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MONTEREY, CALIFORNIA

MBA PROFESSIONAL REPORT

A Cost Benefit Analysis of the Navy Flight Demonstration Team and the U.S. Navy Band

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By: **Andre Fields,**
Donald Gardner, and
Christopher Cousino

June 2012

Advisors: **David R. Henderson,**
Danny G. Matthews

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REPORT DOCUMENTATION PAGE		Form Approved OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	June 2012	MBA Professional Report

4. TITLE AND SUBTITLE A Cost Benefit Analysis of the Navy Flight Demonstration Team and the U.S. Navy Band

5. FUNDING NUMBERS

6. AUTHOR(S) Andre Fields, Donald Gardner, and Christopher Cousino

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Naval Postgraduate School
Monterey, CA 93943-5000

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES)
N/A

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB Protocol number _____N/A_____.

12a. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for public release; distribution is unlimited

12b. DISTRIBUTION CODE

13. ABSTRACT (maximum 200 words)

This project is a cost benefit analysis of both the U.S. Navy Flight Demonstration Team and U.S. Navy Band (D.C.). We examined both operations' associated costs and benefits. Our methodology used established cost benefit analysis techniques in order to provide the Navy with information to determine whether the benefits of flight demonstrations to the public in support of recruiting are worth the costs of operating and maintaining all resources. The same cost benefit analysis techniques were used to determine whether the benefits of musical support to the President of the United States, the Department of Navy, and other senior military and government officials is worth the costs associated with operations of the Navy Band. We found that using the value of the recruiting leads as a benefit, against all associated costs, that the costs outweighed the benefits for both The Navy Flight Demonstration Team and the U.S. Navy Band (D.C.).

14. SUBJECT TERMS U.S. Navy Flight Demonstration Team, U.S. Navy Band (D.C.), Cost Benefit	15. NUMBER OF PAGES 89
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UU

NSN 7540-01-280-5500 Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. 239-18

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A COST BENEFIT ANALYSIS OF THE NAVY FLIGHT DEMONSTRATION TEAM AND THE U.S. NAVY BAND

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Submitted in partial fulfillment of the requirements for the degree of

MASTER OF BUSINESS ADMINISTRATION

from the

NAVAL POSTGRADUATE SCHOOL
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A COST BENEFIT ANALYSIS OF THE NAVY FLIGHT DEMONSTRATION TEAM AND THE U.S. NAVY BAND

ABSTRACT

This project is a cost benefit analysis of both the U.S. Navy Flight Demonstration Team and U.S. Navy Band (D.C.). We examined both operations' associated costs and benefits. Our methodology used established cost benefit analysis techniques in order to provide the Navy with information to determine whether the benefits of flight demonstrations to the public in support of recruiting are worth the costs of operating and maintaining all resources. The same cost benefit analysis techniques were used to determine whether the benefits of musical support to the President of the United States, the Department of Navy, and other senior military and government officials is worth the costs associated with operations of the Navy Band. We found that using the value of the recruiting leads as a benefit, against all associated costs, that the costs outweighed the benefits for both The Navy Flight Demonstration Team and the U.S. Navy Band (D.C.).

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LIST OF ACRONYMS AND ABBREVIATIONS

AI ……..	Awareness Index
BAH ……..	Basic Allowance for Housing
BAS ……...	Basic Allowance for Subsistence
BCR ……...	Benefit-Cost Ratio
DMA …….	Designated Market Area
DoD ……	Department of Defense
FY ……...	Fiscal Year
GRL ……	Gross Response Leads
MFR ……	Music for Recruiting
NAVCRUITCOM ….	Navy Recruiting Command
NPR ……	Net Present Value
O&MN ……...	Operations and Maintenance, Navy
OCONUS ……	Outside Continental United States
Pay grades ……	(E6, E7, E8, E9, O3, O4, O5, O6) Letter “E” denotes Enlisted, Letter “O” denotes Officer. Number denotes pay grade level from 1 to 9
RMIS ……	Recruit Marketing Information System
ROI ……...	Return on Investment
TDY ……..	Temporary Duty
VSL ……...	Value of a statistical Life

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ACKNOWLEDGMENTS

We would like to thank all our instructors at Naval Postgraduate School for a truly enriching experience that has given us additional tools to better serve the U.S. Navy and Department of Defense. We would also like to acknowledge our advisors, David Henderson and Dan Matthews, who were invaluable in the completion of this research.

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I. INTRODUCTION

A. GENERAL

No studies exist to quantify the value of the Navy Flight Demonstration Team and the U.S. Navy Band to the Navy relative to costs. Therefore, further research was necessary to determine the costs and benefits that they provide. Through our research, we found no studies on the impact of the Navy Flight Demonstration Team or the U.S. Navy Band on the Navy's recruiting efforts, which is a centerpiece of both organizations' mission.

Due to sequestration and the fiscal constraints facing the Department of Defense (DoD), policies and programs that are not deemed critical or essential to the defense of the United States have come under debate. In order to have a productive debate, the actual costs involved must be known—and today little cost data exists. The economy and budget challenges faced by the United States in recent years have put pressure on Congress to decrease the deficit and move towards balancing the budget. In 2011, the Federal Budget totaled $3.6T. $708.2B or 19.66% was discretionary funding for the DoD (Department of Defense, 2011).

The Department of Defense has been tasked with cutting approximately one trillion dollars from its budget over the next 10 years while maintaining its strategic objectives and operational commitments around the globe. With an immediate $450M reduction in spending required in FY12, there is debate as to how to achieve cost savings. The purpose of this paper is not to determine if the Navy Band or Navy Flight Demonstration Team should be continued, but to add quantitative data to assist the debate. This project performs an analysis of the costs and benefits of the U.S. Navy's Flight Demonstration Team, also known as "The Blue Angels," and the U.S. Navy Band in Washington, DC.

We used a cost benefit model utilizing the value of recruiting as a benefit. Through our research we found that the costs associated with the Navy Flight team and the U.S. Navy Band are greater than the benefits.

B. PURPOSE

1. Flight Demonstration Team

As per the Chief of Naval Air Training Instruction 5452.23F, "the mission of the Blue Angels is to enhance Navy recruiting, and credibly represent Navy and Marine Corps aviation to the United States and its Armed Forces to America and other countries as international ambassadors of good will" (Chief of Naval Air Training, 2012*d*). On average, the Blue Angels perform over 60 demonstrations per year viewed by an estimated 11 million spectators during air shows each year (Chief of Naval Air Training, 2012*a*). Additionally, the Blue Angels visit more than 50,000 people a show season (March through November) during their school and hospital visits.

2. Navy Band

> The United States Navy Band's mission is to provide musical support to the President of the United States, the Department of the Navy, and other senior military and government officials. Through ceremonies, national tours, public concerts, and recordings, the United States Navy Band inspires patriotism, elevates esprit de corps, enhances Navy awareness and public relations, supports recruiting and retention efforts, preserves our nation's musical heritage, and projects a positive Navy image at home and abroad. (Bureau of Naval Personnel, 2011)

C. OBJECTIVE OF THE RESEARCH

This project is a cost benefit analysis of both the Navy Flight Demonstration Team and the U.S. Navy Band. We examine both operations' associated costs and benefits. Our methodology is to use established cost benefit analysis techniques in order to provide the Navy with information to determine whether the benefits of flight demonstrations to the public in support of recruiting are worth the costs of operating and maintaining all resources. Additionally, we use the same cost benefit analysis techniques to determine whether the benefits of musical support to the President of the United States, the Department of Navy, and other senior military and government officials are worth the costs associated with performing, travelling, training, and the upkeep of equipment. The expected results can help decision makers determine if the Navy Flight Demonstration Team and Navy Band are beneficial as is, or should be remodeled.

D. SCOPE AND METHODOLOGY

1. Scope – Navy Flight Demonstration Team

The costs considered in our research included the aggregate costs necessary to support the Blue Angels. Total cost was not readily available. Therefore a cost picture was developed by individually identifying cost elements. Captured costs included: personnel, transportation and lodging (TDY), aircraft and equipment maintenance, and operations and support costs for each unit. Benefits were calculated as a contribution to recruiting, whereby a dollar figure is attributed to a recruiting lead. Goodwill created by the Navy Flight Team was calculated by using a percentage of consumer spending at Blue Angels' airshows.

The Blue Angels currently have 16 jets: four single-seat F/A-18 'A' models, nine single-seat F/A-18 'C' models, one 2-seat F/A-18 'B' and two 2-seat F/A-18 'D' models. The Team has a Logistics Support Aircraft, more commonly known as "Fat Albert," a C-130T that is flown by three Marine Corps Aviators for each show (Chief of Naval Air Training, 2012*a*).

2. Scope – U.S. Navy Band

The Leadership of the U.S. Navy Band consists of a Captain who is the Commanding Officer and Leader, a Lieutenant Commander who is the Executive Officer and Assistant Leader, an Ensign who leads the specialty groups, acts as the Department Head, Administrative Officer, Supply Officer and Associate Conductor, and a Master Chief Musician (MUCM) who acts as the Senior Enlisted Leader. The band comprises 172 enlisted band players, working in the six different bands and support team, eight are Master Chief Musicians, (MUCM), 20 are Senior Chief Musicians (MUCS), 41 are Chief Musicians, and the remaining 103 are Musicians First Class (MU1).

E. ASSUMPTIONS

1. Navy Flight Demonstration Team

The researchers made a number of assumptions to bridge the gap in the absence of specific data.

- Medical costs for pilots are assumed to be consistent with the Navy average.
- Facility costs were insignificant. The building site is shared with Training Air Wing 6 and the expenses would still exist without the presence of the Flight Team.
- The salaries of the five civilian personnel assigned to the Blue Angels, working for the Boeing Corporation, are assumed to be paid as part of the acquisition contract and therefore the cost is folded into the acquisition cost and depreciation of the aircraft.
- To determine goodwill, 20% of consumer spending was used to determine consumer surplus.

2. U.S. Navy Band

The Navy Band personnel retirement package is conservatively based on Navy statistics. However, members of the Navy Band are in a specific career field, and joined the Navy later in their life; so the likelihood for staying in the Navy until retirement eligibility is high. Therefore the same percentage as pay grade E7 attaining retirement was applied for all members.

F. RISK

1. Flight Demonstration Team

- Risk includes loss of life and equipment*
- Loss of pilot life
    - Since 1946 there have been 26 deaths and 28 loss of Aircraft (Associated Press, 2007)
    - This equates to 0.3939 pilot death/year and 0.4220 Aircraft loss/year

*This assumes the historical risk is consistent in the future but does not take into account newer equipment to be used by the team against the older equipment against which it is measured.

II. BACKGROUND

A. FLIGHT DEMONSTRATION TEAM

1. Mission

"The mission of the Blue Angels is to enhance Navy recruiting, and credibly represent Navy and Marine Corps aviation to the United States and its Armed Forces to America and other countries as international ambassadors of good will" (Chief of Naval Air Training, 2012*a*). Per the mission statement of the Blue Angels, there are two declared objectives: 1) Recruiting and 2) Goodwill.

2. History

The Navy Flight Demonstration Team was created at the end of World War II. Amid waning interest in Naval Aviation, Admiral Nimitz with the support of the Secretary of the Navy, James Forrestal, initiated the creation of a Navy aerobatic team in April of 1946. The team was formed in Jacksonville, Florida. The first Commander was LCDR Roy Voris who was an ACE WWII pilot. He was then charged with assembling the rest of the team (Aerobatic Teams, 2012).

Two months after formation, the Flight Team held its first public demonstration in Jacksonville, flying the Grumman F6F Hellcat, WWII fighter, painted in blue and yellow. The first shows lasted about 17 minutes and highlighted an aerial attack of the American formation by a Japanese fighter. The proposed name for the team by the Naval Air Advanced Training Command was the "Navy Blue Lancers." Fortunately, one of the pilots, LT Wickendoll, suggested naming the team after a New York Bar, the "Blue Angel"; the team then became officially known as the "Blue Angels" (Wilcox, 2004).

