



Climate Safe Infrastructure Working Group

Meeting 5

Port of San Diego

Training Room

3165 Pacific Hwy

San Diego, CA 92101

Wednesday, May 9, 2018

10am – 4pm

Welcome & Introductions

The Climate-Safe Infrastructure Working Group

Co-Facilitators



Juliette Finzi Hart
USGS



Susi Moser
Susanne Moser
Research & Consulting



Amir Aghakouchak
UC-Irvine



Bruce Swanger
Cal-Trans



Chester Widom
DGS, State Architect



Cis Liban
L.A. Metro



Dan Cayan
UC-San Diego, SIO



David Groves
RAND



Nancy Ander
DGS, Off. of Sustain.



Deb Niemeier
UC-Davis



James Deane
High-Speed Rail Auth.



John Andrew
DWR



Kristin Heinemeier
Realized Energy



Kyle Meng
UC-Santa Barbara



Martha Brook
CEC



Noah Diffenbaugh
Stanford



Gurdeep Bhattal
Cal-Trans



Robert Lempert
RAND

Project Team



Keali'i Bright
Natural Resources
Agency



Elea Becker Lowe
Natural Resources
Agency



Joey Wall
Natural Resources
Agency



Guido Franco
California Energy
Commission

... and YOU

AB 2800 (Quirk): Purpose

Examine how to integrate scientific data concerning projected climate change impacts into state infrastructure engineering, including oversight, investment, design, and construction.



AB 2800 (Quirk): Scope of Assessment and Recommendations

The working group shall consider and investigate, at a minimum, the following issues:

- (1) The current informational and institutional barriers to integrating projected climate change impacts into state infrastructure design.
- (2) The critical information that engineers responsible for infrastructure design and construction need to address climate change impacts.
- (3) How to select an appropriate engineering design for a range of future climate scenarios as related to infrastructure planning and investment.

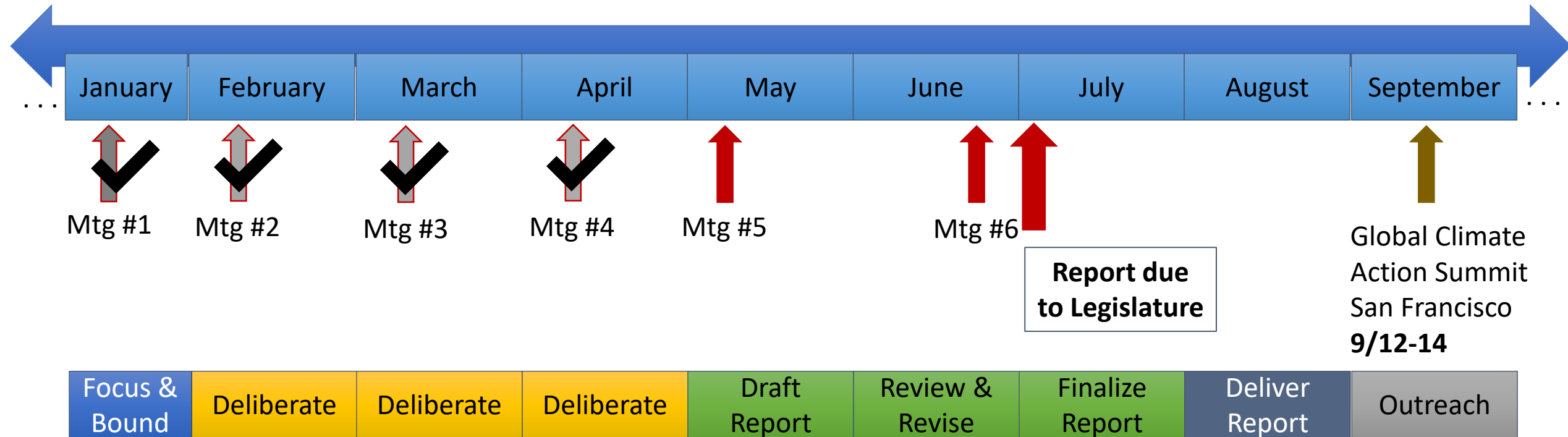
AB 2800 (Quirk): Additional Scope of Recommendations

(A) Integrating scientific knowledge of projected climate change impacts into state infrastructure design.

(B) Addressing critical information gaps identified by the working group.

(C) A platform or process to facilitate communication between climate scientists and infrastructure engineers.

