

**TEES**  
TEXAS A&M ENGINEERING  
EXPERIMENT STATION

**ENGINEERING  
INNOVATION  
AT WORK**

**CPI Briefing**  
January 2018

**Dimitris C. Lagoudas, Ph.D., P.E.**  
Deputy Director, Texas A&M Engineering Experiment Station  
Senior Associate Dean for Research  
Associate Vice Chancellor for Engineering Research  
University Distinguished Professor  
John and Bea Slattery Chair

## TEES – Leadership



**M. Katherine Banks, Ph.D., P.E.**  
Vice Chancellor and Dean of Engineering  
Director, Texas A&M Engineering Experiment Station  
Harold J. Haynes Dean's Chair Professor



**Dimitris C. Lagoudas, Ph.D., P.E.**  
Deputy Director, Texas A&M Engineering Experiment Station  
Senior Associate Dean for Research  
Associate Vice Chancellor for Engineering Research  
University Distinguished Professor  
John and Bea Slattery Chair



**N.K. Anand, Ph.D., P.E.**  
Associate Agency Director,  
Texas A&M Engineering Experiment Station  
Executive Associate Dean, Dwight Look College of Engineering  
James M. and Ade Sutton Forsyth Professor



**Narasimha Reddy, Ph.D.**  
Associate Agency Director for Strategic Initiatives and Centers,  
Texas A&M Engineering Experiment Station  
Associate Dean for Research  
J.W. Runyon, Jr. '35 Professor I - Electrical and Computer  
Engineering



**Cindy Lawley, Ph.D.**  
Assistant Agency Director for Workforce Development  
Assistant Vice Chancellor for Academic and Outreach Programs

2

# TEES – Leadership



**Balakrishna Haridas, Ph.D.**  
Executive Director for Commercialization & Entrepreneurship  
Texas A&M Engineering Experiment Station  
Professor of Engineering Practice  
Director, BioInnovation Masters Program, Biomedical Engineering



**Kiley Wren**  
Executive Director for Industry Relations,  
Texas A&M Engineering Experiment Station



**Eyad Masad**  
Executive Director, Global Partnerships  
Texas A&M Engineering Experiment Station



**Cindy Wan**  
Assistant Agency Director for Regional Divisions,  
Texas A&M Engineering Experiment Station



# TEES – Leadership



**John Crawford**  
Assistant Vice Chancellor for Business Management  
Chief Financial Officer, Texas A&M Engineering Experiment Station



**Ed Pierson**  
Director of IT, Chief Information Officer  
Assistant Vice Chancellor of Industry Partnerships



**Dr. Stuart B. Anderson**  
Assistant Vice Chancellor for Facilities Planning and Management  
Professor and Holder, Zachry Chair in Construction Integration



