

# October Brown Bag Lunch Presentations

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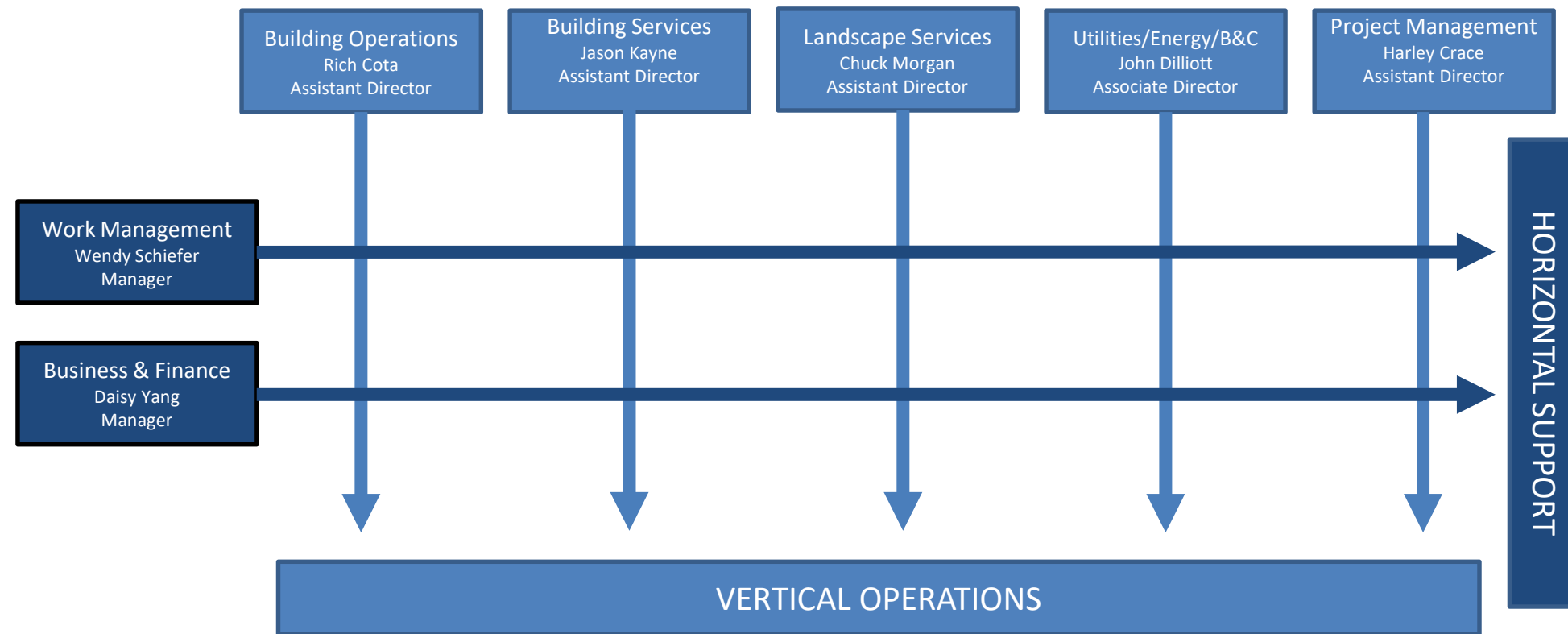
Presentation 1: Campus Energy & Water Management Reporting

Presentation 2: FM Project Charters

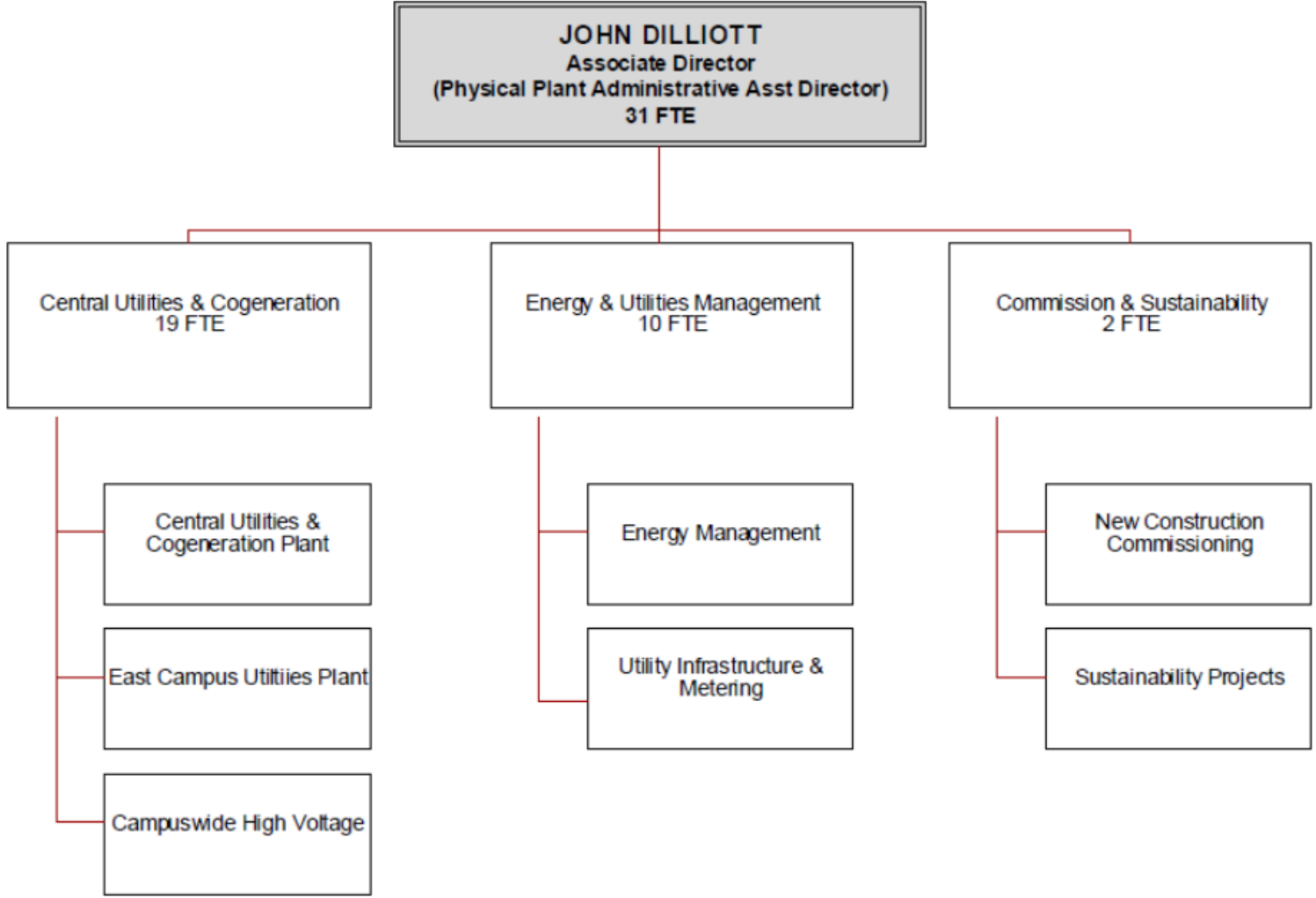
Presentation 3: Various FM & Transportation Updates

