This product is purely conceptual at this point and is targeted at the anticipated growth in consumer interest to have video streaming capabilities. While this standard is still being clearly defined by the industry, it is expected that a generally accepted standard will be identified in the next 12-18 months. Our video compression product will provide customers with the ability to access the abundance of video content that will permeate the web.

Video streaming technology is still being developed and Bandwidth+ must conduct market research to ensure the market needs are well understood. However, our success in establishing key relationships and creating a graphics standard with Web Express 1.0 will put us in an ideal position to capitalize upon the opportunity to establish Web Express 3.0 as the industry standard.

### Future Products

Other potential features that could be included in future releases of our products include:

- Compression of *software* for transmittal over the Internet
- *Intranet* compression products
- Compression of files for storage on *any medium* (cd-rom, hard disk, floppy disks, etc.)

*Given the rate of change in the Internet marketplace, it is difficult to predict how Bandwidth+ can best leverage its competencies to provide standard-setting Internet technologies in the distant future. However, it is the company's goal to continue to provide not only leading edge technologies, but also the marketing know-how to establish Bandwidth+ products as the industry's de facto standards.*

## 1.5 Management Team

*Due to the infancy of Bandwidth+ within idealab!, there does not exist a permanent management team. While Bill Gross will be the Chief Executive Officer of the organization, a President, Sales & Marketing Manager, and technical personnel must still be secured for this opportunity. Based on idealab!'s ability to attract and retain experts in the Internet field, we do not anticipate the company will have difficulty attracting experienced management and technical personnel within a short period of time.*



## 1.6 Financial Projections

Sales for the years 1998, 1999, 2000 and 2001 are projected to be \$368,000, \$5.6 MM, \$16.5 MM, and \$18.0 MM, respectively. These projections assume successful development, launch, and market acceptance of Web Express 1.0 as well as a second product to be released in the third quarter of 1999. These projections do not account for additional products or revenues that may arise from research and development efforts related to the initial products. Total Web Express 1.0 software licenses sold are projected to be 7,000, 81,250, and 21,256 in 1998, 1999 and 2000, respectively. For the second product, we project license sales of 1,500, 25,000, and 27,000 in 1999, 2000, and 2001, respectively. Based upon these assumptions, we are projecting a net loss for 1998 and 1999 of \$1.6 million and \$1.3 million, and net income for 2000 and 2001 of \$3.6 million and \$3.3 million. When WebExpress is considered alone, a net loss of \$892,000 is projected for 1998, and net income of \$1.06 million 1999 and \$196,000 in 2000.

Capturing these revenues requires intensive research and development and marketing efforts. Operating Expenses for 1998 and 1999 are \$2.0 million and \$6.1 million, respectively. The first quarter of profitability is projected to occur in the first quarter of 2000. The company will require an equity infusion of \$3,000,000 for product development and marketing programs. This equity investment may be staggered over the first five quarters of operations to allow investors to define benchmarks for performance and make investment decisions at each point accordingly. Cash needs for quarters one through three are \$260,000, \$490,000, and \$500,000. An additional \$1.25 million is required in the first quarter of 1999.

	1998	1999	2000	2001
<b>Income Statement Data</b>				
Revenues	\$ 368,421	\$ 5,611,559	\$ 16,549,674	\$ 17,950,549
Cost of Revenues	35,368	875,403	2,581,749	2,800,286
Gross Margin	333,053	4,736,156	13,967,925	15,150,264
Gross Margin %	90.4%	84.4%	84.4%	84.4%
Operating Expenses	1,978,464	6,054,543	7,477,915	9,268,031
EBT	(1,645,412)	(1,318,387)	6,490,010	5,882,232
EBT%	-446.6%	-23.5%	39.2%	32.8%
Net Income	\$(1,645,412)	\$(1,318,387)	\$ 3,634,405	\$ 3,294,050

<b>Balance Sheet Data</b>				
Cash and Cash Equivalents	\$ 145,757	\$ 38,711	\$ 4,052,928	\$ 7,544,161
Working Capital	(44,250)	(155,941)	4,148,137	7,497,902
Total Assets	228,743	472,987	4,966,124	8,277,209
Retained Earnings	(1,645,412)	(2,963,799)	1,350,280	4,644,331
Stockholder's Equity	104,588	36,201	4,350,280	7,644,331

<b>Valuation</b>				
At 3.6x Revenues	\$ 1,326,316	\$20,201,613	\$ 59,578,826	\$ 64,621,978
At 24x NI			87,225,730	79,057,204

## 2 Company Overview

Bandwidth+ is a business opportunity being developed by idealab!. idealab! is an integrated incubator for starting and growing Internet businesses located in Pasadena, California. idealab! was formed in March, 1996, and currently has 26 businesses in various stages of incubation. Web Express was developed within a portfolio of several other internet tools being pursued by idealab!. idealab! provides various services to each Internet start-up company, particularly in the business conceptualization, planning, and launch phases. idealab! services are primarily in the creative area, and although the firm does provide seed capital to the start-ups as well, it considers itself a "Creative Capital" firm as opposed to a venture capital firm. The creative services provided include development and technology services, graphic design, business strategy, branding, corporate structure, marketing, and competitive research. Each spin-off company is a fully separate entity controlled by the management of that company. idealab! specifically does not take a controlling interest in each of the companies, but does take an equity stake in return for its start-up capital, technology, and services.

### 2.1 Vision

Bandwidth+ will become a leader in the world wide Internet compression industry by attracting the best industry talent, creating leadership products and setting industry standards; being easy for customer to do business with; and generating attractive returns for financial investors.

### 2.2 Mission

Our mission is to become and remain the leader in the *Internet compression software* business. We will carry out this mission by creating, making, and marketing compression software and associated products packaged as high performance bandwidth solutions. Our solutions enable web content providers and consumers to efficiently and effectively obtain unparalleled performance for a variety of Internet applications, such as viewing graphic, audio, and video content.



### 3 Market Opportunity

#### 3.1 Market Growth

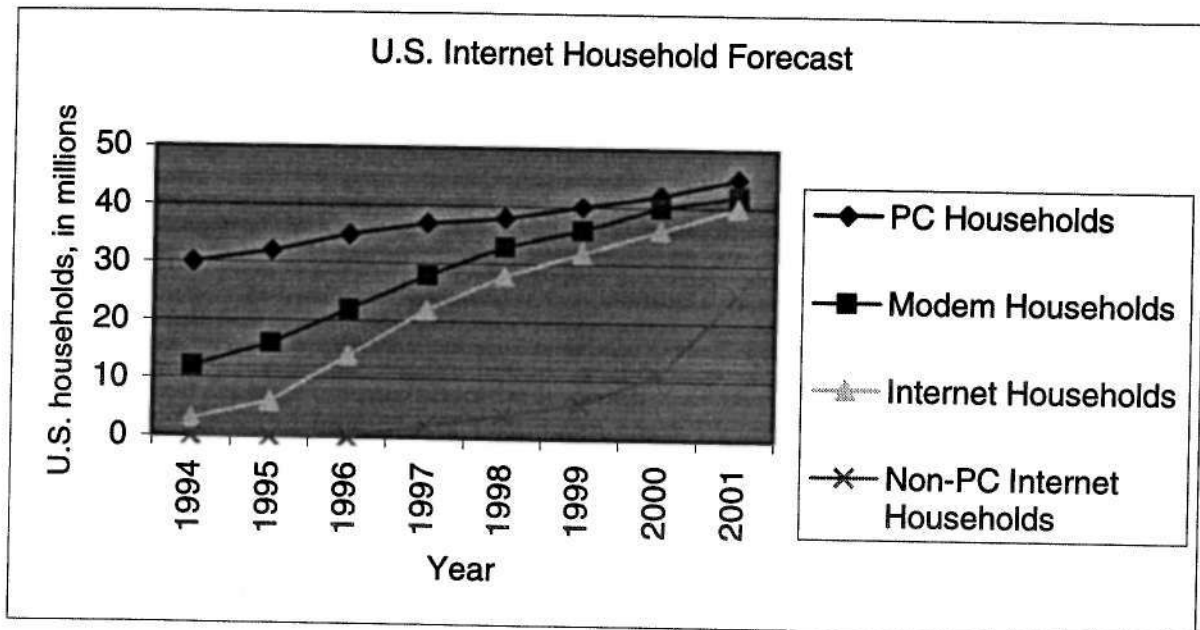
The increased access to information on a global scale is one of the most powerful and significant forces of the global economy. The Internet is the central facilitator of this information age. There are a number of estimates regarding the number of Internet users that illustrate the substantial market opportunity for Internet-based products and services.

