Climate-Safe Infrastructure Webinar Series • September 5, 2018

Paying It Forward

The Path Toward Climate-Safe Infrastructure in California

Report Release

CALIFORNIA natural resources AGENCY

Hosts

Susi Moser | Susanne Moser Research & Consulting

Co-Facilitator of CSIWG's work

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Juliette Finzi Hart | USGS

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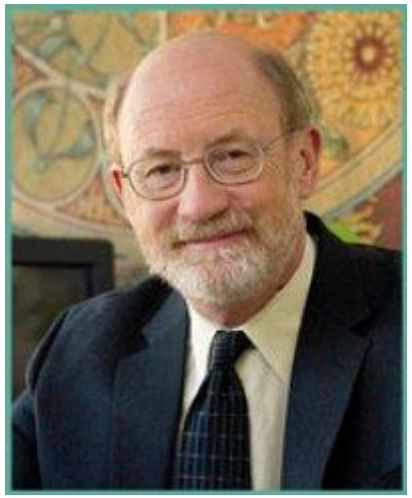
Overview

- Introduction and overview to webinar
- Opening Remarks
  - Secretary John Laird
  - Jamesine Rogers Gibson (UCS)
- Highlights of AB 2800 report
- Q&A with Climate-Safe Infrastructure WG members
- Closing

A Couple of Housekeeping Items

- Please type your questions for presenters into the chat box
- We will try to answer as many as possible after the presentations
- Answers to remaining questions will be posted on the website
- Thank you to USC Sea Grant!

Opening Remarks



Secretary John Laird
Natural Resources Agency

Jamesine Rogers Gibson
Union of Concerned Scientists

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.

Project Decision Making

Climate Change Impacts Science

Engineering Standards, Project Planning and Design

Project Construction Maintenance and Monitoring

AB 2800 (Quirk): Scope of Work & Recommendations

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

(1) **informational and institutional barriers** to integrating climate change into infrastructure design.

(2) **critical information needs** of engineers.

(3) **selection of appropriate engineering designs** for different climate scenarios.

AB2800 Working Group and Support Team

Co-Facilitators

Juliette Finzi Hart
USGS

Susi Moser
Susanne Moser
Research & Consulting

The Climate-Safe Infrastructure Working Group

Amir Aghakouchak
UC-Irvine

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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

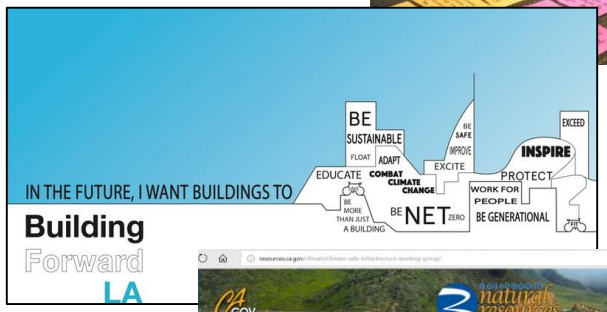
Elea Becker Lowe
Natural Resources Agency

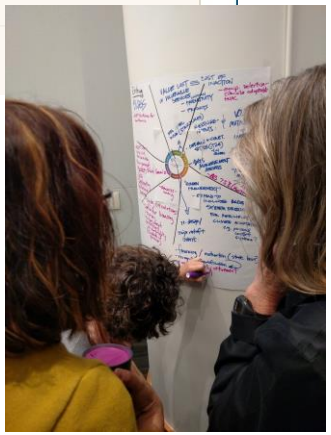
Joey Wall
Natural Resources Agency

Guido Franco
California Energy Commission

How We Got Here

- 6 Working Group meetings (Jan-June 2018)
  - Structured, focused, highly interactive
  - Open to public, public comment periods and active engagement in activities
  - Presentations or panels of local experts/examples
- In parallel: Ongoing webinar series to
  - Highlight WG members' expertise and work
  - Bring in outside expertise
  - Educate and engage interested stakeholders
- Literature review
- Outreach (deliberate and opportunistic)





http://resources.ca.gov/climate/climate-safe-infrastructure-working-group/

Paying it Forward:

The Path Toward Climate-Safe Infrastructure in California

A Report of the Climate-Safe Infrastructure Working Group to the California State Legislature and the Strategic Growth Council

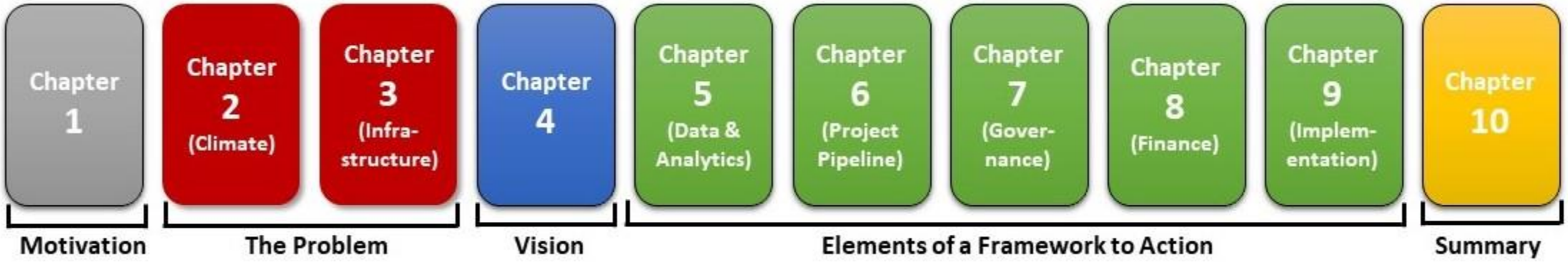
September 2018

A Wealth of Resources For You

- 16-page Executive Summary
- 160-page Full Report
- 13 Appendices
- These and additional materials (meeting materials and webinars) produced over the course of the project are all available at:

http://resources.ca.gov/climate/climate-safe-infrastructure-working-group/

Overview: A Report in 10 Parts



The Problem

Changing climate • More and/or worsening extremes

Aging infrastructure • Deferred maintenance • Changing technology • Population growth

California at a Crossroads

Our infrastructure
must be resilient and sustainable
to withstand these growing threats,
particularly from
worsening extreme events.
Yet California's infrastructure is not.

