

COVER SHEET FOR PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

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IS AWARDEE ORGANIZATION (Check All That Apply) (See GPG II.D.1 For Definitions) <input type="checkbox"/> FOR-PROFIT ORGANIZATION <input checked="" type="checkbox"/> SMALL BUSINESS <input type="checkbox"/> MINORITY BUSINESS <input type="checkbox"/> WOMAN-OWNED BUSINESS						
TITLE OF PROPOSED PROJECT Commo Neo						
REQUESTED AMOUNT	PROPOSED DURATION (1-60 MONTHS) 6 months	REQUESTED STARTING DATE January 10, 2006	SHOW RELATED PREPROPOSAL NO., IF APPLICABLE			
CHECK APPROPRIATE BOX(ES) IF THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW						
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<input type="checkbox"/> HISTORIC PLACES (GPG II.D.10)		<input type="checkbox"/> RESEARCH OPPORTUNITY AWARD (GPG V.H)				
<input type="checkbox"/> SMALL GRANT FOR EXPLOR. RESEARCH (SGER) (GPG II.D.12)						
PI/PD DEPARTMENT Computer Science			PI/PD POSTAL ADDRESS 925 Brandon Ave Apt 5A Norfolk, VA 23517			
PI/PD FAX NUMBER 757-555-1234						
NAMES (TYPED)		High Degree	Yr of Degree	Telephone Number	Electronic Mail Address	
PI/PD NAME Dennis Ray		M.S.	1971	757-683-3653	ray@cs.odu.edu	
CO-PI/PD Jeremy Hoesly						
CO-PI/PD						
CO-PI/PD						
CO-PI/PD						

CERTIFICATION PAGE

Certification for Principal Investigators and Co-Principal Investigators

I certify to the best of my knowledge that:

- (1) the statements herein (excluding scientific hypotheses and scientific opinions) are true and complete, and
- (2) the text and graphics herein as well as any accompanying publications or other documents, unless otherwise indicated, are the original work of the signatories or individuals working under their supervision. I agree to accept responsibility for the scientific conduct of the project and to provide the required project reports if an award is made as a result of this proposal.

I understand that the willful provision of false information or concealing a material fact in this proposal or any other communication submitted to NSF is a criminal offense (U.S.Code, Title 18, Section 1001).

Name (Typed)	Signature	Social Security No.*	Date
PI/PD Dennis Ray	Dennis Ray	555-12-1234	
Co-PI/PD Jeremy Hoesly	Jeremy Hoesly	111-22-3333	
Co-PI/PD			
Co-PI/PD			
Co-PI/PD			

Certification for Authorized Organizational Representative or Individual Applicant

By signing and submitting this proposal, the individual applicant or the authorized official of the applicant institution is: (1) certifying that statements made herein are true and complete to the best of his/her knowledge; and (2) agreeing to accept the obligation to comply with NSF award terms and conditions if an award is made as a result of this application. Further, the applicant is hereby providing certifications regarding Federal debt status, debarment and suspension, drug-free workplace, and lobbying activities (see below), as set forth in the *Grant Proposal Guide (GPG)*, NSF 00-2. Willful provision of false information in this application and its supporting documents or in reports required under an ensuing award is a criminal offense (U.S. Code, Title 18, Section 1001).

In addition, if the applicant institution employs more than fifty persons, the authorized official of the applicant institution is certifying that the institution has implemented a written and enforced conflict of interest policy that is consistent with the provisions of *Grant Policy Manual* Section 510; that to the best of his/her knowledge, all financial disclosures required by that conflict of interest policy have been made; and that all identified conflicts of interest will have been satisfactorily managed, reduced or eliminated prior to the institution's expenditure of any funds under the award, in accordance with the institution's conflict of interest policy. Conflicts that cannot be satisfactorily managed, reduced or eliminated must be disclosed to NSF.

Debt and Debarment Certifications (If answer "yes" to either, please provide explanation.)

- Is the organization delinquent on any Federal debt? Yes No
- Is the organization or its principals presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal Department or agency? Yes No

Certification Regarding Lobbying

This certification is required for an award of a Federal contract, grant or cooperative agreement exceeding \$100,000 and for an award of a Federal loan or a commitment providing for the United States to insure or guarantee a loan exceeding \$150,000.

Certification for Contracts, Grants, Loans and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

AUTHORIZED ORGANIZATIONAL REPRESENTATIVE		SIGNATURE	DATE
NAME/TITLE (TYPED)			
TELEPHONE NUMBER	ELECTRONIC MAIL ADDRESS	FAX NUMBER	

*SUBMISSION OF SOCIAL SECURITY NUMBERS IS VOLUNTARY AND WILL NOT AFFECT THE ORGANIZATION'S ELIGIBILITY FOR AN AWARD. HOWEVER, THEY ARE AN INTEGRAL PART OF THE NSF INFORMATION SYSTEM AND ASSIST IN PROCESSING THE PROPOSAL. SSN SOLICITED UNDER NSF ACT OF 1950, AS AMENDED.



SBIR II Proposal

Project Team

Daniel Allen
Jeremy Hoesly
Neal Porter
Shane Tyner
Clint Winfrey

Old Dominion University
Fall 2005

Project Summary

Intellectual Merits

This SBIR Phase II project will provide a solution to the common problem of leaving personal belongings behind. Losing a personal item costs time and money. It takes time to look for the item, and it costs money to replace the item once it can not be found. Sometimes it is impossible to replace what is lost because the item has sentimental value. Imagine a daughter that loses a family heirloom given to her by her grandmother. Some items, once lost, cause security issues. Imagine a police officer that loses a gun, or a CEO that loses important classified documents. In today's society, the item will inevitably be picked up by a dishonest person. There must be a solution, and finding one is our main objective. The system we are creating will alert the user when a tagged item is left behind, increasing the likelihood that the item will be retrieved. During the course of this project we will show that this proposed system does work and is ready to move on to the next step.