##### 3.1.1 Growth in the U.S. Internet Market

The following table provides several estimates of the current size of the U.S. market:

Source	Definition	1997 Estimates
Computer Intelligence CTI	Number of users who have used the Web or another application besides email	33 million (17 million via ISPs, 16 million via on-line services)
Boardwatch Magazine	(Number of host computers connected to the Internet) X (average of 1.75 users/host)	28 million
Find/SVP	Number of users who have used the Web or another application besides email in the last 3 months	30-35 million

An average of about 30 million current Internet users seems appropriate. The number of Internet users continues to rise as technology becomes more accessible and individuals become more technology-aware. According to Find/SVP's 1997 User Internet Survey, there will be around 40 million Internet households by the year 2001.<sup>1</sup>



<sup>1</sup> Find/SVP, U.S. Internet Consumer Timeline

Many corporate and educational institutions have found it critical to have a presence on the World Wide Web. A Domain Survey by CyberAtlas attempted to discover every host on the Internet with a complete search of the Domain Name Server (DNS)<sup>2</sup>.

The rapid increases in number of hosts can be seen below:

Date	Number of Hosts	6 Month Growth	Annual Growth
Jul 1997	19,540,000	21%	52%
Jan 1997	16,146,000	25%	70%
Jul 1996	12,880,699	36%	94%
Jan 1996	9,472,224	43%	95%
Jul 1995	6,642,000	37%	107%
Jan 1995	4,852,000	51%	119%
Jul 1994	3,212,000	45%	81%
Jan 1994	2,217,000	25%	69%
Jul 1993	1,776,000	35%	--
Jan 1993	1,313,000	--	--

### **3.2 Market Opportunity**

The problem that has occurred due to the growth in popularity of the Internet is that as traffic increases, speed decreases for users due to limits of the server infrastructure and the bandwidth transmitting technologies.

### **3.3 Segmentation**

There is a clear opportunity to provide a product which significantly decreases the amount of time it takes to access web content on the Internet. The current bandwidth and infrastructure limitations constrain both web developers/content providers and end-users -- our two target segments. In fact, The Graphics, Visualization, & Usability Center's (GVU) 7<sup>th</sup> WWW User Study found speed to be the number one problem facing Internet users, with 66% reporting that it takes too long to download web pages.<sup>3</sup> Our market research (refer to Section 5) indicates a significant desire from web developers to alleviate their existing constraints and enable them to produce the most compelling content to support their business objectives. There are clear benefits for both of Web Express' target segments as indicated on the following table:

<sup>2</sup> <http://www.cyberatlas.com>

<sup>3</sup> [http://www.cc.gatech.edu/gvu/user\\_surveys/survey-1997-04/](http://www.cc.gatech.edu/gvu/user_surveys/survey-1997-04/).

Target Segment	Description	Key Benefits
<p>Web Developers/ Content Providers</p> <p>1.6 million</p>	<ul style="list-style-type: none"> <li>• These are the people that create and maintain web sites. Examples of content-providers are ESPN, <i>The Wall Street Journal</i>, and CNET. These sites will let you browse through their relevant information, some for a fee. Note: A web developer can also be an individual not representing a company.</li> </ul> <p>They can be divided into the following categories:</p> <ul style="list-style-type: none"> <li>• <b>Tier 1:</b> One of the top 100 web sites with an average monthly audience of more than 15 million unique visitors. Heavily influence industry standards.</li> <li>• <b>Tier 2:</b> Web site with an average monthly audience of less than 15 million unique visitors. Quickly adopt the technologies of Tier 1 web sites.</li> <li>• <b>Tier 3:</b> Individuals who develop non-company web sites.</li> </ul>	<ul style="list-style-type: none"> <li>• Ability to create more compelling and effective web content targeted to their unique business goals</li> <li>• Reduced bandwidth yields significant cost savings</li> <li>• Appeal to largest possible audience using a wide range of Internet hardware and software access methods. Minimize turning potential customers away who frustrated by response times.</li> <li>• May increase the amount of time and money spent on the Internet by visitors</li> <li>• Provides customers with the most enjoyable web experience possible with quick and easy navigation</li> </ul>
<p>End-Users</p> <p>30 million</p>	<ul style="list-style-type: none"> <li>• A typical end-user is someone who dials-in to an ISP using a modem and a personal computer. Most individuals who use the Internet are considered end-users. End-users typically pay a fee to an ISP for the Internet connection and potentially to some content-providers for access to their sites.</li> <li>• This group can be divided into the following categories: <ul style="list-style-type: none"> <li>• <b>Novice (35%):</b> Includes nearly everyone who uses an on-line service (AOL, MSN, etc.) Use the Internet primarily for email, chat, and basic information hunting (restaurant reviews, stock info, etc.).</li> <li>• <b>Intermediate (40%):</b> Access the Internet at least once/week, proficient at running searches to find specific information, have purchased goods or services online more than once and/or have subscribed to some sort of content service (whether free or pay).</li> <li>• <b>Advanced (25%):</b> People who rely on the Internet nearly everyday. Typically, they have downloaded plug-ins or new software and can install it without difficulty. May also design their own web pages.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Ability to navigate web pages quickly and easily</li> <li>• Experience high quality web sites with minimal degradation in quality of graphics</li> </ul>

### **3.4 Competitive Environment**

The bandwidth expansion industry is rapidly evolving. The development of several new Internet transmission technologies will threaten to reduce the value-added proposition of Web Express. In addition, there are many firms that are attempting to use compression to enhance transmission rates. With these thoughts in mind, our competitors may be divided into two primary categories:

1. **Competing Technologies** - New technologies that increase the transmission speed of data over the Internet.
2. **Competing Products** - Companies developing Internet transmission enhancement using compression/caching technology.

#### **Competing Technologies**

There exist several different approaches to increasing transmission rates over the Internet. These approaches include cable modems, ISDN, ADSL, wireless, satellites, etc. (an in-depth description of each of these competing technologies is included in *Appendix 1*). Each technology promises to improve access to the Internet--but each is not without its share of technical and logistical problems. ISDN is the best bet in the next few years: The products are mature and it is widely available. The only cloud on ISDN's horizon is the phone companies, which are notoriously voice-centric. Earlier this year, for example, several phone companies raised their ISDN residential tariffs, complaining that home users were spending too much time on their ISDN lines.

This is an opportunity cable companies can seize, but it will not be easy; making the one-way cable networks interactive requires a tremendous capital investment. The best efforts, such as the much touted @Home venture, will require cable operators to think and act like ISPs. They will have to build their own Internet backbones and route IP networks on top and alongside their existing networks. Also, the fractious debate over standards needs to be resolved quickly so vendors can produce equipment that works with more than one cable system.

Leased lines are the toughest competition for the cable companies, and chances are prices will drop as phone companies devise new ways to cut their high profit margins in this area. Satellite technologies will evolve as a means to deliver bulk data transfers, but the software and hardware has to improve so that installing multiple IP configurations becomes easier.

The opportunity for Web Express in this scenario lies in two different areas. First, the implementation of the above technologies in major metropolitan areas will be slow and expensive. The end of the decade will surely approach before any of these technologies are substantially in place. Second, even after the adoption of these transmission enhancement technologies, future versions of Web Express will add real value given the rich multimedia that will be contained on web pages given the increased bandwidth. This fact allows Bandwidth+ the ability to add real value to the Internet user for some time to come.