The Team transitioned to the F8F Bearcat in August 1946 which it flew until 1946, then switching to the first jet aircraft, the F9F-2 Panther. In November 1950, the Blue Angels were transferred for combat training for the Korean War. The Blue Angels were reconstituted in October 1951. The incorporation of the Marine Corp into the ranks took place in 1954 with the first Marine Blue Angel pilot. In 1955, the Blue Angels

moved to Pensacola Florida, their home station to this day. They also transitioned to the F9F-8 Cougar, and two years later to the F11-1F Tiger. In 1969, the team transitioned to the F4-J Phantom. In 1970 the Team began using the KC-130, flown currently, which was nicknamed "Fat Albert" after a popular animated children's show. The year 1974 was significant as the Blue Angels were officially recognized as a squadron and transitioned to the A-4 Skyhawk. In 1986, the Team transitioned to its current aircraft the F/A-18 (Blue Angels, 1995).

B. U.S. NAVY BAND

1. Mission

> The United States Navy Band's mission is to provide musical support to the President of the United States, the Department of the Navy, and other senior military and government officials. Through ceremonies, national tours, public concerts, and recordings, the United States Navy Band inspires patriotism, elevates esprit de corps, enhances Navy awareness and public relations, supports recruiting and retention efforts, preserves our nation's musical heritage, and projects a positive Navy image at home and abroad. (Bureau of Naval Personnel, 2011)

The declared objectives of the mission statement are 1) Musical Support to DoD, 2) Goodwill (as specified by patriotism, esprit de corps, Navy awareness, preserve heritage, and project a positive image) and 3) recruiting.

2. History

The United States Navy Band was formed in 1926. It grew out of the Washington Naval Yard Band which was formed in 1916. In 1918, ADM Willard saw the potential of the band in Public Affairs, and designated the Sail Loft Building as its rehearsal space, current to this day. Today, the Navy Band, Washington, DC, is the foremost musical group within the Navy. It is composed of 172 members who make up the Concert Band and six ensembles which play a variety of music from Jazz to Country to Bluegrass. The U.S. Navy Band is dedicated to fostering musical growth and appreciation, which it accomplishes through educational programs including: Music in the Schools, High School Concerto Competitions, and the International Saxophone Symposium. The band performs over 270 public concerts and 1,300 ceremonies each year. The U.S. Navy Band

conducts national tours where ensembles will travel specific regions for several weeks, reaching out to audiences who otherwise would not see the band in Washington, DC (U.S. Navy - Public Affairs Office, 2012).

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III. DATA ANALYSIS – FLIGHT DEMONSTRATION TEAM

A. COST BENEFIT ANALYSIS MODEL

This thesis applies a Benefit-Cost Ratio (BCR) model to examine the cost and benefits of the U.S. Navy's Flight Demonstration Team (Blue Angels). The BCR serves as a value indicator of the Blue Angels' program. The BCR is expressed as the benefits, in monetary units, relative to the costs, in monetary units. A BCR greater than 1 indicates the program is a sustaining, good investment, while a BCR of less than 1 indicates the program is a bad investment. The BCR of the Blue Angels' program is based on recruiting costs and benefits. The Navy allocates money for recruiting and advertisement each Fiscal Year, a portion of which is used to fund fuel expenses for the Blue Angels. The Blue Angels, in turn, are able to generate recruiting leads. In generating leads, the Blue Angels perform at air show events and contribute to communities throughout the country. The BCR model does pose some challenges. "There is an inherent ambiguity in computing benefit-cost ratios because benefits can always be counted as 'negative costs' and vice versa. Thus, by judicious classification of benefits and costs, any admissible project's benefit-cost ratio can be arbitrarily high" (Rosen & Gayer, 2010).

B. DISCUSSION OF COSTS

The annual costs associated with the flight demonstration team include the following elements:

1. Pay and Allowances for personnel
2. Aircraft costs (depreciation, maintenance, fuel)
3. Air show costs
4. Facility costs
5. Risk

1. Pay and Allowances consists of basic pay, allowance for housing, allowance for subsistence, flight pay, per diem, medical, and weighted retirement pay. This amounts to $12,546,035, and excludes the value of medical care benefits accrued

towards retirement. Personnel for the Blue Angels consist of people in the following pay grades: one O6, three O4, twelve O3, two E9, five E8, six E7, forty-six E6, thirty-nine E5, and three E4. The 2011 pay chart (Defense Financial Accounting Service, 2011) and an approximation of years of service was used to determine basic pay.

Annual Basic Pay= $4,875,792

Basic Allowance for housing is paid to each service member for housing expenses based upon location and pay grade. Year 2011 was used from the BAH calculator (Defense Travel Management Office, 2012). Additionally there is a difference in BAH rates for married members (or with dependents) and single members. In order to capture the difference in rates, a ratio was used from the 2008 Active Duty Demographic Profile (DMDC, 2008) reflecting 51.3% of Enlisted and 69.3% of Officers being married; this was then weighted for the BAH rate at zip code 32508.

Annual Allowance for Housing= $1,560,631

Basic Allowance for Subsistence (BAS) is paid to each service member (with unavailable military dining facilities) to offset the cost of meals. The rate was changed in 2009 to $223 per month for Officers and $324 for Enlisted (Office of the Secretary of Defense, 2012*a*).

Basic Allowance for Subsistence= $435,354

A clothing allowance is paid to enlisted members upon joining the service and on an annual basis. For clothing allowance calculations an average of the FY11 standard rate $468/yr for males and $471.60/yr for females is used (Defense Financial Accounting Service, 2011).

Yearly Clothing Allowance= $47,450

Flight Pay is paid to members within certain billets and in flight status. The Navy Flight Demonstration Team has 11 Officers and 45 Enlisted in Flight status. The pay is $650 per month for Officers with over 6 years flight service and $225 per month for Enlisted with over 4 years of flight service (Defense Financial Accounting Service, 2011).

Annual Flight Pay= $207,300

Per Diem is paid to members as reimbursement for expenses incurred while on official travel. The standard rate is $123 per day (GSA, 2011). The Flight team does 70 performances in 35 cities each year, traveling from March to mid-November (Chief of Naval Air Training, 2012*b*). The Team brings approximately 45 members on travel for approximately 250 days.

Annual Per Diem= $1,383,750

Medical costs are associated with every service member. These are medical services provided to the member at no charge to the member. Medical costs are increasing significantly every year for the Military. In FY2000, military spending on healthcare was $17.5B; in FY2009 it was $43.8B; it is projected to be $64B by FY2015 (Don J. Jansen, 2009). Additionally, the percentage of active duty versus retirees is shifting; Mr. Jansen states the DoD estimates that 43% of 2010 benefits are towards active duty members and dependents and 57% are for retirees. The DoD estimates that by 2015, 65% of benefits will be towards retirees. There are 9.3 million eligible beneficiaries. An estimated FY2011 medical cost of $50 billion is used to determine the average yearly costs for the Flight Demonstration Team. The estimate is slightly low because the 9.3 million eligible beneficiaries include dependents.

Annual Medical Costs= $629,032

Retirement pay is paid to each service member after completion of at least 20 years of active duty service. This amount is then paid until the member's death. Using a percentage of each pay grade making it to the 20 year retirement, the stream of retirement

payments can be allocated for each year worked by the service member based on the value of the retirement stream. The Defense Business Board estimates that 93% of pay grade O4 and above and pay grade E6 and above will retire, 43% of pay grade 03, and 13% of those in pay grades E4/E5 will complete at least 20 years of service (Defense Business Board, 2011).

The pay grades of O5 and E7 are used at the 20 year mark on the FY2011 pay charts to calculate the value of retirement pay. The current retirement system pays 50% of the average pay for the highest paid three years of service. A retired Officer will draw payments for an estimated 32 years, and a retired Enlisted member for an estimated 37 years based on lifespan according to actuarial tables (Social Security Administration, 2012). The military retirement pay is adjusted annually for inflation (Office of the Secretary of Defense, 2012*b*); this calculation uses a constant real payment and a real discount rate of zero. Whereas normally one uses positive real discount rates, nominal yields on federal government bonds, even long-term bonds, are now so low that a zero real discount rate is closer to being accurate.

05 32yrs X 0.5($8070)(12) = $1,549,440
Straight lined over 20 years: $1,549,440/20= $77,472

E7 37yrs x 0.5($4189)(12)= $929,958
Straight lined over 20 years: $929,958/20= $46,498

93% * 4{O4+} *$77,472=$288,196
93% * 59{E6+} * $46,498=$2,551,345
43% * 12{O3} * $77,472=$399,756
13% * 42{E4/E5} * $46498=$253,879

Retirement Pay accrued annually= $3,493,176

2. Aircraft costs consist of the depreciation, maintenance, and fuel costs for the Navy Flight Demonstration Team's Aircraft which is composed of 16 jets and 1 transport plane (Chief of Naval Air Training, 2012*a*). The team maintains four F/A-18A, nine F/A-18C, one F/A-18B, two F/A-18D, and one C-130T. The F/A-18 C/D has an approximate unit cost of $39.5M, 1998 dollars (Federation of American Scientists,

2011*b*). The F/A-18 has an estimated service life of 20 years. The team does not fly the F/A-18 E/F "Super Hornet" at this time. Converting to 2011 dollars and depreciating over 20 years yields a $32.5M yearly depreciation for the 16 F/A-18 aircraft.

The C-130 has a unit cost of approximately $37M (Global Security, 1995) (1995 dollars), and an upgrade cost of about $12.5M (Space War, 2006) which allowed a service extension from 25 years to approximately 43 years (Federation of American Scientists, 2011*a*). Converting to 2011 dollars and depreciating over 43 years results in the annual depreciation costs of the C-130T in the amount of $1.35M/yr.

Fuel is paid for out of the Navy Recruiting budget. For FY11, fuel costs were $9,319,000 (Department of the Navy, 2011). Maintenance teams for the aircraft are covered under Personnel costs. Funding for maintenance parts/spares/shows/misc. is covered by Operation and Maintenance, Navy. The FY2011 budget was $26,746,000 (Department of the Navy, 2011).

3. Air show costs are for the costs of hosting the numerous flight shows per year for the Blue Angels. FY2011 budget estimates were for 55 shows. This funding comes out of the Navy's O&MN budget. Fewer shows were held in FY2011 than both the preceding year (64 shows) and subsequent year (72 shows) (Department of the Navy, 2011).

4. Facility costs are not significant. The Flight Demonstration Team utilizes a suite within a structure shared by Training Air Wing 6. On a base employing 16,000, the footprint of the Flight Demonstration Team's 117 personnel is minimal. The facility costs would remain in the absence of the flight team.

5. Risk includes the potential loss of life and equipment. From the formation of the Blue Angels in 1946 through 2011, there have been 26 accidental pilot deaths (Associated Press, 2007) and 28 losses of aircraft. This amounts to a 39.39% risk of a pilot death and a 42.42% risk of a loss of an aircraft per year. Using an average of the cost of the F/A-18 A/B and the F/A-18 C/D yields $30.25M per aircraft loss. A risk of 42.42% yields a yearly cost of $12,832,050 for aircraft.

A common method of evaluating the value of life is to use the "value of a statistical life (VSL)." VSL is calculated by evaluating data on the tradeoffs between risk and money, such as how much greater a wage people would demand for a riskier job or how much more people are willing to spend for a safer product. While statisticians can determine the value of a statistical life, it is not the same as the value of life. If an individual were asked what the value of his life is, the answer would often be infinite in monetary terms. For C/B models, VSL is a common and accepted method. However, VSL does not reflect the cost to the Navy in terms of a C/B model. The cost of a lost life to the Navy is not the VSL, but the cost of a replacement.

The cost to the Navy of a lost pilot is the cost to fill the gap by training a replacement pilot. The Government Accountability Office (GAO, 1997) estimates that it costs about $5M in training to develop an experienced pilot. Using an inflation factor of 1.6378 from 1997 to 2011, a training cost of $8.19M in 2011 dollars is derived. A 39.39% risk of pilot loss per year translates to $3,226,041.

Risk of aircraft loss = $12,832,050
Risk of loss of life= $3,226,041

The total cost of the Navy Flight Demonstration Team is: Annual Basic Pay $4,875,792 + Annual Allowance for Housing $1,560,631 + Basic Allowance for Subsistence $435,354 + Clothing Allowance $47,450 + Annual flight pay $207,300+ Annual Per Diem $1,383,750 + Annual Medical Costs $629,032 + Retirement Pay accrued annually $3,493,176 + F/A 18 (16) aircraft depreciation $32,500,000 + C130T aircraft depreciation $1,350,000M + fuel costs $9,319,000 + parts/shows/misc. $26,746,000 + risk of aircraft $12,832,050 + risk of life $3,226,041.

