UC San Diego
FACILITIES MANAGEMENT

March 2019 Brown Bag Lunch Presentations

- Presentation 1: Campus Micro-Mobility Improvements
- Presentation 2: Campus Irrigation Management
- Presentation 3: Movement Towards Improvement – Project Selection

UC SAN DIEGO MICRO-MOBILITY UPDATE

Resource Management & Planning

MICRO-MOBILITY DEFINED

In response to the increased popularity of scooters, bikes, and other wheeled devices on campus, pedestrians are sharing paths more than ever. Resource Management & Planning is updating policies, providing educational outreach, and implementing separated lanes with upcoming projects to aid in minimizing conflict areas between multi-modal travelers.

Micro-mobility refers to the use of small, manually or electrically powered vehicles used to travel short distances.

Comprehensive Improvements to Safety & Circulation

Campus & Community Engagement -Workshops and open house events where staff and community members can share ideas and concerns

Improving Design & Infrastructure – Designing campus projects that are focused on circulation design and minimizing conflicts between pedestrian and wheeled traffic

Immediate Action & Interim Solutions – Implementing new signage, updating campus policy and creating new compliance and enforcement strategies

Outreach and Education – creating an ongoing program to hold events to help educate campus community about new policy and guidelines. Sharing newly developed resources and future plans

CAMPUS & COMMUNITY ENGAGEMENT

Outreach will be ongoing so that we can gather information about concerns and seek solutions to our safety and circulation goals. The following efforts have already taken place:

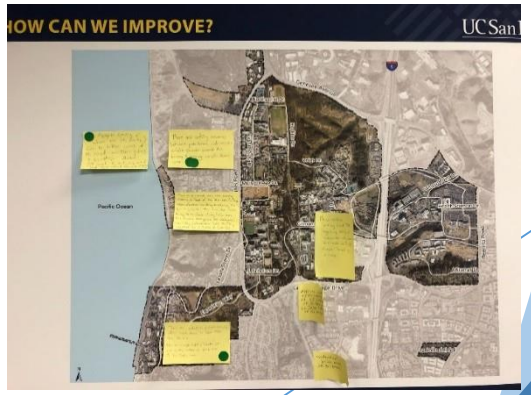
Committee on Campus Community Environment (January 2019)

Micro-Mobility Workshop (January 2019)
- Outreach to students, staff, and faculty
- Received feedback on areas for improvement

Open Space Committee (February 2019)

Campus/Community Planning Committee (February 2019)

Marine Sciences Physical Planning Committee (March 2019)



NEWLY INSTALLED & NEAR TERM PROJECTS

These public realm improvements will include significant circulation Improvements:

<u>Completed</u>

Peterson Hill

Hopkins Dr

<u>In Design or Construction</u>

Ridge Walk South

Ridge Walk North

Triton Pavilion

Pepper Canyon West

Future College

Mesa Housing

Gilman Bridge

Mesa Bike & Pedestrian Bridge

LRT Related Pubic Realm

For current routing, please see: https://maps.ucsd.edu

SEPARATED PATHS

The Hump

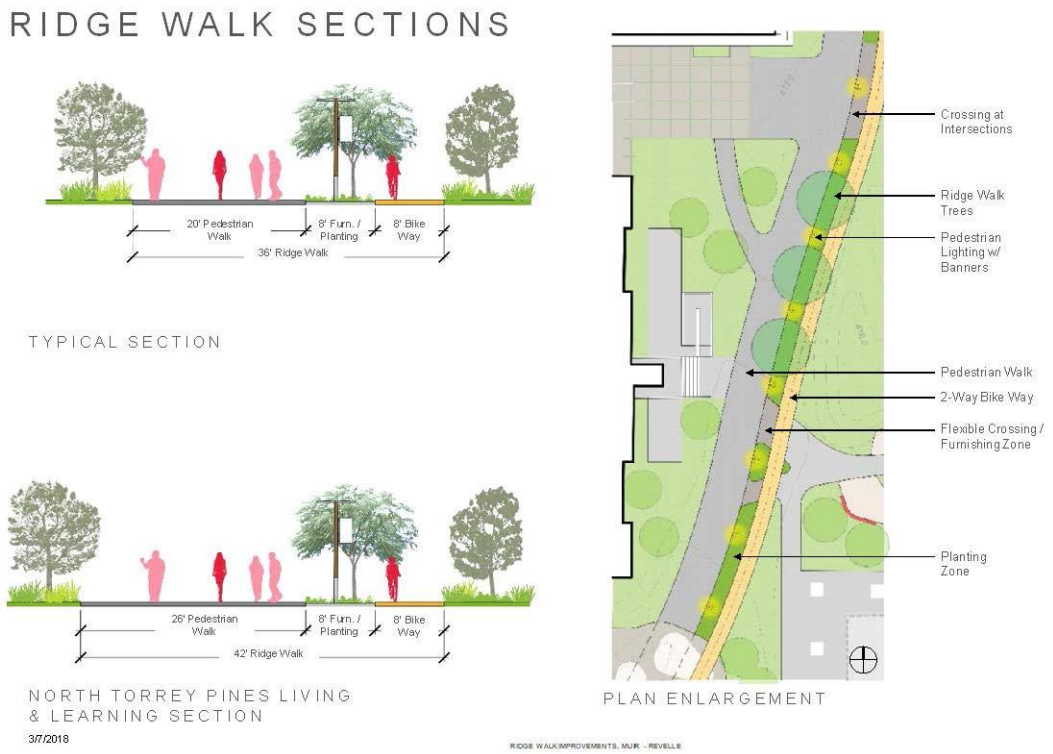
Separated paths help improve traffic flow by incorporating pedestrian paths separate from wheeled device paths

These facilities minimize conflicts between wheeled and pedestrian traffic creating safer circulation through the campus for all modes

These paths are being planned and installed in all high traffic areas where adequate space exists to accommodate these facilities

UC San Diego

RIDGE WALK TYPICAL CROSS SECTION



Ridge Walk will be a model for future projects to create separated lanes

- 2-way 8 foot wide separated lanes for bicycles and wheeled devices
- Furniture and planting could be used to create buffers for pedestrians

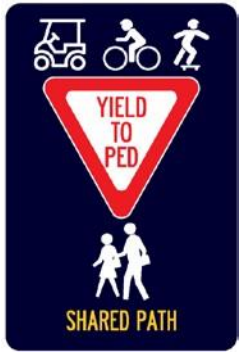
UC San Diego

IMMEDIATE ACTION & INTERIM SOLUTIONS

These include 'Yield to Pedestrian' signs, and 'Shared-Use Path' stencils to notify pedestrians and wheeled device users to share the paths. The new signage will be supported by **updated policies**, **compliance standards** and **enforcement strategies**. The campus continues to work with outside vendors to help limit speeds of motorized scooters that currently utilize campus paths

Shared Path Stencils - Placed at strategic locations in heavily trafficked areas

Shared Path Signs - Identify shared use paths throughout campus



These new signs will begin to be installed over Spring Break

UC San Diego

ONGOING CAMPUS OUTREACH & EDUCATION

Outreach will include Transportation Services led pop-up events to educate the campus community regarding micro-mobility circulation and safety on campus. These events will be supported by Campus Planning, Campus Police, Student Affairs, Graduate Student Association, and Associated Students. The events themselves will occur at high traffic locations so that we can engage the everyday users of these spaces