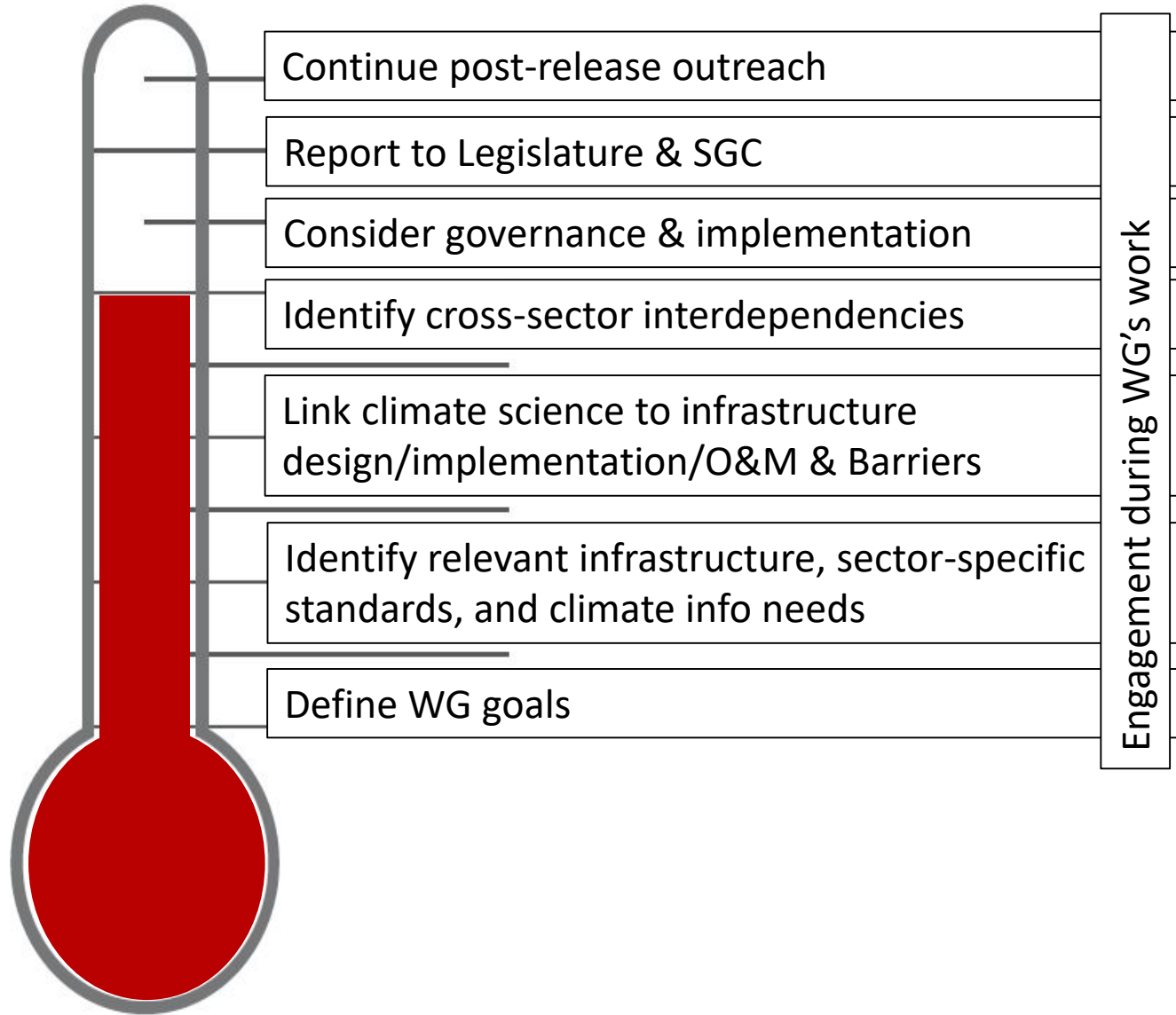
Project Timeline



Meeting Dates, Locations, Topics & Tasks

Mtg	Dates	Locations	Topics and Tasks
1	1/18	Sacramento	Determine project goals; WG structure and process
2	2/12	Los Angeles	Identify relevant infrastructure, sector-specific infrastructure standards, climate-sensitivity, information needs
3	3/13	San Francisco	Linking forward-looking climate science and impacts information with standards, codes, certifications throughout infrastructure life cycle, identify barriers to information use and potential ways to overcome them
4	4/11	Davis	Considering more than climate changes (land use, demographics, economy, mitigation, disasters) and cross-sector interdependencies in infrastructure design
5	5/9	San Diego	Governance of infrastructure and related standards and codes; non-standard strategies to ensure climate-safe infrastructure; tools & platform needs; deliberation of draft report; agree on refinement needs
6	6/20	Davis	Agree on final report revisions; delivery and outreach/promotion; project debrief

Measuring Progress



AAAS 2019
Session
submitted

City of
Boston



The Arc of Our Work to Date

- Scoping
- Process

Meeting 1

- Identify, prioritize climate-sensitive infrastructure;
- Agree on definitions
- Prioritize relevant standards, codes, guidelines
- Identify information needs

