A Forrester Total Economic Impact™ Study Prepared For Cisco

The Total Economic Impact Of Cisco's Borderless Networks

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FORRESTER®

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Executive Summary

In 2009, Cisco commissioned Forrester Consulting to examine the total economic impact and potential value that enterprises may realize by deploying components of Cisco's Borderless Networks. Borderless Networks is a comprehensive architecture, which, for this case study, incorporates routing, switching, mobility, security, and wide-area network (WAN) optimization using Wide Area Application Services (WAAS) solutions.

This study highlights the benefits and costs of deploying Cisco's Borderless Networks across the enterprise of a composite *Organization* (see Appendix A: Composite *Organization* Description). The findings in this study are in large part based on in-depth interviews conducted by Forrester with 13 Cisco customers currently using components of Cisco's Borderless Networks. The study presents the aggregate findings derived from the interviews and analysis process as well as our independent research. The composite *Organization* is based on characteristics of the interviewed customers and illustrates the quantifiable costs and benefits of Cisco's Borderless Networks. The *Organization* is a large North American-based company with 5,000 employees providing manufacturing, distribution, and services worldwide. It has a large global operation, including 40 branch offices in North America and 10 branch offices in Europe and Asia.

The study found that for the composite *Organization*, Cisco's Borderless Networks provided quantified benefits and savings in the following areas:

- Mobility productivity savings of $5,400,000.
- Security benefits and cost savings of $711,000.
- WAAS benefits and cost savings of $2,367,600.

The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of deploying these components of Cisco's Borderless Networks in their organizations.

Cisco's Borderless Networks

Our interviews with 13 existing Cisco customers and subsequent financial analysis found that our composite *Organization* experienced the risk-adjusted ROI, costs and benefits shown in Table 1.

Table 1
Organization Three-Year Risk-Adjusted Costs And Benefits

Risk-adjusted ROI	Payback period	Total benefits (PV)	Total costs (PV)	Net present value
163%	12 months	$5,737,156	($2,184,032)	$3,553,124

Source: Forrester Research, Inc.

The three-year risk-adjusted total NPV of $3,553,124 represents the net costs and benefits attributed to using Cisco's Borderless Networks, compared with the *Organization*'s previous generations of mobility, security, and WAN implementation solutions (see details below in the Costs, Benefits, Flexibility, and Risk sections). In addition, the risk-adjusted benefits (NPV) were $5,737,156, and the payback period was 12 months. From the customer interview process, Forrester also identified several significant unquantified business benefits attributed to the Cisco's Borderless Networks, and these are listed in the Benefits section of this study.

If risk-adjusted costs and benefits still demonstrate a compelling business case, it raises confidence that the investment is likely to succeed because the risks that threaten the project have been taken into consideration and quantified. The risk-adjusted numbers should be taken as "realistic" expectations, as they represent the expected value considering risk. Assuming normal success at mitigating risk, the risk-adjusted numbers should more closely reflect the expected outcome of the investment.

The objective of this study is to identify savings and benefits experienced by the interviewed customers and portray those savings using a composite *Organization*. These results can be used as a guide to allow other organizations to determine the appropriate benefits for their particular environments.

Disclosures

The reader should be aware of the following:

- The study is commissioned by Cisco and delivered by the Forrester Consulting group.
- Forrester makes no assumptions as to the potential return on investment that other organizations will receive. Forrester strongly advises that readers should use their own estimates within the framework provided in the study to determine the appropriateness of an investment in the various Cisco's Borderless Network solution components.
- Cisco reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.
- The customer names for the interviews were provided by Cisco, and Cisco did not participate in the interviews.

TEI Framework And Methodology

Introduction

From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ framework for those organizations considering implementing Cisco's Borderless Networks. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision.

Most monetary values shown in this study are rounded to the nearest dollar for simplicity of presentation. Actual financial calculations might be based on figures carried to more decimal points than shown here and, therefore, not entirely match the resultant figures presented in the tables.

Approach And Methodology

Forrester took a multistep approach to evaluate the impact of Cisco's Borderless Networks on an organization. Specifically, we:

- Interviewed Cisco marketing, sales, and product management personnel as well as Forrester subject matter analysts to gather data relative to Cisco's Borderless Networks and the marketplace for Cisco's Borderless Networks.
- Interviewed 13 Cisco customers that were each using portions of Cisco's Borderless Network components examined in this study) to obtain data with respect to costs, benefits, and risks.
- Designed a composite *Organization* based on characteristics of the interviewed Cisco customers (see Appendix A).
- Constructed a financial model representative of the interviews using the TEI methodology. The financial model is populated with the cost and benefit data obtained from the interviews as applied to the *Organization*.

Forrester employed four fundamental elements of TEI in modeling the Cisco's Borderless Networks components:

1. Costs.
2. Benefits to the entire organization.
3. Strategic flexibility options.
4. Risk.

Given the increasing sophistication that enterprises have regarding value-based analyses related to IT investments, Forrester's TEI methodology serves the purpose of providing a complete picture of the total economic impact of purchase decisions. Please see Appendix B for additional information on the TEI methodology.

Cisco's Borderless Networks: Overview

According to Cisco, its Borderless Networks deliver secure, reliable, and seamless connectivity to any device, any person, and in any location. Cisco's Borderless Network architecture uses the power of the network to:

- Deliver a media experience that enhances productivity.
- Streamline operations to increase flexibility, resiliency, and security.
- Accelerate business growth through technology innovation.

- Reduce total cost of ownership and increase ease of operations.
- Provide seamless, highly secure, wired, and wireless connectivity.

With its Borderless Networks portfolio, Cisco delivers systems capabilities that facilitate increased business innovation with video, mobility, and security.

Analysis

Interview Highlights

Interviews for this study involved executives from the following Cisco customers (all of whom were promised anonymity):

1. **A public school district in the Eastern US.** We interviewed the IT director of this public school district that has more than 12,000 students in K-12, and more than 1,400 employees, including: teachers, clerical, custodial, maintenance, and cafeteria staff who support the instructional program in the 14 schools, including 10 elementary schools. For the past five years, the school district has been using **Cisco's mobility infrastructure** consisting of 211 access points dispersed throughout the infrastructure and **Cisco's security solutions** at the data center perimeter and Internet gateways.