**Marilyn Martell**  
Senior Assistant Vice Chancellor for Marketing and Communications



**Norman Garza**  
Assistant Vice Chancellor for Government Relations



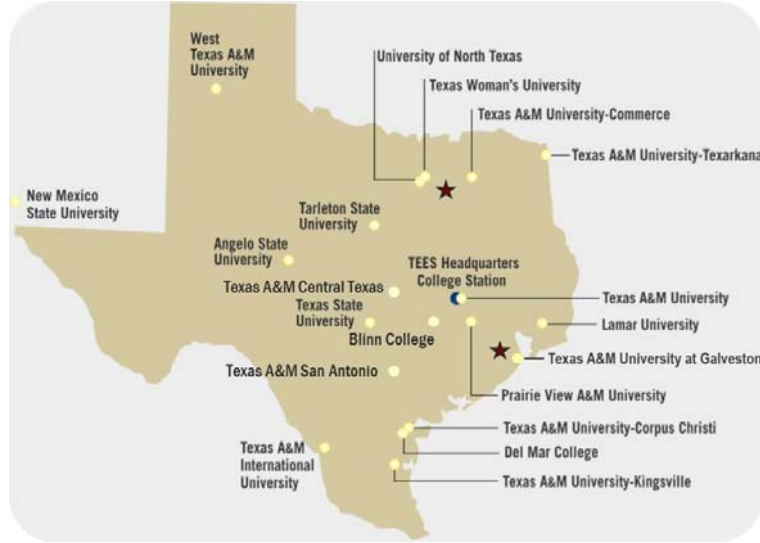
# TEES Across Texas

## Regional divisions

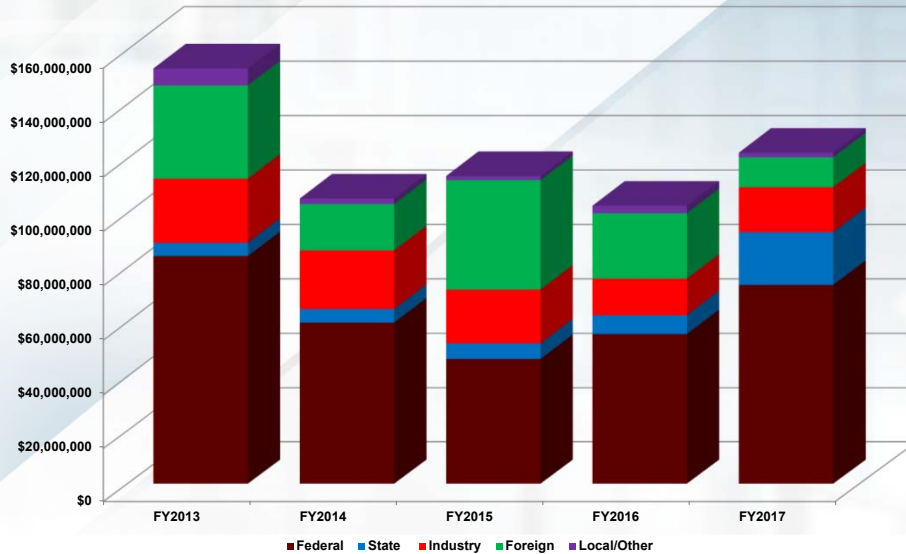
- Angelo State University
- Blinn College
- Del Mar College
- Lamar University
- New Mexico State University
- Prairie View A&M University
- Tarleton State University
- Texas A&M International University
- Texas A&M University
- Texas A&M University at Galveston
- Texas A&M University-Central Texas
- Texas A&M University-Commerce
- Texas A&M University-Corpus Christi
- Texas A&M University-Kingsville
- Texas A&M University-San Antonio
- Texas A&M University-Texarkana
- Texas State University
- Texas Woman's University
- University of North Texas
- West Texas A&M University

