Transportation at ASU

G. Edward Gibson, Jr.
Director, School of Sustainable Engineering and the Built Environment
2017 Arizona Pavements/Materials Conference
November 15, 2017
Welcome!
Yesterday’s equipment fair
this conference’s impact

• 14th ASU Pavements/Materials Conference
• 400+ participants
• Matt Witczak Faculty Endowment now is over $44k; funds will enable our faculty in this area discretionary funds to support pavement program and students
• equipment fair yesterday and ongoing training throughout the year
• knowledge shared will allow all of us to do a better job

Thank you!!
about asu
ASU Charter

ASU is a comprehensive public research university, measured not by whom it excludes, but by whom it includes and how they succeed; advancing research and discovery of public value; and assuming fundamental responsibility for the economic, social, cultural and overall health of the communities it serves.
new american university
ASU’s design aspirations

Leverage Our Place
Transform Society
Value Entrepreneurship
Conduct Use-Inspired Research
Enable Student Success
Fuse Intellectual Disciplines
Be Socially Embedded
Engage Globally
make. code.
fly. build.
design.
engineer.
Research and Innovation at scale

447 Total Faculty

349 Tenure/Tenure-Track Faculty

10 NSF CAREER Awards in 2016-2017

$103M Research Expenditures

Lead institution on two and partner on two NSF Engineering Research Centers

QESST Center for Bio-mediated & Bio-inspired Geotechnics

CBBG

NEWT

FREEDM SYSTEMS CENTER
How we stack up

Largest engineering school in the United States

Top Additive Manufacturing facility in the Southwest

Responsible for 96 patents and 17 startups in the last three years

#1 Most undergraduate engineering students

#5 Most graduate engineering students

30% of Barrett, the Honors College students are in the Fulton Schools

#7 Most women as Tenure/ Tenure-Track Faculty

#10 Most technology graduates hired by Top 25 technology companies

1 American Society for Engineering Education; U.S.-based schools
2 University Statistics; Business Insider and HiringSolved Survey; 2017
school of sustainable engineering and the built environment
data snapshot

enrollment

1723  total enrollment
1304  undergraduate students
419   graduate students
281 M.S./138 Ph.D.

student profile

25/1157  ACT/SAT
11%      Barrett Honors students
21%      female
22%      international
31%      underrepresented minority
69       Accelerated Bachelor’s plus Master’s Program students (4+1)

Scholars: Udall, Fulbright, Eisenhower

Global Engagement
Engineers Without Borders, Bridges to Prosperity, US/Mexico Border Water Training Program

22% of FTF first generation

faculty

47  tenured and tenure-track faculty
6   lecturers
8   research faculty
3   professor of practice
Where we have come from, 2009-2017

• Research:
  – Thirteen >$1 million awards in past three years (as many as previous six years)

• Students

• Faculty

• Fundraising/philanthropy since 2009, >$17 million

• Since 2009, initiated three programs: On-line MSE Sustainable Engineering, Environmental Engineering, Construction Engineering
world-class facilities
NEW Residence Hall for 1,600 Fulton Schools with technology-enhanced programming spaces.
transportation at asu
2013 university transportation center (UTC) competition (cross-Schools)

- first USDOT UTC project at ASU
- subcontracted to Univ. of Maryland, UTC title: “National Center for Strategic Transportation Policies, Investments, and Decisions”
- dates of performance: 1/1/14 to 6/30/17
- expenditure total (ASU): $825K
- faculty involved:
  - Kamil Kaloush (lead PI)
  - Xuesong Zhou
  - Pitu Mirchandani
  - Mounir El Asmar
  - Shane Underwood
  - Mike Chester
  - Yingyan Lou
  - Ram M. Pendyala

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2016 university transportation center (UTC) competition

- USDOT received more than 200 proposals in response to 2016 solicitation and made a total of 32 awards
- ASU SEBE faculty members involved in nearly 20 proposals
- ASU awarded first ever USDOT UTC led by an institution of higher education in Arizona

- Center for Teaching Old Models New Tricks (TOMNET) is a Tier 1 UTC dedicated to improving mobility for all
- Consortium led by ASU includes Georgia Tech, University of Washington, and University of South Florida

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center for teaching old models new tricks (TOMNET)

