



# The New Water Regulations

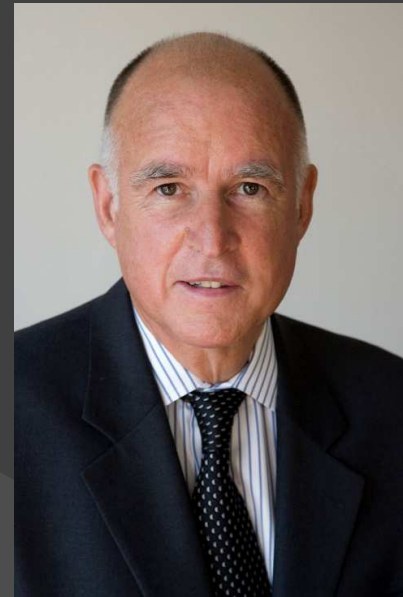
What to expect?  
How they impact you?

ACBO Fall Conference – October 26, 2015

Presented by: Chester A. Widom – FAIA, California State Architect  
Aris Hovasapian – Utility Program Manager, LACCD  
Larry Frapwell – Hill Partnership Architects

## GOVERNORS EXECUTIVE ORDER

*“ In almost every way conceivable, Californians have to get used to a very different world, and we’re going to have to live just a little bit differently. ”*



# CALIFORNIA BUILDING CODE

## TITLE 24

- ◎ Building Standards Commission

> CALGreen®

- ◎ Dept. of Housing & Community Development
- ◎ Office of Statewide Health Planning & Development
- ◎ Division of the State Architect

# DEPARTMENT OF WATER RESOURCES

## TITLE 23

- ◉ Model Water Efficient Landscape Ordinance (MWELO)
  - > Structure
    - Planning and Designing
    - Installation and Maintenance
    - Managing
  - > Calculator
- ◉ Evapotranspiration Adjustment Factor (ETAF)
- ◉ Special Landscape Areas

## MWELO

- Housing and Community Development  
ETAF: 0.55
- Building Standards Commission  
ETAF: 0.45
- OSHPD: Require local agency review  
and approval
- Division of the State Architect  
ETAF: 0.65

## INCLUDED: K-12 AND COMMUNITY COLLEGE PROJECTS

- All New or Rehabilitated Irrigated Landscape
- New Campuses
- New Buildings on Existing Campuses



## LANDSCAPE IRRIGATION REQUIRMENTS-1

- ⦿ All landscaping on new campuses *must* be 100% in compliance with MWELO requirements except that:
  - > ETAF for general landscape areas shall be 0.65
  - > *Additional* water allowance of 0.35 for Special Landscape Areas
  - > ETAF for Special Landscape Areas of 1.0

## LANDSCAPE IRRIGATION REQUIRMENTS-2

- ⦿ On existing campuses, compliance with the MWELO is required for:
  - > New landscape irrigation projects **500 SF** or more in area.
  - > Rehabilitated landscape irrigation projects **1,200 SF** or more in area.
  - > Projects  $\geq$  **500 SF** and  $<$  **2,500 SF** may use prescriptive compliance method of MWELO Appendix D



## LANDSCAPE IRRIGATION REQUIRMENTS-3

- ⦿ Rehabilitated landscape area requirements on existing campuses:
  - > Triggered by new building or addition to an existing building of  $\geq$  **1,600 SF**
  - > Existing landscape area equal to 75% of new building footprint or building addition footprint:
    - Must be upgraded to comply with 2015 MWELO
    - May be located on any campus within the district
    - May include existing landscape area removed from service

## THINK DISTRICT–NOT CAMPUS

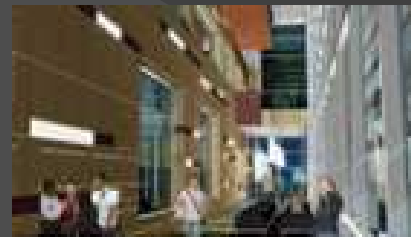
- ⦿ Goal is the district's reduction of water usage
- ⦿ Required landscape rehabilitation projects can be located in a variety of places:
  - > Adjacent to construction project
  - > Elsewhere on the campus
  - > Anywhere on other district campuses

## THINK DISTRICT–NOT CAMPUS

- ⦿ Credit for MWELO compliant stand alone landscape irrigation projects for future construction projects
- ⦿ If new building is placed on existing landscaped area, there is no requirement for additional landscape irrigation rehabilitation
  - > Credit for excess area

# SELF CERTIFICATION

- ⦿ Design Professional
  - > Architect
  - > Landscape Architect
  - > Civil Engineer
- ⦿ Requirements
  - > Certification that design meets MWELO requirements-at project submittal
  - > Certification that construction conforms to MWELO requirements-at completion



*“ DSA: A partner in the design and construction of great and safe schools.”*

**7x7x7** | **DESIGN ENERGY WATER**  
7 ARCHITECTS 7 SCHOOLS 7 INNOVATIONS

## STATEWIDE SAVINGS

X 12,000 Campuses  
3 Buildings/Campus

## STATEWIDE SAVINGS

$$\begin{array}{r} 12,000 \text{ Campuses} \\ \times \quad 3 \text{ Buildings/Campus} \\ \hline = \quad \mathbf{36,000 \text{ Buildings}} \end{array}$$



## STATEWIDE SAVINGS

$$\begin{aligned} & 36,000 \text{ Buildings} \\ & \times \$10,000 / \text{Building /Year} \\ & \times 10 \text{ Years} \\ & \hline = & \text{\$3.6 Billion} \end{aligned}$$

## STATEWIDE SAVINGS

$$\begin{aligned} & 36,000 \text{ Buildings} \\ & \times \$5,000/ \text{ Building/ Year} \\ & \times 10 \text{ Years} \\ \hline = & \text{ \$1.8 Billion} \end{aligned}$$





## PARTICIPANTS

- ⦿ Aedis Architects (San Jose)
- ⦿ DLR Group (Riverside)
- ⦿ Ehrlich Architects (Culver City)
- ⦿ Hamilton + Aitken Architects (San Francisco)
- ⦿ HGA (Santa Monica)
- ⦿ Lionakis (Sacramento)
- ⦿ WRNS Studio (San Francisco)
  
- ⦿ Tim Culvahouse

## TENTATIVE SCHEDULE

- Regional Presentations: 3<sup>rd</sup> & 4<sup>th</sup> wk. of January
- Call to Action Event: 4<sup>th</sup> wk. of February









## PROPOSITION 39 FUNDING POTENTIAL

- ⦿ Opportunity for funding 7x7x7 measures
- ⦿ Program still active for several more years
- ⦿ Available funds

**7x7x7** | **DESIGN ENERGY WATER**  
7 ARCHITECTS 7 SCHOOLS 7 INNOVATIONS



Los Angeles Community College District

Water Conservation and Drought  
Response



# Governor's Executive Order

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On April 1, Governor Brown issued an executive order to reduce statewide urban water consumption by 25%

California State Water Resources Control Board (Water Board) was tasked to devise a plan to achieve 25% reduction

Water Board plan assigns water agencies to one of nine tiers of conservation, from 4% to 36%, in increments of 4

Water agencies must reduce consumption by assigned percentage for period of June to September 2015 against baseline period of June to September 2013

# R-GPCD

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Water agency performance will be measured by Residential Gallons per Capita per Day (R-GPCD)

R-GPCD takes the total water sales (“production”) of a water agency and divides by population in their service territory

Statewide water conservation metric is driven by residential usage

However, all customers of any given water agency have their water consumption included in the metric

# Conservation Targets

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Conservation tier is for the entire water agency, and not necessarily for each customer

Individual water agencies are responsible for setting up their own strategies and programs to meet their respective conservation targets

Water agencies submit monthly reports to Water Board, published on web

Different classes of customers within a single water agency may have different targets, different incentives, different penalties

Water agencies that fail to meet their targets are subject to fines of \$500 per day until they meet their conservation target

# About LACCD

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9 Colleges

1 District Office

3 Other Properties

1 Natural Gas Utility (Southern California Gas Company)

2 Electric Utilities (LADWP and SCE)

5 Water Agencies

Consumed 514,423 HCF of water in 2014  
374,788,139 gallons

# Water Agencies Servicing LACCD

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Los Angeles Department of Water and Power (16% reduction target)

- Services 6 colleges, District Office, and Van De Kamp Innovation Center

Golden State Water Company (16% and 12% reduction target)

- Services West LA College (16%) and Southwest LA College (12%)

California Water Service Company (8% reduction target)

- Services East LA College

City of Monterey Park (20% reduction target)

- Services East LA College Corporate Center

City of South Gate (12% reduction target)

- Services Firestone property



# Data Collection

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On April 9, 2015, CCCCCO sent survey asking for five years of District water cost and consumption data