- Connect engineers' information needs with climate science;
- Identify barriers to information use, solutions
- Work through concrete examples

- Consider comprehensive approaches to climate-safe infrastructure that integrate...
 - Land use change
 - Ecol., econ., demogr. data
 - Disaster recovery
 - Interdependencies

- Understand governance challenges
- Assess tools, platforms and processes to support science-engineering interaction
- Deliberate report & recommendations

Meeting 2

Meeting 3

Meeting 4

Meeting 5

- Report refinement, approval

Meeting 6

Agenda Overview

Time	Agenda Item
10:00-10:30am	Welcome, Intros, Status Report
10:30-11:30am	Governance Panel
11:30am-12:00pm	Review and Gap-filling: Barriers to Using Forward-Looking Climate Science in Infrastructure Design, Construction and Operation
12:00-1:00pm	Lunch
1:00-2:00pm	Assess Tools, Platforms and Processes to Support Science-Engineering Interaction
2:00-2:15pm	Report draft: Review of Status and Gaps
2:15-3:00pm	Report draft: Deliberation of Recommendations
3:00-3:45pm	Report draft: Implementation Steps
3:45-4:00pm	Wrap-up: Review, Next Steps
4:00pm	Adjourn

Tasks for Meeting #5:

- **Task 1:** Gain fuller understanding of governance challenges regarding changing & implementing forward-looking infrastructure standards
- **Task 2:** Assess tools, platforms and processes to facilitate communication between engineers/architects and scientists
- **Task 3:** Review status of report, fill gaps, refine selected elements
- **Task 4:** Work toward agreement on report recommendations and implementation steps



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Governance Challenges

Governance –

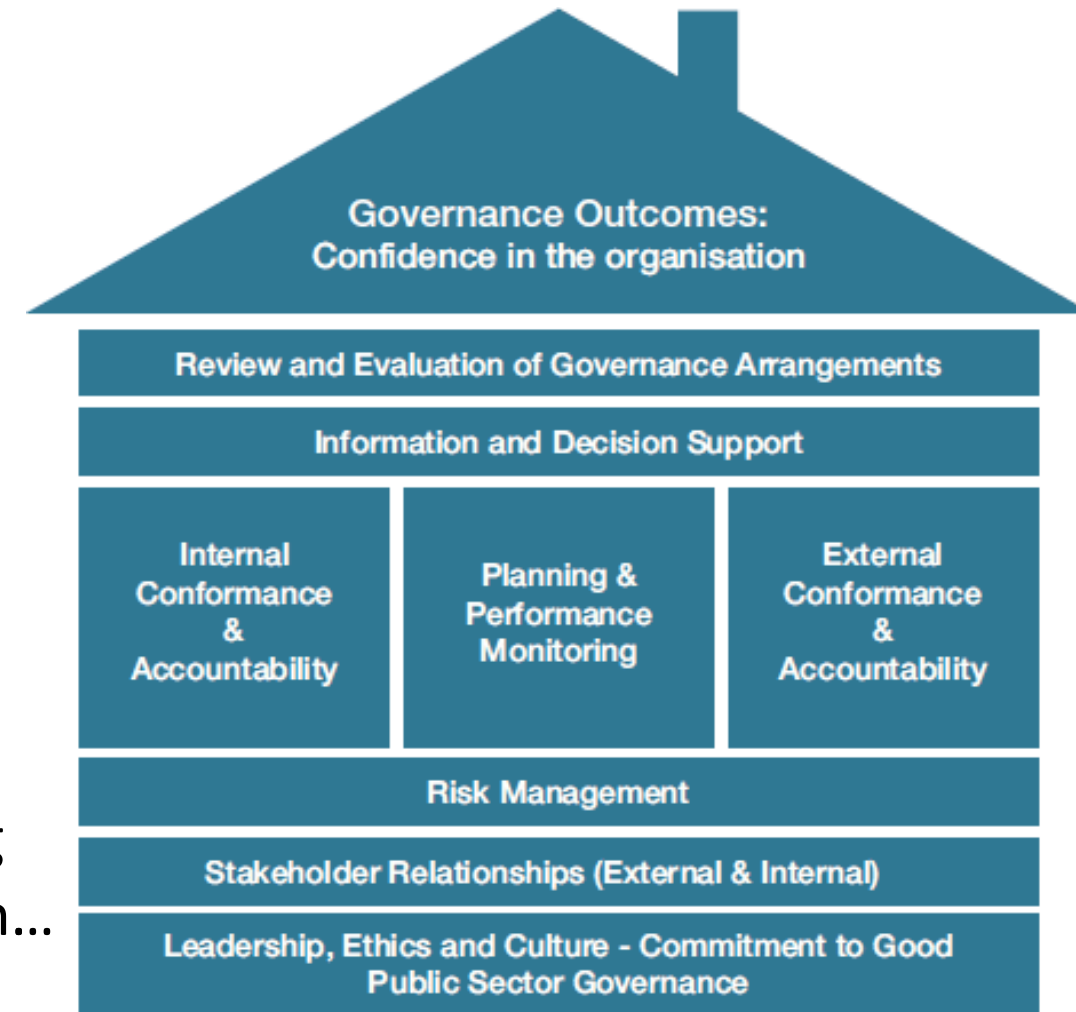
The use of institutions, statues of authority, and collaboration to allocate resources and coordinate or control activity within a project, program, or portfolio.

