

#### Research Town Hall Meeting: Federal R&D Funding Outlook for 2013 and Beyond

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### Lewis-Burke Associates LLC



- Began working with Boston University's Office of Federal Relations last year.
- 23 professional staff members
- 18 registered lobbyists
- 23 clients, all nonprofits involved in research and/or education
  - 15 universities
  - 3 contractors running national research facilities
  - 6 national associations

#### **Select Services**



- Advanced intel on new programs or emerging agency themes.
- Strategic university-wide agenda development.
- Enhancing resources for researchers.
  - Information on new funding initiatives and prominent solicitations.
  - Support for post-docs and graduate students.
  - Thematic *deep dives* on federal funding.
- Coalition building.
- Program and project support at both political and policy levels.
- Positioning and profile enhancement.

#### Outline



- Budget Outlook for Federally-Funded Research
- Interagency Research Themes and Initiatives
- Specific Agency Activities and Directions





#### Budget Outlook for Federally-Funded Research



#### Short Term Picture



- Federal agencies implementation of sequestration.
  - Efforts to protect essential priorities.
- Finalization of FY 2013 federal funding Mar 27, 2013.
  - Flat funding and continuing resolution for most agencies.
  - Full appropriations for NSF, NASA, DOD, DHS, USDA
- FY 2014 federal budget proposal and debate on FY 2014 federal funding with future spending caps.
- Undetermined path for mandatory spending reductions for healthcare, education, etc.

#### Sequester is Here... For How Long?



Source: Steve Sack, Star Tribune



# Sequestration Being Implemented

- Broad agreement this is bad policy Divergent views over what's better.
- Biggest impact already occurring affecting agency attitudes.
- Largest impact on *future* awards:
  - Many NIH institutes: Already have implemented lower pay-lines.
  - NSF: Delayed solicitations, fewer awards.
  - Large projects will be subject to reductions.
- New initiatives favored but also most susceptible to delay.
- Agency program managers are holding highly scored proposals in reserve if sequestration is reversed.
- Obligated funds protected.

#### Horizon



- Universities have to adjust to relatively flat federal research budgets for coming years.
- Will be efforts to return to more *regular* order for spending in FY 2014 or 2015.
- R&D and basic research still a TOP priority on both sides of the aisle.
- New Initiatives still expected in the current environment.
- Public-private partnerships will remain the favored mechanism for large-scale efforts.

#### Final FY 2013 Research Funding



\*FY 2013 levels do not account for sequestration



#### **Interagency Research Themes and Initiatives**



# **Cross-Agency Research Priorities**



Multi-agency research priorities for FY 2014:

- Innovation and Commercialization
- Advanced Manufacturing
- Big Data
- Materials Research
- Cybersecurity
- Drug Discovery, Development and Translation
- Neuroscience
- Environmental Sustainability and Climate
- International
- Graduate Education
- Mental Health and Gun Control



# Innovation & Commercialization

- Administration sees innovation as key priority to support the U.S. economy.
- Administration and federal agencies are exploring ways to reduce the barriers in the translation of research results into new products, industries, and jobs.
- Increased focus at federal agencies on:
  - Public-private partnerships (e.g. NNMI).
  - Innovation training (e.g. NSF I-Corps program).
  - Translational science/drug development (e.g. NCATS at NIH).
  - Support for proof of concept funding (e.g. NHLBI CAI; NSF AIR).
  - Efforts to support economic development and regional cluster (e.g. EDA i6 program).
  - Efforts to use low cost innovations to support change (e.g. USAID DIV).

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# Advanced Manufacturing



- DOD, DOE, NSF, DOC/NIST, and NASA all involved in the effort.
- Advanced Manufacturing National Program Office (AMNPO) hosted by NIST to coordinate interagency efforts.
  - White Paper/Roundtable opportunities for input.
- Timeline:
  - March 2012 President Obama announced \$1 billion proposed National Network for Manufacturing Innovation (NNMI).
  - August 2012 First NNMI pilot awarded to Ohio in Additive Manufacturing.
  - March 2013 Three new pilot competitions expected to be announced two from DOD, one from DOE.