Broader Impacts

Although there are many reminder-systems on the market, none are capable of tracking multiple items at once. The Commo Neo continually monitors the distance between a master and its slaves in a Bluetooth network. When the master device (carried by the user) detects that one or more of the slaves (a tag attached to the item being tracked) are out of range, the device alerts the user and notifies him/her that an item has been left behind. The Commo Neo can track up to seven items at one time.

Many factors such as stress, excitement, or distraction cause people to leave items behind every day. This does not have to be the case. The technology is available and simply needs to be implemented. The time is now to change an age-old problem. With the use of the Commo Neo, we can put a serious dent in permanent loss of personal property.

Keywords

tracking, communication, Bluetooth, networking, lost property, electronics, embedded systems wireless network, security

Phase I Topic name and Subtopic letter

Division of Design, Manufacture, and Industrial Innovation

Electronics (EL) and Security Technologies (ST)

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*Proposers may select any numbering mechanism for the proposal. The entire proposal, however, must be paginated. Complete both columns only if the proposal is numbered consecutively.

NSF Form 1359 (10/99)



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Project Description

Results of the Phase I Project

The Commo Neo device has been proven feasible. By building a working prototype, the Commo Neo team has shown that Bluetooth is capable of tracking personal items. In the past, there have been doubts as to whether or not Bluetooth could be used to tell a user when communication is disrupted. The prototype has now proven that Bluetooth is capable of such a task. Further, the device's software and hardware specifications have been proven realistic. The concept of the Commo Neo is to track seven items at one time. The prototype is capable of tracking seven items, which means that a manufactured version of the Commo Neo can do the same thing. Because the prototype proves that all questions of feasibility have been answered, the Commo Neo is indeed feasible.

Support from the National Science Foundation is justified because the Commo Neo is an innovative product. There are currently no portable devices on the market that are used to track multiple items. Furthermore, Bluetooth has never been used to track items. This is because Bluetooth technology was created with the intention of communicating between two units, while the Commo Neo uses Bluetooth to identify when communication is not taking place between two units.

The Commo Neo is a revolutionary idea. Through the Commo Neo team's research, there is proof that consumers are interested in purchasing it. The price per unit and profit margin per unit are within bounds as well. The Commo Neo is expected to be a very profitable product for this company.

Surveys and research have been conducted and have come back with very positive results. A group of random people were asked to think of an item that they had misplaced. Seventy percent of the people said that they never recovered the item. Sixty percent said that the value of the lost item was between \$101 and \$500 dollars. The most astounding statistic is that eighty-nine percent of the people surveyed said they would purchase a product that alerts them when a personal item is misplaced.

Phase II Technical Objectives, Approach, and Work Plan

Phase II research will revolve heavily around 1) Bluetooth, 2) hardware, and 3) software research. This will cost a lot of money, and it will take a lot of time.

There is still a lot to learn about Bluetooth technology and how it should work with the Commo Neo. Ideally, this research will find a resolution for any delay between when an item is lost and when the Commo Neo alarm is sounded. Further, Bluetooth testing must take place to ensure that casing for a tag is small enough yet durable enough to work in a real-world setting.

The team hardware experts will have to create a working Commo Neo that is small enough to be portable. This will not be an easy task, and it will require a lot of research as well. Shell casing for the unit should be durable, yet cost-effective. Building a unit with all of the necessary buttons, battery power, and processing power will not be an easy task, but it is a reasonable expectation once the necessary research has taken place.

The software design must be tested in Phase II to ensure a better, more effective product. A large amount of program testing must take place to ensure that the final prototype will be reliable. Programmers will work closely with the hardware and Bluetooth experts, as their research will be crucial to the success of the necessary software.

The best way to create a final prototype of the Commo Neo is to set up Bluetooth, hardware, software, and testing teams. Each team must have set deadlines for specific milestones. Communication among the three groups will be very important for each team's success.

The first deliverable from the hardware team is a Commo Neo with all of the necessary parts inside of a small case. At this point, the unit does not have to function, but it must contain all necessary hardware for the device to work properly. The next deliverable from the hardware team is a unit that can actually be charged, turned on, and has all of the hardware working.

The Bluetooth team's first deliverable is a working Bluetooth slave chip. Their next deliverable is to create a durable casing for the Bluetooth slave chip. Their final deliverable is a

Bluetooth chip that is used inside of the Commo Neo for communication with the slave chips they have created.

The software team's first deliverable is a working version of the Commo Neo software without Bluetooth implementation. Their second deliverable is a working implementation of the Bluetooth hardware.

As the other three teams are creating, the testing unit is finding problems with the unit. Testing of every possible situation must take place. All four teams must then work together as a large unit to create a working final prototype of the Commo Neo product.

Organizational Information

Our company was formed inside of Old Dominion University as part of CS410 course for Computer Science undergraduates. Our company works alongside the University to produce and distribute this product. The company was conceived in January of 2005 in Mrs. Brunelle's classroom and work on the project has continued into CS411w under Mr. Ray. The company currently consists of Jeremy Hoesly, Clinton Winfrey, Shane Tyner, Neal Porter, and Daniel Allen. We plan to continue to work in the domain of Old Dominion University's offices and use the equipments provided by the University.