# CAMPUS ENERGY & WATER MANAGEMENT & REPORTING

# FM Organization Structure

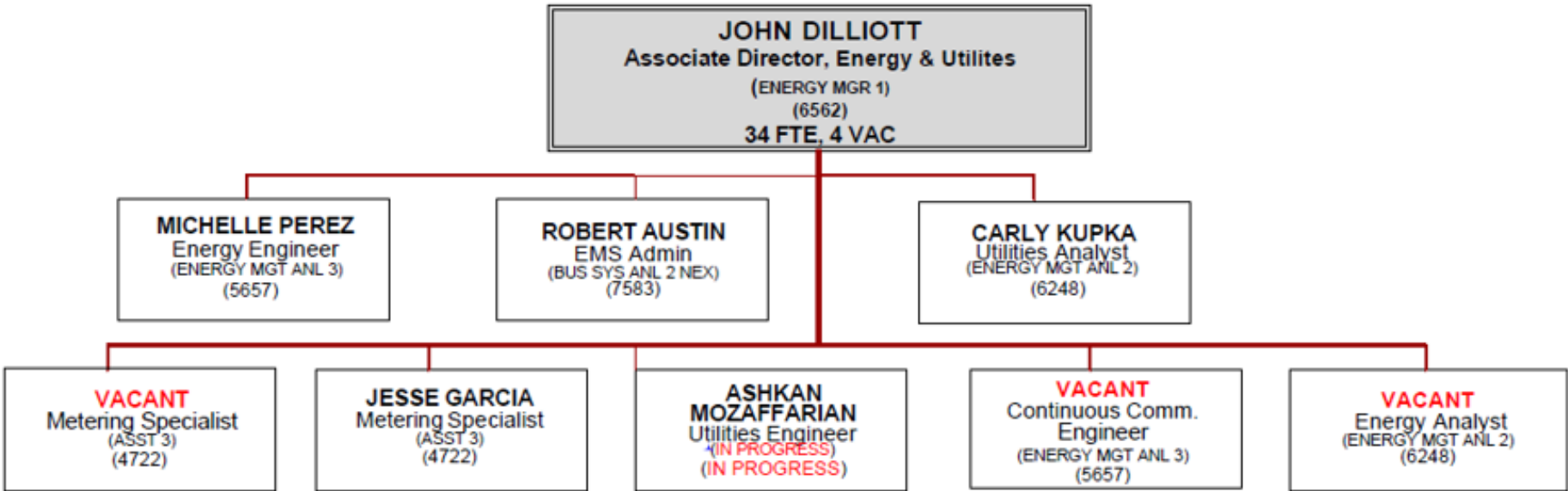


# Energy & Utilities Organization Structure

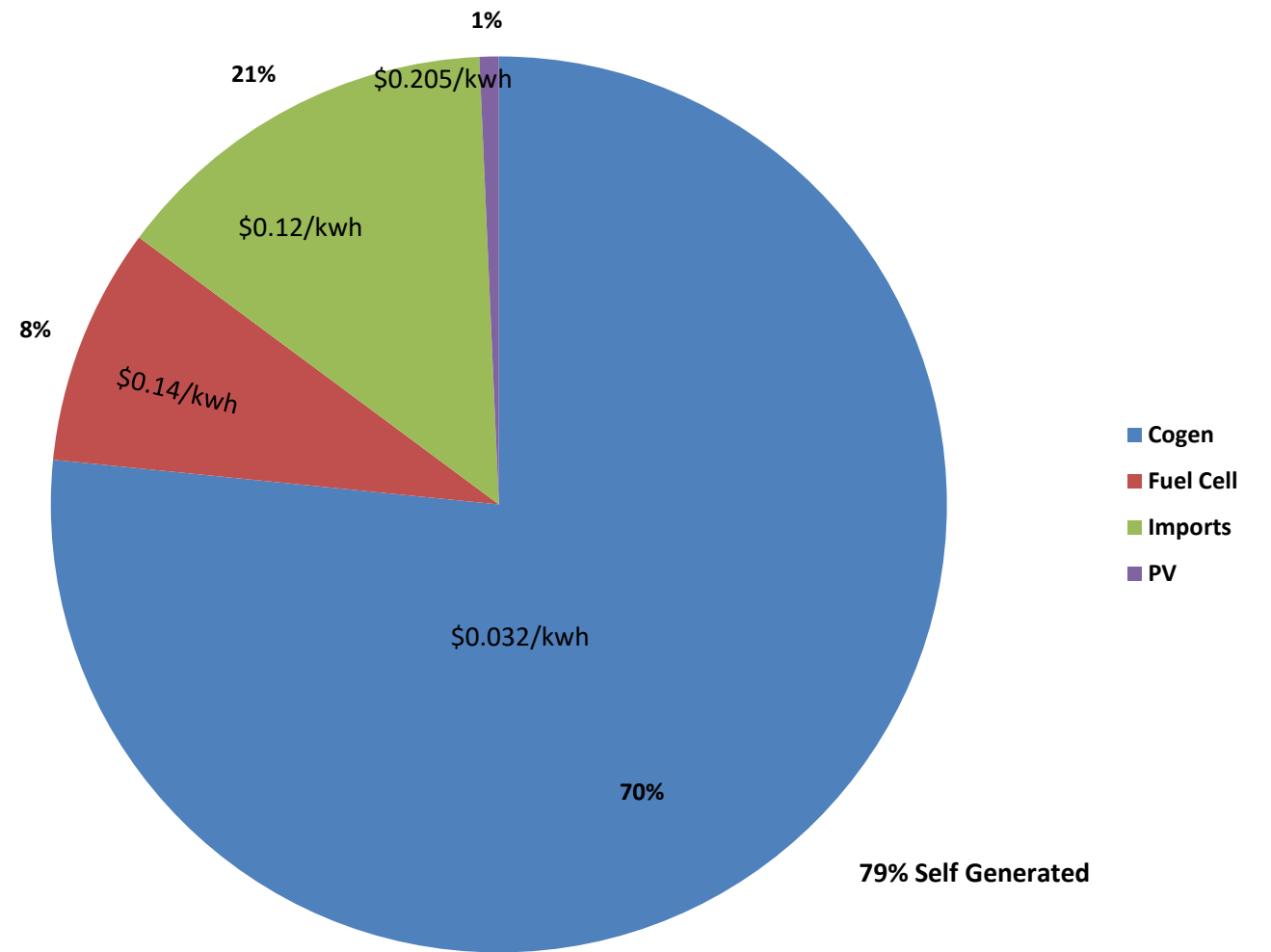
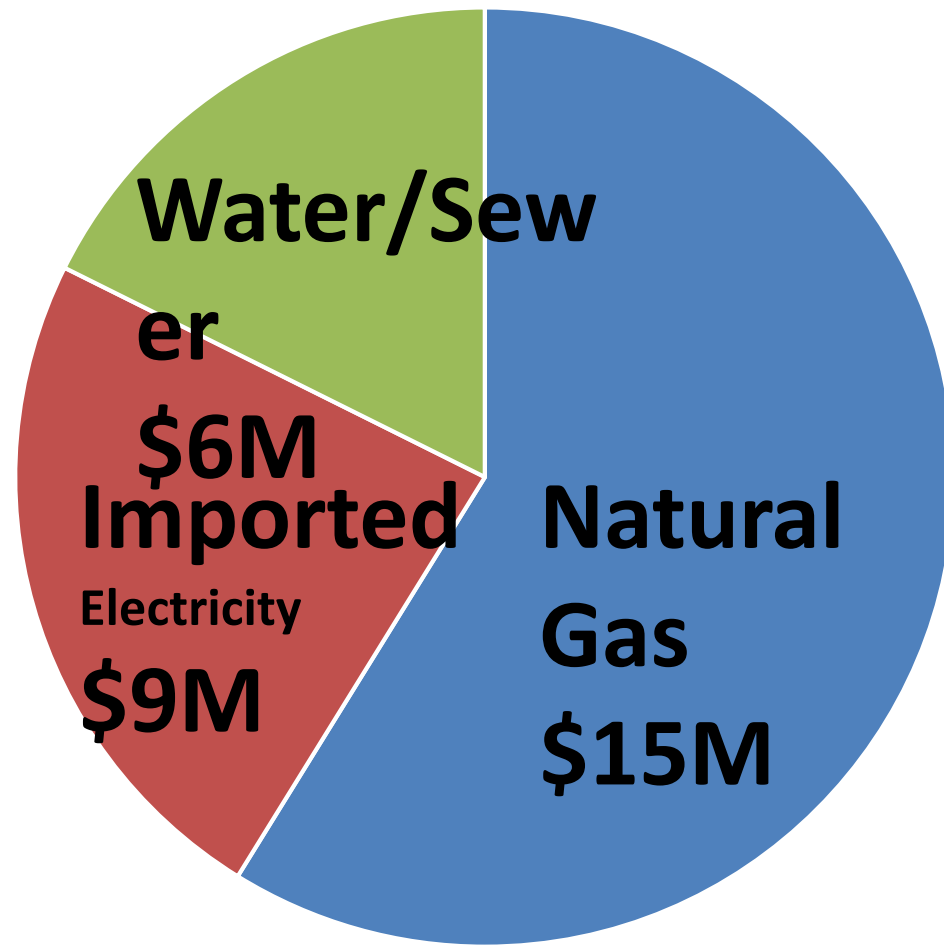




# Metering Organization Structure



# Annual Utilities Spend



# Energy/Carbon Goals

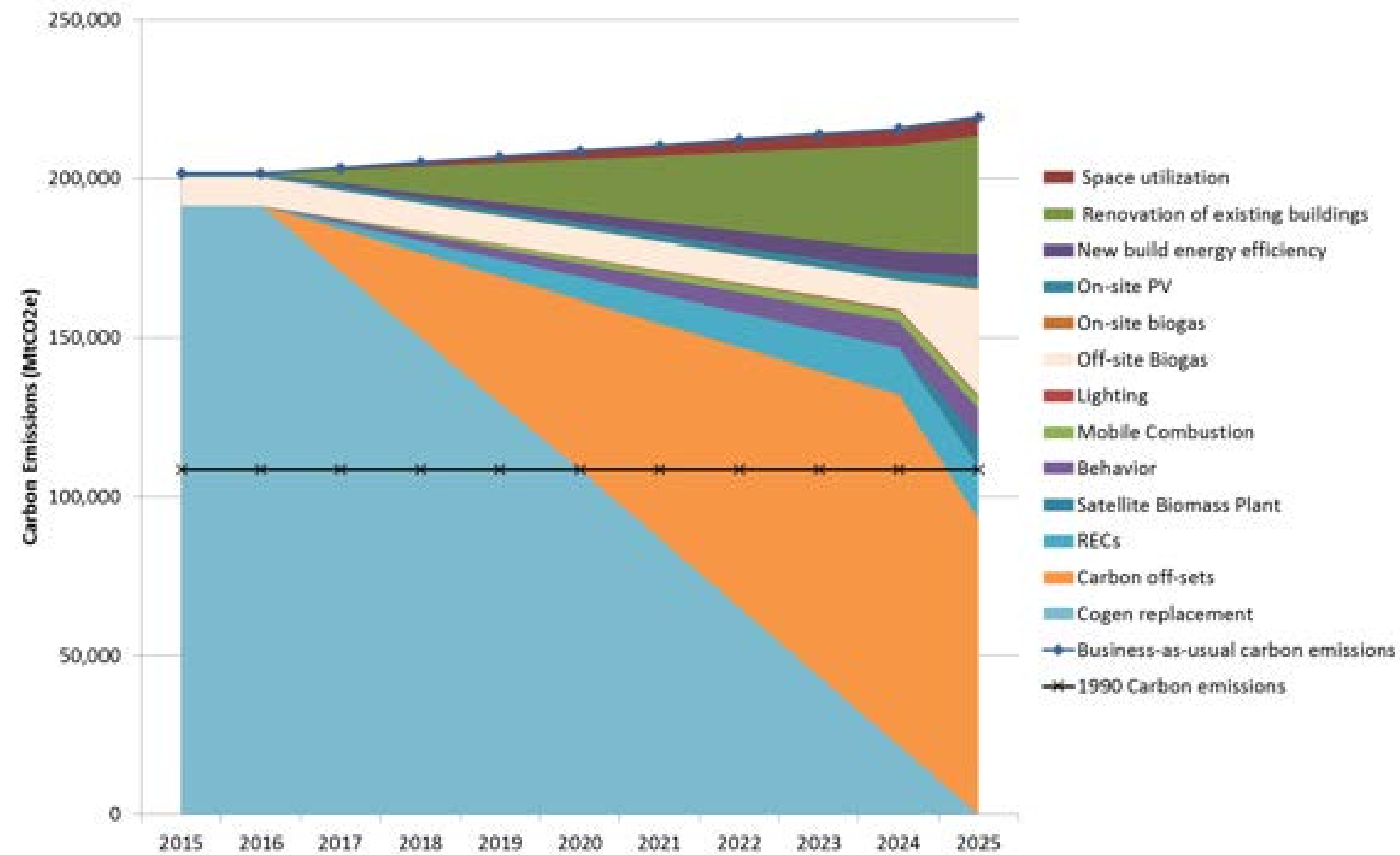
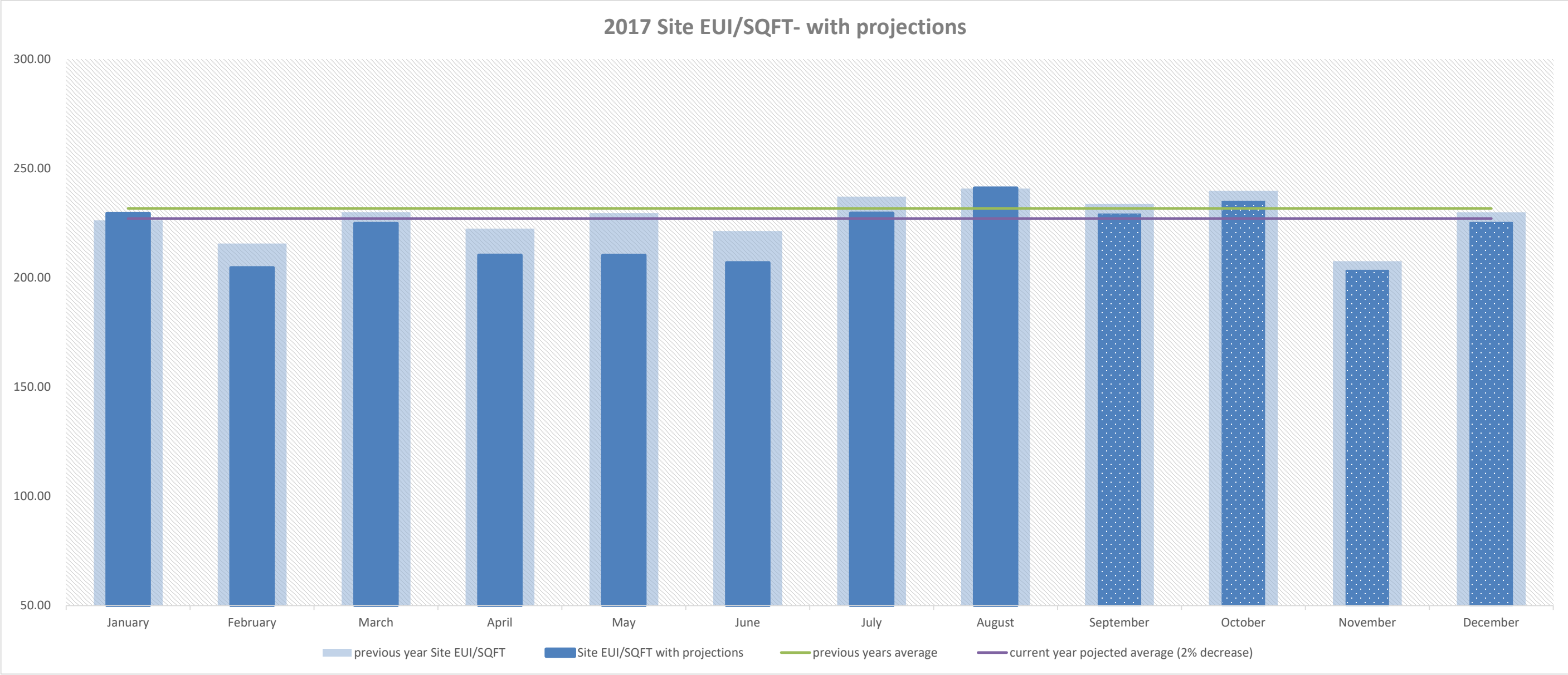
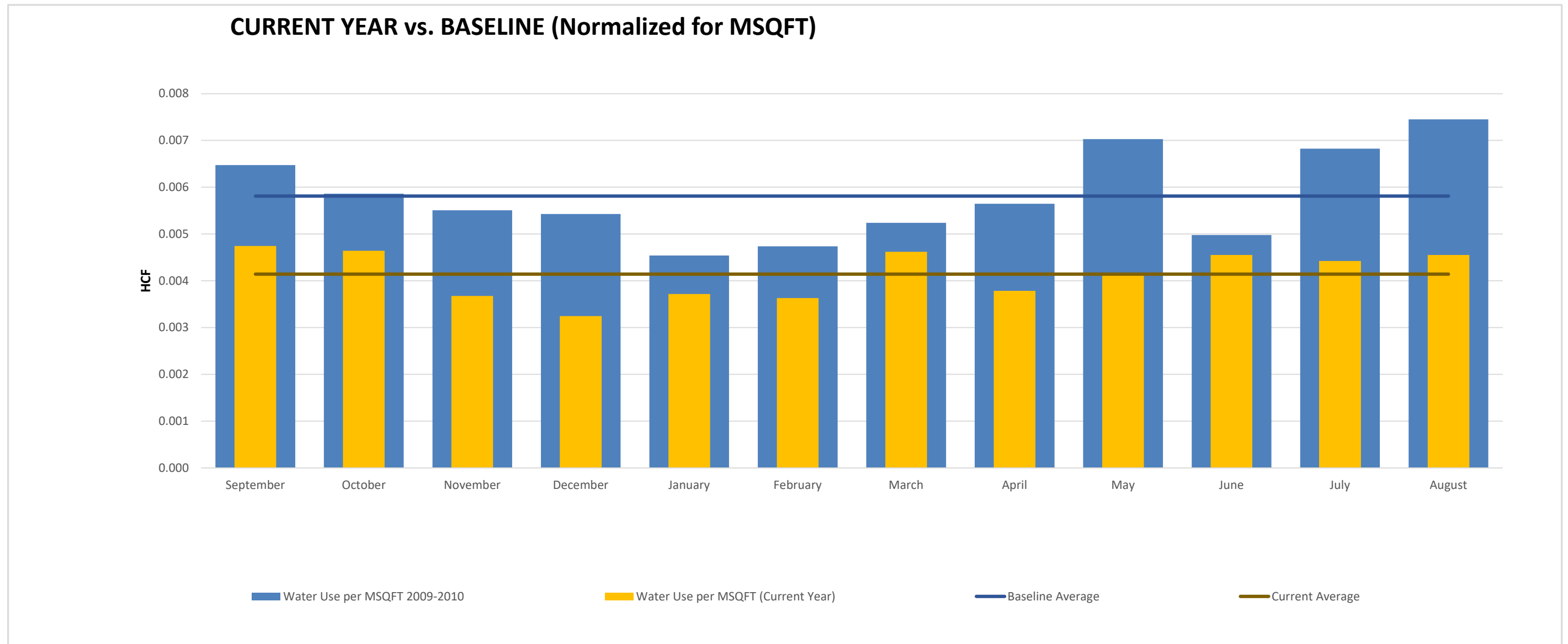