Total cost for Navy Flight Demonstration Team= $98,605,576

C. DISCUSSION OF CURRENT BENEFITS

The benefits associated with the U.S. Flight Demonstration Team include, but are not limited to the following elements:

- Naval Airpower
- Navy Awareness
- Recruiting
- Navy Morale
- Maneuverability
- Economy

1. Naval Airpower

The Blue Angels' objective is not only to maintain public interest in naval aviation, but to demonstrate naval airpower as well. In support of retaining the best pilots, there are high performance measures required of all naval aviators. The skills and experience acquired by naval aviators are valuable not only during war, but in training others as well. In war, gaining air superiority is a primary objective in a conflict. Without the attainment of air superiority, achieving success in a military campaign is more difficult.

> Air superiority is having total control of the airspace above a battlefield or theater of conflict. Gaining this control means the destruction or neutralization of enemy air assets that can pose a threat. Such assets include fighters, bombers and even recon aircraft. This can be done by their destruction in the air or on the ground by bombing airfields. (Antill, 2003)

Demonstrating high levels of air superiority allows the U.S. to deter potential threats from other countries.

The U.S. invests heavily in deterrence measures. Deterrence remains a key element of U.S. National Security. Given the number of potential threats throughout the world, this element of protection will continue to be a topic of discussion and debate in U.S. defense and policy communities. Naval airpower will continue to be a factor in the

discussions and debates of U.S. deterrence measures. The Blue Angels play a large role in promoting public support of Naval Airpower and is a contributing factor to the debates.

2. Navy Awareness

According to Navy Recruiting Command (NAVCRUITCOM), "Navy Awareness is the likelihood that consumers recognized the availability of the Navy Recruiting 'product', which is employment/career opportunities available through Naval Service" (NAVCRUITCOM, 2011). The metrics that NAVCRUITCOM uses to measure Navy Awareness are Designated Market Area (DMA), Eligible Population, and Gross Response Leads. According to NAVCRUITCOM, "the DMA is a metropolitan region where the population can receive the same (or similar) television and radio station offerings, and may also include other types of media including newspaper and internet content. There are currently 211 DMAs in the United States. The Eligible Population is the number of eligible 17-to-29 year olds within a given DMA" (NAVCRUITCOM, 2011).

NAVCRUITCOM recognizes Gross Response Leads (GRL) as, "the number of responses from all advertising sources for Navy recruiting information, which they use to identify potential recruiting leads" (NAVCRUITCOM, 2011). NAVCRUITCOM recognizes the Awareness Index (AI) as "a comparison of Gross Response Leads per eligible population of each DMA to the national average of all DMAs." As a result, values that exceed 1.00 indicate above average awareness and values that do not exceed 1.00 indicate below average awareness.

a. First Quarter of FY09 and FY10

For Navy Awareness, we assessed FY09 and FY10 due to the current unavailability of FY11 Awareness Index data. The analysis of Blue Angels' events of recurring DMAs for the first quarter of FY09 showed a 5% increase in the Awareness Index from FY08. Additionally, there was a 2% decrease from FY09 to FY10. As depicted in Figure 1, the Blue Angels represented 10% and 12% of the total number of Navy Awareness events for the first quarters of FY09 and FY10, respectively. The

average AIs for FY09 and FY10 (First Quarters) were 1.09 and 1.07, respectively. As noted, the AIs for the recurring DMAs in the first quarters of FY09 and FY10 exceed the 1.00 threshold by an average of 8%. Therefore, the DMAs during this specific timeframe have an above average awareness index. The assessed DMAs are where Blue Angels' events occurred in the First Quarter of FY09 and FY10, indicating a positive impact on awareness levels.

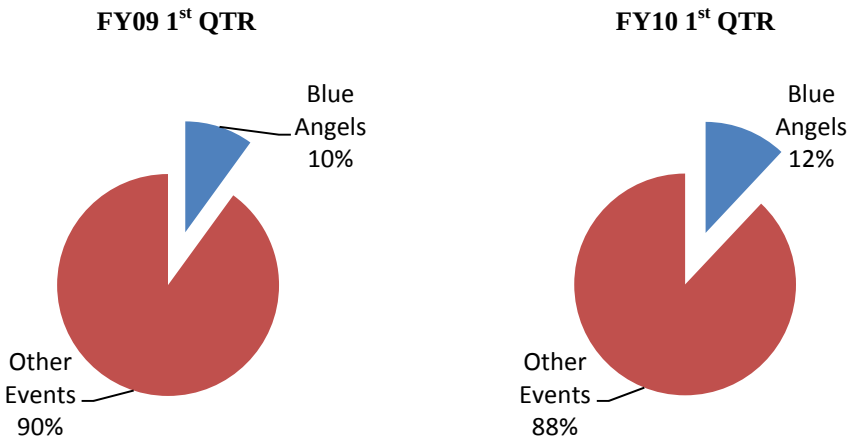

Figure 1. FY09&10 1st QTR Participative Percentages of Navy Awareness Events

b. Second Quarter of FY09 and FY10

Looking at the Blue Angels' events of recurring DMAs for the second quarter of FY09, there was a 39% increase in the Awareness Index from FY08. Additionally, there was a 3% decrease from FY09 to FY10. As depicted in Figure 2, the Blue Angels represented 7% and 9% of the total number of Navy Awareness events for the second quarters of FY09 and FY10, respectively. The average AI for FY09 and FY10 (Second Quarters) were 1.25 and 1.21, respectively. As noted, the AIs for the recurring DMAs in the second quarters of FY09 and FY10 exceed the 1.00 threshold by an average of 23%. Therefore, the DMAs during this specific timeframe have an above average awareness index. The assessed DMAs are where Blue Angels' events occurred in the Second Quarter of FY09 and FY10, indicating a positive impact on awareness levels.

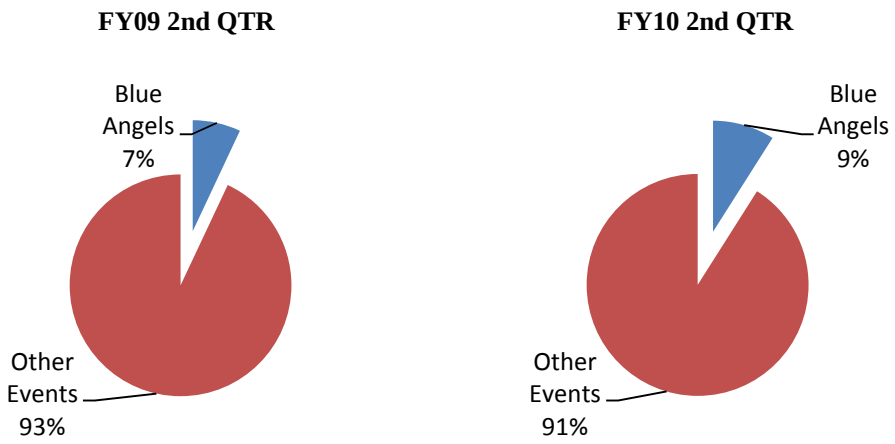

Figure 2. FY09&10 2nd QTR Participative Percentages of Navy Awareness Events

c. Third Quarter of FY09 and FY10

Looking at the Blue Angels' events of recurring DMAs for the third quarter of FY09, there was a 2% decrease in the Awareness Index from FY08. Additionally, there was a 19% increase from FY09 to FY10. As depicted in Figure 3, the Blue Angels represented 8% and 12% of the total number of Navy Awareness events for the third quarters of FY09 and FY10, respectively. The average AI for FY09 and FY10 (Third Quarters) were 1.04 and 1.14, respectively. As noted, the AIs for the recurring DMAs in the third quarters of FY09 and FY10 exceed the 1.00 threshold by an average of 9%. Therefore, the DMAs during this specific timeframe have an above average awareness index. The assessed DMAs are where Blue Angels' events occurred in the Third Quarter of FY09 and FY10, indicating a positive impact on awareness levels.

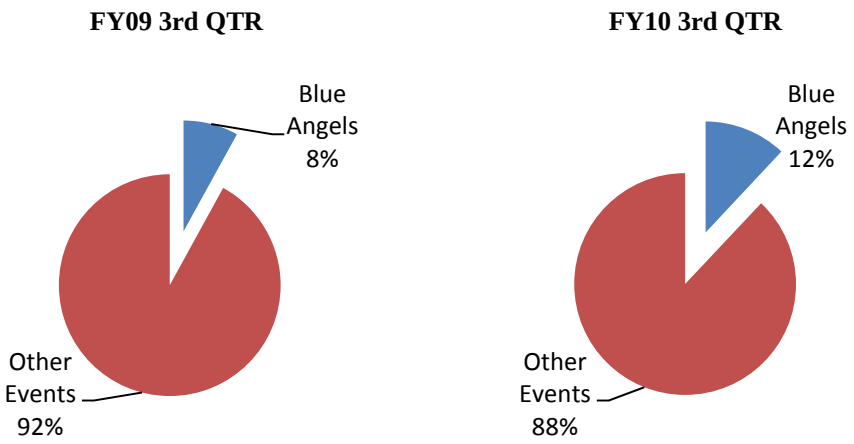

Figure 3. FY09&10 3rd QTR Participative Percentages of Navy Awareness Events

d. Fourth Quarter of FY09 and FY10

Looking at the Blue Angels' events of recurring DMAs for the fourth quarter of FY09, there was a 14% increase in the Awareness Index from FY08. Additionally, there was a 15% decrease from FY09 to FY10. As depicted in Figure 4, the Blue Angels represented 21% of the total number of Navy Awareness events for the fourth quarters of FY09 and FY10, respectively. The average AI for FY09 and FY10 (Fourth Quarters) were 1.14 and 0.99, respectively. As noted, the AIs for the recurring DMAs in the fourth quarters of FY09 and FY10 exceed the 1.00 threshold by an average of 6.5%. However, FY10 fell short and is individually assessed as generating below average awareness while FY09 is individually assessed as generating above average awareness. The assessed DMAs are where Blue Angels' events occurred in the Fourth Quarter of FY09 and FY10, indicating an overall positive impact on awareness levels.

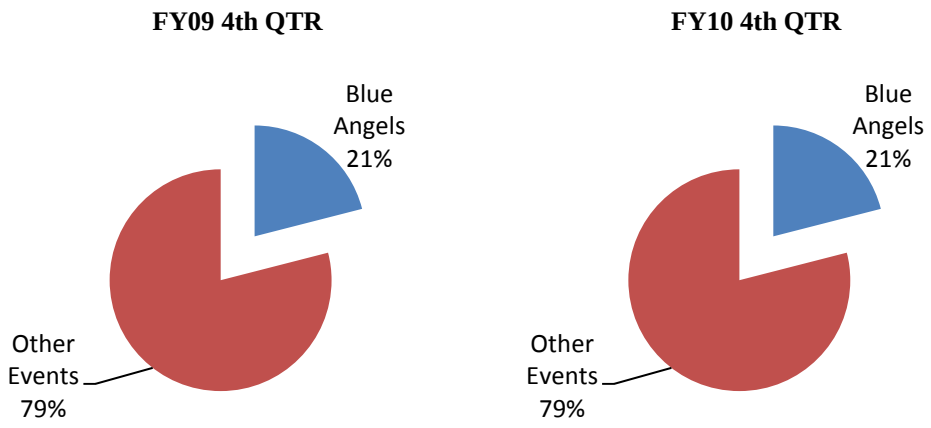

Figure 4. FY09&10 4th QTR Participative Percentages of Navy Awareness Events

Following the above assessment of awareness levels for DMAs that have hosted Blue Angels' events in FY09 and FY10, we have concluded that these events have positively impacted awareness levels within the geographical locations of each assessed DMA. The awareness levels are a reflection of the awareness index. The awareness index standard is 1.00, which the assessed FY09 and FY10 DMAs have exceeded by an overall average of 11.6 percent.

3. Recruiting

The Navy greatly depends on its marketing efforts to support recruiting goals each Fiscal Year. Their efforts are impacted by a number of factors, including recruiter effectiveness, current state of the economy, and operational costs. Each year the Navy conducts a number of public events to enhance its awareness and support recruiting efforts. According to FY11 President's Budget, "the Recruiting and Advertising budget for FY09, FY10, and FY11 totaled $256,792,000, $256,007,000, and $261,287,000, respectively" (Comptroller, 2011). Additionally, "the Navy actual recruiting numbers for enlisted sailors in FY09, FY10, and FY11 were 35,527, 34,180, and 33,444, respectively" (Commander, 2011*b*).