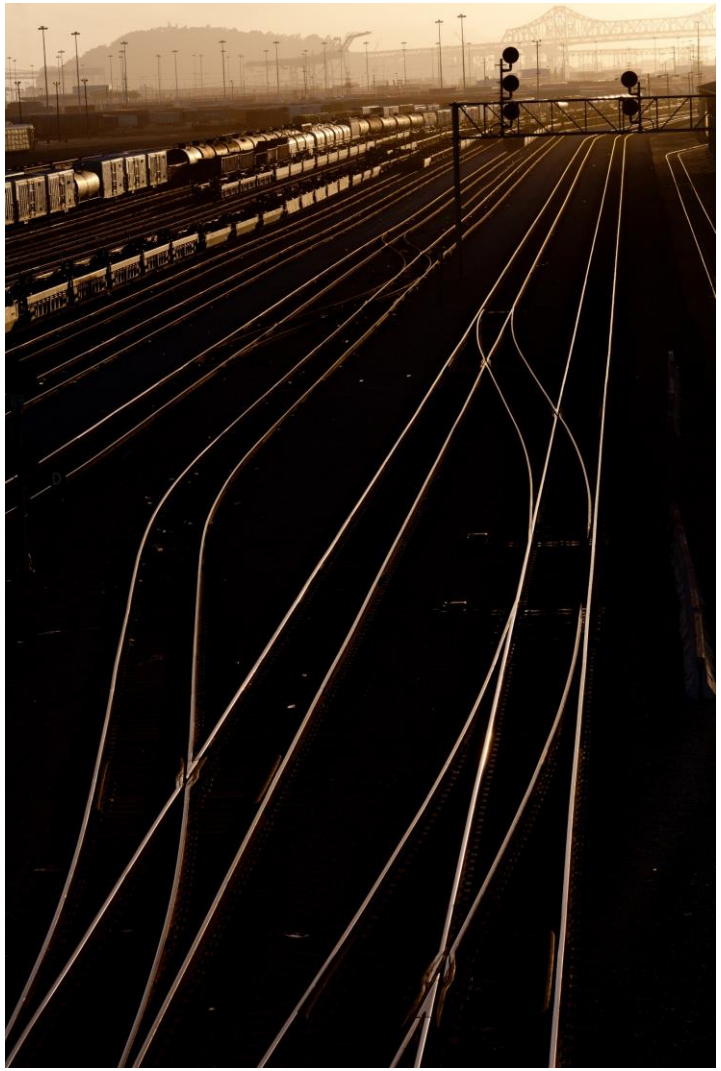
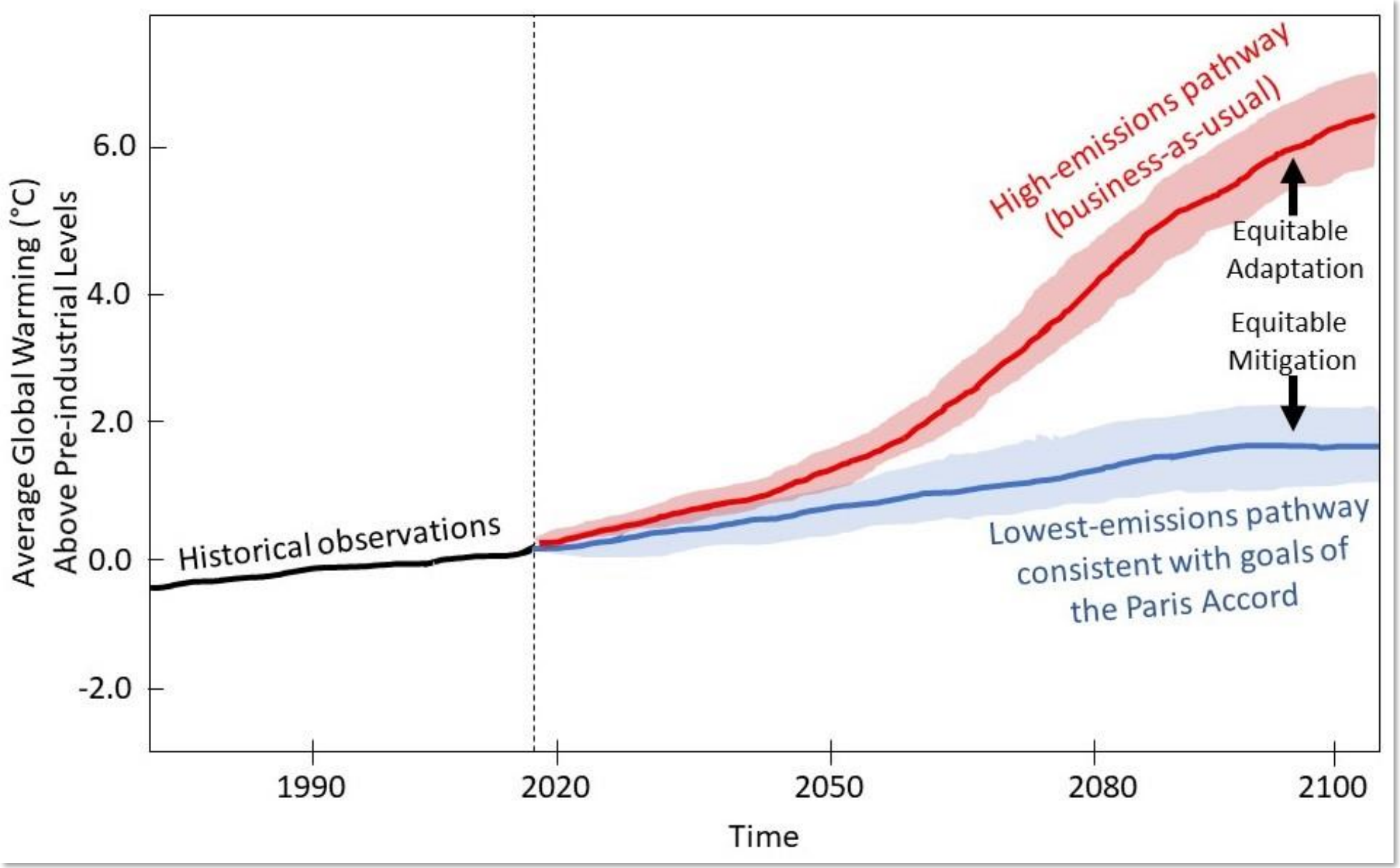