Equivalent or Overlapping Proposals to other Federal Agencies

NONE.

References Cited

United States General Accounting Office. "Characteristics and Choices of Internet Users." Feb 2001. US General Accounting Office <<http://www.gao.gov/>>. Dec. 12, 2005.

Newburger, Eric. "Home Computers and Internet Use in the United State: Aug. 2000." Sept. 2001. US Census Bureau <<http://www.census.gov/>>. Dec. 12, 2005.

Bauman, Kurt. "Extended Measures of Well-Being: Living Conditions in the United States: 1998." Mar. 2003. US Census Bureau <<http://www.census.gov/>>. Dec. 12, 2005.

Bluetooth

How Bluetooth Works

<http://electronics.howstuffworks.com/bluetooth8.htm>

Bluetooth a Mile Away

<http://www.popsci.com/popsci/how2/article/0,20967,714017,00.html>

Comata

<http://www.gigaant.com/?id=864>

Expert: Gaps still pain Bluetooth security

<http://news.com.com/2100-1009-5197200.html>

Stolen\Lost Items

Lost Property Office – Statistics

http://www.tfl.gov.uk/tfl/ph_lost-stats.shtml

Orlando Airports

<http://www.orlandoairports.net/goaa/ops/lost&found.htm>

Thousands of mobile devices left in Sydney taxis

<http://www.cnet.com.au/mobilecomputing/0,39028703,40003663,00.htm>

Wake Up! People Lose Thousands of Gadgets in Taxis

<http://www.techworthy.com/Blog/People-Lose-Thousands-of-Gadgets-in-Taxis.htm>

Theft and Loss Protection for Linux Laptops, Notebooks and PDAs

http://tuxmobil.org/stolen_laptops.html

Construction theft

http://www.forester.net/gx_0411_construction.html

General Hardware

IPv6, RFID, GPS, and finding lost devices

<http://www.embedded.com/showArticle.jhtml?articleID=17200223>

Related Technology

Golf Ball Locator

<http://www.greatgadgetsandgizmos.com/golffinder.asp>

Wozniak Crafts High-Tech Lost and Found

<http://www.pcworld.com/news/article/0,aid,111668,00.asp>

SMS to locate lost property

<http://www.textually.org/textually/archives/006971.htm>

Legoland uses RFID for finding lost kids

<http://www.networkworld.com/news/2004/0503widernetside.html>

Bluetooth to Find Lost Luggage

<http://www.internetnews.com/bus-news/article.php/710411>

Real Time Locating Systems

http://www.dassnagar.com/Software/AMgm/it_RTLS.htm

Funding Agencies

National Science Foundation

<http://www.nsf.gov/>

Biographical Sketches

Daniel Allen

Daniel Allen is in his senior year at Old Dominion University majoring in Computer Science. He hopes to gain a position as an AI/graphics programmer after graduation. He has experience in Computer/Network Administration, Computer Programming, and Graphics Programming.

Jeremy Hoesly

Jeremy Hoesly is completing his Bachelor's Degree in Computer Science at Old Dominion University. He currently works in copy production at OfficeMax and as a section editor for ResExcellence, a user interface website. Jeremy has a background in web design with a focus on standards compliance, multimedia authoring, and writing. He hopes to one day work for the National Weather Service in weather simulations or meteorological research.

Neal Porter

Neal Porter is a full-time student at Old Dominion University. Upon graduation in the Fall of 2005, Neal will have earned a Bachelor's Degree in Computer Science with a minor in Computer Engineering. Neal is an experienced web programmer and web designer which gives him the tools necessary to develop the Commo Neo website. Prior to returning to ODU in 2003, Neal worked as a systems administrator and programmer for a local Internet Service Provider.

Shane Tyner

Shane Tyner is a full time student at Old Dominion University where he is a senior majoring in Computer Science. He currently lives at home with his family in Virginia Beach, VA.

Clinton Winfrey

Clinton Winfrey has one course left before he completes a bachelor's degree in Computer Science. He holds an associate's degree in Information Systems Technology, and he currently works for a government contractor called Chugach. Clint works in the AEGIS training center which is on base at Dahlgren, VA.

Budget

<u>Components</u>			
<i>Item</i>	<i>Quantity</i>	<i>Cost/Unit</i>	<i>Total Cost</i>
Bluetooth ICs	10	\$17	\$170
Disposable Li-Ion 10-pack	2	\$15	\$30
Rechargeable Li-Ion 10-pack	1	\$52	\$52
Character LCD Display	3	\$9	\$27
85Db Buzzer	3	\$23	\$69
18 DIP Capacity Breadboard	2	\$44	\$88
USB-Interfaced Universal Programmer	1	\$549	\$549
12-Key Keypad	2	\$24	\$48
Total for Components			\$1,033
<u>Personnel</u>			
<i>Position</i>	<i>% Time on Project</i>	<i>Salary/Year</i>	<i>Total Cost</i>
Project Manager	100	\$50,000	\$100,000
Hardware Engineer	50	\$50,000	\$50,000
Software Engineer	50	\$50,000	\$50,000
Hardware Engineer (injection mold)	50	\$60,000	\$60,000
Total for Personnel			\$260,000

Current and Pending Support

The project team has committed time to the research performed in Phase I and also for the research to be performed in Phase II. The team put their efforts into analyzing the feasibility of the project and building a lab prototype. In Phase II, the team will continue their research by building a more advanced prototype.