2. **Major university in the Midwestern US.** Forrester interviewed the executive director of IT networking and security of this large university comprised of more than 40,000 students and almost 19,000 faculty and staff. The university has utilized Cisco's switching and routing hardware for more than 12 years while recently investing in **Cisco's mobility solutions** by deploying 1,800 access points, with future plans to deploy a total of 6,000 access points campus wide.

3. **A US-based beverage bottling company with international operations.** We interviewed the vice president and CIO of this organization that has been using Cisco's routers and switches for more than five years. It more recently installed **Cisco's security solutions and Cisco's mobility solutions** by deploying 400 access points to serve 65,000 employees as well as **Cisco's WAAS** to improve application performance to 400 remote locations.

4. **An independent, not-for-profit, and locally controlled healthcare organization.** Forrester interviewed the CIO and the senior systems and security analyst of this organization serving the needs of 10 US counties and employing more than 2,000 people. The IT group is responsible for providing 99.99% uptime on all pieces of equipment, including 200 servers, 2,000 workstations, public and private wireless access points, and machines that run highly specialized medical applications for surgical and other procedures. It has been using Cisco's routers and switches for more than seven years and more recently added **Cisco's security and mobility solutions**.

5. **A public school district in British Columbia, Canada.** We interviewed the assistant secretary-treasurer of the school district that has more than 7,000 students using 3,000 computers in 30 buildings. For the past

three years, the district has been using **Cisco security solutions** to secure its infrastructure while providing wireless coverage with **Cisco mobility solutions** (150 access points).

6. **Another public school district in British Columbia, Canada.** We interviewed the manager of technology and education service programs of the school district that has 22,000 students in 48 school buildings with access points in every classroom. It has been providing wireless services with **Cisco's mobility solutions** while securing the infrastructure with **Cisco security solutions** over the past three years.

7. **A global pharmaceutical company specializing in healthcare and nutrition.** The interview was conducted with a staff analyst on the network protection team and the network services administrator. This company has been using Cisco's routers and switches for more than 15 years and deploys **Cisco's mobility solutions** for "at home" workers and has been leveraging videoconferencing for two years.

8. **A pharmaceutical and healthcare services company.** Forrester interviewed the vice president of network operations for this organization that has been using Cisco's routers, switches, **security solutions, and WAN optimization products (WAAS)** for 11 years. There are more than 100 access points in 30 locations serving 1,500 wireless users. Cisco's WAAS solutions increase application performance in 13 locations today.

Forrester interviewed five Cisco customers specifically for their adoption of Cisco's WAAS solutions.

1. **A provider of community-based behavioral healthcare.** This organization offers a full range of mental health services, substance abuse treatment, and related educational services. It serves almost 70,000 individuals and families at more than 120 facilities. Forrester conducted an in-depth interview with the IT director and technology manager and found that the organization has deployed **Cisco WAAS** to improve application performance to 13 sites and two data centers since late 2006.

2. **An operator of a fleet of cargo aircraft and ground service equipment.** Forrester conducted an in-depth interview with the IT director about the company's experience using Cisco WAAS. The company provides flexible transportation schedules and services, including a comprehensive domestic ground transportation trucking network allowing for expedited delivery of freight in both the continental US and Canada. It has been using **Cisco's WAAS** to increase application performance to its five branches over the past 18 months.

3. **A European-based chemical and systems manufacturer.** This company serves the construction, automotive, and general industries. It has 170 locations and more than 15,000 employees around the globe. Forrester conducted an in-depth interview with this company's IT team leader and its senior systems administrator about the results of using **Cisco's WAAS** to optimize WAN traffic to and from 40 of its 170 offices.

4. **A world leader in building materials.** Forrester conducted an in-depth interview with this company's lead enterprise architect about the benefits of deploying **Cisco WAAS** to increase application performance to 65 remote sites. With 90,000 employees in 76 countries, this organization specializes in cement, concrete, and gypsum products.

5. **An engineering and consulting company for public and private sector clients worldwide.** Forrester conducted in-depth interviews with this company's CIO and two project managers in the architecture group. With more than 4,000 employees in 50 offices, the company focuses on the following markets: aviation, defense, environmental, homeland security, and pipelines and utilities. This company is using **Cisco WAAS** across 32 branch offices today and, over the next 12 months, will be expanding to 50 branches as equipment leases expire.

Composite Organization

Based on the interviews with the 13 Cisco customers, Forrester constructed a TEI framework, a composite *Organization*, and an associated value-based analysis that illustrates the areas financially affected. The *Organization* that Forrester synthesized from these results is intended to represent a large North American-based company providing manufacturing, distribution, and services worldwide. It has a large global operation, including 40 branch offices in North America and 10 branch offices in Europe and Asia. For more information on the composite *Organization,* see Appendix A.

Framework Assumptions

Table 2 provides the model assumptions that Forrester used in this analysis.

Table 2
Model Assumptions

Ref.	Metric	Value
A	Fully burdened annual salary† per sales and field service professionals, customer care team, and logistics personnel	$120,000
B	Fully burdened annual salary† per security administrator	$90,000
C	Workdays per year	250
D	Discount rate	12%

†Includes salary, variable compensation, and all direct benefits (e.g., health insurance, pension)

Source: Forrester Research, Inc.

The discount rate used in the PV and NPV calculations is 12%, and the time horizon used for the financial modeling is three years. Organizations typically use discount rates between 8% and 20% based on their current capital structure. Readers are urged to consult with their respective company's finance department to determine the most appropriate discount rate to use within their own organizations.

Costs

Mobility Costs

Per the *Organization's* business needs, Cisco recommends the following deployment scenario based on best practices.

