

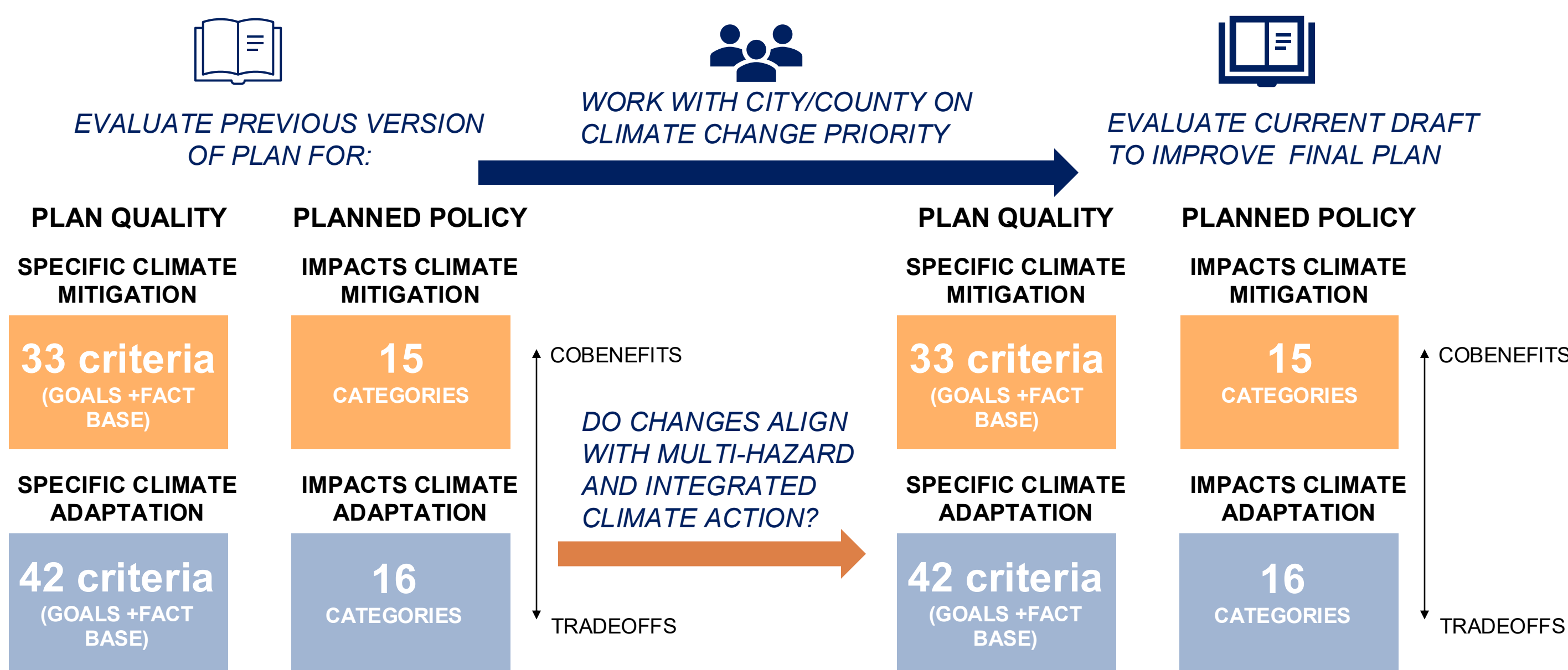
A COMPARATIVE PLAN EVALUATION OF CITY & COUNTY GENERAL PLANS

Acknowledgment
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1. Understanding how **multi-hazards have occurred over time and space** and how exposure is likely to change (Chang et al., 2019; Kappes et al., 2012)
2. Building on **synergies between adaptation and mitigation-** e.g., encouraging walkability, maintaining forestry (Georgescu et al., 2023; Sebestyén et al. 2023)
3. Prioritizing **cobenefits across policy sectors-** e.g., public awareness, investing in public-private partnerships (APA, 2022; Godschalk 2004)
4. Navigating maladaptation **across different hazards-** e.g., tree maintenance for drought versus wildfire (Zhu et al. 2023)
5. Navigating **tradeoffs between different policy sectors-** e.g., providing housing unhoused versus limiting UHI effect in downtown (Reckien et al., 2023)

