

Pilot Program Proposal

October 17, 2008

The attached document describes a pilot program of a Policy Option Package for funding approval by the 2009-2011 Biennium Session of the State of Oregon. The Policy Option Package is being submitted by the Engineering Technology Industry Council (ETIC). ETIC is an established association of Oregon Technology Companies that work closely with the State of Oregon to propose and oversee state approved funds to improve higher education. The goal of ETIC is to double the number of Engineering and Technology degrees granted over the next 10 years by the seven state schools that comprise the Oregon University System.

Currently the Engineering Schools within the Oregon University System have capacity for more students. The program being piloted is focused on increasing the number of secondary school students who choose to pursue and complete an engineering degree. The approach is to provide increased opportunities for students to experience real engineering by empowering local school champions who would direct and coach extracurricular engineering challenges and activities. A number of State and National Engineering Challenges already exists, but the lack of competitive teacher stipends is limiting the number of school sponsored teams.

The ETIC Policy Option Package proposes to enable these extracurricular activities by incentivizing schools to pay stipends to Engineering Directors/Head coaches and assistant coaches through a 3-year matching grant. Stipends are to be comparable to those currently paid to Athletic Directors, Head Coaches, and assistant coaches. Biennium funding of \$400K is currently being proposed for this component of the ETIC Policy Option Package, but this figure could change based on economic conditions and the results of this Pilot Program.

Biennium approval for continued funding of the ETIC base budget is expected even if the Policy Option Package is not approved. OPAS has proposed a \$115K funding level from the ETIC base budget for the proposal that is being piloted. The \$115K funding equates to \$62.5K per year. Several charts are included in Appendix C to illustrate how the seed funding generates ramping matching funds, participating schools and participating students. The charts assume continued funding through 2014 at the levels contained in the OPAS proposal to ETIC. A copy of the funding table from the OPAS proposal is included in Appendix D.

Detailed analysis show that schools currently offer stipends in all other areas that have strong student involvement. Examples include athletics, band, debate, choir, drama, etc. The lack of stipends for engineering activities contributes directly to the low number of outside school programs sponsored by the schools to attract students to engineering, invention, innovation, and design. Another study shows 80% of the schools sponsoring a FIRST Robotics Challenge (FRC) team made plans to increase their engineering classroom opportunities by the second year of the program. Recognizing the importance of this, Washington State recently approved stipends for FIRST Robotics Challenge coaches.

ETIC supports this approach as one way to increase the number of high school students pursuing an engineering degree. The attached pilot program will be used to fine-tune the ETIC proposal and determine how best to administer the funding that is listed in Appendix D.

Pilot Program for Establishing High School Engineering Activity Directors and Coaches

Purpose: Determine feasibility of seeding out-of-school-time engineering coaching stipends as a way to establish permanent school district funding in support of a Policy Option Package proposal for Oregon Biennium from July 1, 2009 to June 30, 2011

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Summary of ETIC Policy Option Package proposal being piloted:

Purpose

Increase secondary school student's motivation and preparation to pursue a college Engineering Degree program by enabling more out-of-school-time engineering experiences for students.

Vision Statement

All Oregon High Schools will provide the opportunity to actively participating in after school engineering experiences and challenges.

Long-term Goals

1. *Schools will prioritize funding for engineering challenge participation at an equivalent or higher level than student athletics. School based athletic programs have created an enviable system of developing pro athletes in the USA. A core part of that system is an extensive coaching stipend program that assures committed individuals will be compensated in a way that encourages the growth and stability of the system. They are the undisputed model of how to motivate and involve large numbers of students and parents.*

Analysis: Multiple statewide and national, volunteer driven, engineering challenge sponsoring organizations already provide the infrastructure for organizing and hosting different types of engineering challenge. Examples include: Engineering Design (e.g. Design Squad), Computer Programming (e.g. Oregon Game Programming Challenge), or Robotics (FIRST Tech Challenge, FIRST FRC Challenge). Teams will be required to pick a challenge from an approved list to increase program consistency and local school competitions.

2. *In 2015, after 6 years of seed funding provided by this proposal, a successful out-of-school-time (OST) engineering program will result in at least 70 Oregon high schools sponsoring Engineering Clubs that organize engineering challenge teams.*

Analysis: These OST clubs and teams will be funded in the same manner as current school athletic programs which encompass teacher stipends, materials, and participation fees. These clubs will enable at least 2000 students to participate in small team engineering challenges. Contact hours per students on a challenge team are expected to be a minimum of 150 hours. Contact hours for students interested

in joining these Engineering clubs, but deciding not to participate at the team challenge level are expect to be around 100 hours per school year.