Figure 1: UCSD Scope 1 and 2 Greenhouse Gas Abatement Wedge

# Energy Report



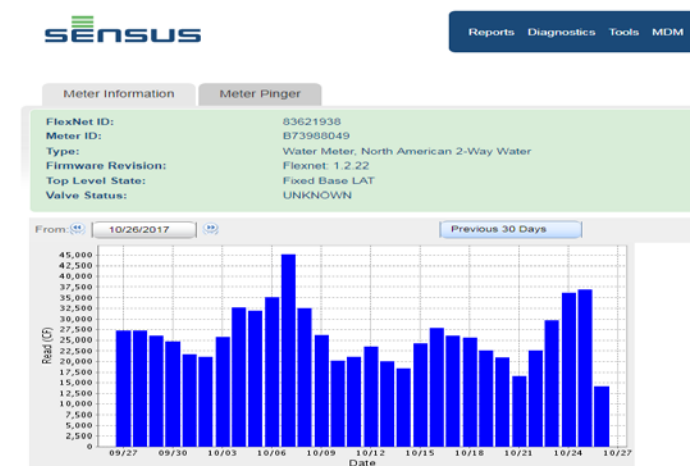
# Water Report



# WATER MANAGEMENT & REPORTING

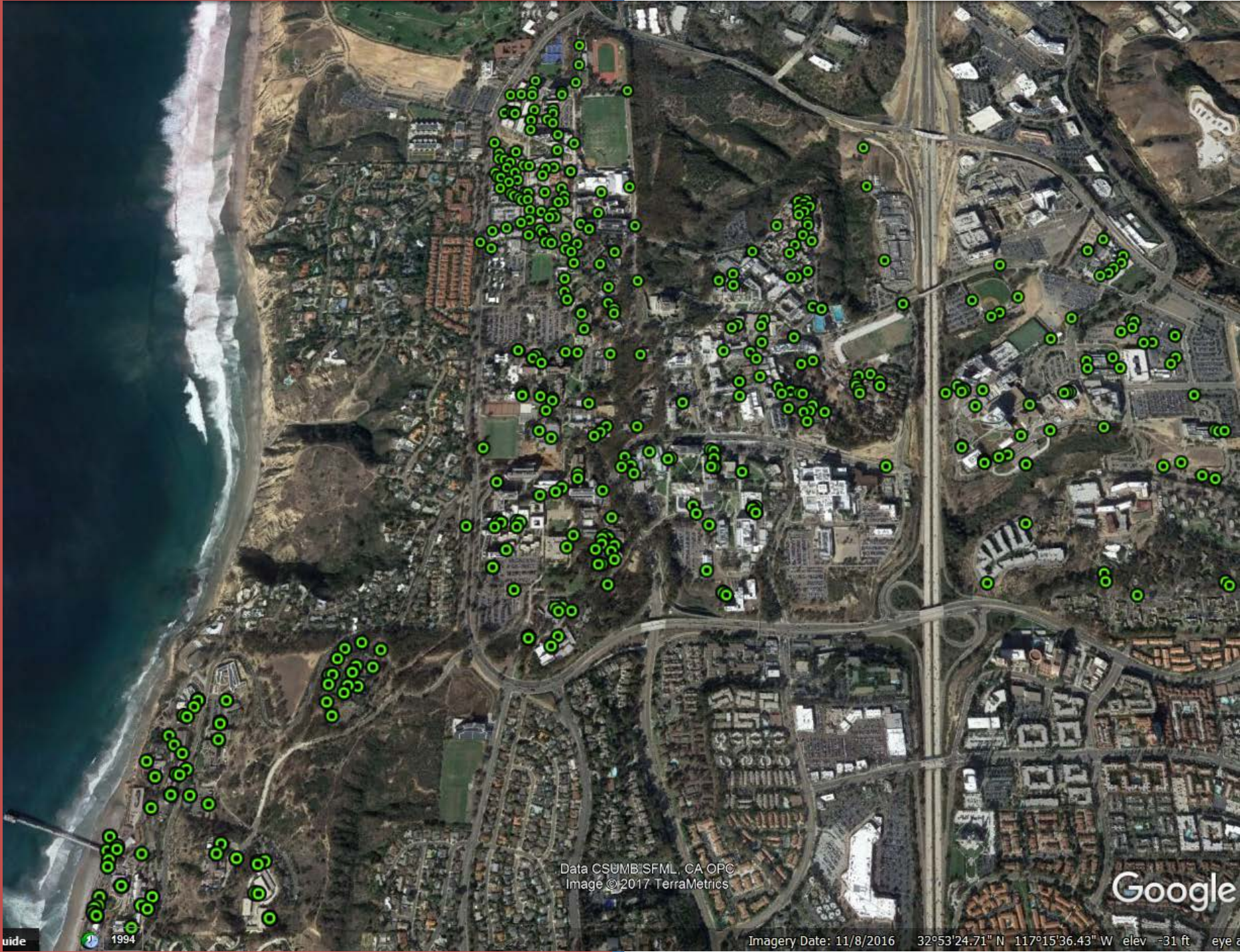
# Meter Data Collection

- ~200 non-smart meters
- Monthly data only
- 2-3 weeks to collect
- ~400 smart meters (70% upgraded)
- Hourly data, scheduled reports, alarms





# CAMPUS SMART METERS



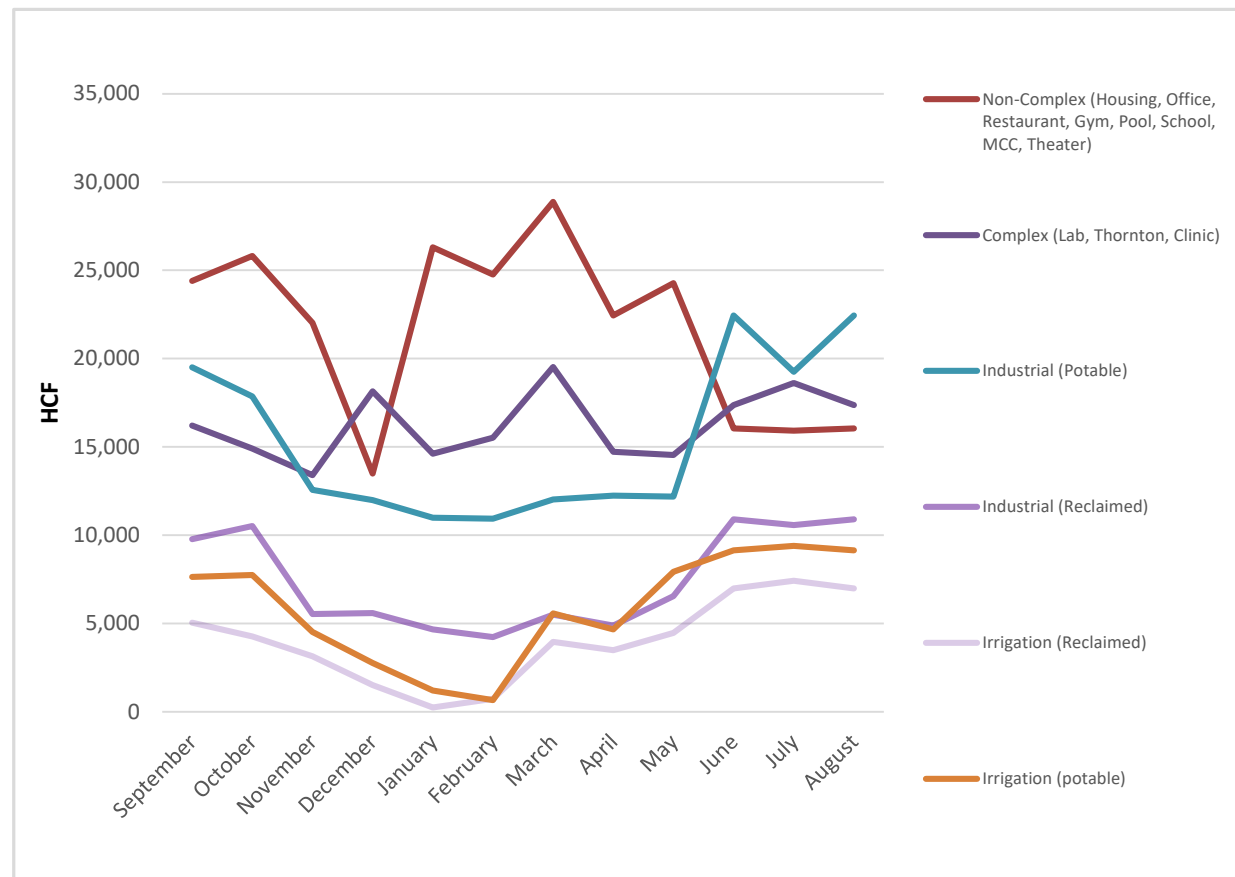




# Data Analysis & Reporting

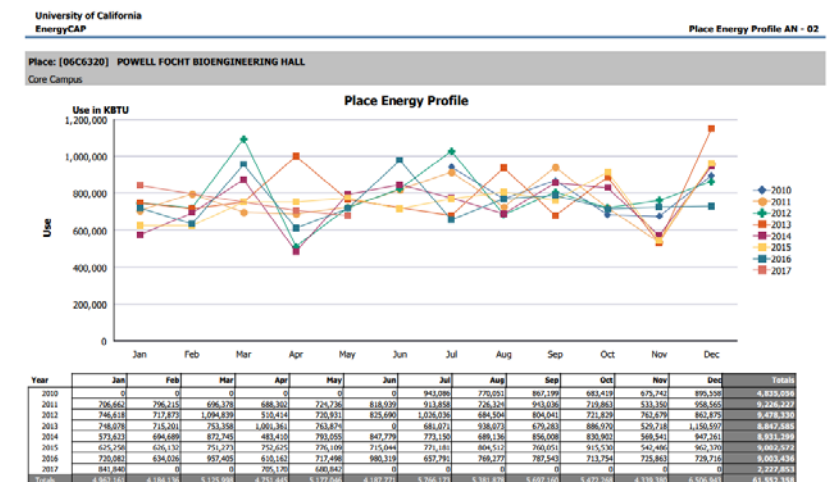
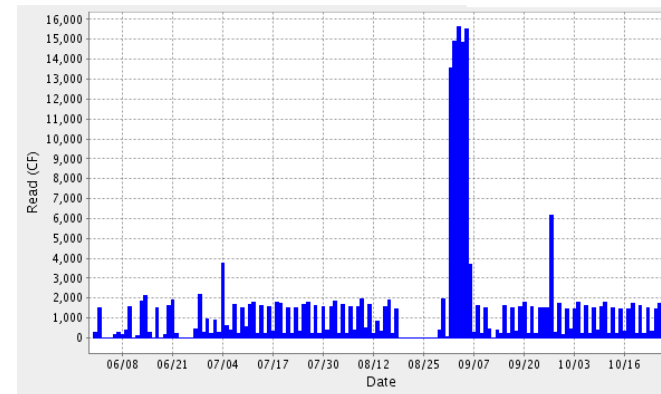
## OLD SYSTEM

- Variance check & data validation
- Custom spreadsheets
- Not readily available to building users



