Grand Challenges and Incentive Prizes

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"By defining our goal more clearly, by making it seem more manageable and less remote, we can help all peoples to see it, to draw hope from it, and to move irresistibly towards it."

- President John F. Kennedy

June 10, 1963

Commencement Address,

American University

Strategy for American Innovation

"The Federal government should … use high-risk, high-reward policy tools such as prizes and challenges to solve tough problems."

-President Barack Obama

August 5, 2009

Grand Challenges

Grand Challenges

Attributes of Grand Challenges

1. Significant impact in areas of national and global priority
2. Ambitious yet achievable
3. Compelling and intrinsically motivating
4. “Goldilocks” level of specificity and focus
5. Able to harness innovation and advances in science and technology

Benefits of Grand Challenges

1. Help solve important economic and societal problems
2. Serve as a "North Star" for high-impact, multi-disciplinary collaborations and public-private partnerships
3. Create the foundation for the industries and jobs of the future
4. Capture public imagination and increase support for public policies that foster science, technology, and innovation
5. Inspire the next generation of scientists, engineers, and entrepreneurs

Current Public Sector Grand Challenges

Department of Energy: Clean Energy Grand Challenges

- **SunShot:** To make solar energy cost competitive with other forms of energy by 2020
- **EV Everywhere:** To make electric vehicles as affordable and convenient to own as gas-powered vehicles by 2020

USAID: Grand Challenges for Development

- **Saving Lives at Birth**: To increase access to primary health care for pregnant women and newborns by at least 50%
- **All Children Reading**: To have students in low-income countries leave primary school with basic reading skills

All Hands on Deck

1. Foundations and donors: organize philanthropic giving around Grand Challenges
2. Universities: organize research initiatives to meet ambitious Grand Challenge goals
3. Companies:
   - Identify a Grand Challenge they can contribute to
   - Sponsor major incentive prizes designed to address a Grand Challenge
   - Be early customers, provide capital, or provide mentoring to startups pursuing a Grand Challenge
4. Angel, venture, and impact investors can back startups that are pursuing Grand Challenges
5. Media companies and America's storytellers can help make engineers and entrepreneurs pursuing Grand Challenges the rock stars of the 21st century

Incentive Prizes

Prizes: Long Track Record of Spurring Innovation

1919 Orteig Prize
Charles Lindbergh: Non-Stop Flight NY-Paris

"[T]otal funds from large prizes have more than tripled over the last decade to surpass $375 million."

- And the winner is…
McKinsey 2009

Benefits of Prizes

1. Shine a spotlight on a problem or opportunity
2. Pay only for results
3. Target an ambitious goal without predicting which team or approach is most likely to succeed
4. Reach beyond usual suspects to tap top talent
5. Stimulate private sector investment many times greater than the prize purse
6. Bring out-of-discipline perspectives to bear
7. Inspire risk-taking by offering a level playing field
8. Establish clear target metrics and validation protocols

America COMPETES Reauthorization Act

"Each head of an agency, or the heads of multiple agencies in cooperation, may carry out a program to award prizes competitively to stimulate innovation that has the potential to advance the mission of the respective agency"

-Congress

December 21, 2010

Prize Types

1. Exemplar (recognition)
2. Point-solution
3. Exposition
4. Participation
5. Network
6. Market stimulation

Considerations in Prize Design

START WITH:

- What problem, gap, or market failure will be addressed?
- Why a prize instead of another form of R&D or engagement?
- Who do you hope to mobilize to compete?

THEN CONSIDER:

- Target audiences
- Potential partners
- Available data sets
- Metrics, judging, evaluation
- Size of prize purse
- Non-monetary incentives
- Estimated operating funding
- Milestones/stages/timeline
- Key risks

AFRL Vehicle Stopper Challenge

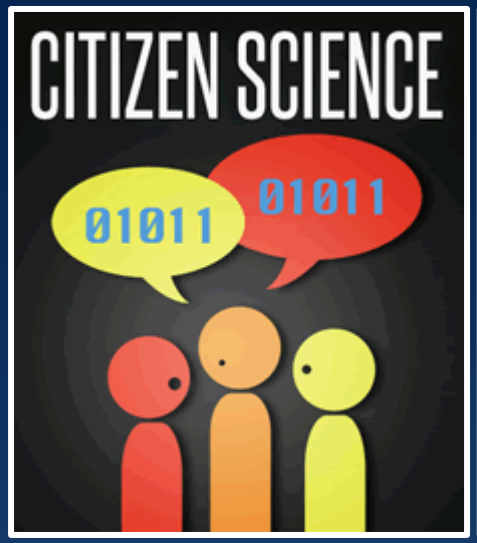
- $25,000 for design for a system that could safely stop uncooperative fleeing vehicles without harm
- Solution in 60 days
- Winner was a retired 66-year-old mechanical engineer from Lima, Peru

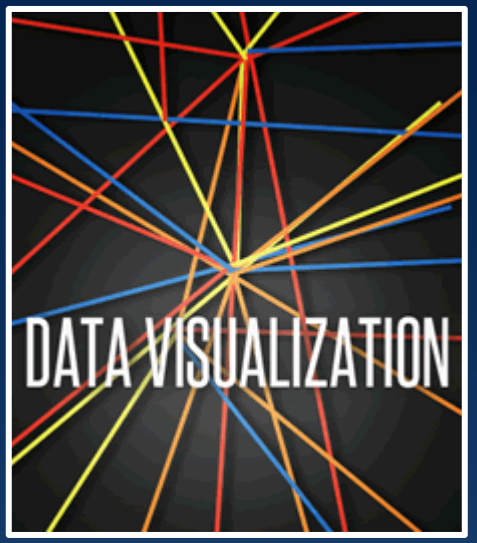
- Solution was a remote electric-powered vehicle that can accelerate up to 130 mph within 3 seconds, position itself under a fleeing car, and then automatically trigger a restrained airbag to lift the car and slide it to a stop