Early decision was made to focus solely on nine colleges

Colleges receive, pay, and file all utility bills; bills were generally received and filed as paper, and no historical data was collected

Historical data would have to be collected from water agencies, but water agencies would need account numbers to pull data

Colleges provided account numbers where needed

Data was acquired from water agencies

# Special Considerations

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Wide disparity in landscape acreage across nine campuses

- Landscape data comes from 2010 landscape study

Campus size and acreage

Coastal campuses vs. inland campuses

Meter types: irrigation, fire, domestic, mixed, recycled water

Water used by contractors during construction

Capital projects have added square footage to campuses

Irrigation vs. domestic use

Irrigation, Irrigation, Irrigation

# Data Presentation

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Critical to normalize data across campuses of varying sizes

- Districtwide aggregated annual data would show general trend, but not enough resolution to determine specific trends and recommendations

Data was normalized by averaging per acre of landscape

- Determination was made that domestic use accounted for a low percentage of total use

In 2014, colleges used between 998 and 4,060 HCF per acre of landscape

- Average 2,884 HCF per acre

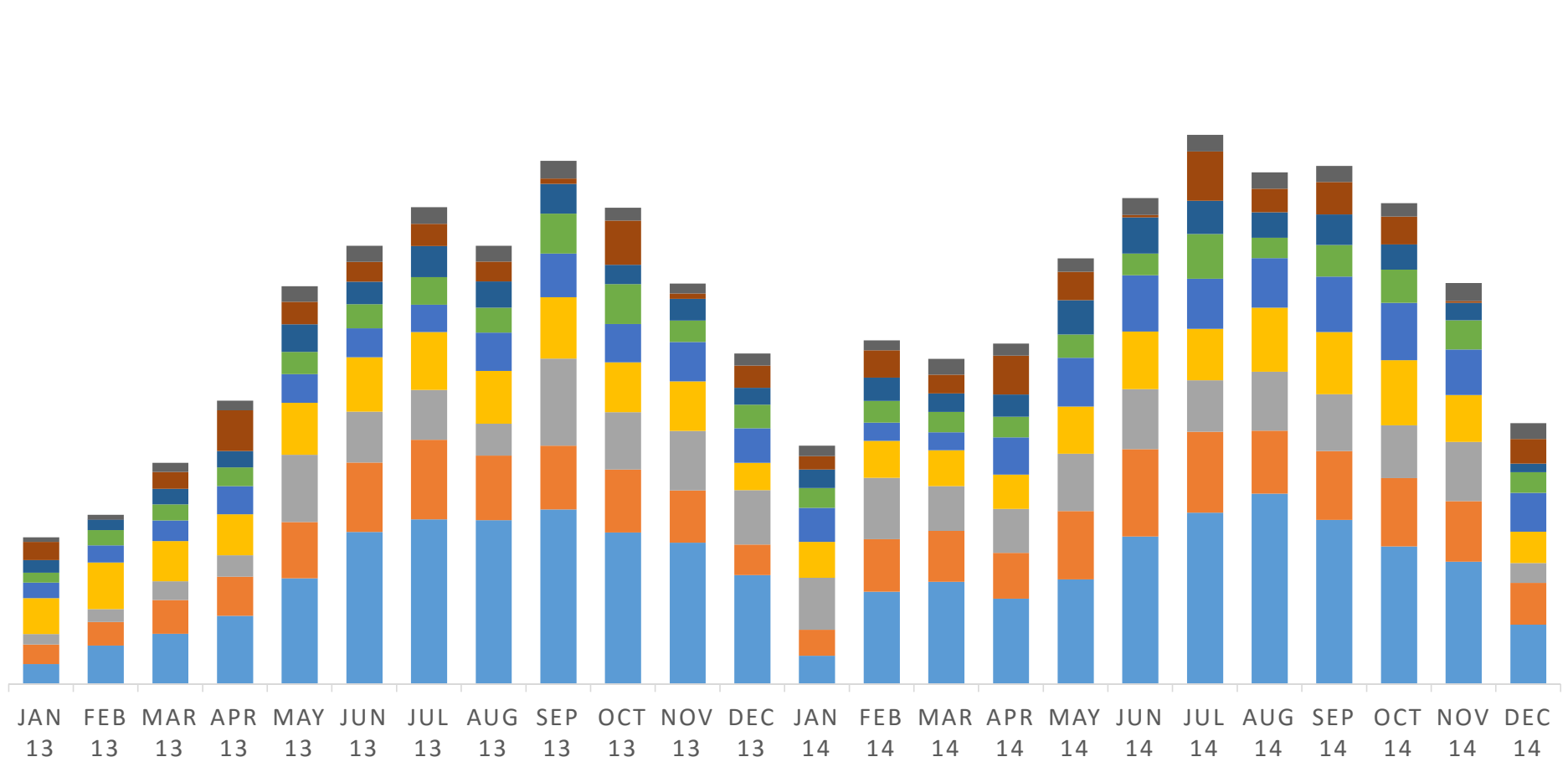
In 2014, colleges spent between \$3,930 and \$23,333 per acre of landscape

- Average \$12,901 per acre

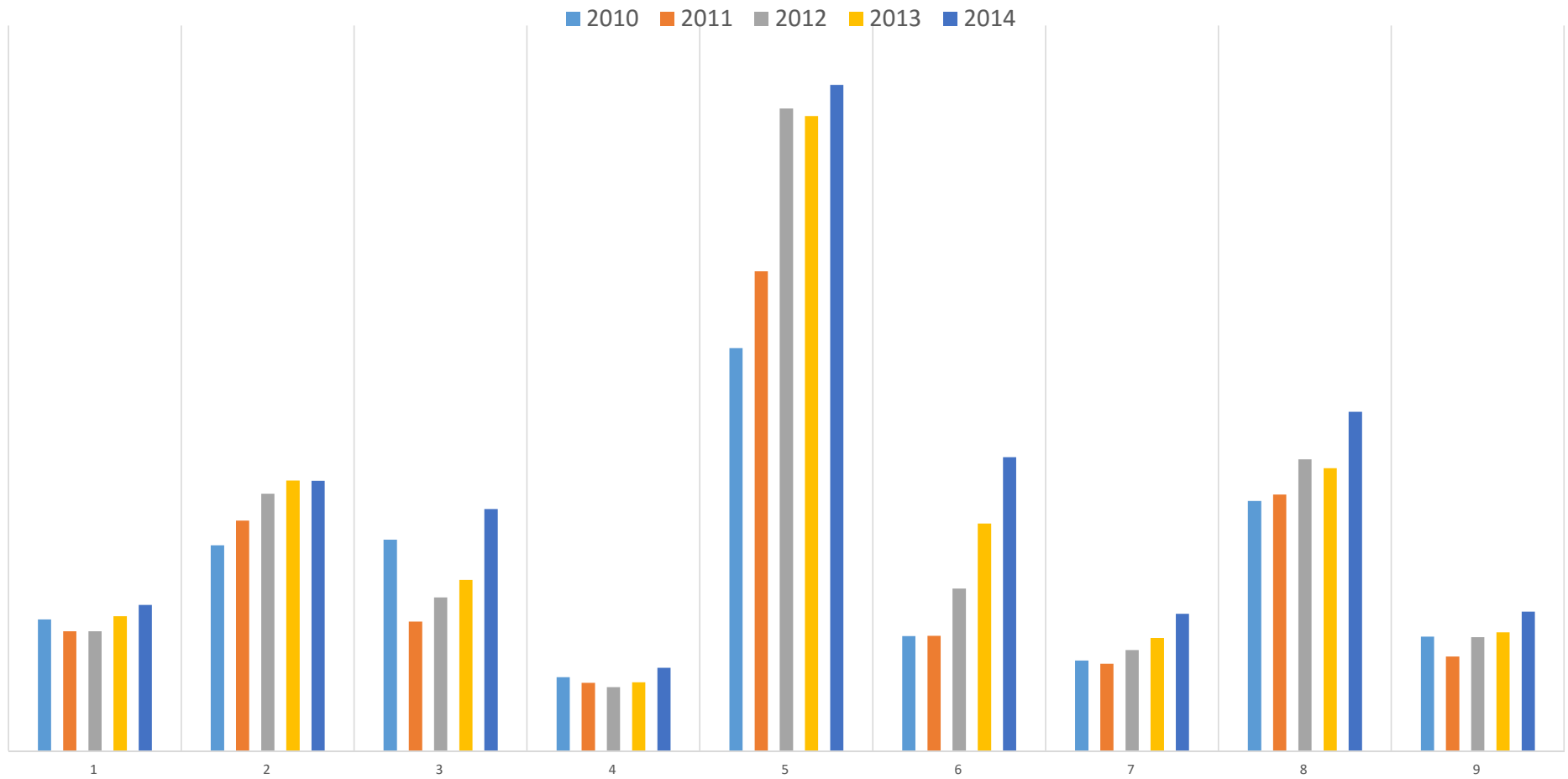
# What does the data tell us?