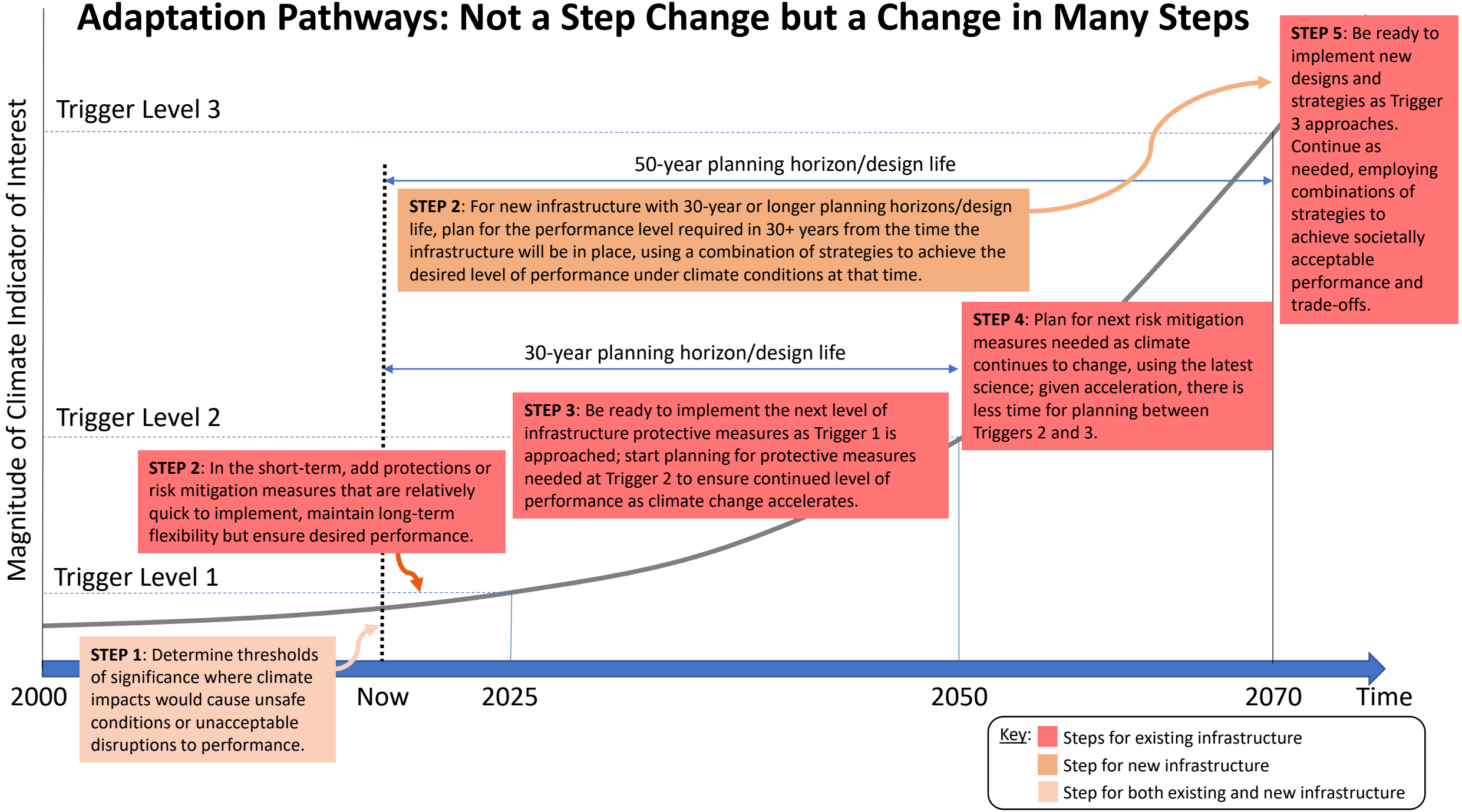
Photo: Thomas Hawk, flickr, CC 2.0

The Vision: A Climate-Safe Path for All



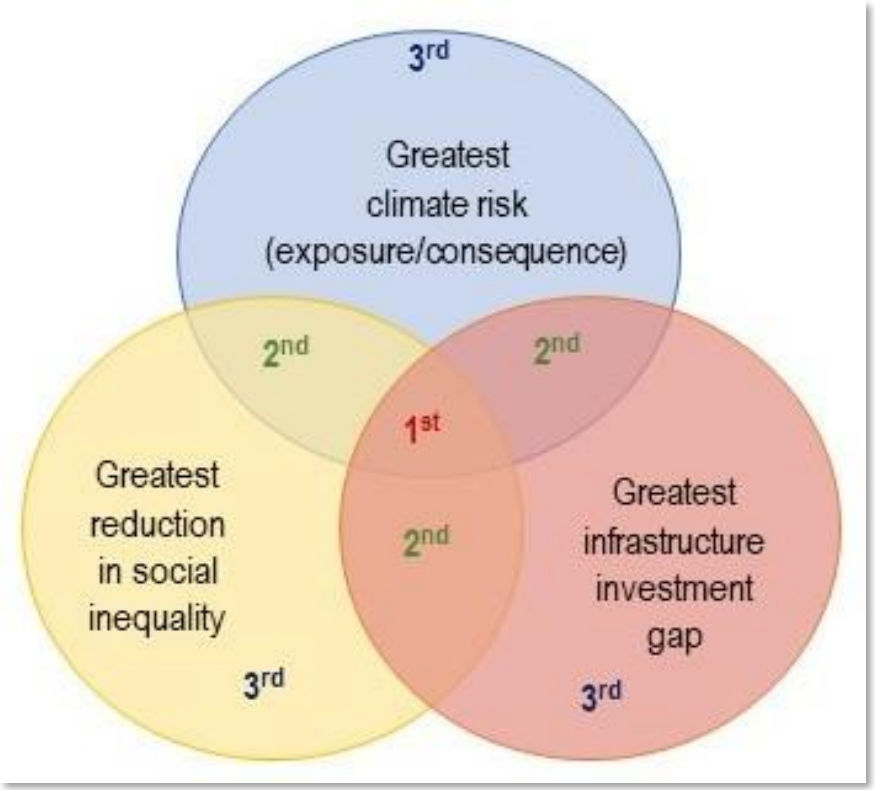
Source: CSIWG (2018), *Paying It Forward*

Adaptation Pathways: Not a Step Change but a Change in Many Steps



Photos (T>B): Scott Strazzante, SF Chronicle; Brookings Institution; San Francisquito Creek Joint Powers Authority

Prioritize Social Equity & Inclusion



Source: CSIWG (2018), *Paying It Forward*

In…

- Research
- Project development and prioritization
- Decision-making processes
- Finance
- Workforce development
- Procurement
- M&E

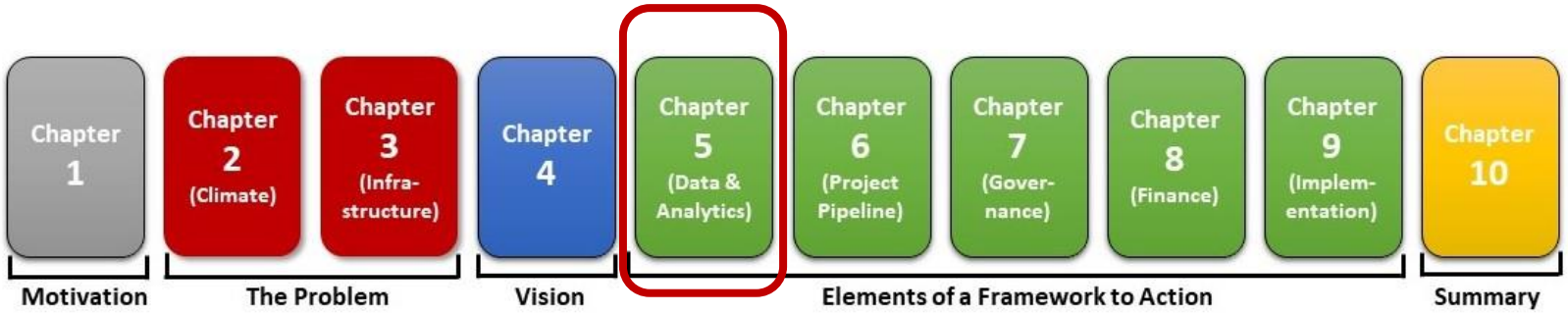
Framework for Action: “It Takes a System”

Data and Analytics	• Climate risk forecasts • Vulnerability assessments	**COORDINATION & INTEGRATION ACROSS SCALES** **ITERATIVE PLANNING & REVIEW CYCLE**
Project Pipeline	• Planning process • Standards for prioritizing • Project management & coordination	
Governance Structures	• District & municipal • Regional & State • Federal & private projects	

Financing Tools	• Funding (revenue source)
	  • *Taxes, fees, grants, private $*
	• Financing (deal structure)
	  • *Debt, pay as you go, risk hedging*
	• Innovative instruments
	  • *Financing-insurance combination*	

Implementation Aids	• Training & Professional development • Accountability mechanisms • Monitoring & Evaluation	

Source: CSIWG (2018), *Paying It Forward*



Data & Analytics

- What is used • What is needed • What is available • In what form
- More than forward-looking climate science
  - Societal drivers of change (population change, land use, technology, values)
  - Social inequities and vulnerabilities
  - Economics of adaptation and inaction
  - Full life-cycle assessment, valuation of costs and benefits
  - Adaptive design
- Platforms, processes, tools

