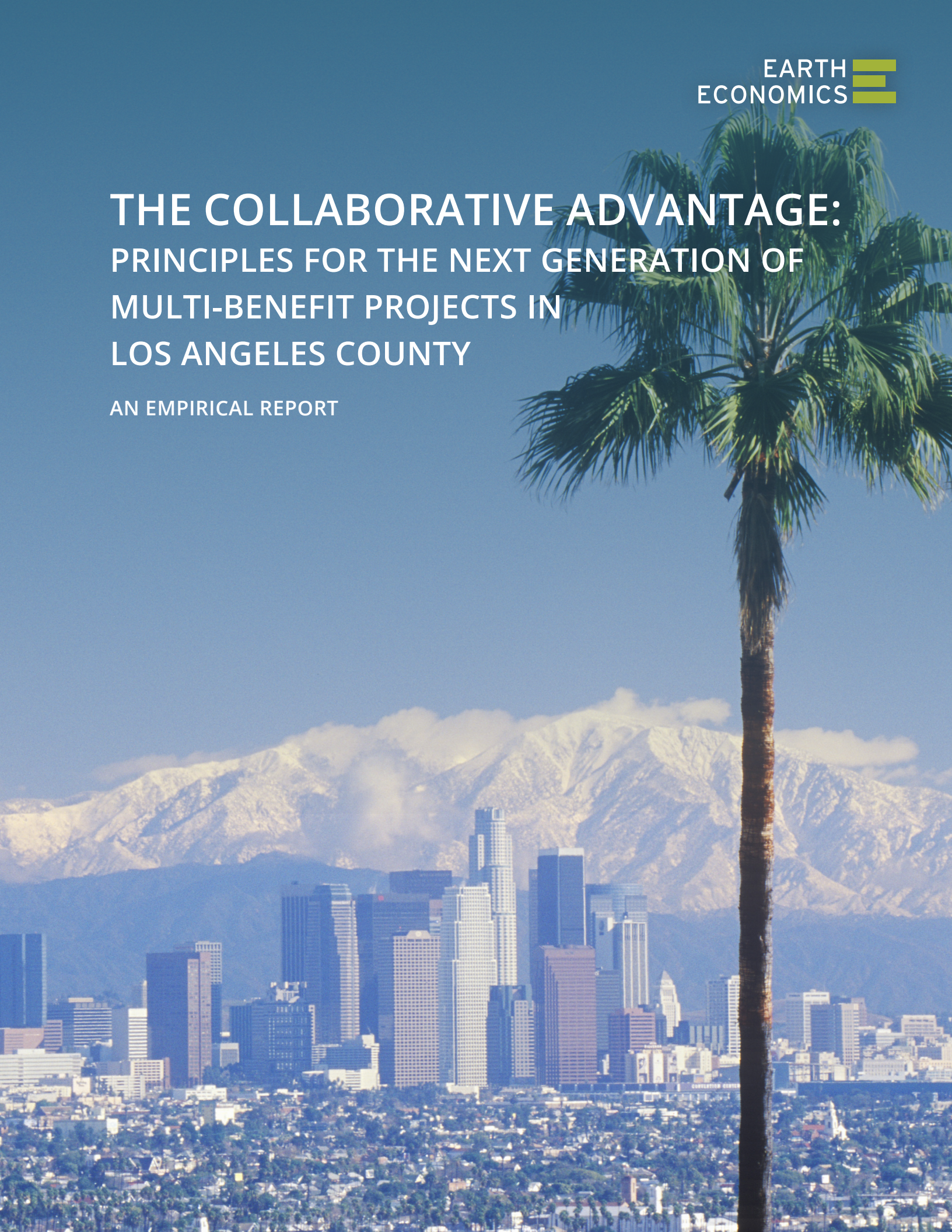
EARTH ECONOMICS

THE COLLABORATIVE ADVANTAGE:
PRINCIPLES FOR THE NEXT GENERATION OF MULTI-BENEFIT PROJECTS IN LOS ANGELES COUNTY

AN EMPIRICAL REPORT



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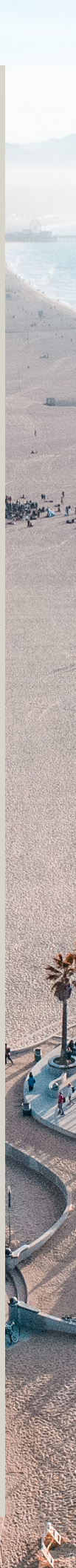

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1. EXECUTIVE SUMMARY

Los Angeles County is in a state of climate and social emergency that increasingly threatens the health, safety, and security of its people, economy, and ecosystems. Adapting to climate change and mitigating its risks requires significant investments in infrastructure and social goods and services. The urgent need for these investments invites a strategic reassessment of the long-term strategy for delivering public benefits, including reducing climate hazard risk; providing economic opportunity; and making investments that enhance quality of life and equitable outcomes.

Addressing these complex challenges with meaningful investments and support systems requires an unprecedented level of collaboration among citizens, governments, and the private sector—one that the public sector is uniquely positioned to lead. A whole-systems approach to climate adaptation and climate resilience that incorporates an ecological perspective and favors collaborative efforts can help unlock social and environmental synergies, leverage additional funding, support representative participatory processes and, fundamentally, help develop holistic, sustainable, multi-benefit responses to these multidimensional challenges.

A collaborative approach to multi-benefit project development, funding, and management can lead to more sustainable and equitable resilience outcomes for more people. Using evidence from Los Angeles County, this research explores applications of whole-systems approaches to collaborative multi-benefit projects, identifies factors that contribute to project success, uncovers barriers to achieving project goals, and provides actionable recommendations for getting started. Although the empirical work is rooted in L.A. County, the findings and insights from this work are designed for broader application.

This report synthesizes findings from a review of the collaborative governance literature; expert interviews; an analysis of various attributes' effects on project performance; and an assessment of three case studies. These findings are organized into Key Principles and specific action opportunities that will improve collaborative multi-benefit projects to advance and accelerate resilience.

KEY PRINCIPLES

While recognizing that each project and place is unique, and that there is no one-size-fits-all solution to complex challenges, the authors have synthesized the study's key findings into principles of collaboration. This Executive Summary provides a succinct synopsis of these core principles and the correlating action items. Readers are encouraged to examine the full report to learn about L.A. County-based projects that demonstrate these principles; understand the research process and key findings in more depth; and find additional discussion of the action opportunities that can advance these principles and promote collective impact (see Section 7 for more details).

PRINCIPLE 1: A SHARED PURPOSE REQUIRES A SHARED LANGUAGE

Creating a shared language to build mutual understanding and shared purpose is a prerequisite for cross-sector collaboration. Doing so ensures consistency and transparency in assumptions and definitions and aligns stakeholder efforts across a project's lifecycle in pursuit of complex goals.

1.1 Action Opportunity: Governing bodies and key stakeholder groups can **guide the development of a precise, common vocabulary** and understanding of key terms relevant to collaborative, multi-benefit projects.

1.2 Action Opportunity: Governing bodies and key stakeholder groups can **lead the effort of identifying and mapping benefits and beneficiaries of multi-benefit projects** to help resolve existing ambiguities in definitions.

PRINCIPLE 2: THE RIGHT PROCESS DELIVERS THE RIGHT PROJECT

How entities go about developing and managing multi-benefit projects can influence the project's overall success. Collaboration, although not a panacea, can influence a project's results and therefore may be a goal in and of itself. Such recognition can help break established conventions and widen the perspective of groups seeking to collaborate on novel projects that build community resilience.

2.1 Action Opportunity: Governing bodies and key stakeholder groups can **establish discrete goals and metrics for both collaborative processes and project outcome performance**. Keeping a clear distinction between process evaluation metrics and multi-benefit project metrics—especially in a complex, multi-stakeholder process—can reduce ambiguity and align the efforts of planners and implementers.

PRINCIPLE 3: CULTIVATING MUTUALLY REINFORCING GOALS AND STRATEGIES PROMOTES COLLABORATION

Individual government agency goals and strategies are often aligned with a broader vision (e.g., county or regional). However, pursuit of those mutually supporting goals and strategies typically occurs in silos. Identifying and aligning mutually beneficial goals across agency partners can advance opportunities to collaborate on multi-benefit projects. Crafting project strategies that are consistent with an overarching strategic plan will streamline the process of identifying opportunities for collaboration.

3.1 Action Opportunity: Governing bodies can **review their individual goals and strategies for consistency with key planning documents** (e.g., county or regional sustainability plans; equity, diversity, and inclusion plans; and climate vulnerability plans) **to determine opportunities for collaboration** (e.g., design, planning, funding, implementation, maintenance, and/or monitoring). This process can help multiple agencies deliver better and more diverse benefits than if projects were pursued individually.[1]

3.2 Action Opportunity: Governing bodies can **designate a neutral convening entity to guide participating agencies and stakeholders** through a strategic review of goals,

[1] For example, The L.A. County Department of Parks and Recreation is developing its own sustainability plan to ensure that its programs are consistent with broader County sustainability goals.

objectives, policies, regulations, projects, contracts, and metrics to help ensure they are mutually reinforcing and aligned with a shared purpose.

PRINCIPLE 4: A NEUTRAL CONVENING ENTITY FACILITATES ONGOING COLLABORATION

The benefit of a neutral facilitating entity is that it can provide a physical or virtual space for members to deliberate and problem-solve around topics that extend beyond the reach of their individual agencies or organizations. Facilitation is crucial to cross-sector collaboration, which depends on systems for building and maintaining consensus. Either external professional facilitators or task-oriented committees formed by stakeholders themselves should be appropriately equipped with dedicated resources (e.g., skills, funding, and staff capacity) and authority to fulfill their role as conveners (e.g., communicating with members, coordinating the development of strategic or project plans, and supporting meetings). As conveners, these entities can listen to collaborators to enhance engagement across departments.

> ***4.1 Action Opportunity:*** Governing bodies and key stakeholders can **identify or designate a coordinating entity or committee** to support the core functions of convening collaborators, such as communicating with members, coordinating the development of strategic plans, supporting meetings, and coordinating project implementation.

PRINCIPLE 5: CULTIVATING WHOLE-SYSTEMS LEADERSHIP FORTIFIES CULTURES OF COLLABORATION

Strong projects are often guided and/or supported by visionary leaders who prioritize collaboration. Such leaders can help overcome bureaucratic hurdles and build political will to pursue novel projects that expand agency capability and increase benefits to the communities they serve. Cultivating a durable culture of collaboration helps attract those visionary and creative leaders. Moreover, once ingrained in mid- and high-levels of an institution, a multi-benefit mindset will persist despite changes in leadership.

> ***5.1 Action Opportunity:*** Governing bodies can **adopt explicit organizational goals, strategies, and enabling mechanisms for training, retaining, and supporting visionary, creative, and collaborative leadership at all levels.**

> ***5.2 Action Opportunity:*** Governing bodies and key stakeholder groups can **build internal systems for maintaining institutional memory** (e.g., rotating staff participation, regular reporting among staff, and clear documentation of project meetings and decisions).

> ***5.3 Action Opportunity:*** Governing bodies, philanthropic organizations, and academic institutions can **invest in cross-sector whole-systems learning, capacity building, and leadership development** to build and sustain relationships across multiple institutions while preparing future leaders to navigate complex challenges and opportunities.

PRINCIPLE 6: COMMITMENT TO COLLABORATION BOLSTERS MULTI-BENEFIT PROJECT OUTCOMES

There are a range of informal to formal partnership structures that can facilitate collaboration depending on the circumstance. They can also help mitigate potential risks of collaboration, such as under-performance, budget exceedance, mission creep, transaction costs (e.g., staff capacity, convoluted bureaucratic processes), and path dependency (i.e., only following previous approaches).

6.1 Action Opportunity: As an informal strategy, governing bodies and other key stakeholder groups can explicitly **seek to build trusted relationships with partners and beneficiary communities**, for example, by reserving funding for relationship-building and following best-practices for community engagement.

6.2 Action Opportunity: Governing bodies can **lead efforts to formalize collaborative partnership mechanisms** to help institutionalize trust and reduce ambiguity regarding roles and responsibilities. These efforts can include the identification and development of standard agreements and partnership models, including independent workgroups or networks like L.A. County's Healthy Design Workgroup; Memoranda of Understanding (MOUs), which are indicators of commitment showing parties have reached an understanding and are ready to move forward; or more formal structures (such as Joint Power Authorities or Enhanced Infrastructure Finance Districts).

- Governing bodies can **establish "model MOUs" for participating agencies** to adopt to streamline the partnership formation process.
- Governing bodies can select an agency or create an independent entity to provide guidance and incentives for agencies, school districts, community-based organizations, or other stakeholders to follow the format of cooperation that best suits their objective.
- Governing bodies and other key stakeholder groups can create or adopt existing MOUs with lists of pre-approved community-based organizations (CBOs) and nonprofit organizations that are eligible to work as community-liaisons so that participating agencies can partner with those organizations to strengthen community engagement efforts.

PRINCIPLE 7: A KNOWLEDGE HUB CAN DEMOCRATIZE DATA AND RESOURCES

Readily available and easy-to-interpret data and technical resources can help capacity building, project development, metric selection, and communication of the importance of multi-benefit solutions. Moreover, having comprehensive and publicly available information on the benefits of different types of multi-benefit projects (e.g., urban heat mitigation, water quality, and recreation access) and on their beneficiaries (e.g., sectors, agencies, businesses, or communities), can provide a foundation to align potentially conflicting agendas, prioritize project components, and engage the community to inform project planners about local conditions.

7.1 Action Opportunity: Governing bodies, academic institutions, and the philanthropic sector can **invest in research, data sharing, and the translation of research for public and inter-agency use**.

7.2 Action Opportunity: Governing bodies, other key stakeholder groups, academic institutions, and philanthropic organizations can **streamline the process for their research to become part of a common pool of intellectual property** that includes open-source software and open access GIS products, publications, and datasets.

7.3 Action Opportunity: Governing bodies can **commission the creation of an inventory of vacant and/or underutilized lands that can be adapted as multi-benefit project sites or turned into supportive sites to produce materials for those projects** (e.g., native plant nurseries).

PRINCIPLE 8: A STRONG GREEN WORKFORCE IS NECESSARY TO ACHIEVE CLIMATE RESILIENT OUTCOMES

A well-developed green workforce is needed to deliver high-quality and time-efficient multi-benefit projects that are also cost-effective. A trained workforce can also provide timely maintenance and repair services. Moreover, this workforce can be a driver for economic growth and upward mobility.

8.1 Action Opportunity: Governing bodies can **establish workforce development programs that train workers and certify contractors with specific skills for managing green infrastructure**.

8.2 Action Opportunity: Agencies can **seek long-term contracts with certified entities specializing in the maintenance and monitoring of multi-benefit green infrastructure projects.**

PRINCIPLE 9: FLEXIBLE FUNDING IMPROVES PROJECT EFFECTIVENESS

Funding terms and timing are two vital ingredients to collaborative implementation. Relying on one-time grants with rigid schedules makes strategic, sequential, and incremental planning overly difficult and strenuous. Access to recurring and flexible, though not necessarily unlimited, funds can improve the planning and design process and would also help project proponents leverage additional funds.

9.1 Action Opportunity: Philanthropic institutions and funding agencies can **consider creating more flexible funding terms and timing (i.e., aligning funding cycles or accepting rolling applications) in service of improved project outcomes**.

9. 2 Action Opportunity: Recognizing that O&M is a common breaking point for multi-benefit projects, governing bodies and funding agencies can **ensure projects include designated and continuous O&M funding by identifying and seeking alternative mechanisms for**

perpetual O&M funding in future multi-benefit infrastructure policies. For example, operations and maintenance (O&M) activities could be funded by creating special districts with funding authority that are created to fill a specific gap, like a landscape maintenance district.

9.3 Action Opportunity: Key stakeholder groups can **explore the legal intricacies of existing funding terms to discover existing yet unrecognized flexibilities**, such as the legal analysis of L.A. County Measures W, H, A and M, commissioned by L.A. Waterkeeper, which discovered new possibilities for collaboration among agencies as it indicated they could blend funds across measures and leverage other local, state, and federal funds.

9.4 Action Opportunity: Project proponents can seek funding for studies that **establish baseline social and ecological conditions at potential project sites** as well as project monitoring and evaluation to **assess what has worked (or not worked) as intended**. This will help measure project success and facilitate periodic project evaluation.

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INTRODUCTION

1. INTRODUCTION

Los Angeles County, the State of California, and the nation are in a state of climate and social emergency that increasingly threatens the health, safety, and security of its people, economy, and ecosystems. Adapting to climate change and mitigating its risks requires enormous investments in infrastructure and social goods and services. **The urgent need for these investments invites a strategic reassessment of the long-term strategy for delivering public benefits, including reducing climate hazard risk, providing economic opportunity, and making investments that enhance quality of life and equitable outcomes**. Recent challenges like the COVID-19 pandemic and the global financial crisis of 2008 have demonstrated that throwing money at a problem is only effective if paired with robust social and political structures that organize how those funds are managed (Mazzucato, 2021).