1. Do **plan aspects, specifically goals and fact-base** integrate details on climate change mitigation, adaptation, multi-hazards?
2. Do **policies** in plans undertake a cross-sectoral approach to integrate climate change mitigation, adaptation, and multi-hazards? Do policies consider cobenefits and tradeoffs?

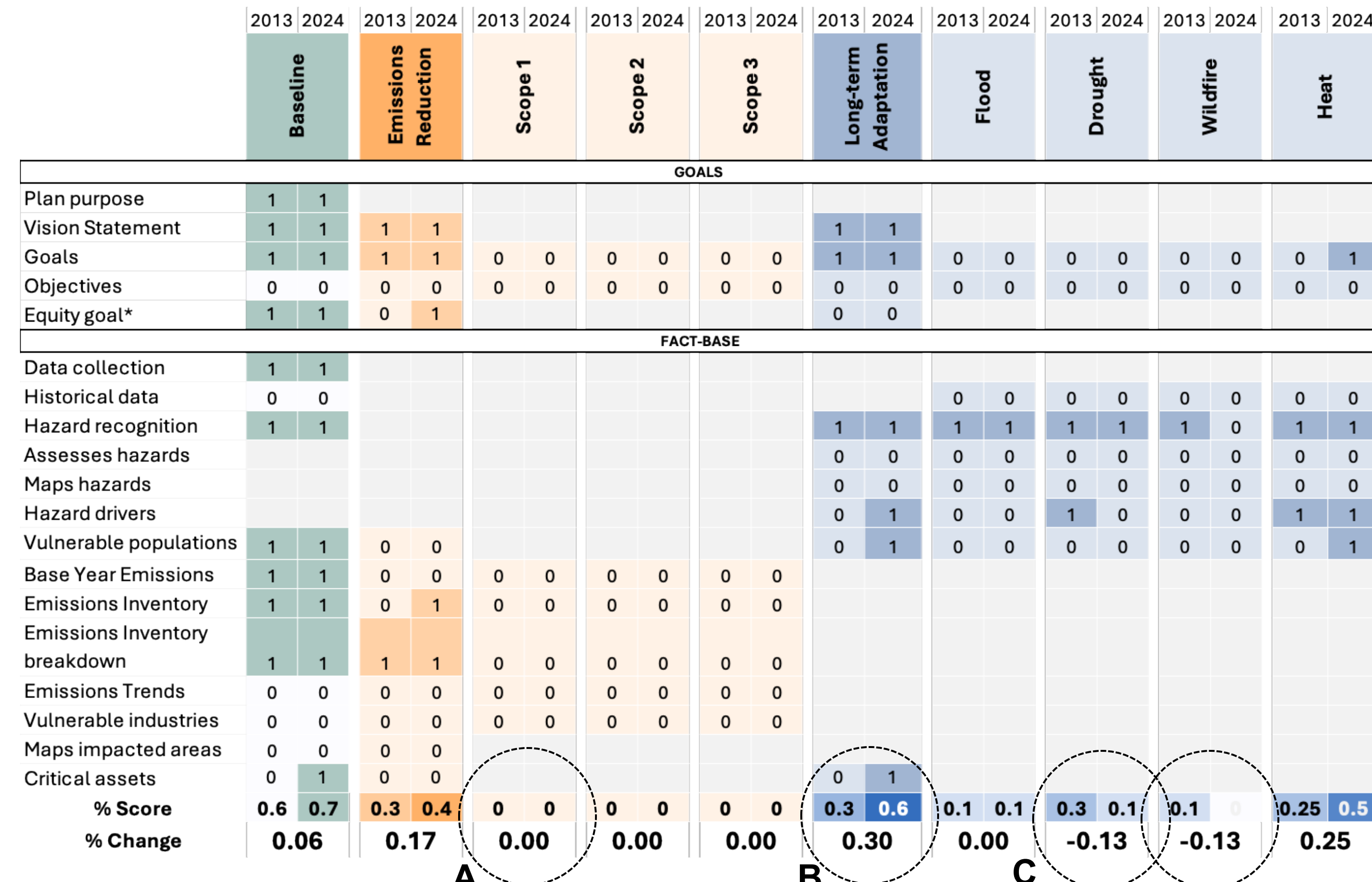
- We propose a novel plan evaluation method called **Climate Action Planning Evaluation** to proactively identify areas of alignment and misalignment in helping community plan for integrated climate resilient development during the plan development process. We worked with two communities on general plans.