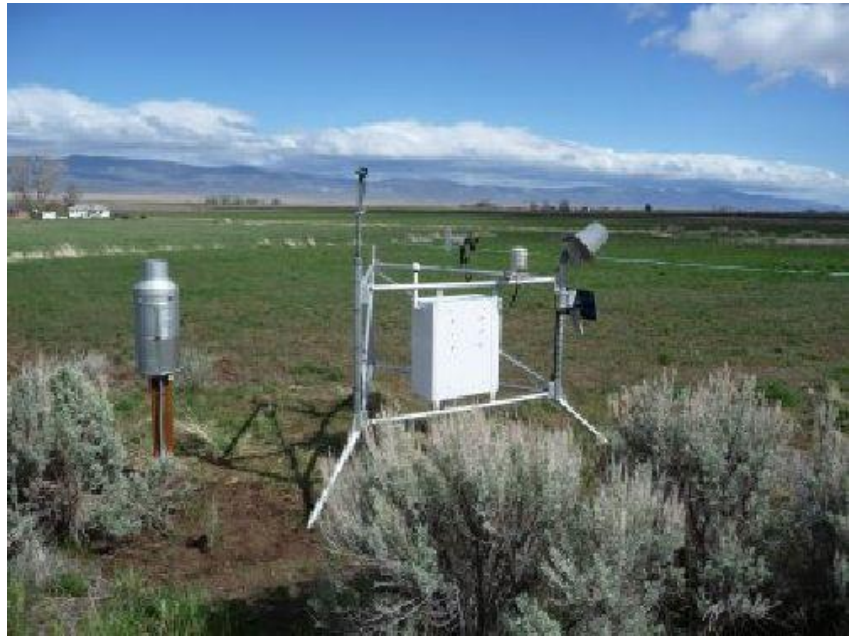
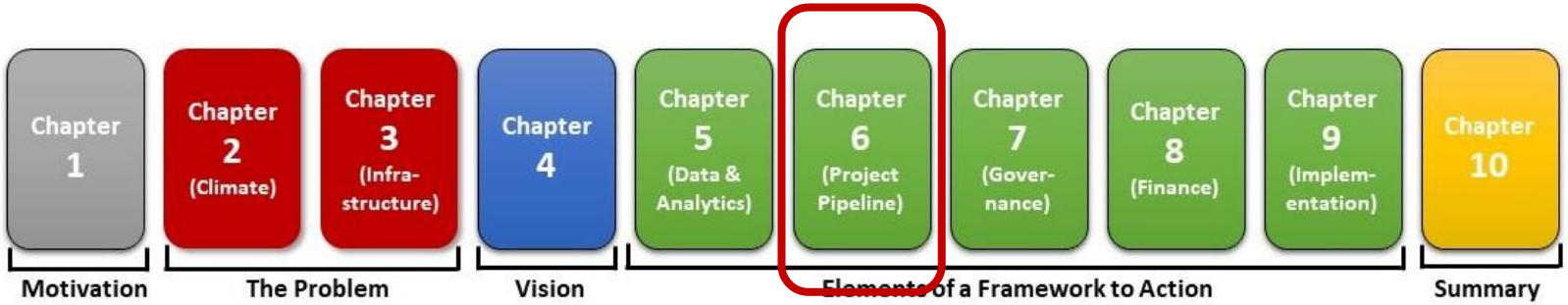
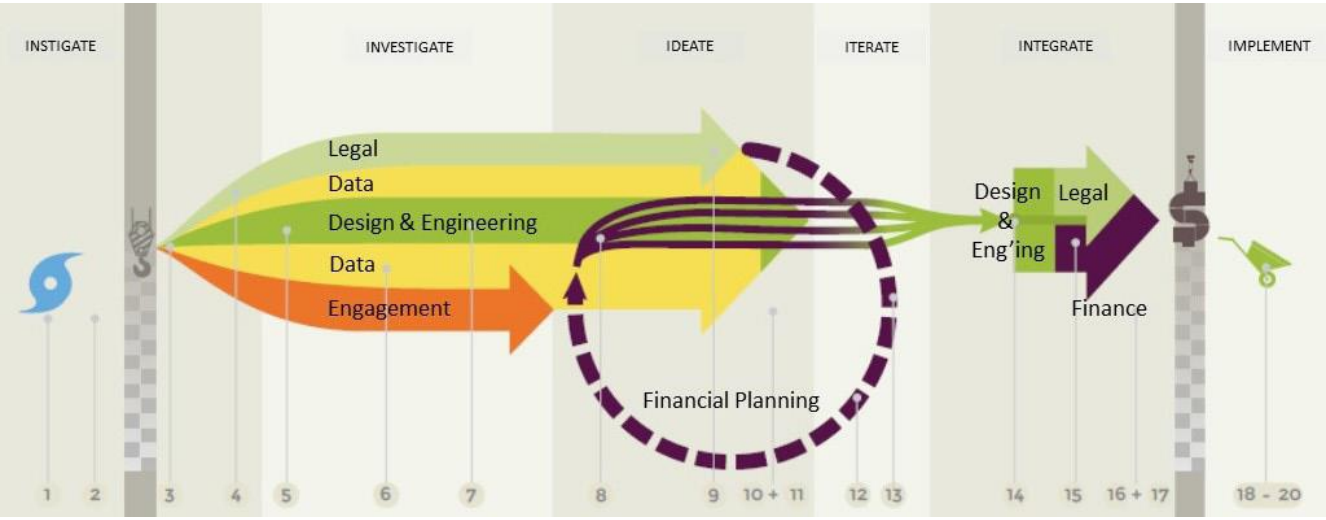


