

# *Paying It Forward*

## The Path Toward Climate-Safe Infrastructure in California



Report Release



# Hosts



**Susi Moser** | Susanne Moser Research & Consulting

Co-Facilitator of CSIWG's work

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Co-Facilitator of CSIWG's work

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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

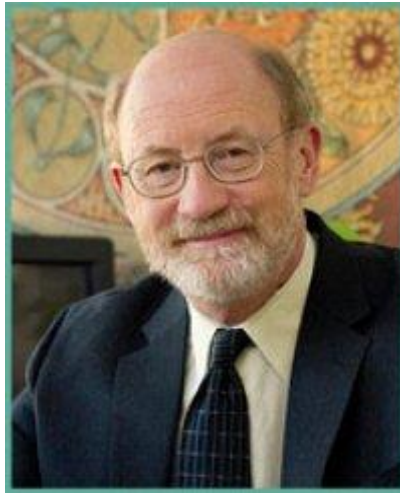


# A Couple of Housekeeping Items



- 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

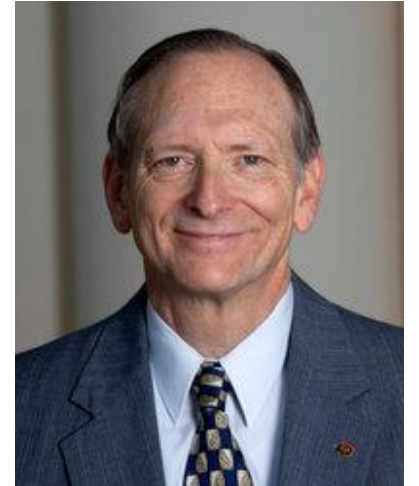


**Jamesine Rogers  
Gibson**  
Union of Concerned  
Scientists



# 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



# 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



**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

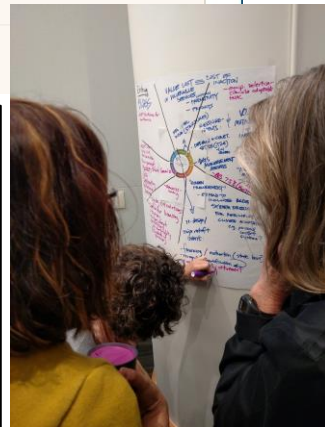
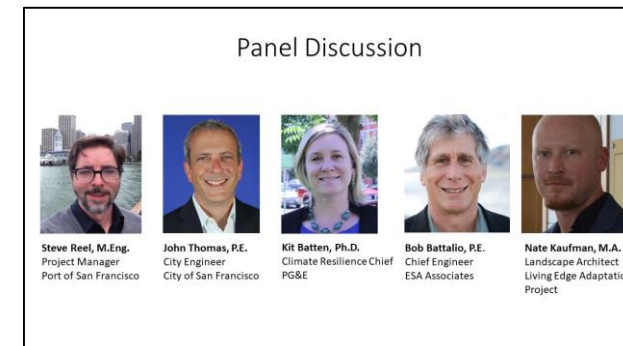
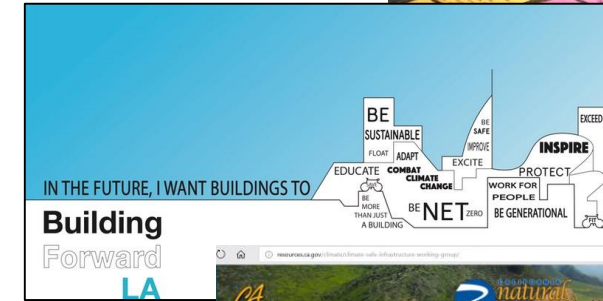


**Guido Franco**  
California Energy  
Commission



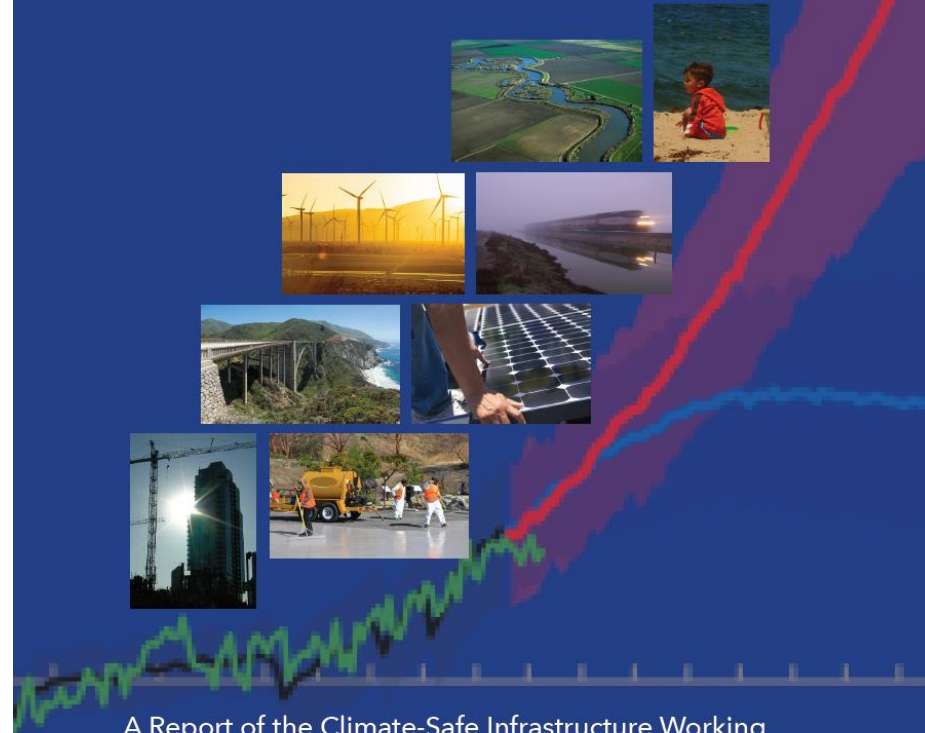
# How We Got Here

- 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)