- 3. In year 2015 at least 1000 Oregon High School Students will Letter in Engineering with a high percent pursuing an Engineering Degree. Schools will be encouraged to develop criteria for receiving a letter of engineering (parallel to "Lettering" in sports) based on active participation in one or more engineering challenges plus some course requirements.*

Pilot Investment Description

The pilot investment description is the same as what is proposed in the Policy Option Package except the funding is for five schools instead of 20 and will extend for one school year (2008-2009) instead of multi-year funding. Pilot monies will be used as matching funds to pay an extra duty stipend for an Engineering Director/Head Coach and their Assistant Coach. The one year Pilot funding will match up to 6K to cover up to a 12K stipend expense. This amount is based on current stipends paid to athletic Oregon High School Coaches and Assistants. For the Pilot, school districts are required to pay or fundraise 50% of the stipend costs.

School districts selected for the pilot are expected to continue the program through funding provided by the ETIC Policy Option Package. In this ETIC program school districts are required to pay or fund raise 50% of the costs for the first two years, 75% for the third year, and commit to funding the program at 100% for at least two additional years. The Pilot program will be considered as the first year of this ETIC program. Stipend matching funds beyond the first year (2008-2009) are contingent upon approval of the ETIC Policy Option Package. Additional fundraising may be undertaken based on the success of this Pilot Program if requested ETIC funds are not approved by the 2009-2011 Oregon Biennium.

Seed funding to purchase engineering material is also included. The initial year funding is 4K per school and is based on the current cost of purchasing three First Tech Challenge Robotic kits. The school and/or associated parent booster club is expected to pick up material funding for the following years.

Total Pilot funding request is for 50K, to be budgeted as follows:

Stipends for five school (6K matched by school district) – 30K

Material for five schools (4K per school) – 20K

Actual stipend amounts will be determined by each of the 5 Pilot schools based on being competitive with a current athletic coach stipend with equivalent qualifications and experience. The size of the extra duty stipend for the Engineering Director/Head Coach needs to be significant enough to establish the coach as a school champion for engineering, similar to the role a head football coach plays in championing that sport for the school. As with athletic stipends, the stipend amount is intended to make this position a highly coveted assignment and to bring recognition to this position, the mission and the students served. It is expected that the training and recruitment of assistant coaches and student team members and the encouragement of a parent booster club will be assumed responsibilities of this position and covered by the extra duty stipend. Like the head football coach extra duty stipend, this extra duty stipend will be performance based and can even be awarded to a non-faculty member if trained faculty are not on staff.

Funding is not being requested for organizing and hosting engineering challenges as there are already several such organizations in place. Some examples are the FIRST organization with its First Robotics and First Tech challenges; the MIT Lemelson Foundation's current InvenTeam challenge; IEEE has developed a Design Squad program for local events based on the Design Squad TV show. The Pilot seed funding will enable high school faculty to organize and coach teams to participate in these programs in the same way athletic coaches participate in sporting events through extra duty stipends and team parent booster clubs. These engineering challenges are expected to compliment and extend the impact of the in classroom engineering courses and faculty training programs.

Pilot School selection will be for schools that already have trained and experienced engineering coaches. Coach training and instruction is not part of this pilot program

Private and Federal Support

As mentioned above, several private organizations are already sponsoring engineering challenges of various types. They are supported by a collection of participant fees and foundation grants. The requested seed money is expected to greatly increase participation in these events by compensating high school teachers to recruit and coach teams while developing a sustainable program around these challenges. No additional explicit private or federal funding is required. It is expected that a successful OST engineering challenge program will cause additional funds to be channeled through the sponsoring organizations.

Pilot Funding Management

The Tech Start Foundation has agreed to administer the Pilot program finances. They have already appointed a program manager, who will arrange for the funds to be deposited into a 501c3 account and will work with the selected Pilot schools to arrange the distribution of the matching stipend funds and the 4K material reimbursement.

Pilot Schools

The following five schools have already completed or are expected to successfully complete a Pilot funding application. All of these schools already have OST engineering challenge teams with coaches.