With 3,000 headquarters employees and guests requiring network access to a variety of services, Cisco suggests the organization deploy 300 access points, one access point for every 10 users, which will provide optimum coverage and connection bandwidth. This ratio takes into account the extra capacity needed for meeting rooms, public areas, etc., in addition to sporadic connections associated with guest users. In addition, to support 50 employees at each branch office, four access points in Hybrid Remote Edge Access Point (H-REAP) mode supported by workload license charges (WLCs) at the central office are required at each of the 50 branch offices. Based on the above configuration the Mobility costs total **$848,532**, as follows:

- Three Cisco 5508 Series Wireless Controllers (controls up to 250 access points) — $42,250 each (includes one extra for N+1 redundancy). Total cost is **$126,750.**
- Cisco 5508 Series Wireless Controller for guest access in the demilitarized zone (DMZ) at a cost of **$42,250.**
- Cisco Aironet 3500 series access points with CleanAir technology (802.11a/g/n Fixed Internal Antenna and Unified Access Point); need 500 access points at $845 each for a total cost of **$422,500.**
- Internal preparation and planning labor costs of **$24,000.**
- Cisco planning design and configuration cost (no installation included) is **$175,000.**
- Three years of Cisco annual support cost is **$58,032** (100% paid upon implementation).

Security Costs

At the corporate campus, to support 2,500 employees and guest users, Cisco suggests deploying an intelligent threat defense solution and providing secure communications services with full redundancy. These requirements dictate a pair of Cisco ASA 5540s with AIP-SSM-40s and another pair of ASA 5540s providing 2,500 concurrent sessions of Secure Sockets Layer virtual private network (SSL VPN) in full redundant mode. Below is the Cisco-recommended security solution configuration for the *Organization*. The security configuration total costs are **$647,292** as follows:

- Cisco ASA 5540 Appliance with AIP-SSM-40, SW, HA, 4GE+1FE, 3DES/AES — needs two for IPS and FW/NAT for a total cost of **$88,400.**
- Cisco ASA 5540 VPN Edition with 2500 SSL User License, HA, 3DES/AES — needs two to provide 2,500 sessions of SSL VPN with redundancy for a total cost of **$113,100.**
- Cisco 5508 Series Wireless Controller for wireless guest access — needs two (one for redundancy) for a cost of **$15,600.**

- Dual Cisco IronPort C370 Email Security Appliances for HA, inbound protection (anti-spam, anti-virus, virus outbreak filers) and three-year bundled support for 50 users, including hardware and software subscription for a total cost of **$186,973**.
- Management for the Cisco IronPort C370 includes a single Cisco IronPort Security Management Appliance M670 with support for three years and a three-year centralized web reporting and policy management license. Email software license is also included for a total cost of **$20,459**.
- Internal preparation and planning labor costs of **$10,000.**
- Cisco Professional Services — the advanced services budgetary estimate pricing for planning, development, and implementation is **$155,610**.
- Three years of Cisco annual support cost is **$57,150** (100% paid upon implementation).

Note: Cisco IronPort solutions provide customers a choice with the selection of on-premise appliances, cloud-based SaaS services or a hybrid of them both. Pricing is equally comparable for these varying service delivery options.

WAAS Costs

To ensure optimum application delivery over WAN connections, Cisco recommends one Central Manager plus two WAAS head ends plus 50 NME modules (one per branch office) for Integrated Services Routers (ISR). Below is the Cisco-recommended WAAS solution configuration for the Organization. The total WAAS costs are $**688,208** as follows:

- A pair of Wide Area Application Engine (WAE) 7371s with enterprise license at the primary data center with redundant configuration for high availability at a cost of **$175,500**.
- WAAS Central Manager running on a Wide Area Virtualization Engine (WAVE)-274 at the data center for a cost of **$4,225**.
- 10 SRE-700 modules embedded in Cisco Integrated Services Router (ISR) 2911 with enterprise license, for 10 international branch offices at a cost of **$77,675.**
- Five WAAS Express licenses embedded in Cisco ISR 2911, for five international branch offices at a cost of **$11,360**.
- Five WAAS Express licenses embedded in Cisco ISR 2911, for five North America branch offices at a cost of **$11,360**.
- 30 SRE-700 modules embedded in Cisco ISR 2911 with enterprise license, for 35 North American branch offices at a cost of **$233,025**.
- Internal preparation and planning labor cost of **$14,400**.
- Cisco professional services fees for planning, training, and implementation at a cost of **$120,000.**

- Three years of Cisco annual support cost of **$40,663** (100% paid upon implementation). Forrester assumes the reader has already purchased a SMARTnet contract for each ISR router.

Total Costs

Total costs for implementing and managing Cisco's Borderless Networks components are shown in Table 3 below.

Table 3
Total Costs

Costs	Initial	Year 1	Year 2	Year 3	Total
Mobility costs	($848,532)	$0	$0	$0	($848,532)
Security costs	($647,292)	$0	$0	$0	($647,292)
WAAS costs	($688,208)	$0	$0	$0	($688,208)
Total	**($2,184,032)**	**$0**	**$0**	**$0**	**($2,184,032)**

Source: Forrester Research, Inc.

Cisco costs are based on typical Cisco reseller-discounting practices offered to customers as of November 2010.

Benefits

This benefits section details the quantitative benefits for the *Organization*. We also included qualitative benefits that the interviewed customers experienced, but that could not be quantified. Such benefits relate to mobility, security, and WAN optimization and are potentially as valuable as the quantitative ones and should be taken into consideration when analyzing the total return on investment realized by implementing Cisco's Borderless Networks.

Quantified Benefits And Savings — Mobility

As workers become increasingly distributed and mobile, work is no longer confined to always-wired devices. As firms hire and retain younger and more tech-savvy employees who have loftier mobility expectations than Baby Boomers, IT departments find themselves rudely awakened to the requirements of supporting a wider array of mobile devices, operating systems, and applications conflicting with historical corporate standards and sourcing practices. Our *Organization* is also facing heavy pressure to support personal and consumer-grade mobile devices and applications. This poses a twofold challenge: 1) mobile device management, and 2) mobile security.

Our *Organization* defined its mobile enterprise policy as something that:

- Reduces risk.
- Defines a clear technical road map in a muddled technology landscape.

- Enables new business processes and efficiencies.

Successful mobile policies have three main elements:

- A mobility framework or strategy.
- A security policy.
- Device management and support.