• Multi-disciplinary center directed by SEBE faculty member, Ram Pendyala
• $10 million in total funding over a 5-year period
• Center aims to:
  – Develop new methods to analyze impacts of transformational technologies and mobility services on transportation infrastructure
  – Design sustainable future transportation systems and mobility options that will benefit all segments of society
  – Forecast and shape the future of mobility in an era of connected and autonomous vehicles, IoT, drones, and Hyperloop
• MAG has joined TOMNET as an agency partner, committing to support one graduate student per year for the life of the center
  – Seeking additional partners

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Ed Kavazanjian and his team, leading a project entitled: “NSF Engineering Research Center for Bio-Mediated and Bio-Inspired Geotechnics”
- $18.5 million over five years
- Partners: ASU, UC-Davis, NMSU, Ga Tech
- [https://engineering.asu.edu/cbbg/](https://engineering.asu.edu/cbbg/)

Paul Westerhoff and his team, subcontracting with a Rice-led initiative entitled: “NSF Engineering Research Center for Off-Grid Nanotechnology Enabled Water Treatment (NEWT)”
- ~$3.2 million over five years
- Partners: Rice, ASU, Yale, UTEP
- [http://www.newtcenter.org](http://www.newtcenter.org)

NSF Engineering Research Center Projects Awarded (SSEBE)
transportation materials and systems expertise at asu

transportation systems:
Ram Pendyala, Professor
Yingyan Lou, Assistant Professor
Xuesong Zhou, Associate Professor
Mikhail Chester, Associate Professor

Pavements, structures, and materials:
Kamil Kaloush, Professor
Ed Kavazanjian, Professor
Mike Mamlouk, Professor
Barzin Mobasher, Professor
Narayanan Neithelath, Professor
Claudia Zapata, Associate Professor
Sandra Houston, Professor
Matt Witczak, Professor Emeritus
Christian Hoover, Assistant Professor

construction, project planning and delivery:
G. Edward Gibson, Jr., Professor
Sam Ariaratnam, Professor
Mounir El Asmar, Assistant Professor
Pingbo Tang, Assistant Professor
David Grau, Assistant Professor
Tony Lamanna, Associate Professor
Wylie Bearup, Professor of Practice

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transportation materials and systems expertise at asu (cont’d)

**logistics and simulation:**
Pitu Mirchandani, Professor
J. Rene Villalobos, Associate Professor
Ron Askin, Professor
Arnold Maltz, Associate Professor

**water and air quality:**
James Anderson, Research Professor
Zhihua Wang, Assistant Professor
Matt Fraser, Professor
Enrique Vivoni, Professor

**Planning and society:**
Michael Kuby, Professor
Deborah Salon, Assistant Professor
David King, Assistant Professor
Patricia Mariella, Director
David Hondula, Assistant Professor
Thad Miller, Assistant Professor

Current search ongoing for a faculty member in pavement materials

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The future (?) of transportation

AZLoop finished in the top eight out of 35 teams in August competition hosted by SpaceX.
What we need to do is always lean into the future; when the world changes around you and when it changes against you – what used to be a tailwind is now a head wind – you have to lean into that and figure out what to do because complaining isn’t a strategy.

- Jeff Bezos

**Other future transportation trends - Gibson**

- Resiliency in the face of global warming
- Driverless vehicles
- Safety/security
- Move away from hydrocarbons
- Urban growth
- Workforce shortages
- New ways to finance and contract
ASU launches transportation campaign

Greatly expand and enhance transportation research and education activities

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musing on leadership
Leadership lessons in the Crow era

- Transformation of ASU
- My background
- My tenure here since 2009
- What is unique about ASU and what it has been doing
Leadership lessons in the Crow era (2)

• Stay with your vision, but adapt
• Embrace change
• Focus on your strengths
• Don’t micromanage, build a strong team
• Align your hires with vision, then mentor….
Leadership lessons in the Crow era (3)

• Be careful what you promise, then over produce
• Pay attention to the details
• Think geometrically
• Outwork everyone else; don’t ask anyone to do something you would not...
• Know when to hold’em, know when to fold’em
“What we need to do is always lean into the future; when the world changes around you and when it changes against you – what used to be a tailwind is now a head wind – you have to lean into that and figure out what to do because complaining isn’t a strategy.”

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