Solving these complex challenges with meaningful investments and support systems will require an unprecedented level of collaboration among citizens, governments, and the private sector—one that the public sector is uniquely positioned to lead. A whole-systems approach to climate adaptation and climate resilience that incorporates an ecological perspective can help unlock social and environmental synergies, leverage additional funding, support representative participatory processes, and help develop holistic, sustainable, multi-benefit responses to these multidimensional challenges. Governmental organizations, which are vested with protecting public interests and benefits, are well situated to use public funds to guide a cross-sectoral and holistic approach to climate risk management. As such, **this research focuses primarily on strategies governments can take to support and accelerate collaborative, multi-benefit projects**.

A whole-systems approach is a holistic and dynamic practice that focuses on the relationships among social and ecological system functions (Meadows, 2008). As a result, a whole-systems approach inherently brings together diverse needs to achieve multiple outcomes. Compared to traditional projects that tend to emerge from silos and focus on one primary value, **multi-benefit projects** explicitly focus on generating multiple outcomes across needs, such as housing, water management, transportation, and recreation. As the Pacific Institute summarizes, multi-benefit projects "… build partnerships, leverage resources, optimize the value of investments, and garner public support" (Diringer et al., 2019). Addressing complex and intersecting environmental and social challenges to build resilience demands a whole-systems approach.

The whole-systems approach is a practice that identifies and combines the activities of one or more agencies according to the project specifications. A whole-systems approach yields better outcomes than a single agency approach because it (1) relies on differential expertise across agencies; (2) mitigates unintended consequences; (3) allows for overhead cost sharing and therefore reduces cost; (4) lowers the cost of multiple projects creating efficiencies; (5) reduces time to completion by bringing in stakeholders early in the process; and (6) allows for single-agency projects if they are thought to be the most cost-effective and equitable alternatives.

Ultimately, a collaborative approach to multi-benefit project development, funding, implementation, and adaptive management can lead to more sustainable and equitable resilience outcomes for more people. Using evidence from Los Angeles County, this research explores applications of whole-systems approaches to collaborative multi-benefit projects, identifies factors that contribute to project success, uncovers barriers to achieving project goals, and provides actionable recommendations for getting started. Although the empirical work is rooted in L.A. County, the findings and insights from this work are designed to be broadly applicable.

1.1 REPORT STRUCTURE

This report is organized as follows: **Section 2** provides an overview of the study's foundational theory of change and empirical analysis design. **Section 3** presents key findings from a literature review about the advantages of a holistic, collaborative multi-benefit approach to advancing climate resilience. **Section 4** presents findings from conversations with experts involved with collaborative, multi-benefit project development in L.A. County. **Section 5** presents three case studies that showcase replicable aspects of existing projects, as well as a series of project-specific lessons. **Section 6** empirically explores how different attributes may influence project performance to uncover predictors of success. **Section 7** ties together findings from the earlier empirical pieces and presents a list of core principles for successful collaboration and specific action items that can be carried out to support the development of collaborative, multi-benefit projects. **Section 8** concludes with a discussion of opportunities for future research. This report will help guide audiences in a position to help collaborative multi-benefit projects in their efforts to advance and accelerate resilience by identifying key principles for collaboration and offering ideas for actionable next steps.

STUDY DESIGN

2. STUDY DESIGN

Earth Economics designed a multi-step, iterative framework and combined qualitative and quantitative methods of research to test a hypothesized theory of change. This section presents the theory and describes the steps taken to approach the propositions derived from it.

2.1 THEORY OF CHANGE

Collaborative project development has the potential to combine social and environmental benefits, leverage additional funding, and produce novel combinations of benefits that help advance resilience goals. Community-led, multi-stakeholder projects have already improved the well-being of many Angelenos. Civic groups, nonprofit organizations, and public agencies increasingly recognize multi-benefit projects as key drivers of ecological and social change. The establishment of the City of Los Angeles' Green New Deal, and the County's WHAM motion and Infrastructure L.A. Initiative are just a few high-profile examples illustrating this recent collective understanding and policy goal alignment.[2]

The analysis began with the following hypotheses:

- Multi-benefit projects are an important way to meet the County's climate goals by offering more benefits to more people with each project;
- Collaboration among multiple organizations can produce more and better multi-benefit projects than siloed projects conducted by single organizations; and
- Collaboration at different stages of a project lifecycle—planning, design, funding, implementing, operating, and monitoring—will have different benefits and different challenges.

Building on that foundation, this empirical study of collaborative multi-benefit projects in L.A. County sought to understand:

- How whole-systems approaches can increase community benefits (e.g., human and ecological health, employment, and economic development opportunity for disadvantaged communities);
- What conditions facilitate collaboration, what barriers exist, and what options exist to overcome these barriers;
- The extent to which collaboration across agencies and entities produces improved and expanded outcomes for more people in the region;
- What factors enhance or hinder a project's performance in terms of providing equitable benefits over time; and
- Where common points of success and failure occur in a project's lifecycle, especially as they pertain to elements of collaboration.

[2] L.A.'s Green New Deal Sustainability Plan is available at https://plan.lamayor.org/. The repository of documents and motions by L.A. County's Chief Sustainability Office is available at https://cso.lacounty.gov/board-motions/.

2.2 OVERVIEW

To answer these questions, Earth Economics designed a multi-step, iterative framework and combined qualitative and quantitative research methods. Figure 1 summarizes the methodological structure.

1. Researchers reviewed relevant literature, including reports on multi-benefit projects in Los Angeles County, literature on scorecard design, and articles and books on collaboration.
2. Researchers conducted semi-structured, informal interviews with experts in the field who provided both specific and general information on collaborative multi-benefit work in L.A. County.
3. Researchers employed three types of analyses of the information gathered from interviews. Thematic analysis synthesized and organized findings from interviews into factors that help or hinder collaboration (or "fuels" and "frictions"). Researchers also conducted a systematic analysis of ten multi-benefit projects in L.A. County using a scorecard approach and selected the three best performing projects as case studies. Finally, researchers developed project profiles for the ten projects and used these to discover the project characteristics most important to project performance, that is, which project traits signal success.
4. Results include Fuels and Frictions (Section 4), Three Case Studies (Section 5), and Predictors of Project Performance (Section 6).
5. Earth Economics compared results from the expert interviews, the systematic evaluation of projects, and the analysis with existing literature to inform the development of core principles for collaboration and corresponding opportunities for action.
6. Earth Economics distilled Principles of Collaboration (Section 7) with associated Action Opportunities from this research process.

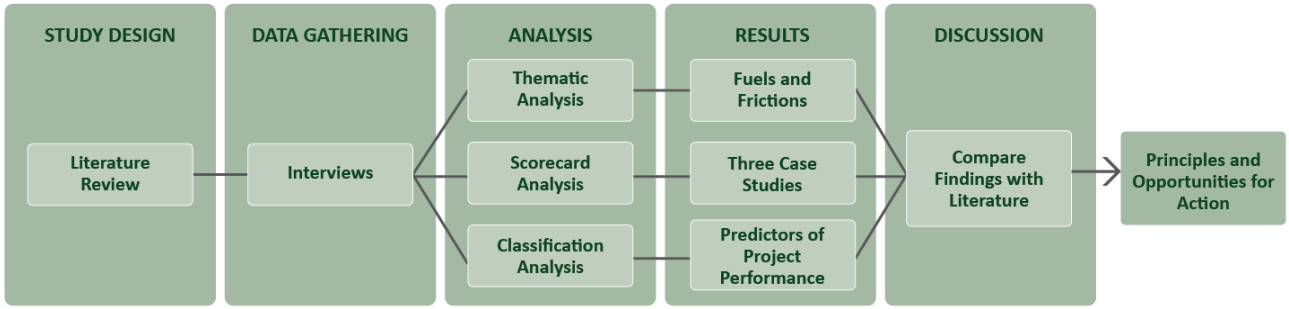


Figure 1. Summary of Methodological Structure.

LITERATURE REVIEW: COLLABORATIVE GOVERNANCE

PHOTO CREDIT: LOS ANGELES WATERKEEPER

3. LITERATURE REVIEW: COLLABORATIVE GOVERNANCE

Earth Economics reviewed literature on collaborative governance and related concepts. It is worth noting that terms, such as *collective impact*, *public governance*, *policy networks*, *cross-sector collaboration*, *participatory governance*, *holistic governance*, *integrated governance*, and *collaborative adaptive management* each intersect with the topic of collaborative governance. Broadly, collaborative governance refers to a style of decision making and management that involves public and private sectors coordinating around a goal or problem (Ansell & Gash, 2008). The research on collaborative governance centers around the idea that multiple entities from different sectors and disciplines working together can achieve more than a single entity working alone (Bardach, 1998). The following section summarizes insights from several key studies and papers on collaborative governance, including interdisciplinary literature reviews and empirical research (e.g., Korfmacher, 2019; Emerson, Nabatchi, & Balogh, 2012; Koontz, 2016).

One study of collaborative processes and outcomes found that the effectiveness of collaborative efforts depends on incentives to participate, a sense of shared purpose, early establishment of trust, conflict management, accountability, and flexibility or adaptability (Malekpour et al., 2021). Furthermore, unintended negative outcomes occur without intentional work up front to design, experiment, and institutionalize collaborative processes. A longitudinal study of collaborative governance regimes found that "a fixed process design and early investment in leadership and accountability are not enough" (Douglas et al., 2020; Ulibarri et al., 2020). To address the challenges imposed by rigid structures and project schedules, Ulibarri and colleagues (2020) recommend that practitioners incorporate periodic reflection, adjustment, and transformation of plans to either maintain momentum or stop so that resources can be used more productively elsewhere. As Korfmacher (2019) explains, collaboration is an ongoing process, not an organizational structure.

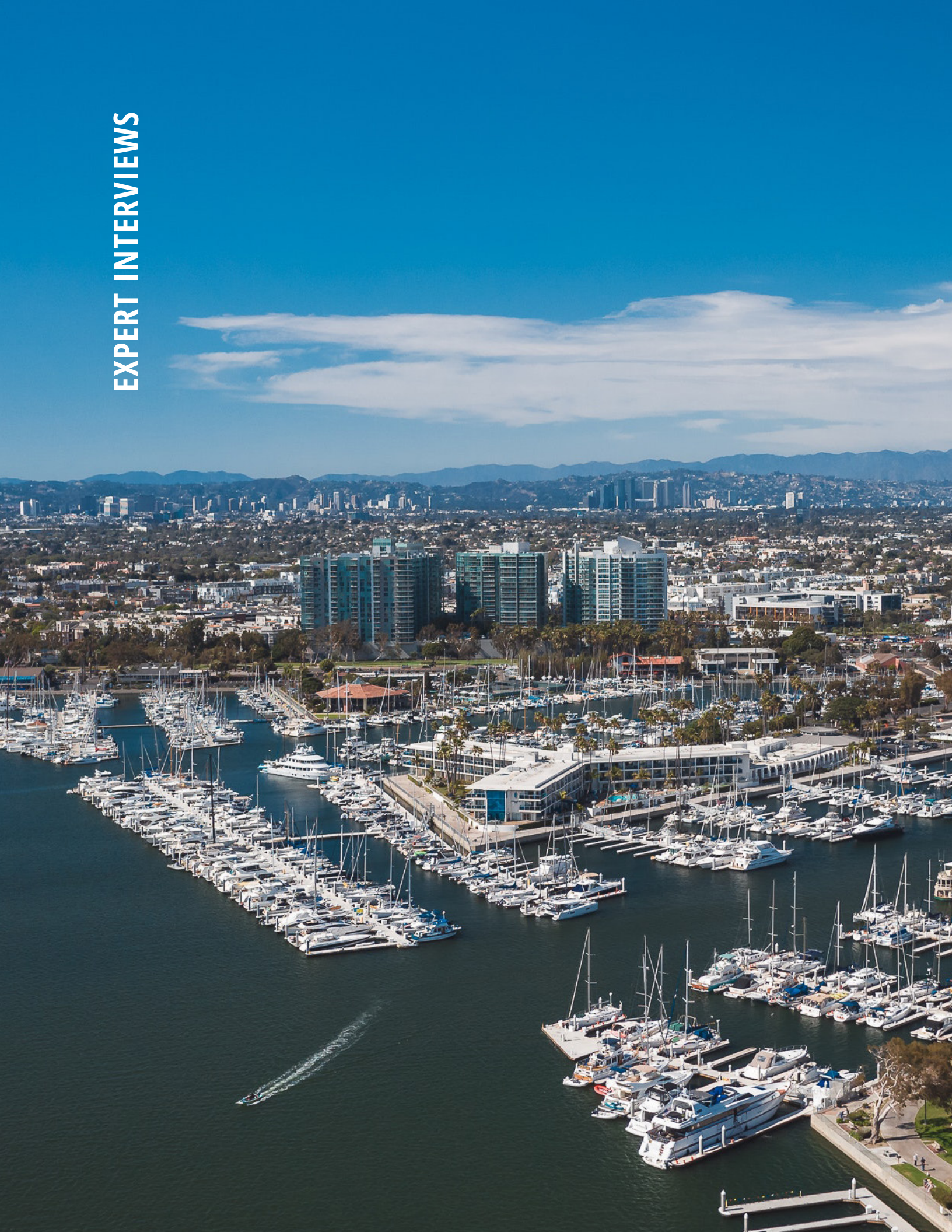
Complementary empirical studies identify the elements that set the foundation for collaborative governance arrangements. These include government involvement, funding, coordinators, leadership, partner, and institutional networks, committed and willing partners, and trust (Koontz & Newig, 2014; Leach & Pelkey, 2001). Sustained collaboration relies on a shared purpose and shared language, together with a sense of legitimacy, commitment, trust, and the formal and informal protocols that enable collaboration, such as leadership, and sharing of knowledge and resources, like funding, time, and logistical support (Emerson et al., 2012). These findings are echoed by parallel literature on collective impact. Proponents and researchers of the collective impact approach show how toolboxes for collaboration typically include five key components: (1) a common agenda; (2) shared measurement systems; (3) mutually reinforcing activities; (4) continuous communication; and (5) a backbone support organization (Kania & Kramer, 2011).

3.1 KEY FINDINGS

A review of the literature on collaborative governance shows that collaborative efforts are more likely to generate intended results when they are driven by a shared language, purpose, and goals; effective conflict resolution procedures; mutual respect; and accepted external legitimacy.

Equity and Collaborative Governance: While collaborative governance centers around representation, inclusion, and the democratic process, several researchers have found that even in these settings, wealthier and whiter communities tend to be more involved and/or receive greater benefit (e.g., Brink & Wamsler, 2018; Ravikumar et al., 2018). Dobbin and Lubell's (2021) study of community representation in the 2014 Sustainable Groundwater Management Act in California (SGMA) finds the best intentions for inclusion do not always play out without adequate planning. For instance, the researchers found that farmer participation in collaborative groundwater management programs was largely driven by their connections to preexisting networks rather than by perceptions of drought risk or water insecurity. This was largely because disadvantaged communities faced barriers to participation that were not experienced by larger and wealthier organizations. As suggested by their primary and secondary data, without addressing the drivers of structural inequities, a participatory design alone is not enough to promote equitable outcomes.

EXPERT INTERVIEWS



4. EXPERT INTERVIEWS

To understand the opportunities and obstacles associated with collaborative multi-benefit projects in L.A. County, Earth Economics researchers identified and interviewed local practitioners from the public and nonprofit sectors with experience in such projects. Findings from these interviews were synthesized and organized into factors that help or hinder collaboration, referred to as fuels and frictions. This section presents methods and results associated with these interviews.

4.1 METHODS

The interviewees were selected for their expertise and experience organizing, managing, implementing, and researching multi-benefit projects in L.A. County and elsewhere.[3] The Earth Economics team focused on connecting with people whose roles allow them to think strategically about collaboration and multi-benefit project outcomes, and many work for public agencies or nonprofit organizations. Names of experts and dates of the conversational interviews are included in Appendix A.

Researchers posed open-ended questions designed to elicit each expert's perspective on the strengths, weaknesses, opportunities, and threats associated with collaborative processes and multi-benefit projects. Each interview lasted between 45 and 90 minutes and was divided into two parts. First, experts shared their perspectives on what characterizes a successful project and defined success in their own terms.[4] Second, experts provided examples of successful multi-benefit projects they thought spoke to the elements shared in part one. As part of a snowball sampling method, at the end of each interview, experts were prompted to recommend other experts to contact and projects that might provide illustrative examples of the themes reflected in each conversation.

In this interview phase, Earth Economics researchers held ten conversations yielding a robust compilation of perceptions and experiences. Insights from the expert interviews were analyzed and organized to derive applicable lessons and explain the elements and forces that enable multi-benefit projects to succeed or fail (e.g., processes, steps, stakeholders, incentives, and challenges).