Mobility Productivity Benefits — Remote Sales, Field Service, And Logistics Employees — $5,400,000

In addition to the costs associated with the Cisco solution, there was a positive IT benefit associated with Cisco mobility solutions. Our *Organization* seeks to make mobile investments to enhance the productivity of employees who are truly mobile — away from their desk often of which there are 1,000 mobile employees, including sales professionals, field service professionals, customer care team, and logistics personnel who use the *Organization's* CRM and other applications to improve customer-facing productivity at remote sites. Several of the interviewed customers reported an average 3% productivity gains in their larger, high-staff-concentration geographies as a result of their remote employees using Cisco's mobility solutions. For the *Organization,* its 1,000 remote employees will use CRM and other applications to track down answers about order status and inventory in real time and answer questions while visiting a customer or on a customer call. This will result in significantly decreased calls to the customer care team, allowing the customer care reps to focus on addressing more complex and strategic customer issues. The *Organization* will be able to defer hiring in similar high-staff concentration geographies, which represented about one-half of the 1,000 mobile workers (500 workers). Our *Organization* will be able to defer replacement hiring of sales, field service, and logistics personnel in the impacted geographies, saving 3% of those labor charges over the next three years. At a fully loaded cost of $120,000 per FTE (full-time equivalent), the *Organization* will save 15 FTEs or $1,800,000 in each year of this three-year analysis for a total savings of **$5,400,000**.

Table 4
Organization — Mobility Productivity Benefits (Non-Risk-Adjusted)

	Year 1	Year 2	Year 3	Total	NPV
Mobility productivity savings benefits: remote sales, field service, and logistics employees	$1,800,000	$1,800,000	$1,800,000	$5,400,000	$4,323,296

Source: Forrester Research, Inc.

Unquantified Benefits — Mobility

In addition to the benefits quantified in this study, most of the interviewed customers reported other significant benefits, which they were *not* able to quantify. Forrester encourages readers to consider how the following unquantified benefits may impact their *mobility* environment.

- Mobile devices on the next-generation 802.11n networks can now offer five to 10 times the bandwidth that facilitates the deployment of high-definition video and other advance services and applications that offer richer and more reliable collaboration for faster decision making.
- Several of our interviewed customers sought to improve the productivity of mobile employees as well as guests — those workers who do not necessarily work away from their desk — such as administrative assistants, contractors or finance professionals. Like their truly mobile colleagues, they want to access business-oriented applications through their personal mobile devices, such as expense tracking, PDF document reader applications, and staff or time-approval applications.
- Other benefits customers cited included lowered IT costs due to simplified wireless network management by deploying a centralized architecture. This made it easy for IT to optimize the wireless network's capacity and coverage, and to automatically identify and eliminate sources of RF interference that could impact network downtime

Benefits And Savings — Security

Several interviewed customers agreed that the Cisco network foundation provides wired/wireless/WAN connectivity with integrated security supporting all modes of connection and data transports with their products: switches routers; unified wireless solution; and a security solution offering VPNs, firewalls, intrusion detection systems (IDSes), and access control lists (ACLs). The integrated Cisco solution closes the security gaps associated with multivendor solutions and reportedly is more manageable, easier to support, and costs less to own. In addition, Cisco offers a modular approach to security, which enables small- and medium-sized businesses to add components as they grow. To address a diverse set of business conditions and IT infrastructures, Cisco offers integrated solutions (routers with built-in firewall capabilities, for example) or dedicated devices.

Cost Savings Benefit Of Security Staff — $270,000

The Cisco solution has reduced the number of time-consuming calls related to security issues, allowing our *Organization* to reduce security administration staff by 33% (reduce one FTE) saving the *Organization* $90,000 (fully loaded cost) per year, or **$270,000** over the three years of this analysis.

Cost Savings Benefit From Avoiding Manual Downloads For Cleanups — $351,000

Prior to implementing Cisco's solution, the previous antivirus application required 1.5 FTEs to support this application with site visits to the impacted workstations to force the update or to uninstall and re-install the application — or install another application to clean up the virus. Once the Cisco security (antivirus) solution was installed, 90% of the previous cleanup efforts went away. This saved security administrators 90% of their time or approximately 1.3 FTEs at a fully loaded cost of $90,000 per FTE or $117,000 total annually, or **$351,000** over the three years of this analysis.

Savings From Combining IPS And VPN Appliances — $90,000

Our *Organization* was able to save $30,000 annually (hardware and maintenance) by purchasing Cisco ASA 5540 VPN Edition, which consolidates the VPN and IPS in one appliance. In addition to reducing the number of maintained devices, there's a common authenticated footprint within the single device. The total savings is **$90,000** over the three years of this analysis.

Table 5
Organization — Security Savings Benefit (Non-Risk-Adjusted)

	Year 1	Year 2	Year 3	Total	NPV
Cost savings benefit of security staff	$90,000	$90,000	$90,000	$270,000	$216,165
Cost savings benefit from avoiding manual downloads for cleanups	$117,000	$117,000	$117,000	$351,000	$281,014
Savings from combining IPS and VPN appliances	$30,000	$30,000	$30,000	$90,000	$72,055
Total security benefits and cost savings	$237,000	$237,000	$237,000	$711,000	$569,234

Source: Forrester Research, Inc.

Unquantified Benefits — Security

In addition to the benefits quantified in this study, most of the interviewed customers reported other significant benefits, which they were not able to quantify. Forrester encourages readers to consider how the following unquantified benefits may impact their *security* environment.

- Cisco security solutions have enabled customers to segment their network into logical domains, which was not something they could do previously. Security can be increased by partitioning the network into logical workgroups and entities separated by firewalls for compliance reasons or segmented in order to prevent cascading failures across a set of systems.
- Beyond traditional virtual local area network (VLAN) and firewall segmentation, security services, such as intrusion prevention and network admission control, offer heightened protection. Integrated network-based (e.g., network access control [NAC] support within a switching device) security services offer an efficient and effective solution.

Benefits And Savings — WAAS

Based on an analysis of the interviews with the participating customers, the following quantifiable benefits were attributed to the *Organization* as a result of implementing Cisco WAAS.