## Regional offices

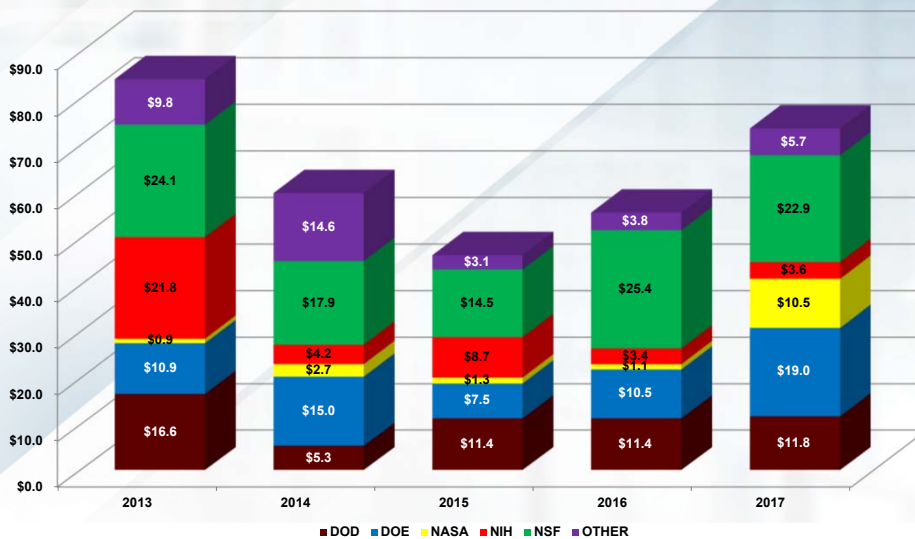
- ★ Houston
- Mesquite



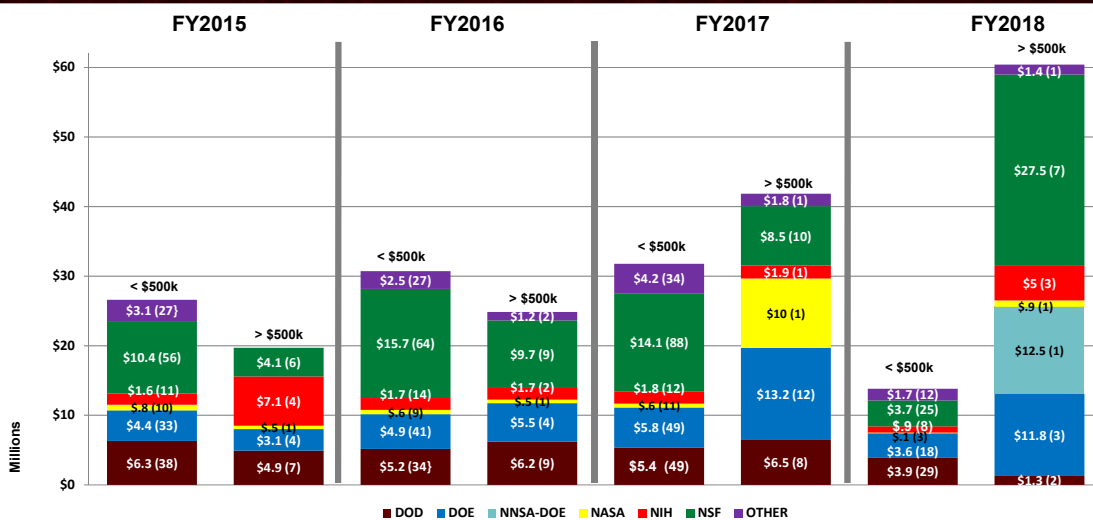
# Award Amounts by Major Source



# Award Amounts by Federal Agency



# Federal Agency Awards < \$500K & >= \$500K



## Return on Investment

# 14

ENGINEERING  
GENESIS AWARD

## Return on Investment

ENGINEERING  
GENESIS AWARD

Dr. Karen Kirkland – \$1 million	Dr. Luc Vechot – \$1.7 million
Dr. Perla Balbuena – \$1.2 million	Dr. Radu Stoleru – \$1.8 million
Dr. Jim Morel – \$1.4 million	Dr. Rodney Bowersox – \$1.9 million
Dr. Bahman Yazdani – \$1.4 million	Dr. Melissa Grunlan – \$1.9 million
Dr. Jim Morel – \$1.5 million	Dr. Mladen Kezunovic – \$4.4 million
Dr. Bryan Rasmussen – \$1.5 million	Dr. Dimitris Lagoudas – \$10 million
Dr. Xia Hu – \$1.6 million	Dr. Gerard Cote – \$40 million

**\$71.3 million total**

## Strategic Research Focus Areas



### Energy Systems and Services

- Nuclear, Oil & Gas
- Smartgrid/Power



### Materials and Manufacturing

- Materials
- Manufacturing



### Healthcare

- EnMed



### Infrastructure and Transportation

- Center for Infrastructure Renewal



### Information Systems and Sensors

- Autonomy/Sensors



### National Security and Safety

- Hypersonics
- Informatics/Cybersecurity



Ahead of the Curve



On-Track



Future Focus

11

## Energy Systems & Services



- Texas A&M Energy Institute
- Crisman Institute for Petroleum Research
- Energy Systems Laboratory
- Gas and Fuels Research Center
- Smart Grid Center
- Turbomachinery Laboratory

12

## Healthcare



- Center for Bioinformatics & Genomic Systems Engineering
- Center for Remote Health Technologies and Systems
- National Center for Therapeutic Manufacturing

13

## Information Systems & Sensors



- Center for Autonomous Vehicles and Sensor Systems
- Texas Center for Applied Technology

14

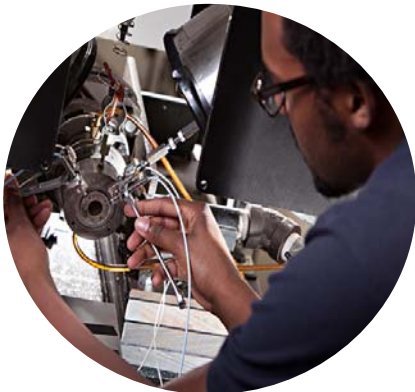
## Materials & Manufacturing



- Center for Intelligent Multifunctional Materials and Structures
- Institute for Manufacturing Systems
- Processing Engineering R&D Center

15

## Infrastructure



- Center for Infrastructure Renewal
- Offshore Technology Research Center
- Thomas & Joan Read Center for Distribution Research & Education

16



# National Security & Safety



- Center for Large Scale Scientific Simulation
- Institute for National Security & Cyber Education & Research
  - Texas A&M Cybersecurity Center
  - Center for Nuclear Security Science & Policy Initiatives
- Lone Star Unmanned Aircraft Systems Center of Excellence
- Mary K. O'Connor Process Safety Center
- Nuclear Power Institute
- Nuclear Science Center

# Governor's University Research Initiative (GURI) and Chancellor's Research Initiative (CRI)

\*Indicates GURI recipient



Dr. Bonnie J. Dunbar



Dr. Ignacio Rodriguez-Iturbe



Dr. Richard B. Miles\*



Dr. Alan Needleman



Dr. Thomas J. Overbye\*



Dr. George M. Pharr IV\*



Dr. Peter M. Rentzepis



Dr. Robert Skelton

## Latest GURI and CRI Hires

**M. Cynthia Hipwell, PhD**  
 TEES Chair Professor  
 National Academy of Engineering  
 Mechanical Engineering



**Roderic I. Pettigrew, MD, PhD**  
 CEO, EnHealth and Executive Director, EnMed  
 National Academy of Engineering  
 National Academy of Medicine  
 Biomedical Engineering/College of Medicine



## Investment in Energy: The Texas A&M Energy Institute

*Discovering Energy Solutions  
 Improving Quality of Life*

Systems-Wide Thinking and Structure

Transform the Energy Research Landscape



Educate the Next Generation of Leaders in Energy



Establish a Vibrant External Partnerships Program in Energy



## Investment in Energy: New DOE Award

### Dr. Dan Hill

- 8 Million DOE grant to create the Eagle Ford Shale Laboratory
- Partners
  - Lawrence Berkley National Laboratory
  - Stanford University
  - WildHorse Resource Development Corporation