Applying a cost to each potential enlisted recruit while considering the fiscal year budgets and actual recruiting numbers, we first determined the number of leads per each FY that allowed the Navy to meet or exceed its recruiting goals. According to

NAVCRUITCOM, "the Navy factors in a 5–7% conversion rate for enlisted leads" (NAVCRUITCOMINST, 2009). We used the average of 6% as the conversion rate. In determining the number of leads, we applied the conversion rate of 6% to the actual number of recruits that were enlisted in FY09, FY10, and FY11, which totaled 592,117*, 569,667*, and 557,400*, respectively. These numbers indicate that on average, the Navy has to generate at least 550,000 recruiting leads in order to continue to meet or exceed annual recruiting goals. For example, in FY09 there were 35,527 actual recruits that entered the Navy. Applying a 6% conversion rate to the actual number of recruits in FY09, resulted in an estimate of 592,117 recruiting leads. To determine the estimated value of each recruiting lead in FY09, we divided the recruiting and advertising budget of $256,792,000 by the estimated recruiting leads of 592,117. Given the estimated number of recruiting leads and recruiting and advertising budget, we determined that the total Navy estimated value for each recruiting lead in FY09, FY10, and FY11 was $434**, $449**, and 469**, respectively. On average, the Navy has applied a monetary value of at least $430 for each recruiting lead in support of meeting annual recruiting goals.[1]

We examined event location and qualified recruit population data for Blue Angels' events held during FY09, FY10, and FY11. According to Navy Recruiting Command, "there was a total of 33 Blue Angels' event locations in FY09, 33 in FY10, and 32 in FY11, excluding Canada, Alaska, and OCONUS locations" (NAVCRUITCOM, 2011). Typically, Blue Angels' events include 2 days of flight demonstrations over a weekend. The ages for the targeted used for this analysis are ages 17–24. In order to determine the Qualified Recruit Population for each event location, the Total State Populations of each respective event location from the government census website were identified.

1 Calculations

*592,117 (35,527 / .06); 569,667 (34,180 / .06); 557,400 (33,444 / .06)

**$434 ($256,792,000 / 592,117); $449 ($256,007,000 / 569,667); $469 ($261,287,000 / 557,400)

Next, the Total Population of each event location was determined. A percentage was calculated using the events and the total state population. This percentage is applied to the Targeted Recruit Population by state in an effort to determine the qualified recruit population of each event location. The Recruit Market Information System (RMIS) provided the needed information for determining the qualified recruit population. "RMIS is designed to analyze and report marketing information for recruiting purposes." (Department of Defense, 2012) For example, in the 1st Quarter of the CY2009, a Blue Angels' event was held in El Centro, CA. According to *www.census.gov*, "the state population was 37,691,912 and the population of the event location was 45,598, which is approximately 0.12% of state population" (Department of Commerce, 2012).

The 0.12% applied to the RMIS Targeted Recruit Population by state (ages 17–24) equates to a Qualified Recruit Population by (event location) of 4,412 as indicated in Appendix A. The same calculation concept was applied to all events in Appendices B and C as well. The purpose of Appendices A through C is to highlight the Navy's opportunity to establish potential leads from the Qualified Recruit Population of Blue Angel events in FY09, FY10, and FY11.

Appendix D is an estimation of qualified leads for FY09, FY10, and FY11 derived from RMIS. This data depicts estimated leads from the actual number of contracts for each applicable FY. According to NAVCRUITCOM, "the Navy factors in a 5–7% conversion rate for enlisted leads." This analysis uses the average of 6% as the conversion rate. Table 1 provides an overview of estimated leads for FY09 thru FY11. In FY09, the targeted population of the geographical locations of Blue Angels' events totaled *928,299* (Department of Commerce, 2012). RMIS indicated 1,039 actual contracts were gained from the geographical locations of Blue Angels' events. Given this data and 6% conversion rate, the total estimated leads from the geographical locations of Blue Angels' events was 17,317***. Given the number of actual contracts, we were able to estimate the number of potential recruiting leads to be 17,317.

In FY10, the targeted population of the geographical locations of Blue Angels' events totaled *1,350,922* (Department of Commerce, 2012). RMIS indicated 883 actual contracts were gained from the geographical locations of Blue Angels' events. Given this

data and 6% conversion rate, the total estimated recruiting leads from the geographical locations of Blue Angels' events totaled 14,717***.

In FY11, the targeted population of the geographical locations of Blue Angels' events totaled *858,933* (Department of Commerce, 2012). RMIS indicated 750 actual contracts were gained from the geographical locations of Blue Angels' events. Given this data and 6% conversion rate, the total estimated recruiting leads from the geographical locations of Blue Angels' events totaled 12,500***.

In determining what proportion of FY09 through FY11 recruiting leads are generated by the Blue Angels, we applied an estimated 12.5% proportional rate. The proportional rate was derived by averaging the participative percentages of Navy Awareness events in Figures 1 through 4. For FY09, we estimated that the Blue Angels generated 2,165 recruiting leads out of the total 17,317. For FY10, we estimated that the Blue Angels generated 1,840 recruiting leads out of the total 14,717. For FY11, we estimated that the Blue Angels generated 1,563 recruiting leads out of the total 12,500. Given the total number of recruiting leads from geographical locations that have hosted Blue Angels' events and the 12.5% proportional rate, we were able to determine an estimated value of the Blue Angels' recruiting efforts.[2]

From previous calculations of the dollar value of each lead, listed in the 'Recruiting' paragraph and noted in the footnotes, the estimated FY09 value from the geographical locations of Blue Angels' events totaled $939,610 or 0.37% of the respective recruiting and advertising budget. For FY10, the estimated value from the geographical locations of Blue Angels' events totaled $826,160 or 0.33% of the respective Recruiting and Advertising Budget. For FY11, the estimated value from geographical locations of Blue Angels' events totaled $733,047 or 0.28% of the

2 Calculations

***17,317 (1,039 / .06); 14,717 (883 / .06); 12,500 (750 / .06)

$939,610 (2,165 * $434); $826,160 (1,840 * $449); $733,047 (1,563 * $469)

respective Recruiting and Advertising Budget. For the purpose of valuating the benefits of recruiting, we used the average estimated values for FY09 thru FY11.[3]

Table 1. Estimated Leads from Blue Angels' Events

FY	Targeted Population	Contracts	Leads
FY09	928,299	1,039	17,317
FY10	1,350,922	833	14,717
FY11	858,933	750	12,500

4. Navy Morale

Navy Morale is an important non-quantifiable benefit that continues to be at the forefront of military effectiveness. In recognition of the importance of morale, Clausewitz stated:

> The soldier's first requirement is morale and physical courage, both the acceptance of responsibility and the suppression of fear. In order to survive the horror of combat he must have an invincible martial spirit, which can be attained only through military victory and hardship (Clausewitz, 1989).

Boosting Navy Morale has always been an important objective of the Blue Angels. They have gained a great level of notoriety and worldwide fame from their many exhibitions. This fame gives most sailors a sense of pride to be associated with such a well-known group. The level of pride gained by association has a positive impact on Navy morale. Sailors with high morale benefit not only the command he or she supports, but the Navy as a cohesive unit as well. Even though the Navy is governed by strict rules, policies, and regulations, it is easier to retain and motivate sailors when morale is high. Knowing that pride is also a non-quantifiable benefit, it would be difficult if not impossible to place a specific value on the impact it has on Navy morale.

3 Calculations

($939,610 + $826,160 + $733,047) / 3 = $832,939

5. Maneuverability

The Blue Angels are well known for their high speed in-flight aerial maneuverability. Although the activity is very dangerous, the skill set and experience that are required of all naval aviators minimizes the risks of potential incidents. Their performances involve a variety of aerobatic maneuvers that include group and solo events.

"During the aerobatic demonstration, the Blue Angels operate six FA-18 Hornet aircraft, split into the Diamond and the Lead and Opposing Solos. Most of the show alternates between maneuvers performed by the Diamond and those performed by the Solos" (Chief of Naval Air Training, 2012*c*). Weather conditions are always a huge factor in what types of maneuvers are to be conducted during public flight demonstrations. "The parameters of each show must be tailored to local weather. The 'high' show requires an 8,000-foot ceiling and visibility of 3 nautical miles from the show's center point. 'Low' and 'flat' ceilings are 3,500 and 1,500 feet respectively" (King News Corporation, 2010). The aircraft flown by the Blue Angels have the same maneuverability capabilities as those in the fleet. The Blue Angels F/A-18 aircraft were previously used in the fleet and can easily be returned to the fleet with minimal modifications within a few days.

The Blue Angels are a highly trained and well experienced group of fighter jet pilots. Given the aviation experience and aircraft knowledge of a Blue Angels' pilot, the Navy does not have to rely solely on industry for information in support of aviation-related tests or studies, such as the NAE study.

> The Naval Aviation Enterprise (NAE) has initiated a study to assess the capabilities required when the F/A-18 reaches the limits of its service life beginning in 2025. This assessment is being led by the Director, Air Warfare (N88), with inputs from the other services and industry. (Naval Aviation Enterprise, 2012)

The Blue Angels' pilots have experience and knowledge that would be helpful to the NAE study. First consulting with the Blue Angels pilots as opposed to industry about information related to fighter jets would likely result in cost savings.

6. Economy

According to the Blue Angels' website, "on average their air shows generate an estimated 11 million spectators each year. In addition to air show events, the Blue Angels visit more than 50,000 people each year, including schools and hospitals" (Chief of Naval Air Training, 2012*a*). The Blue Angels visit an average of 30 different cities each year and draw an average of 350,000 spectators per each city. Typically, the size of each host city's population varies and correlates to the number of actual spectators.

As a source of data, we assessed previous Blue Angels' events. In FY11, an event in San Diego, CA that was hosted by the Marine Corps Air Station attracted approximately 700,000 spectators during a weekend event. Considering San Diego's population of 1,300,000, the Blue Angels' events accounted for more 50 percent of the population. As one spectator noted, "the San Diego air show provides a firsthand opportunity for the general public to visit and enjoy a world-class air show and aviation trade exposition. It is San Diego's largest weekend event filled with free family entertainment" (MCAS Miramar Air Show, 2012). During Blue Angels' events, vendors are allowed to sell their products. A portion of the proceeds normally benefit the communities in one form or another.

Next, we looked at the impact on a smaller city that has hosted Blue Angels' events. Salinas, CA was our city of choice. It is a small city located in Monterey County with a population over *150,000* (Department of Commerce, 2012). The economic impact that a Blue Angels' event would have on a small city was assessed. According to Salinas Airshow Chairman, Harry Wardwell:

> In the past 27 years, the California International Airshow Salinas has brought in almost $7 million…all proceeds go to charity." Salinas' air shows have grown into one of the premiere aviation events on the West Coast, drawing between 40,000 and 50,000 visitors each year. (Nichols, 2008)

Another small city, Fargo, ND has a population of over *100,000* (Department of Commerce, 2012). During a 2011 Blue Angels' event, "it was reported that over 25,000 spectators attended the air show" (North Dakota Aviation Council, 2011). The number of

spectators accounted for 25 percent of the population, which is an indication of the event popularity. Reported by the North Dakota Aviation Quarterly (2011), "headlining the show was the world famous Navy Blue Angels' Flight Demonstration Team. Net proceeds from the air show went to support the Fargo Air Museum and various other non-profit organizations in the area" (North Dakota Aviation Council, 2011). Regardless of size, cities that host Blue Angels' events receive some form of benefits that ultimately support their communities.

In determining the estimated monetary value that Blue Angels' events provide to host cities, we used the analogy method.

> The analogy method compares a new or proposed system with one analogous system that was typically acquired in the recent past, for which there is accurate cost and technical data. There must be a reasonable correlation between the proposed and historical system. The estimator makes a subjective evaluation of the differences between the new system of interest and the historical system. (Defense Acquisition University, 2012)

The historical data that we used in determining the Consumer Spending at Blue Angels' events is derived from the 2009 Northeastern Recreation Research Symposium. This symposium focused on the economic impact following air show events. Given the similarities and the fact that the research had focused specifically on air shows, we applied the same formula to the Blue Angels' events. According to the research symposium, "the formula used to determine the Direct Economic Significance from air show events is Total (Estimated) Visitors at the Air show * Average spending per group / group size" (Warnick, 2009).

