



Shift Change Project Proposal

To: BNRC
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Contact Information

Project Sponsor:

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on behalf of the **Shift Change** Project Leadership Team

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Imagine a gathering of diverse people coming together to produce and act on solutions for environmental problems—solutions that work for today and into the future. More than just a traditional conference, **Shift Change** is a platform for action. Through **Shift Change** we intend to move our community paradigm from ‘technically impracticable’ to ‘mission possible’. This is an **exploratory** learning experience for youth and adults from backgrounds encompassing science, policy, and art. Most meetings or conferences consist of like-minded individuals in a similar discipline gathering together to share knowledge and ideas. **Shift Change** is different – it will be a melding of highly talented and committed scientists, artists, educators, students, policy-makers, and economic development thought-leaders aimed at creating solutions to shared environmental problems. Including students in the event will inspire and prepare the next generation of community leaders. The BAO small projects request calls for “education or research projects that are specific to and can benefit restoration of Butte area natural resources.” **Shift Change** is both an educational platform and a method for increasing research efforts regarding BAO solutions.

During the event, participants will form solutions teams and submit their ideas to the Leadership Team for consideration. If funded, the teams will commit to following through with ideas generated during the meeting for an entire year, supported by small grants, called **Shift Change Solution Awards**, given out on the last day of **Shift Change**. Our leadership team will provide long-term support and follow-up to determine the efficacy and outcomes of **Shift Change**. This proposed **Butte Area One Small projects grant** will support two, long-term solution awards that will address issues unique to Butte Area One. The Leadership Team for **Shift Change** has identified three domains: 1) SEE (Science, Engineering, and Education); 2) AND (Policy and Economic Development); and ACT (Arts, Communication, and Technology). We will seek proposals from each of the three domains and include two additional topics as identified by the event participants. The BAO-funded awards will meet the requirements set forward by the BNRC small projects request form.

Shift Change is purposefully designed to spur adult STEM professionals, artists, policy-makers, community members, and educators to think and act in new, transformative ways. We plan to create a platform for the development of environmental revitalization solutions and a re-engagement and involvement of concerned community members. The forum will be deliberately curated to ensure that people with differing professional backgrounds, cultural affiliations, age groups, and genders work together to create innovative solutions to communal problems. In Butte Area One, we have been working at creating solutions for our community for over 30 years under Superfund. Our community is ready for a new perspective that can further our goals and build upon the great work already done in BAO. **Shift Change** will inspire and develop solutions to be implemented in the immediate future. In addition, this dynamic and integrative model of collaboration, learning, and action will be analyzed to better understand how groups and communities with diverse skills that share a common goal can learn and create together. High school and college students are the next generation of environmental leaders and will be a vital part of **Shift**

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Change. How students interact and react to working with adults and professionals seeking to create positive changes impacting the next generations will be studied. We are studying this methodology and its impact for our students in order to develop a high-quality model for both engaging our public and to better understand if engaging students in relevant topics about their home produces a stronger outcome in their academic career and ultimately leads to students remaining in our home town and furthering economic prosperity for Butte Area One.



Figure 1: Schematic depicting the melding of science, policy, and art in a transformative environment (**Shift Change**) with the ultimate goal of engaging the public and inspiring

The format of **Shift Change** is novel and highly interdisciplinary, and emphasizes non-traditional overlap between STEM, policy, economy, and art. Merging thoughts and ideas from these areas has profound implications for educating citizens about environmental restoration. Generational issues, such as our local environmental challenges, require participation from a wider network of professionals, community members, and policy-makers, and **must** include the next generation in

order to succeed. To successfully engage a diverse network, an innovative approach is required to ensure that progress is made toward viable solutions. **Shift Change** is that approach. This event will serve as both an educational opportunity and as a foundation for future action. In our community, Superfund has been ongoing for more than three decades, demanding a generational transition to assure the success of long-term restoration goals. Should this model prove to be effective, it can be utilized by other communities also facing large-scale, multi-generational impacts from issues such as vast pollution related to Superfund. The BAO small project award can help to inspire the future generation of stewards and change-makers, as well as help to develop innovative **solutions for our community's immediate future.**

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The overarching goal of **Shift Change** is simple—create long-term solutions for our community that drive economic prosperity, ensure a healthy environment, and provide a methodology for inspiring the next generation of leaders. The Leadership Team intends that **Shift Change** will continue for many years to come. For the purpose of the BAO small projects grant, we are seeking funding for our first event in June 2018. This initial support will help establish the project and ensure that the leadership team is able to leverage funding from other sources for future programming.