21

## Manufacturing USA

A National Network of Institutes Focused on Advanced Manufacturing Technologies



22

TEES Involvement - Manufacturing Innovation Institutes		
<p><b>Advanced Regenerative Manufacturing Institute</b></p> <p>Function: Tissue Biofabrication Lead Agency: DoD Federally Funded through: ~2024</p> <p><b>TEES POC: Haridas</b></p>	<p><b>Advanced Robotics Manufacturing</b></p> <p>Function: Robotics Lead Agency: DoD Federally Funded through: ~2022</p> <p><b>TEES POC: Pagilla</b></p>	<p><b>National Institute for Innovation in Manufacturing Biopharmaceuticals</b></p> <p>Function: Biopharmaceuticals Lead Agency: NIST Federally Funded through: FY 2021</p> <p><b>TEES POC: Karim</b></p>
<p><b>Clean Energy Smart Manufacturing Innovation Institute</b></p> <p>Function: Smart Manufacturing Lead Agency: DOE Federally Funded through: ~2021</p> <p><b>TEES POCs: Pistikopoulos/Schneider</b></p>	<p><b>RAPID</b></p> <p>Function: Process Intensification Lead Agency: DOE Federally Funded through: ~2022</p> <p><b>TEES POCs: Pistikopoulos/Schneider</b></p>	<p><b>America Makes</b></p> <p>Function: Additive Manufacturing Lead Agency: Formerly DoD Was Federally Funded: Now Independent</p> <p><b>TEES POC: Wren</b></p>

## International Manufacturing Conference

**Texas A&M Engineering will host the  
North American Manufacturing Research Conference (NAMRC)  
June 18-22, 2018**







750+ Attendees

250 Students

84 Technical Sessions

## NSF – Engineering Research Center



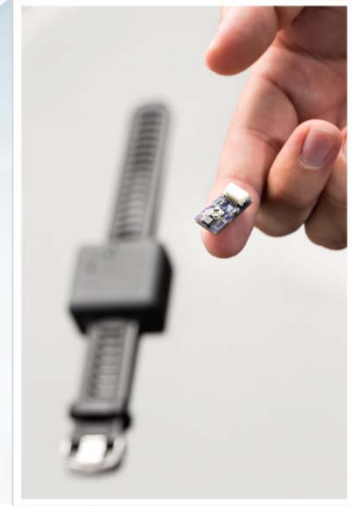
**PATHS-UP**

Precise Advanced Technologies and  
Health Systems for Underserved Populations

**Dr. Gerard Cote**

**PATHS-UP will:**

- Engineer transformative, robust, and affordable, technologies and systems to improve healthcare access, enhance the quality of service and life, and reduce the cost of healthcare in underserved populations
- Recruit and educate a diverse group of scientists and engineers who are ready to lead the future in developing enabling technologies to improve health in underserved communities



25

## Center for Infrastructure Renewal

Joint Center between TEES and TTI opening in March



26

# Autonomous Systems



## Autonomous Connected Vehicles

### Collaborative Robotics



27

# NASA – University Leadership Initiative

## Commercial supersonic flight represents a potentially large new market for aircraft manufacturers and operators

- Global demand for fast air travel is growing
- New supersonic vehicle production will lead to more high-quality jobs in the US

## Environmental impact of supersonic flight must continue to be an overarching consideration

Restrictions on overland supersonic flight represent a major barrier to supersonic aircraft adoption

## We will address overland supersonic boom

- We will sense conditions between the aircraft and the ground
- We will make distributed adjustments to the shape of the aircraft to reduce boom for all flight conditions



*Example aircraft regions that will be adapted to reduce sonic booms as flight conditions change*



28

## Cybersecurity

### Consolidated parts of national nuclear security and cybersecurity efforts as part of a broader realignment

- Institute for National Security & Cyber Security Education & Research (INCSER)
  - Texas A&M Cybersecurity Center
  - Nuclear Security Science and Policy Institute

### IoT Apartment to be constructed at RELLIS

- Bio-medical focus opportunity to build community of interest among manufacturers, suppliers and users

### NSA Cooperative Research and Development Agreements (CRADA)

### National Security Agency – National Center for Academic Excellence for Cyber Defense

### 4.4 Million National Science Foundation Scholarship for Service Award



Recent testimony before The Subcommittee on Cybersecurity and Infrastructure Protection of the Committee on Homeland Security and the Subcommittee on Higher Education and Workforce Development of the Committee on Education and the Workforce

29

## Army Research Lab South



TEES was instrumental in the establishment of ARL South as a hub in Texas through partnerships with other Texas universities to accelerate discovery, innovation and transition of science and technology

- Cooperative Agreement in Synthetic Biology –Up to \$5 million over 5 years
- Funded Projects in Electric Power --\$150K this year, working toward making this a cooperative agreement
- Joint Work Statements in Materials and Manufacturing
- Joint Proposal in Cybersecurity Education