- Two coders independently read and scored the plans using Quality Principles Evaluation and Policy Evaluation and reconciled scores (Lyles & Stevens, 2014).

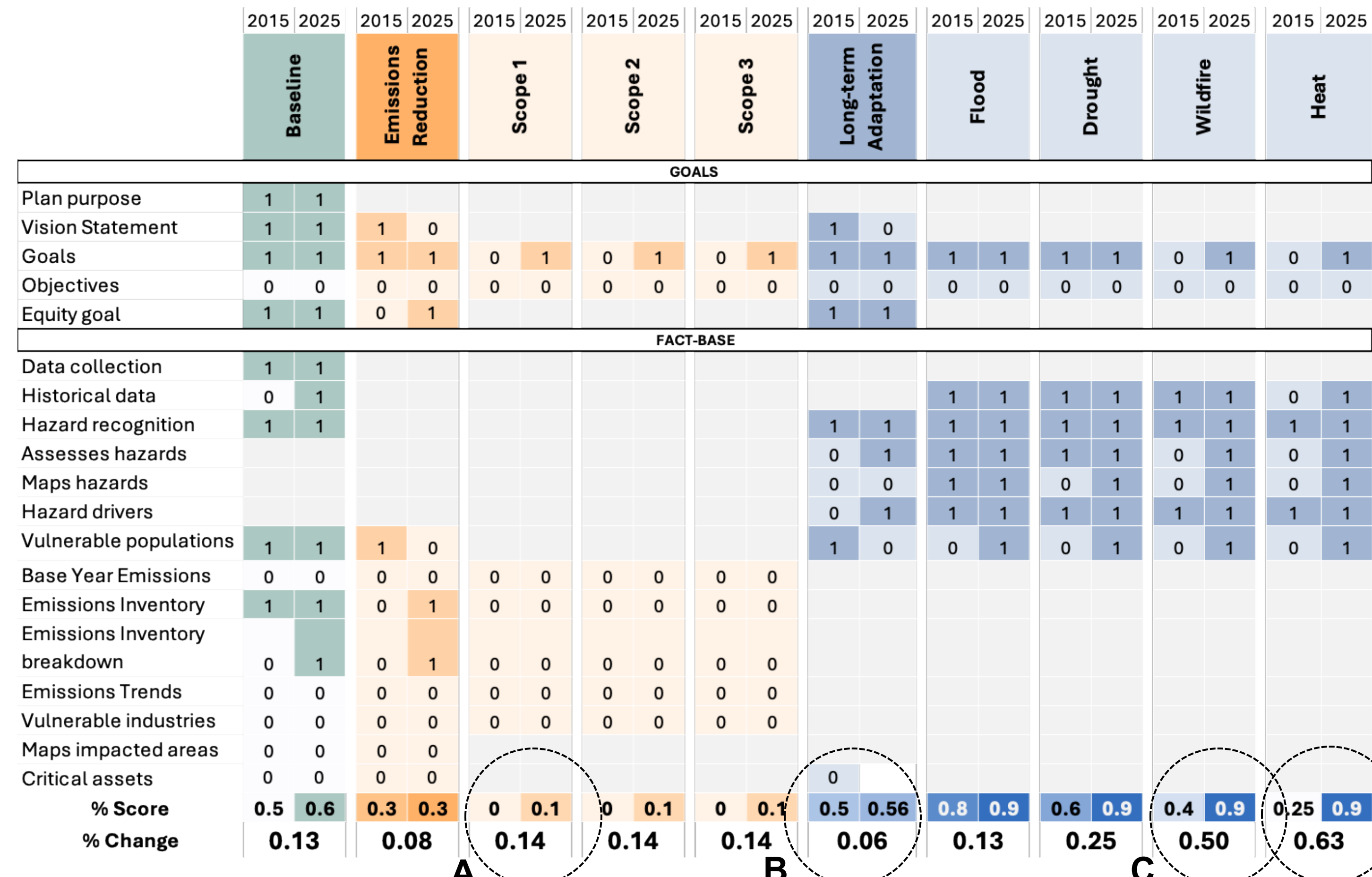
- First, we examined whether the plan development process reported in plans included **clear goals, detailed fact-base, strategies, implementation and monitoring, and inclusive participation for addressing greenhouse gas emissions reduction, scopes 1,2,3, climate adaptation and relevant hazards** (Berke & Godschalk, 2009; Woodruff et al., 2021; Meerow et al., 2024). We scored inclusion as 1, otherwise 0.