# 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

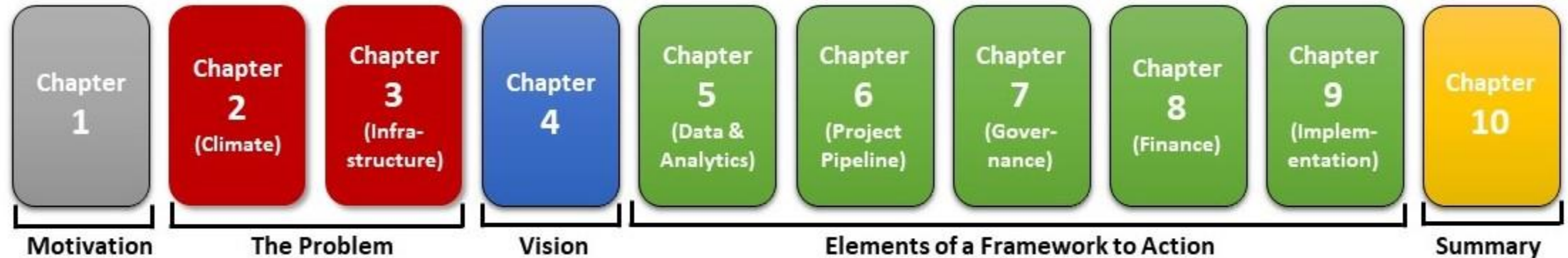
# A Wealth of Resources For You



- 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

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

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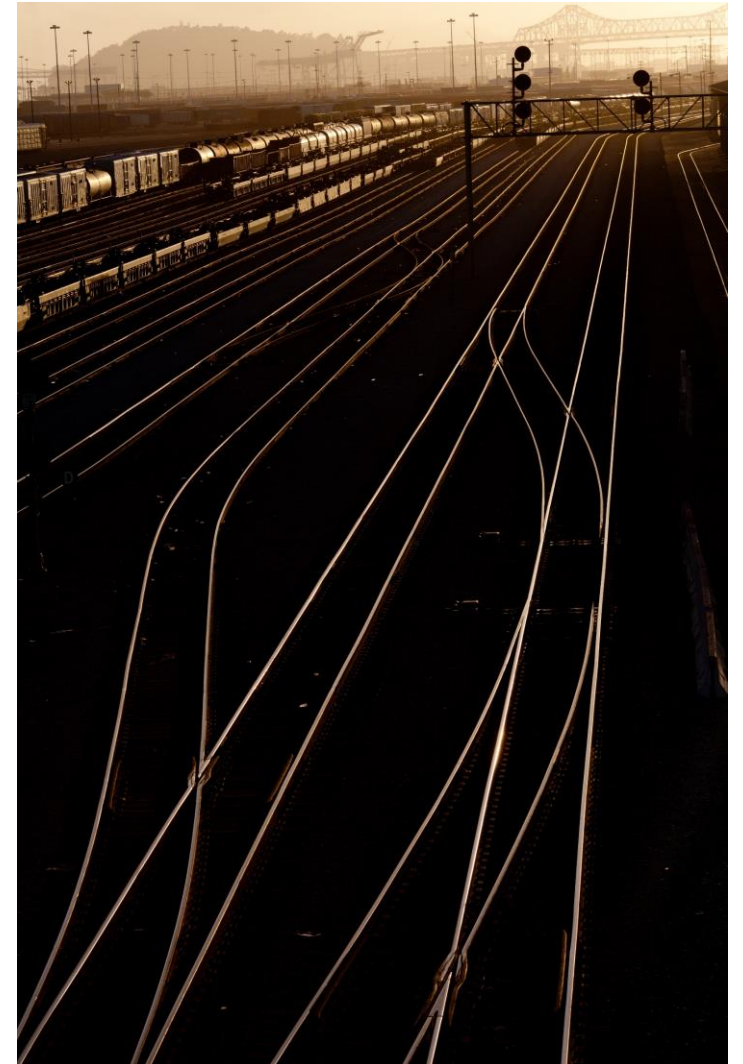
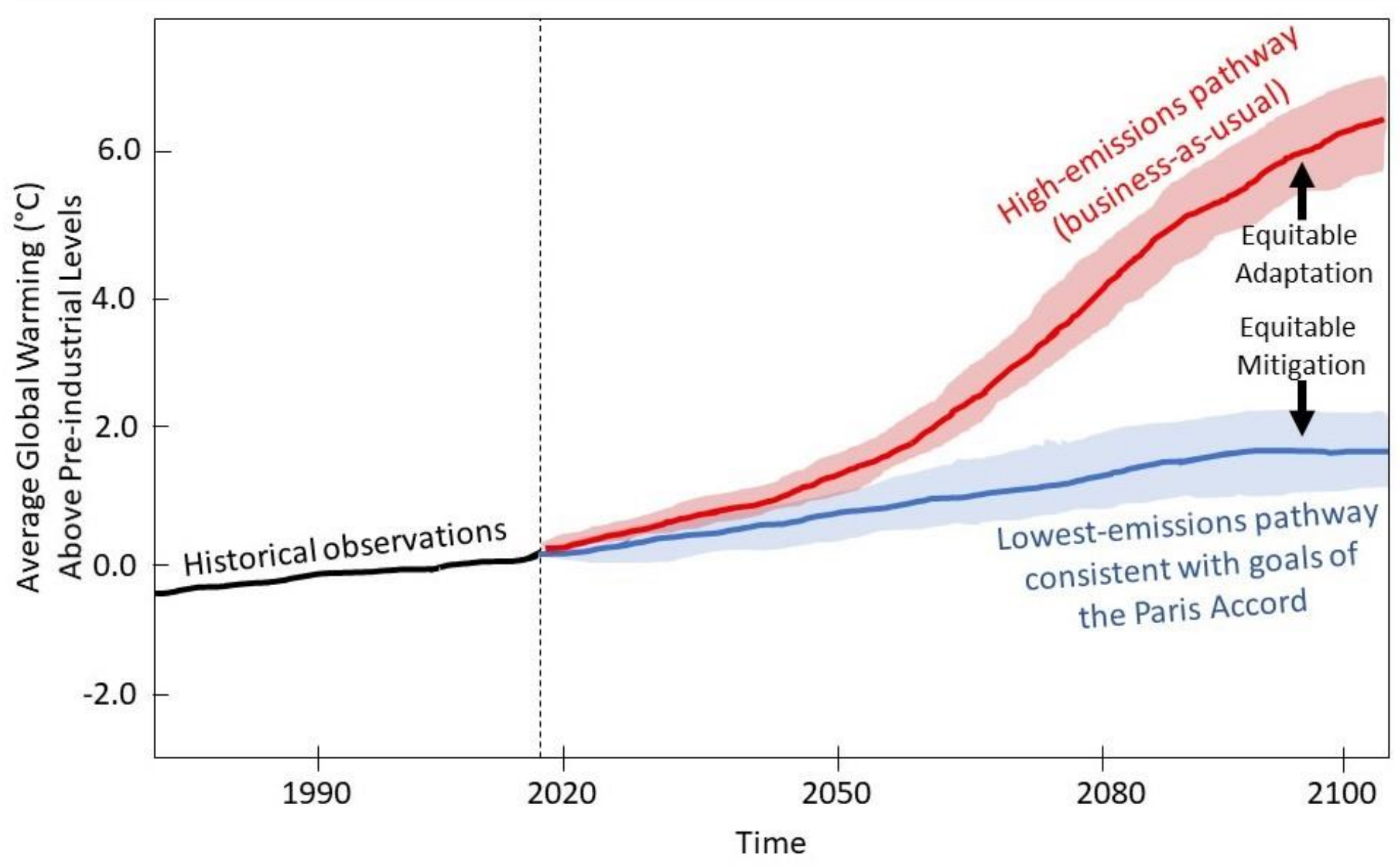