UC San Diego

UCSD Landscape Irrigation

David Boggs

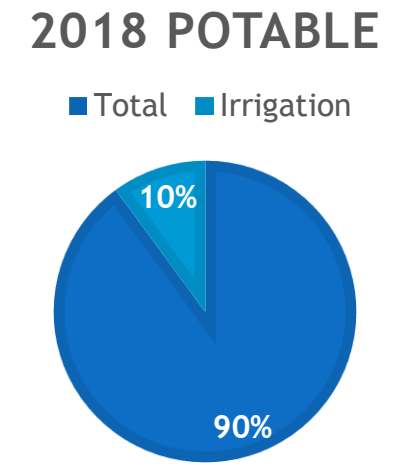
Irrigation Supervisor

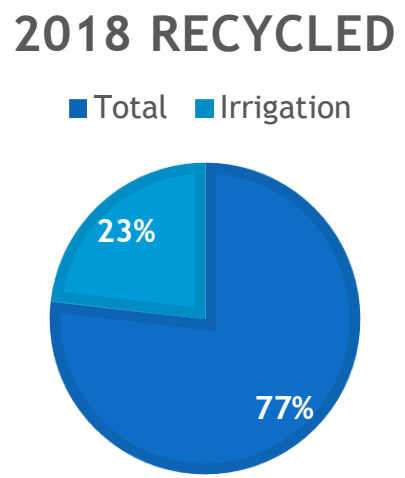
Campus Landscape

- 1200 acres of landscape campus wide
  - Including off site areas
- 834 acres maintained by FM
  - Acreage includes groves and native areas that receive occasional maintenance
  - Total irrigated area currently unknown
- Areas not under FM control:
  - Sports Facilities, UC Health, Real Estate, Student Centers (Price Center and Original Student Center), UC Extension

Campus Water Use

- Measured in HCF units – Hundred Cubic Feet
- 748 gallons in 100 cubic feet
- Total Potable use for 2018 in Gallons: 534,947,148
- Total Recycled use for 2018 in Gallons: 139,985,956
- Total potable cost in 2018: $5,789,858.25
- Total recycled cost in 2018: $772,917.11
- Since 2014 potable landscape water usage has averaged 11.5%
- Reclaim water use in the landscape as a percentage dropped from 74% - CUP?





Irrigation System

- 193 irrigation controllers on campus under FM control.
  - Station counts vary from a few per controller up to 40.
- 155 are set up on our Maxicom central control system.
- 38 are standalone controllers with the majority scheduled for upgrade.
- Many additional controllers on sites outside of FM control, or shared with Sports Facilities and outside contractors.
- Over 3,700 valves.

Technology

How UCSD uses technology to manage landscape irrigation

Maxicom Central Control System

- Access to all controllers from one central location
- Ability to make changes on one or all controllers
- Automatic run time adjustments based on local weather
  - On site weather station
  - CIMIS
- System wide rain shut off
- Flow Monitoring – detect breaks in the system
- Flow Manager – run multiple stations at once

Automatic Irrigation Adjustments

- Weather data from a weather station connected to the Maxicom system, or data collected from other sources is used to adjust run times.
- Weather stations collect data on solar intensity, temperature, relative humidity, wind run, and precipitation. This data is compiled in to a reference Evapotranspiration number (Eto) that is used as a multiplier in the schedule equation, as well as in water budgets.
- Additional parameters including plant type, plant density, microclimates (shade or reflected heat), soil type, slopes, and sprinkler precipitation rate are included in the schedule equation.
  - These parameters are programmed into the system by the operator
- The system calculates irrigation schedules every evening prior to sending them out to the Custer Control Units (CCU). The CCUs then operate the individual satellite controllers as programmed.

Weather Station Comparison

On Site Weather Station

- Real time data
- Updated continuously
- Automatically uploaded
- Takes up space (8’ x 8’ cage)
- Can be considered an “eyesore”

CIMIS

- Historical data
- Updated every morning
- Download data and input data
- Off site (Torrey Pines Golf Course)
- Hidden from view

Flow Monitoring

- Pulses generated from water flowing through a device are translated into a flow rate.
- The flow rate of each zone is input by the operator. Flow rates are gathered from a custom schedule and must be done when the system is in perfect condition.
- When the flow rate falls outside of the established threshold the system will alert the user and shut down the valve or main line depending on programming.
- The system can determine if a break is on the main line or a lateral line on a specific valve.