Project Deliverables

- Host a high-quality, inspirational event in June 2018 that brings together a diverse audience of 150 participants that include local community members, high-school and undergraduate students, science, technology, engineering, and education professionals, professional artists, economic development experts, and policy-makers. (A follow-up event is planned for 2019, however, the project team is not requesting support from BNRC for the follow-up).
- Present technical, societal, economic, and environmental challenges of one of the nation's largest Superfund sites to diverse, local and external attendees, and foster an experiential setting where they can collaborate, brainstorm, and test possible solutions to these challenges.
- Create collaboration, networking and follow-up opportunities for participants.
- Provide mentorship opportunities for students who choose to participate with a **Shift Change Solutions Award** team.
- Identify/develop and evaluate an effective process to bring together a diverse group of people who create common vision but varied approaches for tackling difficult tasks.
- Create and execute a system for granting **Shift Change Awards** to five innovative project design teams, based on the following criteria: 1) teams must include one high school and one college student; 2) teams must have representation from each of the SEE AND ACT domains; 3) teams must include a minimum of five members; 4) ideas should be innovative solutions for the issues presented during **Shift Change**; and 5) awards will be reviewed based on merit of the idea and potential impacts.
- Track progress of **Shift Change Solution Awardees**, report outcomes, and develop high-impact documentary evidence of project progress and outcomes to the BNRC and others.
- Disseminate key findings to a broad audience including the general public, educators, policy makers, researchers, and conference organizers.

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Project Benefits

The first major benefit of the **Shift Change** project for BAO is the fact that this event will produce innovative solutions for our community. These solutions will be fostered through the collaborative event itself, and will be field tested through the **Shift Change Solutions Awards**. By curating teams that are deliberately trans-disciplinary and include students, the **Shift Change** leadership team is creating a system where innovative solutions can grow. The leadership team, with contracted support from Cfwep.Org, will follow-up with **Shift Change Solutions Awardees** to ensure the timely progress toward their stated goals. This follow-up will keep project teams focused toward producing viable solutions.

A profound benefit of this project is inherent within the name itself. **Shift Change** implies not only a changing of the leaders who are working toward solutions for our community, meaning handing the baton to the next generation, but also a change of paradigm for our community. It is time to change the dialogue about our community as a whole. **Shift Change will move the conversation about Butte from that of the 'largest Superfund in the nation' to that of 'the model community for creating innovative solutions to challenging environmental problems'.**

A third benefit of the project lies directly within the educational realm. Local students will be invited to participate in the **Shift Change** event and will be included in the **Shift Change Solutions** teams. These experiences can create great benefits for our students who may be seeking ways to be more involved in their local community. Twenty local students with varied interests in science, policy, and art will be selected to attend the **Shift Change** event. These students will gain valuable background knowledge in all three domains (SEE, AND, ACT). Those students who choose to participate with a **Shift Change Solutions** team will receive a year of mentoring and support from Cfwep.Org staff and other **Shift Change** Leadership team members, alongside of mentoring and support from their professional adult team members. Another important educational benefit is generated through the effects for the adult learners who participate in the event. Our community has developed a number of important solutions for environmental issues over the past 30 years. By hosting this event, we will be able to share our lessons learned with a larger, national and global audience.

A fourth benefit of the project is our strategy for public engagement beyond the event. Project leaders from the artist working group will include documentary pieces, a focus on data visualization and design for the **Shift Change Solutions** projects, and landscape architecture projects that will relate the story of environmental destruction and re-birth. Artist teams will create art pieces that will be left in place within the watershed to allow informal learners, who may be touring or otherwise utilizing walking trails, to gain information about the landscape issues. In addition, artifacts from the event and updates regarding new innovative technologies will be utilized by the Science

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Mine for creating displays and interactive exhibits regarding the status of Superfund in Butte, and the solutions the project teams are creating. These artworks are an important benefit for our community.