Source: CA Office of System Integration, Best Practices

Governance –

The processes of interaction and decision-making among the actors involved in a collective problem...

Source: Hufty (2011)



Some Questions About Governance: Infrastructure Planning, Construction, Operation

- Coordination Challenges?
 - Within levels of government
 - Across levels of government
 - Beyond government
- Prioritization?
- Inst. Overlaps and Gaps?
- Alignment?
- Formal/Informal Structures?
- Oversight?
- Capacities?
- Communication?
- Rights, Roles and Responsibilities?
- Decision-making authority?
- Public engagement opportunities?
- Clarity and Transparency?
- Compliance?
- Accountability?
- Organizational Culture(s)?
- Resource Allocation?
- Performance?

Our Governance Panel



Phil Gibbons
Port of San Diego



Cody Hooven
City of San Diego



Ralph Redman
San Diego Airport



Andrew Martin
San Diego Association
of Governments

Opportunity for Public Comment



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The working group shall **consider and investigate**, at a minimum, the following issues:

(1) The **current informational and institutional barriers** to integrating projected climate change impacts into state infrastructure design. ...

Adaptation Process		Types of Barriers						
Phase	Stage	Informational	Capacity/skill	Attitudinal	Political	Financial	Legal/regulatory	Institutional
Understanding	Just becoming aware of CC risks	Lack of shared risk info (FEMA or other flooding is)	Majority not use of climate data/forecasting projection information	Climate & skepticism	Need for strong state leadership esp. w/ low			Lack of uniform climate info systems
	Gathering info to better understand risks	Information variability, lack of data/research, lack of data/research, lack of data/research	Extension of existing personnel to address needs, lack of guidance/research of data	Uncertainty of moving from scenario to action, lack of guidance/research of data	Lack of political will, challenges associated w/ current political climate	Insufficient funds for localized data collection		Lack of cross-agency communication for integrated view
	Completed assessment of CC risks	Lack of shared risk info (FEMA or other flooding is)	Lack of guidance/research of data	Skepticism of climate models	Political will to move forward-looking science			Lack of understanding of infrastructure, related to system
Planning	Brainstorming range of options	Lack of shared risk info (FEMA or other flooding is)	Lack of guidance/research of data	Uncertainty of moving from scenario to action, lack of guidance/research of data	Political will to move forward-looking science			Lack of understanding of infrastructure, related to system
	Completed assessment of potential options	Lack of shared risk info (FEMA or other flooding is)	Lack of guidance/research of data	Uncertainty of moving from scenario to action, lack of guidance/research of data	Political will to move forward-looking science			Lack of understanding of infrastructure, related to system
	Selected subset of adaptation options	Lack of shared risk info (FEMA or other flooding is)	Lack of guidance/research of data	Uncertainty of moving from scenario to action, lack of guidance/research of data	Political will to move forward-looking science			Lack of understanding of infrastructure, related to system
Managing	Begin implementing options	Lack of shared risk info (FEMA or other flooding is)	Lack of guidance/research of data	Uncertainty of moving from scenario to action, lack of guidance/research of data	Political will to move forward-looking science			Lack of understanding of infrastructure, related to system
	Monitoring performance of actions	Lack of shared risk info (FEMA or other flooding is)	Lack of guidance/research of data	Uncertainty of moving from scenario to action, lack of guidance/research of data	Political will to move forward-looking science			Lack of understanding of infrastructure, related to system
	Evaluating and reassessing option	Lack of shared risk info (FEMA or other flooding is)	Lack of guidance/research of data	Uncertainty of moving from scenario to action, lack of guidance/research of data	Political will to move forward-looking science			Lack of understanding of infrastructure, related to system

Review & Correct



Complete/filling gaps



Prioritize



Share & Discuss

Barriers: Review and Filling Gaps

Phase	Stage	Types of Barriers							
		Informational/ knowledge	Human capacity	Attitudinal	Political	Financial	Legal/ regulatory	Institutional	Other
Understanding	Just beginning to become aware of CC								
	Gathering info to better assess risks								
	Completed an assessment of issue								
Planning	Brainstorming range of options to adapt								
	Completed assessment of potential options								
	Selected a subset of response options								
Managing	Begun implement-ting options								
	Monitoring performance of actions								
	Evaluating and reassessing risks and options								

Opportunity for Public Comment



Lunch



12:00-1:00pm

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Tools, Platforms, Processes:

Helping Scientists and Engineers/Architects Interact More Easily





Tools Abound...