30

## NSF Grants for Rapid Response Research (RAPID)

- **Shankar Chellam**, Water impacts of Hurricane Harvey
- **Ali Mostafavi**, Establishing Disaster System-of-Systems Requirements for Network Centric and Data Enriched Preparedness and Response
- **Ali Mostafavi**, Assessment of Risks and Vulnerability in Human-Physical Networks of Houston's Flood Protection, Emergency Response and Transportation Infrastructure
- **Robin Murphy**, Collaborative Research: Unmanned Aerial Systems Datasets from Hurricanes Harvey and Irma
- **Le Xie**, Powering Through the Hurricane: Self-Organizing Power Electronics Intelligence at the Network Edge
- **J Am Womble**, Preservation of 3D Damage Data for Reality-Capture-Enhanced Modeling of Engineered Steel Structures on the Texas Coast Subjected to Harvey

31

## Engineering Research Digest

A weekly newsletter for Engineering PIs interested in funding opportunities and news



TEXAS A&M ENGINEERING  
EXPERIMENT STATION

Prepared by TEES Research Development

- **Funding Opportunities**
- **Proposers Days/Webinars**
- **Upcoming Events**
- **Research News**

[teesresearch.tamu.edu](http://teesresearch.tamu.edu)

32



## Junior Faculty Assistance

- **Junior Faculty Proposal Writing Academy**  
(campus-wide in partnership with Texas A&M Division of Research)
  - [jfa.tamu.edu](http://jfa.tamu.edu)
- **Engineering Faculty Bootcamp**
- **Young Investigator Program assistance**
  - Strategy/interpreting the RFP
  - Timeline
  - Technical generalist review/editing
  - Broader impacts linkages
  - Addressing reviews in a resubmit
- **TEES Research Development Website:**
  - [teesresearch.tamu.edu](http://teesresearch.tamu.edu)
  - List of Young Investigator Programs

33

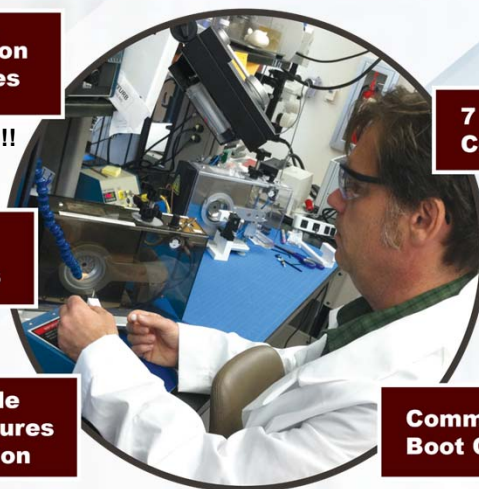
## Highlights 2017 - Commercialization

**71 Invention  
Disclosures**

Highest in 5 years!!

**41 Provisionals  
26 Patent Filings**

**Texas-wide  
New Ventures  
Competition**



**7 Startup  
Companies**

**Commercialization  
Boot Camps**

34

# TEES Start-Up Portfolio & Pipeline

2012 – 2016 (9)	2017 (7)	2018 & Beyond (10)
Claridge-Culp	Incendium	Herotrak
Allvar	LT2	Indoor GPS
TexasLDPC, Inc	Thermascape	Infraframe
TakTik USA	Plurimatrix	Li Ion Battery NewCo
BNE International Pty Ltd	Saber	Nanodiamonds
Dexneo	Fortis Biosciences	Wearable Healthcare
Adallo, LLC	Vozi	Nuclear Engineering NewCo
LifeMotion Technologies, LLC		Electrochemistry Start-up
Asteros Technologies, LLC		Microfluidics Device
		OCT Device System

35

# Industry-Driven Workforce Development Programs

## Sample of Current Certificate Programs

- Lean Six Sigma Yellow & Green Belt
- Asset Management and Economics
- Process Safety Practice
- Distribution Manager
- Intensive Inventory Management
- Optimizing Distributor Profitability
- New Science of Customer Service
- Certificate in Energy
- Sales and Marketing Optimization

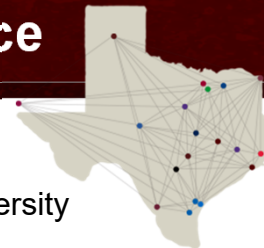
## Certificate Programs – in Development

- Additive Manufacturing
- Advanced Manufacturing Quality Assurance
- Cybersecurity in Advanced Manufacturing
- Engineering Systems Management
- Data Center Operations
- HealthCare Informatics



36

## 2017 TEES Annual Research Conference



**200+** Researchers gathered at Prairie View A&M University

**18** Multi-institution collaborations pitched to a panel of judges at the end of the conference

**17** Multi-institution collaborations awarded \$2,500 in seed funding to continue their work together

**1**



Grand prize collaboration—**CHIME: Continuous Health Intervention and Monitoring for the Elderly**—awarded \$20,000 (*Principal Investigator: Justin Foreman, Prairie View A&M University; Team Members: Farzan Sasangohar, Texas A&M University & Austin Riddle, TEES Texas Center for Applied Technology*)