Aspen Prize for Community College Excellence

- $1M prize to recognize community colleges with outstanding academic and workforce outcomes in both absolute performance and improvements over time
- Administration and Dept. of ED support in prize design and launch, but no government funding
- Created discussion among key stakeholders regarding the data and metrics to be used to judge excellence
- Resulted in collection in large body of data about community college programs
- Winner: Valencia College (FL) + 4 finalists-with-distinction
- Year two under development

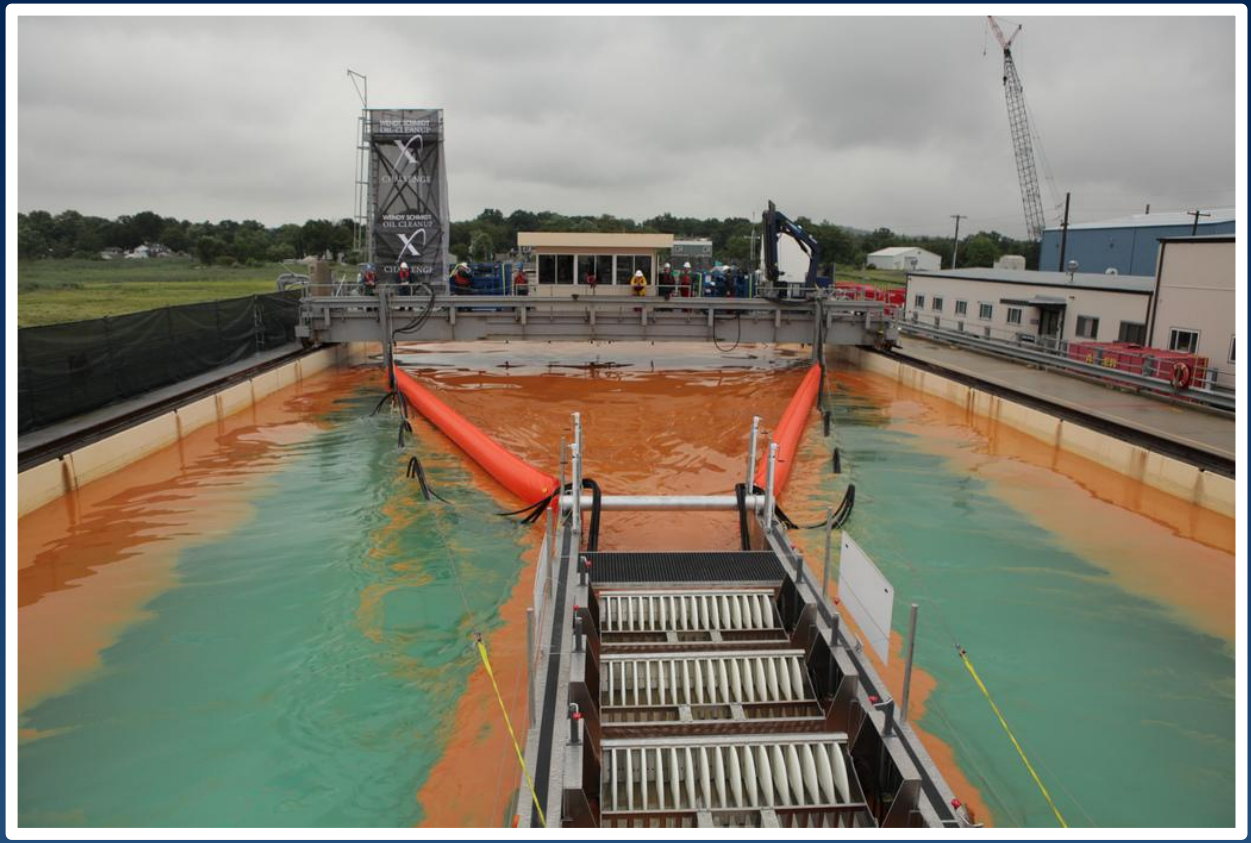
International Space Apps Challenge





- Codeathon-style event led by NASA and 17 other global partners
- 2100 participants took part in 24 cities around the world over 2 days
- More than 100 solutions for 61 challenges related to space exploration and social need
- Global winners being selected by panel of VC investors and other experts

Wendy Schmidt Oil Cleanup X Challenge



- Target: 2500 gpm at 70% efficiency, 2x today's standard oil recovery rate
- 350+ narrowed down to 10 finalist teams
- $1,000,000 First Place Winner **Elastec** (Illinois)
- Achieved **4x** today's standard oil recovery rate in <6 months product development
- 4670 gallons per minute at 89.5% efficiency

Lessons Learned

1. You get what you incentivize
   - Clearly defined problem statement/goal
   - Metrics, data, and judging protocol
   - Legacy plan
2. Get the word out
   - Outreach strategy for before, during, and after
   - Think about your audiences
   - Public-private partnerships

Questions? Ideas?

Thank you