Photo: Bureau of Reclamation

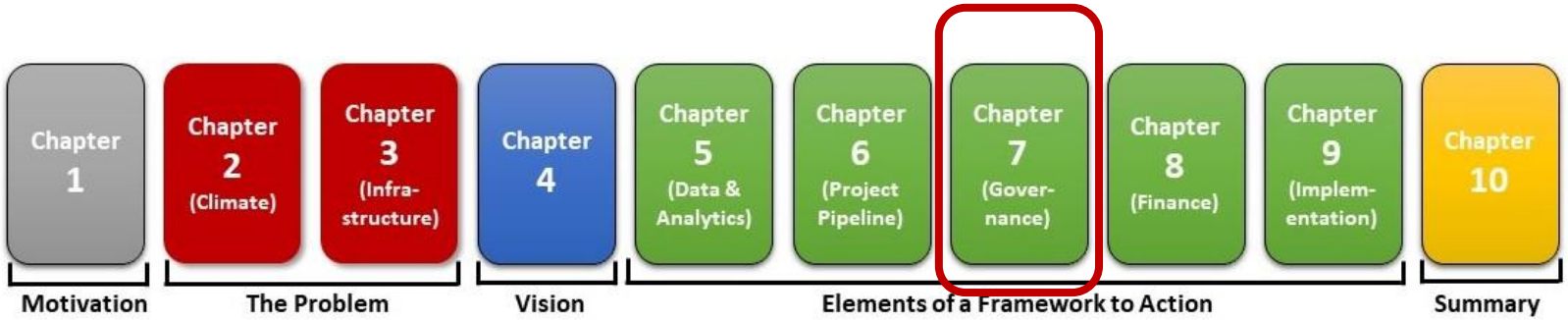


Project Pipeline

- Iterative process
- Meaningful engagement
- Systemic planning
- Screening for climate impacts
- Calculating project feasibility
- Probabilistic risk management
- Innovative design options



Source: Adapted from re:focus partners (2015)



Governance

- Traditional governance through standards, codes, guidelines etc.
- Compilation of those relevant to state infrastructure
- Processes for updating and augmenting them at state level
  - Performance standards
  - Standards of professional practice
  - Standards of care
  - Voluntary standards
  - Manuals of practice
- Liability needs special attention
- Institutions for integrated infrastructure systems

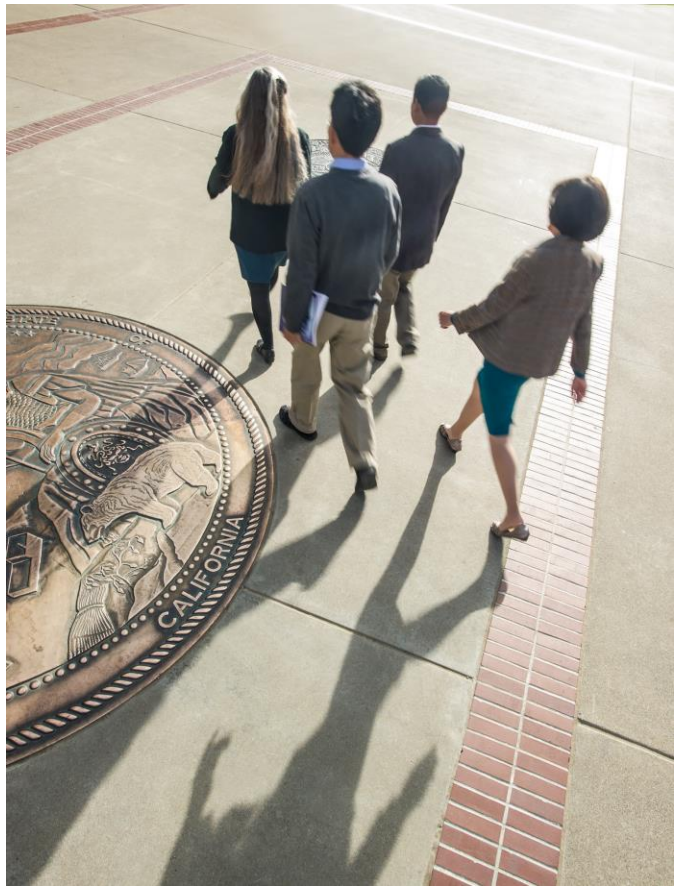
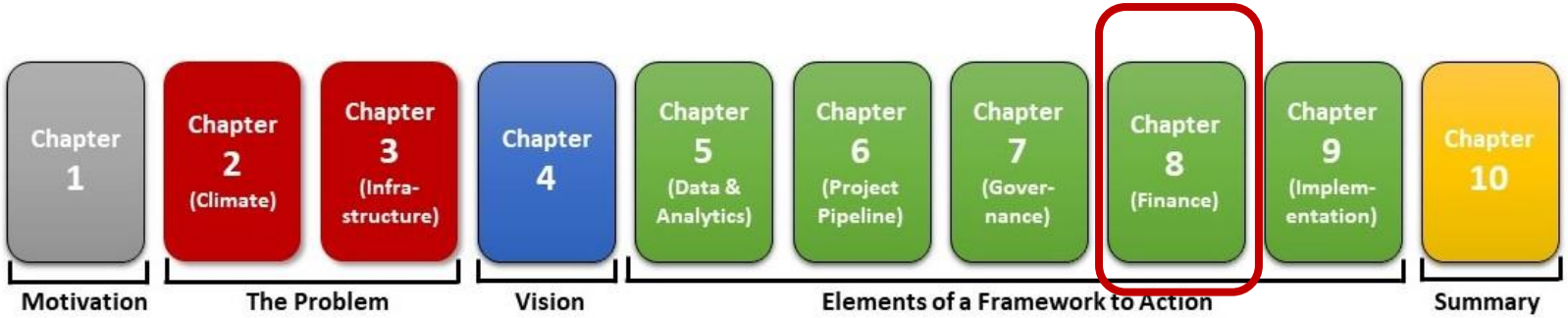