**Competitive Analysis - Web Compression  
Competitor and Reference List**

No	Company Name	Product Name	Comments	URL Address
1	Algorithmic Research BV	SDR	Compresses images and text	<a href="http://www.algoresearch.com/">http://www.algoresearch.com/</a>
2	BrowseFast	BrowseFast	Looks like compression software designed for Netscape. No other information is available.	<a href="http://www.browsefast.com/">http://www.browsefast.com/</a>
3	Compaq Computers	Accelerated Server Technology	Hardware solution that requires purchase of Compaq Server	<a href="http://www.compaq.com/isp/index.html">http://www.compaq.com/isp/index.html</a>
4	Compression Engines, LLC	WIF Internet Plug-In	A new file format for images. Claims huge reductions in image file size	<a href="http://www.cengines.com/cehome.htm">http://www.cengines.com/cehome.htm</a>
5	Cyberview Co.	Cyberview Image	Essentially a JPEG compressor	<a href="http://www.cyberviewcd.com/index.html">http://www.cyberviewcd.com/index.html</a>
6	Datalytics Inc.	Blaze	Has not been released yet.	<a href="http://www.datalytics.com/">http://www.datalytics.com/</a>
7	Fourelle Systems, Inc.	Venturi	Uses hardware/ software for speed increase.	<a href="http://www.fourelle.com/">http://www.fourelle.com/</a>
8	Raspberry Hill Publishing	GIF Wizard	Compresses GIF images into smaller GIFs.	<a href="http://www.gifwizard.com/">http://www.gifwizard.com/</a>
9	Hewlett-Packard Corp.	HP Flash Pix	Compresses images into a new file format.	<a href="http://www.hp.com/gsyinternet/ec_wp/ecwp-5.html">http://www.hp.com/gsyinternet/ec_wp/ecwp-5.html</a> <a href="http://www.livepicture.com/products/index.html">http://www.livepicture.com/products/index.html</a>
10	Infinop, Inc.	Lightning Strike	Compresses GIFs to a new file format.	<a href="http://www.infinop.com/fhtml/entrypt.html">http://www.infinop.com/fhtml/entrypt.html</a>
11	Intel Corporation	QuickWeb	A hardware-based solution using compression and caching.	<a href="http://www.intel.com/quickweb/home.htm">http://www.intel.com/quickweb/home.htm</a>
12	Martin E. Haring	GifClean32	Compresses GIFs into smaller versions of themselves	<a href="http://members.tripod.com/~mharing/gifclean.html">http://members.tripod.com/~mharing/gifclean.html</a>
13	PeakSoft Corporation	PeakJet	Compresses GIFs to a new file format.	<a href="http://www.peak-media.com/PeakJet/PeakJet.html">http://www.peak-media.com/PeakJet/PeakJet.html</a>
14	Pedagoguery Software	A Smaller GIF	Compresses GIFs into smaller versions of themselves	<a href="http://www.peda.com/smaller/desc.html">http://www.peda.com/smaller/desc.html</a>
15	Pegasus Imaging Corporation	RapidVUE	Claims to specialize in JPEG image compression.	<a href="http://www.jpg.com/product.html">http://www.jpg.com/product.html</a>
16	Picobello.com	Web-Speed	Compresses images into GIF, JPEG, or PNG	<a href="http://www.picobello.com/">http://www.picobello.com/</a>
17	Plenio Software Solutions	WebGraphics Optimizer	Compresses images into any one of 24 graphic file formats.	<a href="http://www.WebOpt.com/">http://www.WebOpt.com/</a>
18	Sausage Software	Bandwidth Buster 1.0	Compresses GIFs into compressed JPEGs	<a href="http://www.sausage.com/bbuster.htm">http://www.sausage.com/bbuster.htm</a>
19	Summus, Ltd.	WI Viewer	Another product that uses a new image file-format.	<a href="http://www.summus.com/index.htm">http://www.summus.com/index.htm</a>
20	Ulead	Smartsaver	Compresses images into GIF, JPEG, or PNG	<a href="http://www.ulead.com/webutilities/ssaver/noslip.htm">http://www.ulead.com/webutilities/ssaver/noslip.htm</a>
21	XA Tech	JPEG Optimizer	Compresses JPEG into smaller JPEGs	<a href="http://www.xat.com/">http://www.xat.com/</a>



## Competing Products

There are presently many competing products in the Internet transmission enhancement market (see table on previous page). All differ in many respects: type of firm, software and hardware compatibility, special requirements, targeted market segments, revenue model, and phase of introduction. However, one of the most important differences of all is the type of technology utilized. These technologies are described as follows:

- **New Image File Format** - Many competitors (including Web Express) have developed a new image file format that essentially replaces GIF, JPEG, etc. In most cases, this new file format claims to better utilize present compression technology using smaller image files to provide equal clarity and quality.
- **Real-Time Compression** - Some products simply compress image/text data in real-time. In other words, the content provider does not have to pre-save images and text in a new file format for the transmission speed to be increased.
- **Caching** - This is a term that simply means storing web pages in memory before the user needs them. For example, some products actually try to anticipate what web sites the end user will visit next and "cache" those pages on the user's hard drive. Then, when the user does want to visit that site, the pages from the hard drive are pulled up, giving the impression that the transmission rate is very high when, in fact, it really is not (caching is primarily a hardware-based solution).

## 4 Product/Market Strategies

### 4.1 Product Strategy

Our product strategy is to develop Internet-based applications that provide the end-users of our products with quicker transmission of web pages. This is achieved through the use of algorithms that compress the original files associated with a web page without making changes to the file which noticeably degrade the quality. The more efficient compressed files require less bandwidth and are more quickly transmitted to the end-user. Our initial product, Web Express 1.0, is specifically designed for GIF file types, and our development plan is to grow our expertise, and product line, to provide similar solutions for other image file types used on the Internet.

Our longer-term objective is to leverage our initial product development learnings to create a compression technology that will more quickly transmit video images across the Internet.

### 4.2 Sustainable Competitive Advantage

#### *Product Benefits*

The benefits of Web Express 1.0 are as follows:

- **Speed** – Web Express 1.0 can increase the transmission rate of information over the Internet by as much as two times the present rate. This results in much more productive use of the end-user's time by not having to wait as long for web pages to download.
- **Cost savings** – The savings associated with Web Express 1.0 can be analyzed based upon the reduced transmission costs customers and providers will experience. For example, The New York Times home page ([www.nytimes.com](http://www.nytimes.com)) includes a 48.2 Kb GIF file which when





transmitted via TCP/IP increases to 78.6 Kb. Using Web Express 1.0 this file can be reduced to 32.2 Kb and transmitted at 53.4 Kb—thus the total volume of data transmitted per image load is 25.1 Kb. Assuming a charge of \$ 0.10 per Mb transmitted, this would result in savings of \$119.77 per 50,000 image loads, and would rise to \$2,395.53 for 1,000,000 image loads. (See figure XX for details) Additional savings that the end-user may incur if they incur charges based on volume of usage is not included, nor are any savings associated with the reduced volume of space required to store the compressed files.

- **Compatibility** - Web Express 1.0 is currently compatible with both Microsoft Internet Explorer and Netscape Navigator used on an IBM-PC running Windows 95. These browsers are the most commonly used by Internet users. Because of programming differences, different versions of Web Express 1.0 must be created for different types of browsers.
- **Ease of Use** - Through the use of a plug-in, users can have the software easily installed on their personal computers. Many users are already familiar with popular plug-ins such as RealAudio, Shockwave, and QuickTime which all use the same technique to download and install.
- **Low Cost** - Users of the Web Express software would pay much less than they would by switching to a different technology that can transmit data at a faster rate. In addition, there is no special hardware required to make Web Express work.
- **Immediate Availability** - This technology is here today. Many other advances in access speed are much further into the future.

#### ***Why is Web Express unique, competitive, and does it have a sustainable advantage?***

There are many reasons why Web Express is unique, competitive, and holds a sustainable advantage compared to both present and future competition:

- **Early Market Entry** - Web Express is one of the first products of its kind in the market of Internet transmission improvement tools. Its unique design will enable Web Express to develop a strong brand name with Internet users, a critical step in establishing a large installed base.
- **No Implementation Hassles** - Users of the Web Express software would have very little trouble installing and using this product on their personal computers. This is definitely not the case with almost any other alternative to enhancing speed of transmission.
- **Low Cost Alternative** - Web Express will probably be the lowest cost alternative to speed access to the Internet. This is because it is simply a piece of software. Hardware and special cable connections are much more expensive in both the initial purchase price and possible monthly fees that may be assessed.
- **Simple Distribution** - Because Web Express would be a plug-in available to every user on the Internet, the distribution of the product is ideal. There would be little cost to distribute a plug-in versus the hardware alternatives.
- **Raises the Performance Ceiling** - As web developers include increasing amounts of information on their web pages, Web Express would allow users to realize performance gains unseen in today's most common communications schemes.

*One of the most important facts to point out is that there does not exist a de facto standard on the Internet for transmission enhancement products. Many web developers interviewed through our marketing analysis were not even aware that such products exist. This fact gives an excellent product such as Web Express a*

*real shot at becoming the standard among Internet transmission enhancement products.*

### **4.3 Initial Products and Services**

The initial Web Express product offering, Web Express 1.0, is intended solely for Internet image files, specifically GIFs (General Interchange Format). Because this format is used on a wide variety of on-line services, it has become a cross-platform standard. GIF is an 8-bit, 256-color bitmapped image format. The use of our current compression algorithm allows GIF files to be compressed without severely reducing the quality of the visible image. This greater efficiency in file storage and transfer, along with the resulting increase in speed, comes with minimal effect to visible image quality, thus being attractive to end-users.

Bandwidth+ Web Express 1.0 will consist of two components: a server-based "writer" and a browser-based "reader." Both of these components are discussed in detail in the following paragraphs in terms of current product features needed for Web Express to be successful.