Finally, when ***Shift Change Solutions Teams*** produce innovative products, there is likely to be an economic benefit to the community in terms of both creating jobs in the green collar sector, and secondly, for the technologies that are invented. In order to solve the issues present in Butte Area One, there needs to be a reinvigoration of ideas. ***Shift Change*** will help create that reinvigoration.

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For the BNRC proposal, the **Shift Change** Leadership Team is seeking support to host the first **Shift Change** event in June 2018, and award two **Shift Change Solutions Award** projects that will commence in June 2018 and finish in June 2019 as a presentation at the second **Shift Change** event. The Leadership Team is seeking external funding to support additional follow-up awards and the costs of hosting the two events. The team submitted a proposal to the National Science Foundation for two years (\$300,000) of support on November 8th, 2016. The team is currently seeking funding from other foundations in order to meet the funding goals for this project.

In order to meet the implementation goals, Leadership Team meetings will be held monthly. The External Advisory Board will meet two times during the year and members will attend the event.

Jan-March 2017

- Recruit External Advisory Board Members
- Recruit Speakers for June 2017
- Identify additional funding sources for the project

April-June 2017

- Continue speaker recruitment
- Develop student recruitment materials
- Begin planning for fly-over film development
- 1st Advisory Board Meeting in June
- Seek additional funding for follow-up projects

July-Sept 2017

- Continue speaker recruitment
- Website Development
- Marketing materials completed
- Planning for documentary
- Fly-over introduction film completed
- Develop survey instruments

Oct-Dec 2017

- 2nd External Advisory board meeting
- Confirm speakers for June 2018
- Begin recruitment of student and adult participants
- Confirm additional funding for follow-up projects
- Continue documentary planning
- Logistics planning for event

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Jan-March 2018

Speakers confirmed
Recruitment of student and adult participants continues
Logistics planning for event
Documentary planning completed
Website and marketing finalized
Continue development of survey instruments

April-June 2018

Speakers confirmed, contracts signed
Participants finalized
Logistical planning finalized

Shift Change Event June 6-9, 2018

External Advisory Board meeting at ***Shift Change*** event
Shift Change Solutions Awards presented on last day of the event

July-Sept 2018

Event outcomes posted on website
Documentary filming about projects begins
Shift Change Solution Awardees begin work
Event survey analysis completed
External Advisory Board meeting
Report to BNRC regarding event outcomes

Oct-Dec 2018

Recruit speakers for June 2019
4-month follow-up interviews of awardees
Identify funding for 2019 event

Jan-March 2019

Continue documentary filming of projects
Speakers confirmed for 2019
Recruitment of student and adult participants
Logistics planning for event

April-June 2019

Speakers confirmed, contracts signed
Participants finalized
Logistical planning finalized
Shift Change Event June 5-8, 2019
External Advisory Board meeting at ***Shift Change*** event
2018 ***Shift Change Solutions Awardees*** present at the event
Final report to BNRC regarding outcomes

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Partnership Activities	2017						2018						2019		
	Jan-Feb	Mar-Apr	May-June	July-Aug	Sept-Oct	Nov-Dec	Jan-Feb	Mar-Apr	May-June	July-Aug	Sept-Oct	Nov-Dec	Jan-Feb	Mar-Apr	May-June
Monthly Planning Meetings	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Recruit External Advisory Board		x	x												
External Advisory Board Meetings				x		x			x		x			x	x
Recruit Speakers		x	x	x	x	x			x	x	x	x	x		
Confirm Speakers							x	x					x	x	
Award Notification			x												
Website Development				x	x										
Marketing Materials Completed					x						x				
Logistics Planning Completed						x	x					x	x		
Documentary Planning					x	x	x								
Flight Video for Intro. Completed					x										
Seek funding for follow-up projects	x	x	x	x	x	x				x	x	x	x		
Follow-up project funding confirmed						x	x					x	x		
Recruit participants/advertise							x	x	x				x	x	x
Shift Change Event									June 6-9, 2018						June 5-8, 2019
Follow-up Projects Awarded									x						x
Event Outcomes Posted on Web										x					x
Video Document of Funded Projects									x	x	x	x	x	x	
Final Video Artifacts Presented															x