As previously noted in this paper, the Blue Angels' perform for an estimated 11 million spectators each year, resulting in the average number of spectators per each host city to be around 350,000. The Blue Angels perform for not only large cities, but small cities as well, so the actual number of spectators for each host city can range from 50,000 to 700,000. In an effort to determine the economic benefit of Blue Angels' events, we had to first determine the estimated value of consumer spending. In any given year, the total estimated visitors at the Blue Angels' Air show equates to 11,000,000. Using

the analogy approach the average spending per group equates to $98 and the group size is estimated to be 3.77. As calculated below, the yearly estimated Consumer Spending at host cities from Blue Angels' events is $285,941,645. Consumer spending is not a good measure of benefits from Blue Angels' events. What matters is the consumer surplus that consumer spending generates. For this model, we assume that consumers are willing to pay an additional 20% at Blue Angels' events on average and that; therefore, consumer surplus is 20% of consumer surplus. Given this assumption, we estimated consumer surplus to be 20% of $285,941,645, which is a benefit of $57,188,329. All benefits researched for the Blue Angels are indicated in Table 2.

Direct Economic Significance = 11,000,000 * ($98/3.77) = $285,941,645
Estimated Consumer Surplus = 0.2 x $285,941,645 = $57,188,329

Table 2. Overview of Blue Angels' Benefits

Blue Angels' Benefits			
Benefit	**Quantifiable**	**Non-Quantifiable**	**Monetary Value**
Airpower	n/a	**YES**	n/a
Awareness	**YES**	n/a	n/a
Recruiting	**YES**	n/a	$832,939
Morale	n/a	**YES**	n/a
Economy	**YES**	n/a	$57,188,329
Total	$58,021,268	n/a	**$58,021,268**

D. DISCUSSION OF ALTERNATIVES (FLIGHT DEMONSTRATION TEAM)

1. Continue the Program

As with any Government program, there will be costs incurred to operate and sustain it throughout each Fiscal Year. Additionally, costs will continue to grow each year to include inflation and program cost growth. The advantage of continuing this program is the connection it has with American citizens throughout the country in support of Navy Awareness and recruiting efforts. One huge disadvantage of continuing such a program is the potential accidents that will likely cause loss of life and millions of dollars in damages.

Considering the risks and magnitude of Blue Angels' events, risk measures are in place to minimize accidents. However, the Blue Angels have measures in place to minimize the risk of potential accidents. If an in-flight accident were to occur, pilots' actions are limited. Although Blue Angels' in-flight accidents are rare, if one were to occur the potential loss of life and aircraft translate to very high costs as well as negative publicity. When Blue Angels' pilots perform at events, one of their many objectives is to safely satisfy the crowd with death-defying feats that have always been the center of air shows. To get an idea of the number of aviation accidents that have occurred within the last century, we have included aircraft accident stats for all air shows to include non-military.

- Between 1910 and 1970, there were 45 recorded air show crashes.
- Over the next ten years, by 1980, 14 incidents brought the number to 59.
- There were 20 crashes between 1980- 1990 bringing the total to 79.
- By 2000, 29 more incidents drove the number to 108.
- Over the next ten year period, from 2000 to 2010, the number jumped from 108 to 153.
- In the year 2011, there have been 11 incidents (King, 2011).
- Since 1946 there have been 26 deaths and 28 loss of Aircraft (Associated Press, 2007).

Spectators are normally attending Blue Angels' events for the thrill and excitement that comes with dangerous aerial performances. Based on the estimated 11 million spectators who view Blue Angels' events each year, and their world-wide popularity, there is a high demand for the Blue Angels demonstrations. This brief assessment reflects a supply and demand concept. If this assessment holds true, then spectators potentially prefer to witness dangerous high-speed aircraft maneuvers, which Blue Angels' pilots will continue to demonstrate at a reasonable and safe level.

2. Expand the Program

Expansion of the program would include increasing the number of shows, pilots, aircraft, and support structures. Expanding the Blue Angels' program would allow the Navy to reach more potential recruits around the world and demonstrate its military

aviation capability to millions of more spectators. However, the cost for such expansion would be difficult to justify amid current reductions in the Department of the Navy budget. A potential downside of expansion would be the likelihood that too many air shows throughout the year would likely cause a decrease in attendance, resulting in diminishing returns. "This law states that after a certain point, additional input to a system of production will produce less and less output" ("Law of Diminishing Returns," 2012). In addition to the Blue Angels' performances, there is the Patriots Jet Team who also perform airshows throughout the year.

> The Patriots Jet Team consists of civilian pilots who perform air shows around the country. Occasionally, they perform air shows in conjunction with Blue Angels' events. The all-volunteer team has added two jets to its current four-ship demonstration program. The Patriots perform precision aerobatic maneuvers in sleek, midnight black L-39 jet aircraft at speeds over 500 miles per hour. The team members have more than 80,000 hours of total flight time and have performed in over 1,500 air shows. (Patriots Jet Team, 2010)

The relationship between the Blue Angels and Patriots Jet Team is one that's based on good competition in an effort to increase their fan base or in the Blue Angels' case, increase the number of recruiting leads. The primary difference between the two is that the Patriots Jet Team can be hired to perform air shows, and the Blue Angels cannot be hired. Additionally, the Patriots Jet Team is a "for-profit" organization and the Blue Angels are a "not for profit" program. Expanding the Blue Angels' program would come at a very high cost to the Navy, not just with direct costs, but competition costs as well. Such expansion would likely overlap into event locations of the Patriots Jet Team. This overlap would require the Patriots Jet Team to expand as well, therefore, resulting in a level of competition. The Patriots Jet Team is sponsored and financially backed by a number of corporations that would allow them to effectively compete for audience market share if deemed necessary.

3. Discontinue the Program

Due to the estimated 11 million spectators that watch the Blue Angels' events each year, there could be political backlash against congressional leadership who support

discontinuing the Blue Angels' program. However, with ongoing budget cuts and the millions of dollars it costs to produce their shows, the existence of the program could face challenges.

The main argument for discontinuing the program is to save money so that other low-cost, but important, programs may remain active. The counter argument to avoid discontinuing the program is that it serves as a tool, not only to unite the different services, but also to inspire potential recruits. The Secretary of the Navy states:

> The Blue Angels are important because they show the incredible skill level of U.S. Military. They are ambassadors for not just the Navy but for the entire American military across this country and around the world. We get way more than our money's worth for what they do. (Nelson, Blue Angels fly into age of budget woes, 2011)

With this type of support it is highly likely that the Blue Angels will continue to be funded. However, due to the demanding budget cuts across DOD, the Blue Angels may need to reduce expenses.

E. ANALYSIS OF DISCUSSION (FLIGHT DEMONSTRATION TEAM)

The total cost associated with the Blue Angels is estimated at $98,605,576 per year. The total benefit value associated with the Blue Angels translated into the value of recruiting leads is $832,939. Total benefit value, including an estimated goodwill value of $57,188,329, is $58,021,268. The estimated goodwill value resulted from the economic impact of 11 million spectators who visit the Blue Angels' events each year on host cities. The host cities for these events are benefited by increased business, contributions to non-profit organizations including military organizations. Analysis is conducted both with and without the estimated value of goodwill. Recruiting benefits and costs associated with the Blue Angels are analyzed first. The BCR is the primary model for this research. In order to provide further analysis on the results of costs and benefits associated with the Navy Flight Demonstration Team, we have applied secondary models. The secondary models are the Return on Investment (ROI), comparing net benefits and Net Present Value (NPV), highlighting the net benefit.

As depicted in Table 3, the BCR was estimated to be 0.01. This was calculated by dividing total estimated recruiting benefits (not including goodwill) of $832,939 by the total estimated recruiting costs of $98,605,576. The results from the BCR model imply that for every $1 of cost incurred by the Blue Angels, there is a benefit gain of 1 cent. When using the ROI and NPV models, as indicated in Table 3, the results are -0.93 and -$97,772,637, respectively. The ROI was calculated by subtracting the total estimated cost of $98,605,576 from total estimated recruiting benefits (not including goodwill) of $832,939 resulting in a Net Benefit of -$97,772,637. Then the Net Benefit of -$97,772,637 is divided by total estimated cost of $98,605,576 resulting to an ROI of -0.99. The result from the ROI model implies that the Blue Angels will generate a net benefit that equates to -99% of the total cost of the program. The NPV was calculated by subtracting the total estimated costs of $98,605,576 from the total estimated recruiting benefits (not including goodwill) of $832,939 resulting in a NPV of -$97,772,637. The result from the NPV model implies that the costs outweigh the benefits.

Table 3. Snapshot of Cost Benefit Analysis- Blue Angels without Goodwill

Benefits	Costs	***Benefit-Cost Ratio (BCR)***	Return on Investment (ROI)	Net Present Value (NPV)
$832,939	$98,605,576	***0.01***	-0.99	-$97,772,637

When applying goodwill to this analysis, the results are significantly different. The reason to conduct this research without including goodwill is that the Blue Angels' primary goal is in support of recruiting, and the monetary value of benefits associated with the Blue Angels is limited to recruiting efforts. However, in an effort to assess the impact that an estimated value of goodwill would have on the primary and secondary models, we applied a portion of goodwill to support this assessment. As noted in the "Economy" benefit section of this paper, we applied the analogous cost estimating approach in determining the estimated value of goodwill. Based on this approach, the estimated value of goodwill is $57,188,329, using an assumption of 20% of consumer spending.

As depicted in Table 4, the BCR was estimated to be 0.59. This was calculated by dividing total estimated recruiting benefits (including goodwill) of $58,021,268 by the total estimated recruiting costs of $98,605,576. The results from the BCR model implies that for every $1 of cost incurred by the Blue Angels' program, there is a benefit gain of 59 cents. When using the ROI and NPV models, as indicated in Table 4, the results are -0.41 and $40,584,308, respectively. The ROI was calculated by subtracting the total estimated cost of $98,605,576 from total estimated recruiting benefits (including goodwill) of $58,021,268 resulting in a Net Benefit of -$40,584,308. Then the Net Benefit of -$40,584,308 is divided by total estimated cost of $98,605,576 resulting to an ROI of -0.41. The result from the ROI model implies that the Blue Angels' will generate a net benefit that equates to -41% of the total cost of the program. The NPV was calculated by subtracting the total estimated costs of $98,605,576 from the total estimated recruiting benefits (including goodwill) of $58,021,268 resulting in a NPV of -$40,584,308. The results from the NPV model implies that the costs outweigh the benefits.

Table 4. Snapshot of Cost Benefit Analysis- Blue Angels with Goodwill

Benefits	Costs	***Benefit-Cost Ratio (BCR)***	Return on Investment (ROI)	Net Present Value (NPV)
$58,021,268	$98,605,576	***.59***	-0.41	-$40,584,308

The costs that were applied to this analysis included Pay and Allowance for personnel, aircraft (depreciation, maintenance, and fuel), air shows, facility, and risk. The bulk of the costs were generated from aircraft (F/A 18) depreciation and a combination of parts, maintenance, and air shows. Collectively, these costs were determined to be over 50% of total costs associated with the Blue Angels. In an effort to gain a better ratio in the BCR model (without Goodwill), the Navy Flight Demonstration Team would need to reduce costs and identify methods to increase benefits. Since only 14% of Blue Angels' cost elements make up over 50% of total estimated costs, these cost elements should be evaluated for reduction opportunities.

The benefits that were applied to this analysis included naval airpower, awareness, recruiting, navy morale, maneuverability, and economy. The bulk of the benefits were non-quantifiable, with no monetary value. When applying an estimated value of goodwill, the monetary benefits included recruiting efforts and Consumer Surplus at host cities for Blue Angels' events. The estimated amount of goodwill that was applied to this research paper was limited. The inclusive value of goodwill as a benefit would better support the justification of the Navy Flight Demonstration Team per the BCR model.