Why Design Our Cities with Old Data?

WeatherShift™ – Bringing Climate Science into Daily Practice

SCRIPPS INSTITUTION OF OCEANOGRAPHY

This site is best viewed with [Chrome](#) (recommended) or Firefox. Some features are unavailable when using Internet Explorer. [Requires JavaScript to be enabled.](#)

Welcome About Tutorials Projections: Subset Request Projections: Complete Archives Feedback Links

Downscaled CMIP5 climate and hydrology projections' documentation and release notes available [here](#).

Summary

This archive contains fine spatial resolution translations of climate projections over the contiguous United States (U.S.) developed using three downscaling techniques (monthly BCSD Figure 1, daily BCCA Figure 2, and daily LOCA Figure 3), CMIP3 hydrologic projections over the western U.S., and CMIP5 hydrology projections over the contiguous U.S. corresponding to monthly BCSD climate projections.

Archive content is based on global climate projections from the [World Climate Research Programme's](#) (WCRP's) [Coupled Model Intercomparison Project phase 3](#) (CMIP3) multi-model dataset referenced in the Intergovernmental Panel on Climate Change Fourth Assessment Report, and the phase 5 (CMIP5) multi-model dataset that is informing the IPCC Fifth Assessment.

For information about downscaled climate and hydrology projections development, please see the [About](#) page.

Purpose

Climate and Hydrology Projections

Figure 1. Central Tendency Changes in Mean-Annual Precipitation over the contiguous U.S. from 1970-1999 to 2040-2069 for BCSD3, BCSD5, and Difference.

Mean-Annual Precipitation Change, percent
CMIP3, 1970-1999 to 2040-2069, 50%tile

around 2040, then decline

strongly through 2050 and plateau around 2100

QUICK STATS

Extreme Heat Threshold
103.9°F

Average number of days with high above 103.9°F in 1961-1990
4.3

Some Platforms Out There...



Creating a Platform/Process

On your own...

- When you talk across disciplines, what has worked, what hasn't?
- What resources do you turn to? Which are useful and why?
- What do you mean by a “platform”?
- What do you mean by a “process”?

Now into the fish bowl...



Opportunity for Public Comment



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Status of Report Draft

Sections	Status Assessment
Executive Summary	To be developed last
Section 1: Introduction	Status presented @ meeting
Section 2: Climate Change and Infrastructure – the Challenge	Status presented @ meeting
Section 3: Vision for Climate-Safe Infrastructure	Status presented @ meeting
Section 4: Approaches to Building Climate-Safe Infrastructure <ul style="list-style-type: none">- Background/context- Closing knowledge gaps- Tools and platforms- Changing Standards- Non-standards based approaches- Overcoming barriers	Status presented @ meeting
Section 5: Summary of Recommendations	Discussed @ meeting
Section 6: Implementation of Recommendations	Discussed @ meeting
Appendices	Status presented @ meeting

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Deliberating on Recommendations



The Report Audiences

STATE LEGISLATURE

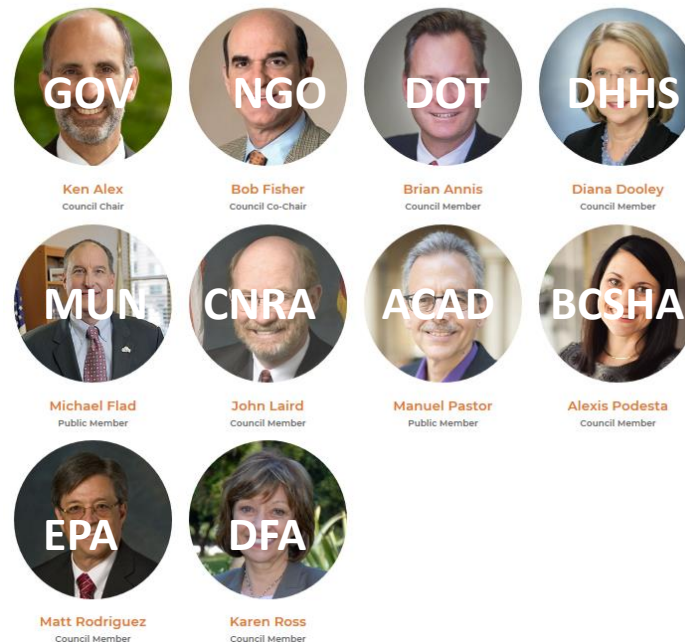


Key Levers:

- Sets, changes or amends policy and law
- Drafts, negotiates, passes budgets
- Creates policy positions

STRATEGIC GROWTH COUNCIL

SGC Council Members



Programs:

- Transformative Climate Communities
- Affordable Housing and Sustainable Communities
- Sustainable Agricultural Lands Conservation
- Health in All Policies
- Technical Assistance
- Climate Change Research
- Prop. 84 Programs

Mission:

SGC coordinates the activities of State agencies and partners with stakeholders to promote sustainability, economic prosperity, and quality of life for all Californians

Key Levers: Coordination, guidance, programs, etc.