37

## Facility Investments

- Giesecke Engineering Research Building
- Center for Infrastructure Renewal
- TEES Health Technologies Building
- Testing and Characterization Facility
- Industry Lab
- TEES HQ and Mary Kay O'Connor Process Safety Center
- Industrial Distribution Research and Education Building



38

## Facilities Under Construction

### TEES/TTI Center for Infrastructure Renewal

- Opening March 2018



### Health Technologies Building (Formerly Coastal Engineering Lab)

- Opening 2019



39

## Projects at RELLIS Campus

### TEES Headquarters Building

- Construction begins 2018



### Industry Lab

- Construction begins 2019

### Rowlett Industrial Distribution Building

- Construction begins 2019



40



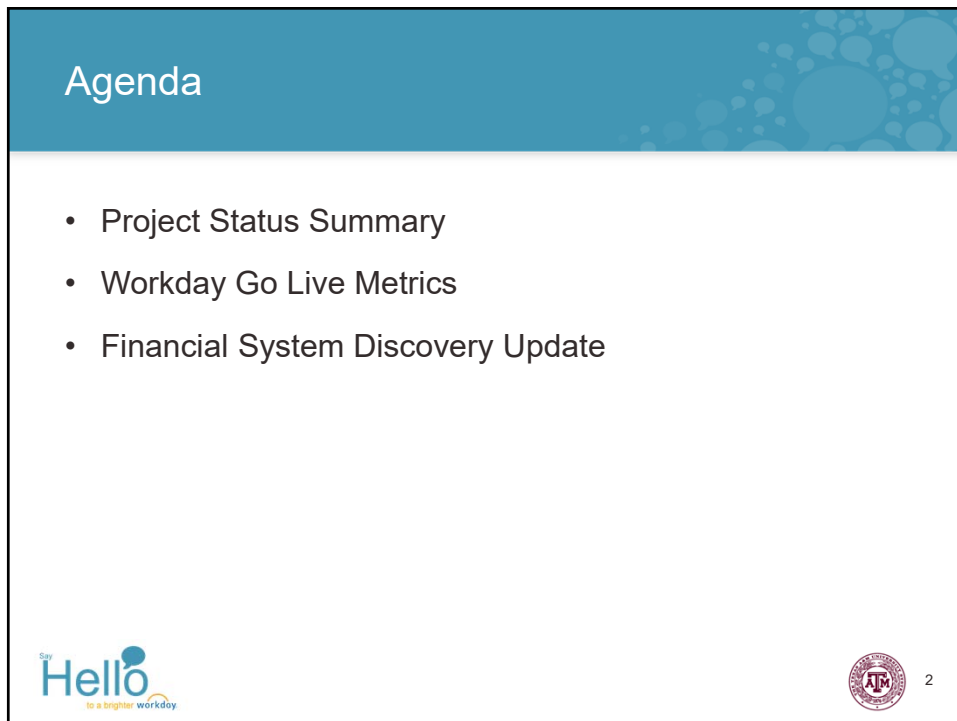
The slide header features a light blue background. In the top left, a white circular shape contains the text "Say Hello to a brighter workday." with "Hello" in a large, blue, sans-serif font and "to a brighter workday." in a smaller, orange, sans-serif font. To the right, a cluster of colorful icons includes a smartphone, a laptop, a cloud with the "workday." logo, a gear, a speech bubble, a bar chart, and a pie chart. Below the icons, a dark blue horizontal bar contains the text "Council of Principal Investigators" in white, bold, sans-serif font. Underneath this bar, the date "January 17, 2018" is written in white, sans-serif font. In the bottom right corner of the slide, there is a circular seal of the University of Tennessee at Martin.

Say Hello to a brighter workday.

workday.

**Council of Principal Investigators**

January 17, 2018



The slide content area has a white background with a dark blue header bar at the top. The header bar contains the word "Agenda" in white, sans-serif font. Below the header, a list of three items is presented in a bulleted format. At the bottom left of the slide, there is a small version of the "Say Hello to a brighter workday." logo. At the bottom right, there is a circular seal of the University of Tennessee at Martin and the number "2".

Agenda

- Project Status Summary
- Workday Go Live Metrics
- Financial System Discovery Update

Say Hello to a brighter workday.

2

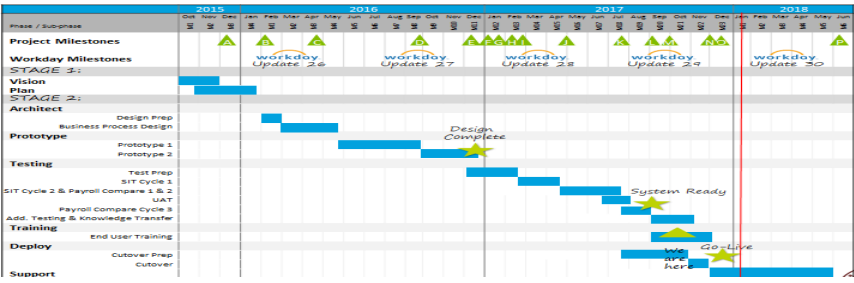


# Project Status Summary




3



# Project Status Summary




<b>Current Status</b>	<b>Green</b>	<b>30 Day Trend</b>	<b>Green</b>
-----------------------	--------------	---------------------	--------------