FACILITIES, EQUIPMENT & OTHER RESOURCES

Facilities: None

Laboratory: None

Clinical: None

Animal: None

Computer: Website hosting and software development environment
Web server on broadband Internet connection (T1 or greater) running at all times
Version control server on LAN with development workstations running at all times

Office: Office space at Old Dominion University (Hughes Hall) with all necessary furnishings (electricity, Internet connection, etc.) provided

Other: Office Supplies

MAJOR EQUIPMENT: List the most important items available for this project and, as appropriate, identify the location and pertinent capabilities of each.

- Server (for website and version control system)
- Router (for security and remote access)
- Computer workstations (Quantity 6)
- Bluetooth development kit
- Printer

OTHER RESOURCES: Provide any information describing the other resources available for the project. Identify support services such as consultant, secretarial, machine shop, and electronics shop, and the extent to which they will be available for the project. Include an explanation of any consortium/contractual/subaward arrangements with other organizations.

- Database consultant
- Graphical user interface consultant
- Bluetooth networking consultant

Payment Schedule and Project Milestone Chart

Payment Schedule

Based on the expected utilization of resources and expenditures of funds, the standard payment schedule described in the SBIR Phase II General Conditions, Article 6, is appropriate for this project.

Unless otherwise stated in the grant letter, payments will be made by NSF as follows: Twenty percent (20%) advance payment will be made at the time of the award, twenty percent (20%) upon acceptance by NSF of each satisfactory semiannual report (assumes a 24 month award duration), and the remainder (20%) upon acceptance by NSF of a satisfactory final report as described in Article 5 above and in the SBIR Program Solicitation. Request for initial advance payments should be made within 30 days of the date of the award, and must be made using an NSF SBIR Award Request for Initial Payment form. Any interest earned on advance payments may be retained by the grantee and used to further project objectives. Payments will be made by the Foundation on the basis of submission and acceptance of the semiannual and final reports. Failure to submit an acceptable and timely report will result in withholding of payment and may be grounds for suspension or termination of the award.

Phase II Project Report Milestone Chart
(as provided by NSF)

Gantt Chart X= 1 month effort	Estimate Duration for eachTask	Reporting Period 0-6 months	Reporting Period 6-12 months	Reporting Period 12-18 months	Reporting Period 18-24 months
Task 1: Documentation	2 months	^XX^			
Task 2: System Design	3 months	^XXX^			
Task 3: Software	5 months	^XXXXX^			
Task 4: Hardware	5 months	^XXXXX^			
Task 5: System Testing	5 months	^XXXXX^			
Task 6: Prepare Final Report	4 months	^XXXXX^			

Task 1: Documentation - Develop specifications for the project components

Task 2: System Design – Develop functional requirements for hardware and software

Task 3: Software – Review requirements, draft design, design review, draft test plan, develop modules, code review, testing.

Task 4: Hardware – Review requirements, draft design, design review, purchase hardware, build assemblies, testing.

Task 5: System Testing – Review design, draft test plan, configure hardware, install software, test system.

Task 6: Prepare Final Report – Create report on Phase II results

	Estimate Total Months Effort for entire Project	Reporting Period 0-6 months	Reporting Period 6-12 months	Reporting Period 12-18 months	Reporting Period 18-24 months	Actual for the Entire Project
John Doe	24	8	4	4	8	24
K. Jones	13	4	3	2	4	13
S. Michaels	13	4	2	3	4	13
T. Smith	5	0	1	3	1	5
Expenditures Provide dollar amount for: Key Personnel, Consultants, Subawardees, Permanent Equipment, & Other (List by name)	Estimate Total \$ for Entire Project	Reporting Period 0-6 months	Reporting Period 6-12 months	Reporting Period 12-18 months	Reporting Period 18-24 months	Actual \$
John Doe	\$100,000	\$33,000	\$17,000	\$17,000	\$33,000	\$100,000
K. Jones	\$50,000	\$12,000	\$14,000	\$12,000	\$12,000	\$50,000
S. Michaels	\$50,000	\$12,000	\$12,000	\$14,000	\$12,000	\$50,000
T. Smith	\$60,000		\$10,000	\$40,000	\$10,000	\$60,000
R&D Testing	\$15,000	\$7,500	\$7,500			\$15,000
Other*	\$20,000		\$10,000	\$5,000	\$5,000	\$20,000
TOTALS	\$295,000	\$64,500	\$60,500	\$88,000	\$72,000	\$295,000

*Other includes non-key personnel, indirect costs, materials, travel, etc.

Commercialization Plan

Introduction of the SBIR Project, Expected Outcomes, and Impact

The Commo Neo team acknowledges that there is a common problem in society that requires a solution using computer technology. The problem is leaving personal belongings behind in public or private places; examples include wallets, laptops, book bags, and similar items usually misplaced by individuals. The solution to this problem is the Commo Neo. The Commo Neo is a computerized device that includes a portable handheld device and three Bluetooth transceivers. The portable handheld device is carried around by the users and the Bluetooth transceivers are individually placed on selected personal belongings. The user will carry the personal handheld device and when selected transceivers are out-of-range from the handheld device, the user will be notified that an item is left behind and then the user can retrieve the lost belongings quicker than without a Commo Neo device.