- Second, we analyzed policies for predicted impacts and potential tradeoffs on climate mitigation, scopes 1,2,3 and climate adaptation, and relevant hazards. Building on a systematic literature review, we classified policies into sixteen sectors- 2 process-based and 14 action focused as shown below. Then policies were scored +1, -1, 0 or U based on their predicted impacts.

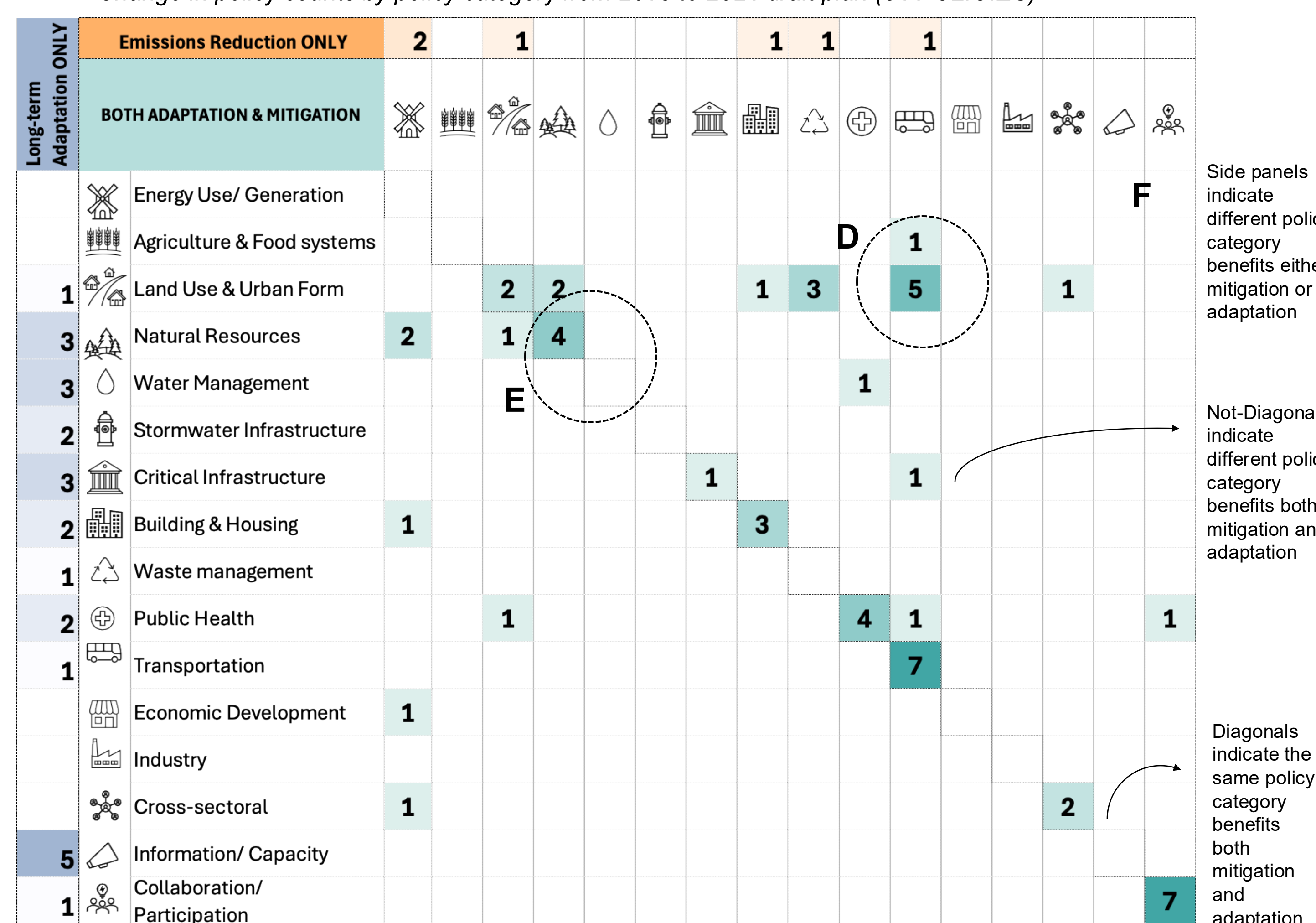


Improving climate mitigation goal, but consistent
lacking of fact base of emission scopes in Plan
Tucson, but added in 2025 Pima Prospers Draft,
suggesting improved attention to emissions
reduction at county level

Improved attention to long-term climate adaptation in both city and county general plans, with higher improvement at the city level



Fact base scores on specific hazards better in county plans. Scores on drought and wildfire drops in newer Draft of Plan Tucson, while improves by 25% on drought, and more than 50% for heat and wildfire in newer Pima County Prosper. This might be because Pima County is more impacted by wildfire.



Both city and county plans leverage transportation “multi-modal” policies to densify land use patterns, prioritizing emissions reduction, forestry protection (wildfire), walkability benefits over possible urban heat island, air pollution, disaster evacuation tradeoffs

Both city and county plans also indicate cobenefits and tradeoffs. For example, policies seek to conserve and enhance natural resources (parks, forests, washes) for carbon sequestration & reducing flood-heat-wildfire exposure, without always specifying tradeoffs for drought.

Including policies from under-represented sectors seen in adaptation (e.g., economic development and adaptation), mitigation (public awareness on emissions), and adaptation-mitigation nexus (waste management for hazard recovery and energy generation)

- Climate mitigation is a priority in southern Arizona but needs to be paired with better fact base on emissions and vulnerabilities.
- City and county adopt different approaches to adaptation. While county draws from the county hazard mitigation plan to develop a detailed multi-hazard fact – base, the city integrates a high quality fact base on future hazard risks and climate adaptation
- Some policy sector are used for integrated climate action (e.g., transportation), some for either mitigation or adaptation (e.g., public awareness for adaptation) while other policy sectors are overlooked (e.g., waste). .

- We present a new methodology to systematically evaluate and refine plans to meet the combined challenges of **mitigation broadly, three emissions scopes, adaptation broadly, and four relevant hazards**.
- Future plans include deploying CAPE in larger sample of cities to understand trends and catalysts of climate resilient development and pathways to advance climate action.
- Research on the role and performance of different sectors on the integrated climate change action and multi-hazard resilience is needed. This would enable policymakers diversify the types of policies that are prioritized. .