Working with a Wide Range of Recommendations



Turning your “ingredients”



..... into a tasty, well-rounded meal

AB 2800 (Quirk): Reminder about Scope and Recommendations

At minimum...

- The **current informational and institutional barriers** to integrating projected climate change impacts into state infrastructure design.
- The **critical information** that engineers responsible for infrastructure design and construction **need** to address climate change impacts.
- How to **select an appropriate engineering design** for a range of future climate scenarios as related to infrastructure planning and investment.

Additional...

- **Integrating scientific knowledge** of projected climate change impacts **into state infrastructure design**.
- Addressing **critical information gaps** identified by the working group.
- A **platform or process** to facilitate communication between climate scientists and infrastructure engineers.

Working Through Draft Recommendations

A	B	C	D	E	F	G
Engineers' & architects' critical information needs to address climate change impacts.	Addressing critical information gaps	Integrating forward-looking science into infrastructure design.	Selecting appropriate engineering designs for uncertain climate futures	Informational & institutional barriers to integrating climate change into infrastructure design.	Platform or process to facilitate exchange of climate scientists and engineers/architects.	Other

1. Sort and organize
2. Refine: integrate, eliminate, edit
3. Identify and fill gaps
4. Step back: the arc of story, the big picture

Opportunity for Public Comment



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Making It Happen – Making It Real



Note:
The discussion of this
item was postponed
due to time constraints

Recommendations – Barriers = Implementation

State Level Implementation

- Which are for the legislature and which are for SGC?
- What are the barriers/incentives for each?

Agency Level Implementation

- Who would you need to loop in from your own agency? From outside your agency?
- What institutional changes would be necessary?
- What type of training / resources would be required?
- What are the barriers/incentives?



Note:
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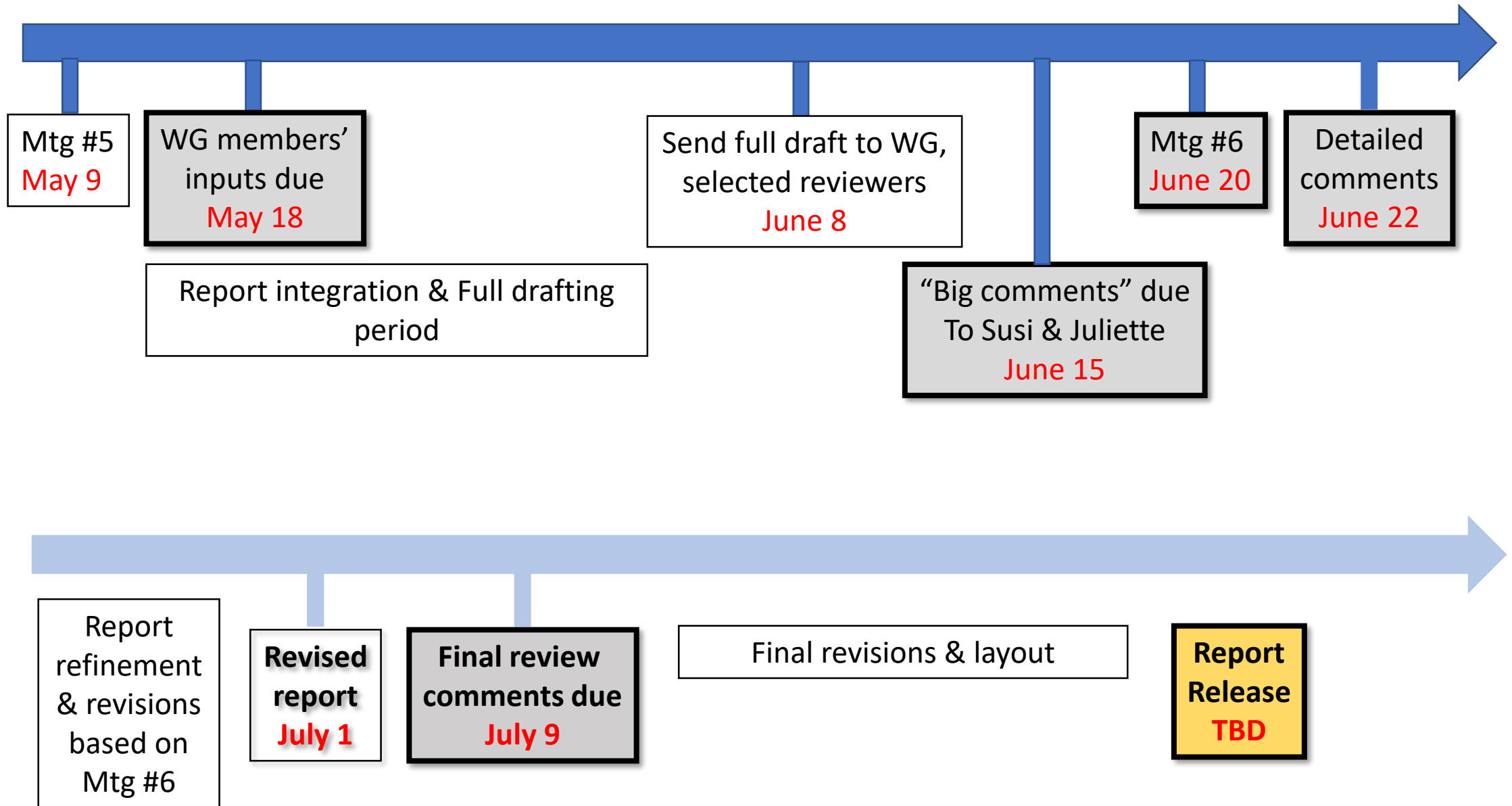
Opportunity for Public Comment