## NEW SYSTEMS

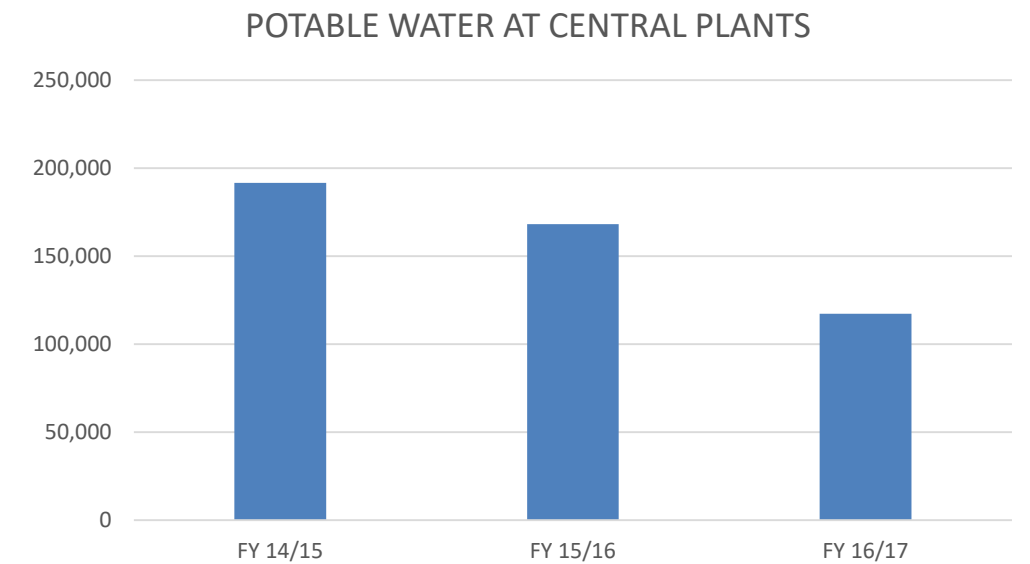
- Library of reports
- Scheduled reports (daily, monthly) for facilities and users
- User access and participation



# Water Conservation Programs

## Reclaimed Water

- CUP, ECUP, MC CUP ~over 100 MG/yr
- Irrigation ~20 MG/yr



## Air Handler Condensate Recovery

- York, Mayer, Urey, and Bonner ~2 MG/year

## BRF-II

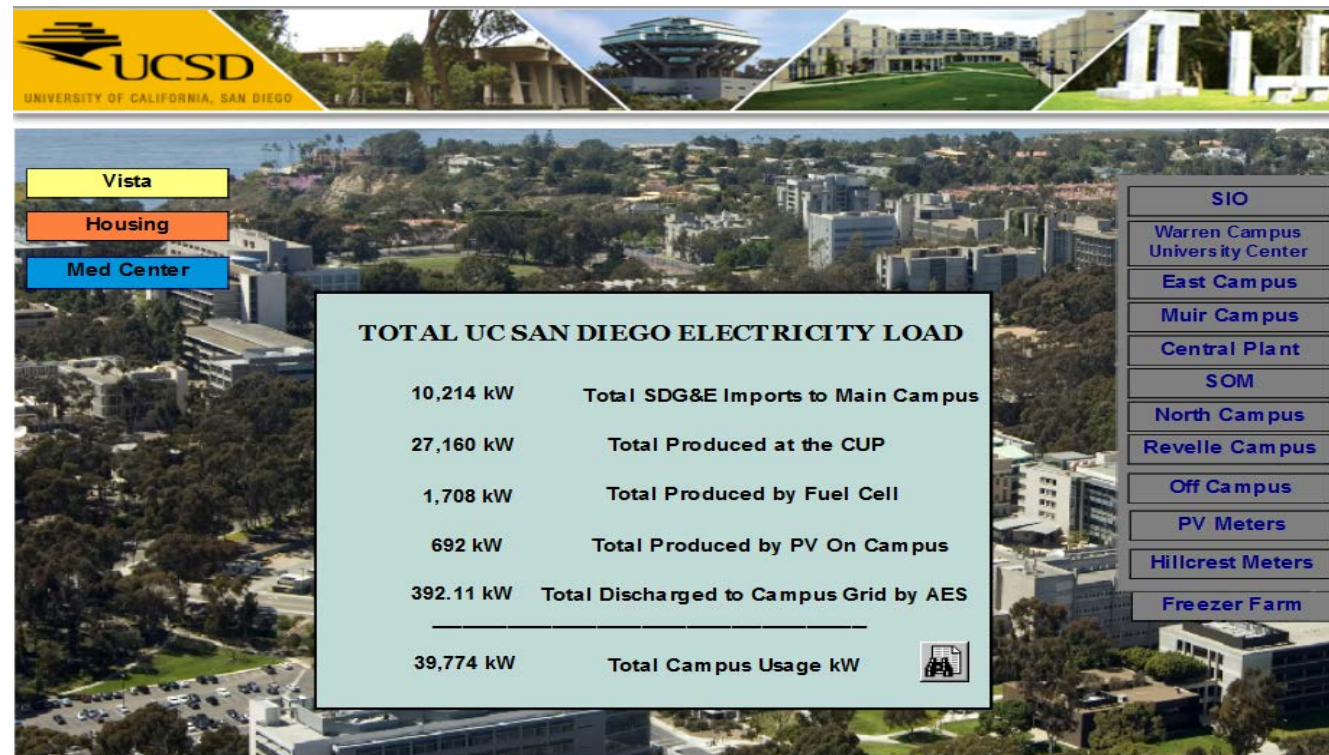
- Air Handler condensate + RO concentrate ~1 MG/yr

- Smart Metering
  - 400 upgraded, 200 more to go



# ENERGY MANAGEMENT & REPORTING

# Daily Monitoring

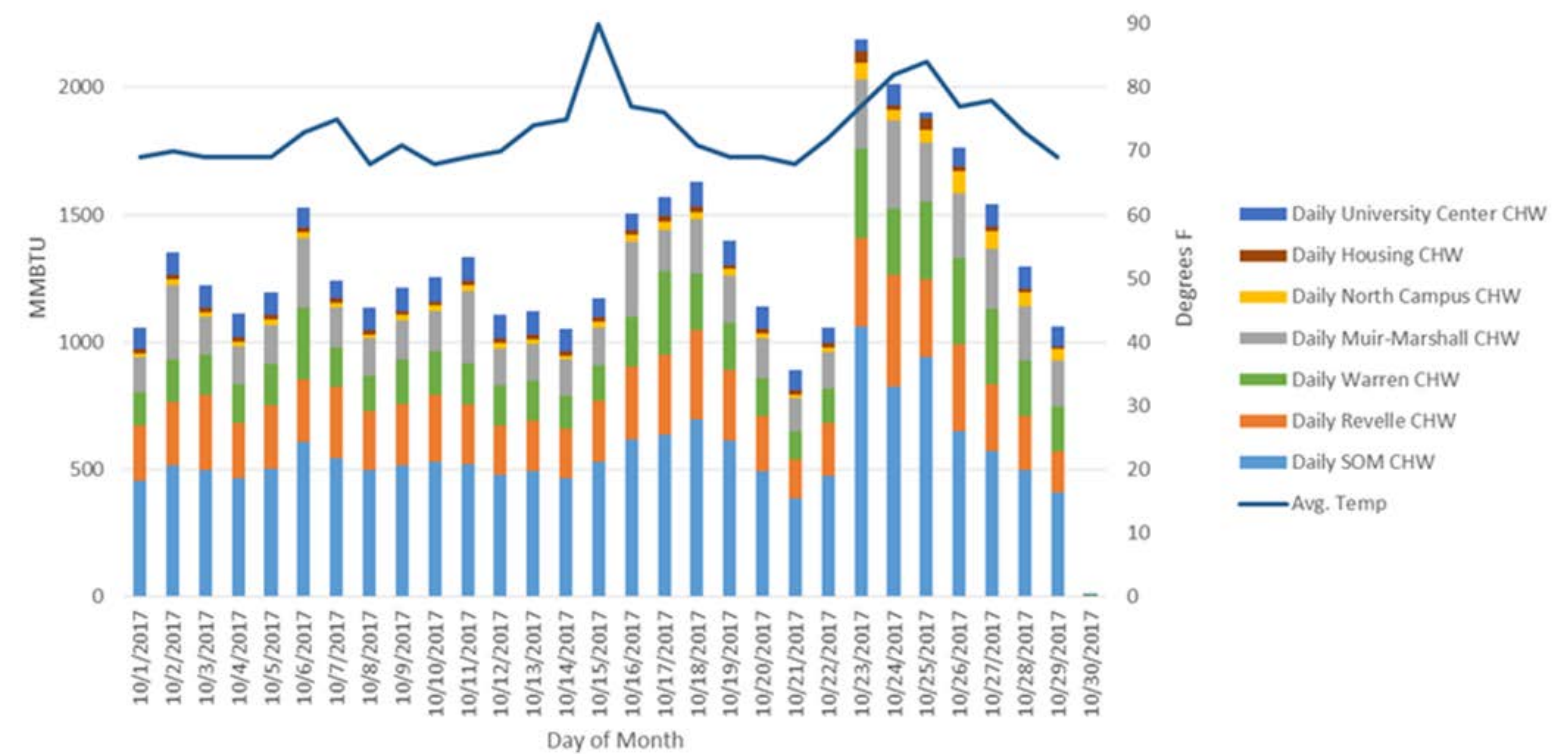
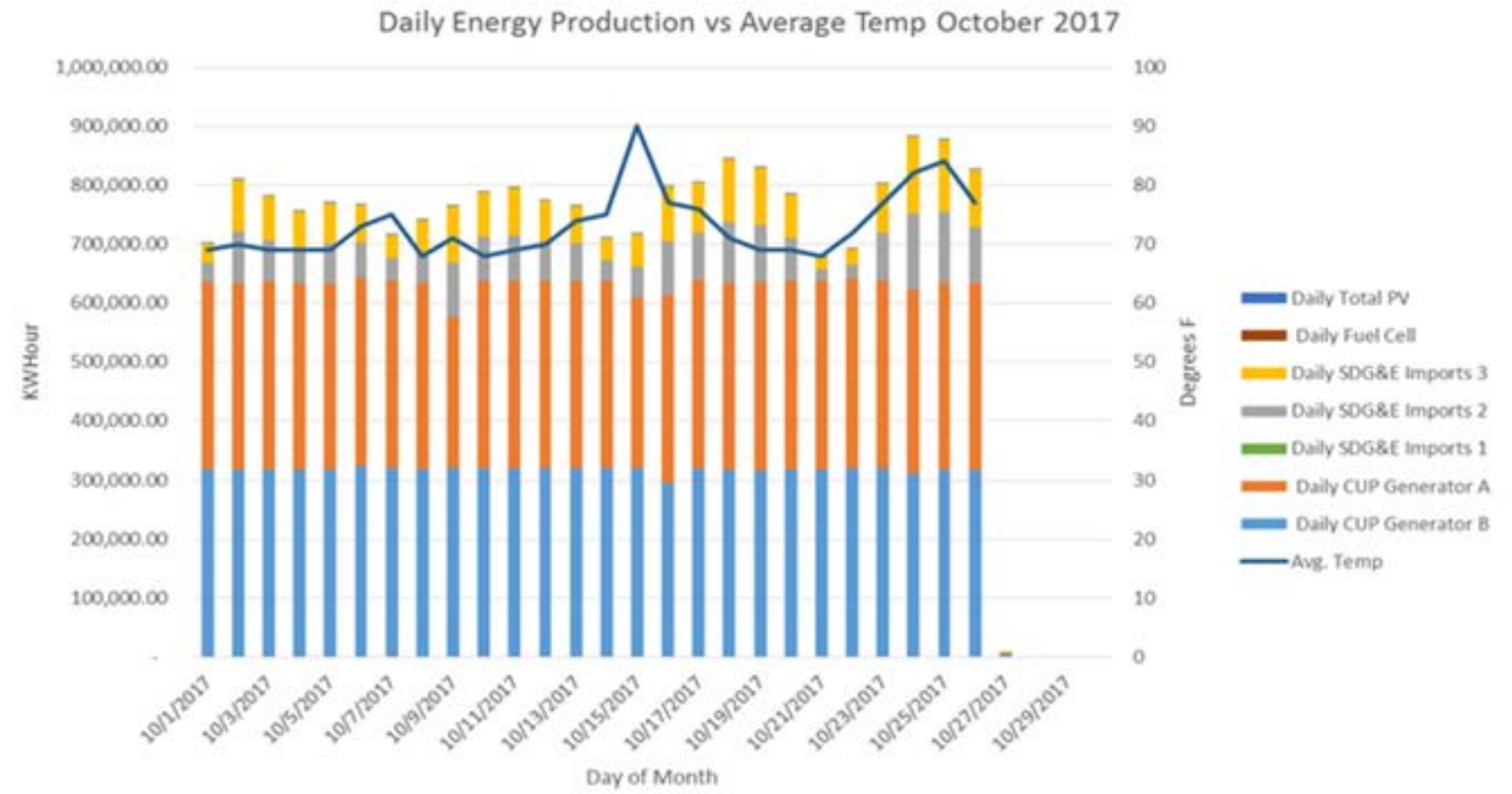