Flow Manager

- UCSD has tight “water windows” – the time we are allowed to irrigate.
- Per City of San Diego regulations, recycled water systems can only be operated between the hours of 9:00pm – 6:00am.
- We avoid irrigating on weekends when staff is not on site.
- Drought restrictions may limit irrigation to specific days of the week.
- Events further limit irrigation.
- Used in conjunction with a flow sensor, Maxicom’s “Flow Manager” allows multiple valves to be ran simultaneously – up to a programmed flow limit.
  - Flow limits are based on water velocity. Too much velocity can break pipes.
- By running multiple valves at once we reduce the amount of time required to complete our irrigation schedules.

Training

Technology is no good if we do not know how to use it.

Manufacturer Training Classes

- Rain Bird Factory Trained
  - Maxicom, Two Wire Systems, etc.
  - $100 per hour – not cheap but very informative!
- Hunter Industries Classes
  - Training classes on all Hunter products.
  - Free online courses.
- Irrigation Association Classes
  - Advanced classes on troubleshooting and new technologies.

Qualified Water Efficient Landscaper QWEL

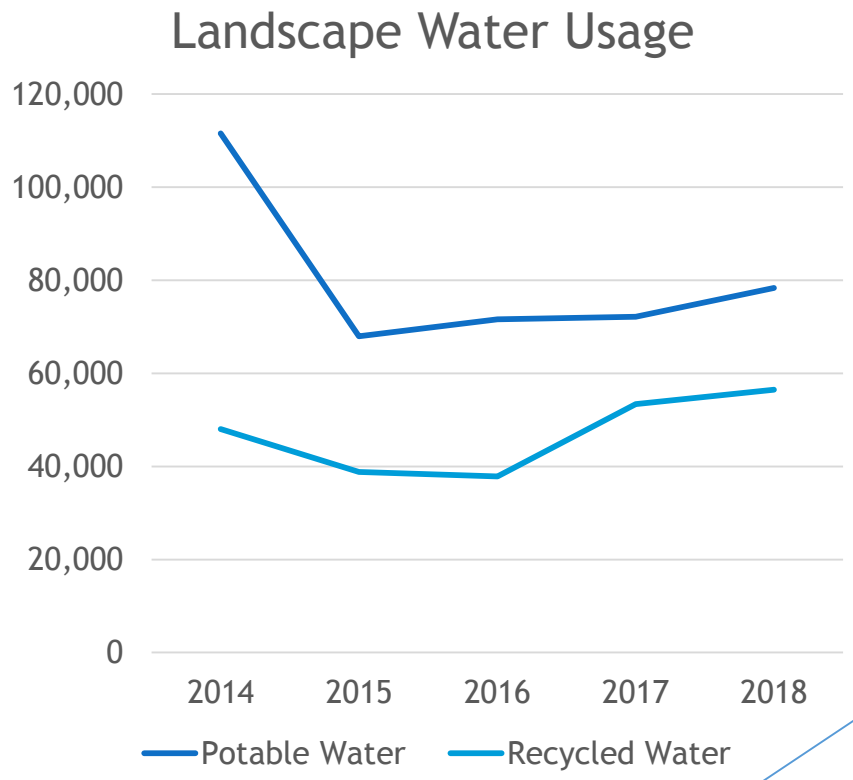
- All of our landscapers have attended the QWEL class.
- QWEL is a survey course designed to enhance understanding of efficient landscape irrigation as it relates to:
  - Plant water needs.
  - Soil structure, water infiltration, and water holding capacity.
  - ET based irrigation scheduling.
  - Water Efficient Technologies.
    - Smart Controllers.
    - Low Volume Irrigation.

Alternative Water Sources

Why irrigate the landscape with what we drink?