Based on expert input, the researchers created a list of ten collaborative multi-benefit projects in L.A. County that had been at least partially successful at overcoming obstacles and/or taking advantage of contextual opportunities (see Table 1 in Section 5 for more information).

1. Life is Better with Trees
2. Jeff Seymour Family Center
3. Urban Orchard Park
4. Elmer Avenue + Elmer Paseo
5. East L.A. Sustainable Median Stormwater Capture Project

[3] It is important to underscore that the empirical findings from this part of the analysis are restricted to the experiences of the interviewed experts. In other words, the key elements revealed during these interviews do not account for a full list of relevant conditions and forces that may be affecting the multi-benefit project sector in L.A. County, and would expand, contract, or change with a different composition of interviewees.

[4] Interviews with key experts inform the findings shown in this report but should not be considered exhaustive. Additional research would likely reveal additional conditions that are relevant to multi-benefit projects in L.A. County.

6. Adventure Park Multi-Benefit Stormwater Capture Project
7. Rio Hondo Westside Multi-Use Trail
8. The Active Transportation Rail to River Corridor Project –Segment A
9. Sherman Way Station Urban Cooling and First-Last Mile Strategic Plan
10. Multi-benefit Stormwater Management Projects at the Hillary T Broadous School and Open Magnet Charter School Cistern and Stormwater Retrofit

4.2 RESULTS

All experts were careful to point out the many nuances in defining what each considered a "successful" project. Over the course of a project's lifecycle, there are various opportunities for success in the form of intermediate and long-term outcomes and collaborative processes. Ultimately, they stressed that the definition of success must include the long-term delivery of project functions and overall impact on a community. In other words, the long-term impact must be considered when designing a project for success.

Following thematic analysis of the interview data, Earth Economics uncovered seven "fuels" and twelve "frictions." Fuels are factors that help increase the uptake of collaborative multi-benefit projects or improve project outcomes. Frictions are factors that hinder additional and/or more ambitious collaborative multi-benefit projects. Fuels and frictions may be related, but they are not necessarily oppositional forces (i.e., a given friction may not necessarily be overcome by adding fuel). In general, the more fuels and the fewer frictions, the better.

Below is the complete list of fuels and frictions identified. It is worth noting that these fuels and frictions reflect perceptions and experiences shared by the experts based on real world projects described below. Thus, they constitute empirical results from this study.

4.2.1 Fuels that drive collaboration and multi-benefit project development

Fuel 1: Mutual and explicit expectations for sustained collaboration

- Agreements, whether informal or more binding, set the ground rules for collaborative engagement and evaluation of results. They provide critical structure to create and sustain collaboration over a duration that is meaningful to those who build projects to deliver public benefits. Establishing norms and routines allows collaboration to flourish; well-intended but poorly structured efforts toward collaboration can dwindle without structure.
- One often overlooked result of expectation setting is identifying a physical space for collaboration. Creating a convening location where collaborators can bring their agenda can accelerate and boost existing ideas into action by reducing the transaction costs associated with coordination, including costs of searching, convening, and negotiating with involved stakeholders. This finding is supported by the experience of the Healthy Design Workgroup (HDW) of the L.A. County Public Health Department, which leveraged space with the County's Internal Service Department to meet in person with key stakeholders across multiple agencies to secure money for and coordinate the placement of bicycle racks across County facilities.

Fuel 2: Trust, accountability, and reciprocal relationships with communities

- Experts identified three fundamental elements for securing participatory community input: trust building, accountability, and community representation at the decision table. A fourth, parallel component is sustained representation or engagement over the duration of the process, as it allows for authentic relationships to develop among project leaders and beneficiaries.
- Community input is important for project success. At the initial stages, community input allows for integrated design and increases the likelihood of a positive project impact by guaranteeing the project addresses actual community needs. Such was the experience for the Elmer Avenue/Paseo project, where residents wanted lighting, sidewalks, and a safer street in addition to the flood reduction benefits offered by the project. This feedback ultimately changed the design specifications. In turn, at later stages of the project, an engaged community can help support project O&M, as has been the experience at the Jeff Seymour Family Center. This project is a neighborhood hub so frequently visited by the community that users contribute—both formally and informally—to ongoing maintenance and site monitoring.
- Overall, institutionalizing participatory processes and supporting reciprocal engagement with communities builds trust. Doing so can raise timely feedback from communities and partnering organizations, help extend planned services and benefits, or draw attention to unforeseen threats. Various County efforts recognize this imperative and strive to encourage high quality engagement practices and activities over quantity (e.g., the L.A. County Sustainability Plan, the efforts of the Safe, Clean Water Program Watershed Coordinators, and Measure A's grant manual on how to carry out effective community engagement). The Urban Orchard project with the Trust for Public Land and the City of South Gate also provides a replicable model for building trust among government, nonprofits, and the community itself.

Fuel 3: Leaders who cultivate durable cultures of collaboration

- Collaboration is both an individual skill and a cultural norm; nurturing both requires that leaders identify collaboration as a goal unto itself and invest in the people and processes necessary to facilitate it. Additional staff, training, and financial resources in support of collaborative work can unlock additional bandwidth for busy staff, opening space for novel collaborations and project types. Expecting collaboration without also providing specific support to grow the process may lead to fully-allocated staff neglecting either the new collaborative tasks or their preexisting responsibilities.

Fuel 4: Strong institutional memory of successes and lessons learned

- Pilot or demonstration projects identify opportunities to accomplish new goals, bring together new people or funding sources, or test out new approaches. Those organizations that regularly reflect on these experiences are better equipped to build institutional memory and create feedback mechanisms that generate better projects and more efficient strategies over time. This is a necessary approach for breaking away from business-as-usual to advance the kinds of novel, multi-benefit solutions that match the scope and scale of the climate crisis threats.

Fuel 5: Diverse teams from different fields with complementary skill sets and perspectives

- Often dismissed as a "soft" skill, collaboration among specialized teams can reveal broader opportunities for resilience. Organizations with highly specialized staff—often, the ones that plan, permit, and build infrastructure—will not have staff trained primarily for collaboration, but instead trained to quickly meet isolated goals that are generally decontextualized and disconnected from their role within a larger organizational strategy or mission. Organizations that train staff members in collaborative, whole-systems approaches, or that collaborate with outside stakeholders that possess these whole-systems approach capacities, are in a better position to design, plan, and implement multi-benefit projects.

Fuel 6: Good data regarding social and environmental benefits and risks, and their distribution

- Good planning requires good data. Accelerating multi-benefit, collaborative projects to build climate resilience requires substantial site-specific data, not only on environmental needs, but also on what a community wants and who stands to benefit. Metro's Rails to River multimodal transit and green space project provides a good example of identifying social and environmental needs. Metro achieved this through deep and sustained community engagement, which revealed new opportunities and data points which unlocked funding for additional elements.
- It is important to monitor project performance for evaluation purposes and for improving future projects. In this research, Earth Economics found that only one of the studied projects included an evaluation and monitoring component. Monitoring activities should track both project performance and project management decisions.

Fuel 7: Biophysical and social synergies between projects

- Strategically siting projects within a watershed can increase benefits. The interviews yielded multiple examples of how small, distributed projects can enhance each other's features when the broader watershed context is accounted for in the design process. In other words, multiple smaller projects can have a cumulative impact greater than the sum of their parts. The Elmer Avenue project that brought together L.A. County Public Works along with City and Federal agencies and nonprofits provides a useful example. This project added green stormwater elements to address residential flooding, along with other features the community desired. As a result, flooding was mitigated at the project site and throughout the surrounding neighborhood.

4.2.2 Frictions that hinder collaboration and multi-benefit project development

Friction 1: Metrics that conflate project outcomes and process outcomes

- In performance evaluation, it is important to distinguish between the type of metrics used to evaluate project performance and the metrics for evaluating a process. This distinction is particularly relevant for those interested in building a durable interagency collaborative structure while simultaneously advancing multi-benefit projects. Collaboration is a process meant to produce projects that extend more benefits to more people. Projects should be evaluated according to a set of metrics different from the metrics used to evaluate how well collaboration is taking place within and across agencies. It is important to clearly distinguish

between these two objectives to help collaborators maintain clarity over what is being measured and the purpose of those measurements.

Friction 2: Divergent understandings of definitions, costs, benefits, models, and assumptions

- If collaborating partners lack a shared understanding of what constitutes a community benefit, or how to value a community benefit so it can be counted in a comparison of benefits and costs, or how to identify beneficiaries of a given project feature, then collaboration is impeded, which may lead to inefficiencies and delays.
- Different organizations may follow different evaluation methods or apply different tools to aid decision-making (e.g., traditional benefit-cost analysis, qualitative evidence, and beneficiary mapping). Different internal guidelines or assumptions tied to these methods can hinder collaboration and joint application to common grants.
- Additionally, organizations have varying levels of familiarity and comfort with attaching monetary value to the different aspects of multi-benefit projects. If the value of various project components in a collaborative project are not well understood, it can be difficult to determine how collaborators can co-finance based on project outcomes as well as level of effort.
- It is important to address temporal benefits and costs from the very beginning. Recognizing that a project that provides some benefits to some stakeholders in the short term may offer greater benefits for other stakeholders further in the future requires evaluating the dynamic allocation of benefits among stakeholders. Furthermore, this discussion should inform the design of O&M plans that accompany a project.

Friction 3: Perceived risks of working in collaboration

- Risks, whether real or perceived (e.g., concerns over liability, litigation, under-performance, limited partners' experience, or budget exceedance) may actually be manageable. Accepting managed and considered risks can lead to great benefits, especially when considering the alternative: the status quo will not build resilience in the face of more intense climate-driven hazards and underlying socio-economic pressures.
- Supportive research and evidence can help reduce uncertainty around the benefits of collaboration and multi-benefit projects. Legal analysis, for example, can identify possibilities within the confines of current policy and funding measures; pilot projects can test something new; and leveraged funding can increase the budget to learn and try new things. Proceeding with recognition and updated expectations of risk, rather than allowing perceptions to impede action, will help produce more multi-benefit projects. Furthermore, the process of collaboration will gradually become less novel and risky as it takes hold—particularly if a collaborative arrangement is accompanied by explicit dispute resolution or risk-sharing guidelines that delineate how partners should confront tension.

Friction 4: Limited capacity, resources, and authority

- Collaboration that is dependent on goodwill relies on every stakeholder voluntarily sustaining a good-faith effort to advance multi-benefit goals. It was found that the individuals best suited to collaborative initiatives are usually the most in demand within their own agencies and are consistently put on urgent tasks, giving them little headspace to think and plan creatively. Staff capacity is not the only nor necessarily the most stringent

constraint for effective collaboration. Establishing the expectation for collaboration beyond best intentions often requires additional powers and authority, financial and human resources, and other features that support a collaborating group.

Friction 5: Isolated goals and objectives

- During this investigation, it was repeatedly noted that an obstacle to the long-term impact of a project and cultural transformation within agencies was the short-sightedness of favoring status quo projects that can easily check boxes born from isolated goals and objectives. Faced with looming compliance needs, organizations often rely on tried-and-true methods for achieving targets. However, in doing so, agencies miss out on opportunities to deliver novel multi-benefit projects that can achieve compliance while also delivering a broader swathe of benefits to more people. According to the experts, much of this commitment to the status quo stems from fear of litigation and liability issues. Too strong of a focus on objectives and goals defined in isolation from the broader social and ecological context can hinder the pursuit of multi-benefit projects (e.g., Margerum & Robinson, 2016; Bodin et al., 2020).
- Some projects may provide greater benefits for a different set of stakeholders in the future, rather than in the immediate or short term. Broadening the planning horizon to incorporate long-term goals for project functionality is critical for adequately managing a collaborative multi-benefit project and for planning an accompanying O&M schedule. Moreover, because multi-benefit public works projects often involve large upfront capital costs for infrastructure, a long-term perspective may be crucial for adequately characterizing and calculating the project's Return on Investment (ROI) and conducting the appropriate benefit-cost analysis (BCA).

Friction 6: Superficial community engagement (e.g., box-checking, surface-level engagement, or unfulfilled promises)

- Even well-designed collaborative programs can result in failure, often due to the lack of diversity of stakeholders involved and the lack of suitable models or methods to enhance a strategic learning process, manage conflicts, build trust, pursue a shared view, and identify and evaluate outcomes. Building reciprocal relationships typically comes with trade-offs and is likely to be a tough balancing act. For instance, addressing community needs can lead to fundamental conflicts with project goals and broader social/ecological objectives.
- Close attention must be given to frontline communities and those lacking sound representation and/or capacity to bring ideas forward, including community-based organizations. A positive example of community engagement is L.A. Metro's Rails to River project, which could have exclusively focused on the goal of connecting transit assets. Instead, Metro has pursued deeper engagement with SLATE-Z and other community partners, which are bringing climate and community planning grants to bear on the project. This collaboration and the promise of these additional funding sources helps amplify the community voices calling for additional active transport and beautification solutions, which expands the project scope in desirable ways and focuses attention on the economic opportunities and changes the community can expect because of a more connected South L.A.

- Another innovative example is that of the HDW, run by the Department of Public Health since 2006. The HDW is a collaboration among County departments and includes the L.A. County Arts and Culture Department. The Department of Arts and Culture engages with communities differently than other departments, and its participation in the HDW has encouraged new modes of community connection to identify and elevate their needs. Notably, successful projects, such as those led by Amigos de los Rios, the Council for Watershed Health, and the Rails to River project have found ways to deeply engage communities via arts and culture.

Friction 7: High transaction costs (i.e., the time or other resources used in setting up a collaborative process)

- Establishing a collaborative process and culture requires effort and often comes with high transaction costs, especially at larger organizations like County agencies. These costs include covering staff time, identifying appropriate venues, convening, negotiating, agreeing on ground rules and objectives, and sustaining the effort over time. Joint grant writing groups, like the grants committee of the HDW, are positive examples from the public sector of how to drive collaboration, unlock its benefits, and reduce transaction costs.

Friction 8: Bureaucratic burdens and convoluted contractual processes

- Permits and other requirements add complexity to every project but pose a particular challenge for co-funded collaborative projects; the more funds with unique restrictions and schedules, the more difficulties these standard disruptions can pose. To paraphrase one expert: the sequencing of funds and project timelines can make it a challenge to spend money already allocated for projects and not experience project delays.
- Bureaucratic burdens, such as the time and effort required to process contractual agreements with the County, limit the ability of public agencies to partner with CBOs. To avoid this, the HDW created a "master agreement for community engagement services" where various CBOs were officially vetted and approved for an on-call list allowing them to enter contracts with the departments in ways they could not before.
- In the public sector, adding new job categories can take years, making it difficult to expand the range of roles and skills of agency staff. This structural issue presents an argument in favor of acquiring new necessary skills by partnering with institutions that already possess them and by establishing durable processes for collaboration.

Friction 9: Loss of institutional knowledge

- According to the experts interviewed, staff turnover hinders project development and partnership formation because it erodes at least three key ingredients for success: trust, technical expertise, and experience. It takes time to develop a shared vision. If an important actor leaves the partnership in the project development process, some projects may not reach their potential as the vision and purpose may be lost. This vacuum can result in greater transaction costs to build subsequent collaborative processes.

Friction 10: Path dependency and a business-as-usual approach

- Having a tried-and-true process for achieving certain goals is important for efficiency but can stand in the way of novel projects or run counter to County goals. The expanded goal of building climate resilience demands a reexamination of processes, relationships, and

contracts to ensure that they help, rather than hinder, resilience-building efforts (e.g., revisiting the relevance of recurrent contracts to periodically repave schoolyards for achieving resilience goals). A positive example of this is from a Streets L.A. project in the City of L.A. where it was found that incorporating new technology and cool coatings could improve the albedo of paved surfaces and reduce the urban heat island effect.

Friction 11: An underdeveloped green workforce

- O&M is critical to the long-term success of multi-benefit projects. Currently, there is a lack of common-pool workforce specializing in green infrastructure and multi-benefit construction and maintenance. There is an opportunity to induce demand for more resilience-building technology and labor and bolster the green economy by seeking to update existing project approaches and processes, like reviewing contracts for periodic and recurring re-paving of lands that could offer community benefits by being de-paved or greened.
- It is important to note that O&M staff and labor unions that currently work on traditional capital projects may perceive a threat from a publicly stated push to recruit a green workforce with new skills to the nascent green economy. It will be important to work closely with these trusted partners to provide training and demonstrate a commitment to prioritize the transformation of the existing workforce as the nature of resilience-building work changes and expands. This could be accomplished through employment protection programs and agreements, or by establishing countywide workforce development programs to train workers with specific skills for managing nature-based infrastructure.
- Training and educational opportunities need not be new, standalone programs; instead, they can be integrated directly into projects, as seen in the County's Life Is Better with Trees project, which incorporated youth development and GED-certification assistance components.