## Campus-wide Chilled Water

Location	Supply Temp	Return Temp	Flow (GPM)	Location	Supply Temp	Return Temp	Flow (GPM)
<u>Revelle</u>				<u>School of Medicine</u>			
Pac Hall	42.3	55.3	629.3	BSB / Biomed Lib/ MTF / Stein / Brain Img'	47.1	56.6	3,125.2
NSB	40.8	55.3	881.3	Biomed II	42.8	57.6	889.3
Mayer	44.3	59.1	573.3	CMME	43.3	55.3	761.3
Urey	42.3	52.1	901.3	CMMW/GPL	44.6	56.4	468.6
Galbraith	40.6	64.1	101.2	CNCB	43.6	58.6	131.3
Mayer Annex	42.6	65.6	106.7	Leichtag	42.6	62.6	390.7
York	41.6	63.1	42.3	Pharm Sci	42.3	57.1	569.3
Bonner	41.8	62.1	452.7	Telemed	42.6	60.8	192.3
HDH Admin	40.8	60.6	73.7	Cage Wash	43.3	67.1	172.3
<u>Muir</u>				<u>Warren</u>			
McGill/Mandler	55.3	43.1	270.7	EBU-1	43.3	58.8	486.7
AP&M	43.6	60.1	404.7	EBU-2	43.6	61.8	276.7
H&SS	43.6	57.1	210.3	EBU-3A	43.6	65.1	237.3
Muir Bio	42.8	55.6	769.3	CSE	42.8	64.6	304.7
Mandeville	43.1	54.3	190.3	Atkinson	43.6	56.8	921.3
Stewart Commons	64.6	43.3	91.2	SERF	43.1	58.3	268.7
<u>North Campus</u>				CMRR	43.6	56.3	93.7
SDSC West	43.3	64.1	805.3	Warren Lect Hall	43.6	56.6	318.7
				Literature	43.8	61.3	116.7
				SME	42.8	60.3	490.7

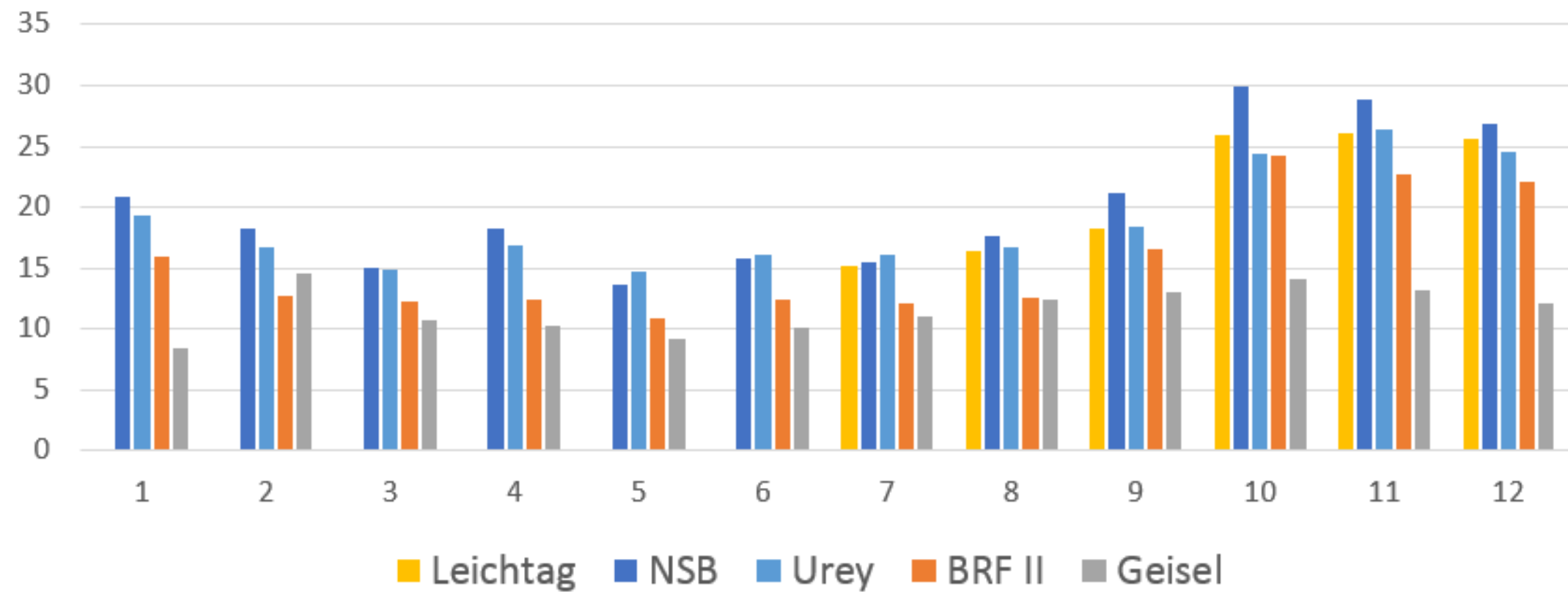


# Data Analysis & Reporting



# Building Level Analysis

## ROLLING 12 MONTHS

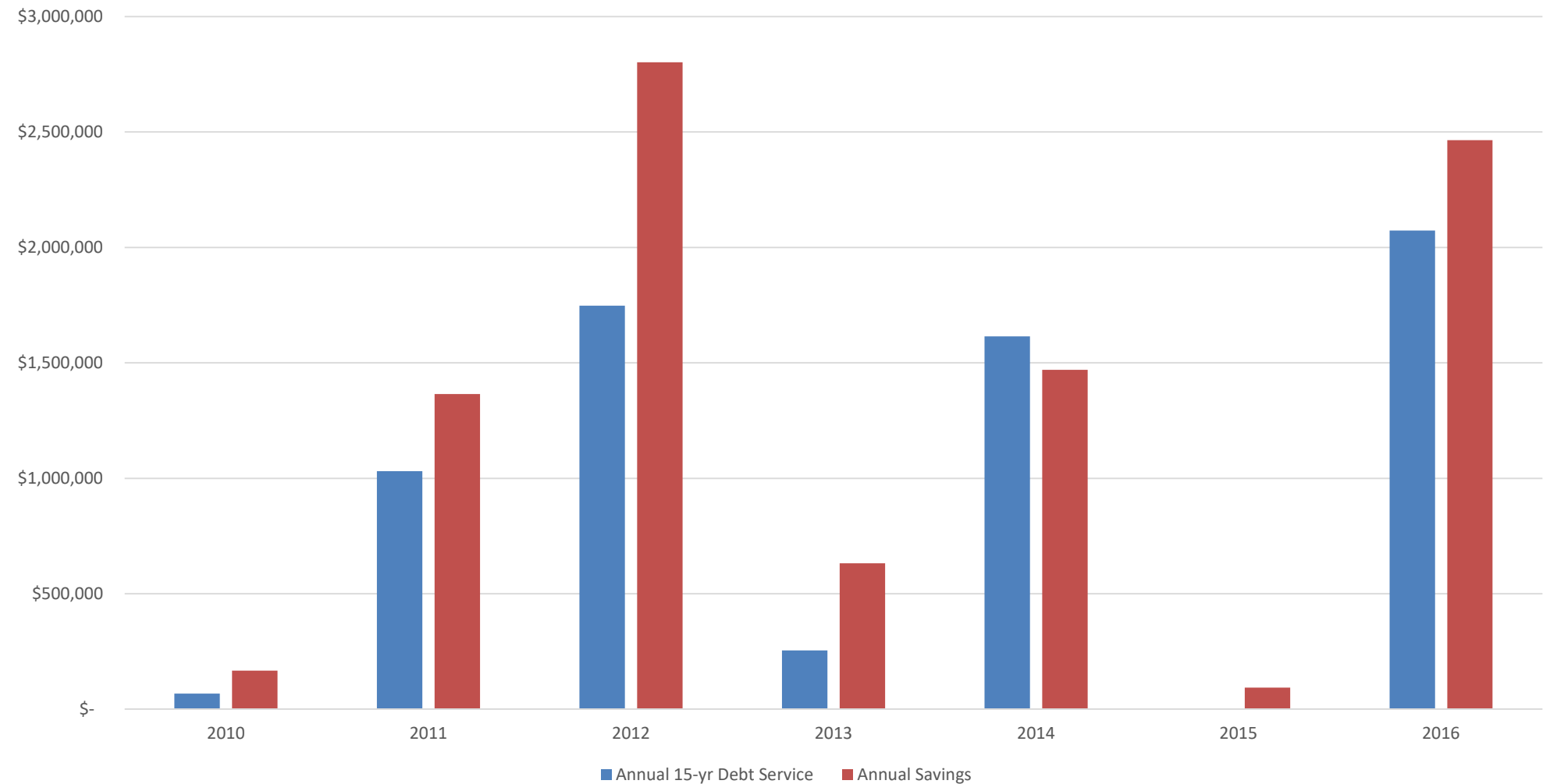


Funded by utility incentives and a low interest revenue bond

In seven years, UCSD has completed more than \$79M of projects, & received \$15.6M in incentives

yielding \$10M in avoided annual energy costs

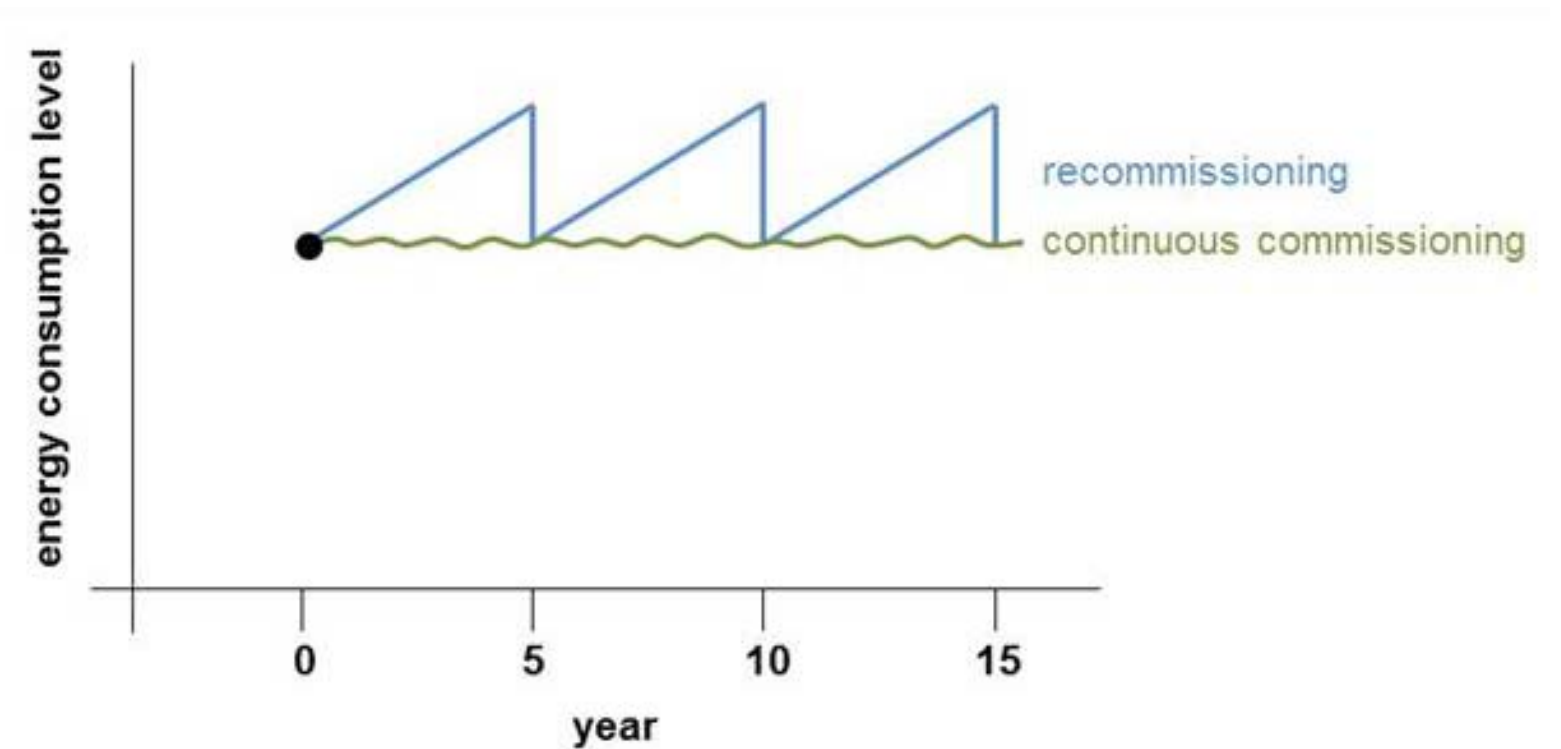
More than \$33M more are in progress





# PROJECTS

- On-going Commissioning
- Monitoring Based Commissioning
- VAV Retrofits
- Condensing Economizer at CUP
- SDSC Free Cooling
- Lighting