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## WATER CONSUMPTION BY COLLEGE, JAN 2013 TO DEC 2014

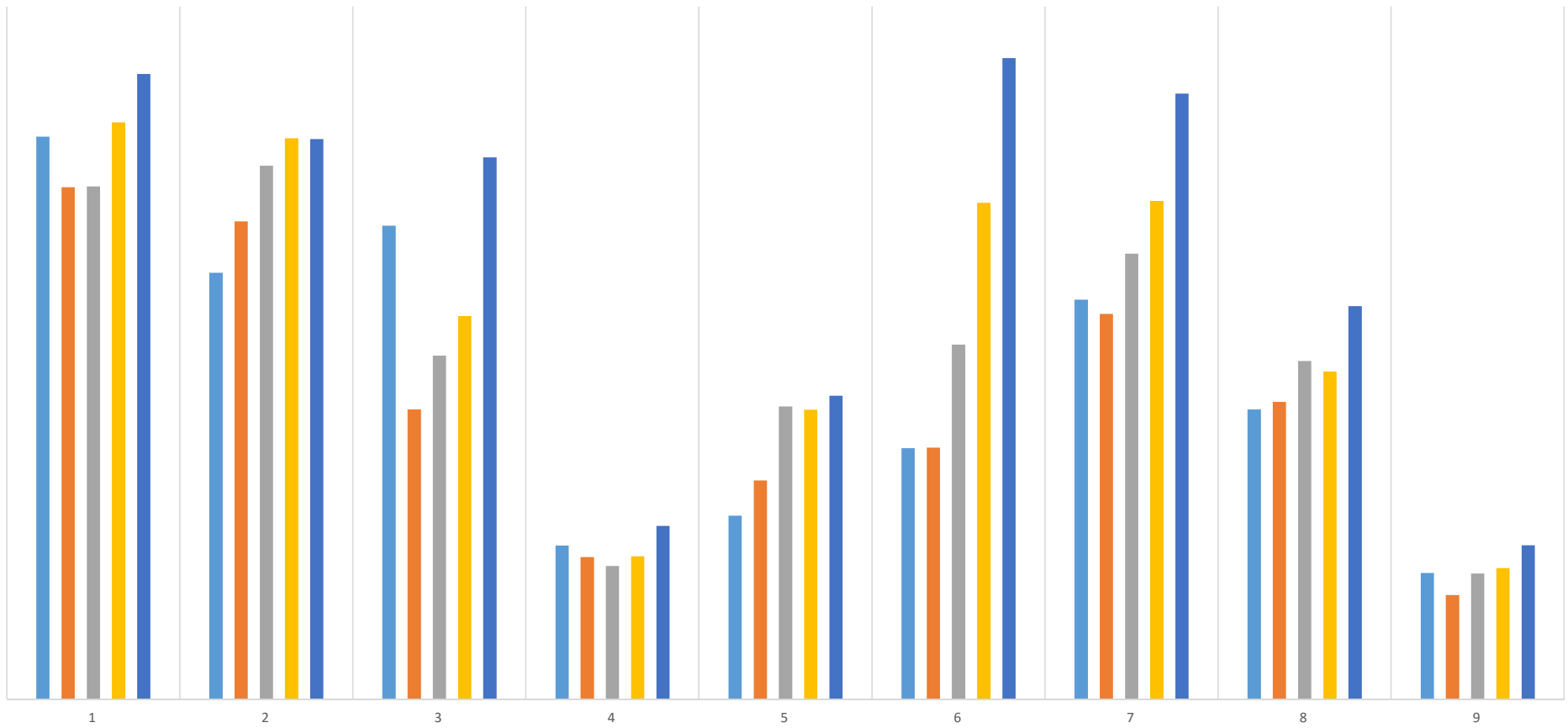


## ANNUAL WATER CONSUMPTION (HCF) BY FACILITY



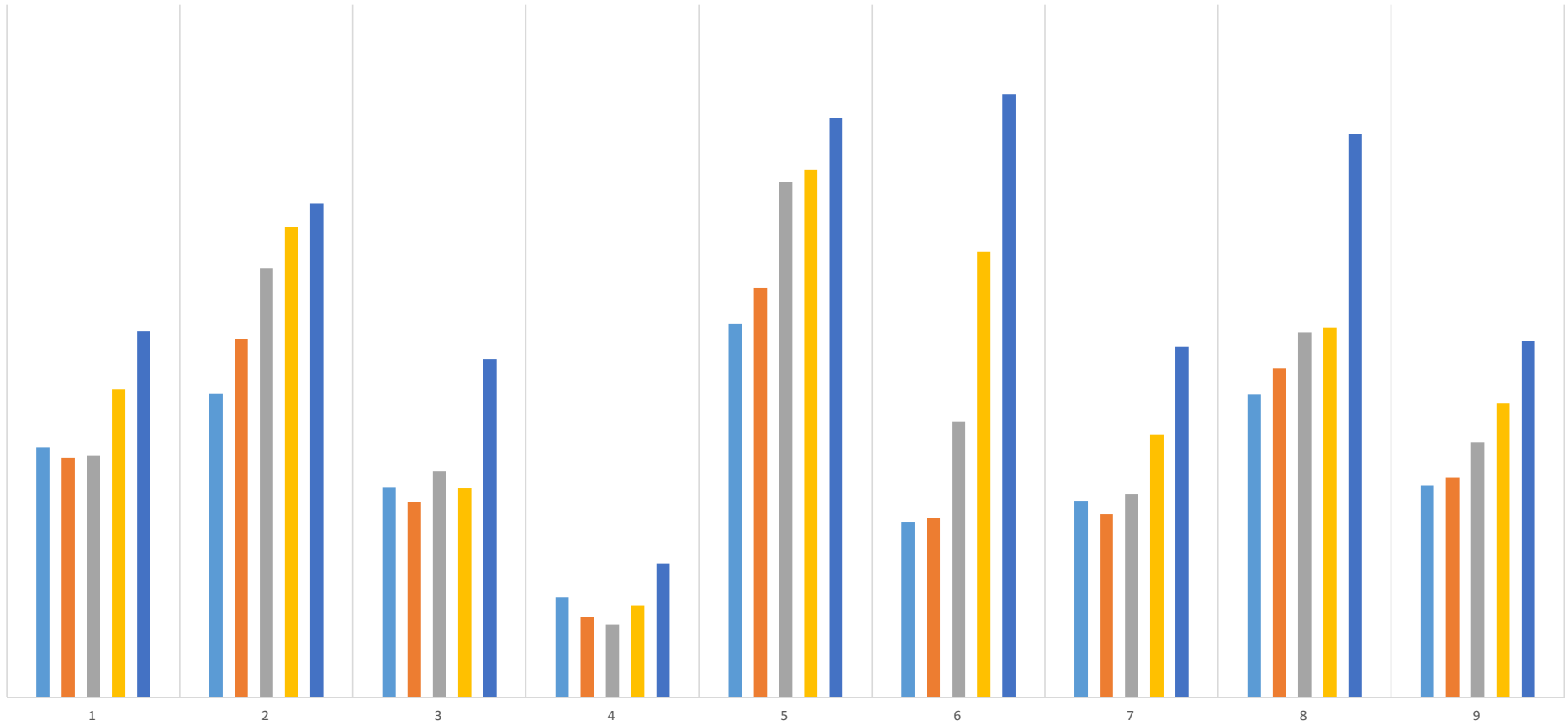
# WATER CONSUMED (HCF) PER ACRE OF LANDSCAPE