Friction 12: Rigid funding cycles and structures

- Project implementation can be hindered by the timing and terms of funding, even if there are ample dollars to go around. Experts noted that it is common for public projects in the County, even ones in advanced stages of development, to experience delays due to funding cycles. They also highlighted how leveraging funding from multiple sources typically entails different levels of funding restrictions and staggered arrival of funds, both of which can hinder implementation.
- Relying on bond measures and inflexible grants often makes strategic, sequential planning overly difficult and strenuous. Access to perpetual—but not unlimited—funding sources (e.g., tax-funded measures) can add stability to the planning and design process while also helping CBOs and other project proponents leverage additional funds. Projects that mix public funds with private and philanthropic resources have more flexibility and thus more power to develop adaptively as opportunities and restrictions emerge.
- In addition, some organizations have longer track records of producing collaborative, multi-benefit projects. Organizations that have not established a blueprint for this type of work are likely to have more difficulties accessing funding and may get trapped in a loop that further slows their ability to build the structures and practices that allow this sort of work to grow.

Encouraging and supporting organizations with less experience in developing multi-benefit projects can help produce novel multi-benefit projects.

- Lack of sufficient funding for project O&M—historically coming from agency budgets and growing in magnitude as more public projects are built—has posed a significant challenge. New funding sources, like Measure W, that specifically allow for O&M funds are a welcome development that can alleviate pressure on agency budgets and increase the uptake of green infrastructure projects that require long-term maintenance to succeed and deliver sustained benefits.

The Healthy Design Workgroup (HDW)

HDW is a collaboration among L.A. County departments to develop policies and practices for planning, designing, and building healthy community environments with the goal of constantly improving interdepartmental coordination. It was formed in 2012 by a L.A. County Board of Supervisors Motion directing the Chief Executive Office (CEO) to coordinate an interdepartmental effort.

In 2013, the HDW leadership was transferred from the CEO to the Department of Public Health (DPH). The CEO awarded The DPH's Policies for Livable Communities and Environments (PLACE) Program* with a new position to be funded through the County budget for the sole purpose of supporting the HDW. The new staff was hired in October 2015. That year, the HDW Grants Committee, including staff from multiple departments, was recognized with the County's Quality and Productivity Commission "Gold Eagle Award," the highest honor bestowed for departmental productivity and quality improvement efforts deserving recognition by the Board of Supervisors, the CEO, the Quality and Productivity Commission, and the public.

The HDW brings together high-level representatives from the following departments:

- Public Health
- Public Works
- Regional Planning
- Parks and Recreation
- Sheriff
- Chief Information Office
- Beaches and Harbors
- Arts Commission
- Fire
- Chief Executive Office
- Agricultural Commissioner/Weights and Measures
- Community Development Commission
- Internal Service Department/Office of Sustainability

This innovative inter-departmental initiative is a commitment to teamwork, system-wide change, significant process and workflow improvements, and enhanced fiscal effectiveness.[5]

*The PLACE Program was launched in 2006 as part of an effort to bring funding allocated for chronic disease and injury prevention into greater alignment with the death and disability caused by chronic disease and injury. The PLACE Program fosters change to develop healthy, safe, and active environments for L.A. County residents. It does so by following a holistic model that includes funding, technical assistance, coordination with other County Departments, and collaboration with outside agencies and community stakeholders.

[5] Additional information on the HDW work and achievements is found on the DPH PLACE website.

4.3. KEY FINDINGS

Earth Economics organized and synthesized expert perceptions and experiences using a thematic analysis of fuels and frictions. In summary, fuels that improve multi-benefit projects include setting clear expectations for collaboration, building trusted and transparent relationships, cultivating cultures of collaboration, retaining strong institutional memory, assembling diverse teams with unique skills and perspectives, obtaining good data, and considering the synergies among projects. Frictions that hinder multi-benefit projects include a lack of clear process and project metrics, misaligned definitions and assumptions, risk averse leadership, objectives set in isolation of broader conditions, inadequate community engagement, high transaction costs and bureaucratic requirements, underdeveloped workforce, and rigid funding structures.

In general, the more fuels and fewer frictions the better, which raises the question: how to add fuels and remove frictions to accelerate the path toward more novel, collaborative, multi-benefit projects that help advance the County's climate resilience goals? This question guided other stages of this research and ultimately helped inform the principles presented in Section 7. Appendix Table B1 summarizes how the principles are connected to the question of how to add fuels and remove frictions.

CASE STUDIES

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TREEPEOPLE

5. CASE STUDIES

Practitioners can benefit from comparing their process and performance metrics with best practices from other entities. This study systematically evaluated the ten L.A. County collaborative multi-benefit projects identified in the first phase of interviews as examples of projects that were at least partially successful at overcoming obstacles and/or taking advantage of contextual opportunities. Then, using a scorecard developed exclusively for this study, Earth Economics researchers identified the three best performing projects**. Agencies and project developers (including nonprofit entities) can replicate characteristics specific to these three projects or seek to establish the institutional conditions that would allow them to adopt and even enhance some of the desirable features these three projects exhibit.**

It is worth underscoring that the experts interviewed considered all ten analyzed projects as illustrative of success and that the project sample is diverse. Given that projects have varying starting points and conditions, each one can be used as a reference point or a "route to success" for future multi-benefit projects. Table 1 summarizes the ten evaluated projects.

Table 1. Selected projects from expert recommendations.

PROJECT NAME	LOCATION	YEAR	PARTNERS
Life is Better with Trees	Unincorporated L.A. County areas	2017	PLACE Program (Policies for Livable, Active Communities and Environments); HDW
Jeff Seymour Family Center	City of El Monte	2017	City of El Monte School District, Amigos de los Rios, L.A. County Parks and Recreation Department
Urban Orchard Park	City of South Gate	Under construction	Trust for Public Land, City of South Gate Department of Public Works
Elmer Avenue + Elmer Paseo	City of L.A.	2010-2012	Council for Watershed Health, L.A. County Department of Public Works, L.A. Sanitation and Environment, L.A. Regional Water Quality Control Board, L.A. Department of Water and Power, US Bureau of Reclamation, Water Replenishment District of Southern California, and TreePeople
East L.A. Sustainable Median Stormwater Capture Project	Unincorporated L.A. County areas	2021	L.A. County Department of Public Works: Stormwater Quality Division and Road Maintenance Division, City of Monterey Park, City of Montebello
Adventure Park Multi-Benefit Stormwater Capture Project	Unincorporated L.A. County areas	Under Construction	L.A. County Department of Public Works, L.A. County Sanitation District, L.A. County Parks and Recreation Department
Rio Hondo Westside Multi-Use Trail	City of El Monte	In planning	L.A. County Parks and Recreation Department, City of El Monte, and supported by other agencies in the Emerald Necklace Consortium
The Active Transportation Rail to River Corridor Project – Segment A	City of L.A.	In planning	L.A. County Metropolitan Transportation Authority and supported by community-based organizations from the Los Angeles Equity Alliance
Sherman Way Station Urban Cooling and First-Last Mile Strategic Plan	City of L.A.	In planning	StreetsLA, Climate Resolve and supported by Alta Planning and Design
Multi-benefit Stormwater Management Projects at the Hillary T Broadous School and Open Magnet Charter School Cistern and Stormwater Retrofit	City of L.A.	2001-2006	TreePeople, L.A. Unified School District, City of L.A. Department of Water and Power, and the Santa Monica Bay Restoration Commission

5.1. METHODS: SCORECARD ANALYSIS

The use of expert knowledge for ecological research has a long history and has gained momentum in recent decades (Drescher et al., 2013; Oakes et al. 2021; St-Laurent et al., 2022; Martin et al., 2012; Landeta, 2006).[6] In this study, Earth Economics researchers relied on expert deliberation to consistently evaluate the ten projects listed above. To guide the project evaluation process, Earth Economics developed a scorecard resembling that presented by St-Laurent and colleagues (2022).

The scorecard is composed of 18 performance criteria organized under two broad domains that consider every stage of a project's lifespan. The two broad domains are: (1) collaboration process metrics; and (2) project outcomes metrics. Earth Economics found it useful to separate the evaluation of process outcomes from project outcomes to determine how each contributed to overall project. Table 2 shows the scorecard performance criteria.

[6] As shown by St-Laurent et al. (2022), when rigorously completed, the elicitation of experts' judgements —defined as the professional opinions of individuals with specialized knowledge, as well as educational, research, and practical experiences (Martin et al., 2012)—is considered a valuable, appropriate approach to increase understanding of and explore solutions to complex and controversial environmental problems, particularly when data, empirical evidence, and knowledge are rare or nonexistent (Landeta, 2006).

Table 2. Scorecard criteria and definitions.

COLLABORATIVE PROCESS CRITERIA	
Co-envision	Multiple organizations (including agencies, nonprofits, community-based organizations, private parties, etc.) came together to create a shared vision of the project.
Co-plan	The project is co-planned by multiple entities (including agencies, nonprofits, community-based organizations, private parties, etc.).
Co-design	The project design is executed by multiple partners/stakeholders (including agencies, nonprofits, community-based organizations, private parties, etc.).
Co-investment	The project utilizes and shares, or is scheduled to utilize and share, funding from multiple sources, particularly from implementing partners.
Co-implementation	The project is implemented by multiple entities.
Accountability	There is clarity over the boundaries, roles, and authorities of participating entities (i.e., clear jurisdictions).

PROJECT OUTCOMES CRITERIA	
Climate policy alignment	The project objectives support a model of social and economic development that advances climate resilience principles.
Public participation	The project involves high-quality community and stakeholder engagement and is responsive to community input and needs.
Replicability	The project model can be replicated elsewhere.
Social cohesion	The project promotes/strengthens social cohesion (e.g., through public participation) and existing or new support systems.
Equitable investment	The project addresses historical inequities and reduces systemic harm to disadvantaged communities.
Coverage (scale)	The project provides benefits to multiple communities or to a wide base of beneficiaries.
Multi-benefits	The project provides multiple social and ecological benefits such as job creation, housing, transportation, parks, urban heat island mitigation, or habitat enhancement.
Ecosystem function	The project supports natural processes and helps improve ecological systems (e.g., water, soil, climate, or carbon). It also supports habitat for improved quality of life for human and non-human populations.
Financial sustainability	The project has a sound financial model (i.e., it is dependable and can deliver benefits without running out of money).
Economic resilience	The project provides sustainable job opportunities to local communities.
Economic development	The project helps support local businesses and/or creates opportunities for growth in local economic subsectors.
Project maintenance, monitoring, and longevity	The project is maintained and functioning as (or close to) intended.

To evaluate if projects used collaborative processes, researchers determined whether each criterion had been met, not met, or did not apply, assigning scores of +1, -1, or 0. The maximum potential score for collaboration process performance was six points.

To evaluate a project based on its outcomes, researchers used a scale from -5 to +5 for each metric. A score of -5 meant the project led to much worse outcomes compared to starting conditions, a score of 0 indicated no change (i.e., the project had no impact), and a score of +5 meant the project led to much better outcomes compared to the current status. Those projects still in the planning phase were evaluated based on expected outcomes. The maximum score for outcomes performance was 60 points.[7]

The final score included both collaborative process performance points and project performance outcome points, with a maximum possible total score of 66 (i.e., equaling 100 percent performance). A blank copy of the scorecard is shown in Appendix C,[8] and the standardized scores for all outcomes for each project are shown in Appendix D.[9]

5.2. RESULTS

After evaluating the ten projects, the three with the top overall performance scores were selected to be featured as case studies. Figure 2 shows the final scores of all ten projects, with the three top-scoring case study projects on the far right.

[7] It is important to note that in evaluating project performance, evaluators considered information on the project's geographical and historical context as well as the starting point on those variables being evaluated. That is to say that a project's impact was measured in relation to the baseline conditions in the project's location. It is possible that projects in areas that have been historically neglected are more costly to construct and maintain—simply because many of the necessary components need to be built. This does not mean they are less beneficial than projects that are cheaper to build and maintain due to abundant pre-existing supporting infrastructure.

[8] As will become apparent by examining the template included in Appendix C, the scorecard allowed for the use of weights. In this study, weights were not implemented but it is an interesting feature of multi-criteria project evaluation that can be incorporated in future efforts.

[9] Table D shows the standardized scores for all outcomes evaluated through the scorecard approach. These results were used for the selection of the case studies as well as for the classification exercise.

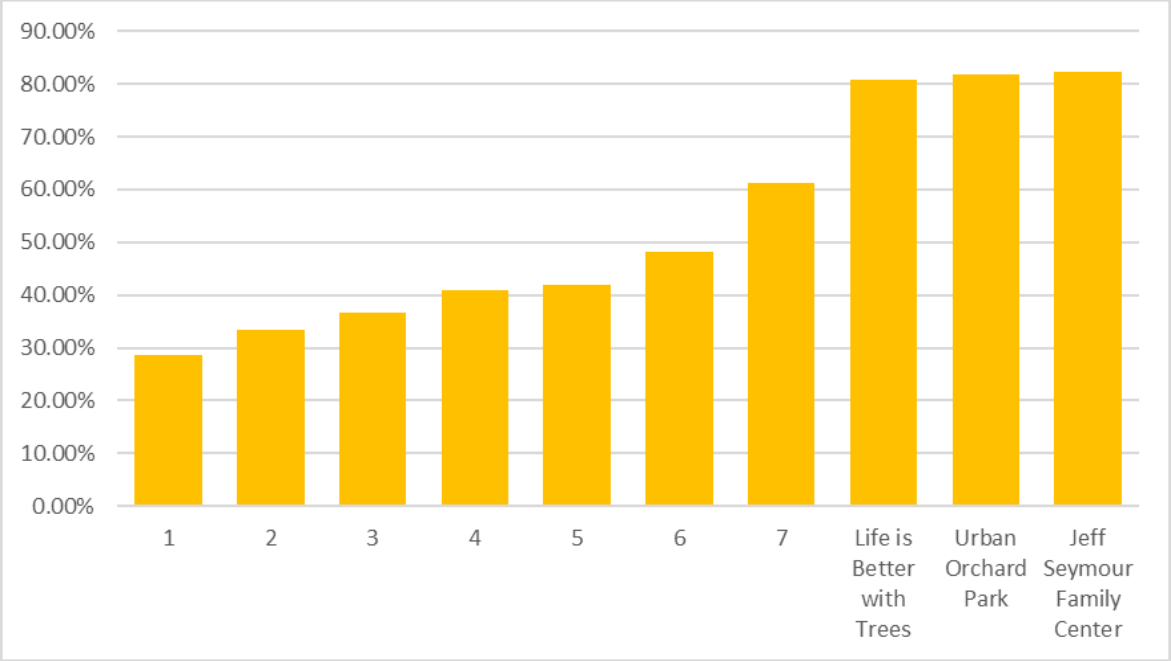

Figure 2. Final scores for all ten projects.

Table 3 shows project features of the three top-performing cases. The three cases and their scores are:

1. Jeff Seymour Family Center (82.6%)
2. Urban Orchard Park (80.3%)
3. Life is Better with Trees (78.8%)

Table 3. Comparison of project features.