*(Source: Pike Res)*

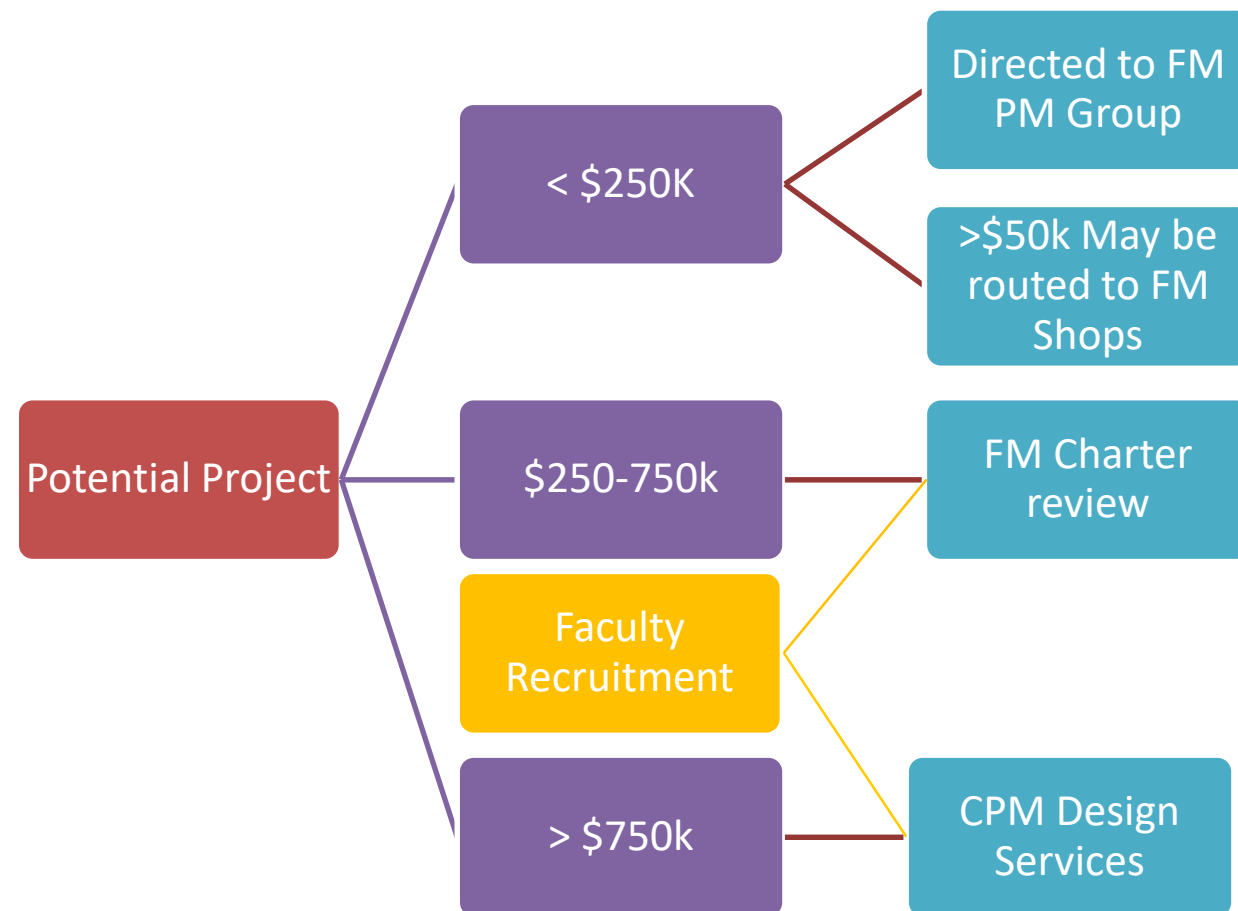
# UCSD RMP Project Charters

Definition and process

# What is a Project Charter?

- High level cost estimate for New Faculty Recruitment renovation projects and for projects presumed over \$250,000
- The FM service is for projects with potential costs of \$250,000-750,000
- Projects greater than \$750,000 will be evaluated by CPM
- Projects seeking a completion date within 14 months should not go through the charter process
- Decision tool not a budget

# Project classification brackets



- Work order projected at being below \$250,000
  - Forwarded to FM PM Department for assessment
  - If project is believed to be at below \$50,000 may be routed to FM Shops
- FM charters believed to be between \$250-750,000 – FM Pre-Design Manager to provide estimate
- CPM charters if presumed greater than \$750,000 the project will be evaluated by CPM Pre-Design staff

# FM Charter Level Types

## Level 1 – Estimate provided by Pre-Design Manager

- A broad windowed estimate generated from previous projects at the same location and/or of the same scope and dimensions at another location, using square footage costs, unit costs. Results in a ROM (Rough Order of Magnitude) cost with a value range of -10% to +25%.
- Based on meeting with requesting Department participants for review of requirements, wants, and needs and a visual inspection of existing space and infrastructure.
- Preliminary space plan may be created to validate feasibility.
- Contractors and Consultants are not used.

# FM Charter Level Types, cont...

Level 2 – Estimate provided by third party.

- Based on an initial design scheme from an AE firm that defines the project's program, general scope, and design.
- Facilities Management Project Manager will manage, Pre-Design Manager will Hand off charter information if a level 1 charter was completed.

# Class Estimate

## Characteristics

Class of Estimates	Level of Project Definition (Expressed as % of Design Completion)	Typical Purpose of Estimate	Methodology: Typical Estimating Method	Expected Accuracy Range: Typical +/- range Relative to Best Index of 1 (s)	Sample Possible costs Based on \$100 Cost Estimate	Suggested Scope and Market Allowance
Class 5	0% to 2% Budget Development	Conceptual or Order of Magnitude	Capacity-Based, Parametric Models, Judgment, or Analogy	L: -20% to -50% H: +30% to +100%	\$80 - \$200	50%
Class 4	1% to 15% or Planning Study	Feasibility Study or Screening	Equipment-Based or Parametric Models	L: -15% to -30% H: +20% to +50%	\$85 - \$150	30%
Class 3	10%to 40% or Preliminary Design	Preliminary Design	Semi-Detailed Unit Costs with assembly Level Line Items	L: -10% to -20% H: +10% to +30%	\$90 - \$130	20%
Class 2	30% to 70% or Midpoint Design	Design Development, Definitive or Control	Detailed Unit Cost with Forced Detailed Take-off	L: -5% to -15% H: +5% to +20%	\$95 - \$120	15%
Class 1	50% to 100% or Final Design	Bid/Tender, Detailed or Final	Detailed Unit Cost with Detailed Take-off, WBS, and CPS	L: -3% to -10% H: +3% to +15%	\$97 - \$115	5%

\*San Diego County Water Authority – Engineering Department

# UCSD – Level breakdown

FM Levels	Class of Estimates	Level of Project Definition (Expressed as % of Design Completion)	Typical Purpose of Estimate	Methodology: Typical Estimating Method	Expected Accuracy Range: Typical +/- range Relative to Best Index of 1 (s)
Level #1	Class 5	0% to 2% Budget Development	Conceptual or Order of Magnitude	Capacity-Based, Parametric Models, Judgment, or Analogy	L: -20% to -50% H: +30% to +100%
	Class 4	1% to 15% or Planning Study	Feasibility Study or Screening	Equipment-Based or Parametric Models	L: -15% to -30% H: +20% to +50%
Level #2	Class 3	10% to 40% or Preliminary Design	Preliminary Design	Semi-Detailed Unit Costs with assembly Level Line Items	L: -10% to -20% H: +10% to +30%
	Class 2	30% to 70% or Midpoint Design	Design Development, Definitive or Control	Detailed Unit Cost with Forced Detailed Take-off	L: -5% to -15% H: +5% to +20%
	Class 1	50% to 100% or Final Design	Bid/Tender, Detailed or Final	Detailed Unit Cost with Detailed Take-off, WBS, and CPS	L: -3% to -10% H: +3% to +15%



# Sam

UC San Diego Facilities Management		Project Initiation Charter For UC San Diego Capital Improvement Projects		Level 1-DRAFT		
Project Information	Project Name Job/WO #		Project to be Managed By:	FM		
	Project Location:		ASF:	Assignable Square Footage		
	VC Area:		CCCI#:	California Construction Cost Index		
	Project User Needs and Objectives:					
	Project Description:					
	Project Driver:	Schedule <input type="checkbox"/>	Budget <input type="checkbox"/>	Safety <input type="checkbox"/>	Other <input type="checkbox"/>	
	Charter Participants:					
	Requesting Party:				Date:	
Facilities Management	<b>1<sup>st</sup> Business Decision Point</b>					
	Rough Order of Magnitude Cost and Time Assumptions:	Concept Estimated Total Project Time Range:	Projected <i>Time</i> to 2nd Decision Point:			
	Key Issues:	Concept Estimated Total Project Cost Range:	Projected <i>Costs</i> to 2nd Decision Point:			
	Design Approvals:	DRB <input type="checkbox"/>	EH&S <input type="checkbox"/>	CBO <input type="checkbox"/>	Capital <input type="checkbox"/>	Planning <input type="checkbox"/>
CPM Representative:				Date:		
Capital Planning	<b>Budget Approvals</b>					
	Key Issues:					
	Classification:	Minor <input type="checkbox"/>	Mini-Major <input type="checkbox"/>	Delegated Major <input type="checkbox"/>	Regental Major <input type="checkbox"/>	
	Funding Source(s):	State Funds <input type="checkbox"/>	Gift <input type="checkbox"/>	Debt/Financing <input type="checkbox"/>	Other <input type="checkbox"/>	
CP Representative:				Date:		
Physical Planning	<b>Planning Entitlements</b>					
	Key Issues:					
	CEQA Process:	Exempt <input type="checkbox"/>	Neg. Dec. <input type="checkbox"/>	Mit. Neg. Dec. <input type="checkbox"/>	EIR <input type="checkbox"/>	
	Planning Reviews:	OSC <input type="checkbox"/>	MSPPC <input type="checkbox"/>	MSPC <input type="checkbox"/>	Coastal Permit <input type="checkbox"/>	
PCP Representative:				Date:		

# Sample Charter

<b>UC San Diego</b> Facilities Management	<b>Project Initiation Charter</b> For UC San Diego Capital Improvement Projects			<b>Level 1-DRAFT</b>	
<b>Project Information</b>	Project Name Job/WO #			Project to be Managed By: FM	
				ASF: Assignable Square Footage	
	Project Location:			CCCI#: California Construction Cost Index	
	VC Area:			Complexity Level:	
	Project User Needs and Objectives:				
	Project Description:				
	Project Driver:	Schedule <input type="checkbox"/>	Budget <input type="checkbox"/>	Safety <input type="checkbox"/>	Other <input type="checkbox"/>
	Charter Participants:				
Requesting Party:				Date:	

# Sample Charter – cont.

<b>Facilities Management</b>		<b>1<sup>st</sup> Business Decision Point</b>			
	Rough Order of Magnitude Cost and Time Assumptions:	Concept Estimated Total Project Time Range:		Projected <i>Time</i> to 2nd Decision Point:	
		Concept Estimated Total Project Cost Range:		Projected <i>Costs</i> to 2nd Decision Point:	
	Key Issues:				
	Design Approvals:	DRB <input type="checkbox"/>	EH&S <input type="checkbox"/>	CBO <input type="checkbox"/>	Capital <input type="checkbox"/>
CPM Representative:					Date:
<b>Capital Planning</b>		<b>Budget Approvals</b>			
	Key Issues:				
	Classification:	Minor <input type="checkbox"/>	Mini-Major <input type="checkbox"/>	Delegated Major <input type="checkbox"/>	Regental Major <input type="checkbox"/>
	Funding Source(s):	State Funds <input type="checkbox"/>	Gift <input type="checkbox"/>	Debt/Financing <input type="checkbox"/>	Other <input type="checkbox"/>
	CP Representative:				

# Sample Charter – cont.

<b>Physical Planning</b>		<b>Planning Entitlements</b>			
	Key Issues:				
	CEQA Process:	Exempt <input type="checkbox"/>	Neg. Dec. <input type="checkbox"/>	Mit. Neg. Dec. <input type="checkbox"/>	EIR <input type="checkbox"/>
	Planning Reviews:	OSC <input type="checkbox"/>	MSPPC <input type="checkbox"/>	MSPC <input type="checkbox"/>	Coastal Permit <input type="checkbox"/>
	PCP Representative:				Date:

# What's included with the charter response?

- Project Information
- Decision Point
- Budget Approvals
- Planning Entitlements
- Contacts
- Project Location
- Project Description
- Equipment
- Program
- Chemicals
- Assumptions
- Common Abbreviations
- Regulatory Approvals

# Time line for charter

- Work Order initiated by Work Center – 1 day
- Response from the Pre-Design Manager – 1-2 days
- Scope meeting with customer and Pre-Design Manager – 5-10 days
- Project Charter compilation and result response – 10 days (2 weeks)

Average duration 17-22 working days

# Average time for a Project to the start of construction?

## P. = Preliminary Phase (with Project Charter)

- Project Charter Duration (3-5 Weeks)
- Total: (3 - 5 Weeks)**

## W. = Working Drawings Phase

- Contact A/E (1 Week)
  - Meet with A/E (1 Week)
  - A/E Provides Proposal (1-2 Weeks)
  - Execute Contract with A/E (4-5 Weeks)
  - Schematic Design/Cost Estimate (3-4 Weeks)
  - Budget Approval (Minor Cap/CIB) (4-12 Weeks)
  - 85% Design Documents (4-6 Weeks)
  - Review 85% Design (2 Weeks)
  - 100% Design Documents (2-3 Weeks)
  - Review 100% Design (2 Weeks)
  - Issue 100% Construction Documents (2 Weeks)
  - Bid (2-3 Weeks)
  - Award (NTP) (2-3 Weeks)
- Total: (30 - 46 Weeks)**

## C. = Construction Phase

- Construction Phase depends on scope of work.