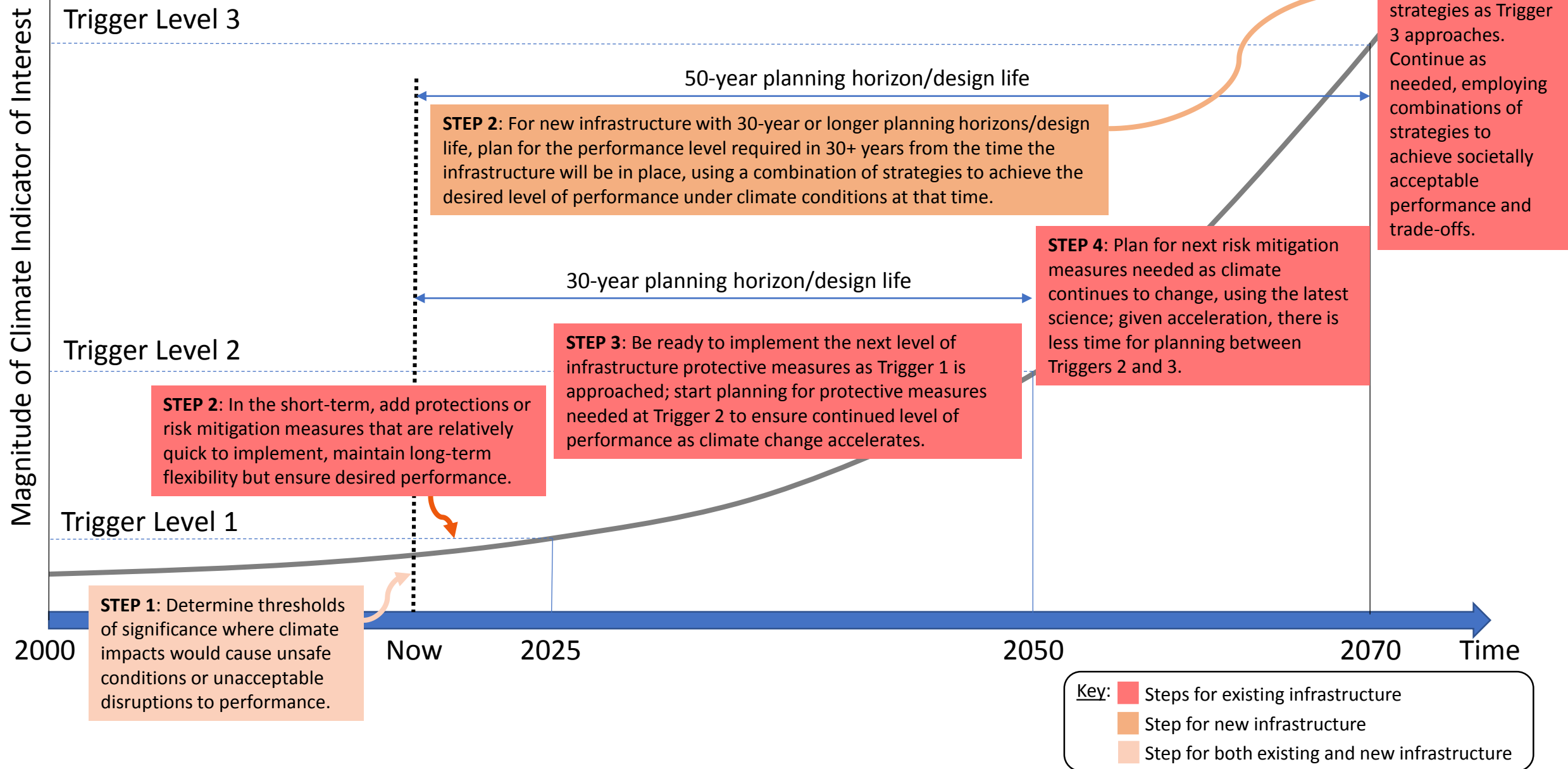
Photo: Thomas Hawk, flickr, CC 2.0



# The Vision: A Climate-Safe Path for All

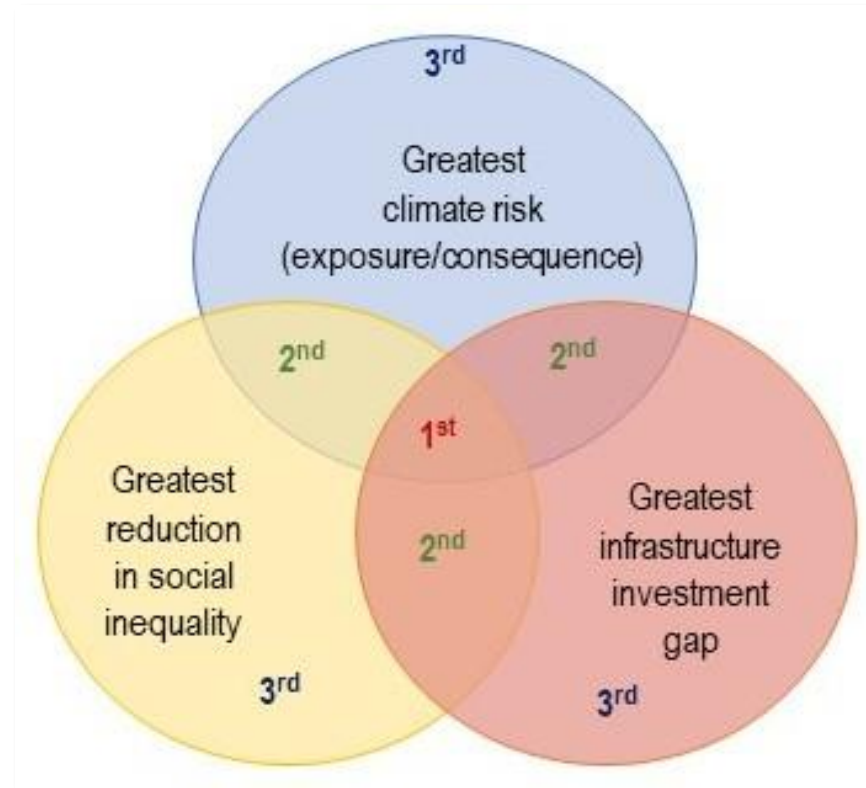


# Adaptation Pathways: Not a Step Change but a Change in Many Steps