Campus Landscape Water Use

- Measured in HCF units – Hundred Cubic Feet
- 748 gallons in 100 cubic feet
- Total Potable use for 2018 in Gallons: 58,588,596
- Total Recycled use for 2018 in Gallons: 42,244,796
- Total potable cost in 2018: $646,197.75
- Total recycled cost in 2018: $233,250.01



Recycled Water

- Recycled water currently feeds the following landscape areas:
  - Rady, Super Computer, Hopkins Parking, CMM, Preuss School, Mesa Nueva , Sports Fields – Warren Field, Triton Ballpark, RIMAC, etc., Hospital areas.
- Recycled water conversion projects are ongoing:
  - Marshall College and Housing in progress.
  - CUP and Switch Station - Awaiting final inspection.
  - Osler parking structure – Soon.
  - Gilman Bridge areas - ???
  - Ridge Walk (southern portion including Sun God) – Summer kickoff
- Some areas are very tricky!
  - School of Medicine is ready but requires building shut downs which jeopardize research experiments!
- Many other areas slated for conversion once the main line can be brought in.

Condensate Capture

- BRF 2
  - 1.1 million gallons per year to be used in the landscape and toilets in the building.
- SME
  - Collects and distributes condensate to the landscape.
  - Currently shut off pending programming issues.
- Tata Hall
  - Predicted to collect approximately 500,000 gallons per year to be used in the landscape and toilets in the building.
- York, Mayer, Urey, and Bonner Halls
  - System predicted to capture 4 million gallons to be used in the CMM landscape.
- New system to be installed at SIO

Landscape Upgrades / Conversions

Utilizing low water use plant material

Turf Removal

- Campus Stormwater Utility project scheduled to remove approximately 36,000 square feet of turf from areas along North Torrey Pines and around School of Medicine
- 36,000 square feet of turf will use approximately 900,000 gallons / year
  - 40.30 (Annual Eto in inches) x .62 (conversion to gallons) x 36,000 (square footage)
  - Nearly $10,000 of potable water

Native Landscapes

- All new landscaping projects are primarily composed of native or low water use non-native plant material.
- Native plant material uses less than half the amount of water that turf uses!
- Southern CA natives need water in the winter, not the summer!