Cost Savings: Bandwidth Savings — $1,402,500

When the *Organization* began centrally deploying applications prior to implementing Cisco WAAS, the IT department received increase complaints from users in the branch offices who felt the applications were slow and inconsistent. Previous to WAAS, they were connected to OC3, DS3, and T1 lines running multiprotocol label switching (MPLS).

Most of the interviewed Cisco customers that deployed WAAS across their WAN links found that application performance and consistency were on par with LAN speeds at the local offices. Cisco WAAS also minimized WAN bandwidth expenses for the interviewed customers with reported reductions between 40% and 69% in bandwidth usage. For our composite *Organization*, the average bandwidth cost per branch prior to implementing Cisco WAAS was $1,700 per month or $20,400 annually ($1,020,000 annually for 50 branches). After implementing Cisco WAAS, bandwidth expenses were reduced by 55% to $765 per month or $9,180 annually ($459,000 for 50 branches) resulting in an average annualized bandwidth savings per office of $11,220 ($561,000 for 50 branches). As with most of the interviewed customers, our *Organization* installed Cisco WAAS over a period of 12 months across its 50 branches. Application centralization was also possible due to the homogeneity of WAN link speeds. Table 6 below depicts the total savings.

Table 6
Organization — WAAS-Related Bandwidth Savings (Non-Risk-Adjusted)

	Year 1	Year 2	Year 3	Total	NPV
Average number of branches using Cisco WAAS	25	50	50	—	—
Average annual savings per branch	$11,220	$11,220	$11,220	—	—
Total bandwidth cost savings across all branches	$280,500	$561,000	$561,000	$1,402,500	$1,096,981

Source: Forrester Research, Inc.

The total three-year bandwidth savings as a result of deploying Cisco WAAS is **$1,402,500**.

Cost Savings: Bandwidth Upgrades Avoided Or Delayed — $540,000

Key among the quantified benefits of investing in Cisco WAAS for this *Organization* has been the cost avoidance and postponement of bandwidth expansion. With the ability to control streaming content, setting policies around both recreational and legitimate business content, and the ability to accelerate applications through compression and caching techniques, the *Organization* was able to delay planned upgrading of circuits in 15 of the largest branches for three years (five branches per year). Average cost avoidance saving per branch, as reported by the interviewed customers, was at $1,500 per month ($18,000 annually). Table 7 depicts the total savings in bandwidth upgrades avoided.

Table 7
Organization — WAAS Savings In Bandwidth Upgrades Avoided (Non-Risk-Adjusted)

	Year 1	Year 2	Year 3	Total	NPV
Cumulative number of branches avoiding upgrades	5	10	15	—	—
Average annual cost avoidance per branch	$18,000	$18,000	$18,000	—	—
Total bandwidth *upgrade* savings across all branches	$90,000	$180,000	$270,000	$540,000	$416,033

Source: Forrester Research, Inc.

The total three-year hardware saving in bandwidth upgrades avoided as a result of deploying Cisco WAAS is **$540,000**.

Cost Savings: A Reduction In Server Hardware And Software Maintenance Licensing — $187,500

Upon implementation of the Cisco WAAS solution, most interviewed customers were able to reduce by an average of *half* the number of branch Windows file and print servers and experienced savings associated with the reduction in server hardware maintenance and licensing. For our *Organization*, we estimate that the savings associated with a reduction in 50 *existing* servers' hardware maintenance and licensing would be $1,500 per server per year, or **$75,000,** annualized based on a reduction of 50 file and print servers coinciding with the phased implementation of Cisco WAAS during Year 1. Table 8 depicts the total server hardware maintenance and licensing savings.

Table 8
Organization — WAAS Savings In Branch Server Maintenance And Licensing (Non-Risk-Adjusted)

	Year 1	Year 2	Year 3	Total	NPV
Cumulative average number of branch servers reduced	25	50	50	—	—
Average annual hardware maintenance and licensing	$1,500	$1,500	$1,500	—	—
Savings in server hardware maintenance and licensing	$37,500	$75,000	$75,000	$187,500	$146,655

Source: Forrester Research, Inc.

The total three-year branch server maintenance and licensing cost savings as a result of reducing the number of existing file and print servers by deploying Cisco WAAS is **$187,500**.

Cost Avoidance: Ability To Forgo Replenishment Of 50 Servers — $237,600

In the preceding section, we recognized the total three-year branch server maintenance and licensing cost savings as a result of reducing the number of existing file and print servers.

We now need to recognize the cost avoidance of not having to replace those 50 servers with replenishment servers. Assuming a four-year server life cycle, the *Organization* would have had to replace 12 servers per year at an annual life-cycle cost of $3,300 each, calculated as follows:

- It would have purchased 12 new file and print servers in Year 1 at a server life-cycle cost of $3,300 per year, or $9,900, over the remaining three years of this analysis for hardware, Windows server license software, infrastructure, and maintenance costs. Total cost avoidance savings associated with these 12 servers is $118,800 over the remaining three years.
- It would have purchased 12 new file and print servers in Year 2 at a server life-cycle cost of $3,300 per year, or $6,600, over the remaining two years of this analysis for hardware, Windows server license software, infrastructure, and maintenance costs. Total cost avoidance savings associated with these 12 servers is $79,200 over the remaining two years.
- It would have purchased 12 new file and print servers in Year 3 at a server life-cycle cost of $3,300 per year, or $3,300, over the remaining one year of this analysis for hardware, Windows server license software, infrastructure, and maintenance costs. Total cost avoidance savings associated with these 12 servers is $39,600 over the remaining one year.

Table 9 depicts the total savings of forgoing replenishment of branch servers.

Table 9

Organization — WAAS Savings From Forgoing Replenishment Of Branch Servers (Non-Risk-Adjusted)

	Year 1	Year 2	Year 3	Total	NPV
Number of replacement branch servers *avoided*	12	12	12	36	—
Annual server life-cycle cost remaining	$9,900	$6,600	$3,300	—	—
Total savings forgoing replenishment of branch servers	$118,800	$79,200	$39,600	$237,600	$197,396

Source: Forrester Research, Inc.