School	Location	Contact	10/1/08 Status
Tigard High School	Tigard - Tualatin School District	Jill Hubbard	Stipend approved by school district. Able to fundraise matching funds
Cleveland High School	Portland – Portland Public Schools	Tamar Purkey	Completed fundraising need for matching stipend dollars
Hillsboro High School	Hillsboro – Hillsboro School District	Don Domes	Secured stipend matching funding from Principal
Sherwood Middle School, Hopkins Elementary, Middleton Elementary, Archer Glenn Elementary	Sherwood – Sherwood School District	Terrel Smith	Secured stipend matching funds from Chalkboard foundation
Cascade School District (Elementary & Jr. High School)	Turner	Kathy Soderstron	Has access to TAG funds for matching stipend dollars

Measuring Pilot Program Results

Semester reports from the Head Engineering Coach of each school will be required that tracks the number of students and contact hours resulting from their engineering challenges and engineering club activities. Reports will also include the number of minority and underserved students. These reports will be sufficient to measure the specific numerical goals of this seeding program. Other metrics, such as coach and student retention will be used to evaluate the Pilot program in support of finalizing the ETIC Policy Option Package proposal.

Pilot Schools will be expected to support the addition of extra duty stipends for Engineering Directors and Assistant Coaches during regularly scheduled union contract negotiations. The inclusion of these extra duty stipends will be another measure of the success of this Pilot program.

The full ETIC/OPAS program has proposed a more extensive set of evaluation criteria. The full program will also identify some focus rural and underserved schools that are currently being served by the MESA and SMILE programs. The OPAS/Motivate work group membership includes directors from these programs, who will help these schools to take full advantage of this ETIC Engineering Challenge Program. Full program metrics will track minority and underserved student participation levels as well as determine the level of use of identified best practices to motivate and prepare students to successfully pursue an engineering career. The Pilot Program will also be used to help finalize how best to evaluate the full program.

Appendix A – Fact Sheet

1. The USA currently produces less than 7% of the world wide Engineering Bachelor degrees
2. "The American education system...just is not stimulating enough young people to want to go into science, math, and engineering." (page 270, The World is Flat by Thomas L. Friedman)
3. FIRST Robotics Challenge (FRC) students enter college at a rate of 88%. (Brandeis University study)
4. School based athletic programs have created an enviable system of developing pro athletes in the USA. A core part of that system is an extensive coaching stipend program that assures committed individuals will be compensated in a way that encourages the growth and stability of the system. They are the undisputed model of how to motivate and involve large numbers of students and parents.
5. 80% of the schools with an FRC team made plans to increase their engineering classroom opportunities by the second year of the program. (FIRST robotics)

Appendix B – DRAFT Pilot Application

TechStart Foundation/Oregon Computer Science Teachers Association

Engineering/ Technology After School Pilot Program and Instructor Application

Purpose: To promote After School Engineering/Technology Programs that complement Athletic/Band/Other opportunities for students. The ultimate goal is to have an Engineering and Computer Science Champion in each school with competitive opportunities for students.

The school district could choose one of two technology activity structures:

Suggested district-wide engineering/ technology activities director responsibilities:

- Publicize and promote the clubs through district and community publications and the web
- Manage the volunteers
- Schedule locations
- Coordinate competitions
- Attend the competitions
- Manage forms and paperwork
- Submit articles to the local newspapers
- Attend two club meetings every week
- Communicate with parents on a regular basis
- Be a member of the district technology committee
- Coordinate the technology classes offered during summer school

Suggested building engineering/ technology club coach responsibilities:

- Publicize and promote the building club through building and community publications and the web
- Manage and track the budget
- Coordinate competitions
- Attend the competitions with the team/s
- Manage forms and paperwork
- Submit articles to the local newspapers
- Communicate with parents on a regular basis
- Be a member of the district technology committee
- Meet with the team two days per week
- Provide competition options through the following contests:
 - FTC, FLL, FRC, Willamette Programming contest, OGPC, Invent Team

TechStart
Education Foundation

The TechStart Foundation will provide the following seed funding:

(Total Program cost is estimated at \$15,000 per year: Coach, Assistant Coach and some supplies/registrations)

- 50% of the total program costs for the first two years estimated at \$7500 per year
- 25% of the total program costs for the third year estimated at \$3750
- Note: Head Coach stipend should approximate Head Coach salaries for Football/Basketball

The school district will commit to:

- Long term funding and training for the Coach/Director positions
- Facilities, storage and meeting locations
- Contractual agreement with the local certified association (teachers union) for these positions
- Funding for needed supplies and transportation (TechStart Foundation expects to have limited funding grants to help with start-up supply costs on an as needed basis)

The above signed agrees that the _____ School District will provide the above resources to establish an engineering/ technology after school program.