IV. DATA ANALYSIS – U.S. NAVY BAND

A. COST BENEFIT ANALYSIS MODEL

Similar to the analysis of the Blue Angels, a BCR model is used to examine the costs and benefits of the Navy Band Program. The BCR serves as a value indicator of the Navy Band program. The BCR is expressed as the benefits, in monetary units, relative to the costs, in monetary units. A BCR greater than 1 indicates the program is a good investment, while a BCR of less than 1 indicates the program is an unjustifiable bad investment. The BCR of the Navy Band is based on recruiting costs and benefits. The Navy spends millions of dollars on recruiting and advertisement each fiscal year. With the current level of Department of Navy spending, the Navy Band is able to generate recruiting leads. In generating leads, the Navy Band uses its community performances and Music for Recruiting Initiative. The BCR model does pose some challenges.

> The magnitude of the ratio of benefits to costs is to a degree arbitrary because some costs such as operating costs may be deducted from benefits and thus not be included in the cost figure. This is called netting out of operating costs. This netting out may be done for some projects and not for others. (Watkins, 2012)

B. DISCUSSION OF COSTS

Performance costs are not incurred by the United States on behalf of the Navy Band. Costs such as local facility use, utilities, the printing of programs and tickets, insurance, and local personnel costs are paid by the sponsor. Transportation costs are also typically paid by the sponsor; however, when the Navy does provide transportation, all attempts are made to use government space available flights at no additional cost. Space available flights are those flights that occur as regularly scheduled transports or missions that have extra capacity available. The extra capacity is then used at no additional cost to the government to transport the Navy Band in contrast to scheduling a military flight or booking a commercial flight for the purpose of transporting the Navy Band. Therefore, the relevant costs are for Pay and Allowance and the nominal costs for equipment and supplies (United States Government, 2011).

1. Pay and Allowances for personnel

2. Other

1. Pay and Allowances is by far the largest portion of costs associated with the Navy Band. The minimum rank of a musician in the U.S. Navy Band is E6 and a rating of MU1. There are one hundred seventy two enlisted musicians and four officers within the Navy Band's 6 ensembles. The appointments are considered permanent, as members do not typically transfer to other units/commands. The 2011 pay charts (Defense Finance and Accounting Service) were used to determine pay. Officer pay is calculated as follows: O6 over 22 is $9465/mo., O4 over 12 is $6632, O3 over 6 is $5189/mo., and O1 under 2 is $2784/mo. Enlisted pay is as follows: E9 over 20 is $5437/mo., E8 over 16 is $4325/mo., E7 over 10 is $3555/mo., and E6 over 6 is $2841/mo. There are one O6, one O4, one O3, one O1, eight E9, twenty E8, forty one E7, and one hundred three E6.

Annual Basic Pay = $7,109,328

There is a difference in BAH rates for married members (or with dependents) and single members. In order to capture the difference in rates, a ratio was used from the 2008 Active Duty Demographic Profile (DMDC, 2008) reflecting 51.3% of Enlisted and 69.3% of Officers being married, this was then weighted for the BAH rate at zip code 20374.

Annual BAH= $4,310,728

Basic Allowance for subsistence (BAS) for FY2012 is $223 per month for Officers and $334 per month for Enlisted.

Annual BAS= $670,688

A clothing allowance is paid to enlisted members upon joining the service and on an annual basis. For clothing allowance calculations, an average of the FY11 standard rate of $468/yr. for males and $471.60/yr. for females was used (Defense Financial Accounting Service, 2011).

Yearly Clothing Allowance= $80,806

A Per Diem is paid to members as reimbursement for expenses incurred while on official travel. The standard rate is $123 per day (GSA, 2011). The amount of travel varies by which band or ensemble a member belongs to. Rod Powers from About.com states “Band members spend a significant amount of time traveling within the band's area of responsibility (AOR) to conduct performances. This job is travel intensive” (Powers). The 2011 tour of the Navy Band was one month (Hovey, 2011). With some additional travel days involved, the conservative number of 30 days per year was used for our calculation.

Annual Per Diem= $634,680

Medical costs are associated with every service member. In FY2000, military spending on healthcare was $17.5 billion, in FY2009 it was $43.8 billion, and is projected to be $64 billion by FY2015 (Jansen, 2009). Additionally, the percentage of active duty versus retirees is shifting; it is estimated that 43% of 2010 benefits are towards active duty members and dependents and 57% for retirees. The DoD estimates that by 2015 65% of benefits will be towards retirees. There are 9.3 million eligible beneficiaries. An estimated FY2011 medical cost of $50B is used to determine the average yearly costs for the U.S. Navy Band. The estimate is slightly low because the 9.3M eligible beneficiaries include dependents.

Annual Medical Costs= $946,237

Retirement pay is paid to each service member after completing at least 20 years of active duty service. This amount is then paid until the member's death. Using a percentage of each pay grade making it to the 20-year retirement, the stream of retirement payments can be allocated for each year worked by the service member based on the value of the retirement stream. The Defense Business Board estimates that 93% of pay grade O4 and above and pay grade E6 and above will retire, 43% of pay grade O3, and 13% of pay grade E4/E5 will complete at least 20 years of service (Defense Business Board, 2011). A retirement estimate will be used at a flat 93% for the Navy Band for all 176 members.

Pay at the 20 year mark on the FY2011 pay charts was used. Current retirement system pays 50% of the highest three years of service. A retired Officer will draw payments for an estimated 32 years, and a retired Enlisted member for an estimated 37 years according to actuarial tables on lifespan (Social Security Administration, 2012). For the Navy Band, 32 years will also be used for Enlisted, due to increased age when joining the Navy for Band recruits. An average retirement pay grade of O5 for Officers and E7 for enlisted was used. The military retirement pay is adjusted annually for inflation (Office of the Under Secretary of Defense, 2012*b*); this calculation uses a constant real payment and a discount rate of zero.

O5 32yrs X 0.5($8070)(12)=$1,549,440
Straight lined over 20 years: $1549,440/20 = $77,472

E7 37yrs x 0.5($4189)(12)= $929,958
Straight lined over 20 years: $928,958/20 = $46,498

93% * 4{O4+} *$77,472=$288,196
93% * 172{E7+} * $46,498=$7,437,820

Retirement Pay accrued annually= $7,726,016

2. Other costs include the costs to purchase and maintain instruments/equipment, supplies, and administration costs. Individual cost data for this were not available; however, the Pentagon did respond to Congresswoman Betty

McCollum (Minnesota Central, 2011) with overall amounts spent on military bands. The Pentagon responded that $339M is spent annually on military bands with $305M of that being personnel costs (our calculation does not include retirement accrual or medical costs). This yields a ratio of $305M personnel to $339M total costs across the military bands. For the Navy Band in Washington, DC, the personnel costs are $12.7M per year. The ratio from the Pentagon's numbers were used to calculate other costs outside of personnel costs.

Other=$1,400,000

We estimated total Navy Band Washington, DC, costs to be: Annual Basic Pay $7,109,328 + Annual BAH $4,310,728 + Annual BAS $670,688 + Clothing Allowance$80,806 + Annual Per Diem $634,680 + Annual Medical Costs $946,237 + Retirement Pay accrued annually $7,726,016 + Other $1,400,000, yielding a total Navy Band (Washington, DC) cost of $22,878,483.

C. DISCUSSION OF CURRENT BENEFITS

The benefits associated with the U.S. Navy Band include, but not limited to the following elements:

- Navy Awareness
- Ceremonial Events
- Recruiting
- Community Relations

1. Navy Awareness

The United States Navy Band is an organizational asset, providing musical support for official and non-official military and government functions mainly in the Washington, D.C., area, though they may perform occasionally in other states. Some of their most noteworthy performances have included, "the 1991 Desert Storm 'National Victory Celebration' Parades in Washington, DC and New York City and, in 2000 the 111th Rose Parade in Pasadena, California" (U.S. Navy - Public Affairs Office, 2012).

The Navy Band performs nationally while increasing Navy awareness and supporting recruiting goals. When assessing presidential inaugurations, the magnitude of potential awareness from such an event is massive. The Navy Band performed in President's Obama's 2009 inauguration. "Nielson television ratings indicated 29.2% of televisions in the 56 largest media markets in the United States were tuned to the inauguration. The event achieved an average of 37.8 million across 17 broadcast and cable channels" (Luft, 2009). The Navy's participation in this massively televised event greatly increased its awareness throughout the country.

To determine the level of Navy Awareness from the many elements of Navy Band, we took the same approach as with the Blue Angels. NAVCRUITCOM recognizes AI as a comparison of gross response leads per eligible population of each Designated Market Area (DMA) to the national average of all DMAs. As a result, values greater than 1.00 indicates above average awareness and values less than 1.00 indicates below average awareness. The AI for both FY09 and FY10 were 1.19 and 1.16, respectively. As noted, the AIs for the recurring DMAs in FY09 and FY10 exceeded the 1.00 threshold by an average of 17.5%. Therefore, the DMAs of this specific timeframe are generating above average awareness.

2. Ceremonial Events

Music and musicians play an important role in military life. The ceremonial event that is supported by U.S. Navy Bands supports not only Naval tradition, but also the level of pride instilled in military personnel. The U.S. Navy Band also supports military funerals. "On any weekday at Arlington National Cemetery in Virginia, a military ritual occurs that is both familiar and moving. This ritual is performed almost twenty times daily during many funerals held at Arlington" (Villanueva, 2012). The U.S. Navy Band's main focus is to support morale, motivate the troops, and to play active roles in ceremonies.

3. Recruiting

Music for Recruiting (MFR) is a recruiting effort spearheaded by NAVCRUITCOM and supported by the Navy Band. The program's ultimate objective is to generate leads. According to the Navy Band's website:

> The MFR allows the recruiter to get their [sic] foot in the door in areas that are generally closed to Navy recruiters because of the lack of a larger Navy presence. MFR provides a way to demonstrate firsthand, the professionalism, pride and job diversity of the U.S. Navy to target audiences such as high school and college students. MFR is a great initiative to use when trying to gain relationships with schools, allowing you access to generate leads. MFR also fosters a good relationship with the community and centers of influence, which is very valuable to the Navy and its recruiting efforts. (Commander, 2011*a*)

In determining the value of the U.S. Navy Band in terms of recruiting efforts, the metropolitan areas of DC, Maryland, and Virginia (DMV) were specifically examined. Due to the fact that the Navy Band is headquartered in the nation's capital, and a large portion of their estimated 270 events are performed locally, the Navy Band is one of many factors that support recruiting efforts in the DMV area. In FY09 through FY10, RMIS indicated the targeted population of DMV to be 628,978. As a recap, the targeted population includes qualified potential recruits between the ages of 17 and 24. RMIS indicated 869 actual contracts were gained from the DMV in FY09. Given this data and a 6% conversion rate, the estimated leads from the DMV totaled 14,484*. RMIS indicated 742 actual contracts were gained from the DMV in FY10. Given this data and a 6% conversion rate, the estimated leads from the DMV totaled 12,367*. RMIS indicated 713 actual contracts were gained from the DMV in FY11. Given this data and a 6% conversion rate, the estimated leads from the DMV totaled 11,884*. In FY09 through FY11, the number of recruiting leads, specifically in the DMV area, the Navy needed to attain annual recruiting goals ranging from 11,884 to 14,484. Given the number of recruiting leads, we estimated the dollar value of each lead. From previous calculations listed in the 'Recruiting' paragraph, the average dollar value for each lead was at least $434. The estimated FY09 value of the DMV, in terms of recruiting efforts, was $6,286,056** or 2.4% of the respective Recruiting and Advertising Budget. For FY10

and FY11, we determined the estimated values to be $5,552,783** or 2.2% of the budget and $5,573,596** or 2.1% of the budget, respectively. For the purpose of valuating the benefits of recruiting, we used the average estimated values for FY09 thru FY11.[4]

4. Community Relations

For the military, public opinions are important for they are driven by the people who have the power to select government officials that ultimately make decisions about the military. It is as important for military personnel to be actively involved with communities as it is for the public to show support to military personnel serving at home and abroad. "To maintain America's influence as a world power, the U.S. must improve civil-military relations by emphasizing the importance of civil-interaction with service members" (Gorman, 2009).[5]

The Navy Band plays an important role in establishing community relations through the number of programs and events that are shared with the public. Fostering good relations with communities at home and abroad is in the best interest of the DoD. The Navy Band continues to support communities around the world. "The Navy Band's high level of training and visibility present a unique opportunity for educational outreach. In order to accomplish this goal, the Navy Band's efforts include educational resources and music in the schools" (Public Affairs Office, Navy Band Washington, DC). Community relations will always be important to the military and will remain a factor in recruiting efforts. As an overview, benefits researched for the U.S. Navy Band are indicated in Table 5.