	JEFF SEYMOUR FAMILY CENTER	URBAN ORCHARD	LIFE IS BETTER WITH TREES
Focus areas	Physical and mental health; essential services; education; civic engagement; sustainable living	Stormwater capture and ecosystem health; improved access to public open green spaces	Public health; youth development
Leadership	El Monte City School District; Amigos de los Rios; L.A. County Parks and Recreation; L.A. County Public Works; Jeff Seymour Family Center	Trust for Public Land; City of South Gate; L.A. County Public Works Department; Conservation Corps in Long Beach	L.A. County Department of Public Health; L.A. County Public Works; First Supervisorial District; L.A. County Parks and Recreation; San Gabriel Conservation Corps; L.A. County Fire Department; L.A. Sheriff's Department Pitchess Detention Center
Location	10900 Mulhull Street, El Monte, CA	9475 W. Frontage Road, City of South Gate	Unincorporated (East L.A., Valinda, Basset, Walnut Park)
Multi-benefits: Environment	Stormwater capture (rain garden, bioswale, stormwater basin); urban community forest (natural habitat, heat island reduction, carbon sequestration, stormwater capture); community garden (food production, education); cool pavement (heat island reduction)	Cool streets; clean air; reduced greenhouse gas emissions/exposure; new tree watering technology	Access to open green space; stormwater capture; water reuse; urban heat island reduction (300 trees); clean air; barriers to greenhouse gas emissions from the freeway; sound buffer; food production (urban agriculture)
Multi-benefits: Community	Neighborhood beautification; active transportation (bike safety track, walking paths); recreation (bike park/skill tract); interpretative elements (education, community science); on-site social services (head start preschool program, elementary school program for special needs students, middle and high school students from County probation program, urban conservation corps youth, court-mandated violence prevention program, dental clinic, health clinic, grandparents as parents, parent workshops, community garden, food bank); physical and mental health; youth development program through Conservation Corps	Street beautification; active transportation (walking and biking); physical and mental health; youth development (increased employment, high school degree completion, better understanding of the urban ecosystem)	Area beautification; local job creation; educational opportunities; active transport (walking and biking); physical and mental health; youth development through Conservation Corps
Multi-benefits: Equity	Project serves underserved communities; neighborhoods with few parks/green spaces; social services targeted to families in need	Project serves at-risk youth; serves underserved community; serves neighborhoods at risk of urban heat island effect	Project serves underserved communities; gentrification-awareness and anti-displacement recommendations
Scale: Geographic	Small (<5 acres)	Large (>30 acres) and/or distributed	Medium (5-30 acres)

	JEFF SEYMOUR FAMILY CENTER	URBAN ORCHARD	LIFE IS BETTER WITH TREES
Scale: Budget	Small (<$5M)	Medium ($5 - $20 M)	Small (<$5M)
Economics and Finance	El Monte City School District; CAL FIRE Urban Community Forestry Program; additional funding provided by California Natural Resources Agency, REI, Emerald Necklace Coalition Agencies	Funded primarily with grant funds (including State Water Resources Control Board-Prop 1 Storm Water Grant Program funds, Mountains Conservancy funds, and Safe Clean Water-Measure W funds); internal funds from The Trust for Public Land and local funds	Prop A funding ($1M): Tree Inventory Grant ($800K for street tree inventory, $200K for community outreach and education); Public Works ($600K for tree planting)
Maintenance	Volunteer forces and community stewards (Amigos de los Rios)	Planned through the Long Beach Conservation Corps	Requires residents to take care of trees after the first 6 months

5.2.1 Jeff Seymour Family Center

Project summary: Following the decommissioning of an elementary school, the El Monte City School District established the Jeff Seymour Family Center (JSFC) in April 2017 as a community hub for families in need with the goal of providing comprehensive programs to promote overall family wellness. In addition to providing supportive social services, the JSFC added a Green Infrastructure Campus to the premises. The Campus was designed and developed as part of the Emerald Necklace initiative by Amigos de los Rios, in partnership with the El Monte City School District and community stakeholders. Its green infrastructure components include stormwater management, urban forestry, a community garden, and cool pavement that reduces heat island effects. The campus also includes a bike track that brings healthy recreational opportunities to the neighborhood. The JSFC is now a place for the community to enjoy a more natural setting, with features designed to promote both physical and psychological well-being. Expenses are covered with funds from the El Monte City School District and in-kind support from other entities.

Lessons: The JSFC project achieved the highest score of the evaluated projects at 82.6 percent of the total available points. As shown in Figure 3, the project had a perfect score in most multi-benefit project outcomes. The project had an unusually high maintenance score because it relies on well-trained and engaged community volunteers and conservation corps workers that regularly visit and maintain the space. This is a unique feature of the project as volunteering, giving to the community, and stewardship building are central components of the social model advanced by the leading CBO, which in this case is Amigos de los Rios. However, other projects seeking to ensure their own long-term impact can also incorporate elements into the project plan that will draw regular community visitation and promote stewardship. The two areas where the project did not score well (ecosystem health and climate policy alignment) reflect the limitations that relatively small-scale projects (in terms of sheer physical size) acting in isolation have for generating regional ecological impacts.[10]

Despite its small size, the JSFC scored well because (1) local organizations played a vital role in engaging the community and conceptualizing project features that are meaningful to project beneficiaries, and (2) because it provides a variety of programmatic services to a large community that extends beyond the site's immediate vicinity. When considering benefits and costs of a particular multi-benefit project, project managers could consider not only geographic boundaries to define a community, but also the services being offered. Adding novel community benefits to a project can broaden the area of impact and extend a project's reach across a larger area than may be initially anticipated.

Entities interested in leveraging housing-related funds (e.g., Measure H in L.A. County) into green infrastructure projects for stormwater management should review the JSFC model, given that it successfully brings together myriad basic social services that support families in need (e.g., food

[10] It is important to note that small incremental interventions that take advantage of watershed dynamics can act together to generate impacts that are comparable and sometimes superior to those of single large projects, as with the collective stormwater impact of updating medians across east L.A. County (see the East L.A. Sustainable Median Stormwater Capture Project in Table 1).

bank services and court-mandated violence prevention programs) and environmental benefits using infrastructure and services-oriented funding.

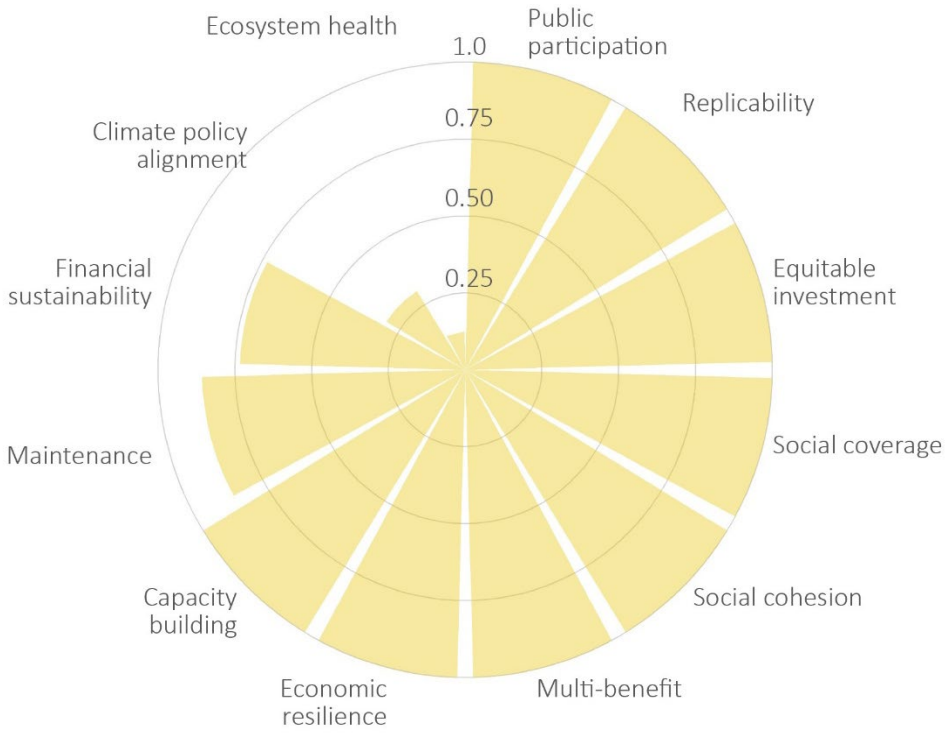

Figure 3. Standardized project outcome scores: Jeff Seymour Family Center project.

5.2.2 Urban Orchard

Project summary: Construction of the Urban Orchard Park (UOP) has been underway in the City of South Gate since August 2021. The project is a joint effort between the Trust for Public Lands (TPL) and The Public Works Department of the City of South Gate. Together, they are constructing a new seven-acre park along the Bandini Channel of the Los Angeles River with the primary purpose of diverting and treating stormwater run-off. As part of their collaborative model, TPL and the City of South Gate are each managing half of the project's funds.

The project site is in an underserved, densely urban community that faces high levels of environmental pollution and social vulnerability. The proposed improvements for the site include: stormwater diversion structures, a wetland overlook area with educational signage and appropriate cultural representations selected by the community, a flexible space to promote environmental education, a flowing stream and wetland, bioswales, an education garden with 18 raised planters, an orchard with fruit trees selected by the community, shade structures, a natural playground with a water element,[11] multi-use walking and bicycle pathways, exercise equipment, benches, picnic

[11] Natural playgrounds have natural features (rocks, gardens, sand pits, etc.) that help children discover and learn about nature while they play.

tables, drinking fountains, trash cans, public art, native shade trees, a drought tolerant landscape, an irrigation system, pathway lighting, a maintenance garage, and a restroom building. This park will promote healthy lifestyles in an area with high levels of obesity and asthma. Additionally, the Conservation Corps of Long Beach will provide workforce training and development onsite, as well as employment opportunities for local youth.

Lessons: As shown in Figure 4, the Urban Orchard Park project achieved the second-highest score with 80.3 percent of the available points. Although not yet complete, the project scored strongly in terms of process outcomes and projected project outcomes. The UOP is unique in its ecological complexity and environmental value added, largely due to a strategic partnership between two organizations with different areas of specialization. Public Works brings the design/technical skillset and TPL acts as a liaison between community and government to ensure the park includes amenities and services meaningful to the community. This partnership illustrates a basic lesson of economics on cooperation: gains can arise from sharing knowledge, dividing labor and/or tasks, and avoiding duplication.

Like the other two case studies, the UOP also had strong performance in public participation and process outcomes, largely due to the active engagement efforts by TPL and local research partners. Finally, a unique feature of the UOP was the active efforts prior to project design to understand and foresee the risk of gentrification and displacement in surrounding communities. Entities interested in multi-benefit project development can learn from this proactive and preemptive approach to community preparedness and resilience-building.

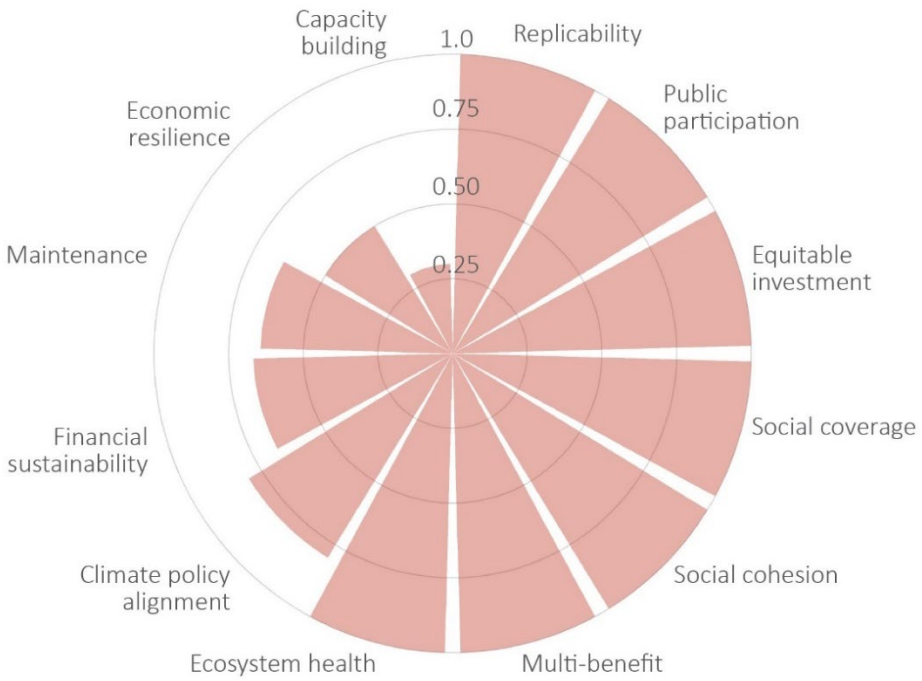

Figure 4. Standardized project outcome scores: Urban Orchard Park.

5.2.3 Life is Better with Trees

Project summary: In February 2017, L.A. County Supervisor Hilda Solis allotted one million dollars to launch a community-building tree inventory initiative called "Life is Better with Trees" (LIBTW). The Department of Public Health collaborated with the Department of Public Works (which provided an additional $600,000 for tree planting), the First District led by Supervisor Hilda Solis, the San Gabriel Valley Conservation Corps, and other community partners through the Trees Committee of the HDW to implement the project and leverage additional funding. The goal was to achieve overall improvements in the social determinants of health of disadvantaged communities by expanding the urban forest in four of the County's unincorporated areas with the lowest canopy cover as shown in the Community Parks and Recreation Plans.

By planting 2,000 trees, the project helped provide shade, clean air, cooler temperatures, and a better quality of life for residents in urban neighborhoods. In addition, the project demonstrated a novel public education and community engagement model under which organizations from the target neighborhoods recruited local, at-risk youth and trained them to plant trees, conduct outreach, and provide education about tree benefits and maintenance. This program gave young adults rigorous job and life skills training while allowing them to work toward a General Educational Development (GED) certification or required community service.

Lessons: The LIBWT project achieved the third-highest score, receiving 78.8 percent of the available points and strong scores for project outcomes (Figure 5). The project did not score as well in ecosystem health and ongoing maintenance outcomes because of concerns about its strategy for funding and long-term project maintenance. In particular, tree survival depends on residents watering and caring for the trees. While leveraging a local workforce to share tree maintenance basics is an important step, education alone may not be sufficient; tree survival ultimately hinges on consistent watering, which can fall away due to the cost or attrition as people move to and from the community. Nevertheless, this project stood out as a "gold standard" project in terms of collaborative outcomes (i.e., co-envision, co-plan, co-design, co-invest, co-implement, and accountability) and illustrates a larger finding that collaborative leadership is a feature of all three best-performing projects. Entities looking to replicate good outcomes and successful models of multi-benefit projects would benefit greatly from studying the process developed and conducted by the HDW through the PLACE Program.

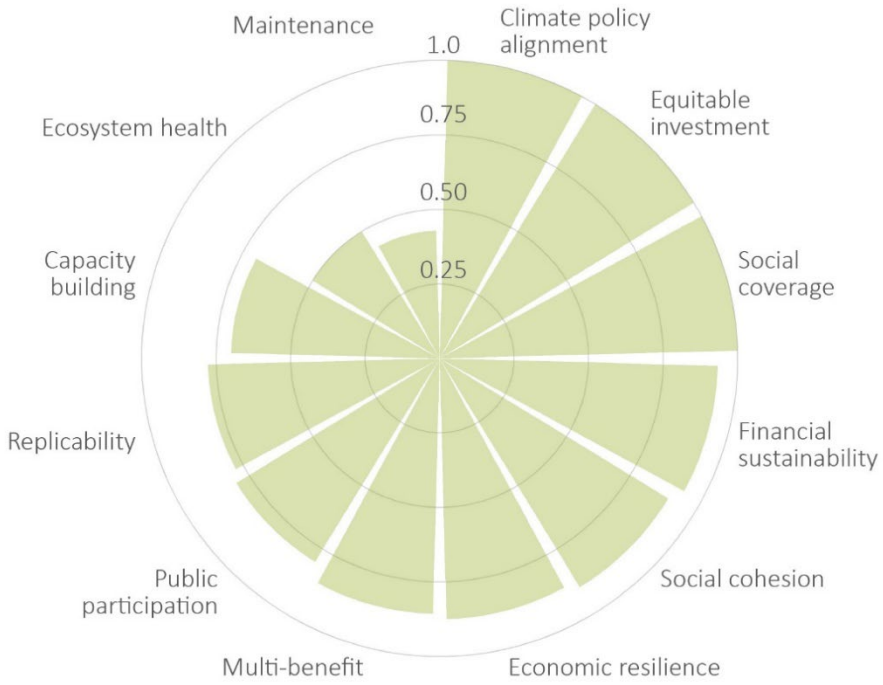

Figure 5. Standardized project outcome scores: Life is Better with Trees.

5.3 KEY FINDINGS

The case studies shared some similar characteristics that contributed to their high scores. In terms of project outcomes, all three had strong scores for participatory outcomes because they were successful at maintaining their participatory approach through the various stages of project development. Additionally, in all three cases, community input was incorporated in the concept and design phases along with input from implementing partners and project leads. Other key ingredients in promoting and sustaining a participatory approach were high-quality community engagement processes and leadership that aimed for deep collaboration as a goal unto itself. Regarding collaborative process metrics, all three cases had high scores for a collaborative project development process.

Each project also featured unique advantages contributing to its success. The LIBWT project was backed by the structure, methods, and resources of the PLACE program and the HDW; the JSFC project benefited from the direction and support of a strong coalition of locally rooted nonprofits and CBOs organized under the theory of collective impact and trained in collaborative management;[12] and the UOP project benefited from complementary and experienced technical cooperating partners.

[12] See the literature review in Section 3.

In addition, projects differed in their approach to the co-investment and co-management of funds. Just as there are many pathways to success, there are multiple ways of designing a co-investment plan, and the case studies illustrate three different strategies for collaboratively funding a project. In addition, analysis revealed that when building a financial plan for the project, it is important to plan on having funding sources that are exposed to different economic pressures to guarantee a stream of revenue exists during inevitable economic downturns. A sound financial model supports leveraging of additional funds and lessens reliance on in-kind donations, personal relationships, local jobs corps, and volunteerism (although Earth Economics found that volunteer-based programs have deep roots in communities and are key for building local stewardship). Given the variety of approaches for co-investment, flexible funding sources can allow project proponents to better take advantage of the range of opportunities available to them and build a resilient financial model.

Finally, it is important to note that even the highest scoring project could have had better scores for maintenance, monitoring, and longevity (see Appendix D). These low scores are due to frictions, including difficulties with planning O&M and hesitancy to allocate funds towards O&M. Earth Economics found that securing ample funding for O&M in a project's financial plans is critical. Without sufficient funding for O&M or an invested local community, multi-benefit projects can fall into a state of neglect, therefore undermining the project's success.