# **Big Data**

- Obama Administration Big Data initiative launched March 2012.
  - Focus on new tools and techniques to manage vast and complex data sets.
  - NSF, NIH, DOD, and DOE are most engaged agencies.
  - Individual agency programs more predominant than interagency activities.
  - Joint NSF-NIH Big Data Competition.
    - First round was very competitive 560 proposals submitted
- NIH Big Data to Knowledge initiative announced December 2012.
  - Data sharing and big data tools.
  - Enhance training in computational skills for biomedical researchers.
    - RFI out now with comments due March 15
  - New Centers of Excellence for Biomedical Big Data.
    - Request for Applications (RFA) expected in Spring.
    - Up to 15 investigator-initiated centers and between 2 and 5 NIH-directed centers through FY 2014 and FY 2015.

# Materials Research

- Materials Genome Initiative launched in 2011 to integrate computational and experimental tools to speed material design.
  - NSF, DOE, DOD, and NIST main agencies involved.
  - More individual agency activities than new interagency programs.
  - Administration interest in data sharing/standards, computational training, commercialization.
- National Nanotechnology Initiative continues.
  - Focus on commercialization and founding of new industries.
  - Signature Initiatives in nanomanufacturing, sensors, solar energy, and nanoelectronics.
- DOD and DOE focus on replacement and recycling of critical rare materials.
- NSF Materials 2022 report on instrumentation funding.
  - Focus on funding for instrumentation development, professional instrumentation staff, Materials Discovery Centers.

# Cybersecurity

#### • Emphasis on both research and training/workforce issues.

- Varying approaches on cyber legislation: piecemeal vs. comprehensive.
  - Narrower scope bills already underway re: research/workforce and information sharing.
- Majority of current federal funding to industry; federal government looking to leverage private sector expertise, but opportunities exist for universities strong emphasis on public-private partnerships.
- In addition to producing research, universities can serve as conveners:
  - Honest brokers.
  - Ability to highlight proven models.
  - Bring industry and other stakeholders together to solve large cyber challenges.
- University funding (smaller scale) still available:
  - NIST NCCOE (NIST currently seeking industry partners—universities scale participation).
  - New NIST Centers of Excellence program (cyber among proposed foci).
  - Ongoing programs and initiatives at NSF, DOD, and DHS—primarily competitive.



#### Drug Discovery, Development and Translation



- NCATS established and focused on science translation across diseases/illnesses.
- Streamline development process; decrease development time and cost.
- FDA drug approval process; improved use of science.
- Increase drug pipeline.
- Ongoing academia, pharma, and federal partnerships
  - Development of multi-CTSA initiatives to increase national capacity for clinical and translational research
  - NIH/FDA partnership to foster career paths in regulatory science.
  - NIH-FDA-DARPA regulatory science partnership (organs on a chip).
  - FDA announces public-private partnership to promote medical device regulatory science.
  - DARPA looking at nanotherapeutics.

#### Neuroscience



- Large scale interagency process underway with 2013 and 2014 money (BAM – NY Times).
  - Public-private partnership with international partners.
- Final interagency report (5-10 key areas of research) expected in June.
- Lots of input: Carlos Pena (FDA) managing with Phil Rubin (OSTP).
  - Representatives from: USDA, DOC, DOD, ED, HHS, DOE, DOJ, VA, EPA, NSF, NASA, ODNI, OMB, and OSTP.
- DOD/DARPA's role practical systems to help the warfighter by preventing and repairing injury, and through accelerated learning.