# Prioritize Social Equity & Inclusion

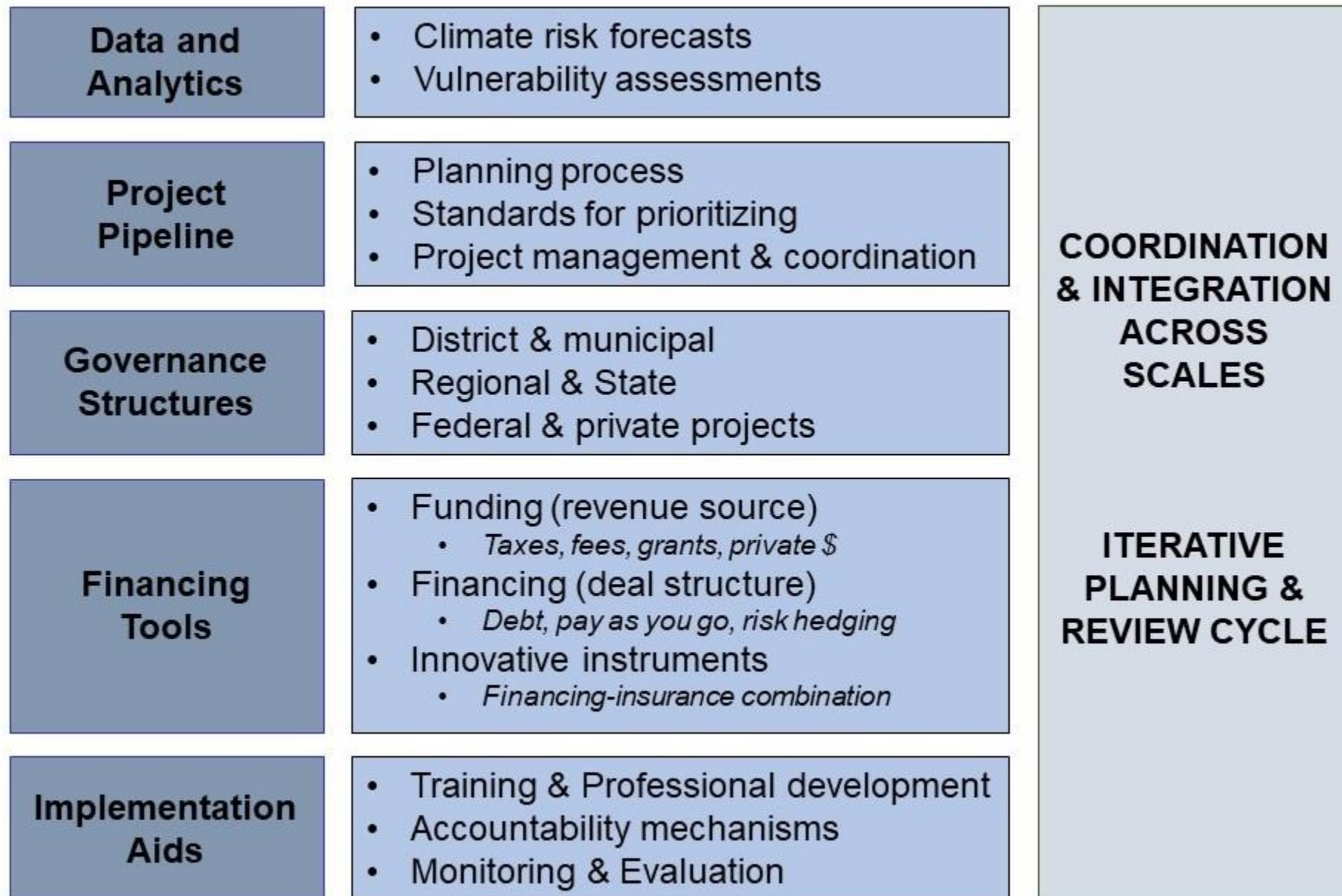


Source: CSIWG (2018), *Paying It Forward*

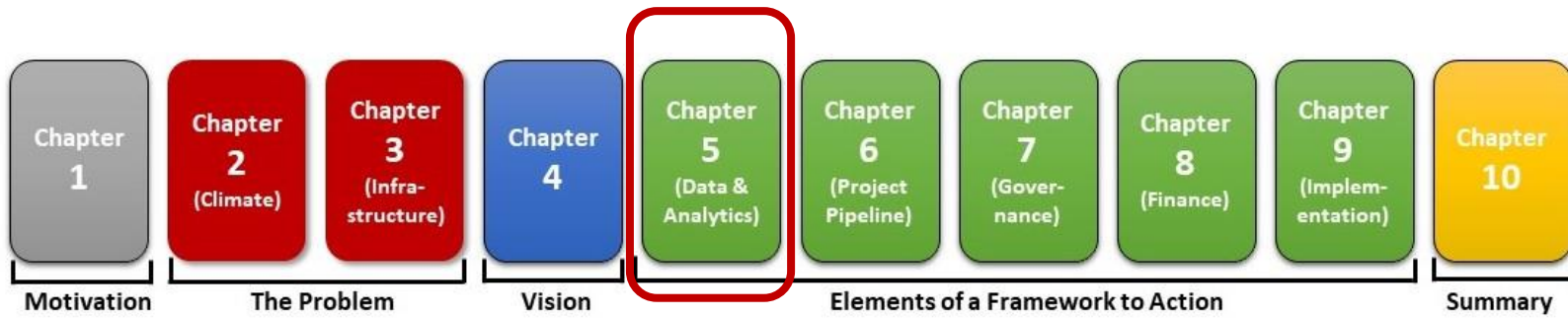
In...

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