Evaluation Activities	2017						2018						2019		
	Jan-Feb	Mar-Apr	May-June	July-Aug	Sept-Oct	Nov-Dec	Jan-Feb	Mar-Apr	May-June	July-Aug	Sept-Oct	Nov-Dec	Jan-Feb	Mar-Apr	May-June
Develop Survey Instruments				x	x	x	x	x							x
Event Surveys Administered									x						x
Event Survey Analysis										x	x				x
4 mo. Follow-up Interviews											x				
8 mo. Follow-up Interviews													x		
Final follow-up Interviews															x
Year 1 Report									x						
Year 2 Report															x
Dissemination/Publication										x	x	x			x

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The **Shift Change** Leadership Team is composed of highly-dedicated professionals who are committed to fulfilling the project goals. The core partner organizations are as follows:

- 1) Butte Local Development Corporation
- 2) Clark Fork Watershed Education Program (Cfwep.Org) at Montana Tech
- 3) Montana Tech Biology and Chemistry/Geochemistry Departments and Office of Sponsored Programs
- 4) Headframe Spirits
- 5) Eye Land Institute/Imagine Butte Resource Center
- 6) The Science Mine
- 7) Montana State University - Billings, Department of Education

The leadership team members are:

Pam Haxby-Cote, Executive Director, Butte Local Development Corporation
Rayelynn Connole, Director of Cfwep.Org
John McKee, Owner, Founder, Chief Technology Officer of Headframe Spirits
Dr. Marisa Pedulla, Biology, Professor Montana Tech
Dr. Alysia Cox, Geochemistry, Assistant Professor Montana Tech
Dr. Arlene Alvarado, Education Coordinator of Cfwep.Org
Dr. Kenneth Miller, Chair College of Education MSU
Olivia Everett, Artistic Director, Eye Land Institute/Imagine Butte Resource Center
Dr. Beverly Karplus Hartline, VC for Research, Dean of Graduate Studies, Montana Tech—Chair, External Advisory Board
Dr. Robert Pal, Restoration Ecology, Assistant Professor, Montana Tech
Dr. Colleen Elliott, Geology, Bureau of Mines and Geology, Science Mine Board Member
Dr. Fred Hartline, Physics, Science Mine Board Member
Justin Ringsak, Executive Director, Red Mountain Communications
Joe Griffin, Retired from MT Department of Environmental Quality, Citizen Member

The leadership team has representation from all three domains of practice that **Shift Change** aspires to include in programming. Each member brings a unique set of experiences, background, and approach. Along with the Leadership Team, **Shift Change** will engage an External Advisory Board that will assist the Leadership Team with development of the programming and with ensuring progress toward project goals. The External Advisory Board will be chaired by Dr. Bev Hartline who will assist the Leadership Team with selection of additional advisory board members in the SEE AND ACT domains. The External Advisory Board will attend the **Shift Change** event and will meet with the Leadership Team twice per year.

Follow-up for the **Shift Change Solutions Awards** will be carried out through sub-contract to the Clark Fork Watershed Education Program (Cfwep.Org). The Cfwep.Org staff team, through their partnership with the Montana State University-Billings, will design a robust evaluation program to assess both the efficacy of the event itself and also

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ensure follow-up project completion. The **Shift Change** leadership team has applied for additional grant funding to assist with studying the efficacy of the **Shift Change** model. If these grant funds are not awarded, the team intends to continue with the monitoring and assessment within the scope of work for Cfwep.Org provided for in this proposal. The following charts outline how the event and the follow-up awards will be assessed.

Table 1: Evaluation measures for assessing effects for participants.