# Environmental Sustainability & Climate



- Congressional Republicans largely opposed to funding for climate change initiatives; however, resurgence of interest in climate change policies (cap and trade/carbon tax) following SOTU.
- NSF is leading on sustainability research activities through it's Science, Engineering and Education for Sustainability (SEES) initiative:
  - Very interdisciplinary, social science seen as a major component.
  - Becoming increasingly interagency.
  - Interested in projects that look at issues from end-to-end and are scalable.
  - Expect SEES to continue to be prioritized for the next several years originally seen as a 5 year initiative, NSF now talking about it with a 10 year lifespan.
- DOD increasingly interested and investing in renewable energy technologies to enhance energy security and stabilize budgeting.

#### International



- NSF and DOD Globalization an opportunity to leverage limited dollars.
- Agencies looking for low-cost ways to promote collaboration (e.g. NSF role in Global Research Council).
- Science diplomacy forced to back burner as foreign policy focus has shifted to unforeseen areas (Mali, Egypt, Iran, etc.).
  - Administration's planned pivot to Asia Pacific and Latin America complicated by events in Africa and Middle East.
- USAID and State Department Use of science, technology, and innovation to modernize global development a top priority.
  - USAID programs including HESN, Development Innovation Ventures, and Grand Challenges for Development continue to provide opportunities.
  - USAID has expanded PEER program to include NIH.

#### **Graduate Education**

- New thinking on graduate education throughout federal agencies.
- General themes:
  - Preparation for alternate careers
  - Diversity
  - Interdisciplinary skills

- Industrial and international experience
- Ability to address social issues
- Sustainability/retention
- NIH has new Biomedical Research Workforce and Diversity Initiatives.
  - Awards for innovative approaches to enhance traditional graduate training.
  - New Building Infrastructure Leading to Diversity program to support mentoring and scholarships.
  - Big Data to Knowledge initiative looking at interdisciplinary training.
- NSF in rethinking stage for 2013 New GROW program to support international experiences for fellows; potential for additional changes and new models.

# Mental Health & Gun Control



- Newtown, CT tragedy a national forcing event for action on mental health.
- White House Executive Order; State of the Union; Congressional Legislation.
  - Research:
    - CDC conduct research on causes/prevention of gun violence.
    - Seek innovative technologies to advance gun safety.
    - NIH/CDC restriction on funding for research incorporating firearm issues.
    - OSTP interagency working group on neuroscience.
    - Finalizing mental health parity legislation.
    - NAS study on impact of violent video games.
  - Workforce training:
    - Members of Congress seeking data.
    - Training for active shooter situations.
    - Hiring incentives for schools in need of mental health professionals.



#### Specific Agency Activities and Directions



#### National Science Foundation



- Focus on interdisciplinary "OneNSF" initiatives aligned with Obama Administration Priorities:
  - Big Data and Cyberinfrastructure Framework for the 21<sup>st</sup> century (CIF21)
  - National Robotics Initiative (NRI)
  - Advanced Manufacturing, including Materials Genome Initiative
  - Secure and Trustworthy Cyberspace (SaTC)
  - Science, Engineering, and Education for Sustainability (SEES)
  - Expeditions in Education (E<sup>2</sup>) focus on undergraduate education
  - Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE)
- New Leadership:
  - NSF Director Subra Suresh stepped down in March
  - New leaders in Mathematical and Physical Sciences, Geosciences, and Engineering

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- Policy issues:
  - Open access
  - Administrative burdens on researchers
  - High staff turnover

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#### **Department of Defense**



- DOD science and technology programs remain a priority despite funding constraints.
  - New grants could be delayed until FY 2014 and beyond to minimize impact of sequestration; seeking "disruptive technologies."
  - Air Force and Navy likely long-term funding winners.
- Defense Strategic Guidance will still guide policy decisions; increased reliance on technology to offset budget reductions budgets and total troop size.
  - Cybersecurity and autonomy will remain emphases regardless of ASD-R&E.
     Maintaining technological workforce a major concern (particularly cyber); other priorities include big data, manufacturing, energy, and counter-WMD.
  - Social sciences being incorporated across BAAs; funding for Minerva uncertain given leadership changes.