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4 Calculations

($6,286,056 + $5,552,783 + $5,573,596) / 3 = $5,804,

5 Calculations

*$14,848 (869 / .06); $12,367 (742 / .06); $11,884 (713 / .06)

** $6,286,056 (14,848 * $434); $5,552,783 (12,367 * $449); $5,573,596 (11,884 * $469)

Table 5. Overview of U.S. Navy Band Benefits

U.S. Navy Band Benefits			
Benefit	**Quantifiable**	**Non-Quantifiable**	**Monetary Value**
Awareness	**YES**	n/a	n/a
Ceremonial Events	n/a	**YES**	n/a
Recruiting	**YES**	n/a	$5,804,130
Community Relations	n/a	**YES**	n/a
Total	$5,804,130	n/a	**$5,804,130**

D. DISCUSSION OF ALTERNATIVES (U.S. NAVY BAND)

1. Continue the Program

One of the key objectives of the Navy Band is to musically support the Navy and government officials. Throughout the year, the Navy Band supports ceremonies, provides concerts, and remains actively involved with the communities through educational programs. As with any program, costs will continue to be incurred over time. However, with the Navy Band, some would argue that their operational and support costs are minimal compared to other programs. Given anticipated future budget cuts, all programs whether small or large will be at risk of losing funds. According to the Department of Defense, "an estimate of $339 million will be spent on military music programs" (Minnesota Central, 2011). This would apply to all of the service bands. As quoted by Congresswoman Betty McCollum, "it's time to ask the Pentagon to make a small sacrifice in their musical budget. Military bands have an important place in our nation's history, but in a fiscal crisis, $200 million should be enough to continue that tradition" (MN Central, 2011). In reference to the Congresswoman's proposal, continuing the program with a 38 percent budget cut would likely pose many challenges for the services' band programs.

2. Expand the Program

Regardless of what the future holds, the Navy Band will always be an important part of Naval History.

> The first real band in the U.S. Navy, however, was deliberately shanghaied. In 1802 while the USS Boston was in port at Messina, Sicily, a local band came aboard and treated the American crew to a concert. The

> Captain was so pleased that he immediately set sail for America with the band still aboard. Bands continued to become a valuable section of the crew on many Navy vessels, including the Constitution, Constellation, and other ships deeply involved in the history of this young and growing country. (U.S. Navy - Public Affairs Office, 2012)

Given the importance of Naval History and the current contributions of the Navy Band, allocating additional funding to expand a program during great budget constraints would be unlikely. However, expanding the number of tours and/or performances with the current force levels would support recruiting efforts through Navy awareness. Many would argue that it is not a question of what the Navy Bands brings to the table in terms of supporting Navy awareness, recruiting efforts, and morale, but it is a question of controlling government spending during a period of budget cuts.

3. Discontinue the Program

The Navy is equipped with many bands that support requirements around the world. The majority of the musical costs associated with the Navy bands are from the salaries of its members. Over three decades ago, the Navy was supported by five times the number of bands it has today. Assessing this downward trend, one could argue that the Navy Band will continue to be around, but probably at a smaller size. "Looking at historical budgets for the Navy Band, in FY09 it was $46.3M, and FY10 it was $49.4M, and FY11 it was $50.6M" (Steele, 2011).

Since there are no musician rating jobs in the fleet other than in a Navy Band, most of the current musicians would have to cross rate or risk involuntary separation from the Navy. There would not be a great operational impact on the fleet, meaning the Navy would still effectively be able to operate and deploy if bands were discontinued. Additionally, the Navy would realize a cost saving of at least $20M for each Fiscal Year. This cost saving is based on historical budgets. To meet musical requirements of the Navy and Government Official events, the Navy would have to contract musicians commercially at potentially high costs or accept musical performances from sailors who would potentially support official musical requirements in a collateral duty status.

E. ANALYSIS OF DISCUSSION (U.S. NAVY BAND)

Based on our research we estimated the total cost associated with the U.S. Navy Band to be $21.88 million per year. The total benefit value associated with the U.S. Navy Band was estimated at $5.8 million. In determining the total benefit value, we were unable to effectively apply a goodwill value to the U.S. Navy Band. Although, there is goodwill associated with the U.S. Navy Band, we assessed only the value of recruiting benefits. We first analyzed recruiting costs and benefits associated with the U.S. Navy Band. The BCR is the primary model for this research. This model calls for separating the estimated costs from benefits. In order to provide further analysis on the results of costs and benefits associated with the U.S. Navy Band program, we have applied secondary models. Similar to the Navy Flight Demonstration Team, the secondary models are the Return on Investment (ROI), comparing net benefits and Net Present Value (NPV), highlighting the net benefit.

As depicted in Table 6, the BCR was estimated to be 0.25. This was calculated by dividing total estimated recruiting benefits (not including goodwill) of $5,804,130 by the total estimated recruiting costs of $22,878,483. The results from the BCR model imply that for every $1 of cost incurred by the U.S. Navy Band, there is a benefit gain of 25 cents. When using the ROI and NPV models, as indicated in Table 6, the results are -0.75 and -$17,074,353, respectively. The ROI was calculated by subtracting the total estimated cost of $22,878,483 from total estimated recruiting benefits (not including goodwill) of $5,804,130 resulting in a Net Benefit of -$17,074,353. The Net Benefit of -$17,074,353 is divided by total estimated cost of $22,878,483 resulting in an ROI of -0.75. The result from the ROI model implies that the U.S. Navy Band will generate a net benefit that equates to -75% of the total cost of the program. The NPV was calculated by subtracting the total estimated costs of $22,878,483 from the total estimated recruiting benefits (not including goodwill) of $5,804,130 resulting in a NPV of -$17,074,353. The result from the NPV model implies that the costs outweigh the benefits.

Table 6. Snapshot of Cost Benefit Analysis – U.S. Navy Band

Benefits	Costs	***Benefit-Cost Ratio (BCR)***	Return on Investment (ROI)	Net Present Value (NPV)
$5,804,130	$22,878,483	***0.25***	-0.75	-$17,074,353

The costs applied to this analysis included Pay and Allowance for personnel and other (supplies, maintenance, and administrative). The bulk of the costs were generated from retirement, allowances, and regular pay. Collectively, these costs were determined to be approximately 86% of total costs associated with the U.S. Navy Band. In an effort to gain a better ratio in the BCR model (without Goodwill), the U.S. Navy Band would need to reduce costs and identify methods or efforts to increase benefits.

The benefits that were applied to this analysis included Navy awareness, ceremonial events, recruiting, and community relations. The bulk of the benefits were non-quantifiable, with the exception of recruiting value. Determining a value of goodwill and applying it to the U.S. Navy Band program would improve the ratio of the BCR model. This analysis finds that unless goodwill is very large, the cost of the U.S. Navy Band program substantially exceeds the benefits.

V. CONCLUSION – FLIGHT DEMONSTRATION TEAM

A. CONSIDERATION

The objective of this project was to examine associated costs and benefits of the Flight Demonstration Team, with a focus on the value of recruiting. A focus on recruiting was considered appropriate due to the fact that the Blue Angels' primary goal is to support recruiting efforts. With the completion of our examination, we determined that costs outweighed benefits of the Blue Angels' program. In this analysis, recruiting was the sole element in determining the value of benefits for the Blue Angels' program. Broadening our research, we briefly looked at the impact goodwill would have on this analysis. Our findings indicated that costs still outweighed benefits of the Navy Flight Demonstration Team when applying only a consumer surplus measure of goodwill. The primary tool used for our analysis was the BCR model. With a focus on recruiting costs and benefits in this analysis, the BCR was 0.01. By applying an estimated value of goodwill in this analysis, the BCR was 0.59. Considering the variance between the two analyses, it is deemed necessary to determine the overall value of goodwill before considering further analyses of the Blue Angels program.

In determining the value of recruiting, there were a number of factors we had to consider. First, we determined the total annual budget that is allocated to Navy Recruiting and Advertisement. Then, we determined how many personnel were actually recruited between FY09 and FY11. Given the number of recruits for each Fiscal Year, we were able to determine the estimated number of leads. We use the number of leads to estimate the value of recruiting. NAVCRUITCOM uses a 5 percent to 7 percent conversion rate to forecast the number of recruiting contracts in any given year. For the purpose of this research, we used the average 6 percent conversion rate to determine the number of leads. Once the number of leads was determined for each Fiscal Year, we divided the annual recruiting budget by the number of leads. This calculation provided this analysis with an estimated value of each lead for FY09 thru FY11, which equated to $434, $449, and $469, respectively. These estimated values provide an idea of how much effort, in a monetary value, the Navy applies to awareness in meeting annual recruiting goals.

Navy awareness is a factor in achieving annual recruiting goals. With the support of the RMIS data base, we were able to perform analyses in an effort to determine a level of awareness in geographical locations that have hosted Blue Angels' events. From our analysis of FY09 through FY11, we made a conservative determination that awareness levels in geographical locations that have hosted Blue Angels' events exceeded NAVCRUITCOM standard awareness levels. In addition to Blue Angels' events, there are other Navy-related events that support awareness levels. This research determined that on average, the Blue Angels' events makes up 12.5 percent of total Navy-related events for applicable geographical locations. Furthermore, we estimated that the Blue Angels' recruiting efforts, in monetary value, is approximately 1 percent of the recruiting budget. Given the ratio of Blue Angels' events to the total number of Navy-related events, there is opportunity to increase the monetary value of the program's recruiting efforts.

B. RECOMMENDATIONS

Considering the lack of readily available data and research on the costs and benefits of the Navy Flight Demonstration Team, there is a need for further research. The focus of our research was on the benefits of recruiting: this does not justify the program. Even including a value of consumer surplus as a measure of goodwill did not come close to getting the benefits to exceed the costs. We recommend further assessing the value of goodwill to determine how that would affect the benefits of the Blue Angels' program.

We assumed consumer surplus to be 20% of consumer spending; however, we would recommend further research on consumer surplus to include conducting polls at events by the Navy Flight Demonstration Team to determine on average how much attendees would be willing to spend at an event beyond what they do spend. This average, when multiplied by the 11 million spectators annually would yield a goodwill benefit that would have an effect on the cost benefit model. For example, if the "extra" willingness to pay for event attendance averaged only $10 per person, then the benefits would then outweigh the costs in this model.

VI. CONCLUSION – U.S. NAVY BAND

A. CONSIDERATION

The objective of this project was to examine associated costs and benefits of the U.S. Navy Band, with a focus on the value of recruiting. A focus on recruiting was considered appropriate due to the fact that one of the U.S. Navy Band's key objectives is to support recruiting efforts. With the completion of our examination, it was determined that costs outweighed benefits of the U.S. Navy Band. In this analysis, recruiting was the sole element in determining the value of benefits for the U.S. Navy Band program. The primary tool used for our analysis was the BCR model. With a focus on recruiting costs and benefits in this analysis, the BCR was 0.25. Applying an estimated value of goodwill in this analysis would increase the BCR.

In determining the value of recruiting, we considered a number of factors. First, we determined the total annual budget that is allocated to Navy Recruiting and Advertisement. Then, we determined how many personnel were actually recruited between FY09 and FY11. Given the number of recruits for each Fiscal Year, we were able to determine the estimated number of leads. We use the number of leads to estimate the value of recruiting. NAVCRUITCOM uses a 5 percent to 7 percent conversion rate to forecast the number of recruiting contracts in a given Fiscal Year. For the purpose of our research, we used the average 6 percent conversion rate to determine the number of leads. Once the number of leads was determined for each Fiscal Year, we divided the annual recruiting budget by the number of leads. This calculation provided us with an estimated value of each lead for FY09 thru FY11, which equated to $434, $449, and $469, respectively. These estimated values provide the reader with an idea of how much effort, in monetary value, the Navy applies to awareness in meeting annual recruiting goals.