PREDICTORS OF PROJECT PERFORMANCE

PHOTO CREDIT:
AMIGOS DE LOS RIOS

6. PREDICTORS OF PROJECT PERFORMANCE

Project proponents may want to predict a future project's performance based on its envisioned characteristics. To discover how different attributes may influence performance, this study also conducted a basic classification analysis to examine relationships between different metrics of project performance using basic correlations. The classification analysis helps identify what features are "good predictors" of success (as defined by overall project score), while the correlations analysis shows how closely related the individual criteria are to determining project success and how closely related those criteria are to each other. These correlations are useful to determine which features influence final project scores more heavily and which objectives may be met somewhat simultaneously.

6.1. METHODS

There are eight general steps in conducting the classification exercise:

1. Identify attributes of interest (e.g., scale, location, leadership, and complexity)
2. Find and organize information to build project profiles
3. Organize information on project attributes and performance scores (from the scorecard evaluation process) in a matrix format suitable for a systematic analysis
4. Cluster projects into groups according to a given attribute (e.g., budget) and calculate average project scores from the scorecard for each class of projects (e.g., small- vs. large-budget projects)
5. Inspect how a group of projects compares to other projects in terms of average performance
6. Repeat the process of splitting projects into groups by another attribute (e.g., geographical scale) and inspect how a group compares to other projects in terms of average performance
7. Repeat until all attributes have been considered
8. Summarize findings and identify the features that drive project performance

6.2. RESULTS

Earth Economics researchers observed certain indicators of successful performance across project attributes (e.g., projects located in smaller cities tended to have higher scores than those in unincorporated areas or the City of L.A.). Earth Economics researchers also observed potential links between individual performance criteria and overall project performance (e.g., scores in social cohesion were strongly and positively correlated with overall performance) as well as apparent connections between attributes (e.g., projects that followed collaborative processes also tended to score well on social cohesion outcomes). Table 4 shows a full list of the attributes included in the project profiles and the classification categories.

Table 4. Project classification categories.

PROJECT FEATURE	CATEGORIES FOR ANALYSIS
Leadership	One county agency
	Nonprofit organization
	Multiple entities
Location	City of Los Angeles
	Small city in L.A. County
	Unincorporated L.A. County areas
Departments/agencies involved	Collected but not used in the analysis
Design process	Bottom-up
	Top-down
	Bottom-up and top-down
Funding source	Collected but not used in the analysis
Budget	Small (<$5 million)
	Medium ($5-$20 million)
	Large (>$5 million)
Geographical scale	Small (<5 acres)
	Medium (5-30 acres)
	Large (>30 acres, concentrated or distributed)
Number and nature of primary community benefits	Few (<3)
	Many (3+)
Nonstructural components (i.e., program elements that extend beyond physical features, like jobs/training or educational programs)	Yes
	No
Social capital (i.e., human connections within key stakeholder groups that facilitate project development)	Weak
	Moderate
	Strong
Social complexity (i.e., how many and which social/urban units/facets/classes are affected)	Low
	Moderate
	High

6.2.1 Success Signals

The ten projects were sorted into categories by project attributes. For example, all ten projects were sorted into one of three categories for the Leadership attribute: having multiple leaders, a nonprofit leader, or a single County agency leader. Total scores were averaged for each category. Table 5 shows the summarized project information in matrix format and Table 6 shows the average scores (from high to low) for projects grouped into different categories. The attributes more strongly associated with project performance are:

1. Being located in a small city (as opposed to in the City of L.A. or in unincorporated areas)
2. Being led by multiple organizations
3. Serving a highly socially complex population
4. Including nonstructural (i.e., behavioral and educational) elements in the project

Table 5. Summarized information in a matrix format for classification analysis.

PROJECT ID	LEADERSHIP	LOCATION	INFRASTRUCTURE L.A. ALIGNMENT	DESIGN PROCESS	BUDGET	GEOGRAPHIC SCALE	NUMBER AND NATURE OF MAIN COMMUNITY BENEFITS	NONSTRUCTURAL COMPONENTS	SOCIAL CAPITAL	SOCIAL COMPLEXITY	SCORE (OUT OF 66)
1	Nonprofit	Small city	Moderate	Bottom-up	Small	Small	Many	Yes	Strong	High	48.5
2	Nonprofit	City of L.A.	Weak	Bottom-up and top-down	Small	Small	Few	Yes	Strong	Low	18.5
3	One county agency	Unincorporated	Weak	Top-down	Large	Large	Many	No	Weak	Low	30
4	One county agency	Unincorporated	Moderate	Top-down	Medium	Medium	Few	No	Moderate	Moderate	23
5	One county agency	City of El Monte	Weak	Bottom-up	N/A	N/A	Few	No	N/A	N/A	31
6	One county agency	City of L.A.	Moderate	Bottom-up	Medium	Large	Few	No	Strong	Moderate	12.5
7	One county agency	City of L.A.	Strong	Bottom-up	Large	N/A	Few	No	Strong	High	32
8	Nonprofit	Small city	Strong	Bottom-up	Medium	Medium	Many	Yes	Strong	High	47
9	Nonprofit	City of L.A.	Moderate	Bottom-up	Small	Small	Many	No	Strong	Low	17
10	Multiple	Unincorporated	Weak	Bottom-up	Small	Large	Many	Yes	Strong	Moderate	46

Table 6. Summary of average project scores by feature and feature category.

FEATURE	CATEGORY	AVERAGE SCORE (OUT OF 100%)
Leadership	Multiple	69.7%
	Nonprofit	49.6%
	One county agency	38.9%
Location	Small city	72.3%
	Unincorporated L.A. County areas	42.4%
	City of L.A.	33.6%
Design process	Bottom-up	50.6%
	Top-down	40.2%
	Bottom-up and top-down	28.0%
Budget	Small	49.2%
	Large	47.0%
	Medium	41.7%
Geographical scale	Medium	53.0%
	Large	44.7%
	Small	42.4%
Number and nature of main community benefits	Many	53.0%
	Few	35.5%
Nonstructural components	Yes	60.6%
	No	36.7%
Social capital	Strong	47.9%
	Weak	45.5%
	Moderate	34.8%
Social complexity	Severe	64.4%
	Moderate	58.6%
	Mild	33.1%

6.2.2 Correlations Exercise

Some project characteristics may innately occur in tandem, in tandem, suggesting that a project typology or sorts may exist. To explore this idea of profiles, correlations between project features were calculated. Correlations between project outcomes and project scores are shown in Table 7; correlations between project outcomes are shown in Table 8. Given that these are simple correlations, no directionality or causality can be inferred. However, these relationships may be of interest to project developers and planners who are trying to achieve many outcomes simultaneously.

As shown in Table 7, this approach revealed that social cohesion, financial sustainability, and return on investment were the most strongly correlated with total project score (0.86, 0.84, and 0.81), followed by replicability, maintenance, and ecosystem health (0.70, 0.66, and 0.55). Additionally, Table 8 shows correlations between different metrics of project performance. Notably:

1. The strongest correlations (0.80) were between:
    a. "Collaborative process" and "social cohesion,"
    b. "Public participation" and "equitable investment,"
    c. "Social cohesion" and "financial sustainability,"
    d. "Social coverage" (scale) and "financial sustainability,"
    e. "Social coverage" (scale) and "maintenance,"
    f. "Social coverage" (scale) and "number and nature of multi-benefits," and
    g. "Economic resilience" and "return on investment."
2. "Social coverage" (scale) and "economic resilience" were positively and strongly correlated with more outcomes than other criteria.
3. "Maintenance" and "climate policy alignment" were negatively correlated (-0.50).

Table 7. Correlation between project outcomes and final project scores.

OUTCOME CRITERION	CORRELATION WITH TOTAL PROJECT SCORE
Social cohesion	0.86
Financial sustainability	0.84
Return on investment	0.81
Replicability	0.70
Maintenance	0.66
Ecosystem health	0.55
Social coverage	0.54
Economic resilience	0.52
Equitable investment	0.52
Collaborative process	0.48
Multi-benefit	0.48
Climate policy alignment	0.27
Public participation	0.24

Table 8: Correlations between individual project outcomes.

	Collaborative process	Climate policy alignment	Public participation	Replicability	Social cohesion	Equitable investment	Social coverage	Multi-benefit	Ecosystem health	Financial sustainability	Economic resilience	Economic development	Maintenance
Collaborative process	1												
Climate policy alignment	0	1											
Public participation	0.5	-0.1	1										
Replicability	0	0.6	-0.1	1									
Social cohesion	0.8	0	0.7	0.3	1								
Equitable investment	0.6	0	0.8	-0.1	0.7	1							
Social coverage	0.2	-0.1	0.3	0.1	0.5	0.3	1						
Multi-benefit	0.1	0.2	-0.2	0.5	0.3	-0.1	0.8	1					
Ecosystem health	0	0.6	-0.2	0.5	0.1	0	0.1	0.4	1				
Financial sustainability	0.1	-0.2	-0.1	0.1	0.3	0	0.8	0.7	-0.1	1			
Economic resilience	0.7	0	0.5	0.2	0.8	0.7	0.7	0.6	0.1	0.5	1		
Economic development	0.5	0.2	0.2	0.2	0.5	0.5	0.4	0.5	-0.1	0.4	0.8	1	
Maintenance	0	-1	0.4	0	0.4	0.1	0.8	0.5	-0	0.6	0.4	0.1	1

6.3. KEY FINDINGS

Throughout the evaluation, Earth Economics researchers developed several overarching observations. First, some attributes are more strongly correlated with success than others. The classification exercise revealed that projects that are located in a small city as opposed to the City of L.A. or unincorporated areas, are led by multiple organizations, extend benefits to a wide population, and/or include nonstructural (programmatic) services and features are more likely to be successful. The correlations exercise found that social cohesion, financial sustainability, and return on investment were the most strongly correlated with total project score.

In addition, O&M is a typical breaking point for multi-benefit projects. Surprisingly, Earth Economics found that the strongest projects did not perform well in ecosystem health or maintenance outcomes because they relied on residents for maintaining ecosystem functions rather than external authorities (or because the scale was small, or the environmental outcomes were not a primary purpose). One of the reasons why projects with multiple elements of success scored lower than their full potential was the inability to sustain the project upon completion, largely a result of fragmented funding structures. Since grants for infrastructure projects are typically provided in stages, project developers may not fully develop an O&M plan until construction has been funded. Only three projects had good O&M performance scores: one of the projects relied entirely on volunteers and the Conservation Corps for maintenance while the other two were County agency projects that had SCWP funds to cover O&M expenses. Counting on a strong volunteer base and a dedicated funding source for O&M activities are unique features and can serve as a guide for entities looking to replicate the longevity aspects of successful projects.

PRINCIPLES FOR COLLABORATION AND OPPORTUNITIES FOR ACTION

7. PRINCIPLES FOR COLLABORATION AND OPPORTUNITIES FOR ACTION

Using a mixed approach to empirical research (qualitative and quantitative), Earth Economics researchers conducted a structured multi-step, iterative analysis that included: (1) reviewing the collaborative governance literature to help develop expectations and evaluate the robustness of the empirical findings from other phases of the analysis; (2) expert interviews to identify key factors that help or hinder the performance of multi-benefit projects in L.A. County; (3) a systematic evaluation of local multi-benefit projects to select three case studies of replicable projects with highly desirable outcomes; and (4) a classification exercise to better understand project features and how they may be predictive of project success. Synthesizing key findings from all four stages led to the identification of key principles of collaboration and of specific opportunities for action that can support and add momentum to existing efforts that promote collaborative management.

Overall, evidence from the different empirical pieces of this research was consistent with the literature for successful collaborative efforts, particularly when examining social and economic indicators of success.[13] Earth Economics researchers repeatedly found some principles of collaboration that are relevant to all projects.[14] This report concludes with descriptions of these key principles and specific opportunities for action to support and add momentum to existing and future efforts promoting collaborative, systems-thinking approaches for addressing complex climate and social challenges (Koontz, 2016).[15]

The following principles call upon governing bodies and key stakeholder groups to consider various actions. These entities are defined as follows:

Governing bodies refers to public sector political and regulatory institutions including federal, state, regional, county, and local government agencies as well as designated interagency groups with authority to lead collaborative efforts. **Key stakeholder groups** include nongovernmental organizations, such as coalitions, nonprofits, and community-based organizations that work with governing bodies to engage in collaborative efforts.

[13] Several studies have identified economic and social benefits of collaborative governance, including grant leveraging, networking, and human and social capital, including Hibbard and Lurie (2006); Stedman et al. (2009); Connick and Innes (2003); Mandarano (2008); and Koebele (2015). Much less has been done to examine ecological conditions resulting from collaboration. Those that do include on-the-ground actions typically focus on outputs as proxies for outcomes (e.g., counting watershed projects completed (Sabatier et al., 2005), wetland plans and permits (Meyer & Konisky, 2007), hydroelectric dam license operational requirements (Ulibarri, 2015), and implementation of collaborative plan recommendations (Mandarano, 2008; Koontz & Newig, 2014)). Measuring ecological outcomes is challenging for many reasons, including the lack of time-series data measuring ecological conditions, the long time horizon between implementing actions and seeing ecological change, and the presence of many confounding factors other than collaborative partnership efforts that affect ecological conditions (Koontz & Thomas, 2006).

[14] Just as it is not possible to form a unified general recipe of what works and what does not work for every project, no theory of urban planning or collaborative governance can capture the full and irreducible complexity of public projects that attempt to address multiple ecological and social challenges.

[15] Collective impact describes an intentional way of working together and sharing information for the purpose of solving a complex problem (See, Kania & Kramer, 2011).

PRINCIPLE 1: A SHARED PURPOSE REQUIRES A SHARED LANGUAGE

Creating a shared language to build mutual understanding and shared purpose is a prerequisite for cross-sector collaboration (Emerson et al., 2012; Innes & Booher, 1999).[16] Doing so ensures consistency and transparency in assumptions and definitions and aligns stakeholder efforts across a given project's lifecycle in pursuit of complex goals (Koontz et al., 2004).

> ***Action Opportunity:*** Governing bodies and key stakeholders can **guide the development of a precise, common vocabulary** and understanding of key terms relevant to collaborative, multi-benefit projects. This effort can clarify assumptions, create alignment in pursuit of agreed-upon objectives, and facilitate trust-building to support collaboration. Using participatory and deliberative tools, such as charrettes and scorecards, can help facilitate the development of a shared language (TreePeople, 2015).

> ***Action Opportunity:*** Governing bodies and other key stakeholders can **lead the effort to identify and map benefits and beneficiaries of multi-benefit projects** to help resolve ambiguities in definitions.[17] Areas in particular need of common understanding among stakeholders include: (1) how to define a beneficiary community, (2) clearly defined community benefits offered by multi-benefit projects, (3) the needs of frontline communities as defined by those communities, and (4) accepted values or valuation methods for measuring these benefits. Such a mapping effort needs to be conducted with the support of and in collaboration with communities.

PRINCIPLE 2: THE RIGHT PROCESS DELIVERS THE RIGHT PROJECT

How entities go about developing and managing multi-benefit projects can influence the project's overall success (Emerson et al., 2012). Clear, mutually agreed upon rules for collaboration foster improved outcomes. Collaboration, while not a panacea, is a process that can influence a project's results and can therefore be a goal in and of itself (Thomas & Koontz, 2011). Such recognition can help break established conventions and widen the perspective of the groups seeking to collaborate on novel projects that build community resilience. L.A. County's HDW is an example of a process that explicitly and intentionally seeks to sustain collaboration throughout the stages of project development.

> ***Action Opportunity:*** Governing bodies and key stakeholders can **establish goals and metrics for both collaborative processes and project outcome performance**. Keeping a clear distinction between process evaluation metrics and multi-benefit project metrics—especially in a complex, multi-stakeholder process—can reduce ambiguity and align the efforts of planners and implementers[18]. In addition, these entities should unambiguously communicate the definitions of these goals and metrics to implementing entities.

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[16] See, for example, The Intersector Toolkit from the Aspen Institute.

[17] Creating a map of beneficiaries involves identifying and locating the populations impacted by a project in a map. It also requires identifying these populations' characteristics and relationships with the landscape, the project, and the project's effects. This identification process is only possible with deep community engagement. A conceptual map that shows system components and how they relate to each other is also an excellent option, as is a Sankey diagram connecting source of benefits to beneficiaries and illustrating distribution of resources. Alternatively, see, MapStakes (Barquet et al., 2022).

[18] This Principle aligns with the Scorecard Analysis methods, see Section 5.

Furthermore, incorporating aspects of participatory, deliberative, multi-criteria evaluation (like the scorecard approach used in this study[19]) to kick-start metrics development can improve both project development processes and project outcomes (Remington-Doucette, 2017).[20]

PRINCIPLE 3: CULTIVATING MUTUALLY REINFORCING GOALS AND STRATEGIES PROMOTES COLLABORATION

Individual agency goals and strategies are often aligned with a broader vision (e.g., county or regional). However, pursuit of those mutually reinforcing goals and strategies typically occurs in silos. Identifying and aligning mutually beneficial goals across agency partners can advance opportunities to collaborate on multi-benefit projects. Crafting project strategies that are consistent with an overarching strategic plan will cultivate the process of identifying opportunities for collaboration (Kania & Kramer, 2011).