# **DOD: Service Branch Research Offices**



- Army Research Office:
  - Continues strong focus around broad basic research topics including physics, materials, computing, engineering, life sciences, and environmental sciences.
  - Emphasis remains around broad scientific areas, but ARO is aligned with crosscutting DOD priorities like big data, manufacturing, and materials.
- Office of Naval Research:
  - Leading funder of basic research across service branches.
  - Priorities include sensors/communications, energy, and portable weapons.
- Air Force Office of Scientific Research:
  - Recent realignment under five new thrust areas reflects increasing interdisciplinary approach to funding research.
  - Priorities include cyber/information science, materials, alternative energy, and communications.

#### DOD: Other Research Entities



- DARPA:
  - Focused on game-changing R&D around threats of the future; program managers enjoy broad autonomy in funding projects.
  - Cyber/cloud computing, big data, and health/biological research top priorities under new Director Prabhakar.
- DTRA:
  - Basic and applied research on bio/chemical/nuclear/information sciences geared towards countering weapons of mass destruction.
  - Small, but underutilized research opportunity for universities.
- TARDEC:
  - R&D focused on tank and automotive technology; universities can engage through BAAs, CRADAs, and regular programs.
  - Electronics, energy/fuel use, robotics, communications, and materials are core focus areas.

#### National Aeronautics and Space Administration

• Administration support for Science and Space Technology.

- Discussions about future of Planetary science and flagship missions.
- Earth Science "protected" by Administration; climate research a partisan issue in Congress.
- JWST continues to be major priority within Science Mission Directorate; no new wedges for Astrophysics until JWST is completed.
- PI-led missions (i.e., Venture Class, Discovery, Explorer) are a high priority.
- Support grows for new Space Technology Mission Directorate.
  - \$573 million in FY 2012; in FY 2013, House proposed \$632 million and Senate proposed \$651 million
  - Future advanced space systems concepts and enabling technology.
  - Across the Technology-Readiness-Level spectrum.
- Top priority science decadal missions putting pressure on smaller programs.
- NASA Human Space Flight program is in flux
  - Dispute about next destination (asteroid?).

# **Department of Homeland Security**



- DHS continues to be an Administration priority; border security, cyber defense, disaster resiliency, immigration enforcement, and terrorist prevention remain the central agency foci.
- The S&T Directorate's (R&D arm) top foci are:
  - Chemical, Biological, Radiological, Nuclear, and Explosives Defense
  - Disaster Resilience
  - First Responders
  - Cybersecurity
- DHS trying to shift its R&D focus to more field-ready technologies that can be easily adapted for DHS-specific purposes.
  - Universities able to participate in funding projects; existing industry partnerships, especially in areas like cyber, will be key to successfully obtaining research funds.
- Despite recent Congressional support, future DHS S&T funding remains uncertain and could be a target.

# Department of Transportation



- Urban and smart infrastructure a focus area for Administration for the next 4 years. The Administration's approach and investments to support domestic infrastructure development include:
  - Efforts to improve resilience, monitoring, and other "smart" features embedded in university research.
  - Improving transportation and infrastructure resources is linked to economic growth.
  - Providing access to jobs, revenue, health care, and education.
- Infrastructure renewal emphasized with renewed interest expected as transportation reauthorization bill expires in 2014.
  - University Transportation Centers (UTC) program underwent significant changes in this bill; remains DOT's flagship university research program.
- DOT's strategic goals: safety, state of good repair, economic competitiveness, livable communities, and environmental sustainability permeate DOT's research portfolio.
  - Much of the research funding flows through state agencies; opportunities for partnership.