The Commo Neo development team has completed a functional proof-of-concept that proves Commo Neo can work as described. This functional proof-of-concept marks the end of SBIR phase 1 and now the development team needs to develop the final product and go into production for customers to purchase in SBIR phase 2. The current market of similar devices to Commo Neo is limited and it is believed that Commo Neo will be the first of its kind to be open to customers.

The current market of products to find belongings is limited and open only to the commercial realm. The possibility that Commo Neo will have a competition is small since no product available to customers uses the Bluetooth technology in the fashion Commo Neo does. It is possible that other companies will jump in the bandwagon if Commo Neo is successful with its customers.

Commo Neo offers new technology in the scientific community. The Bluetooth technology has never been used in the fashion that Commo Neo is using it. Bluetooth is designed for connection and communication between two Bluetooth product; however, Commo Neo is using the Bluetooth communication as a method to determine if the signal is in range or not, and no other

information is shared. If Commo Neo is successful, it is possible that Bluetooth can be used for similar designs.

In conclusion, the Commo Neo has been a big success in the laboratory and indicates that it is possible that such a device can be marketed and developed for consumers. The Commo Neo is ready to be produced and go into production.

Company Description

The Company

The Commo Neo Company was developed in the spring 2005 semester at Old Dominion University under the supervision of Mrs. Janet Brunelle's CS 410 class. The current company has continued into CS 411W under the supervision of Mr. Dennis Ray. The company was conceived by Jeremy Hoesly and other members include Clint Winfrey, Shane Tyner, Daniel Allen, and Neal Porter. The current management plan includes a weekly meeting, weekly reports, and separation of duties among the company's members.

The current company is new with no prior products. The company was started by Jeremy Hoesly during the spring 2005 semester. The company is planning to market its first product: Commo Neo. The company is prepared to take necessary measures to continue into SBIR phase 2 until production by hiring temporary employees, and office equipments and supplies. The objective of Commo Neo Company is to provide customers product with portable devices to track personal belongings.

The Market, Customer, and Competition

I. The Market

There are times in people's lives where they find themselves in the situation of having lost or left behind a valuable possession. Whether the valuable items are stolen, simply misplaced or inadvertently left behind it can be a very annoying and sometimes emotionally painful experience. The loss of property almost always translates in to lost money. For example, during a 12 month period between 2003 and 2004 the office that handles all lost property for the London public transportation system processed over 133,000 lost items valued into the millions of dollars.

Because virtually anyone can fall victim to theft, or inadvertently misplace or leave behind a belonging, the market for Commo Neo is potentially enormous. While the markets may be limited in some developing countries there is still a market for the Commo Neo in almost every country around the globe.

II. Target Customers

The Commo Neo team has researched potential customers and found that the best target market is that of business travelers between the ages of 18 and 64 years. The size of this market, as estimated by the National Business Travel Association in 2004, is approximately 38.3 million. Business travelers are very mobile people and are at great risk of having items stolen, or leaving them behind in places such as hotels or airports.

One of the things that make this a favorable market is that it is most likely to contain users that are comfortable using technology similar to that of the Commo Neo. Business travelers are also a core market because many items are left behind, or stolen in airports. For example the Greater Orlando Airport Authority reports that they handle approximately 2000 lost items each month.

III. The Competition

The competition for the Commo Neo is quite sparse. There are many similar products available but none of them notifies the user that an item is missing. Due to this limited competition the Commo Neo is certainly in an excellent position to become the dominant product of its type.

Intellectual Property (IP) Protection

In order to protect our intellectual property we intend to apply for a U.S. patent for the entire design of the Commo Neo device and it's slave devices. The name Commo Neo will be copyrighted in the U.S. as well as the user's manual, supporting documentation, website, and any slogans we decide to employ. Also to be copyrighted will be the Commo Neo logo.

Financing

There are two sources of funding in Phase III of the Commo Neo. The first source is company funds. It is important for the Commo Neo team to be supported by the company it represents, because such funding and support is crucial to the success of the Commo Neo device. The second source of funds is government loans. Such loans will be helpful in accomplishing the necessary goals of Phase III, as it will relieve some of the budget impact on this company.

Estimated Funds for Phase III

Year 1 Total Expenses: \$1,459,595.00	Government Loans: \$1,000,000.00
Company Funds: \$459,595.00	Money from Profit: \$0
Year 2 Total Expenses: \$1,497,605.00	Government Loans: \$500,000.00
Company Funds: \$500,000.00	Money from Profit: \$497,605.00
Year 3 Total Expenses: \$1,574,605.00	Government Loans: \$250,000.00
Company Funds: \$250,000.00	Money from Profit: \$1,174,605.00
Year 4 Total Expenses: \$1,569,775.00	Government Loans: 0
Company Funds: 0	Money from Profit: \$1,569,775.00
Year 5 Total Expenses: \$1,569,775.00	Government Loans: 0
Company Funds: 0	Money from Profit: \$1,569,775.00