Moving Forward

The future of landscape irrigation at UCSD

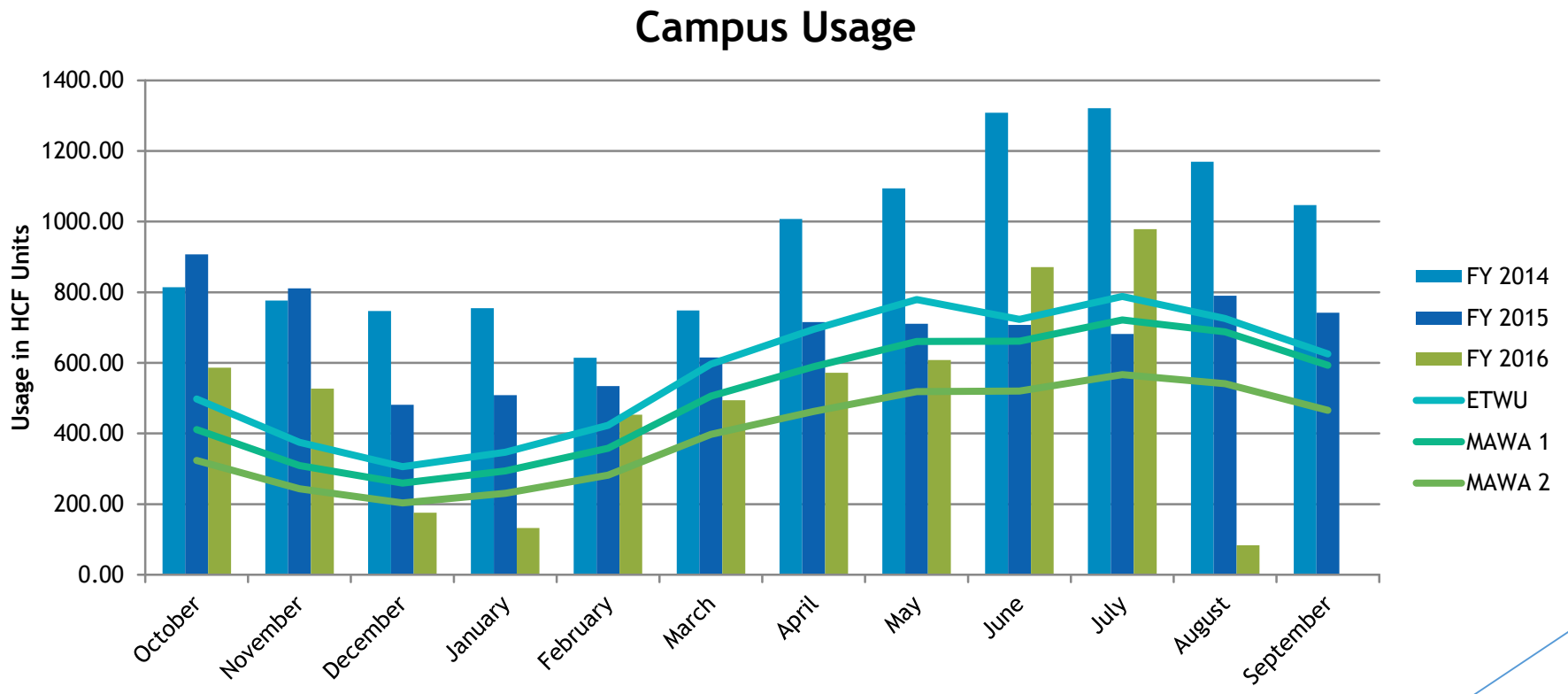
Controller Upgrades

- The Campus Stormwater Utility project is slated to upgrade or eliminate (25) controllers
- The Ridge Walk Expansion project will upgrade (3) irrigation controllers to a single unit, as well as bring recycled water to the area.
- The Public Agency Landscape program through Metropolitan Water District provides up front funding for controller upgrades.
- Additional grants are being applied for.

Water Budgets

- Water budgets will set a goal for water usage, broken up by individual points of connection / water meters.
- Calculation of budget is based on local weather, plant material, square footage, and irrigation system efficiency. Estimated Total Water Use (ETWU)
  - (ETo x 0.62 x plant modifier x square footage) / irrigation efficiency
  - Areas that are predominately turf WILL exceed this
- Budgets are also based on state ordinance – New landscapes are subject to Model Water Efficiency Landscape Ordinance (MWELO). Maximum Applied Water Allowance (MAWA).
  - (Eto x 0.62 x 0.5 x square footage) + (Eto x 0.62 x square footage of approved turf areas)
  - Plant modifier is only 0.5 for new landscapes (older MAWA was 0.7 plant modifier)
  - Irrigation efficiency is not taken into account
  - Turf must be limited and serve a purpose!

Example (from another property)



New Maxicom Software

- Rain Bird is upgrading their software. New features include:
  - Multiple user accounts with system permissions.
  - Using your cell phone as a remote to operate the system.
- Rain Bird will allow us to Beta test the software and offer it free of charge:
  - Allows us to give development feedback and tailor the system to our needs.
- Combines Maxicom with other Rain Bird central control systems into one.
  - May allow us to operate shared irrigation controllers with Sports Facilities and outside maintenance contractors using the Rain Bird IQ system.

Movement to Improvement: First Quarter Selection

Facilities Management
Rich Cota

Nierenberg Kitchenettes

Project Scope

- Current shared spaces were renovated from old offices that did not account for plumbing necessity. We will provide sinks to break rooms on the 2nd and 3rd floors, as well as minor functional and cosmetic updates.

The Space

Nierenberg Hall

- 47,529 square feet
- 4 floors
- 148 spaces
- 21 Research Labs
- 91 Offices
- 4 Conference Rooms
- Approximately 133 Occupants


216


CUSTODIAL
WORK STATION
216
STOP!

Nierenberg Kitchenettes- Project Goals:

- Increase functionality of break room spaces by adding running water source.
- Help with sustainability and zero waste goals by allowing occupants to clean reusable dishes/containers, rinse out recyclable items in a sanitary manner.


Questions/Comments?
THANK YOU!