



Integrating Campus Infrastructure Master Planning & Energy Information Session



Sept 17, 2019

Session Agenda

1) ASU Current State and Goals Alex Kohnen, ASU	(5 mins)
2) Systems Master Planning Jeff Duncan - Vanderweil	(10 mins)
3) Real Time Metering, Data Integration – Alicia Wolfe - Trane	(10 mins)
4) Impacts and Wrap Up - Jim Knutson - Trane	(5 mins)
5) Panel Discussion, Questions and Answers	(15 mins)

Alex Kohnen, ASU Overview

- ASU was founded in 1885 and enrolls approximately 75,000 graduate and undergraduate students across its four campuses: Tempe, West, Polytechnic and Downtown Phoenix.
- The World University Ranking and the Academic Ranking of World Universities [ranks ASU](#) in the world's top 100 universities.
- Total facility count 1,169
- Total GSF 26,655,200
- There are 493 classrooms spread across ASU's four campuses.
- Total Campus acreage 2156 acres

Our Sustainable Commitment

Arizona State University has made an institutional commitment to lead by example through the sustainable operations of its campuses. By demonstrating exemplary practices and sharing solutions, ASU stimulates changes in individual, institutional and corporate behaviors to create a more sustainable world.

ASU launched its sustainable operations plan with the signing of the American College and University Presidents' Climate Commitment. Four critical pillars focus the university's effort: climate neutrality, zero water/solid waste, active engagement and principled practice.



Four Critical Goals



Climate Neutrality



Zero Solid & Water Waste



Active Engagement



Principled Practice

Vanderweil Engineer's Goals:

Infrastructure Utilities Master Plans (IUMP)

Phase 1

for the Tempe and Mesa campuses, Vanderweil was selected to build a comprehensive GIS database for all campus utilities that will include mapping and condition assessments for all plant and distribution assets.

Phase 2 will develop the future capacities for each utility, identifying repairs, needed improvements, energy savings and preventative maintenance (PM) funding to support each campus' Strategic Master Plan.

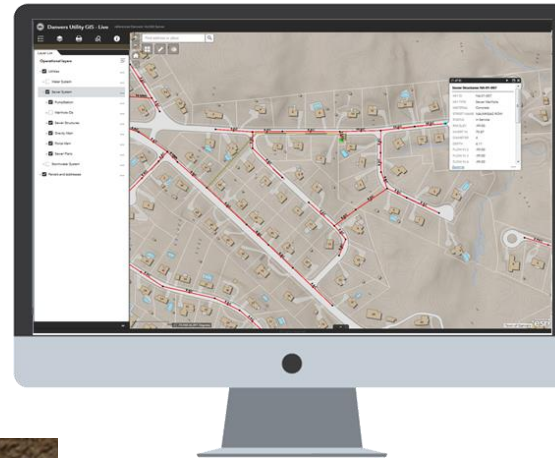
Jeff Duncan, Vanderweil Engineers ASU Infrastructure Utility Master Plan Project