#### **Web Express Writer**

The writer component is a piece of software that gives web page content providers and developers the ability to convert existing GIF files into a BWP (Bandwidth+) file format (this BWP file format is the compressed image on which Web Express is based). The server-side writer will be used as a "tool-kit" for web page developers to optimize the performance of their web site in terms of server space utilized (cost savings to developers) and transmission times to end-users (time and cost savings to end-users). This tool-kit will include other features which will assist web page developers in developing and maintaining their web sites. These features will include:

- **Windows-Based Interface** – This is a graphical user interface that is very common and popular in today's software applications. Ease of use and functionality are the important aspects of such an interface.
- **Image Conditioning** – Defined as compressing an image in an optimal manner to maximize image quality and minimize file size. For developers who are not image experts, the conditioning could be done automatically by the writer. For image professionals, such a feature may be disabled to allow manual adjustment for fine-tuning.
- **Side-by-Side Comparison** – This would allow the developer to compare different preset compression levels side-by-side to evaluate effects on image quality and compression. This comparison would consist of actual images (both compressed and original) as well as image statistics (such as file size).
- **Page Auditing** – Allows the developers to fully gauge the benefit of compressing images on a web site. This feature would analyze a web page and determine the results of Web Express image compression in terms of transmission size, download times, and potential monetary savings.
- **Add-in to Image Processing Packages** – There are already many good image processing packages that allow a developer to adjust images in an almost infinite amount of ways. Such an example would be Adobe PhotoShop, which is currently very popular in the web development industry. Making Web Express an add-in to packages such as PhotoShop would give developers the added compression feature in an environment they are already accustomed to without having to learn how to use a new application.

## Web Express Reader

The reader product will be available, via downloading, on-line and will allow the end-user to view the BWP file types created by the server-based writer. The reader is compatible with Apple Macintosh, IBM PCs, WebTV, operating systems, and other Netscape or Microsoft compatible browser currently on the market.

The first time a user encounters a BWP file, a dialog box will appear that will prompt the user to download the reader from the web page containing the BWP file. By accepting the download of the Web Express reader, the end-user will wait approximately 45 seconds (on a 28.8Kbps modem). After that, the reader is ready to read the BWP files and display them on the end-users screen. From that point forward, the transmission of BWP files to the end-user's computer will be transparent, except for the increased speed. The features of the reader component include:

- **Quick, Easy, One-Time Installation** – All the end-user will have to do to initiate the Web Express reader component is to accept the prompt on the dialogue box. After installation, the user will not have to take further action.
- **Invisible to the End-User** – Once installed, the end-user will not know when a GIF file or a BWP file is being displayed. The only difference will be a noticeable increase in transmission speed.
- **Easily Upgradeable** – As new versions of the reader become available, they can be automatically passed along to users who are still utilizing older versions. This will allow users to continue to receive the increased benefits the new versions will offer, without any effort.
- **On/Off Feature** – Some advanced Internet users may want to view an image in the highest quality possible, no matter how long it takes to download. For these users, Web Express would have an On/Off feature that would allow the end-user to temporarily disable the reader and display the original, uncompressed image file. Not only does this let the user see the highest quality image possible, but it also illustrates to the user how great an improvement Web Express is making on his/her productivity.
- **Adjustable Compression Level** – This feature would allow end-users the option of increasing or decreasing the amount of compression, depending on their specific needs and interests. For example, users who do not really care about the quality of an image may maximize the compression to get the greatest transmission enhancement possible. More discriminating users may wish to set compression to a lower level to see better quality graphics at a slower transmission rate. The choice is up to the user.
- **Complete Compatibility** – The reader component will be compatible with all major browsers such as Netscape Communicator/Navigator, Microsoft Internet Explorer, Mosaic, and any other browser that still exhibits a significant critical mass of users. This feature will ensure that potential customers of Web Express will not be turned away from using the product because it will not work on their browser/operating system (which is currently a large problem for many Internet software plug-ins).

## 4.4 Product Development Plan

In order to be a sustainable product for future use to Internet users, features and enhancements must be added to increase the usefulness of the Web Express product. We envision a whole host of improvements that this product could incorporate in future versions. The following text describes the features we feel should be incorporated into future versions of Web Express.

The first set of improvements would be incorporated into Bandwidth+ Web Express 2.0 and would occur within 12 months of the launch of version 1.0. These improvements are described below in the order we feel they should be implemented:

- **Compression of Animated .GIF Files** - These image files are becoming very popular on advertising throughout the web. These images are composed of several GIF files that cycle frequently to give the illusion of a moving image. These are typically very large compared to regular GIFs and offer an excellent extension of Web Express technology.
- **Compression of Other File Types** - Besides GIF, there are many other image file types that are used on the Internet. Some of the more popular include JPEG and TIFF. By including these file types, Web Express would have the ability to compress almost every image file type posted on the Internet.
- **Image Bundling** - Instead of compressing individual files on a web page and transmitting them separately, a method of increasing transmission speed even further would be to "bundle" these images together. In other words, compressing several separate GIF image files into one BWP file. This would give another boost in transmission rate because the reader would not have to "read" several files, just one.
- **No Plug-In Required** - This feature would allow Web Express to work on a user's computer without any need for user input. In other words, the user would not have to download a plug-in to make it work. This would eliminate almost all barriers to why an end-user may not want to use Web Express.

The second set of improvements would be incorporated into Bandwidth+ 's Web Express 3.0 and would occur within 12 months of the launch of version 2.0. These improvements are described below in the order we feel they should be implemented:

- **Video Compression** - One of the most significant technological movements on the Internet today is the use of video technology. Presently, video files are very large and require much more download time than do GIF files. This would be an obvious direction for Bandwidth+ to take in the future.
- **File Compression for Transmission**- Another natural extension would be to allow Bandwidth+ to compress and transmit *software* applications over the Internet. On-line software distribution is becoming very popular on corporate Intranets as a way to quickly and easily update software on end-user's PCs. The technology behind Bandwidth+ could be made to adapt to such an opportunity.
- **File Compression for Media Storage**- It is becoming increasingly common for businesses to keep large databases of information stored for future access. Bandwidth+ could help shrink the physical size of these files and help these users better utilize their storage capacity.

#### 4.5 Technical Issues and Assumptions

*The product recommendations and features identified above are based upon our competitive research and industry interviews. In our conversations with Mr. Mark Nelson, we have discussed the technical issues associated with the Bandwidth+ product development in both the short and long term, and believe that while there are definite hurdles to overcome, none of them are insurmountable given the right people possessing the appropriate technical skills. The product development challenge does not appear to be a technical one, but instead a marketing and customer understanding challenge.*



*One of the most critical elements of the initial product development will be thorough Beta-site testing. While we expect that the initial product and features can be developed in a period of 4 months, the Beta testing necessary may require an additional couple of months. This is because the only Beta testing procedure will require mimicking the end-user environment, and this will be slow, thus requiring a lengthened Beta-test period.*

## 5 Sales and Marketing Plan

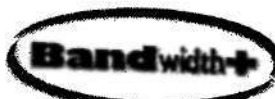
### **5.1 Market Research Highlights**

Our primary research focused on three target segments: Web Developers/Content Providers, Internet Software Providers (e.g. browsers and web authoring tools), and Internet Service Providers. We conducted our qualitative research with the following companies (Please refer to *Appendix 3* for interview verbatims):

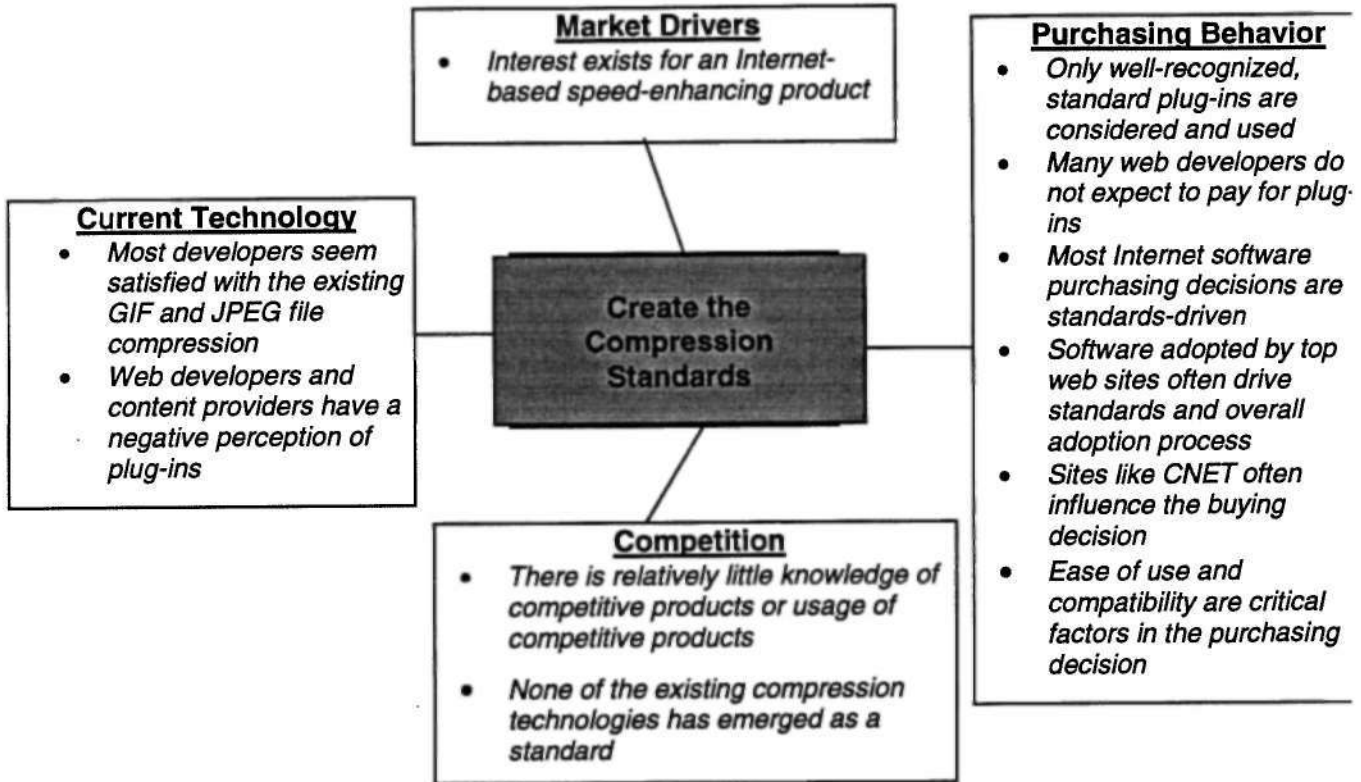
Segment	Company
ISP	Sprint
ISP	Large National ISP
Internet Software Provider	Microsoft (Expedia)
Internet Software Provider	Microsoft (Front Page)
Internet Software Provider	Netscape
Web Developer/Content Provider	Autodesk
Web Developer/Content Provider	Chicago Tribune
Web Developer/Content Provider	Chicago Tribune, Independent Developer
Web Developer/Content Provider	Idealab!
Web Developer/Content Provider	Marelich
Web Developer/Content Provider	Center Stage Media
Web Developer/Content Provider	Reel Graphics