Signature of District official: _____

Engineering/ Technology coach/instructor/assistant will:

- Invest 175-250 hours per year for the head coach
- Invest 125-175 hours per year for the assistant coach
- compete in at least one competition per year
- Provide at least two meetings per week per team
- Complete surveys and annual reports as requested by Tech Start Foundaton

Signature of the head Technology Club coordinator/coach: _____

Application for potential coaching position. Date _____

Your Name / School Name _____

Assistant Coach Name _____

School District _____

Email Address _____

After Hours Phone Number _____

School Phone Number _____

Potential targeted competitions _____

Total estimated number of students involved: # male _____ # female _____

Estimated number of above students who are in under-represented populations: # Minority _____

Approximate size of school _____ Percent of school on free or reduced lunch _____

Answer the following questions: (Use additional paper if desired)

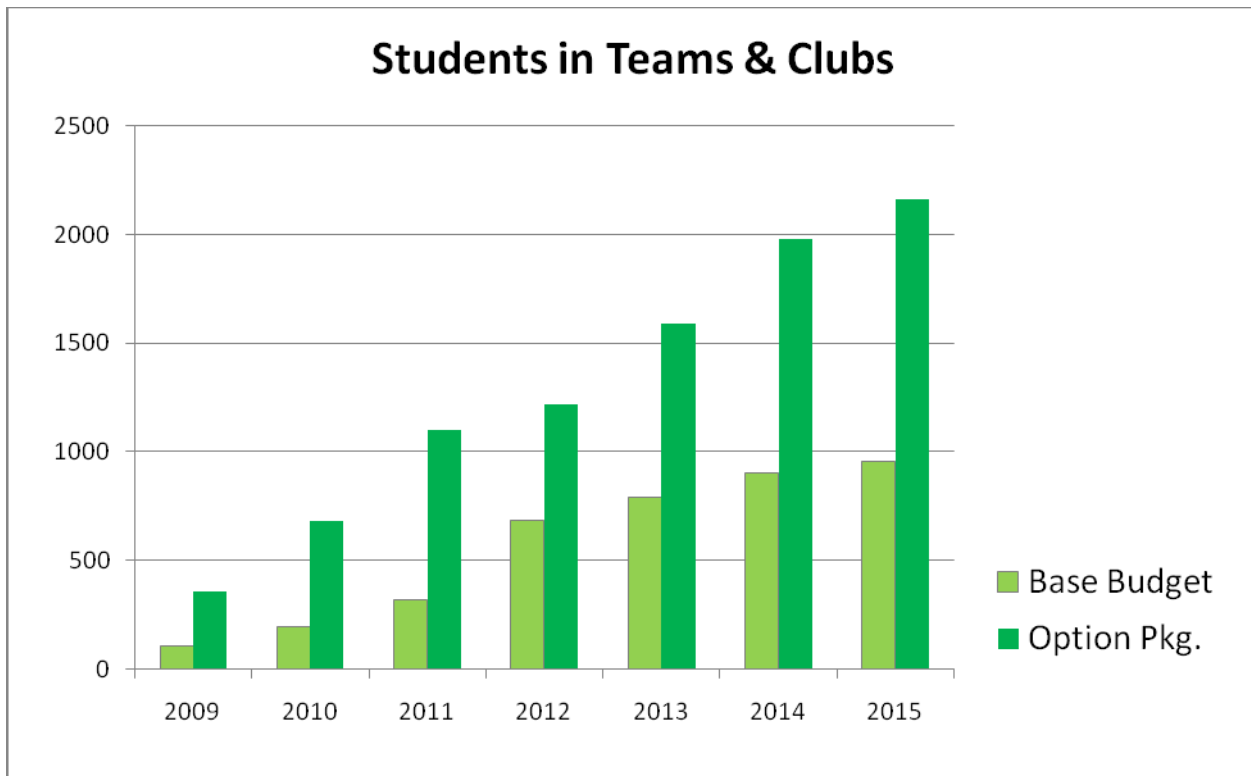
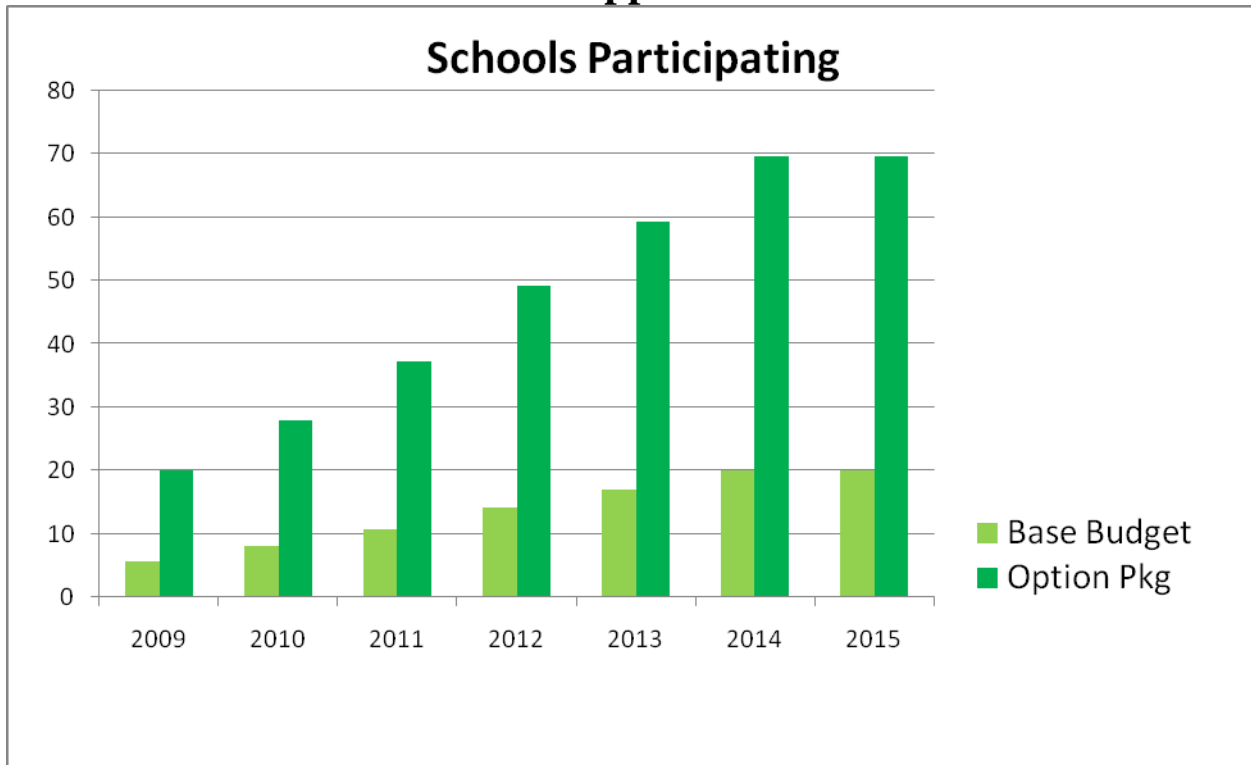
1. How many years have you taught technology courses?