# Framework for Action: “It Takes a System”







# Data & 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

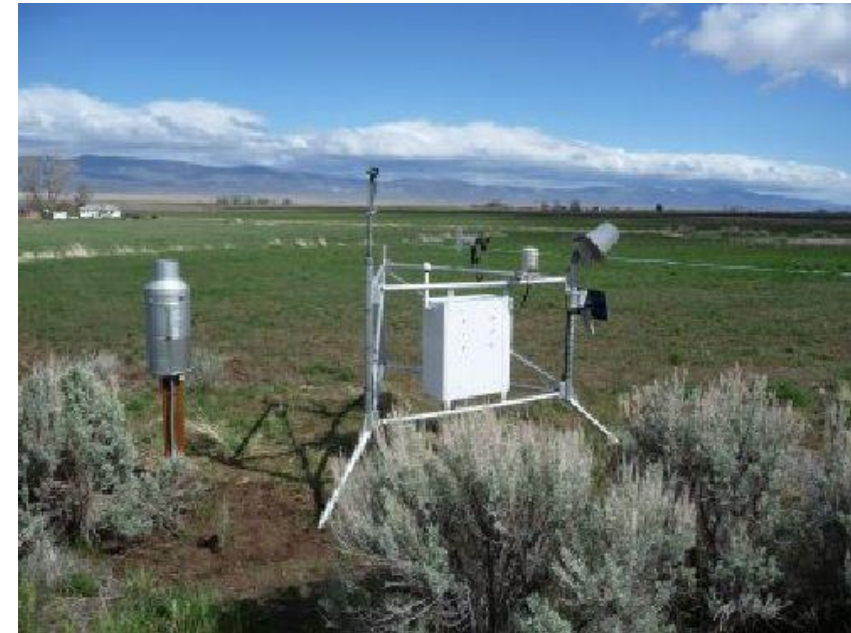
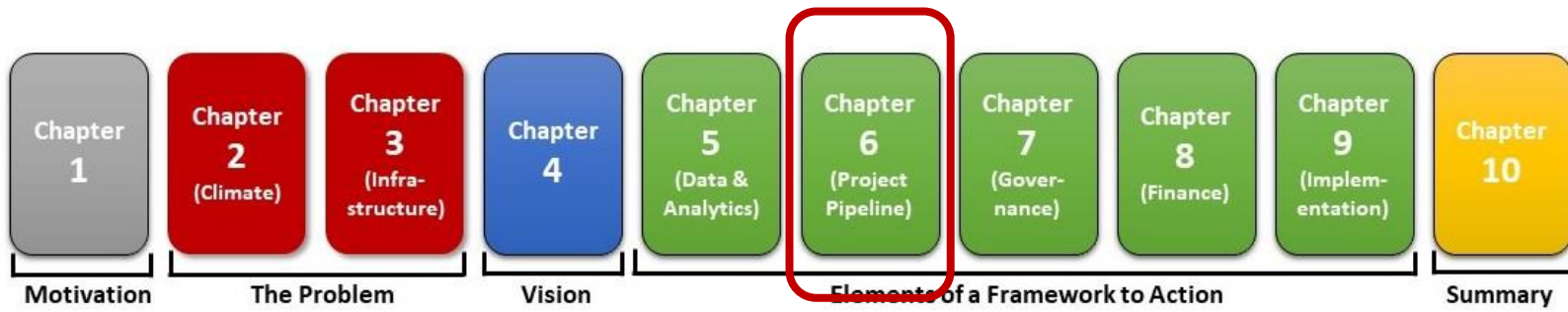
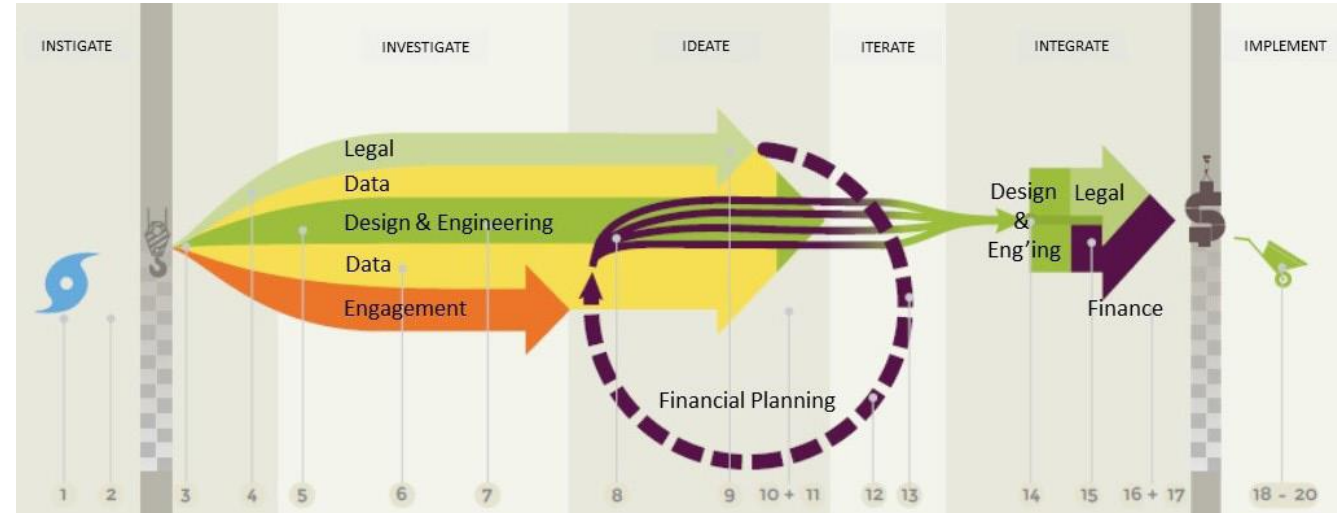