### **5.2 Key Research Findings:**

The diagram below indicates the main findings we discovered from our primary market research separated in to four key categories. These findings indicate a significant opportunity for Web Express 1.0 to become the compression standard.



## Key Market Research Findings



### Additional Findings:

A number of other key points were brought out during the market research interviews. These include:

- Developers developing pages for the masses write to the lowest common denominator/as broad a market as possible—both in terms of browsers and plug-ins
- Developers will not necessarily increase the amount of graphics used with compression software, but may instead improve the quality of the graphics
- Current solutions to speed up access to the Internet are not being offered/focused on at trade shows, etc. Many developers are passively waiting for promised hardware solutions
- Developers and ISPs are looking for products that are easy to administer and more importantly, require no effort on the part of the end-user
- Fear on the developer's side that if user does not want the tool, may skip the web page altogether
- Large, national ISPs unlikely to adopt Web Express due to cumbersome user requirements (download), web development time required to modify existing web pages, lack of technical support and uncertainty of product's viability
- Regional ISPs may be a more realistic target given the ISP competitive environment

Please refer to *Appendix 4* for specific implications of these findings.

### 5.3 Recommendations and Implications

Given the open architecture and standards-oriented philosophy of the Internet reflected in the above market research findings, it is critical for Web Express to become the compression standard as quickly as possible. Clearly, an opportunity exists to develop a standard not only for graphics compression, but especially for future products such as video compression. There are a number of key success factors and implications for Web Express to become a standard as follows:

Key Success Factor	Implication
Web Express must be a technically superior product	<ul style="list-style-type: none"> <li>• Be designed to maximize ease-of-use and convenience for end-users and web developers</li> <li>• Provide features other competitive products do not and which are not easily copyable</li> <li>• Adhere to technical design standards</li> <li>• Provide backward compatibility with key browsers (Netscape Navigator, Microsoft Internet Explorer, and AOL)</li> </ul>
Complete remaining Web Express 1.0 development within the next 6 months	<ul style="list-style-type: none"> <li>• Due to the volume of competitors, threat of new technology, and rate of change, a launch date of July 1, 1998 (or earlier) is assumed</li> </ul>
Gain credibility and mass appeal	<ul style="list-style-type: none"> <li>• Focus on popular, "Tier 1" sites for initial adoption of Web Express and other sites will follow. Initial targets would include: ESPN SportsZone, CNN Interactive, New York Times, U.S. News Online</li> <li>• Target Starwave.com which builds the web sites for several key news, sports, and entertainment sites</li> <li>• Target integration with browsers after adoption by Tier 1 sites</li> <li>• Leverage the idealab!/Bill Gross names to assist in establishing credibility.</li> </ul>
Leverage idealab! resources to gain key partnerships	<ul style="list-style-type: none"> <li>• Utilize contacts to obtain references at above Tier 1 sites</li> <li>• Utilize contacts to secure promotions at CNET, Ziff Davis</li> </ul>
Offer a family of compression software	<ul style="list-style-type: none"> <li>• Offer both graphics and video compression. High demand current and future, for video; no standards exist today.</li> <li>• Conduct market research and recruit video compression technology in parallel with remaining graphics development</li> </ul>
Offer responsive technical service	<ul style="list-style-type: none"> <li>• Ensure that customers receive an acceptable level of support</li> </ul>
Offer simple way for individuals to download Web Express software	<ul style="list-style-type: none"> <li>• Provide access via common sites such as Download.com, Tier 1 sites</li> </ul>
Offer compelling value equation including cost savings (both in terms of server space and download time)	<ul style="list-style-type: none"> <li>• Price graphics product lower initially to build strong user base and generate key partnerships as revenue base for future products</li> </ul>



## 5.4 Customer Usage and Behavior

As discussed, Web Express has both a reader and a writer component. Because revenue will be generated from the writer component, we determined the size of the web developers who will use the writer piece of Web Express by determining the number of web sites, or active addresses with .com extensions. (Please refer to Note below)

Target Segment	Size of Segment	Primary Use of Web Express	Anticipated Behavior
Web Developers/Content Providers for company web sites	1,600,000 .com web sites	Writer	<p><b>Tier 1:</b> Targeted to be the first adopters and establish the standard. May initially offer exclusivity agreements or other special partner arrangements to encourage usage of Web Express.</p> <p><b>Tier 2:</b> Will adopt after successful implementation by Tier 1; will target several months after launch</p> <p><b>Tier 3:</b> Will adopt after successful implementation by Tier 1 and 2 web sites; will also drive demand through advertising and reviews on CNet, ZDNet, etc.</p>
End Users	30,000,000 divided as follows <ul style="list-style-type: none"> <li>• 10,500,000 Novice users</li> <li>• 12,000,000 Intermediate users</li> <li>• 7,500,000 Advance users</li> </ul>	Reader	<p><b>Novice:</b> May be intimidated by Web Express reader dialogs; Most likely to cancel action and avoid web site</p> <p><b>Intermediate:</b> Would not be intimidated by reader; May even download reader from popular site like ESPN</p> <p><b>Advanced:</b> Would not be intimidated by reader; May proactively search sites like CNET and download.com to download the reader product without being "pushed" by popular site</p>

*Note:* Based on the data discussed in the previous *Market Opportunity* section, there are 19,540,000 domain name servers. Of these, approximately 21% of all the extensions respond to a "ping" indicating they are active. In addition, 4,000,000 of the 19,540,000 contain .com extensions. To obtain the number of active .com addresses, we estimate there are more active .com extensions than other extensions, so we estimate 40% of the 4,000,000 coms , or 1,600,000 would respond to a "ping" indicating they are active. In addition to the business targets, consumers also provide another potential revenue source since some of these consumers are web developers themselves. In fact, based on the Gvu's 7<sup>th</sup> WWW Survey Results, the percentage of users who have programmed in Java doubled in the past year to 34%. 58% of the web authors created web pages in support of their hobbies.



Once Web Express has gained critical mass through adoption by a number of Tier 1 and Tier 2 sites, we would recommend targeting national ISPs. (Refer to *Appendix 5* for ISP segmentation). In addition, given the growth of corporate intranets, this could provide another strong revenue source in the near future.

## **5.5 Launch Strategy**

A relatively small window of opportunity exists to become the graphic compression standard given the strengths of Web Express's competitors as well as the on-going commercialization of broadband technologies which will dramatically increase the available bandwidth. As such, our marketing plan incorporates the critical success factors outlined in the *Recommendations and Implications* section above. We emphasize parallel efforts to begin the market research of the video compression product alongside the remaining graphics compression development. Such a strategy will enable the company to develop initial partnerships with Tier 1 content providers to build a base for the graphics product as well as for a video compression product and other future products.

### **5.5.1 Advertising and Promotion Strategy**

Given the intensity of competition and the need to build brand awareness and trial quickly, Web Express will use a number of promotional methods, including:

- Advertising on sites such as CNET, ZDNet with links to Bandwidth+'s web site
- Promotional leverage from presence on Tier 1 sites
- Availability on Internet software stores (see Internet distribution channels above)
- Product reviews by CNET, ZDNet, PC Magazine, New Media Magazine
- Participation in trade shows to demonstrate Web Express's capabilities to developers and end-users
- Creating a Bandwidth+/Web Express Users Group
- Utilizing a 1-800 number for customer service and product purchasing information

Eventually, we would hope to leverage the reputation and installed base Web Express has built on the Tier 1 sites to enable the product to be incorporated into browsers (Netscape Navigator and Microsoft Internet Explorer), incorporated into web authoring tools such as Microsoft FrontPage and Adobe PageMill, and distributed to subscribers to online service providers such as America Online, and subscribers to ISPs who perform web hosting (e.g. Netcom).