■ 2010 ■ 2011 ■ 2012 ■ 2013 ■ 2014



# ANNUAL COST BY FACILITY

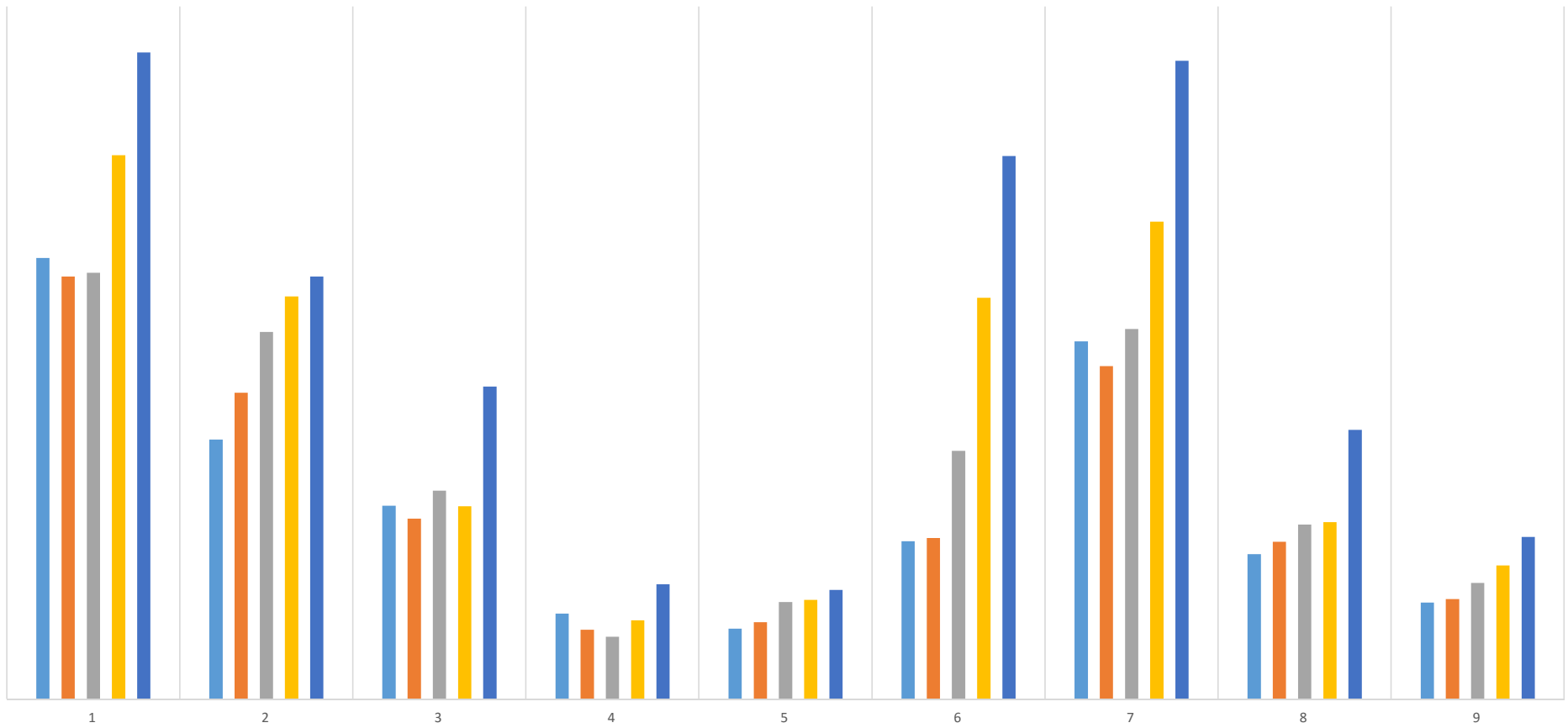
■ 2010 ■ 2011 ■ 2012 ■ 2013 ■ 2014





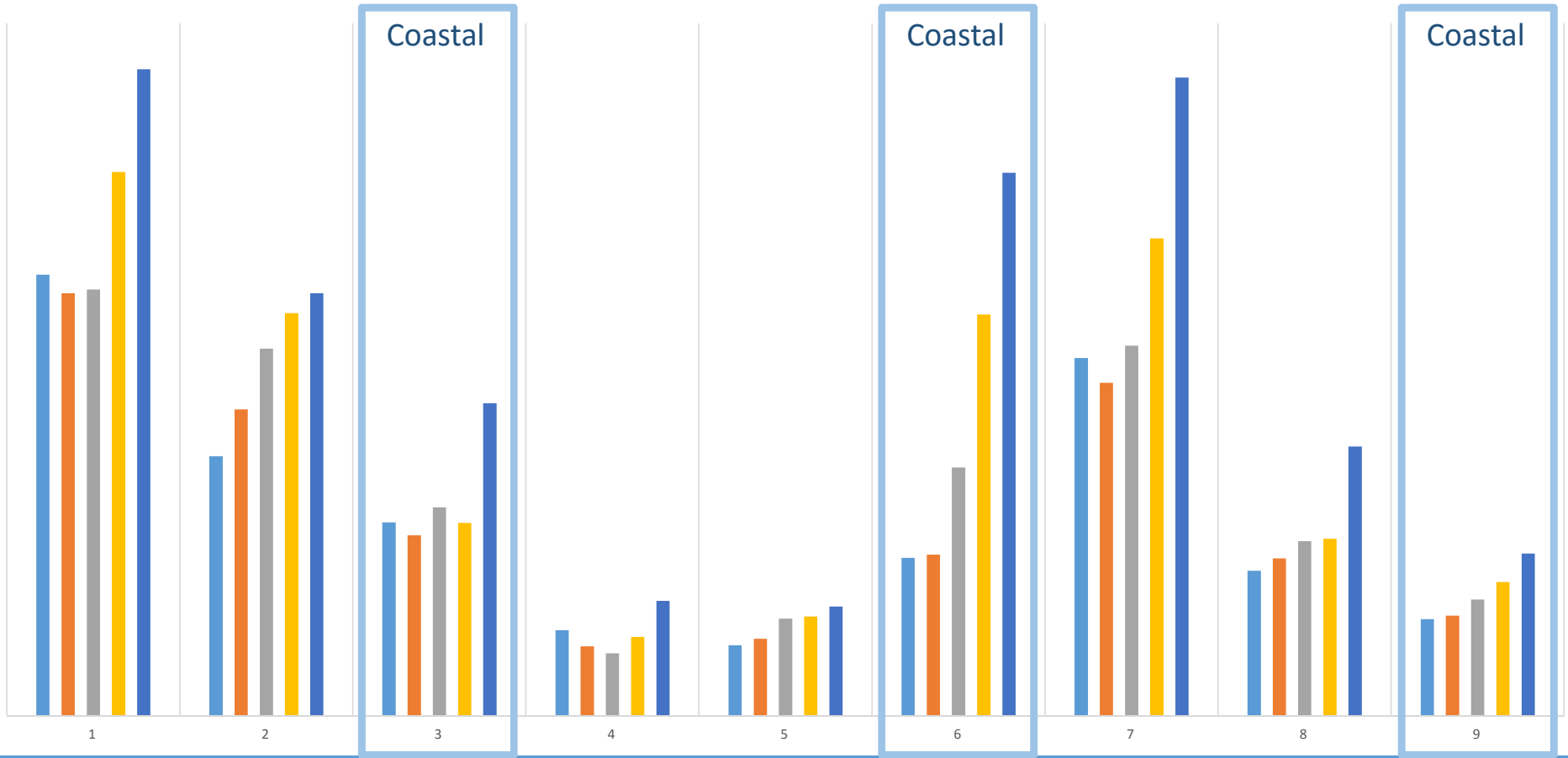
# ANNUAL COST PER ACRE

■ 2010 ■ 2011 ■ 2012 ■ 2013 ■ 2014



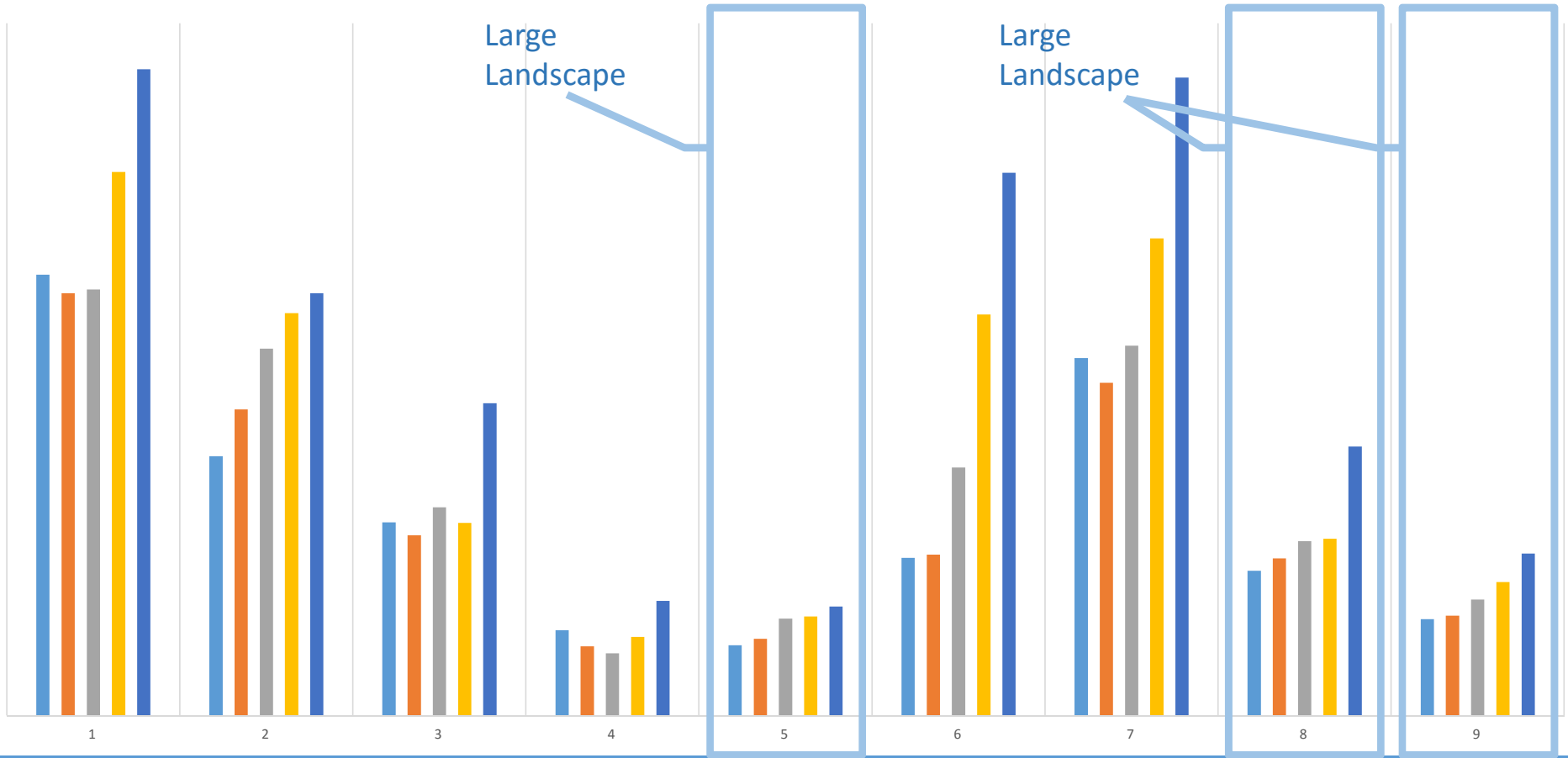
# ANNUAL COST PER ACRE

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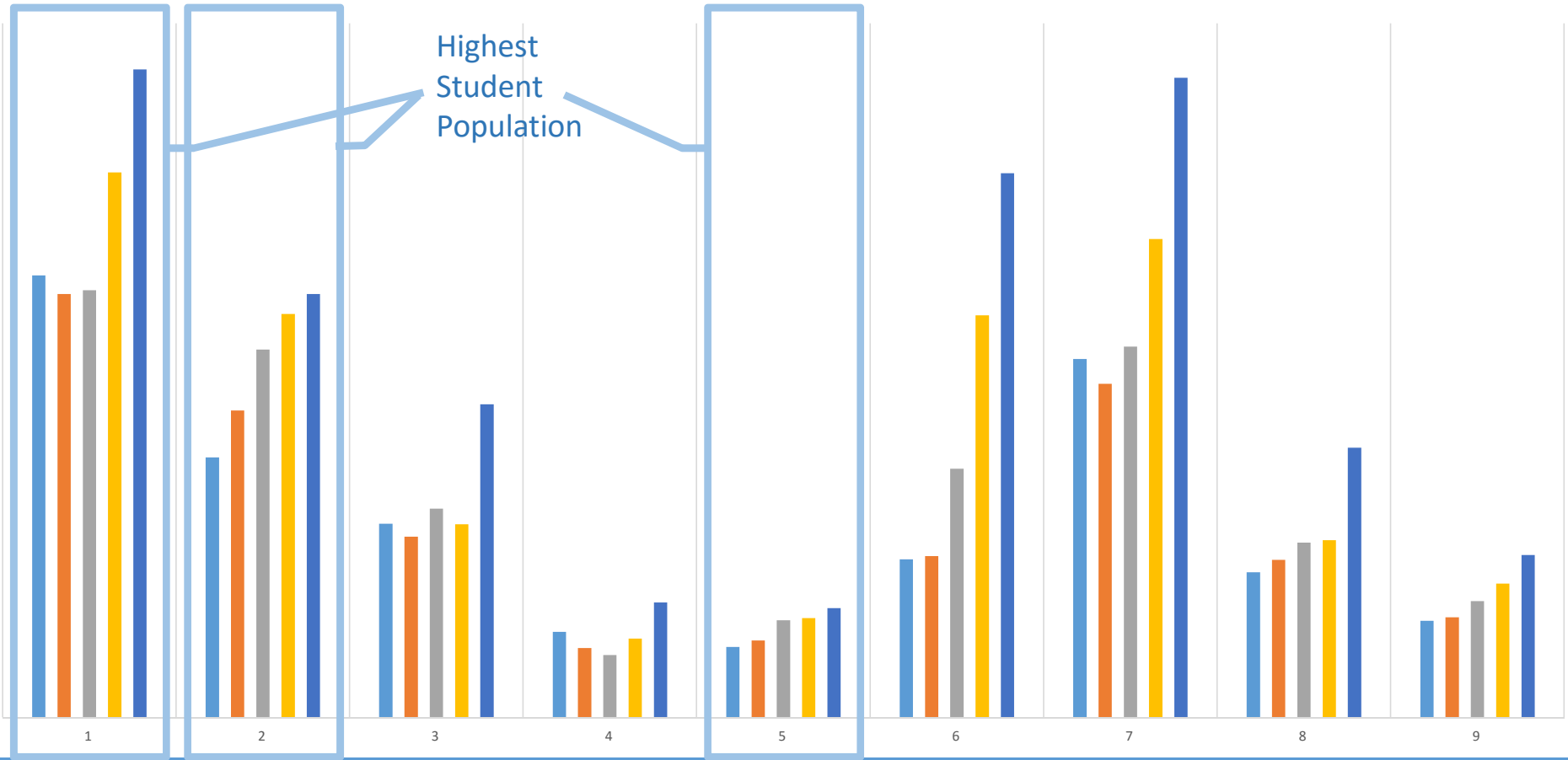
# ANNUAL COST PER ACRE

■ 2010 ■ 2011 ■ 2012 ■ 2013 ■ 2014



# ANNUAL COST PER ACRE

■ 2010 ■ 2011 ■ 2012 ■ 2013 ■ 2014



# What does the data tell us?

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There was not a single factor (geography, campus size, enrollment, OGSF) linking better performing colleges or poorly performing colleges

Colleges that are actively engaging in water conservation and managing their irrigation schedules have lower cost and consumption

Colleges must be vigilant about their irrigation schedules

Utility rates will always increase, and overall costs will increase unless consumption goes down

Data also revealed billing errors that will result in the recovery of approximately \$90,000

# Next Steps

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Water cost and consumption data collected from water agencies only tells part of the story

Campus operations must also be examined

Irrigation schedules for each campus are currently under review

Irrigation schedule review will be used to determine if campuses are engaging in best practices, or if campuses need assistance in improving their water conservation efforts

# Next Steps

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LACCD's Bond Program (Build LACCD) is reviewing current DSA recommendations and will revise landscape specifications to comply with DSA requirements with respect to water conservation

LACCD is in the process of crafting a guidance document for water conservation, with specific focus on irrigation schedules and best practices, but will also include swimming pools, boilers, central plants, custodial, restrooms, and any other equipment or activity that uses water

# Public Perception of Water Conservation

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Intense media coverage at time of Governor's executive order

Many stories of potential waste by public agencies and public figures

California Gold

Turf replacement programs

Water agencies enforced or reinforced mandatory conservation measures

DSA announced new rules on landscape

Strong response from water agencies, public agencies, and end users

Does water conservation have the same spotlight and urgency now as it did in June 2015?