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Report Timeline & Process (proposed)



Review of the Day

Project
status
review

Governance
challenges

Barriers:
review and
filling gaps

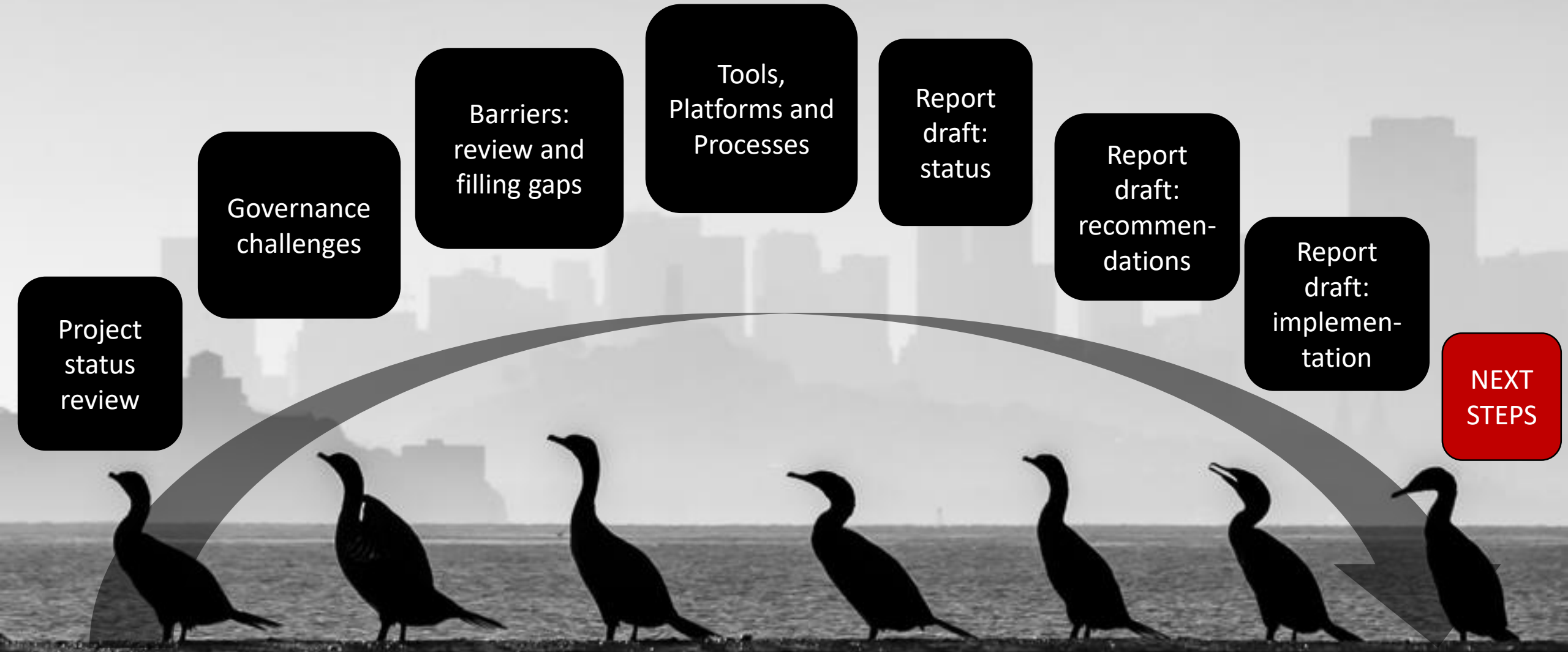
Tools,
Platforms and
Processes

Report
draft:
status

Report
draft:
recommen-
dations

Report
draft:
implemen-
tation

NEXT
STEPS



Reminder: Our Webinar Series

Inaugural Webinar: Setting the Standards and Context: Federal to Local Roles



Mike Sanio | Director of Sustainability
American Society of Civil Engineers



Kathryn Wright | Senior Associate
Meister Consultants Group/Cadmus Group



Peter Adams | Senior Policy Advisor
NYC Mayor's Office of Recovery and Resiliency

Introduction

Today's Webinar: Forward-Looking Climate Science for Use in Infrastructure Engineering: Possibilities and Limits



Dan Cayan, Ph.D. | Researcher | Climate-Safe
Infrastructure Working Group Member
Scripps Institution of Oceanography

Patrick Barnard, Ph.D. | Research Geologist
USGS Pacific Coastal & Marine Science Center

Nicolas Luco, Ph.D. | Research Structural
Engineer | USGS Geologic Hazards Team

Morgan Page, Ph.D. | Geophysicist
USGS Earthquake Science Center



Climate Science

Mobilizing the Future: Infrastructure Challenges and Opportunities in the Transportation Sector



Gurdeep Bhattal
CalTrans



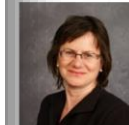
James Deane
High-Speed Rail Authority



Cris Liban
LA Metro

Transportation

Rushing toward the Future: Infrastructure Challenges and Opportunities in the WATER Sector



Kate White, Ph.D., P.E.
Lead, Climate Preparedness
and Resilience Community
of Practice
US Army Corps of Engineers



Amir Aghakouchak, Ph.D., P.E.
UC-Irvine



Andrew Schwarz, P.E.
Dept. of Water Resources

Water

Green Infrastructure: Design and Integration for Climate-Safe Communities



Maya Hayden, Ph.D.
Point Blue



Jeff Odey
American Rivers



Tina Hodges
US Department of Transportation
Federal Highway Administration

Green Infrastructure

Governing Infrastructure: How Regulations, Standards, Codes and Guidelines Are Set and Changed



Ira Feldman
GHGMI Adaptation Leader
Adaptation Coordinator, ISO