2. What technology courses have you taught?

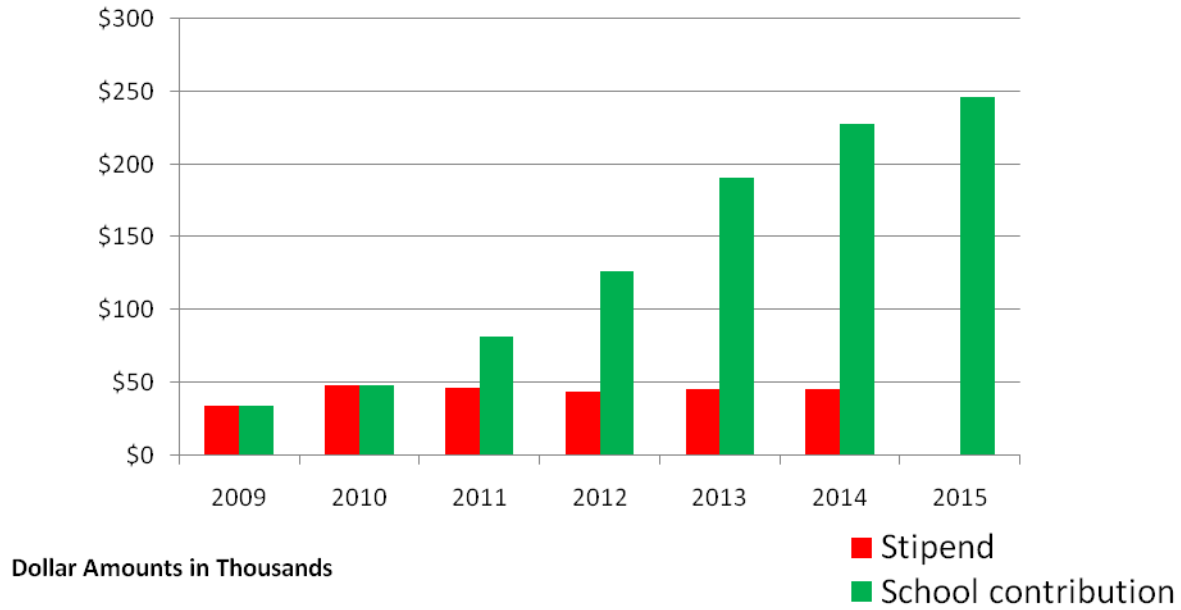
3. Which of these are you currently teaching?
4. What endorsements/CTE licenses/engineering experiences do you have?
5. List any activity/athletic coaching experience.
6. Why do you want to pursue this opportunity?