# National Institutes of Health



- Translational research still emphasized; big projects highlighted.
  - Concerns over diverting funds from basic research.
- Award trends:
  - Milestone-driven, collaborative "U" award mechanism utilized more.
  - Special consideration for first-time applicants continues; new concerns over achieving second grants.
  - Some institutes are decreasing use of program project grants (P01).
- NIH structure and policies:
  - NCATS finding its feet, but has no funding for new activities.
  - NIDA-NIAAA merger cancelled; functional integration being pursued.
  - Peer review process under scrutiny to increase innovative projects and improve diversity of grantees.
  - OMB grant reform to have minimal effect on NIH grant processes. Lewis-Burke
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# National Institutes of Health



- Microbiome project has been successful and now will transfer from Common Fund support to more targeted projects at Ics.
- NCI Provocative Questions Project funds game-changing scientific questions; NCI Center for Global Health a continued priority.
- NINDS planning project has identified priority research in stroke prevention, treatment, and recovery; developing new Stroke Trials Network.
- NIAID initiative to support human immunology project consortium, HIV vaccine research.
- NHGRI continuing technology development, advances in personalized/genomic medicine.

#### Infectious Disease Research



- NIH often features infectious disease research as yielding potentially promising results: universal flu vaccine, HIV/AIDS vaccine.
- NIAID looking to augment RCEs with translational research centers focused on countermeasure development; emphasize broad spectrum technologies and platforms with multi-use potential.
- DOD supports research to develop medical solutions to protect military; partners with HHS, DHS.
- International collaborations and opportunities in AIDS, hepatitis, and other areas; multiple partners often needed to acquire federal support.

#### Cancer Research



- Cancer viewed as leading effort to streamline clinical trials system; NCATS seeking to have a role.
- NCI priorities include: Provocative Questions initiative, global cancer research, cancer genomics, Frederick National Lab for Cancer Research.
- Increased interest on cancer's interaction with other diseases and conditions, such as obesity, diabetes and disability.
- NCI Director Varmus' focus on sustaining same level of new grants despite cuts could affect support for centers, other NCI activities.



# Patient-Centered Outcomes Research Institute



- Research should answer questions that matter to the patient and caregiver.
- Patients are part of the research team.
- Funded research supports PCORI's National Priorities for Research and its Research Agenda.
  - Assessment of Prevention, Diagnosis, and Treatment
  - Improving Healthcare Systems
  - Communication and Dissemination Research
  - Addressing Disparities
  - Accelerating PCOR and Methodological Research
- Two "complementary" paths:
  - Supports three broad funding cycles a year.
  - Will support targeted funding for five topics in 2013.

### Department of Energy



- Energy research central to driving Administration policy goals (energy security and independence, climate change, advanced manufacturing, sustainability).
  - Energy Innovation Hubs remain hallmark of Administration and combine numerous disciplines across the public-private spectrum; 5 of 8 proposed hubs have been funded to date.
  - ARPA-E's high-risk, high-reward research remains popular with members of both parties.
- Transitioning leadership leaves DOE without a forceful advocate.
- Challenges to DOE's research portfolio remain:
  - EERE's applied research portfolio under scrutiny as duplicative of private-sector.
  - Traditional Office of Science programs pinched as emphasis moves toward Hubs, EERE, and ARPA-E.
  - National labs competing with one another to remain relevant as budgets tighten.

# U.S. Department of Agriculture



- USDA's core mission (food and nutrition) a high priority for Administration.
  - Priorities include: childhood obesity prevention (First Lady), climate change, food safety, global food security, and sustainable bioenergy.
  - PCAST ag research report (December 2012) calls for a rebalancing of intramural (ARS) and extramural (AFRI) research within USDA; increased funding for AFRI.
- USDA leadership is engaged in research.
  - Secretary Vilsack is staying for Obama's second term; met with PCAST in advance of its report on ag research
  - New NIFA Director, Sonny Ramaswamy, is eager and cooperative; well-liked by Hill.
- AFRI has good support in Congress, despite the fiscal climate.
  - 2012 House and Senate Farm Bills maintained AFRI's authorization level at same level as 2008 Farm Bill (\$700 million).
  - AFRI maintained level funding for FY 2012 at \$264.5 million; both House and Senate proposed increases to AFRI for FY 2013 (\$276.5 million and \$298 million, respectively).
  - Hard choices for Members of Congress (e.g. Do we feed children (SNAP) or support research?).