President & Senior Counsel,
Greentrack Strategies
Founder, Climate Adaptation Scholars™



J. Alfredo Gomez
US Government Accountability
Office



Stephen A. Cauffman
National Institute of Standards
and Technology

Governance

Energizing the Future: Challenges & Opportunities in the Building/Energy Sector



Nancy Ander
CSIWG Member
CA Dept. General Services



Tom Wells
CA Dept General Services



Guido Franco
CSIWG Project Team
CA Energy Commission



Martha Brook
CSIWG Member
CA Energy Commission



Kristin Heinemeier
Realized Energy

Energy

Presentations, Recordings and Q&A Available at: <http://resources.ca.gov/climate/climate-safe-infrastructure-working-group/>

Upcoming Webinars: May

Building the Future: Infrastructure Challenges and Opportunities in the BUILDING Sector

Speakers: California DGS, FLASH, FEMA, **May 15**

Infrastructure Financing I: Innovative Instruments, Approaches and Partnerships

Speakers: re:focus partners, International Resilience Center, Harvard U., **May 17**

Infrastructure Financing II: Innovative Instruments, Approaches and Partnerships

Speakers: Verea Group, EIFDs, Environmental Finance Center TBD), **Date TBD**

Still upcoming in the series: Tools, Linking science & Engineering, Social Equity, Effective Communication

Next Steps

We Will

- Prepare meeting summary notes
- Draft full report for WG review by 6/8
- Continue webinar series
- Prepare Meeting #6 (Davis)
-
-

You Will

- Send in travel receipts
- Make travel arrangements for June meeting (Sacramento/Davis)
- Attend and contribute to Webinar series
- Complete writing assignments by 5/18, review draft for big issues by 6/15

Be in touch!

- To sign up to the Climate-Safe Infrastructure listserv...
- To stay up to date on CSIWG developments...
- To ask questions or send comments... email:

Until 5/18: Elea Becker-Lowe at Elea.Beckerlowe@resources.ca.gov

After 5/18: Joey Wall at Joey.Wall@resources.ca.gov

or: climatesafeinfrastructure@resources.ca.gov

... and s/he will direct the inquiry accordingly.



Meeting #3 of the Climate-Safe Infrastructure Working Group • San Diego • May 9, 2018

*Toward
Climate-
Safe
Infrastructure*



Thank you!