# Results

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As of reports published on October 1, 2015, all water agencies servicing LACCD colleges were exceeding their targets

- LADWP is at 18.08% against their 16% target
- Golden State Water Culver City is at 18.74% against their 16% target
- Golden State Water Southeast is at 14.91% against their 12% target
- California Water Service Company East LA is at 17.02% against their 8% target

The State of California is at a cumulative saving percentage of 28.6% through the August 2015 reporting period, ahead of the 25% goal established by the governor

# Resources

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California State Water Resources Control Board

<http://www.waterboards.ca.gov/>

Metropolitan Water District

<http://www.mwdh2o.com/>

Books about understanding large data sets and implementing behavior change

- Freakonomics (Levitt and Dubner) and sequels
- Nudge (Thaler and Sunstein) and Misbehaving (Thaler)
- Thinking Fast and Slow (Kahneman)
- The Tipping Point; Blink; Outliers (Gladwell)
- The Power of Habit (Duhigg)
- Numbers Rule Your World (Fung)



## Impact on Facilities Plans



existing campus aerial

ORANGE AVENUE

E. PACIFIC COAST HIGHWAY

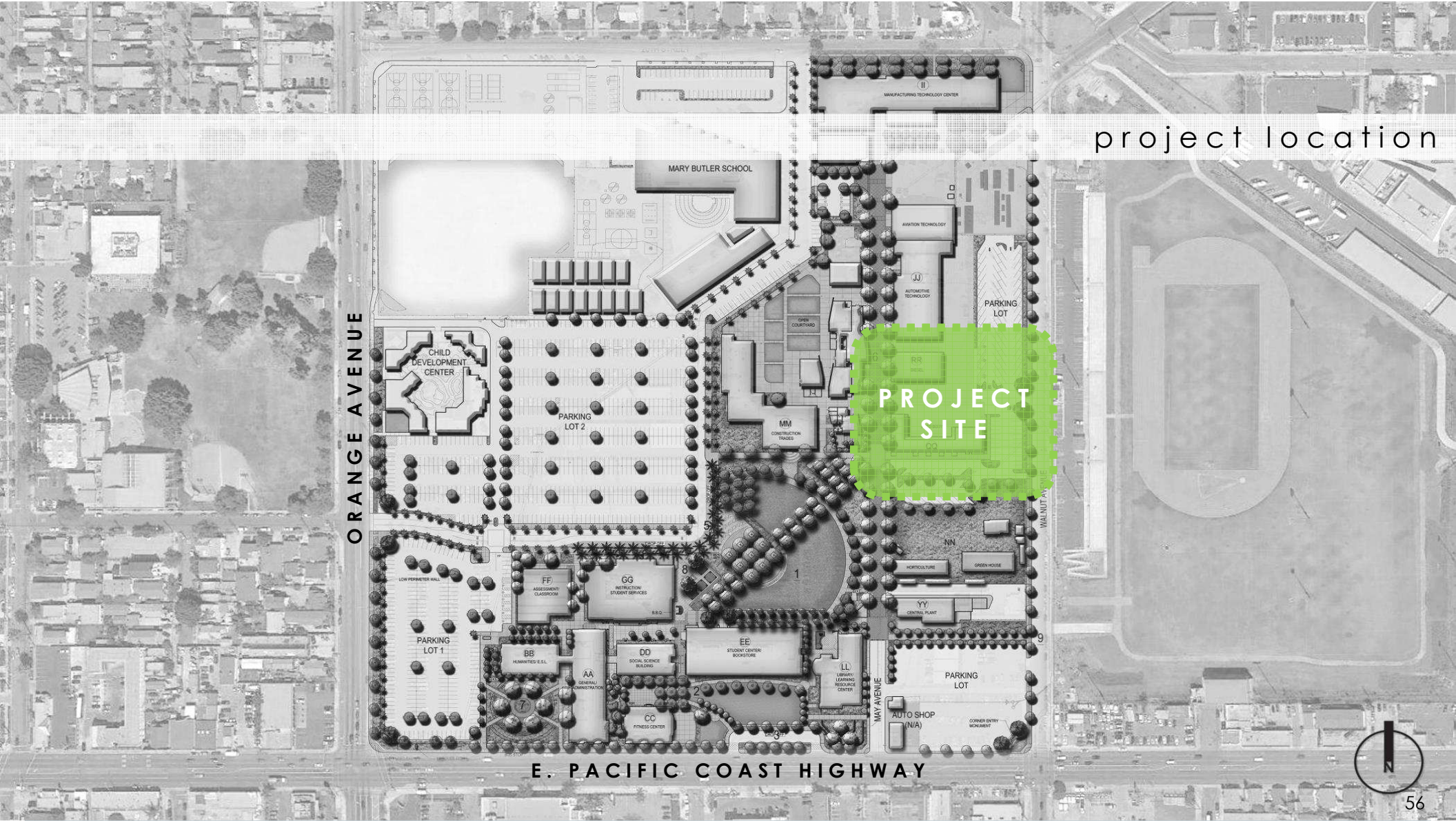




landscape illustrative







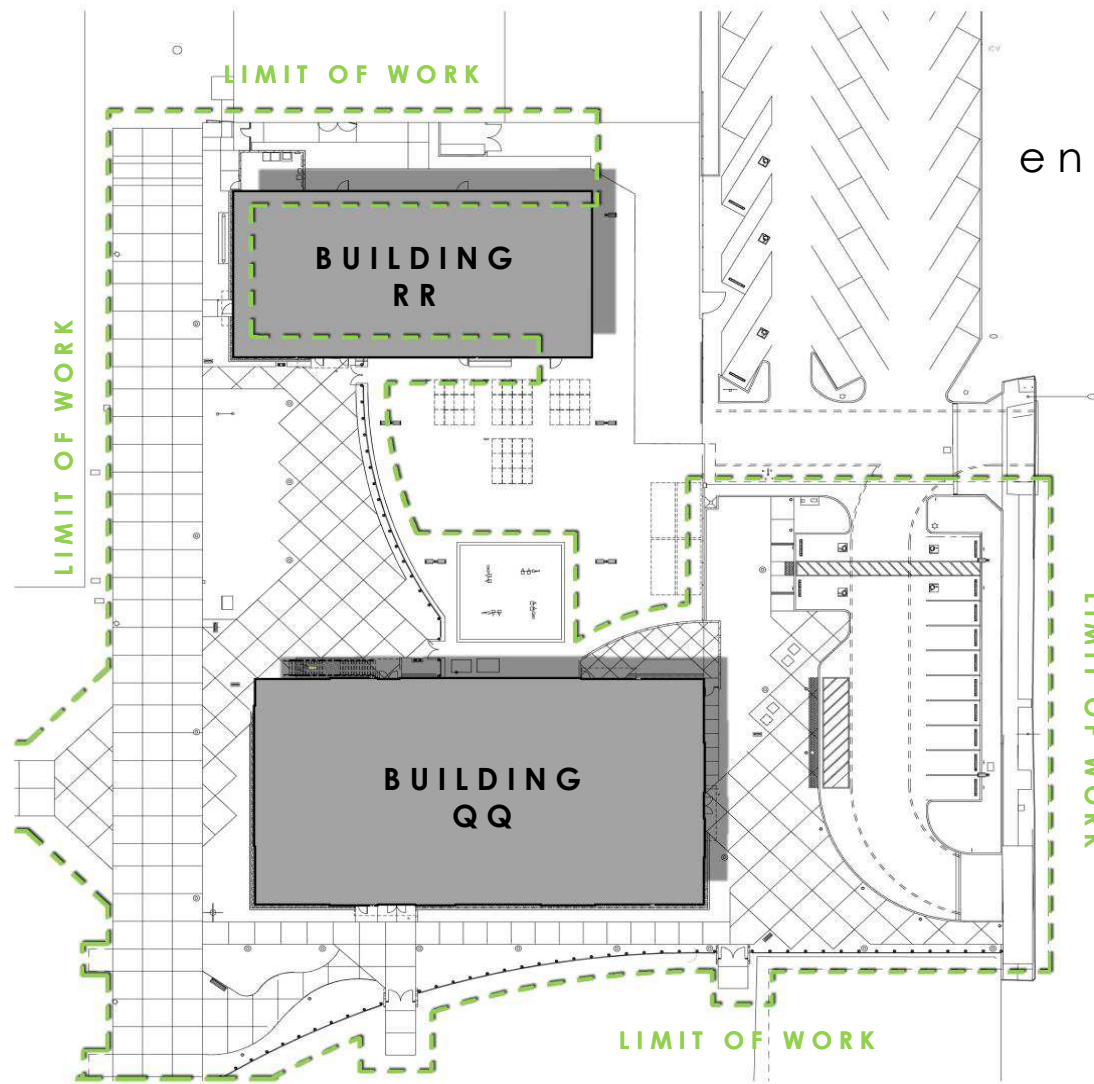
project location

**PROJECT SITE**

ORANGE AVENUE

E. PACIFIC COAST HIGHWAY

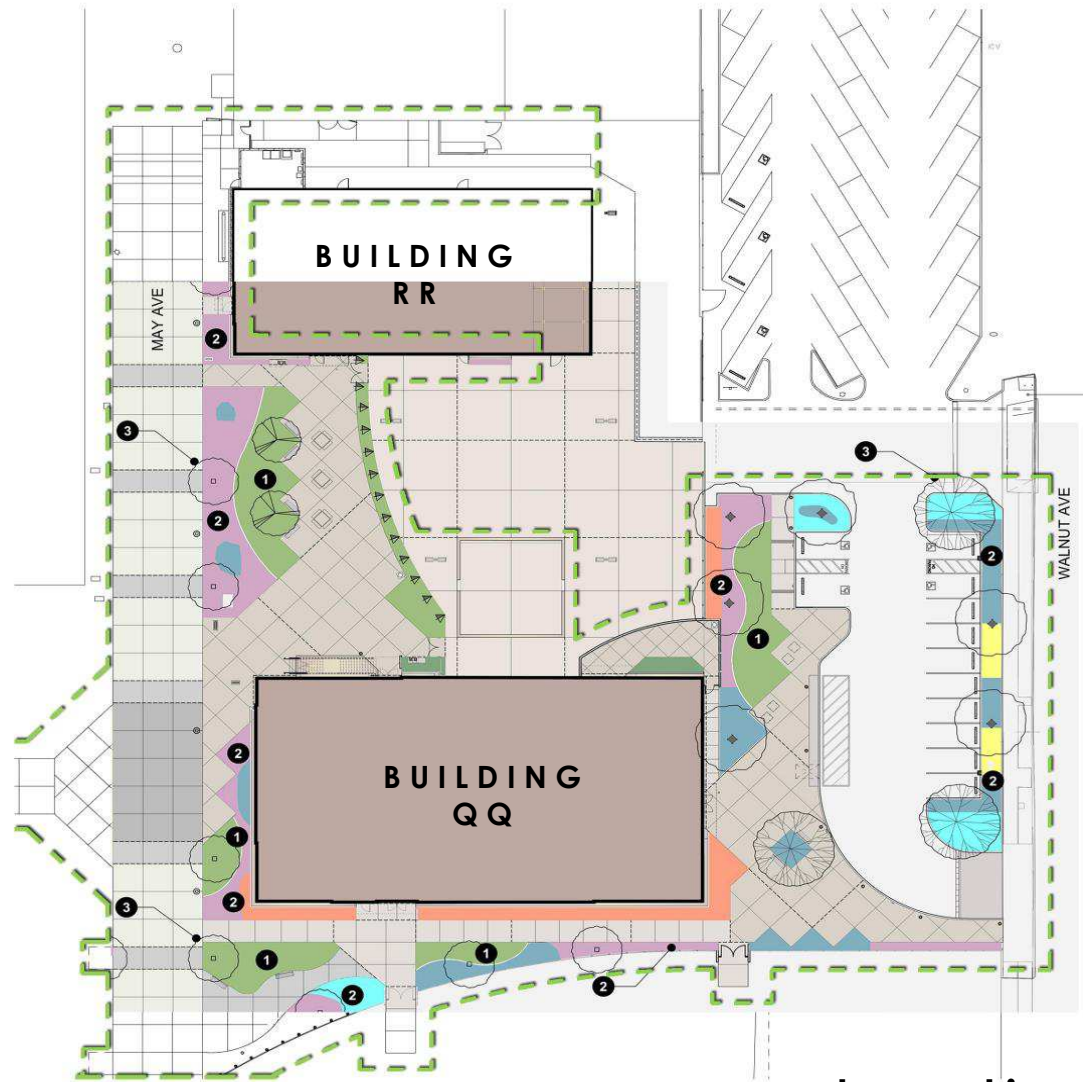
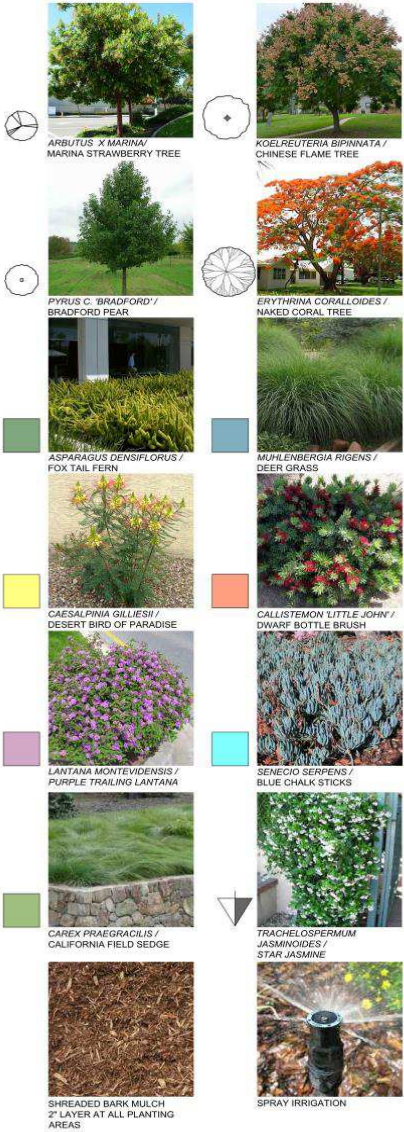




enlarged site plan







20%

225,365 GAL / YEAR  
20% BELOW MAWA

• COMPLIED WITH AB1881 MODEL WATER CONSERVATION ORDINANCE.

LEGEND

- 1 FIELD SEDGE LAWN SUBSTITUTE.
- 2 MODERATE WATER USE SHRUBS AND GROUNDCOVERS.
- 3 TREES PER CAMPUS MASTER PLAN.

baseline - site plan







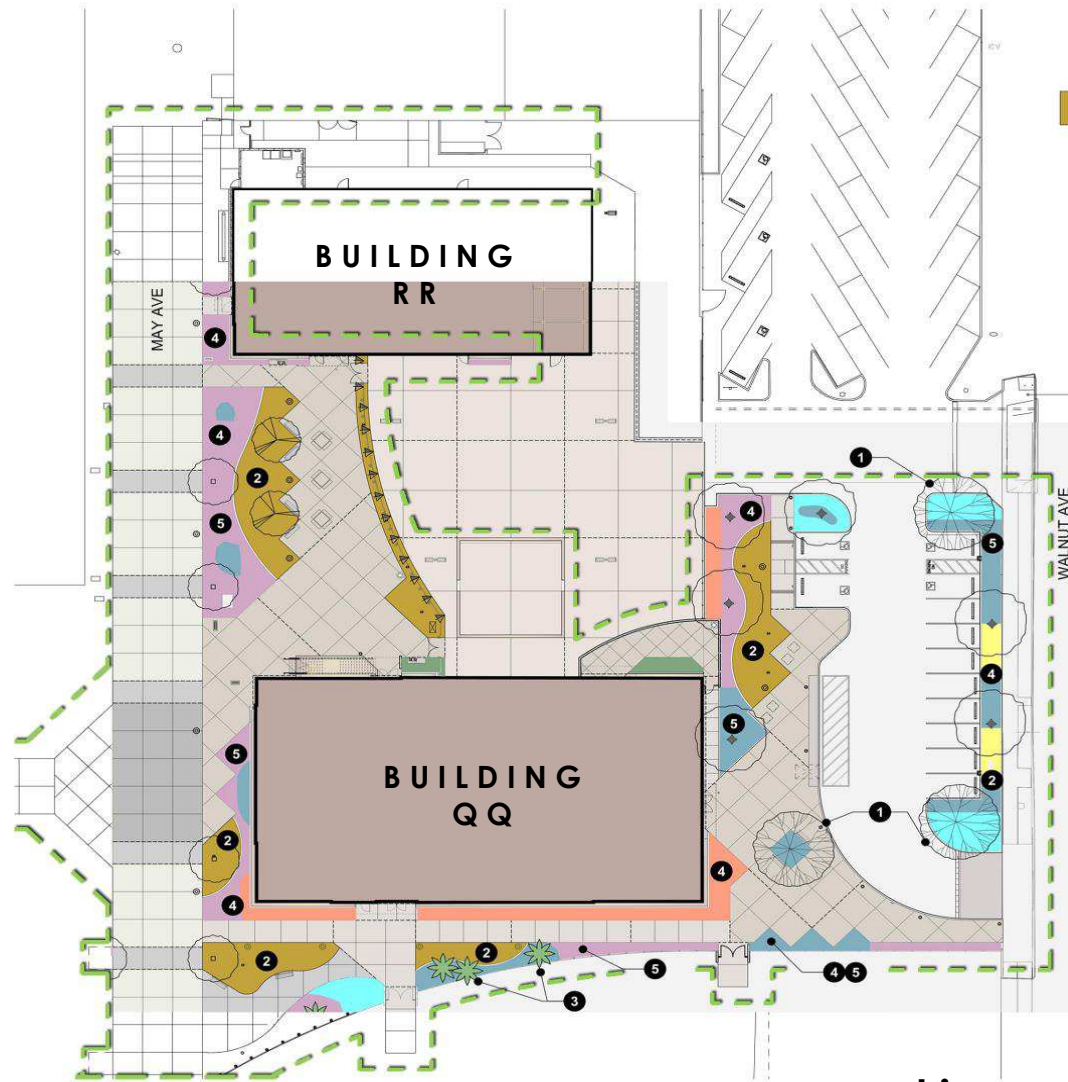
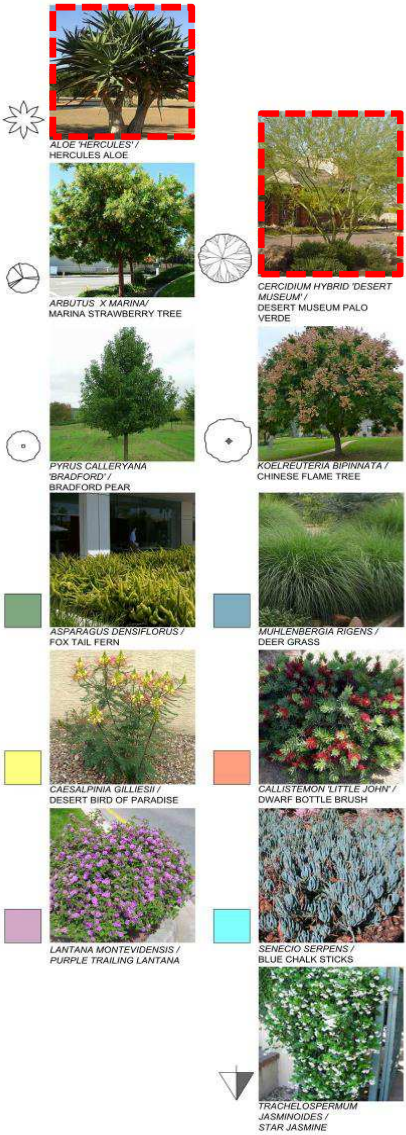
baseline - perspective