### **5.5.2 Pricing Strategy**

Based on the pricing models of similar plug-in software products, we assume the reader product will be downloaded free of charge. Therefore, revenue generation is expected from the writer product. Based on competitive products and some primary market research, the product may be able to collect between \$25.00 and \$100.00. Factors to consider when determining pricing should include: 1) competitor pricing, 2) perceived value of our product (which includes ease of use—both to the user of the writer product and to the consumer, tangible end-user benefits, and relative importance in the development of a web site), and 3) consistent with de facto standard strategy (e.g. our pricing goal is to have a fair price that allows our product to reach price sensitive market segments).



Given the fast-approaching launch date of July 1, 1998, and the need to quickly increase the adoption rate by initially selling to Tier 1 sites, we believe Web Express must be priced competitively to establish itself as a de facto industry standard. Given this and the factors listed above, we believe a reasonable price for the Web Express product is \$50. If we can stimulate demand for the product, additional revenue can be generated through software upgrades, technical service, and future products such as video compression. For multiple site developers, we will license the product with an estimated average price per site of close to \$50. (See Appendix 6 for detailed pricing information.)

*We are currently anticipating a premium price position for future products. There are several reasons for this strategy. First, we expect to hold a first mover position due to the expected installed base generated from Web Express 1.0, from which we can continually provide substantial value ahead of the competition. Second, our ability to leverage the brand equity generated by the successful launch of the Web Express 1.0 will greatly benefit future products.*

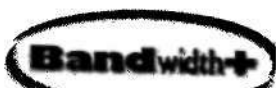
### 5.5.3 Distribution Strategies for 1998

Given Bandwidth+'s objective of making its software the de facto industry standard, Internet distribution is the most appropriate model for the initial year. Electronic distribution provides the company with a low-cost, globally accessible, 24-hour sales channel. The company can make available free beta versions or demo versions of its software for trial use over the Internet via the company's site (bandwidthplus.com), from the various software "stores" (see Internet Distribution Channels chart below) or from one of the Tier 1 sites defined above.

Alternate distribution channels could include retail stores and trade shows. Depending on market demand, the retail store channel may prove effective. However, Bandwidth+ would evaluate the options of contracting much of this work out given the high costs of developing this distribution capability. For a non-Internet distribution channel, a disk or CD product will need to be produced for the Writer product.

#### Internet Distribution Channels

Web Site (Company)	Description
<a href="http://www.Bandwidth+.com">www.Bandwidth+.com</a> (Bandwidth+)	Company Site
<a href="http://www.Download.com">www.Download.com</a> (CNET)	Internet software store
<a href="http://www.Shareware.com">www.Shareware.com</a> (CNET)	Download shareware software
<a href="http://www.Software.net">www.Software.net</a> (CyberSource Corporation)	Software download superstore
<a href="http://www.Buydirect.com">www.Buydirect.com</a> (CNET)	Download software direct from the manufacturer
<a href="http://www.netscape.com/netcenter/marketplace/software.htm">www.netscape.com/netcenter/marketplace/software.htm</a> (Netscape)	Download plug-ins and other software products
<a href="http://www.zdnet.com">www.zdnet.com</a> (ZDNet)	Download plug-ins and other software products
<a href="http://www.adobe.com/purchase/plugins.html">http://www.adobe.com/purchase/plugins.html</a> (Adobe)	If compatible with any of Adobe's products (Photoshop, PageMill, etc, Adobe will sell a vendor's plug-in on their web site.



#### **5.5.4 Distribution Strategies Long-Term**

After 1998, we believe Web Express will continue to be distributed over the Internet using the same channels mentioned above. Ideally, once established, Web Express will also be integrated with web authoring tools such as FrontPage or one of Adobe's web products such as PhotoShop or PageMill as an alternative distribution channel and to reach a larger target market.

#### **5.5.5 Future Research**

*More research needs to be done in this area to solidify actual target numbers. Future research would include:*

- 1) Interview other plug-in companies (established and not yet established companies) to find out their adoption rate*
- 2) Interview Tier 1 companies to determine level of interest in product*
- 3) Interview Tier 2 companies to determine level of interest in product*

**Web Express Launch Plan**  
**Target Launch Date: July 1, 1998**

Timeframe	Key Activities
December, 1997 – February, 1998	<p><b>Research and Development</b></p> <ul style="list-style-type: none"> <li>• Build demonstration software by January, 1998 to be used for additional market research</li> <li>• Begin developing Bandwidth+ web site</li> <li>• Prepare initial design specifications for video compression product</li> </ul> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>• Identify and secure Tier 1 sites to target for beta testing</li> <li>• Prepare feedback form to be used for beta testing</li> <li>• Distribute demonstration software to selected beta test sites</li> <li>• Obtain feedback from selected sites and obtain approval for references</li> <li>• Begin market research for video compression</li> <li>• Conduct focus groups and conjoint analysis with consumers for graphics ready product</li> <li>• Provide feedback to developers based on market research</li> <li>• Prepare electronic registration form for product</li> </ul> <p><b>Human Resources</b></p> <ul style="list-style-type: none"> <li>• Identify/Hire resources to work on video compression product</li> <li>• Identify/Hire Public Relations resource</li> </ul>
March – May, 1998	<p><b>Research and Development</b></p> <ul style="list-style-type: none"> <li>• Complete development of Bandwidth+ web site</li> </ul> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>• Build alliances with other Tier 1 sites using Tier 1 beta test sites as references</li> <li>• Secure agreements with Tier 1 sites for initial distribution, finalize pricing</li> <li>• Build alliances with CNet, ZDNet, CNN Web Flash, best.com to obtain Web Express product reviews and develop advertising and other promotional programs</li> <li>• Build alliances with download.com, software.net, buydirect.com, shareware.cc to offer Web Express download capability</li> <li>• Add plug-in to Netscape's and Microsoft's plug-in directory</li> <li>• Utilize other idealab! contacts for promotional opportunities</li> <li>• Attend tradeshow</li> <li>• Complete press releases for July product launch</li> <li>• Determine technical service model</li> <li>• Continue video compression research</li> </ul> <p><b>Human Resources</b></p> <ul style="list-style-type: none"> <li>• Hire/secure technical service resources</li> </ul>

Timeframe	Key Activities
July, 1998	<p><b>Research and Development</b></p> <ul style="list-style-type: none"> <li>• Start development of video compression</li> </ul> <p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>• Submit press releases</li> <li>• Secure reviews and advertising time on CNet, ZDNet, Computer Chronicles</li> <li>• Secure reviews by PC Magazine, New Media Magazine</li> <li>• Prioritize feedback from customers and technical support with development team</li> <li>• Begin pre-launch activities for video compression</li> <li>• Start 1-800 telephone line for customer service</li> </ul>

## 6 Management Team and Organization Structure

### 6.1 Management Team/Structure

*As mentioned in the Executive Summary, due to the infancy of Bandwidth+ within idealab!, there does not exist a permanent management team. While Bill Gross will be the Chief Executive Officer of the organization, a President, Sales & Marketing Manager and technical personnel must still be secured for this opportunity. Based on idealab!'s ability to attract and retain experts in the Internet field, we do not anticipate the company will have difficulty attracting experienced management and technical personnel within a short period of time.*

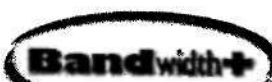
The roles and responsibilities for the initial start-up of the company should include:

**President:** Should have experience in Internet business development. The President should have strong leadership, people management, and negotiation and sales skills. The president should also have some knowledge in how to set up human resource, accounting and other critical processes within a small organization.

**Marketing and Sales:** The individual should have experience with product marketing, ideally with some Internet experience. Strong general management skills are required including project management, financial analysis and technical knowledge.

**Technical Software engineers:** Between the three technical personnel, these individuals must have skills in writing compression software for all Netscape Navigator and Internet Explorer platforms, Windows operating systems, and experience in developing easy-to-use, standards-based Graphical User Interfaces. Also, they must have the ability to meet deadlines and work in an unstructured environment.

**Customer Service Personnel** must be available to coincide with the launch of the product. Depending on customer demand, technical knowledge may be a requirement for these representatives. Otherwise, it may be possible for the established software programmers to provide this service.



During the first year of the company's incubation period, Bandwidth+ will leverage idealab's incubation capabilities by utilizing their human resources, accounting, legal and administrative infrastructure by locating itself in idealab's headquarters. In the company's second year, Bandwidth+ will relocate to its own facility and provide these services. A plan must be developed to prepare for this expected change in the organization during the third and fourth quarter of 1998.