Phase 1

Asset Inventory

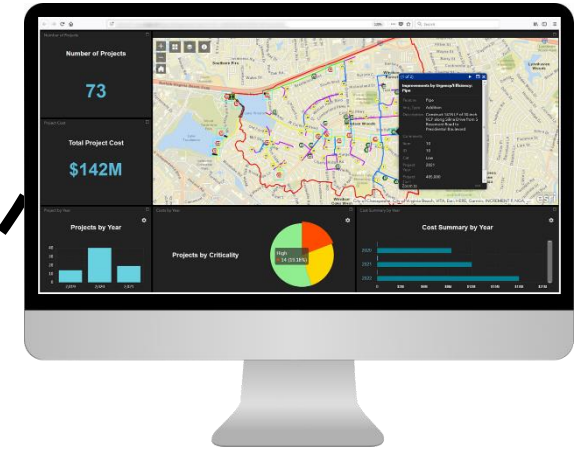


Integrated GIS Database

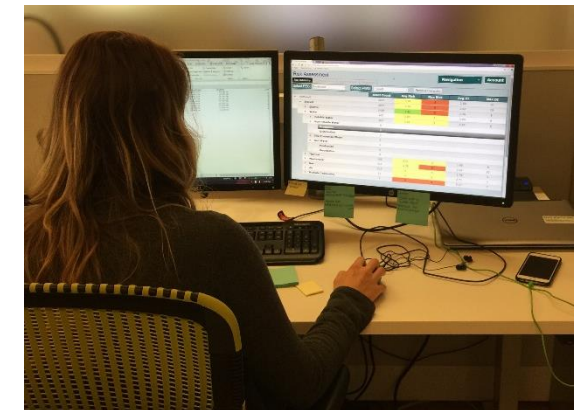


Phase 2

Master Planning



Asset Management



Condition Assessment

Rapid Execution of the GIS Development Process



Planning & Geodatabase Design



Aerial Base Mapping



Records Research & Initial GIS



GPS & Subsurface Utility Engineering



Enterprise GIS Environment

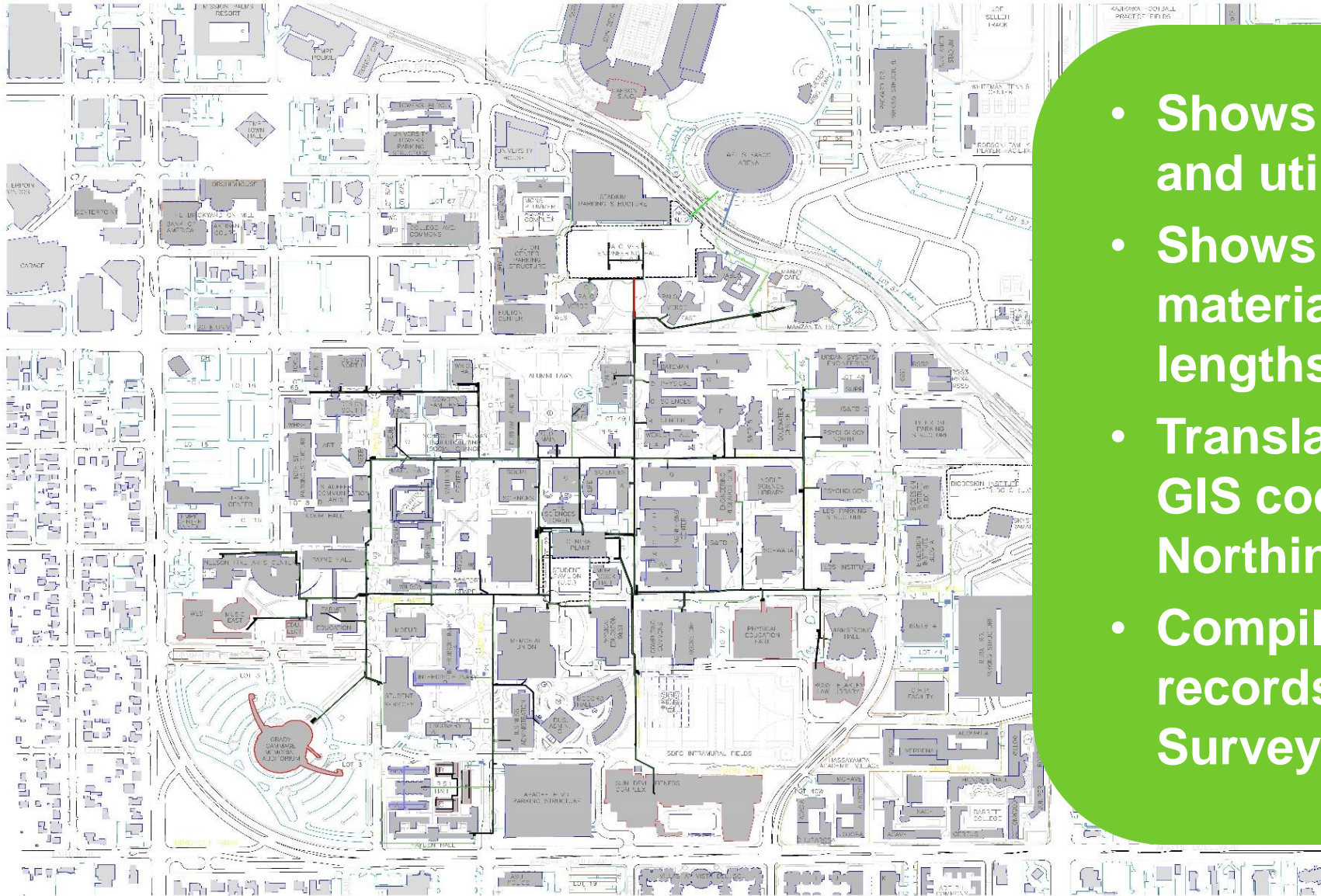


Web, Mobile, & Analytics Applications



Training, Integration, & Process

Campus Utility AutoCAD Data



- Shows location of tunnels and utilities
- Shows pipe sizes, age, materials, locations and lengths
- Translated/verified with GIS coordinates, Northing and Easting?
- Compilation of existing records for Level D Survey

Phase 2 – Utility Master Planning Process

- Near term critical (3 & 5 years) and long term (10 years)
- Data gathering:
 - Site investigation (condition assessment)
 - Review campus Master Plan
 - Planning and Stakeholder Charrette
 - Drawing research and review
 - Staff interviews
 - Collect and evaluate available metering data from Trane's EIS Project
 - Review utility bills, rates and plant logs





**Translate “Big Data” into
Opportunities**

Energy Intelligent Services (EIS)

Alicia Wolfe, Trane

Integration of IUMP and Trane EIS Program:

The integrated goal of the IUMP includes working closely with Trane who was also selected by ASU to implement their Energy Information System (EIS) across 250 of ASU's buildings and 850 meters.

1. The EIS validates the integrated results by identifying opportunities, metering utilities and utilizing analytics to show potential savings and/or results.
2. This data provides insight for attendees on ways to identify, integrate, commission, coordinate and measure utility improvements for their campuses.
3. The IUMP & EIS can also support operating cost reduction opportunities and funding justification or accountability for capital expenditures.

The IoT & Big Data are Transforming Buildings

- Power and Supply Side Systems
 - Equipment and Demand Side Systems
 - Building Automation and Controls
- ... all getting smarter and generating data

ASU – Energy Information System RFP and Selection

- Redesign of ASU's Energy Information System (EIS)
 - Originally developed 2003 with Flash/Flex technology
 - Needed updated to current technology for added flexibility/functionality
- EIS purpose:
 - Public-facing web portal providing energy dashboard, data mining and visualization for:
 - ASU Leadership
 - Faculty and Staff
 - Researchers
 - Vendors
 - Students

Buildings are at a turning point

- Technology-poor buildings are liabilities
- Connected Buildings with Analytics
 - *Do more with less*
 - *Serve occupants better*
 - *Support business goals*