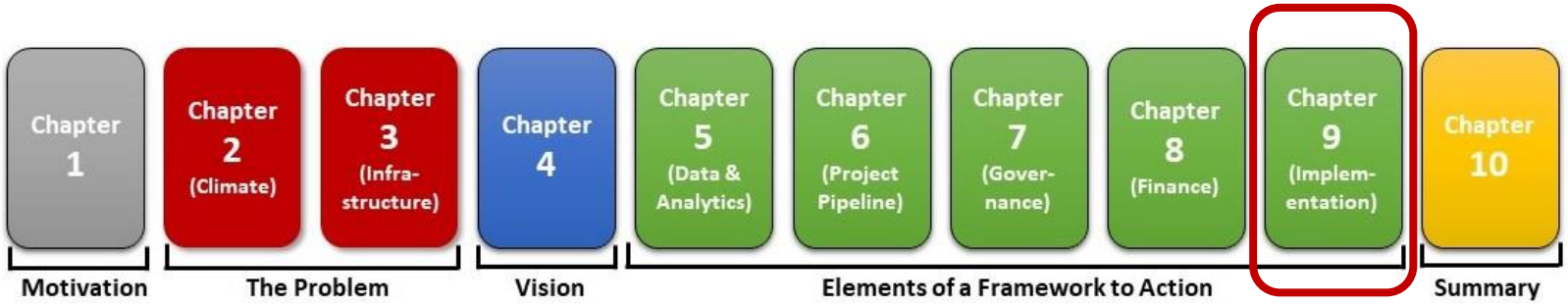
Photo: DWR



Infrastructure Finance

- Federal and state spending trends
- Structural challenges to infrastructure finance – the "pre-existing condition"
- Added challenges (and opportunities) of infrastructure finance under climate change
  - Costs
  - Accounting for CC in finance
  - Data and analytics to support infrastructure financing
- Dedicated funding vs. accountability in all projects
- Emerging innovative financing tools

Photo: 401kcalculator.org, flickr, CC 2.0



Implementation Aids

- Training, capacity building and other workforce issues
- Statewide coordination at the highest level
- Translating State policy to the project level
  - Cal-MOP
  - Procurement guidance
  - Incentives
  - Permitting, waiver guidance, code changes
- Development of metrics of performance & success
- The question of best practices

Photo: Elvert Barnes, flickr, CC 2.0

Walking the Path…: The CSIWG's Recommendations

Vision	• Policy signal • Pathways approach • Centrality of social equity
Data and Analytics	• Climate risk forecasts • Vulnerability assessments
Project Pipeline	• Planning process • Standards for prioritizing • Project management & coordination
Governance Structures	• District & municipal • Regional & State • Federal & private projects

Financing Tools	• Funding (revenue source)
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Implementation Aids	• Training & Professional development • Accountability mechanisms • Monitoring & Evaluation

COORDINATION & INTEGRATION ACROSS SCALES

ITERATIVE PLANNING & REVIEW CYCLE

RECOMMENDATION 1: Adopt Climate-Safe Path for All as Statewide Policy

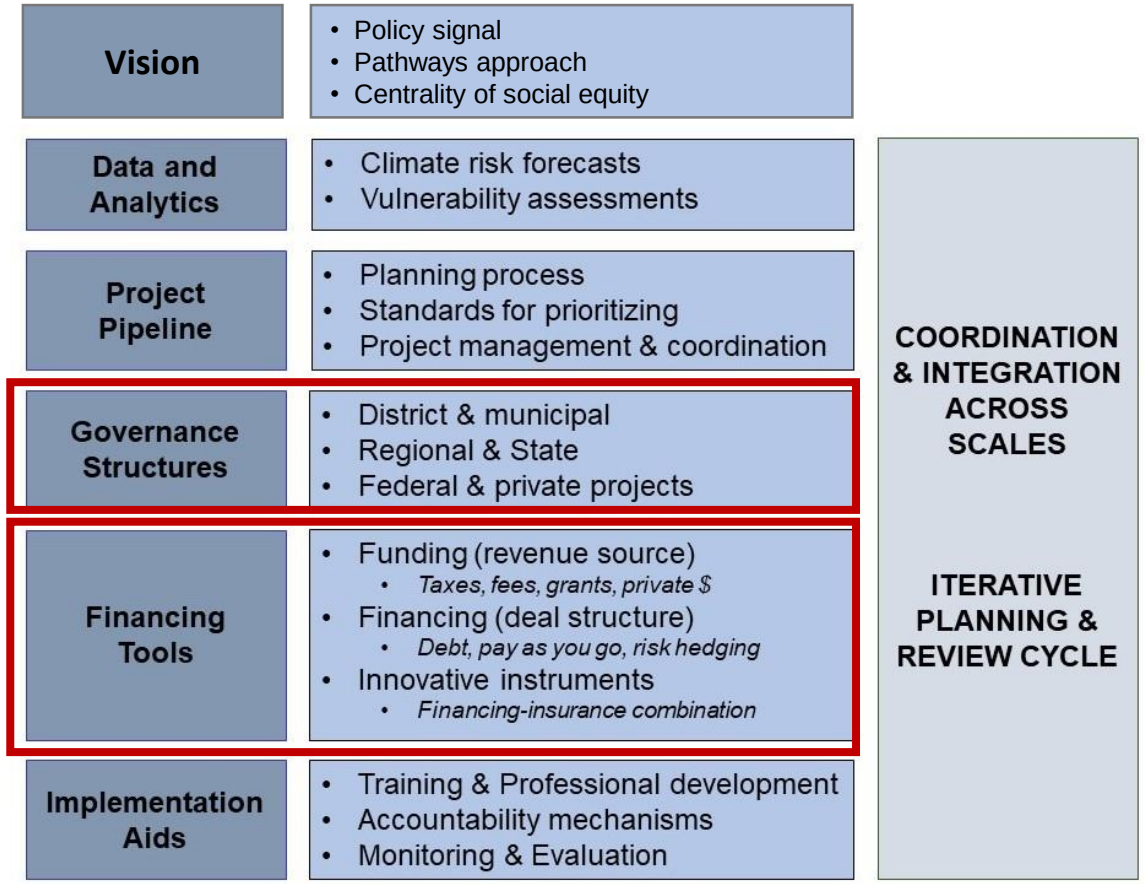
RECOMMENDATION 2: Provide permanent source of funding for state climate change science efforts