Happy Halloween from FM





# Various FM & Transportation Updates

## 31OCT17

Facilities Management

# Agenda

- New Lighting Installation
  - SIO Lighting: Begin Dec 2017 - End February 2018
  - Main Campus: Begin Dec 2017 - End June 2018
- SIO Road Repair
- Transportation Updates



# Installation of New Pole Lighting



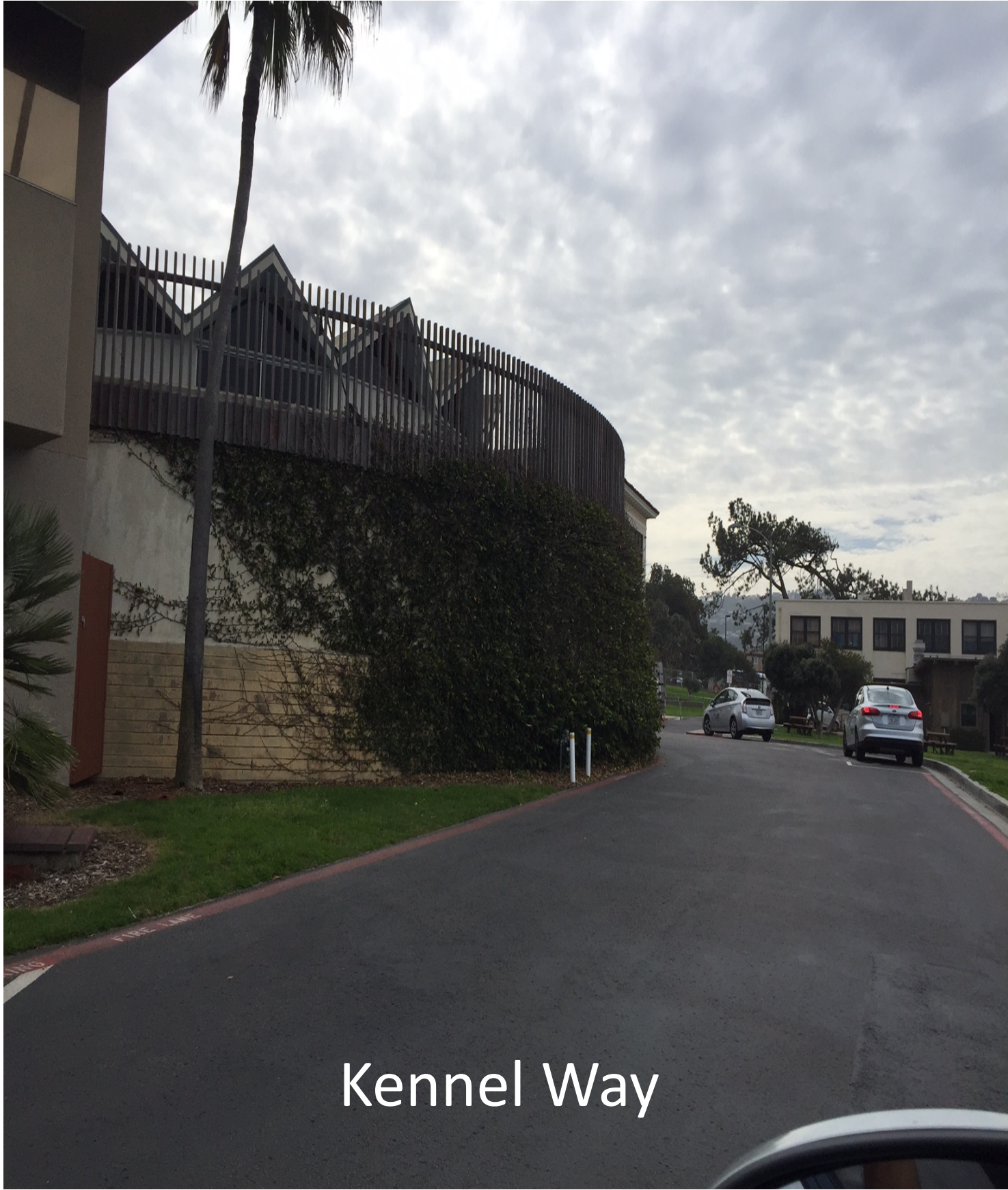


# Installation of New Pole Lighting





# Installation of New Pole Lighting



Kennel Way





# Installation of New Pole Lighting



Naga Way



Discovery Way



# Installation of New Pole Lighting



2 New LED fixtures for existing pole at Old Fisheries Entry



# SIO Road Repair Project

- Phase 1: 16OCT17 - 20DEC17.
- Phase 2: mid MAR18 to Summer 18

Phase 2

Phase 1

Google Earth

5



# Downwind Way & Shell Back Road Repairs

- Positive Flagman Control: 6am – 9pm, M-F