Questions	Measures
<p>Q1: Does this event type change participant understanding of pertinent environmental, engineering, social, political, and economic issues related to the Clark Fork Watershed and its relation to the nation as a whole?</p>	<ul style="list-style-type: none"> • Pre- and post-knowledge surveys for participants • Reflection Exit Tickets collected after each section of the event • Video documentation of collaborative group work during event
<p>Q2: Is there a difference in learning outcomes based on participants' background knowledge, experience, discipline area, or age group?</p>	<ul style="list-style-type: none"> • Survey data is coded and collated by grouping
<p>Q3: Does this event type produce meaningful outcomes in the domains of economy, science, policy, and art/media?</p>	<ul style="list-style-type: none"> • Video documentation of collaborative planning • Video documentation of funded project outcomes • Tracking of number of proposals submitted post event by participants via self-report survey • Tracking of number of presentations/ papers presented by participants via self-report survey • Follow-up interviews with funded project teams
<p>Q4: Do participants' attitudes and dispositions toward creating solutions for complex environmental challenges shift as a result of the event?</p>	<ul style="list-style-type: none"> • Pre- and post-attitudinal surveys for participants • Follow-up interviews

*Shift Change***Table 2:** Measures that address high school and college student response.

Question	Measure
Q5: To what extent does participation in the <i>Shift Change</i> event change student attitudes and disposition toward STEM-related topics?	<ul style="list-style-type: none"> • Student pre- and post-attitudinal survey • Comparison follow-up survey for students who continued on with a project team as compared to those who did not and only attended the event.
Q6: To what extent does participation in the <i>Shift Change</i> event increase student engagement and interest in STEM concepts, processes, and careers?	<ul style="list-style-type: none"> • Student pre- and post-attitudinal survey • Comparison follow-up survey for students who continued on with a project team as compared to those who did not and only attended the event.
Q7: What is the impact of participating with a project team on student self-efficacy and disposition toward science, affecting policy decisions, or making artworks that convey important technical information?	<ul style="list-style-type: none"> • 4-, 8-, and 12-month interviews • Post-funding survey and reflection piece

Table 3: Evaluation questions and measures that address project goals.

Project Goals	Measures/Evidence of Achieving Goal
G1: Provide an inspirational and effective event for diverse participants, ensuring long-term collaborations and a cost effective model. Is a format of this type achievable and effective?	<ul style="list-style-type: none"> • Participant satisfaction survey • Cost analysis provided by External Advisory Board • Network analysis survey completed post event at 6- and 12-month intervals
G2: Create positive collaboration and follow-up opportunities for participants. Does creating an event of this type help create new networks and collaborations that lead to innovative solutions?	<ul style="list-style-type: none"> • External review of <i>Shift Change</i> Awards • Network analysis survey
G3: Provide mentorship opportunities for students involved in <i>Shift Change</i>. What are the long-term impacts (if any) for participants following the event?	<ul style="list-style-type: none"> • Report number of student participants • Follow-up with those who engage in long-term projects (4-,8-, and 12-month interviews)
G4: Identify/develop a process that works for bringing together a diverse group of people who create a common vision for tackling difficult tasks. What are the key elements needed for an effective model of this type? What elements of this unique format do participants rank as most valued?	<ul style="list-style-type: none"> • Report on diversity (background knowledge, experience level, discipline, and demographics) to External Advisory Board • Event surveys • Summarize event outcomes and post-event projects

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The overall costs of the **Shift Change** event are estimated at \$350,000 per year. This estimate includes the follow-up awards, facilitation costs, food, venue, marketing, and overall management. This proposal seeks \$100,000 from BNRC to facilitate the first **Shift Change** event and two **Shift Change Solutions Awards** for 2018. The Leadership Team agrees to matching the \$250,000 needed to host the event in 2018. The **Shift Change** Leadership Team will withdraw our application if the remaining funds for the event are not secured. The following budget outlines how the BNRC funding will be allocated. Funding is requested to begin July 2017 and continue through June 2019. Due to the cost-reimbursable nature of the BNRC funding, this timeline is extended to include the follow-up project awards that will commence in June 2018 through 2019.

Salary and Fringe Benefits**\$0**

Butte Local Development Corporation will match salary and benefits for administering the grant funds for the **Shift Change** project. BLDC estimates approximately 5 hours per month per year for the project. BLDC will match **\$8,712** in salary and benefits. Should the NSF grant (or others) be awarded to our team, a revised match will be provided to the BNRC that includes match from the other sources.