RECOMMENDATION 3: Provide funding for infra-structure agencies to interact with science community

RECOMMENDATION 4: Build staff capacity to improve project development (integrated, inclusive planning, Financing options, full life-cycle assessments etc.)

RECOMMENDATION 5: Provide guidance & encourage effective stakeholder engagement from the start

Walking the Path… The CSIWG Recommendations (cont.)



RECOMMENDATION 6: Update all climate-sensitive standards, codes and guidelines; work through relevant professional societies/standard-setting organizations; develop guidelines to go above minimum standards; work through liability issues

RECOMMENDATION 7: Assess the true costs over the full life-cycle of infrastructure projects; make efforts to help policy-makers and the public to better understand the necessity of bearing these costs through outreach.

Walking the Path… The CSIWG Recommendations (cont.)

Vision	• Policy signal • Pathways approach • Centrality of social equity
Data and Analytics	• Climate risk forecasts • Vulnerability assessments
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Implementation Aids	• Training & Professional development • Accountability mechanisms • Monitoring & Evaluation

COORDINATION & INTEGRATION ACROSS SCALES

ITERATIVE PLANNING & REVIEW CYCLE

RECOMMENDATION 8: Develop work plan on how to address the training and professional development gaps of its infrastructure-related workforce.

RECOMMENDATION 9: Establish a Standing CSIWG to devise and implement a process for coordinating and prioritizing Climate-Safe Path related resilience policies and actions at the highest level

RECOMMENDATION 10: Translate Climate-Safe Path policy into practice (through manuals, contracting language, incentives, identification of metrics of success, best-practices compendium etc.)

Next Steps

Photo: Thomas Hawk, flickr, CC 2.0

- Briefings to SGC, State Legislature
- Conference presentations
  - Academic
  - Practitioners
- Outreach to organizations, professional societies across U.S.
- CSIWG as champions in their respective agencies, organizations, professions
- Engage with other processes where CSIWG experience and insights can serve

Q&A Panel of CSIWG Members

Noah Diffenbaugh, Stanford

John Andrew
DWR

Nancy Ander
DGS

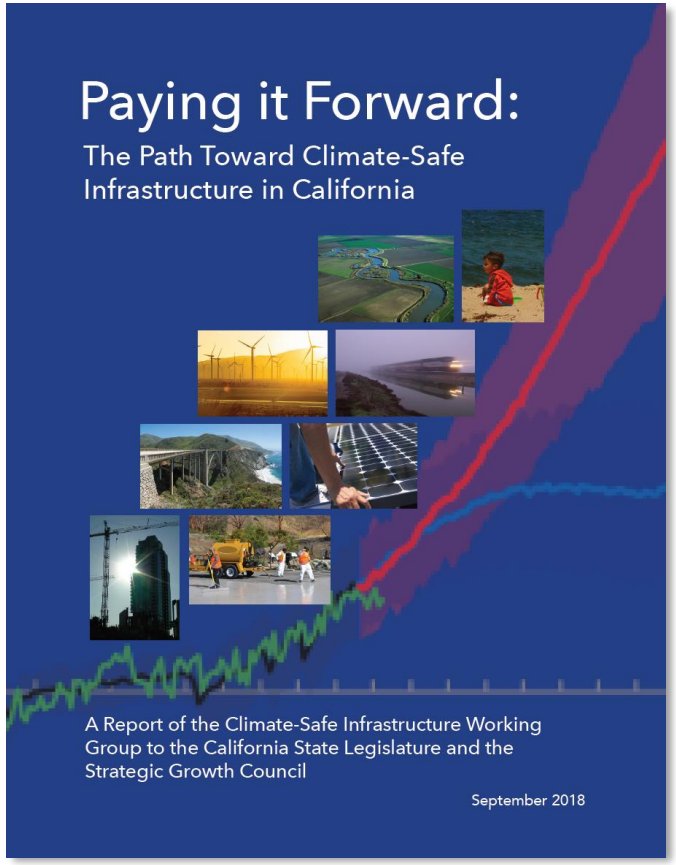
James Deane
CA High Speed Rail Authority

Martha Brook
CA Energy Commission

Cris Liban
L.A. Metro

Report and Additional Resources

- **Permanent website**: http://resources.ca.gov/climate/climate-safe-infrastructure-working-group/
- **For immediate inquiries**:
  Susi Moser at: promundi@susannemoser.com
  Juliette Finzi Hart at: jfinzihart@usgs.gov
- **Agency contact**:
  Joseph.Wall@resources.ca.gov or
  climatesafeinfrastructure@resources.ca.gov



Thank you!

- This concludes the Climate-Safe Infrastructure Webinar Series

- The ***Climate-Safe Infrastructure*** Webinar Series recordings and slides will be a lasting resource
  - Find report, webinars, meeting materials and other outputs of CSIWG at: http://resources.ca.gov/climate/climate-safe-infrastructure-working-group/