Google Earth

5



# Downwind Way & Shell Back Road Repairs





# Downwind Way & Shell Back Road Repairs





# Downwind Way & Shell Back Road Repairs

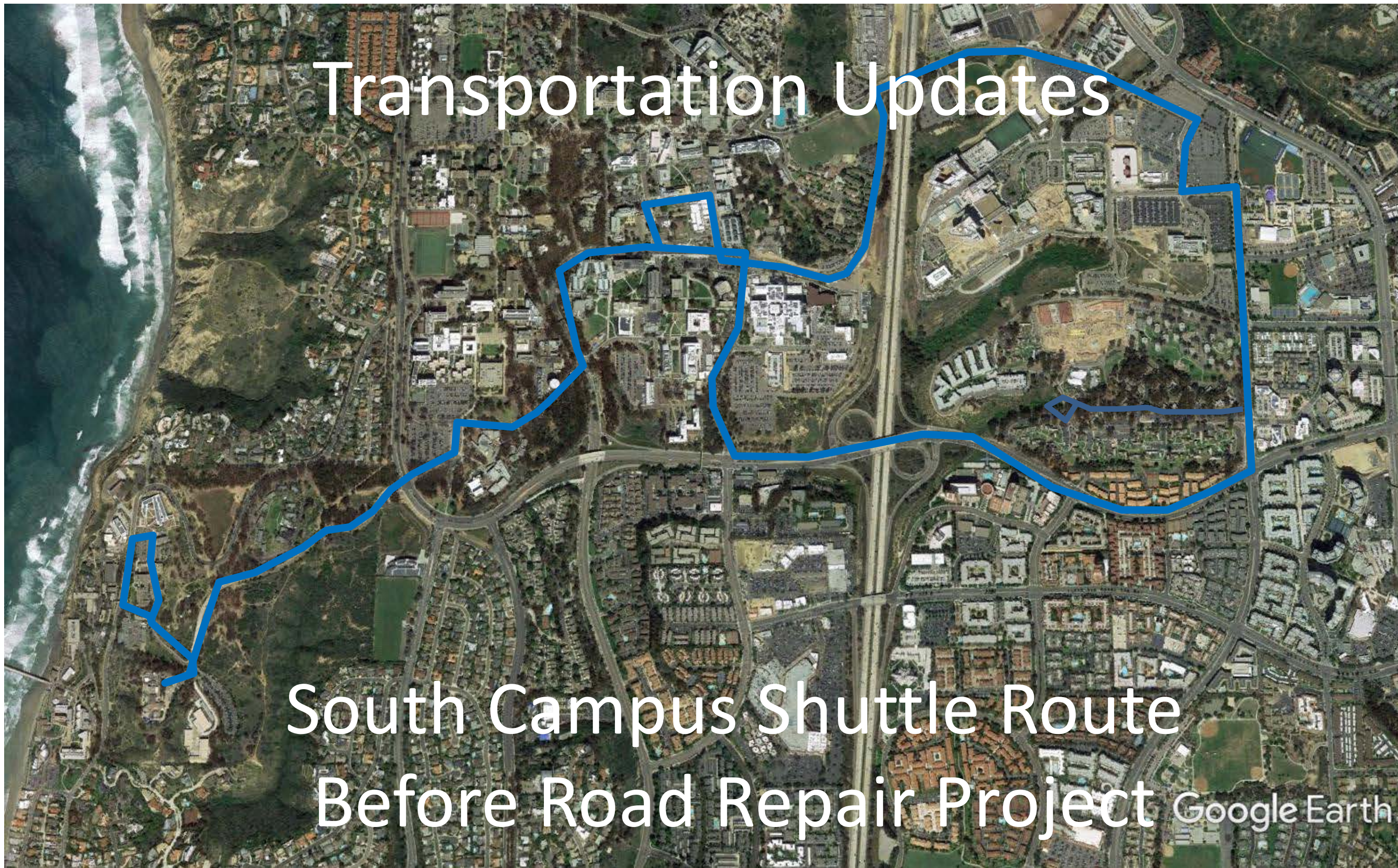




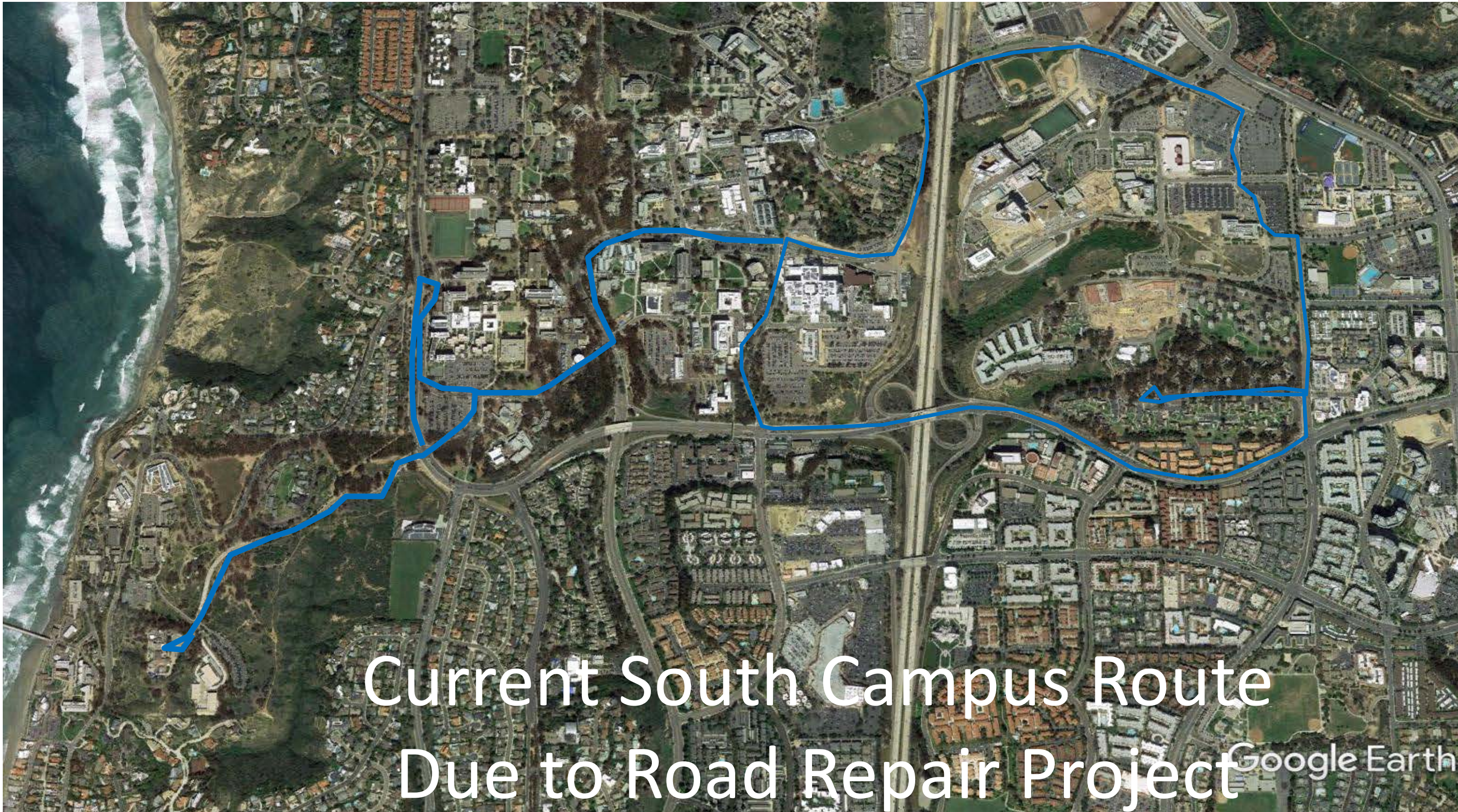
# Transportation Updates

South Campus Shuttle Route  
Before Road Repair Project

Google Earth



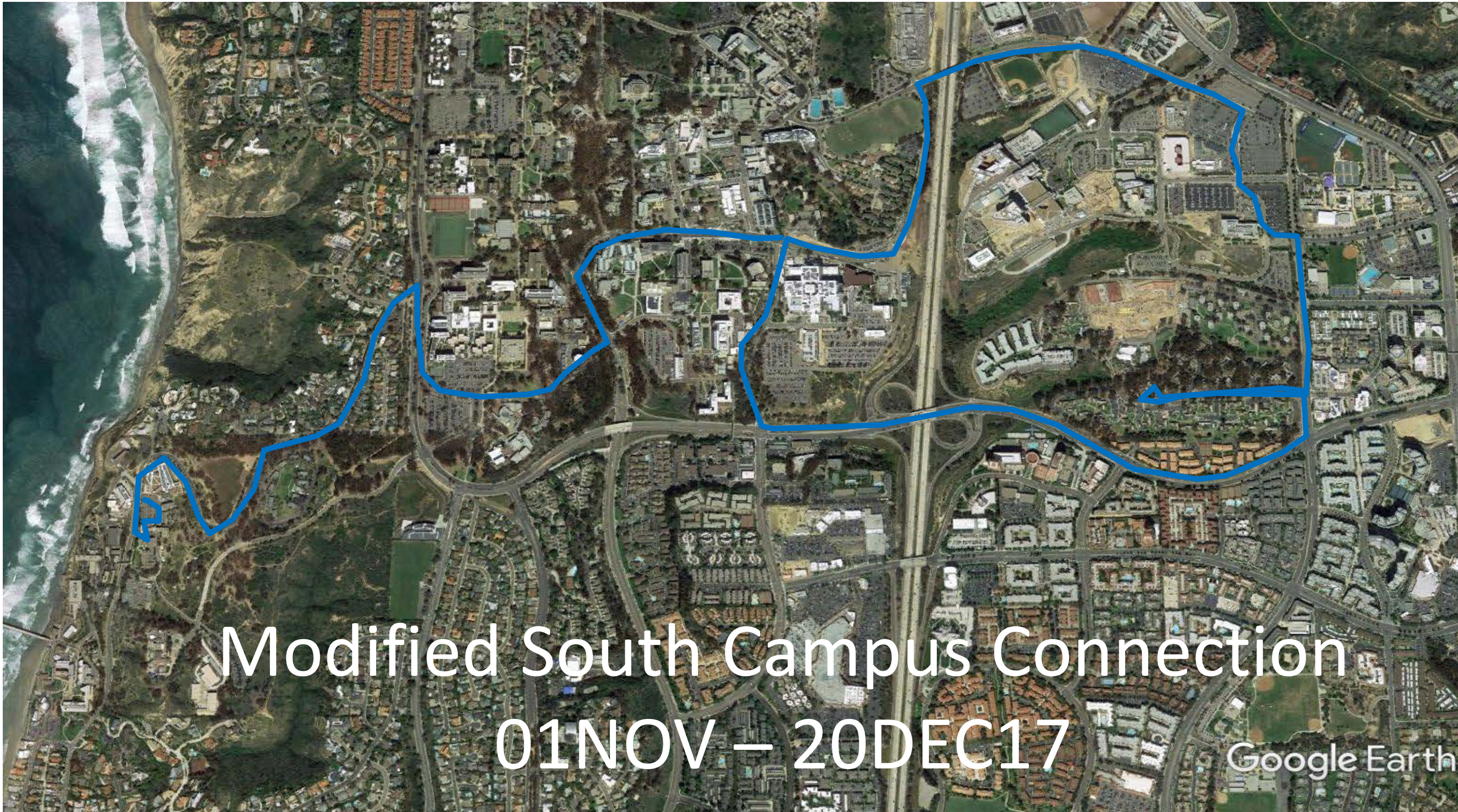




Current South Campus Route  
Due to Road Repair Project

Google Earth





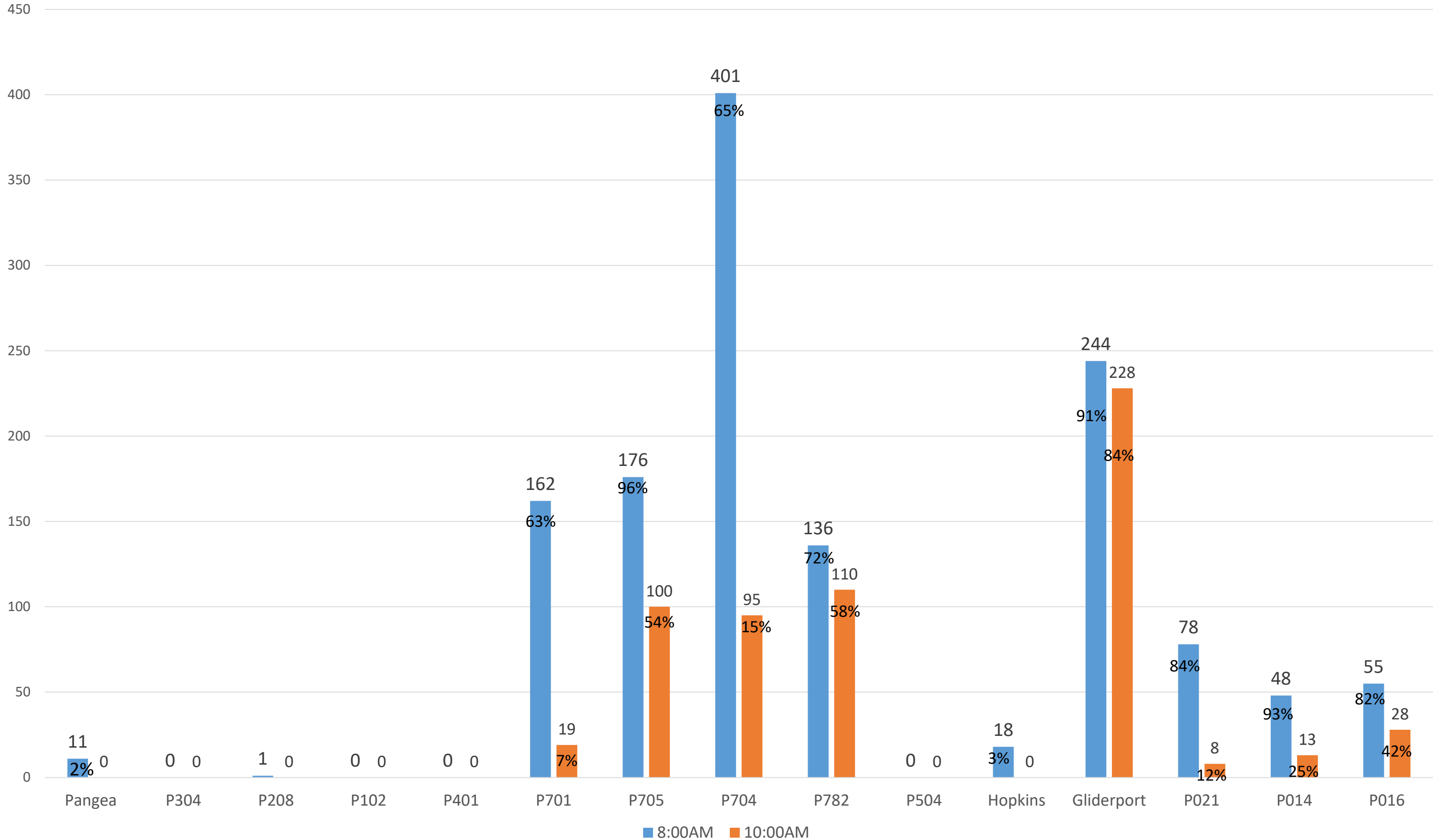
Modified South Campus Connection

01NOV - 20DEC17

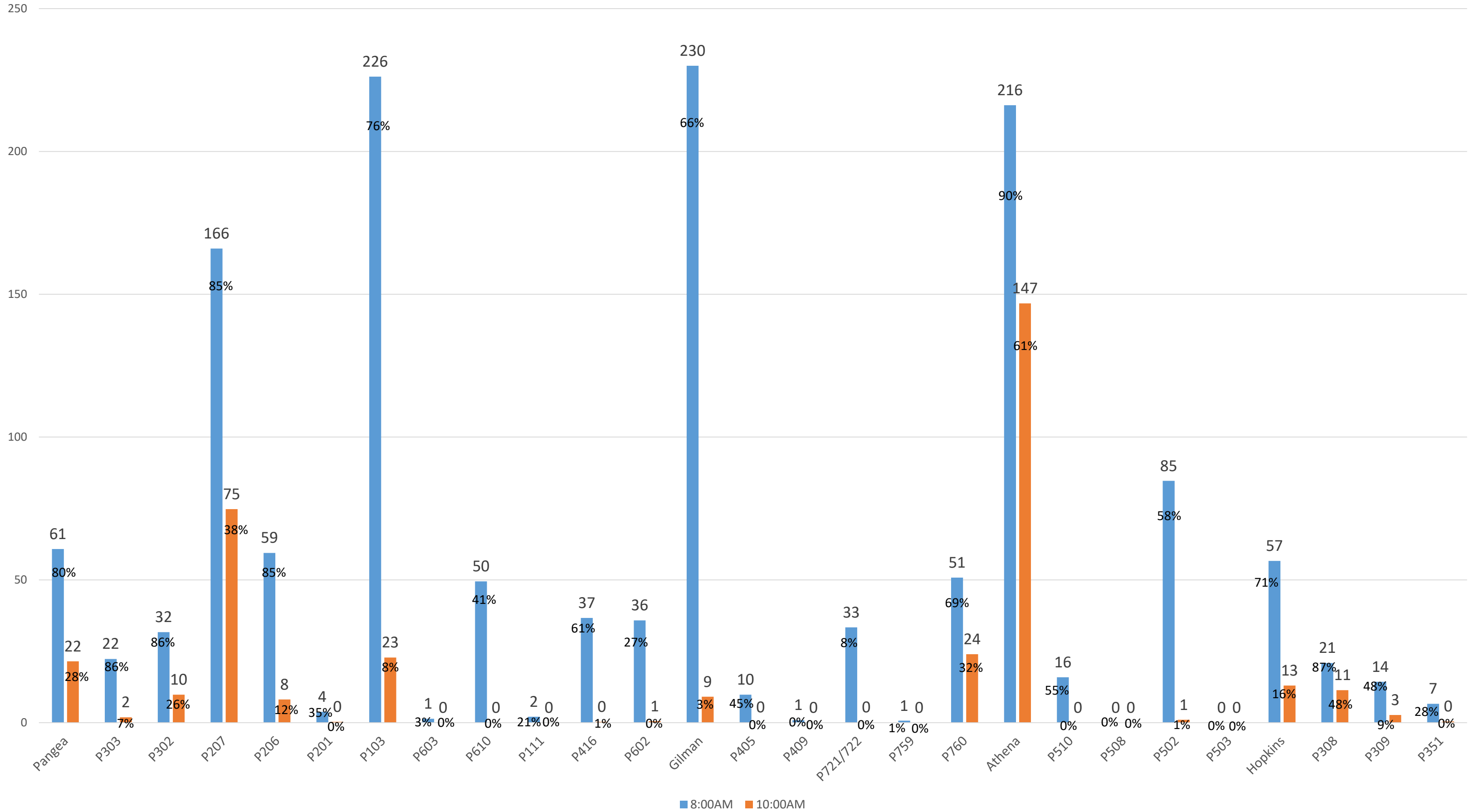
Google Earth



# Average Number of Available B & S Spots



Average Number of Available (A) Spots



8:00AM 10:00AM

# Questions/Discussion



# Downwind Way & Shell Back Road Repairs

- Proposed Road Closure:  
9pm – 6am, M-F &
- 9pm Fri – 6am Mon