Budget for Phase III

Year 1

Staff Description	Hours Needed	Hourly Wage	Sub Total
Tech phone support(2)	4000	\$12.50	\$50,000.00
Technicians (1)	2000	\$15.00	\$30,000.00
Web Master	2000	\$25.00	\$50,000.00
Programmers (5)	10000	\$25.00	\$250,000.00
Marketing Manager	2000	\$30.00	\$60,000.00
DBA	2000	\$30.00	\$60,000.00
System Manager	2000	\$30.00	\$60,000.00
Research Manager	2000	\$30.00	\$60,000.00
Hardware Engineer	2000	\$30.00	\$60,000.00
Software Engineer	2000	\$30.00	\$60,000.00
Finance Manager	2000	\$35.00	\$70,000.00
Lawyer	2000	\$35.00	\$70,000.00
Project manager	2000	\$35.00	\$70,000.00
Sub Total	36000	\$362.50	\$950,000.00
40% Overhead	14400	\$145.00	\$380,000.00
Total Labor Cost	50400	\$507.50	\$1,330,000.00
Software	Units	Cost / Unit	Sub Total
Windows 2000 OS	18	\$75	\$1,350.00
Borland C++ Builder	5	\$50	\$250.00
Sub Total			\$1,600.00
40% Overhead			\$640.00
Total Software Cost			\$2,240.00
Hardware Expense	Units	Cost / Unit	Sub Total
Workstations	18	\$1,500.00	\$27,000.00
BlueTooth chips	7500	\$5.00	\$37,500.00
IC casing	7500	\$0.50	\$3,750.00
Bluetooth crystals	7500	\$0.25	\$1,875.00
Resistors, crystals, and wires	1	\$1,000.00	\$1,000.00
Monitors	18	\$150.00	\$2,700.00
Sub Total			\$73,825.00
40% Overhead			\$29,530.00
Total Labor Cost			\$103,355.00
Housing	Months	Rent	Sub Total
Total Cost (rent, water, etc)	12	\$2,000.00	\$24,000.00
		Total Cost:	\$1,459,595.00

Year 2

Staff Description	Hours Needed	Hourly Wage	Sub Total
Tech phone support(3)	6000	\$12.50	\$75,000.00
Technicians (2)	4000	\$15.00	\$60,000.00
Web Master	2000	\$25.00	\$50,000.00
Programmers (5)	10000	\$25.00	\$250,000.00
Marketing Manager	2000	\$30.00	\$60,000.00
DBA	2000	\$30.00	\$60,000.00
System Manager	2000	\$30.00	\$60,000.00
Research Manager	2000	\$30.00	\$60,000.00
Hardware Engineer	2000	\$30.00	\$60,000.00
Software Engineer	2000	\$30.00	\$60,000.00
Finance Manager	2000	\$35.00	\$70,000.00
Lawyer	2000	\$35.00	\$70,000.00
Project manager	2000	\$35.00	\$70,000.00
Sub Total	40000	\$362.50	\$1,005,000.00
40% Overhead	16000	\$145.00	\$402,000.00
Total Labor Cost	56000	\$507.50	\$1,407,000.00
Software	Units	Cost / Unit	Sub Total
Windows 2000 OS	2	\$75	\$150.00
Borland C++ Builder	0	\$50	\$0.00
Sub Total			\$150.00
40% Overhead			\$60.00
Total Software Cost			\$210.00
Hardware Expense	Units	Cost / Unit	Sub Total
Workstations	2	\$1,500.00	\$3,000.00
BlueTooth chips	7500	\$5.00	\$37,500.00
IC casing	7500	\$0.50	\$3,750.00
Bluetooth crystals	7500	\$0.25	\$1,875.00
Resistors, crystals, and wires	1	\$1,000.00	\$1,000.00
Monitors	2	\$150.00	\$300.00
Sub Total			\$47,425.00
40% Overhead			\$18,970.00
Total Labor Cost			\$66,395.00
Housing	Months	Rent	Sub Total
Total Cost (rent, water, etc)	12	\$2,000.00	\$24,000.00
		Total Cost:	\$1,497,605.00

Year 3

Staff Description	Hours Needed	Hourly Wage	Sub Total
Tech phone support(4)	8000	\$12.50	\$100,000.00
Technicians (3)	6000	\$15.00	\$90,000.00
Web Master	2000	\$25.00	\$50,000.00
Programmers (5)	10000	\$25.00	\$250,000.00
Marketing Manager	2000	\$30.00	\$60,000.00
DBA	2000	\$30.00	\$60,000.00
System Manager	2000	\$30.00	\$60,000.00
Research Manager	2000	\$30.00	\$60,000.00
Hardware Engineer	2000	\$30.00	\$60,000.00
Software Engineer	2000	\$30.00	\$60,000.00
Finance Manager	2000	\$35.00	\$70,000.00
Lawyer	2000	\$35.00	\$70,000.00
Project manager	2000	\$35.00	\$70,000.00
Sub Total	44000	\$362.50	\$1,060,000.00
40% Overhead	17600	\$145.00	\$424,000.00
Total Labor Cost	61600	\$507.50	\$1,484,000.00
Software	Units	Cost / Unit	Sub Total
Windows 2000 OS	2	\$75	\$150.00
Borland C++ Builder	0	\$50	\$0.00
Sub Total			\$150.00
40% Overhead			\$60.00
Total Software Cost			\$210.00
Hardware Expense	Units	Cost / Unit	Sub Total
Workstations	2	\$1,500.00	\$3,000.00
BlueTooth chips	7500	\$5.00	\$37,500.00
IC casing	7500	\$0.50	\$3,750.00
Bluetooth crystals	7500	\$0.25	\$1,875.00
Resistors, crystals, and wires	1	\$1,000.00	\$1,000.00
Monitors	2	\$150.00	\$300.00
Sub Total			\$47,425.00
40% Overhead			\$18,970.00
Total Labor Cost			\$66,395.00
Housing	Months	Rent	Sub Total
Total Cost (rent, water, etc)	12	\$2,000.00	\$24,000.00
		Total Cost:	\$1,574,605.00