#### **Education Research**

- Obama Administration interested in getting education research to the practitioners.
- Advanced Research Policy Agency-Education (ARPA-ED)
  - FY 2012 Budget Request; no funding yet/not yet authorized.
  - Funded projects would address specific identified problems in education (e.g. digital tutors as
    effective personal tutors; courses that improve as more students use them; educational software
    as compelling as video games).
- Institute of Education Sciences (IES)
  - Sustained funding levels
  - Emerging foci Research-Practitioner Partnerships; Researcher and Policymaker Training; evaluation of programs (RttT); statewide longitudinal data systems and how to use them.
  - Possible new R&D Center for education research, contracting opportunities.
- Investing in Innovation (i3) and Race to the Top (RttT)
  - Not yet authorized, but a priority for the Administration.
  - LEA must lead or be a close partner.
  - Focus on Administration policy priorities STEM, Early Learning, Higher Education/ College Cost/ Completion

# Arts, Humanities and Museum/Library Studies



- National Endowment for the Humanities (NEH)
  - University audience: humanities faculty
  - Funding for: Fellowships/Seminars, Challenge Grants, Digital Humanities
    - We the People (focus on U.S. culture and history) remains popular with Congress.
- National Endowment for the Arts (NEA)
  - University audience: arts, music, dance, literature, design, theater, film, and digital art; not research; grants to institutions, not individuals.
  - Funding for: Art Works, Challenge America, Our Town
  - New Chairman may have new priorities
  - Current effort to partner with other agencies (e.g. Arts and Human Development with HHS).
- Institute for Museum and Library Studies (IMLS)
  - University audience: grants for library/museum operations; not research
  - Funding for: Training for librarians; develop programs to serve middle/high school students (e.g. technology access)
  - Like NEH, support for digital efforts (e.g. *Digging into Data Challenge* computationally intensive research in the humanities and social sciences.

# HRSA & Health Professions Training



- Provides support for training, technical assistance, direct financial assistance to state and local healthcare entities (e.g. for HIV/AIDS or emergency services for children), and very targeted research activities.
- Funding is disbursed thematically through bureaus/offices:
  - Bureau of Health Professions; Bureau of Primary Health Care; Bureau of Maternal and Child Health; Office of Rural Health; Office of Women's Health.
- Funds provided for:
  - Health Professions (Title VII/VIII programs) Includes loans/scholarships to students and on-campus training programs covering nursing, geriatrics, public health, dentistry, mental and behavioral health, and other health professions.
  - Health Centers HRSA's signature program, funds 1,100+ community-based health centers (e.g. FQHCs).

# Substance Abuse and Mental Health Services Administration



- SAMHSA as resource for data collection.
- Strategic Plan -> Eight strategic initiatives framing all SAMHSA activities:
  - 1. Prevention
  - 2. trauma and justice
  - 3. military families
  - 4. recovery support

- 5. health reform
- 6. health information technology
- 7. data outcomes and quality
- 8. public awareness and support
- Largest programs are state block grants.
- SAMHSA participating in implementation of Gun Violence Reduction Executive Actions and leading National Dialogue on Mental Health activities (mostly PR).



# Questions?



#### Back Up Slides





# Judging from the Past



Year of Deficit Reduction Legislation	Spending Cuts (Percent of Deficit Reduction)
1983	37%
1984	18%
1987	61%
1990	67%
1993	44%

• Legislation passed under "divided" government.

\* Source: CBO, CRS

#### **Trends in Discretionary Spending**



#### Trends in Research by Agency

in billions of constant FY 2010 dollars





\* Source: AAAS

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