*As the Bandwidth+ organization grows it will have to attract technical programmers and management to continue the product development of current and future products. During the upcoming months it is recommended that a plan be prepared in anticipation of this growth to include job and skill requirements for these positions.*

*The legal structure of the company, ownership and board of directors are all issues that must be addressed by idealab! when officially establishing the company. When establishing the ownership structure it is recommended to ensure that employee stock option programs be factored in.*

## **6.2 Intellectual Property**

Recognizing the importance of intellectual property, Bandwidth+ intends to implement an aggressive overall strategy wherein we will continually seek intellectual property protection as a means to prevent others from copying and reverse-engineering Bandwidth+'s solutions. Bandwidth+ is currently applying for patents to protect its compression algorithms that are incorporated into the Web Express product. Bandwidth+'s most valuable property will be software, which will be copyrighted as soon as possible in the development cycle.

## **6.3 Company Risks**

Product Risks	<ul style="list-style-type: none"> <li>• Product performance inferior to other existing technologies</li> <li>• New competitors enter the market (see competitor risks below)</li> <li>• New technology renders our product obsolete</li> <li>• Product is incompatible with current Internet software</li> </ul>
Market Risks	<ul style="list-style-type: none"> <li>• Piracy issues relating to our pricing structure (if we price by licenses—may have a problem monitoring actual number of licenses)</li> <li>• Internet growth slows</li> <li>• Server pricing changes making our cost-savings proposition (that our product saves money due to saved server space) irrelevant, hence a lower value proposition</li> <li>• Product is not adopted by Tier 1 accounts</li> <li>• End-users are unwilling to download the reader product</li> </ul>
Competitor Risks	<ul style="list-style-type: none"> <li>• New entrant (such as Microsoft) comes with an installed base</li> <li>• A standard is adopted (not ours)</li> <li>• Hardware solutions become a realistic threat</li> <li>• People migrate from our product to competitors' products</li> </ul>
Pricing Risks	<ul style="list-style-type: none"> <li>• Product may not be competitively priced; customers migrate to competitors</li> </ul>
Implementation Risks	<ul style="list-style-type: none"> <li>• Product development delays</li> <li>• Dependence on individual programmer(s)</li> <li>• Staffing shortages for key management personnel</li> <li>• Initial product development funding</li> </ul>



## 7 Financial Assumptions and Summary Projections

	1998	1999	2000	2001
<b>Income Statement Data</b>				
Revenues	\$ 368,421	\$ 5,611,559	\$ 16,549,674	\$ 17,950,549
Cost of Revenues	35,368	875,403	2,581,749	2,800,286
Gross Margin	333,053	4,736,156	13,967,925	15,150,264
Gross Margin %	90.4%	84.4%	84.4%	84.4%
Operating Expenses	1,978,464	6,054,543	7,477,915	9,268,031
EBT	(1,645,412)	(1,318,387)	6,490,010	5,882,232
EBT%	-446.6%	-23.5%	39.2%	32.8%
Net Income	\$(1,645,412)	\$(1,318,387)	\$ 3,634,405	\$ 3,294,050

<b>Balance Sheet Data</b>				
Cash and Cash Equivalents	\$ 145,757	\$ 38,711	\$ 4,052,928	\$ 7,544,161
Working Capital	(44,250)	(155,941)	4,148,137	7,497,902
Total Assets	228,743	472,987	4,966,124	8,277,209
Retained Earnings	(1,645,412)	(2,963,799)	1,350,280	4,644,331
Stockholder's Equity	104,588	36,201	4,350,280	7,644,331

<b>Valuation</b>				
at 3.6x Revenues	\$ 1,326,316	\$20,201,613	\$ 59,578,826	\$ 64,621,978
at 24x NI			87,225,730	79,057,204

### 7.1 Break-Even Analysis

Assuming variable costs of \$4.80 in 1998 and total operating expenses of \$1.2 million, the break-even volume of sales for Web Express 1.0 is 33,558 units. This volume represents 1.35% of the total estimated market. The break-even volume through the second quarter of 1999, at which time the second product will be launched, is 56,320 units, implying a necessary market penetration of 3.17%. Given the previously discussed market need for graphic compression tools, these volumes seem realizable given the development of a technologically superior product and a focused marketing plan. If Web Express 1.0 is successful in becoming a standard compression tool, actual sales will likely far exceed these numbers. An example of such a product is RealAudio, by RealNetworks, which is downloaded by an estimated 200,000 users per day.

#### Break-Even for Web Express 1.0 alone:

	1998	Q2 1999
Cumulative Total Fixed Costs	\$1,214,464	\$ 2,800,207
Total Variable Costs	\$ 4.80	\$ 5.28
Price	\$ 50.00	\$ 55.00
Break-even Volume	26,869	56,320
Implied Market Penetration	1.35%	2.64%



The Break-Even point for the second product is 17,772 units in 1999, as is indicated below. The potential to realize this volume is extremely difficult to predict accurately as the exact nature of the product has yet to be determined. However, RealNetworks estimates that it has sold a total of 150,000 copies of its product RealPlayer Plus to date. In this light, a volume of 17,772 does not seem unreasonable.

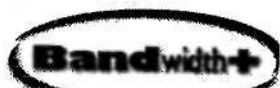
**Break-Even for Second Product:**

	1998	1999
Cumulative Total Fixed Costs	\$1,978,464	\$ 8,033,007
Total Variable Costs	\$ 48.00	\$ 48.00
Price	\$ 500.00	\$ 500.00
Break-even Volume	4,377	17,772
Implied Market Penetration	0.82%	3.35%

**7.2 Sources And Uses Of Cash**

The minimum cash needed for the first quarter of 1998 is \$232,750 estimated as follows:

Amount	Time	Source	Use
\$75,000	1 <sup>st</sup> Quarter 1998	idealab!	Hire three software engineers to continue development of Web Express 1.0 and begin development of second product.
\$18,750	1 <sup>st</sup> Quarter 1998	idealab!	Hire sales & marketing employee to research and guide product development, develop strategic relationships, implement marketing and product launch strategy.
\$17,500	1 <sup>st</sup> Quarter 1998	idealab!	Hire CEO to develop strategic plan for Web Express 1.0 and oversee operations.
\$50,000	1 <sup>st</sup> Quarter 1998	idealab!	Purchase computer equipment for product development and testing.
\$5,000	1 <sup>st</sup> Quarter 1998	idealab!	Purchase office equipment.
\$11,500	1 <sup>st</sup> Quarter 1998	idealab!	Travel and trade show related expenses.
\$38,500	1 <sup>st</sup> Quarter 1998	idealab!	Benefits-related expenses for employees (40% of salaries).
\$5,000	1 <sup>st</sup> Quarter 1998	idealab!	Equipment Leases
\$1,500	1 <sup>st</sup> Quarter 1998	idealab!	Telephone expense.
\$4,000	1 <sup>st</sup> Quarter 1998	idealab!	Insurance Expense
<b>\$232,750</b>	<b>1<sup>st</sup> Quarter 1998</b>		<b>Total cash needed</b>





### **7.3 Exit Strategy**

The most likely exit strategies for equity investors in Bandwidth+ would be (i) IPO, or (ii) Acquisition. In 1999, Bandwidth+ becomes a likely IPO candidate assuming ongoing research and development results in significant future growth opportunities. RealNetworks, a developer of audio and video streaming technologies for the Internet recently issued a successful initial public offering after posting 1996 revenues of \$14 million. Our projections would make Bandwidth+ suitable for an IPO in 2000. A second exit strategy is acquisition by a larger company such as Microsoft or Netscape. Contact with companies such as these has indicated that if Bandwidth+ is successful in developing and marketing technologically superior products, they would become attractive targets for an acquisition.

### **7.4 IRR/Valuation**

To determine a reasonable value of Bandwidth+ through 2001, we analyzed comparable publicly traded companies and the price-to-sales and price-to-earnings ratios at which they are currently trading. Since four of these five have yet to become profitable, a price-to-sales ratio is the most useful valuation tool.

	Last 4Q Sales (\$M)	Last 4Q Operating Income	Market Cap.	Price to Sales	Price to Earnings	Price to Operating Income
RealNetworks	28.16	NE	432.6	15.4	NE	NE
Macromedia	97.9	NE	308	3.1	NE	NE
Yahoo!	48.9	NE	2526.7	51.7	NE	NE
Netscape	520.6	NE	2379.6	4.6	NE	NE
Adobe	892.5	214.2	2851	3.2	14.81	13.31

The valuation of Bandwidth+ and associated IRR to equity investors at a price-to-sales ratio of 3.6 (the average from above excluding outliers RealNetworks and Yahoo!) and a P/E ratio of 24 (the approximate P/E ratio of the S&P 500) is as follows:

	1998	1999	2000	2001
Total Revenues	\$ 368,421	\$ 5,611,559	\$16,549,674	\$17,950,549
Valuation (3.6x Sales)	1,338,596	20,388,665	60,130,481	65,220,330
Net Income	\$(1,645,412)	\$(1,318,387)	\$ 3,634,405	\$ 3,294,050
Valuation (24x Earnings)			87,225,730	79,057,204
Investment	(3,000,000)			
IRR (average valuation)	-55%	184%	286%	302%

## **7.5 Summary Of Assumptions:**

The following is a summary of major assumptions used in the projected financial statements.