The total three-year cost avoidance savings associated with not having to replace the existing file and print server base as a result of deploying Cisco WAAS is $237,600.

Here is a summary of the benefits and costs savings included in Tables 6 to 9.

Table 10

Organization — WAAS Summary Benefits And Cost Savings (Non-Risk-Adjusted)

Total benefits and cost savings	Year 1	Year 2	Year 3	Total	NPV
Total bandwidth cost savings across all branches	$280,500	$561,000	$561,000	$1,402,500	$1,096,981
Total bandwidth *upgrade* avoidance savings across all branches	$90,000	$180,000	$270,000	$540,000	$416,033
Total savings in server hardware maintenance and licensing	$37,500	$75,000	$75,000	$187,500	$146,655
Total savings forgoing replenishment of branch servers	$118,800	$79,200	$39,600	$237,600	$197,396
Total WAAS benefits and cost savings	$526,800	$895,200	$945,600	$2,367,600	$1,857,065

Source: Forrester Research, Inc.

Unquantified Benefits — WAAS

In addition to the benefits quantified in this study, most of the interviewed customers reported other significant benefits, which they were *not* able to quantify. Forrester encourages readers to consider how the following unquantified benefits may impact their remote office environment.

- Increased productivity of remote branch employees due to improved access to mission-critical information and systems.
- Improved performance of revenue-generating applications.
- Streamlined disaster recovery procedures via accelerated remote backups.

Table 11
Organization — Total Borderless Networks Benefits (Non-Risk-Adjusted)

	Year 1	Year 2	Year 3	Total	NPV
Total mobility productivity savings	$1,800,000	$1,800,000	$1,800,000	$5,400,000	$4,323,296
Total security benefits and cost savings	$237,000	$237,000	$237,000	$711,000	$569,234
Total WAAS benefits and cost savings	$526,800	$895,200	$945,600	$2,367,600	$1,857,065
Total Borderless Networks benefits	$2,563,800	$2,932,200	$2,982,600	$8,478,600	$6,749,595

Source: Forrester Research, Inc.

Flexibility

Flexibility, as defined by TEI, represents investing in additional capacity or agility that can be turned into business benefit for some future additional investment. Forrester and the majority of interviewed customers believe that investing in Cisco WAAS for remote offices lays the groundwork to take advantage of Cisco's WAAS Mobile, a software client solution for smaller branch offices and mobile workers who are most often relying on networks less capable than the enterprise LAN. The Cisco WAAS Mobile solution is designed to deliver consistent performance for transfers of remote files, email attachments, Web pages, and Web-based enterprise applications over narrowband, high-latency, and problematic networks.

With many organizations already employing office-to-office acceleration appliances, the opportunity exists to accelerate mobile and branch users. In most organizations today, the mobile user category represents 20% of total employees and is quickly growing. Those likely to reap benefits from using a WAAS Mobile solution are:

- Retail and entertainment outlets.
- Financial services and insurance service branches.
- Field service and sales professionals.
- Remote home workers (home sourced employees) and part-time home workers.
- Occasional business travelers and occasional home workers (day-extenders).

Mobile WAN optimization shares many features with standard WAN optimization, designed to improve application performance by increasing throughput and decreasing latency. It's a symmetrical technology, meaning that technology sits on both ends of the link to help achieve end-to-end optimization. However, unlike traditional WAN optimization, the remote side is a software agent running directly on the endpoint as opposed to a hardware-based appliance at the perimeter of the network. Both mobile and fixed WAN optimizations apply four common acceleration techniques: 1) caching; 2) protocol optimization; 3) compression; and 4) traffic management.

Four of the 13 interviewed Cisco customers indicated that their original investment in Cisco WAAS provided them with the experience and agility to take advantage of this flexibility "option" and the significant savings that WAAS Mobile is forecasted to bring to their organizations. At present, three of the customers Forrester interviewed are in the testing phase of implementing the Cisco WAAS Mobile solution; therefore, this study will not attempt to quantify its benefits. However, we encourage readers to learn more about Cisco's WAAS Mobile to determine the potential quantifiable benefits within their organizations.

The value of flexibility is clearly unique to each organization, and the measure of its value varies from organization to organization. For the purpose of this analysis, we have assumed that the *Organization* sees future value in being able to provide small offices and remote/home workers with LAN-like performance of remote file transfers, email attachments, Web pages, and Web-based enterprise applications over narrowband, high-latency, and problematic networks. The value of the flexibility option when calculated is based on the Black-Scholes Option Pricing formula. (For additional information regarding the flexibility calculation, please see Appendix B.)

Risk

Risk-adjusted and non-risk-adjusted ROIs are both discussed in this study. The *Organization's* individual costs and benefits are quoted in non-risk-adjusted (best-case) terms and before risk adjustments are made. The assessment of risk provides a range of possible outcomes based on the risks associated with IT projects in general and specific risks relative to Borderless Networks projects. In our research, we saw that implementing Cisco's Borderless Networks was a low-to-medium risk endeavor if organizations take the time to thoroughly plan the transition process, including completing a readiness assessment that evaluates costs, benefits, and risks.

Risk factors are used in TEI to widen the possible outcomes of the costs and benefits (and resulting savings) associated with a project. As the future cannot be accurately predicted, there is risk inherent in any project. TEI captures risk in the form of risks-to-benefits and risks-to-costs.

Measurement of risk is a way of incorporating the levels of confidence and uncertainty regarding the cost and benefit estimates of a given investment. Higher confidence that the costs and benefit estimates will be met implies that the level of risk is lower and that the variation between the risk-adjusted and non-risk-adjusted outcomes is minimized.

The following general risks were considered in this study:

- Lack of organizational discipline in creating processes and procedures to best take advantage of the benefits.
- Lack of appropriate training for IT personnel who will be responsible for optimizing the full benefit potential from Cisco's Borderless Networks. Interviewed customers agreed that this risk could be mitigated by engaging with Cisco's (or the value-added resellers (VAR's)] sales engineers and training curriculum.
- The potential that the benefits will not be measured and quantified in the future, and as a result, no TEI benefit would be captured and acknowledged.
- Internal inertia, conflicting priorities, and turnover, reducing the *Organization*'s ability to achieve the benefits.