Year 4

Staff Description	Hours Needed	Hourly Wage	Sub Total
Tech phone support(4)	8000	\$12.50	\$100,000.00
Technicians (3)	6000	\$15.00	\$90,000.00
Web Master	2000	\$25.00	\$50,000.00
Programmers (5)	10000	\$25.00	\$250,000.00
Marketing Manager	2000	\$30.00	\$60,000.00
DBA	2000	\$30.00	\$60,000.00
System Manager	2000	\$30.00	\$60,000.00
Research Manager	2000	\$30.00	\$60,000.00
Hardware Engineer	2000	\$30.00	\$60,000.00
Software Engineer	2000	\$30.00	\$60,000.00
Finance Manager	2000	\$35.00	\$70,000.00
Lawyer	2000	\$35.00	\$70,000.00
Project manager	2000	\$35.00	\$70,000.00
Sub Total	44000	\$362.50	\$1,060,000.00
40% Overhead	17600	\$145.00	\$424,000.00
Total Labor Cost	61600	\$507.50	\$1,484,000.00
Software	Units	Cost / Unit	Sub Total
Windows 2000 OS	0	\$75	\$0.00
Borland C++ Builder	0	\$50	\$0.00
Sub Total			\$0.00
40% Overhead			\$0.00
Total Software Cost			\$0.00
Hardware Expense	Units	Cost / Unit	Sub Total
Workstations	0	\$1,500.00	\$0.00
BlueTooth chips	7500	\$5.00	\$37,500.00
IC casing	7500	\$0.50	\$3,750.00
Bluetooth crystals	7500	\$0.25	\$1,875.00
Resistors, crystals, and wires	1	\$1,000.00	\$1,000.00
Monitors	0	\$150.00	\$0.00
Sub Total			\$44,125.00
40% Overhead			\$17,650.00
Total Labor Cost			\$61,775.00
Housing	Months	Rent	Sub Total
Total Cost (rent, water, etc)	12	\$2,000.00	\$24,000.00
		Total Cost:	\$1,569,775.00

Year 5

Staff Description	Hours Needed	Hourly Wage	Sub Total
Tech phone support(4)	8000	\$12.50	\$100,000.00
Technicians (3)	6000	\$15.00	\$90,000.00
Web Master	2000	\$25.00	\$50,000.00
Programmers (5)	10000	\$25.00	\$250,000.00
Marketing Manager	2000	\$30.00	\$60,000.00
DBA	2000	\$30.00	\$60,000.00
System Manager	2000	\$30.00	\$60,000.00
Research Manager	2000	\$30.00	\$60,000.00
Hardware Engineer	2000	\$30.00	\$60,000.00
Software Engineer	2000	\$30.00	\$60,000.00
Finance Manager	2000	\$35.00	\$70,000.00
Lawyer	2000	\$35.00	\$70,000.00
Project manager	2000	\$35.00	\$70,000.00
Sub Total	44000	\$362.50	\$1,060,000.00
40% Overhead	17600	\$145.00	\$424,000.00
Total Labor Cost	61600	\$507.50	\$1,484,000.00
Software	Units	Cost / Unit	Sub Total
Windows 2000 OS	0	\$75	\$0.00
Borland C++ Builder	0	\$50	\$0.00
Sub Total			\$0.00
40% Overhead			\$0.00
Total Software Cost			\$0.00
Hardware Expense	Units	Cost / Unit	Sub Total
Workstations	0	\$1,500.00	\$0.00
BlueTooth chips	7500	\$5.00	\$37,500.00
IC casing	7500	\$0.50	\$3,750.00
Bluetooth crystals	7500	\$0.25	\$1,875.00
Resistors, crystals, and wires	1	\$1,000.00	\$1,000.00
Monitors	0	\$150.00	\$0.00
Sub Total			\$44,125.00
40% Overhead			\$17,650.00
Total Labor Cost			\$61,775.00
Housing	Months	Rent	Sub Total
Total Cost (rent, water, etc)	12	\$2,000.00	\$24,000.00
		Total Cost:	\$1,569,775.00

Commitment Letters

To the Creators of Commo Neo:

The Bureau of Small Business (BSB) does hereby commit to a contractual loan of up to \$2,000,000 in funding for the Commo Neo product over the next 3 years. This funding is expected to be repaid in full by profit acquired through sales of the Commo Neo, plus an interest fee of 5% per business year.

Sincerely,

H. D. Howard,

BSB board of directors

To Team Commo Neo:

The President of this company has hereby issued an award of 1.5 million dollars in funds for use in the creation and budgeting of the Commo Neo device. Such funds may be used as deemed fit by the Commo Neo team when in the best interest of the Commo Neo and its profits.

Sincerely,

Gerald Foster

Company President

Revenue Stream

According to a 2001 report by the US General Accounting Office, highly educated, higher income individuals are the most likely to adopt Internet technologies at home (GAO 5). This fact, coupled with a 2000 US Census Bureau study on Internet users, indicates that household income levels directly correlate with the adoption of computer technologies (Newburger 3). From this information