Action Opportunity: Governing bodies can **review their individual goals and strategies for consistency with key planning documents** (e.g., county or regional sustainability plans; equity, diversity, and inclusion plans; and climate vulnerability plans) **to determine opportunities for collaboration** (e.g., design, planning, funding, implementation, maintenance, and/or monitoring) that can help multiple agencies deliver better and more diverse benefits than if projects were pursued individually.[21]

Action Opportunity: Governing bodies can **designate a neutral convening entity to guide participating agencies and stakeholders** through a strategic review of goals, objectives, policies, regulations, projects, contracts, and metrics to help ensure they are mutually reinforcing and aligned with a shared purpose.

PRINCIPLE 4: A NEUTRAL CONVENING ENTITY FACILITATES COLLABORATION

The benefit of a neutral facilitating entity is that it can provide a physical or virtual space for members to deliberate and problem-solve around topics that may extend beyond the reach of their individual agencies or organizations. Facilitation is a crucial component of collaboration, as cross-sector collaboration depends on systems for building and maintaining consensus. Effective facilitating entities can be external professional facilitators or task-oriented committees formed by stakeholders themselves (Innes & Booher, 2010; Leach & Sabatier, 2003). These entities or committees should be appropriately equipped with dedicated resources (e.g., skills, funding, and staff capacity) and the authority to fulfill their role as conveners (e.g., communicating with members,

[19] See Appendix C for a scorecard template.

[20] Using a deliberative and participatory approach to developing evaluation tools and metrics, like scorecards, can facilitate the collaborative model for project development by helping ensure efforts remain aligned, helping project partners maintain coordination of different activities, helping create a common vocabulary, and building trust and working relationships. A scorecard can also help develop clear project goals and identify their appropriate metrics.

[21] For example, The Los Angeles County Department of Parks and Recreation is developing their own sustainability plan to ensure that its programs are consistent with broader County sustainability goals.

coordinating the development of strategic or project plans, and supporting meetings). As conveners, these entities can listen to collaborators to enhance engagement across departments.

> ***Action Opportunity:*** Governing bodies and key stakeholders can **identify or designate a coordinating entity** (e.g., similar to the role L.A. County's Department of Public Health played in the HDW) **or a coordinating committee within the group of collaborators** to support the core functions of convening, such as communicating with members, developing strategic plans, supporting meetings, and coordinating project implementation. Coordinating entities must be given dedicated resources (e.g., skills, funding, and staff capacity) to fulfill this role.

PRINCIPLE 5: CULTIVATING WHOLE-SYSTEMS LEADERSHIP FORTIFIES CULTURES OF COLLABORATION

Strong projects are often guided and/or supported by visionary leaders who prioritize collaboration. Because mobilizing toward common goals takes motivation, problem-solving, and intent, it is vital to have visionary, creative, and collaborative leaders (Leach & Pelkey, 2001). Such leaders can help overcome bureaucratic hurdles and build political will to pursue novel projects that grow agency capability and increase benefits to the communities they serve (Bryson & Crosby, 2014; Jansen et al., 2008). Cultivating a durable culture of collaboration helps attract those visionary, creative, whole-systems-thinking leaders. Moreover, once ingrained in mid- and high-levels of an institution, a multi-benefit mindset will persist despite changes in leadership (Korfmacher, 2019).

> ***Action Opportunity:*** Governing bodies can **adopt explicit organizational goals, strategies, and enabling mechanisms for training, retaining, and supporting visionary, creative, and collaborative leadership at all levels**. These entities can design and create mechanisms to cultivate, retain, and support creative, cooperative, and visionary leadership. The purpose should be to help create an ecosystem of people within agencies and other institutions with a durable culture of collaboration, institutional memory, and an ingrained multi-benefit mindset to building climate resilience (Korfmacher, 2019). Examples include training staff in participatory planning and partnership development, reviewing existing job classifications and including collaboration as an explicit responsibility, and developing employee review procedures that reward collaboration.

> ***Action Opportunity:*** Governing bodies and key stakeholders can **set up internal systems for maintaining institutional memory** (e.g., rotating staff participation, regular reporting among staff, and clear documentation of project meetings and decisions) and regular communication with their constituents about their roles in collaborative initiatives and the value of such work (Korfmacher, 2019).

> ***Action Opportunity:*** Governing bodies, philanthropic organizations, and academic institutions can **invest in cross-sector, whole-systems learning, capacity building, and leadership development**. Local universities can function as workshop hosts and provide professional certifications (e.g., Wolfson et al., 2015). Such investments would help to build and sustain relationships across multiple institutions while preparing future leaders to

navigate complex challenges and opportunities facing social and natural systems that are threatened by climate change (Wondolleck & Yaffee, 2000).

PRINCIPLE 6: COMMITMENT TO COLLABORATION BOLSTERS MULTI-BENEFIT PROJECT OUTCOMES

Carefully designed partnership structures, ranging from informal to formal arrangements, can facilitate collaboration, improve outcomes, and support the formation of new partnerships (Terman, 2020). They can also help mitigate potential risks of collaboration, such as duplication, budget exceedance, mission creep, high administrative and transaction costs (e.g., staff capacity or convoluted bureaucratic processes), and path dependency (i.e., only following previous approaches) (Emerson et al., 2012). The best-performing projects all featured collaborative leadership.

Action Opportunity: As an informal strategy, governing bodies and key stakeholders can explicitly **seek to build trusted relationships with partners and beneficiary communities**, for example, by reserving funding for relationship-building and following best-practices for community engagement (Gonzalez et al., 2017). These informal approaches are powerful trust-building tools and, at times, more cost-effective than their formal counterparts (Goldsmith & Eggers, 2004; Leach & Pelkey, 2001).[22] Moreover, governing bodies and key stakeholder groups can explicitly establish measurable goals for community engagement to demonstrate commitment to collaboration.

Action Opportunity: Governing bodies can **lead efforts to formalize collaborative mechanisms** to institutionalize trust and reduce ambiguity around roles and responsibilities (Ansell & Gash, 2008; Getha-Taylor et al., 2019). These efforts can include directing the identification and development of standard agreements and partnership models suited to different scenarios, such as individual projects, types of projects (e.g., greening schoolyards), or broader interagency processes. These partnership models can vary in reach and complexity and include independent workgroups or networks like L.A. County's HDW; Memoranda of Understanding (MOUs), which are commitment indicators showing parties have reached an understanding and are ready to move forward; or more formal structures (such as Joint Power Authorities or Enhanced Infrastructure Finance Districts).

Action Opportunity: Governing bodies can **establish "model MOUs" for participating agencies to adopt**. Model MOUs are standard agreements that could be repurposed without being individually vetted—saving time—and which can expedite future joint projects by:

- Enabling equal participation in the formation of—and access to—common pool resources (e.g., one agency sharing its curriculum to support training outside staff in specialized skills in green infrastructure management);[23]

[22] Leach and Pelkey (2001) highlight the notion that a partnership's strength lies in its ability to provide a flexible, informal, and relatively egalitarian alternative to traditional forms of resource management.

[23] In this research, Earth Economics found that forming and sustaining the reliable, well-trained workforce of community volunteers and conservation corps that were present in many successful collaborative multi-benefit projects requires significant

- Allowing the transfer of liabilities and therefore encouraging partners to design projects with regional impacts. For example, city or county governments can take on the liability for particular project features, giving project developers sufficient leeway to implement more ambitious plans. The Jeff Seymour Family Center in the City of El Monte is one example where the City accepted liability for allowing the school district to build a bike pump track without fear of litigation over injuries in exchange for after-hours community access to the school grounds' recreational and natural amenities;[24] and
- Allowing for fast-tracking certain project types or components (McGuire, 2006; Thomson & Perry, 2006).

Action Opportunity: Governing bodies and key stakeholders can **create or adopt existing MOUs with lists of pre-approved CBOs and nonprofit organizations that are eligible to work as community-liaisons** so that participating agencies can partner with those organizations to strengthen community engagement efforts. At least one such MOU already exists in L.A. County, initiated by the HDW.[25]

Action Opportunity: Governing bodies can **select an agency or create an independent entity to provide guidance and incentives for agencies, school districts, community-based organizations, or other stakeholders** to follow the format of cooperation best suited to their given objective (Kania & Kramer, 2011; Hanleybrown et al., 2014). Such an agency or entity, which can be structured like a Joint Powers Authority (Bernstein, 2020; Bingham, 2014)[26] can also have the authority to host capacity-building programs that facilitate collaboration (e.g., a leadership program) or form Enhanced Infrastructure Finance Districts (EIFDs) to finance public infrastructure projects in a timely fashion.[27]

PRINCIPLE 7: A KNOWLEDGE HUB DEMOCRATIZES DATA AND RESOURCES

Knowledge hubs are institutions or networks dedicated to capturing, sharing, and exchanging information with partners in order to accelerate project development (World Bank, 2012). Readily available and easily interpretable data and technical resources can help capacity building, project development, metric selection, and efforts to evaluate and communicate the importance of multi-benefit solutions (Korfmacher, 2019; Koppenjan et al., 2004). Moreover, having comprehensive and publicly available information on the benefits of different types of multi-benefit projects (e.g., urban

social capital. Jointly forming a workforce is an excellent opportunity for avoiding duplication and redundancies and for taking advantage of the efficiencies derived from specialization and task division.

[24] The Centers for Disease Control and Prevention (CDC) has published on characteristics of joint use agreements in school districts in the U.S. See, Everett Jones & Wendel, 2015.

[25] See discussion on fuels and frictions (Fuel 2 and Friction 6).

[26] A Joint Powers Authority (JPA) serves as the backbone organization establishing collaboration processes and with dedicated staff. In California, JPAs are agreements that either allow two or more public agencies to contract to jointly exercise common powers or allow them to form a separate legal entity with independent legal rights, including the ability to enter contracts and hold property.

[27] EIFDs are a tool to fund economic development projects within a geographic boundary utilizing tax increment financing. They are one of the more popular tools for economic development at the local level and offer means to spur new infrastructure development, attract new capital deployment, and align public funding resources in a geographic area to support business and residents. See, https://opzones.ca.gov/enhanced-infrastructure-financing-districts-eifds/

heat mitigation, water quality, or recreation access) and their beneficiaries (e.g., sectors, agencies, businesses, or communities) can provide a foundation to align potentially conflicting agendas, prioritize project components, and inform project planners about local conditions.

> ***Action Opportunity:*** Governing bodies, academic institutions, and the philanthropic sector can **invest in research, data sharing, and the translation of research for public and interagency use**. They can support the compilation, translation, and publication of research—including technical studies conducted in preparation for, or in assistance of, past and ongoing multi-benefit projects. Research need not be focused on projects, either: other broader or process topics could include measuring the local economic benefits of a green economy, standardized approaches for quantifying community benefits, exploring novel forms of partnership and their potential to support project work and better outcomes, or developing and using optimal participatory deliberative multi-criteria evaluation tools.[28]

> ***Action Opportunity:*** Governing bodies, key stakeholders, academic institutions, and philanthropic organizations can **streamline the process for their research to become part of a common pool of intellectual property** that includes open-source software and open-access GIS products, publications, and datasets.

> ***Action Opportunity:*** Governing bodies can **commission the creation of an inventory of vacant and/or underutilized lands that can be adapted as multi-benefit project sites or turned into supportive sites to produce intermediary products for those projects**. For example, transforming vacant and/or underutilized lots into multi-benefit project sites or supportive sites (e.g., native plant nurseries).

PRINCIPLE 8: A STRONG GREEN WORKFORCE IS NECESSARY TO ACHIEVE CLIMATE RESILIENT OUTCOMES

A well-developed green workforce is needed to deliver high-quality and time-efficient multi-benefit projects that are also cost effective. Such a workforce can also provide timely maintenance and repair services, often needed for multi-benefit, nature-based solutions (LAANE, 2018). Moreover, it can be a driver of economic growth and upward mobility. Thus, it is in the interest of those seeking to advance place-based, multi-benefit project development and implementation to strengthen enabling conditions for a reliable green workforce.

> ***Action Opportunity:*** Governing bodies can **establish workforce development programs that train workers and certify contractors with specific skills to meet demand based on project pipeline projections.** A recent legal analysis of L.A. County notes that such programs could be financed by pooling funding from Measures W, H, and A (Zinn & Balagopalan, 2022). These development and certification programs could be incorporated into hiring policies and labor contracts to promote equitable hiring practices. Training programs can also include incentives, such as GED-certification assistance, as was available to youth involved in the LIBWT project.

[28] Earth Economics found this process highly replicable and invites other entities to mirror the steps taken to conduct a project evaluation analysis systematically and objectively and arrive at a case study selection.

Action Opportunity: Governing bodies can **seek long-term contracts with certified entities that specialize in the maintenance and monitoring of multi-benefit green infrastructure projects**. These groups could be part of a certified list with a model MOU (see Principle 6). Contracts could follow just, equitable hiring practices and prioritize those that have gone through a locally-recognized workforce development program. Taking this approach may require reviewing current contracts to see if they help meet equity, climate resilience, and sustainability goals, and revisiting existing long-term contracts (e.g., recurring paving contracts).

PRINCIPLE 9: FLEXIBLE FUNDING PROMOTES PROJECT EFFECTIVENESS

Research shows that funding terms and agreements are two vital ingredients to collaborative implementation (Koontz & Newig, 2014). The timing and conditions associated with leveraging multiple funding sources are major challenges for developing cohesive and efficient projects. Many of the most creative and promising project types must be tabled until future funding cycles open, delaying important community benefits or leaving gaps in the project lifecycle, which can limit co-investment of funds and resources. This was a recurring finding throughout this study.

Earth Economics found that relying on bond measures and grants with rigid schedules makes strategic, sequential, and incremental planning overly difficult and strenuous. **Earth Economics additionally found that O&M is a typical breaking point for multi-benefit projects, partially as a result of the structure of funding cycles**. Because grants for infrastructure projects are typically provided in stages, project developers often develop an O&M plan only once construction has been funded. Comprehensive funding awards that allow for both construction and O&M activities may encourage project developers to develop O&M plans alongside construction plans and set project longevity as a priority indicator of impact and success. Moreover, access to reliable and flexible funding streams would improve the planning and design process and would also help project proponents leverage additional funds (Korfmacher, 2019). In L.A. County, multi-benefit projects that offer stormwater benefits can now apply for SCWP funds to cover O&M if the project application includes a robust O&M plan and schedule. Future funding sources should consider financing O&M activities and/or allowing projects to flexibly use blended sources of funds to address the issue of long-term maintenance.[29]

Action Opportunity: Philanthropic institutions and funding agencies can **create more flexible funding terms and timing (e.g., aligning funding cycles or accepting rolling applications) in service of improved project outcomes** (Korfmacher, 2019). With increased flexibility, funding sources could incorporate mechanisms that accommodate innovation and adaptation over the long-term as new multi-benefit opportunities emerge.

[29] An important concept raised many times in the interview process was the ability of taxes to fund O&M. Relying on bond measures and one-time grants makes strategic, sequential planning overly difficult and strenuous. Access to stable, though not unlimited, funding sources would improve the planning and design process and would also help project proponents leverage additional resources. Funds fueled by taxes are typically designed to be provided over time, which makes it easier to plan for ongoing O&M needs.

Action Opportunity: Recognizing that O&M is a common breaking point for multi-benefit projects, governing bodies and funding agencies can **ensure projects include designated and continuous O&M funding by identifying and seeking alternative mechanisms for perpetual O&M funding** in future multi-benefit infrastructure policies. For example, county agencies could pay for O&M activities using funds collected through Landscape Maintenance Districts. [30]

- To help accomplish this effort, governing bodies and grant providers can evaluate grant applications based on a project's O&M plan in addition to other evaluation criteria.

Action Opportunity: Governing bodies and key stakeholders can **explore the legal intricacies of existing funding terms to discover as yet unrecognized flexibilities**. One example is the legal analysis commissioned by L.A. Waterkeeper to study opportunities for bringing together funds from L.A. County Measures W, H, A, and M; this analysis revealed possibilities for interagency collaboration to blend funds across measures and leverage other local, state, and federal funds (Zinn & Balagopalan, 2022).

- If legally feasible, governing bodies can consider creating a shared fund to cover costs related to cross-agency O&M activities. These funds can be used to pay workers from a certified pool of trained laborers or a list of authorized contractors. In addition, agencies can collaboratively manage these funds and create training and certification programs (see discussion under Principle 8), and they can work together to expedite the hiring of their services through MOUs (see Principle 6).

Action Opportunity: Project proponents can **seek funding for studies establishing baseline social and ecological conditions at potential project sites as well as project monitoring and evaluation** to assess what has worked (or not worked) as intended. This will help facilitate periodic project evaluation and measure project success.