### **REVENUES**

#### **Web Express 1.0 Sales Assumptions**

- Price* Price is \$50 for the first year and increases by 10% per year. Please refer to Section 5, Pricing Strategy for discussion.
- Market Size* Based on the Internet Domain Survey, July 1997, ([www.cyberatlas.com](http://www.cyberatlas.com)), the number of active .com domains as of July, 1997 is approximately 1.6 million (please refer to Note in Section 5.4). We will use this figure as the foundation for our market sizing.
- Market Growth Rate* According to Cyber Atlas, the number of active domains is growing by approximately 30% per year. This equates to a quarterly growth rate of 7.5%.
- Market Penetration* Our Market penetration in the first year is assumed to be .35% of active domains, increasing to 3.1% by the end of 1999.
- Licenses Sold* We assume sales of 2,000 licenses in the third quarter of 1998 (product launch). The maximum number of licenses sold in a quarter, 25,000, occurs in the second and third quarters of 1999. The life of Web Express 1.0 is assumed to be two years. Total volume in 1999 is 81,250 licenses.

#### **Second Product Sales Assumptions**

- Price* The second product is assumed to be launched in the third quarter of 1999, one year after Web Express 1.0, at a price of \$500. Pricing will be competitive with offerings from competitors such as RealNetworks. There are two possible pricing scenarios for the second product. The first is that the product will be released at a low price with limited functionality and price will increase as the capability of the product is enhanced. The second possibility is that the product will be superior and priced accordingly. This price would then fall over time as competitive pressures increase. Our model attempts to strike a middle ground between the two with price increasing by 10% per year.
- Market Size* The market size for the second product is assumed to be 20% of active domains. This is an estimate by the team of the demand for video compression products in relation to all web sites.
- Volume/Growth Rate* We assume sales of 500 units in the third quarter of 1999 (product launch). The maximum number of licenses sold per quarter, 8,000, occurs in the third and fourth quarters of 1999.
- Service Revenues* Service revenues are estimated to be 5% of Total Revenues in 1998, 7% in 1999, and 9% thereafter. These numbers were determined by benchmarking against similar companies. (Please refer to *Financial Appendix 1: Bandwidth+ Company Financials*)

## **7.6 Cost Of Sales**

*Cost of Sales* Cost of Sales will consist of cost of product media, duplication, manuals, packaging materials, and fees paid to third-party vendors for order fulfillment. Cost of Sales are estimated to be 9.6% in 1998 and 15.6% thereafter. These numbers were determined by benchmarking against similar companies. (Please refer to *Financial Appendix 2: Comparative Company Financials*)

## **7.7 Personnel Assumptions**

In addition to monetary compensation, all employees of Bandwidth+ will be paid in stock options. Management and sales and marketing personnel will receive a greater proportion of their compensation in stock options than will software engineers to make their salary more closely tied to the performance of the company. All salaries increase at a rate of 10% per year.

*Software Engineers* The company will hire five software engineers in the first quarter of 1998 at an annual salary of \$100,000 to complete development of the first generation Bandwidth+ product and to begin development of the second product. The number of software engineers increases over time as sales and revenues increase. By the fourth quarter of 2001, we project a total of seventeen engineers.

*Sales & Marketing* The company will hire one marketing person in each of the first three-quarters of 1998 at an annual salary of \$75,000. The company will hire an additional two marketing personnel in 1999 for the second product launch. By the fourth quarter of 2001, we project a need for eight sales and marketing persons.

*Administrative* The company will not need to hire any administrative personnel until the first quarter of 1999 because of the company's relationship with idealab! The administrative salary for the two persons hired in 1999 will be \$45,000 per year.

*Customer Support* The company will hire one customer service person in the third quarter of 1998 when the first product is released at a salary of \$55,000 per year. An additional customer service representative will be hired in the first and second quarters of 1999 to support the increased demand for Web Express 1.0 and the release of the second product.

*Management* The company will hire a CEO at a salary of \$70,000 per year plus stock options in the first quarter of 1998. Additional management (CFO, COO) will be hired in 1999.

## **7.8 Operating Expenses**

*Website* The company will incur an initial cost of \$20,000 for web site design and development and a recurring cost of \$1,000 per month for web site maintenance. These numbers were estimated from quoted prices of \$10,000 to \$25,000 for the design of a business web site with electronic commerce capabilities.



<i>Travel</i>	The company will allow \$4,000 per month in travel expenses.
<i>Trade Show</i>	The company will incur \$55,000 to \$80,000 per year in trade show-related expenses.
<i>Marketing Materials</i>	The annual cost for marketing materials is estimated to be \$50,000 in year 1, \$160,000 in years two through three.
<i>Advertising</i>	The company has budgeted advertising expenses of \$450,000 in year 1, and \$2 million per year thereafter. These figures were determined by analyzing the costs of advertising on prominent web sites (ZDnet) and various publications as well as benchmarking against comparable companies.
<i>Benefits</i>	The company has budgeted 40% of total salaries for expenses related to employee benefits.
<i>Legal</i>	<i>The company estimates that it will need to secure one to two patents per year. Legal costs relating to such estimates are \$20,000 per patent, per discussions with a patent attorney.</i>
<i>Accounting</i>	The company estimates total accounting expenses to be \$16,000 per year per discussion with accountants.
<i>Rent</i>	The company will utilize idealab! facilities in 1998 and will therefore incur no rent expenses until 1999. At this time, the company should be able to secure suitable office space for \$8,000 to \$10,000 per month.
<i>Equipment Leases</i>	Equipment leasing needs are estimated to be \$20,000 to \$30,000 per year. This is for equipment such as facsimile machines, copiers, telecommunications equipment, etc.
<i>Telephone</i>	Telephone expenses are estimated to be \$500 to \$1,500 per month.
<i>Power, Water &amp; Gas</i>	Because the company will utilize existing idealab! facilities during 1998, it will incur no utility expenses until 1999.
<i>Insurance</i>	Insurance expenses are estimated to be \$16,000 per year.
<i>Depreciation</i>	All fixed assets are depreciated on a straight-line basis over estimated useful life. Computer equipment is depreciated over five years, while office equipment is depreciated over a seven-year period.

## **7.9 Current Assets & Liabilities**

<i>Accounts Receivable</i>	Accounts Receivable turnover is 6.8 which is the average of the comparable companies analyzed.
<i>Accounts Payable</i>	The Accounts Payable turnover ratio of 3.1 was also calculated by averaging the turnovers of comparable companies.

*Accrued Expenses* Accrued Expenses are 18.0% of Operating Expenses. This figure was derived by calculating the ratio of Accrued Expenses to Total Operating Expenses for the comparable companies.

### **Capital Expenditures**

*Computer equipment* The company estimates that it will need to purchase \$50,000 of computer equipment in the first quarter of 1998 for the development and testing of its products. Additional computer equipment expenditures to accommodate growth and increased human resources are \$200,000.

*Office Equipment* The company estimates that it will need to purchase \$5,000 in office equipment in 1998 and an additional \$45,000 in 1999 when new office space is secured.

## **7.10 Crystal Ball Financial Analysis**

We used Crystal Ball®, a forecasting and risk analysis software tool, to analyze the variability in our projected Operating Income for Bandwidth+ with WebExpress only. The assumptions we made are as follows:

### **Assumptions**

*Price* Price was assumed to be normal distributed with a standard deviation of 5. The most likely price was our projected price of \$50. This was determined by analyzing the price of competing products.

*Volume* Our volume forecast was assumed to have a triangular distribution because the average, or most likely, value, is less certain than our price. The maximum volume was 15,000 in 1998 and the minimum was 1,000. Volume in 1999 varied between 50,000 and 100,000 with 81,250 the most likely. In 2000, volume varied between 12,000 and 30,000. Because a high volume in one year would indicate a high likelihood of a high volume in the subsequent year, the volume assumptions were assigned a correlation of 7.

*Operating Expenses* Operating Expenses were divided between R&D expenses, Sales & Marketing Expenses, and G&A expenses. Each variable was assigned a triangular distribution +/- approximately \$75,000 of our projected values.

### **Results**

The results of the Crystal Ball analysis are detailed in Financial Appendix 3, and may be summarized as follows:

- The Operating Loss for 1998 will fall between \$800,000 and \$1 million with a 50% degree of confidence.
- There is a 50% chance that Operating Income for 1999 will be greater than \$2.3 million.
- In 2000, there is a 50% chance that Operating Income will exceed \$400,000.