Photo: Bureau of Reclamation



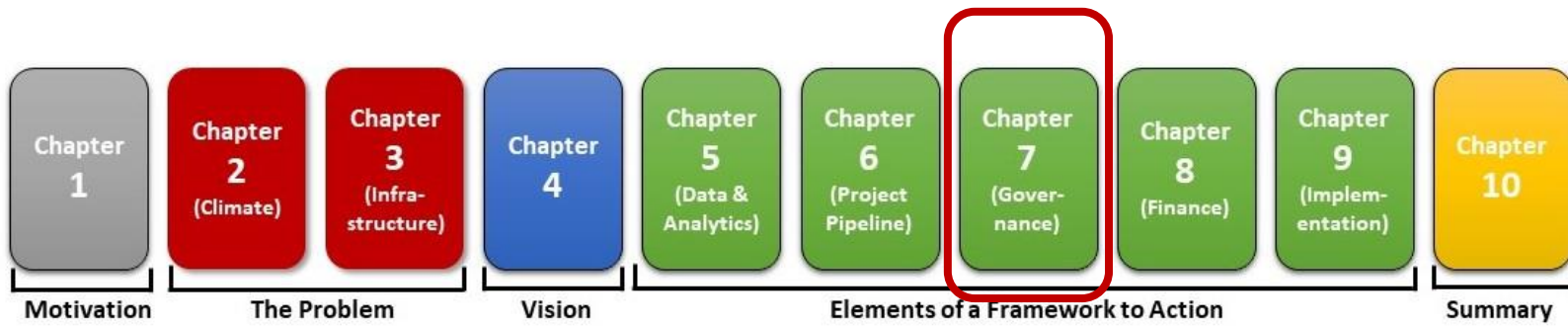
# Project Pipeline

- 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

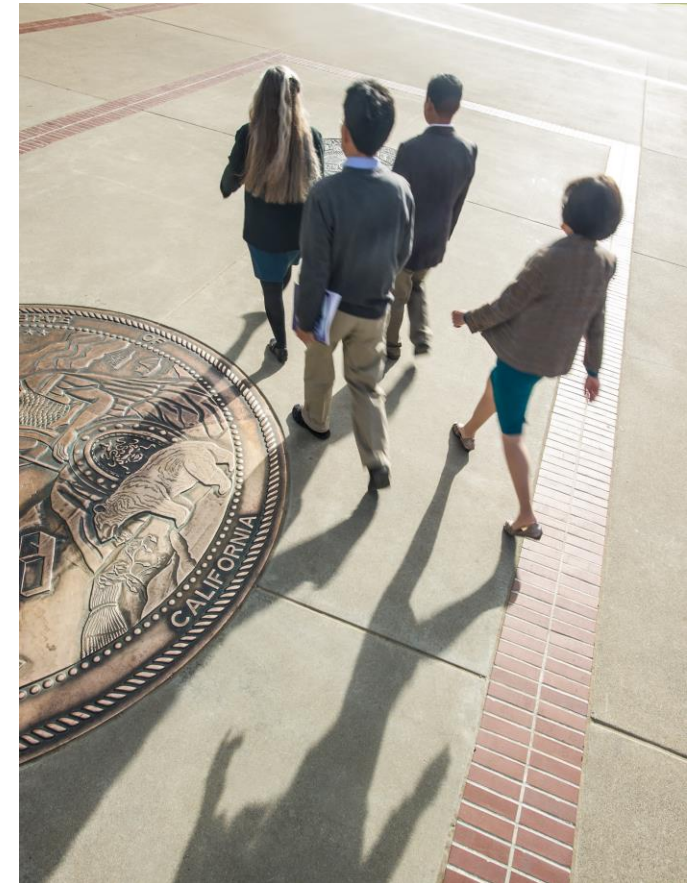
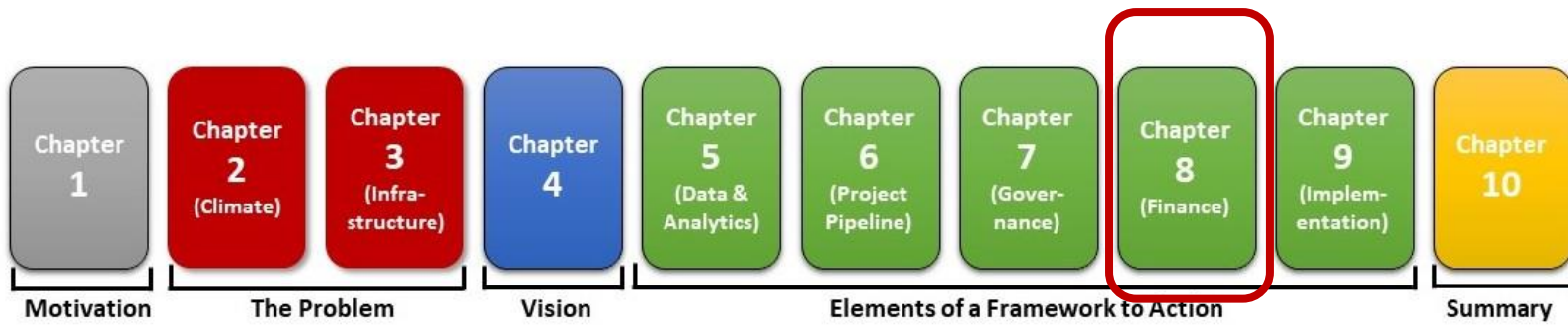