The following risks associated with Cisco's Borderless Networks were considered in this study:

- The inability of the *Organization* to find, train, or retain network administrators fluent in Cisco's networking products overall. Interviewed customers agreed that this risk could be mitigated by engaging with Cisco's (or the VAR's) sales engineers and training curriculum.
- Interviewed customers emphasized the need to test interoperability between Cisco products and third-party products within their unique environments.
- For the WAAS solution, once branch servers are consolidated to the data center, each potential point of failure in the server farm will put significantly more data at risk.

For this study, Forrester applied a 15% risk adjustment (reduction of 15%) to all benefits to reflect the risks listed above; see Table 12. We have not risk-adjusted costs, as these were primarily fixed price quotes from Cisco.

If a risk-adjusted benefit still demonstrates a compelling business case, it raises confidence that the investment is likely to succeed, as the risks that threaten the project have been taken into consideration and quantified. The risk-adjusted numbers should be taken as "realistic" expectations, as they represent the expected value considering risk. Assuming normal success at mitigating risk, the risk-adjusted numbers should more closely reflect the expected outcome of the investment.

Table 12
Organization — Total Borderless Networks Benefits (Risk-Adjusted Downward By 15%)

	Year 1	Year 2	Year 3	Total	NPV
Total mobility productivity savings	$1,530,000	$1,530,000	$1,530,000	$4,590,000	$3,674,802
Total security benefits and cost savings	$201,450	$201,450	$201,450	$604,350	$483,849
Total WAAS benefits and cost savings	$447,780	$760,920	$803,760	$2,012,460	$1,578,505
Total Borderless Networks benefits	$2,179,230	$2,492,370	$2,535,210	$7,206,810	**$5,737,156**

Source: Forrester Research, Inc.

Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

Financial Summary

The financial results calculated in the Costs and Benefits sections can be used to determine the risk-adjusted net present value of benefits, ROI, and payback period for the *Organization's* investment in Cisco's Borderless Networks. These are shown in Table 13 below.

Table 13
Cash Flow, ROI, And Payback Period (Risk-Adjusted)

	Cash flow — Risk-adjusted estimates					
	Initial	**Year 1**	**Year 2**	**Year 3**	**Total**	**Present value**
Costs	($2,184,032)	$0	$0	$0	($2,184,032)	($2,184,032)
Benefits	$0	$2,179,230	$2,492,370	$2,535,210	$7,206,810	$5,737,156
Net benefits	($2,184,032)	$2,179,230	$2,492,370	$2,535,210	$5,022,778	$3,553,124
ROI	163%					
Payback period	12 months					

Source: Forrester Research, Inc.

Study Conclusions

As the data in this study indicates, Cisco Borderless Networks has the potential to provide a very good return on investment. In addition, the **risk-adjusted ROI of 163%, along with a 12-month payback period** (breakeven point), raises confidence that the investment is likely to succeed, as the risks that may threaten the project have already been taken into consideration and quantified. In this study, risks have been modeled conservatively in the hopes of showing worst-case expectations.

A successful, well-planned implementation should allow quantifiable benefits and cost savings to accrue to the *Organization* in the following areas:

- Mobility productivity savings of $5,400,000.
- Security benefits and cost savings of $711,000.
- WAAS benefits and cost savings of $2,367,600.

Organizations that are likely to achieve similar relative savings have the following characteristics:

- Mid- to large-size organizations that are existing Cisco router and switching customers and have a myriad of networking vendors they are trying to consolidate.
- Have a high demand for a 24x7 network ecosystem accessed by multiple users, including: employees, partners, customers, and vendors.
- Are seeking cost reduction opportunities within their IT infrastructure.
- Have a significant mobile workforce using applications remotely.
- Have employees working from remote offices and homes.

For our *Organization*, Cisco Borderless Networks produced **a positive 163% risk-adjusted ROI, and a quick 12-month** horizon to recoup the investment.

We make no assumptions regarding the effects of Cisco's Borderless Networks at other organizations. This study examines the potential impact attributable to the 13 Cisco customers that participated in our examination and applies the common costs and benefits to a representative composite *Organization*. The underlying objective of this document is to provide guidance to technology decision-makers seeking to identify areas where value can potentially be created by investing in Cisco's Borderless Networks.

Appendix A: Composite *Organization* Description

For this TEI study, Forrester has created an *Organization* based on characteristics of the interviewed customers to illustrate the quantifiable costs and benefits of Cisco's Borderless Networks. The *Organization* is intended to represent a large North American-based company providing manufacturing, distribution, and services worldwide. It has a large global operation, including 40 branch offices in North America and 10 branch offices in Europe and Asia.

There are a total of 5,000 employees; 3,000 of which are associated with corporate headquarters, and 2,000 are remote branch office workers.

In adopting Cisco Borderless Networks, the *Organization* was trying to satisfy the following high-level goals and objectives:

- Accelerate business growth, adopting new video-enhanced business models.
- Dramatically lower TCO, using the network as the platform to drive energy efficiency and IT efficiency.
- Enable trusted access, allowing seamless wired and wireless access from any device and any location.
- Provide ease of deployment. The solution must be easily integrated into the *Organization's* existing network infrastructure.
- The need for better, more robust interactions with suppliers, customers, and employees and to make the network more accessible to these constituents. Demands driving this need include supply chain management, new business and delivery models such as video, and addressing increasing security threats.
- Provide ease of operations and management. The solution must not change the *Organization's* existing networking policies, including QoS (quality of service), monitoring, and application response time management.
- Minimize downtime.
- Build a better foundation to deploy network services like unified communications, video, and/or collaboration.
- Cut the operational or capital cost of running a complex network environment with a lot of standalone components.
- Improve network coverage for a more diverse set of users (employees, partners, and/or customers) in geographically dispersed locations.
- Allow employees, partners, and customers to access the *Organization's* resources in an increasingly complex IT environment over the longer term. This includes:
    - Access from any device — corporate-owned or employee-owned.