one may surmise that these

individuals are more willing

to adopt new, emerging

technologies. The initial

target market for the *Commo*

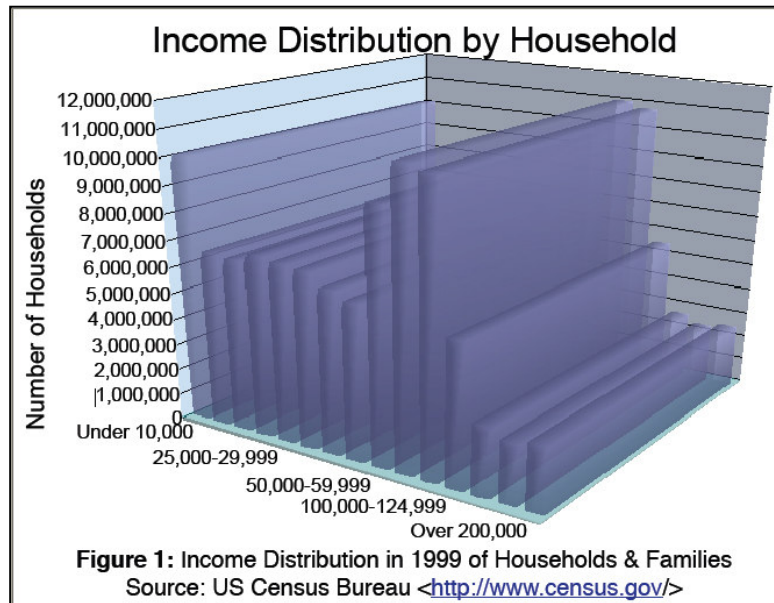
Neo will include individuals

from households with an

annual income level of

\$40,000 or more. According

to a 1998 US Census Bureau



study on well-being, over 90% of them could afford basic necessities such as utilities, food, and rent without difficulty (Bauman 9), leaving them with excess income to improve their quality of life.

Figure 1 graphically depicts the number of families by income group according to data from the

1999 US Census. Of these, 52.6% or 55.5 million individuals reside in our target market. Given

that approximately half of our target market possesses an Internet connection at home according

to a 2000 US Census report (Newburger 3), our initial business presence will be on the World Wide

Web. Customers will navigate to our online storefront where they may order the *Commo Neo*

and/or extra tags and have their purchases shipped directly to them. This eliminates overhead

costs associated with retail facilities such as physical storefronts, sales personnel for each store,

floor displays, registers, and so on. It also avoids merchandising costs associated with selling our

product for resale through retail chains.

Our target market is far-reaching, extending nationwide. Figure 2 demonstrates this by displaying the median family income for each county in the continental United States. Counties colored with a shade of magenta

indicate concentrations of customers in our target market. For a startup business, an Internet presence is a viable solution for reaching such a vast audience. By conducting business solely online for at least the first few years, our expenses will be limited to website hosting and support,

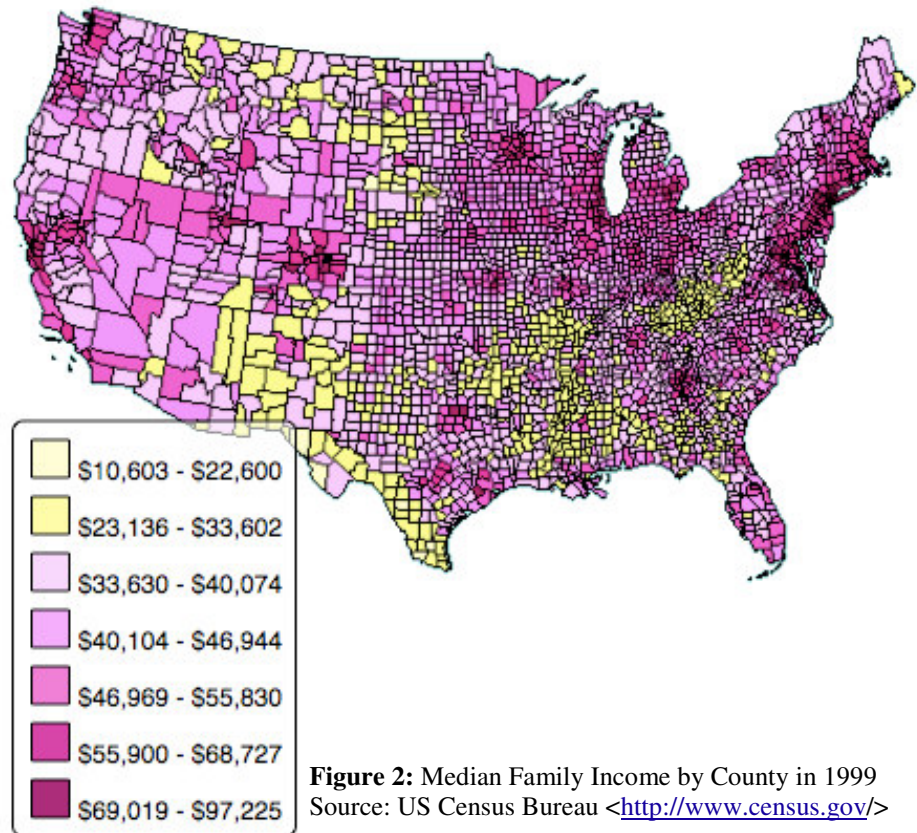


Figure 2: Median Family Income by County in 1999
Source: US Census Bureau <<http://www.census.gov/>>

manufacturing of the product, warehousing of inventory, and shipment of inventory via a third-party carrier. As the *Commo Neo* gains market share and feedback from customers is gathered, we will investigate methods of reducing overhead costs to expand our target audience.

Phase I Final Report

The Commo Neo lab prototype has been successfully completed and is in working order. This prototype demonstrates that the Commo Neo device is perfectly feasible, as it has been successfully proven to work in prototype form. As such, there is justification for the submission and approval of a Phase II grant.