[30] A Landscape Maintenance District (LMD) is a district where property owners can choose to pay for enhanced landscaping and other maintenance services (beyond those that are generally provided by the County) through parcel taxes. In this research, one of the ten sampled projects (Public Works' East L.A. Sustainable Median Stormwater Capture Project) effectively used money collected through LMDs to apply for additional funding that would cover below-ground improvements.

FUTURE RESEARCH

8. FUTURE RESEARCH

Throughout the research process, Earth Economics researchers developed several overarching observations for improving current understanding of processes and outcomes related to collaborative management of multi-benefit projects. The following discussion on research gaps and suggestions for future studies can be helpful to project proponents and those in positions to propose, develop, and manage initiatives for advancing a resilient and equitable future in L.A. County.

The careful design of participatory mechanisms can promote collaboration and deep community engagement.

Incorporating aspects of participatory, deliberative, multi-criteria evaluation into future County efforts can facilitate discussions that kick-start program/project design, planning, and prioritization. A key challenge for leaders of collaborative partnerships is how to engage with stakeholders and representative participants; this includes selecting and/or energizing participants, managing discussions, generating actionable plans, and following through to solve problems. Understanding the role of participation in multi-benefit infrastructure development and management is an important step for future program/project design. In addition, understanding the conditions under which collaboration fosters social learning and community building for participants can be beneficial for guiding community engagement (Kouw, 2014).

A larger sample size and a deliberative multi-criteria evaluation approach can strengthen findings.

Overall, the approach developed for this research is systematic, founded on best practices, and replicable. Therefore, other entities and/or working groups can incorporate aspects of these methods into future processes. If resources are available, Earth Economics recommends that (1) a larger sample of projects are selected and (2) this approach be further developed into a participatory deliberative multi-criteria evaluation approach (DMCE).[31] As Liu and colleagues (2011) explain, a DMCE approach should provide for a truly iterative procedure as more information becomes available and more discussion and deliberation takes place (Liu et al., 2011). Ideally, the process would involve multiple months of workshops held at regular intervals. Such methods could help facilitate discussions about project design, planning, and prioritization.

Future research should examine counterfactuals or contrasting cases.

Periodic project evaluation to identify other successful efforts in the collective drive toward a resilient and equitable future can help refine the strategy to unlock more benefits for more Angelenos through strengthened collaboration. However, a research design that only examines "successful" cases can produce incomplete conclusions. Future research can also include contrasting "less successful" cases. This would allow more robust conclusions about

[31] The DMCE method combines the structure and integration features of traditional multi-criteria decision-making tools with the facilitation, interaction, and consensus-building features of a citizen's jury process, therefore injecting scientific rigor and transparency in the decision-making process while providing a platform for discussion of uncertainties and complexities associated with a project. It has been developed to encourage more effective engagement of multiple stakeholders in the decision-making process.

factors attributing to success or failure, because the presence of a given variable across several “most successful” cases does not mean that variable is helpful, if the analysis does not also look for the presence of that variable in the “less successful” cases. For example, if all the “most successful” cases have collaborative leadership, but the “less successful” cases also have collaborative leadership, then the presence of collaborative leadership is not a sufficient condition for success. Thus, future researchers should not seek only “successful” cases.

Experiment with weights in a multi-criteria decision making process.

Future research can incorporate the use of weights into a multi-criteria decision-supporting tool. In this study, the scorecard allowed for weights to adjust project scores favoring certain characteristics over others, although this strategy was not employed.

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APPENDIX A: EXPERT INTERVIEWS

Conversations were held with:

- Belinda Faustinos. L.A. Waterkeeper and Infrastructure Justice L.A. (formerly the "WHAM Coalition"). Date interviewed: Jan. 2022
- Clement Lau. L.A. County Department of Parks and Recreation. Date interviewed: Jan. 2022
- Rebecca Ferdman. L.A. County Chief Sustainability Office. Date interviewed: Jan. 2022
- Bryn Lindblad. Climate Resolve. Date interviewed: Jan. 2022
- Jean Armbruster and Justin Roberston. L.A. County Department of Public Health. Date interviewed: Jan. 2022
- Teresa Villegas. L.A. City Board of Public Works. Date interviewed: Feb. 2022
- Claire Robinson. Amigos de Los Rios. Date interviewed: Feb. 2022
- Shelley Luce. Former CEO, Heal the Bay. Date interviewed: March. 2022
- Other stakeholders and experts.

Ideas and themes that emerged from these conversations prompted additional, more specific discussions with other experts. For instance, Earth Economics identified a need to understand how green infrastructure projects and workforce development questions intersect, which led to discussions with Lauren Ahkiam at Los Angeles Alliance for a New Economy and Green Infrastructure planners at the San Francisco Public Utilities Commission. Also, Earth Economics researchers determined that greening schoolyards warranted additional discussion to understand how the multi-benefit nature of these projects can help advance County resilience goals. This led to meetings with multiple Measure W Watershed Coordinators and representatives (Mike Antos, Tara Dales, Nancy Shrodes, Mikaela Randolph, and Clarasophia Gust) and participation in the Schools and Stormwater Symposium that took place on May 19th, 2022.

APPENDIX B: FUELS, FRICTIONS, AND CONCLUSIONS

Table B. Principles and their corresponding fuels.

Principle	1. A shared purpose requires a shared language	2. The right process delivers the right project	3. Cultivating mutually reinforcing goals and strategies	4. A neutral convening entity	5. Cultivating whole-systems leadership	6. Commitment to cooperation	7. Knowledge hubs for resilience	8. A strong green workforce	9. Flexible funding
Fuel 1: Expectation for sustained collaboration	●	●	●	●		●			
Fuel 2: Reciprocal relationships with communities		●				●	●		
Fuel 3: Collaborative leadership			●		●				
Fuel 4: Institutional memory of successes	●				●	●	●		
Fuel 5: A diverse team					●		●	●	
Fuel 6: Knowledge of benefits and risks					●		●		
Friction 1: Outcome and process metrics	●	●							
Friction 2: Diverging understandings	●		●	●					
Friction 3: Perceived collaboration risk				●		●			
Friction 4: Resources, capacity, and authority				●		●	●	●	●

Principle	1. A shared purpose requires a shared language	2. The right process delivers the right project	3. Cultivating mutually reinforcing goals and strategies	4. A neutral convening entity	5. Cultivating whole-systems leadership	6. Commitment to cooperation	7. Knowledge hubs for resilience	8. A strong green workforce	9. Flexible funding
Friction 5: Isolated goals and objectives		●	●	●	●	●			
Friction 6: A lack of community engagement						●			
Friction 7: High transaction costs	●			●		●			●
Friction 8: Bureaucratic burdens			●	●	●	●			●
Friction 9: Loss of institutional knowledge		●				●	●		
Friction 10: Path dependency							●	●	
Friction 11: Underdeveloped green workforce					●			●	
Friction 12: Rigid funding structures									●

APPENDIX C: SCORECARD TEMPLATE

Purpose Earth Economics researchers developed this scorecard as a tool to,
(1) objectively select case studies to feature in the final report,
(2) conduct a classification analysis aimed at identifying the most important project features for project performance, and
(3) gain insights about the project evaluation process (e.g., differences between metrics that are useful to assessing project development procedures versus assessing project performance).

This tool can be useful for those in L.A. County and beyond who are interested in developing a systematic approach to project evaluation (e.g., Department of Public Works, which is leading a Metrics and Monitoring Study; Department of Parks and Recreation that is developing a Sustainability Plan; the newly formed County Resilience Office; and the WHAM Taskforce).

The scorecard allows the use of weights. In this study, weights were not implemented, but it is an interesting feature of multi-criteria project evaluation that could be incorporated in future efforts to help project scoring reflect political or agency priorities like public health, sustainability, or climate resilience.

Earth Economics researchers completed a scorecard for each of the ten projects.

SCORECARD INSTRUCTIONS

STAGE 1: STEPS FOR SCORING COLLABORATIVE PROCESS CRITERIA	
Step 1	1. Using a binary scale (-1/1 indicating no/yes), answer whether the project meets the specified outcome in the "Score" column. In the "Metrics" column, identify what characteristics justify the scoring value. Projects that have not yet gone through that stage receive a "0" value. 2. Total the scores and enter under "SUM OF SCORES." 3. If the sum of the scores is greater than or equal to zero (i.e., there are at least as many "yes" as there are "no"), the project is considered "collaborative."
Step 2	1. Distribute 60 points across these outcomes to reflect their relative importance in determining project favorability (favorability may depend on collaborative project process and/or project performance considerations). For example, if you think only one criterion is important to define whether a project is successful, you will give this criterion all 60 points. If you think all the criteria are equally important for defining success, you will give each criterion 10 points. Give each criterion a value of importance under the "weight" column. The sum of all values should be 60. Also, using the "Critical criterion" column, specify with an asterisk if you think a particular criterion is critical and have weighted it of higher importance. 2. Divide the assigned number by 60 and multiply by 6. 3. Calculate the sum of scores and enter the total under "WEIGHTED SUM OF SCORES." 4. If the sum of the scores is greater than or equal to zero (i.e., there are at least as many "yes" as there are "no"), the project is considered "collaborative."

STAGE 2: STEPS FOR SCORING PROJECT OUTCOME CRITERIA	
Step 1	1. In the "Score" column, use a scale from -5 to 5, with 0 being no impact, to indicate the project's impact on the following list of outcomes. In the "Metrics" column, identify what characteristics justify the scoring value. 2. -5 = worst outcome 3. 0 = same/no impact 4. 5 = best outcome 5. Total the scores and enter under "SUM OF SCORES." 6. Sum the scores and score the final value to compare with other projects.
Step 2	1. Distribute 120 points across these outcomes to reflect their relative importance in determining project favorability (favorability may depend on collaborative project process and/or project performance considerations). For example, if you think only one criterion is important to define whether a project is successful, you will give this criterion all 120 points. If you think all the criteria are equally important for defining success you will give each criterion 10 points. Give each criterion a value of importance under the "weight" column. The sum of all values should be 120. Also, using the "Critical criterion" column, specify with an asterisk if you think a particular criterion is critical and have weighted it of higher importance. 2. Divide the assigned number by 120 and multiply by 12. 3. Total the scores and enter under "WEIGHTED SUM OF SCORES." 4. *Optional:* For further analysis, group the scores of certain criteria as shown in the "SUMMARY OF SCORES BY GROUPING" table.

SCORECARD TEMPLATE: STAGE 1

STAGE 1: COLLABORATIVE PROCESS CRITERIA			**PROJECT NAME:**			
Grouping	Criteria	Description	1		2	
			Score	Metrics	Weight	Critical criterion
Management objectives	Co-envision	Multiple organizations (including agencies, nonprofits, private parties, etc.) came together to create a shared vision of the project.			A/60x6	
	Co-plan	The project is co-planned by multiple entities (includes county agencies, nonprofits, private parties, etc.).			B/60x6	
	Co-design	The design of the project is executed by multiple partners/ stakeholders.			C/60x6	
	Co-investment	The project utilizes and shares, or is scheduled to utilize and share, funding from multiple sources, particularly from implementing agencies.			D/60x6	
	Co-implementation	Project is implemented by multiple entities.			E/60x6	
	Accountability	There is clarity over the boundaries, roles, and authorities of participating entities (i.e., clear jurisdictions).			F/60x6	
SUM OF SCORES FROM STAGE 1 OUTCOMES:			SUM OF SCORES /6		WEIGHTED SUM OF SCORES /6	

SCORECARD TEMPLATE: STAGE 2

STAGE 2: PROJECT OUTCOMES CRITERIA			PROJECT NAME:			
Grouping	Outcomes	Description	1		2	
			Score	Metrics	Weight	Critical criterion
Process objective	Climate policy alignment	Project objectives support a development model that advances climate resilience principles.			a/120x12	
	Public participation	The project involves high-quality community and stakeholder engagement/ is responsive to community input and needs.			b/120x12	
	Replicability	The project model can be replicated elsewhere.			c/120x12	
Society	Social cohesion	Project promotes/strengthens social cohesion (e.g., through public participation) and existing or new support systems.			d/120x12	
	Equitable investment	Project addresses historical inequities and reduces systemic harm to disadvantaged communities.			e/120x12	
	Social coverage (scale)	Project provides benefits to multiple communities.			f/120x12	
	Multi-benefits	The project provides multiple social and ecological benefits like job creation, housing, transportation, parks, urban heat island mitigation, or habitat enhancement.			g/120x12	
Environment	Ecosystem function	Project supports natural processes and helps improve ecological systems (e.g., water, soil, climate, or carbon). It also supports habitat for improved quality of life for human and non-human populations.			h/120x12	
Economics and Finance	Financial sustainability	The project has a sound/safe financial model (i.e., it is dependable and can deliver benefits without running out of money).			i/120x12	
	Economic resilience	Project provides sustainable job opportunities to local communities.			j/120x12	
	Economic Development	Project helps support local businesses and/or creates opportunities for growth in local economic subsectors.			k/120x12	
Maintenance	Project maintenance, monitoring, and sustainability	Project is maintained and functioning as (or close to) intended.			l/120x12	
	SUM OF SCORES FROM STAGE 2 OUTCOMES:		SUM OF SCORES /60		WEIGHTED SUM OF SCORES /60	

SCORECARD TEMPLATE: SUMMARY OF SCORES BY GROUPING

PROJECT NAME:	DEFAULT	WEIGHTED
Collaborative Process criteria (Stage 1)		
Management objectives		
Project Outcomes criteria (Stage 2)		
Process objectives		
Results objective: Society		
Results objective: Environment		
Results objective: Economics and Finance		
Results objective: Maintenance		
TOTAL	/66	/66

APPENDIX D: STANDARDIZED SCORING RESULTS

Table D: Standardized scores for all outcomes by project.

	Project 1	Project 2	Project 3	Project 4	Project 5	Project 6	Project 7	Project 8	Project 9	Project 10
Collaborative process										
Co-envision	1	1	1	1	1	-1	1	1	-1	1
Co-plan	1	1	1	1	1	-1	1	1	1	1
Co-design	1	1	1	1	0	-1	0	1	1	1
Co-investment	1	1	1	1	-1	1	1	1	1	-1
Co-implementation	1	1	1	0	0	-1	0	1	1	1
Accountability	1	1	1	1	1	1	1	1	-1	-1
Multi-benefit project outcomes										
Process										
Climate policy alignment	0.3	0.8	1	0.4	1.0	0.7	0.0	0.8	0.8	0
Public participation	1.0	1.0	1	1.0	1.0	0.4	0.4	0.9	0	1.0
Replicability	1.0	1.0	1	0.0	1.0	0.9	0.6	0.7	0.7	0
Results										
Society										
Social cohesion	1.0	1.0	1	0.6	0.5	0.1	0.5	0.6	0.0	0.2
Equitable investment	1.0	1.0	1	0.8	0.8	0	0.1	0.5	0.2	1.0
Social coverage (scale)	1.0	1.0	1	1.0	0.4	1.0	0.6	0	0.3	0.4
Environment										
Multi-benefits	1.0	1.0	1	0.9	0.4	1.0	0.7	0.3	0.7	0
Ecosystem health	0.1	1.0	1	0.0	0.1	0.5	0	0.4	0.5	0.1
Economics and Finance										
Financial sustainability	0.7	0.7	1	0.8	0.4	0.7	1.0	0	0.5	0.3
Economic resilience	1.0	0.5	1	0.5	0.0	0.0	0	0	0	0
Economic development	1.0	0.3	1	0.6	0.4	0.0	0	0	0.4	0
Maintenance										
Maintenance/sustainability	0.9	0.6	0	0.8	0.4	1.0	0.9	0.1	0	0.4

APPENDIX E: LINKS TO PROJECTS

Table E: Projects and links to more information.

PROJECT NAME	RESOURCES
Life is Better with Trees	PLACE program, HDW website Life is Better with Trees project.
Jeff Seymour Family Center	The Jeff Seymour Family Center Amigos de los Rios project website
Urban Orchard Park	The TPL project website The City of South Gate's Department of Public Works project website
Elmer Avenue + Elmer Paseo	Council for Watershed Health Elmer Avenue/Paseo project website
East L.A. Sustainable Median Stormwater Capture Project	Public Works project information and the SCWP portal
Adventure Park Multi-Benefit Stormwater Capture Project	Public Works project information and the SCWP portal
Rio Hondo Westside Multi-Use Trail	Emerald Necklace Implementation Plan Phase I Watershed Conservation Authority project website
The Active Transportation Rail to River Corridor Project –Segment A	The Metro project website and the SCWP portal.
Sherman Way Station Urban Cooling and First-Last Mile Strategic Plan	Alta's project website
Multi-benefit Stormwater Management Projects at the Hillary T Broadous School and Open Magnet Charter School Cistern and Stormwater Retrofit	TreePeople's "The Power of Schools" report and "Moving Towards Collaboration" report