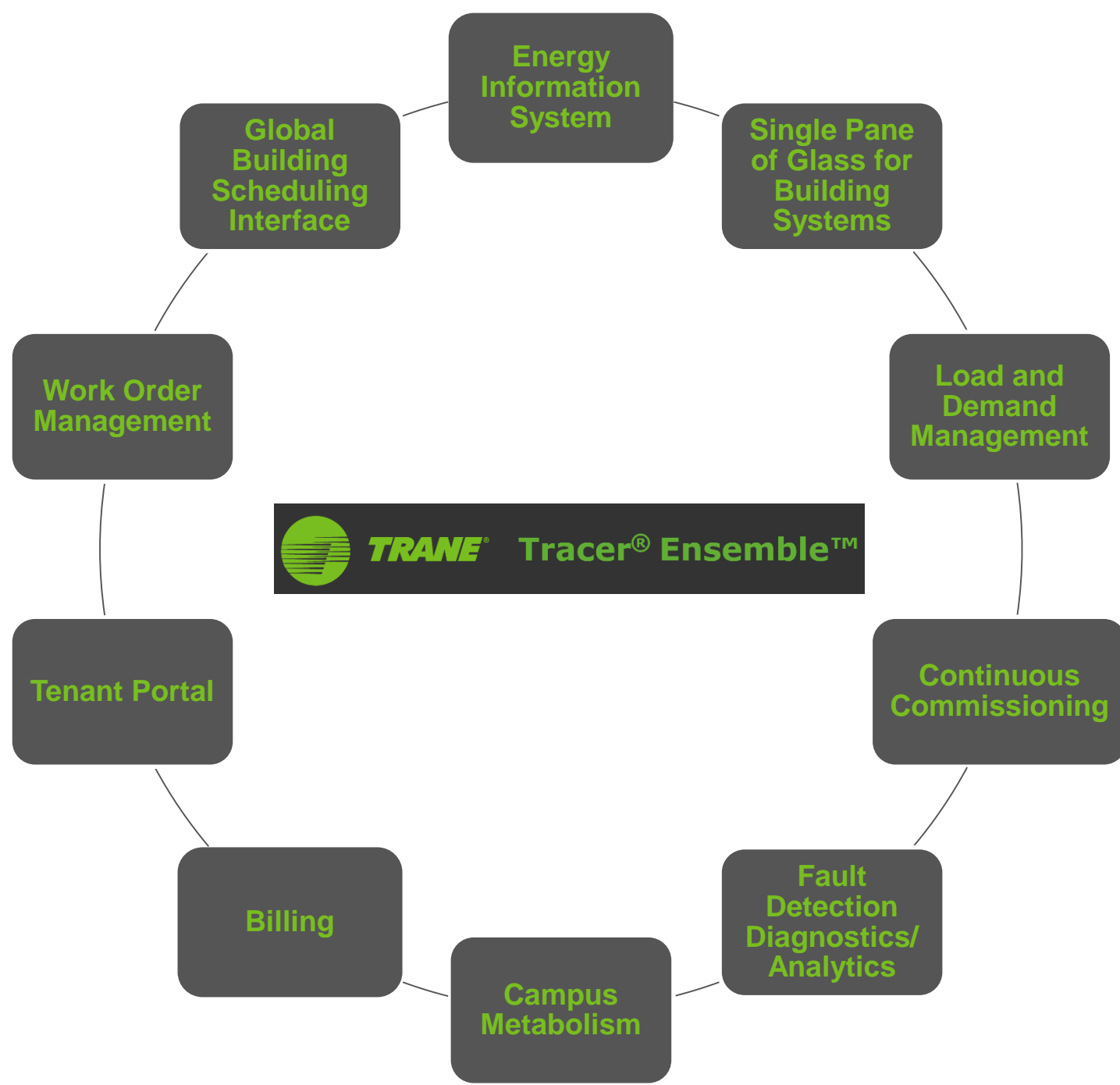
Data is the
greatest
differentiator.



The Key: Always-On Analytics – vs - DRIP



Analyzing building performance 24 hrs/day,
yielding insights otherwise hidden from system operators.



Key's to A Successful IUMP and EIS Integration Plan?

1. Make the decision to move forward with analytics based system and process
2. Create a new (or leverage an existing) congress of cross-functional, silo-crushing leadership team to develop requirements of system, KPIs to measure and track effectiveness, ensure each department is considered, and drive buy-in from all levels
 - UTO leadership
 - Facilities leadership
 - Executive-level sponsor
 - Finance/Business Operations leadership
 - Campus representatives
 - Boots on the ground influencers (get the buy-in from field to leadership)
 - Consultant or business partner/expert on effectively implementing these systems or programs
3. Work with business partner to relay congress outcomes, develop realistic timelines, budgets and objectives
4. Assign budget YOY
5. Create a manageable implementation plan including operational changes and controls that will need to be implemented to support true goals of University and the Project
6. Regular cadence of milestone meetings to ensure we are all moving forward appropriately for accountability
7. Start small and grow to full potential, but do not get trapped in the never-ending piloting cycle!

Panel Discussion

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