Navy awareness is a factor in achieving annual recruiting goals. With the support of the RMIS data base, we performed an analysis in an effort to determine a level of awareness in the District of Columbia, Maryland, and Virginia (DMV) area. The U.S. Navy Band supports a number of local events in the DMV area. From our analysis of

FY09 through FY10, we made a conservative determination that awareness levels in the DMV area exceeded the NAVCRUITCOM standard awareness levels. In addition to U.S. Navy Band's events, there are other Navy-related events that support awareness levels in the DMV area. Given the scope of our research, it was determined that on average, the U.S. Navy Band's events make up approximately 8 percent of total Navy-related events in a given fiscal year. Furthermore, we estimated that the U.S. Navy Band's recruiting efforts, in monetary value, is approximately 2.2 percent of the recruiting budget. Given the ratio of the U.S. Navy Band's events to the total number of Navy-related events, there is an opportunity to increase the monetary value of the program's recruiting efforts.

B. RECOMMENDATIONS

Considering the lack of readily available data and research on the costs and benefits of the U.S. Navy Band, there is a need for further research. Our research revealed that the benefits of recruiting are not large enough to justify the program. The value of goodwill created may or may not put the program over the margin to make it a net benefit for the Navy. We recommend further research on this issue.

One recommended approach would be to evaluate consumer surplus, by conducting polls at events by the U.S. Navy Band to determine on average how much extra attendees would be willing to spend at an event. This average, when multiplied against the attendees per year would yield a goodwill benefit that would have an effect on the cost benefit model.

APPENDIX A

2009 Blue Angels Flight Demonstration Events						
	Date	Event Location	Total Pop. of Event Location	Qualified Recruit Pop. by Event Location (Ages 17-24)	Targeted Recruit Pop. by state (Ages 17-24)	Total Pop. by state
1ST QTR	14-Mar	NAF El Centro, CA	42,598	4,412	3,903,719	37,691,912
	21-22 Mar	Punta Gorda, FL	16,641	1,548	1,773,106	19,057,542
	28-29 Mar	Tyndall AFB, FL	36,484	3,394	1,773,106	19,057,542
2ND QTR	4-5 Apr	Tuscaloosa, AL	90,468	9,555	504,814	4,779,736
	18-19 Apr	NAS Corpus Christi, TX	305,215	30,324	2,550,834	25,674,681
	25-26 Apr	Seymour Johnson AFB, NC	36,437	14,917	3,903,719	9,535,483
	2-3 May	NAS New Orleans, LA	343,829	39,174	516,505	4,533,372
	16-17 May	MCAS Beaufort, SC	12,361	1,266	473,608	4,625,364

	20 & 22 May	USNA, Annapolis, MD	863,420	89,934	601,371	5,773,552
	23-24 May	Pax River, MD	11,626	1,211	601,371	5,773,552
	30-31 May	Janesville, WI	63,575	6,880	615,418	5,686,986
	6-7 Jun	Indianapolis, IN	820,445	86,808	686,027	6,483,802
	13-14 Jun	Denver, CO	416,427	41,092	496,264	5,029,196
	20-21 Jun	Davenport IA	99,685	11,000	336,164	3,046,355
	27-28 Jun	North Kingston, RI	6,974	809	122,174	1,052,567
3RD QTR	4-5 Jul	Binghamton, NY	47,376	10,306	2,150,061	9,883,640
	11-Jul	Pensacola Beach, FL	51,923	4,831	1,773,106	19,057,542
	18-19 Jul	Ypsilanti, MI	19,435	2,179	1,108,302	9,883,640
	25-26 Jul	Sioux Falls, SD	153,888	17,025	90,074	814,180
	1-2 Aug	Seattle, WA	608,660	59,509	657,458	6,724,540
	8-9 Aug	Salinas, CA	150,441	15,581	3,903,719	37,691,912
	22-23 Aug	Fargo, ND	105,549	1,299	82,773	6,724,540
	29-30 Aug	Offutt AFB, NE	50,137	5,449	198,507	1,826,341
	11-Sep	NAS Fallon, NV	8,606	739	231,897	2,700,551
	19-20 Sep	Reno Air Races,	225,221	19,340	231,897	2,700,551

		NV				
	26-27 Sep	Redding, CA	89,861	9,307	3,903,719	37,691,912
4TH QTR	2-4 Oct	MCAS Miramar, CA	1,307,402	135,407	3,903,719	37,691,912
	10-11 Oct	San Francisco, CA	805,235	83,397	3,903,719	37,691,912
	17-18 Oct	NAS Oceana, VA	437,994	43,388	792,587	8,001,024
	24-25 Oct	Fort Worth, TX	741,206	73,640	2,550,834	25,674,681
	31 Oct - 1 Nov	Houston, TX	2,099,451	208,585	2,550,834	25,674,681
	7-8 Nov	Jacksonville Beach, FL	821,784	*76,458*	1,773,106	19,057,542
	13-14 Nov	NAS Pensacola, FL	51,923	*4,831*	1,773,106	19,057,542

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APPENDIX B

2010 Blue Angels Flight Demonstration Events						
	Date	Event Location	Total Pop. of Event Location	Qualified Recruit Pop. by Event Location (Ages 17-24)	Targeted Recruit Pop. by state (Ages 17-24)	Total Pop. by state
1ST QTR	13-Mar	NAF El Centro, CA	42,598	4,455	3,942,243	37,691,912
	20-21 Mar	MacDill AFB, FL	335,709	31,706	1,799,906	19,057,542
	27-28 Mar	NAS Kingsville, TX	26,213	2,639	2,584,972	25,674,681
2ND QTR	10-11 Apr	NAS Key West, FL	24,649	2,328	1,799,906	19,057,542
	17-Apr	Charleston AFB, SC	120,083	12,404	477,775	4,625,364
	24-25 Apr	Vidalia, GA	10,473	1,102	1,019,179	9,687,653
	1-2 May	St. Joseph, MO	76,780	8,093	631,238	5,988,927
	8-9 May	Tuscaloosa, AL	90,468	9,613	507,894	4,779,736

	15-16 May	Andrews AFB, MD	863,420	91,175	609,674	5,773,552
	22-23 May	MCAS Cherry Point, NC	20,735	2,032	934,482	9,535,483
	26-May	USNA, Annapolis, MD	38,394	4,054	609,674	5,773,552
	29-30 May	Jones Beach, NY	18,871	2,096	2,152,530	19,378,102
	5-6 Jun	Eau Claire, WI	65,883	7,096	612,518	5,686,986
	12-13 Jun	Milwaukee, WI	594,833	64,067	612,518	5,686,986
	19-20 Jun	Cape Girardeau, MO	37,941	3,999	631,238	5,988,927
	26-27 Jun	St Cloud, MD	65,842	6,986	562,726	5,303,925
3RD QTR	3-4 Jul	Traverse City, MI	14,674	1,647	1,109,317	9,883,640
	10-Jul	Pensacola Beach, FL	51,923	4,904	1,799,906	19,057,542
	17-18 Jul	Dayton, OH	141,527	15,056	1,227,321	11,536,504
	24-25 Jul	Idaho Falls, ID	56,813	6,102	168,363	1,567,582
	7-8 Aug	Seattle, WA	608,660	60,071	663,672	6,724,540
	14-15 Aug	Chicago, IL	2,695,598	290,360	1,382,067	12,830,632

	28-29 Aug	Portsmouth, NH	20,779	2,217	140,472	1,316,470
	4-6 Sep	Cleveland, OH	396,815	42,216	1,227,321	11,536,504
	11-12 Sep	Scott AFB, IL	44,478	4,791	1,382,067	12,830,632
	18-19 Sep	NAS Oceana, VA	437,994	44,007	803,888	8,001,024
4TH QTR	1-3 Oct	MCAS Miramar, CA	1,307,402	136,743	3,942,243	37,691,912
	9-10 Oct	San Francisco, CA	805,235	84,221	3,942,243	37,691,912
	16-17 Oct	Dobbins AFB, GA	56,579	5,952	1,019,179	9,687,653
	23-24 Oct	NAS Jacksonville, FL	821,784	77,614	1,799,906	19,057,542
	30-31 Oct	Fort Worth Alliance, TX	741,206	74,626	2,584,972	25,674,681
	6-7 Nov	Homestead AFB, FL	60,512	5,715	1,799,906	19,057,542
	13-Nov	NAS Pensacola, FL	51,923	4,904	1,799,906	19,057,542

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APPENDIX C

2011 Blue Angels Flight Demonstration Events						
	Date	Event Location	Total Pop. of Event Location	Qualified Recruit Pop. by Event Location (Ages 17-24)	Targeted Recruit Pop. by state (Ages 17-24)	Total Pop. by state
1ST QTR	12-Mar	NAF El Centro, CA	42,598	4,460	3,946,330	37,691,912
	19-20 Mar	Keesler AFB, MS	44,054	4,995	336,459	2,967,297
	26-27 Mar	NAS Meridian, MS	41,148	4,666	336,459	2,967,297
2ND QTR	2-3 Apr	Sun-N-Fun, Lakeland, FL	97,422	9,296	1,818,498	19,057,542
	9-10 Apr	NAS Corpus Christi, TX	305,215	31,145	2,619,953	25,674,681
	16-17 Apr	Fort Worth JRB, TX	741,206	75,636	2,619,953	25,674,681
	30 Apr - 1 May	MCAS Beaufort, SC	12,361	1,284	480,281	4,625,364

	3-4 May	NAS Pensacola, FL	51,923	4,955	1,818,498	19,057,542
	7-8 May	NAS New Orleans, LA	343,829	38,828	511,941	4,533,372
	14-15 May	La Crosse, WI	51,320	5,492	608,555	5,686,986
	21-22 May	Andrews AFB, MD	863,420	91,780	613,719	5,773,552
3RD QTR	18-19 Jun	Davenport, IA	99,685	10,807	330,272	3,046,355
	25-26 Jun	North Kingston, RI	6,974	804	121,394	1,052,567
	2-3 Jul	Muskegon, MI	38,401	4,298	1,106,247	9,883,640
	9-Jul	Pensacola Beach, FL	51,923	4,955	1,818,498	19,057,542
	16-17 Jul	Rochester, NY	210,565	23,196	2,134,706	19,378,102
	23-24 Jul	Ypsilanti, MI	19,435	2,175	1,106,247	9,883,640
	30-31 Jul	Kalispell, MT	19,927	2,118	105,168	989,415
	6-7 Aug	Seattle, WA	608,660	60,448	667,833	6,724,540
	13-14 Aug	Fargo, ND	105,549	12,092	77,052	672,591
	21-28 Aug	Brunswick, ME	15,175	1,456	127,454	1,328,361
	3-4 Sep	NAS Patuxent, MD	11,626	1,236	613,719	5,773,552
	10-11 Sep	Lincoln, NE	258,379	27,501	194,389	1,826,341

	17-18 Sep	Millington, TN	10,176	1,026	639,999	6,346,105
	24-25 Sep	NAS Oceana, VA	437,994	44,510	813,084	8,001,024
4th QTR	1-2 Oct	MCAS Miramar, CA	1,307,402	136,885	3,946,330	37,691,912
	8-9 Oct	San Francisco, CA	805,235	84,308	3,946,330	37,691,912
	15-16 Oct	NAS Lemoore, CA	24,531	2,568	3,946,330	37,691,912
	22-23 Oct	El Paso, TX	649,121	66,230	2,619,593	25,674,681
	29-30 Oct	San Antonio, TX	1,327,407	135,436	2,619,593	25,674,681
	5-6 Nov	NAS Jacksonville, FL	821,784	78,416	1,818,498	19,057,542
	11-12 Nov	NAS Pensacola, FL	51,923	4,955	1,818,498	19,057,542

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APPENDIX D

FY 2009 Qualified Leads				
FY Quarters	Targeted Pop. (Event Location)	Number of Contracts	Conversion Rate	Estimated Leads
1	440,410	678	0.06	11,300
2	9,355	40	0.06	667
3	332,969	176	0.06	2,933
4	145,565	145	0.06	2,417

FY 2010 Qualified Leads				
FY Quarters	Targeted Pop. (Event Location)	Number of Contracts	Conversion Rate	Estimated Leads
1	625,707	329	0.06	5,483
2	38,801	66	0.06	1,100
3	215,044	137	0.06	2,283
4	471,370	351	0.06	5,850

FY 2011 Qualified Leads				
FY Quarters	Targeted Popu. (Event Location)	Number of Contracts	Conversion Rate	Estimated Leads
1	389,775	357	0.06	5,950
2	14,121	23	0.06	383
3	258,415	193	0.06	3,217
4	196,622	177	0.06	2,950

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