Contracted Services**\$45,438**

This category includes funds for logistics support for Ten Directions, a change management facilitation firm, that has agreed to assist the Leadership Team with development of the **Shift Change** event. The total cost of facilitation is \$30,000 per year. We are requesting **\$15,000** for the first year from BNRC. Graphics/printing are minimally supported at **\$1,500** and **\$938**. Speakers fees are calculated at \$1,000 plus travel for 8 speakers and totals **\$10,000**. Venue costs and food for the event for 200 people is estimated at \$50,000. We are seeking **\$10,000** to support this line item. Follow-up and monitoring activities will be conducted through contract with Cfwep.Org. The total estimate for development of the evaluation tools and completion of the analysis is \$10,000 per year. We are seeking **\$5,000 to support Cfwep.Org's efforts for evaluation and follow-up mentoring for students.**

Supplies and Materials**\$1,000**

Minimal support for supplies and materials is included in the budget. The Leadership Team is working to identify sponsor partners who may be able to supply incidentals for the event.

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Communications**\$1,000**

Communications are allocated at **\$1,000** to help support advertising and media outreach for the event. This line item includes planning for website development.

Travel**\$11,800**

Overnight accommodations for speakers and the event facilitation team are requested at **\$5,400**, which is approximately half of the total costs for this category. The nature of the event is to be retreat-like, meaning that all participants and facilitators will be staying at the same venue and will not leave during the event. Student overnight accommodations are also included for **\$5,400**, which is the total estimate for this category. Field trips are included in the event planning. Tucker bus rental is requested for **\$1,000** for two buses. Montana Tech buses will also be utilized for transport and will be matched by Cfwep.Org.

Participant Support Costs**\$36,000**

Two **Shift Change Solutions Awards** are planned at **\$15,000** each. The awards will be given to innovative projects that address an issue in BAO. An additional **\$6,000** is requested for 20 student scholarships to attend the event. Students will be selected from area schools in April/May 2018.

Indirect Costs

Indirect costs are requested at 5%, totaling **\$4,761** to assist with BLDC costs of administering the grant. The cost reimbursement arrangement of the small project award necessitates credit accounts which carry interest. The indirect costs will be utilized to support any banking fees that are accrued by BLDC for purchases made ahead of reimbursement.

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Expense Category	Expense		Notes	July 2017-June 30 2019	BLDC Matching Costs
Salary & Wages			Annual Rates		
	BLDC Staff		30000/ 5 hrs/mo/24 mo		1800
	BLDC Admin		80000/ 5 hrs/mo/2yrs	\$ -	4800
	Total	0.00		\$ -	\$6,600
Fringe Benefits					
	Contracted Professional		32%	\$ -	\$2,112
				\$ -	
	Total			\$ -	\$2,112
					\$8,712
Contracted Services					
	Conference Logistics Support		10 Directions	\$ 15,000	
	Graphics Work			\$ 1,500	
	Fly Over Video Development			\$ 3,000	
	Printing			\$ 938	
	Venue Rental/Food			\$ 10,000	
	Speaker Fees		\$1,000 + travel/8 speakers	\$ 10,000	
	Project Follow Up Support		Contract to CFWEP	\$ 5,000	
	Total			\$ 45,438	
Supplies & Materials					
	Conference Supplies			\$ 1,000	
	Total			\$ 1,000	
Communcations					
	Media/advertising			\$ 1,000	
	Total			\$ 1,000	
Travel					
	Overnight accommodations for speakers and event staff		\$180/room 10 rooms for 3 days	\$ 5,400	
	Student overnight accommodations		\$180/room 10 rooms for 3 days	\$ 5,400	
	Field Trip Buses		2 Tucker Buses (2 days)	\$ 1,000	
	Total			\$ 11,800	
Participant Support Costs					
	Shift Change Solution Award			\$15,000	
	Shift Change Solution Award			\$15,000	
	Student Event Scholarships		20 students at \$300/student	\$6,000	
	Total			\$36,000	
Total Direct Costs				\$ 95,238	
Modified Direct Costs					
Indirect Costs BLDC				5% \$ 4,761.90	
TOTAL				\$ 100,000	
					\$8,712
					BLDC Match