**Top Line Status**



- Workday Go Live occurred on time and under budget for December 17
- Issues have remained minor with low noise
- The first monthly and biweekly payroll completed
  - Monthly – 26,979 checks and DD – 0.57% error rate
  - Biweekly – 23,979 checks and DD – 0.16% error rate

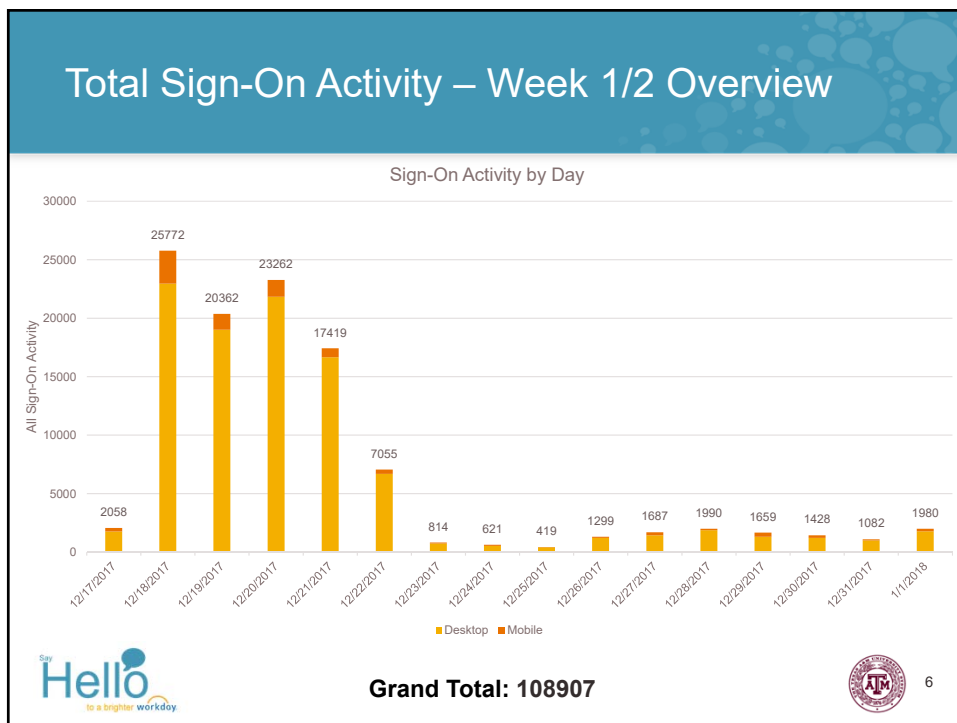
4

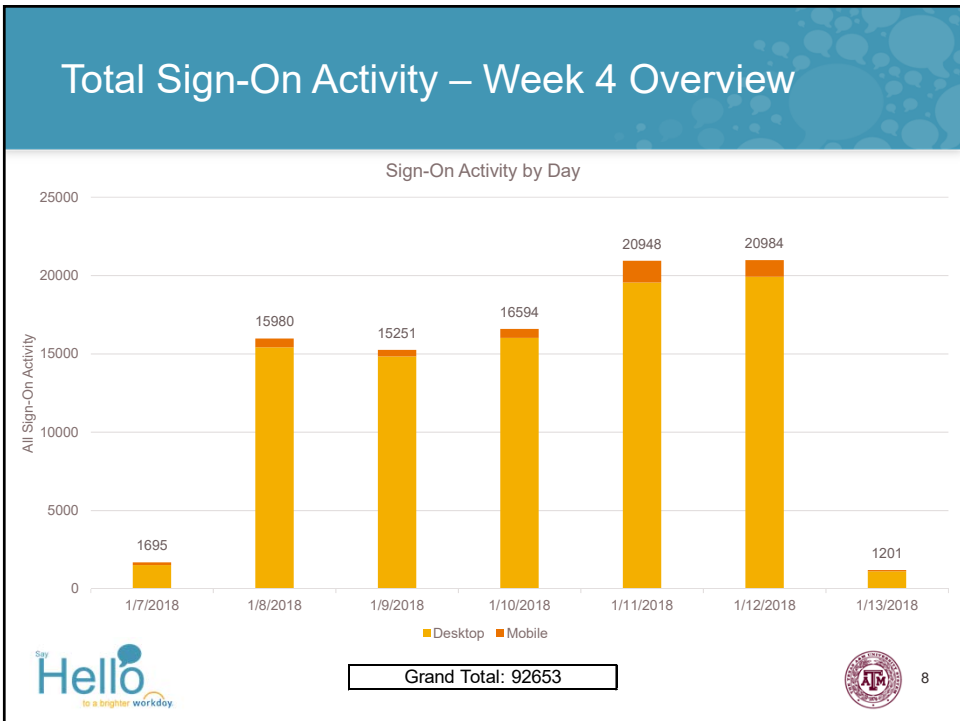


# Workday Go Live Metrics

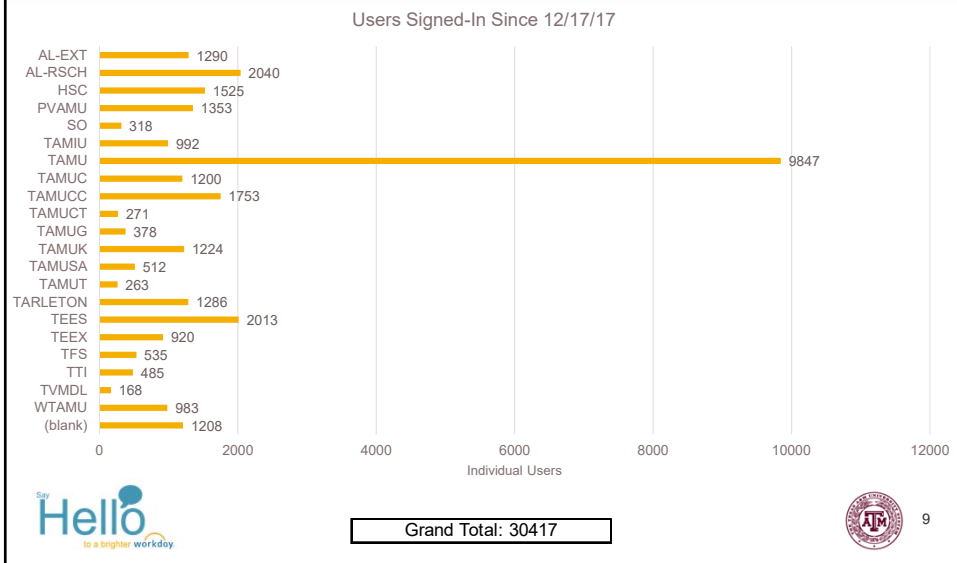
5



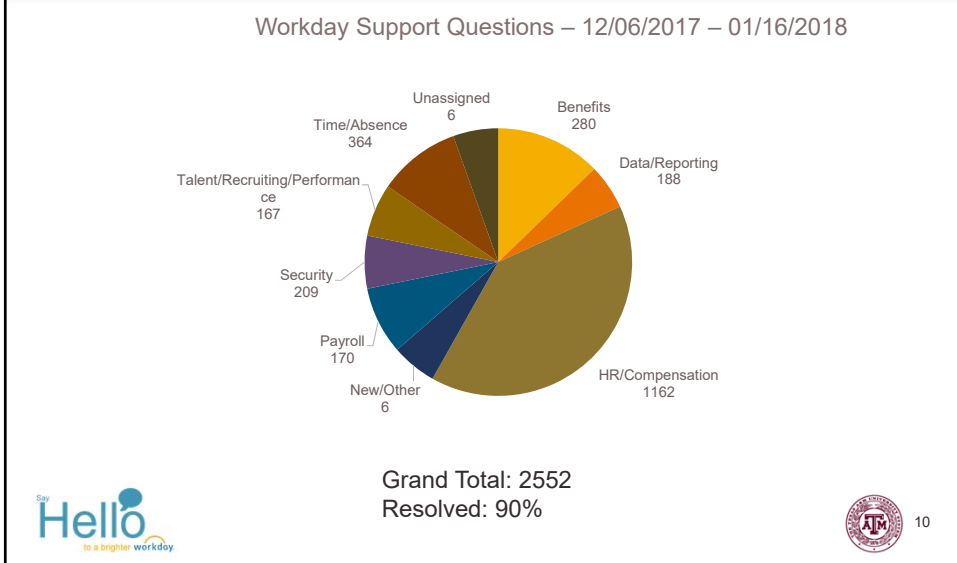




## Workday System Metrics – by Member



## Workday System Metrics – Workday Support







# Finance System Discovery Update




11

## Finance System Discovery Timeline

<ul style="list-style-type: none"> <li>• September 2016</li> <li>• November 2016 – April 2017</li> <li>• May – June 2017</li> <li>• August – October 2017</li> <li>• October 2017</li> <li>• March – September 2018</li> <li>• October 2018</li> </ul>	<p>Formation of working group</p> <p>Develop, issue and evaluate RFI</p> <p>Vendor presentations with Oracle and Workday</p> <p>Corporate site visits, other university site visits</p> <p><b>Decision</b> to pursue deeper dive with Workday</p> <p>Gap analysis, vendor demos, process mapping</p> <p>Decision point</p> <ul style="list-style-type: none"> <li>• Implementation</li> <li>• Re-evaluate</li> <li>• Wait</li> </ul>
--	--

12

## Finance Discovery Working Group

- Representation from every member of the A&M System
- Includes:
  - Representation from SRS
  - TAMU Vice President for Research
  - AgriLife Research
  - TEES
- Discovery process will include demonstrations of Workday Finance modules which will be open to all faculty and staff the A&M System



13

## Thank You!



14