baseline - perspective





**38.5%**

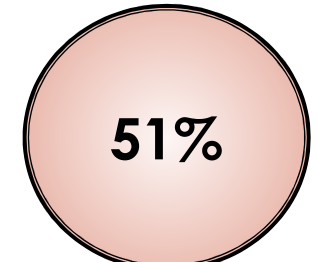
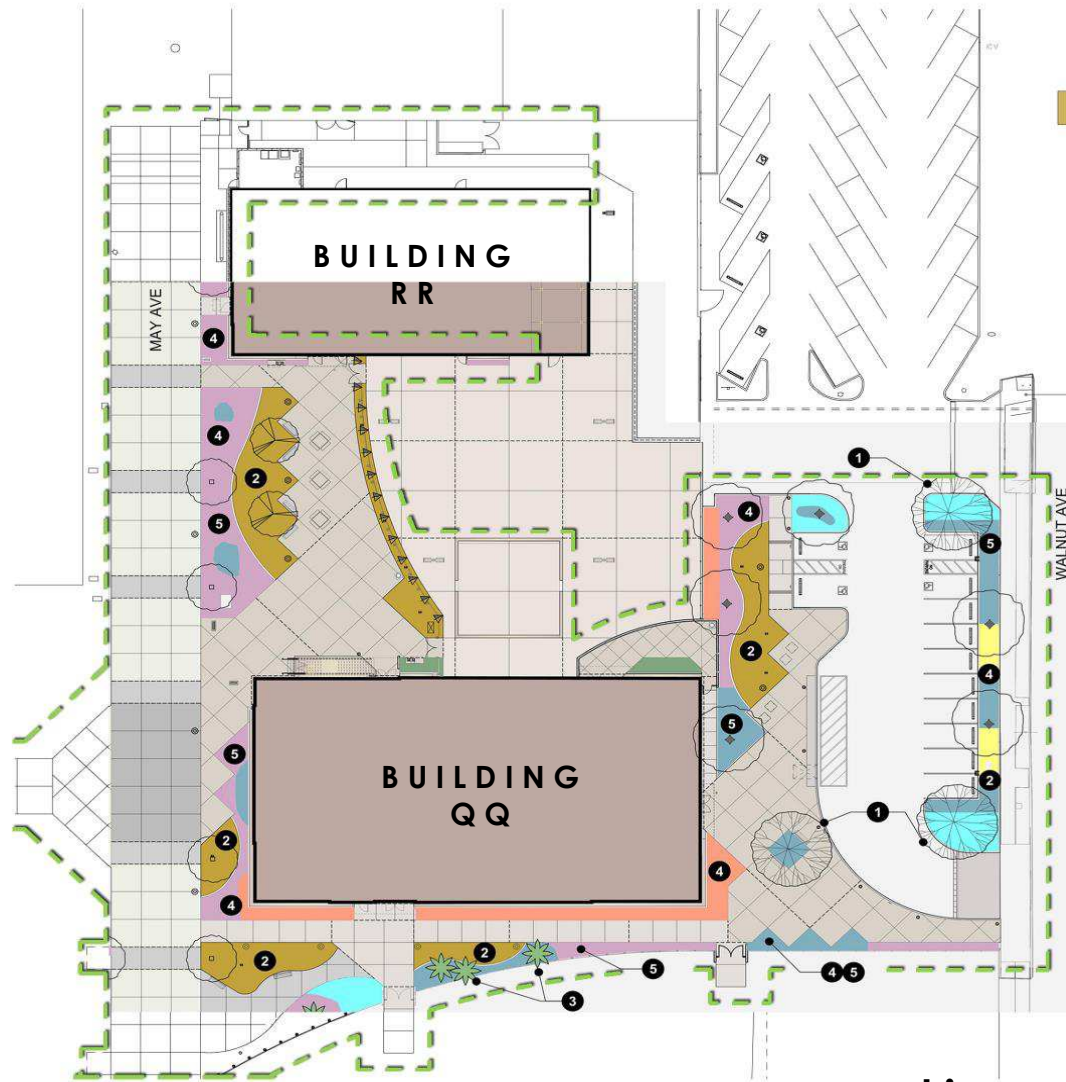
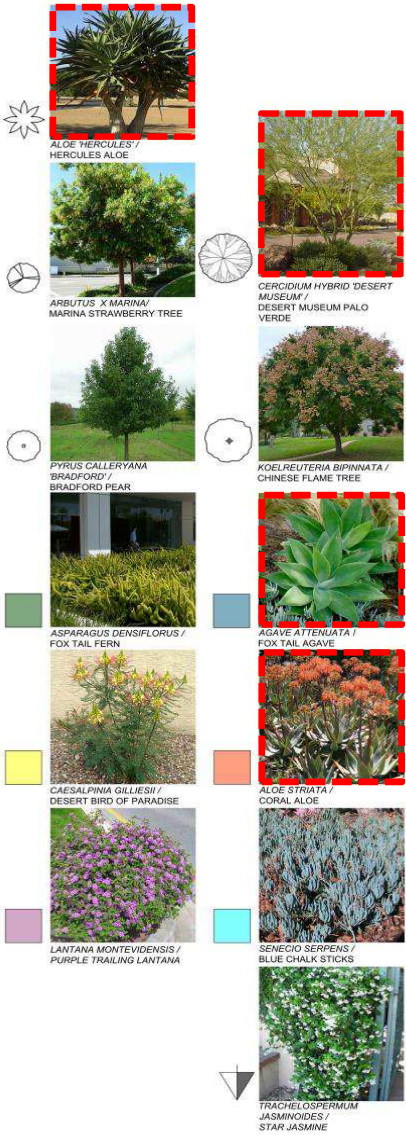
**171,926 GAL / YEAR  
38.5% BELOW MAWA**

- DECOMPOSED GRANITE PAVING TO REPLACE LAWN SUBSTITUTE.
- SPRAY IRRIGATION
- MODERATE WATER USE PLANT MATERIALS

- LEGEND
- 1 REPLACE 'NAKED CORAL TREES' WITH 'DESERT MUSEUM PALO VERDE' TREES.
  - 2 REPLACE 'CALIFORNIA FIELD SEDGE' WITH DECOMPOSED GRANITE PAVING.
  - 3 REPLACE (3) ARBUTUS X MARINA TREES WITH ALOE 'HERCULES'.
  - 4 PROVIDE A 2" THICK LAYER OF 3/8" DIAMETER PEA GRAVEL MULCH IN LIEU OF SHREDDED BARK MULCH.
  - 5 SPRAY IRRIGATION.

option A - site plan





136,725 GAL / YEAR  
51% BELOW MAWA

- DECOMPOSED GRANITE PAVING TO REPLACE LAWN SUBSTITUTE.
- DRIP IRRIGATION
- LOW WATER USE PLANT MATERIAL

- LEGEND
- 1 REPLACE 'NAKED CORAL TREES' WITH 'DESERT MUSEUM PALO VERDE' TREES.
  - 2 REPLACE 'CALIFORNIA FIELD SEDGE' WITH DECOMPOSED GRANITE PAVING.
  - 3 REPLACE (3) ARBUTUS X MARINA TREES WITH ALOË 'HERCULES'.
  - 4 PROVIDE A 2" THICK LAYER OF 3/8" DIAMETER PEA GRAVEL MULCH IN LIEU OF SHREDDED BARK MULCH.
  - 5 SPRAY IRRIGATION.

option B - site plan







option A & B - perspective





option A & B - perspective



## Questions & Answers

**Thank You!**



# Contact

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