Send completed application to: Don Domes
Learning@aracnet.com
Fax: 503-648-4857

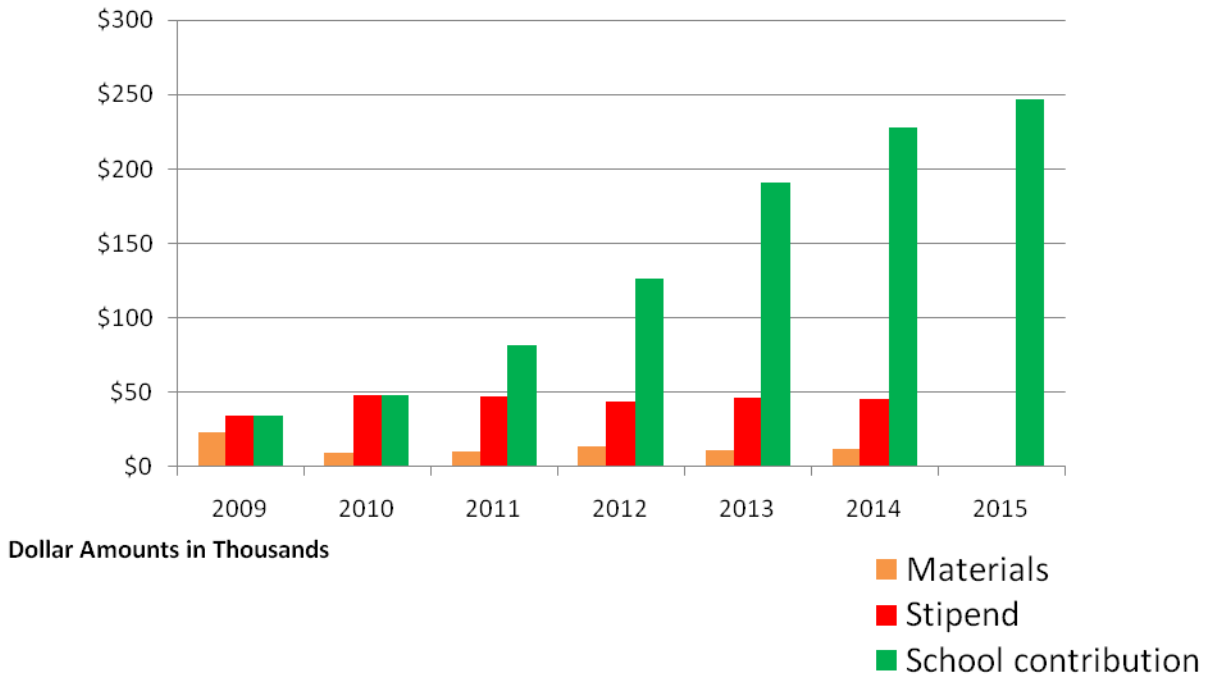
Appendix C



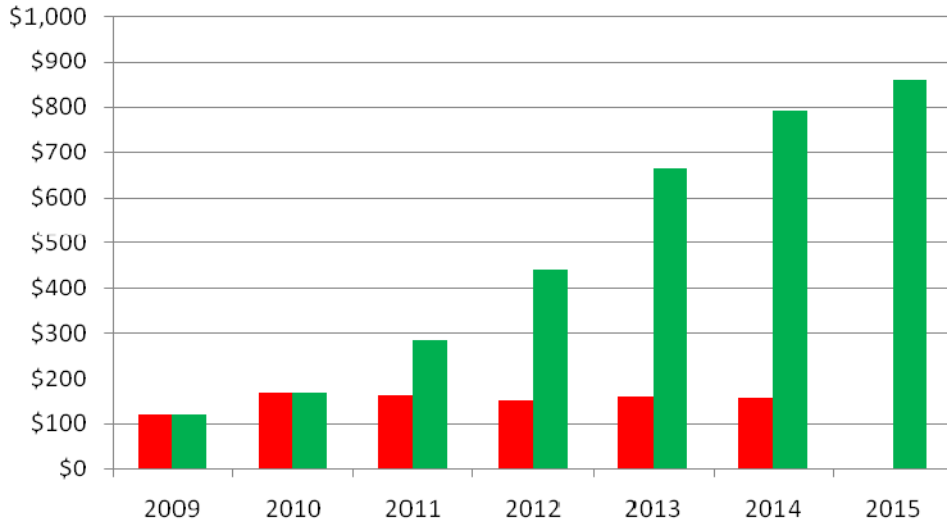
Stipend Amounts - Base Budget (\$115K)



ETIC and School Funding - \$115K Base Budget



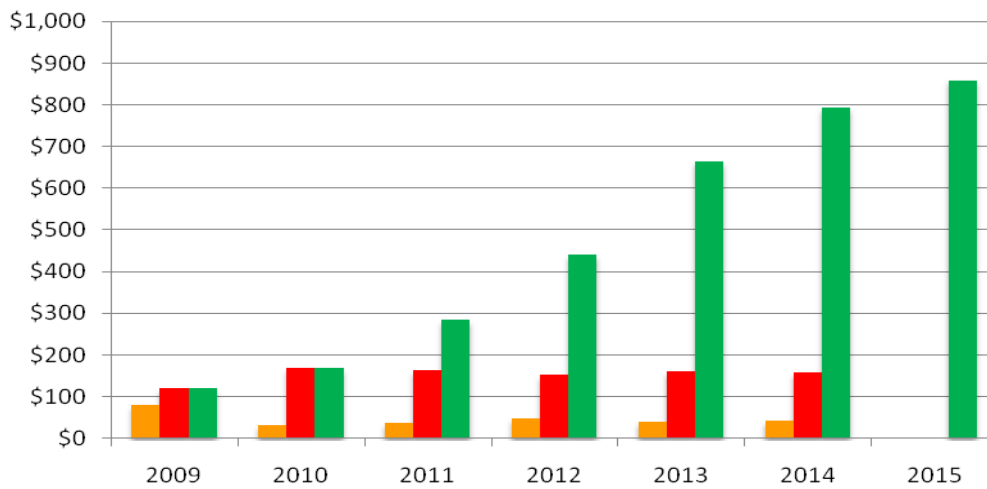
Stipend Amounts - \$400K Option Pkg.



Dollar Amounts in Thousands

■ Stipend
■ School contribution

ETIC and School Funding - \$400K Option Pkg.



Dollar Amounts in Thousands

■ Materials
■ Stipend
■ School contribution

Appendix D

From OPAS Proposal to ETIC

April 7, 2008

Budget	EBL	POP	Total
▪ Programs for grades 9 through 12			
▪ Leadership, administration, marketing and reporting	\$ 34,474	\$ 85,526	\$ 120,000
▪ Stipends to teacher/coaches	\$ 71,820	\$ 178,180	\$ 250,000
▪ Materials and registration for teams	\$ 43,092	\$ 106,908	\$ 150,000
▪ Training of teachers/coaches -- for all pre-engineering co	\$ 14,364	\$ 35,636	\$ 50,000
▪ Grants specific to particular "leagues" for training and re	\$ 28,728	\$ 71,272	\$ 100,000
▪ Evaluation	\$ 11,491	\$ 28,509	\$ 40,000
▪ Subtotal	\$ 203,969	\$ 506,031	\$ 710,000