Photo: DWR

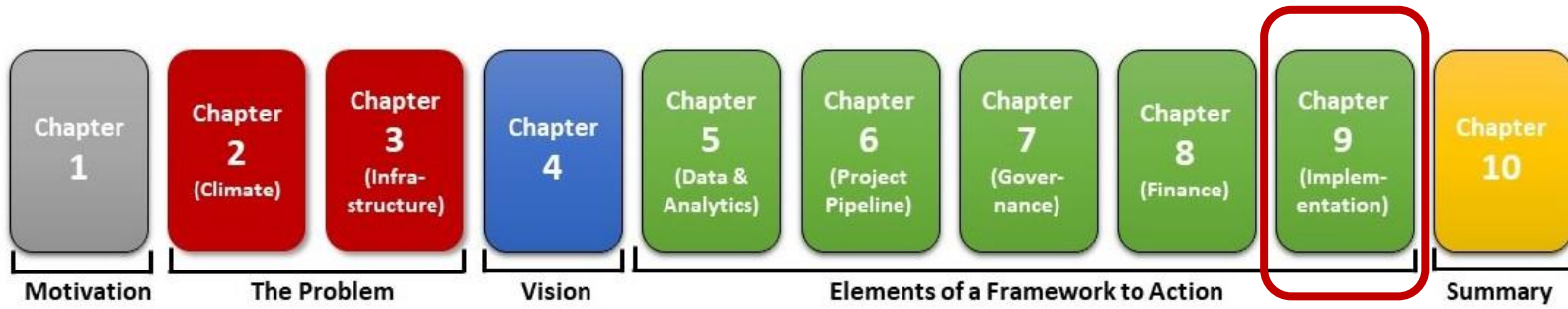


# Infrastructure Finance

- 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

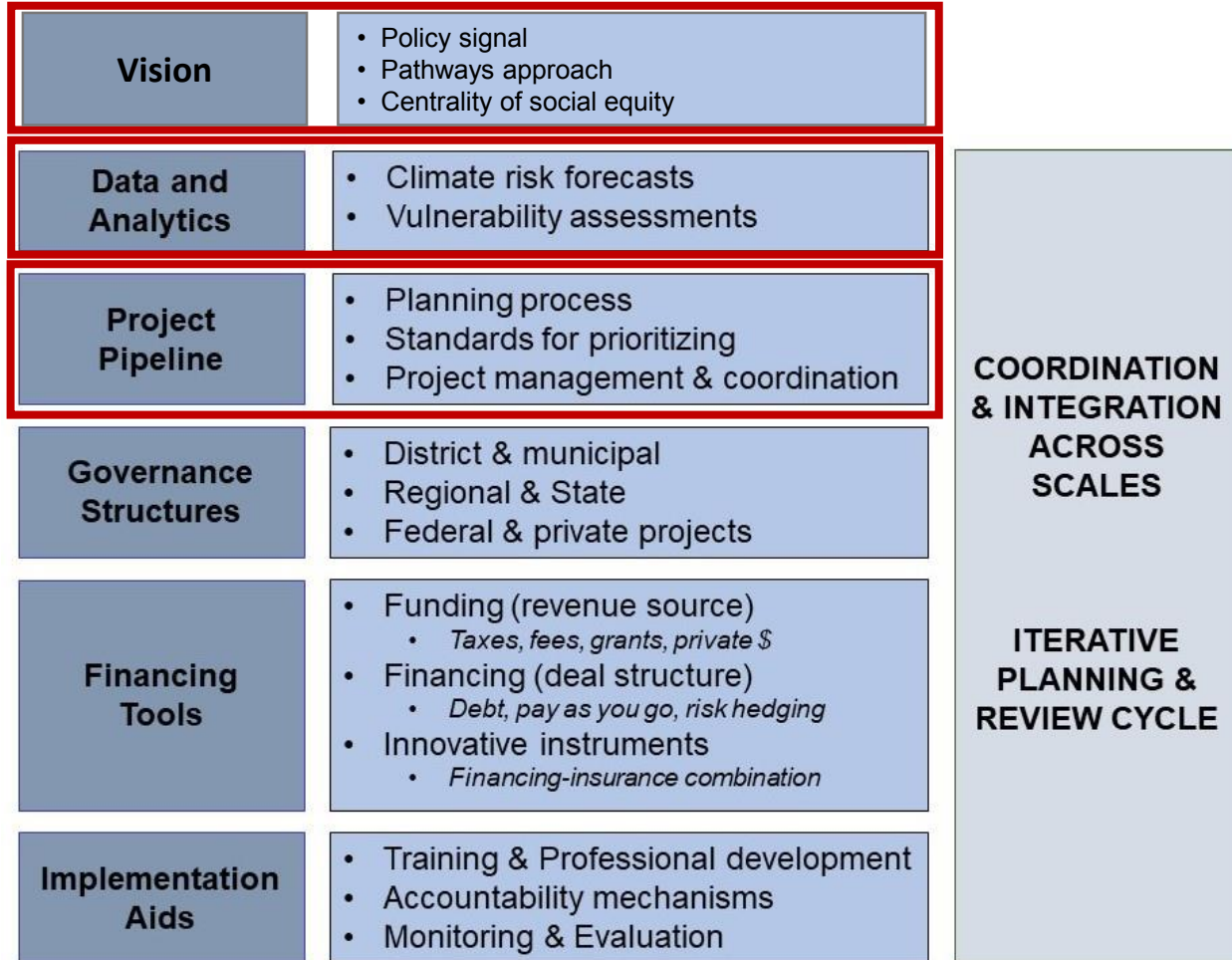
- Training, capacity building and other workforce issues
- Statewide coordination at the highest level
- Translating State policy to the project level
  - Cal-MOP
  - Procurement guidance
  - Incentives
  - Permitting, waiver guidance, code changes
- Development of metrics of performance & success
-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