- Access to any application — inside the corporate, Web-based, or even "cloud-based."
- Access from anywhere — from public locations as well as remote offices, partner sites, etc.

Mobility objectives:

- Enable consistent coverage WLAN in the branch office to make it easier to add applications to its WLAN, such as voice or video or upgrade to 802.11n to support new applications and devices and to obtain improved wireless performance.

Security objectives:

- Meet compliance and regulatory requirements that require security monitoring and segmentation features.
- Seek a security infrastructure to support firewall, intrusion prevention (IPS), and VPN.
- Support existing security policies. The solution must not accelerate application delivery at the expense of creating new security vulnerabilities or violating current security standards.

WAN optimization objectives:

- Improve application performance, and minimize WAN bandwidth expenses. Any solution must improve application performance while minimizing WAN bandwidth consumption.
- Consolidate maximum number of branch-IT infrastructure components. The solution must provide a significant level of branch-IT equipment consolidation to reduce device footprints and operational costs.
- Reduce branch IT costs by centralizing branch servers, storage, and networking equipment into a single data center.
- Improve remote employee productivity by ensuring local LAN-like application performance.
- Reduce WAN bandwidth expenses.

Appendix B: Total Economic Impact™ Overview

Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

The TEI methodology consists of four components to evaluate investment value: benefits, costs, risks, and flexibility.

Benefits

Benefits represent the value delivered to the user organization — IT and/or business units — by the proposed product or project. Often product or project justification exercises focus just on IT cost and cost reduction, leaving little room to analyze the effect of the technology on the entire organization. The TEI methodology and the resulting financial model place equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization. Calculation of benefit estimates involves a clear dialogue with the user organization to understand the specific value that is created. In addition, Forrester also requires that there be a clear line of accountability established between the measurement and justification of benefit estimates after the project has been completed. This ensures that benefit estimates tie back directly to the bottom line.

Costs

Costs represent the investment necessary to capture the value, or benefits, of the proposed project. IT or the business units may incur costs in the forms of fully burdened labor, subcontractors, or materials. Costs consider all the investments and expenses necessary to deliver the proposed value. In addition, the cost category within TEI captures any incremental costs over the existing environment for ongoing costs associated with the solution. All costs must be tied to the benefits that are created.

Risk

Risk measures the uncertainty of benefit and cost estimates contained within the investment. Uncertainty is measured in two ways: 1) the likelihood that the cost and benefit estimates will meet the original projections, and 2) the likelihood that the estimates will be measured and tracked over time. TEI applies a probability density function known as "triangular distribution" to the values entered. At a minimum, three values are calculated to estimate the underlying range around each cost and benefit.

Flexibility

Within the TEI methodology, direct benefits represent one part of the investment value. While direct benefits can typically be the primary way to justify a project, Forrester believes that organizations should be able to measure the strategic value of an investment. Flexibility represents the value that can be obtained for some future additional investment building on top of the initial investment already made. For instance, an investment in an enterprisewide upgrade of an office productivity suite can potentially increase standardization (to increase efficiency) and reduce licensing costs. However, an embedded collaboration feature may translate to greater worker productivity if activated. The collaboration can only be used with additional investment in training at some future point in time. However, having the ability to capture that benefit has a present value that can be estimated. The flexibility component of TEI captures that value.

Appendix C: Glossary

Discount rate: The interest rate used in cash flow analysis to take into account the time value of money. Although the Federal Reserve Bank sets a discount rate, companies often set a discount rate based on their business and investment environment. Forrester assumes a yearly discount rate of 12% for this analysis. Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult their respective organization to determine the most appropriate discount rate to use in their own environment.

Net present value (NPV): The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made, unless other projects have higher NPVs.

Present value (PV): The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total net present value of cash flows.

Payback period: The breakeven point for an investment. The point in time at which net benefits (benefits minus costs) equal initial investment or cost.

Return on investment (ROI): A measure of a project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits minus costs) by costs.

A Note On Cash Flow Tables

The following is a note on the cash flow tables used in this study (see the example table below). The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1. Those costs are not discounted. All other cash flows in Years 1 through 3 are discounted using the discount rate (shown in Framework Assumptions section) at the end of the year. Present value (PV) calculations are calculated for each total cost and benefit estimate. Net present value (NPV) calculations are not calculated until the summary tables and are the sum of the initial investment and the discounted cash flows in each year.

Table [Example]
Example Table

Ref.	Category	Calculation	Initial cost	Year 1	Year 2	Year 3	Total

Source: Forrester Research, Inc.

Appendix D: About The Project Director

Bob Cormier
Vice President, Principal Consultant

Bob is a vice president, principal consultant for Forrester's Total Economic Impact™ (TEI) service. He is a leading expert on deriving business value from technology investments, specializing in advising clients on the TEI framework — services that help organizations understand the overall financial value of IT strategies and investments. He serves the following client roles:

- **CIOs and their staff.** Bob serves as a trusted advisor to create consistent, repeatable, and best-practice processes to justify and add credibility to technology investments business cases using Forrester's TEI methodology.
- **Technology vendor sales enablement professionals.** Bob works with these professionals in their efforts to clearly articulate the unique value proposition of their solutions to prospects and customers using Forrester's TEI methodology.

Bob has authored numerous TEI case studies for Forrester's vendor clients. He has also delivered his acclaimed Justifying Technology Investments (JTI) workshop to more than 800 participants representing 400 organizations.

Bob has more than 25 years experience in the IT and consulting industries. Prior to joining Forrester, he held senior-level positions at two leading eBusiness consulting firms, ZEFER and Cambridge Technology Partners. Bob has successfully led company efforts to optimize financial, operational, and resource planning activities, incorporating leading-edge, professional service automation (PSA) applications and enterprise resource planning (ERP) systems. He has also held senior financial management positions at Digital Equipment and Anixter International.

During his career, Bob has consulted with global users and vendors of IT and has been a frequent speaker at conferences, events, and seminars.

Education

Bob earned an M.B.A. from Bentley University and a B.S. in business from the University of New Hampshire. As an adjunct professor, he has taught finance and economics courses for more than 10 years at Southern New Hampshire University and Daniel Webster College.