Photo: Elvert Barnes, flickr, CC 2.0



# Walking the Path...: The CSIWG's Recommendations



**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 infrastructure 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.)

|                              |  |   |
|------------------------------|--|---|
| <b>Vision</b>                | <ul style="list-style-type: none"><li>• Policy signal</li><li>• Pathways approach</li><li>• Centrality of social equity</li></ul>  | <b>COORDINATION<br/>&amp; INTEGRATION<br/>ACROSS<br/>SCALES</b> |
| <b>Data and Analytics</b>    | <ul style="list-style-type: none"><li>• Climate risk forecasts</li><li>• Vulnerability assessments</li></ul>   |   |
| <b>Project Pipeline</b>      | <ul style="list-style-type: none"><li>• Planning process</li><li>• Standards for prioritizing</li><li>• Project management &amp; coordination</li></ul>  |   |
| <b>Governance Structures</b> | <ul style="list-style-type: none"><li>• District &amp; municipal</li><li>• Regional &amp; State</li><li>• Federal &amp; private projects</li></ul>   |   |
| <b>Financing Tools</b>       | <ul style="list-style-type: none"><li>• Funding (revenue source)<ul style="list-style-type: none"><li>• <i>Taxes, fees, grants, private \$</i></li></ul></li><li>• Financing (deal structure)<ul style="list-style-type: none"><li>• <i>Debt, pay as you go, risk hedging</i></li></ul></li><li>• Innovative instruments<ul style="list-style-type: none"><li>• <i>Financing-insurance combination</i></li></ul></li></ul> |   |
| <b>Implementation Aids</b>   | <ul style="list-style-type: none"><li>• Training &amp; Professional development</li><li>• Accountability mechanisms</li><li>• Monitoring &amp; Evaluation</li></ul>  | <b>ITERATIVE<br/>PLANNING &amp;<br/>REVIEW CYCLE</b>            |

**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.)

|                              |  |   |
|------------------------------|--|---|
| <b>Vision</b>                | <ul style="list-style-type: none"><li>• Policy signal</li><li>• Pathways approach</li><li>• Centrality of social equity</li></ul>  | <b>COORDINATION<br/>&amp; INTEGRATION<br/>ACROSS<br/>SCALES</b><br><br><b>ITERATIVE<br/>PLANNING &amp;<br/>REVIEW CYCLE</b> |
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**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

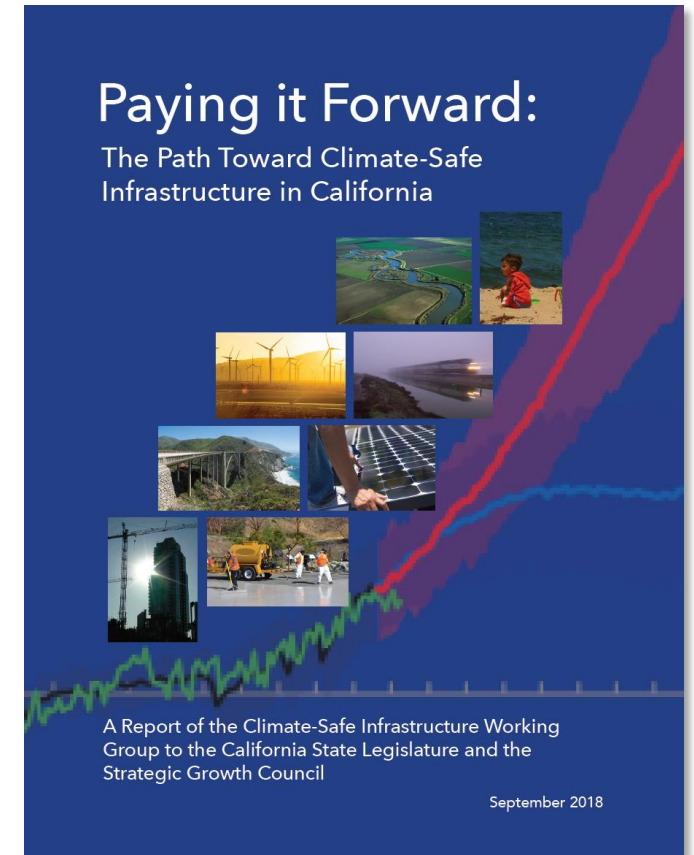


**Cris Liban**  
L.A. Metro



# 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](mailto:promundi@susannemoser.com)  
Juliette Finzi Hart at: [jfinzihart@usgs.gov](mailto:jfinzihart@usgs.gov)
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[climatesafeinfrastructure@resources.ca.gov](mailto: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/>