GREEN INFRASTRUCTURE, CLIMATE RESILIENCE, & HEALTH EQUITY

AN INTEGRATED POLICY AGENDA

PREPARED BY THE PUBLIC HEALTH ALLIANCE OF SOUTHERN CALIFORNIA

MAY 2022

Public Health Alliance™
OF SOUTHERN CALIFORNIA

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ACKNOWLEDGEMENTS

This policy agenda was authored by the Public Health Alliance of Southern California (Public Health Alliance). The Public Health Alliance is a coalition of the executive leadership of 10 local public health jurisdictions (LHJs) in Southern California. Collectively, the Public Health Alliance's members have statutory responsibility for the health of 60% of California's population. The Alliance vision is "vibrant and activated communities achieving health justice and opportunities for all." The Public Health Alliance builds healthy, equitable communities through upstream multi-sector policy, systems and environmental change; and mobilizes the transformative power of local public health for enduring health equity. The Public Health Alliance is fiscally administered by the Public Health Institute.

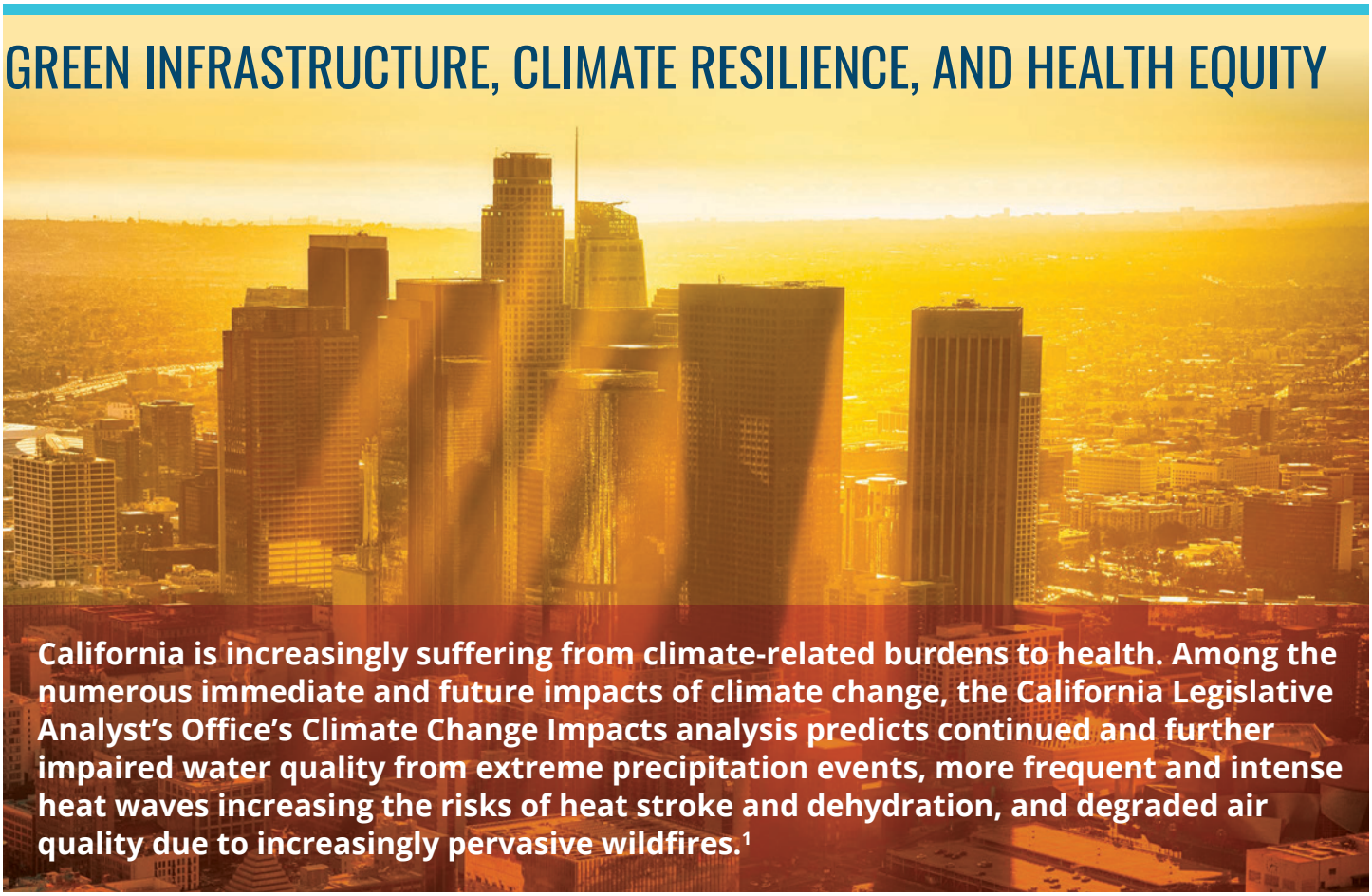
This report was supported by generous funding from the Resources Legacy Fund. The analyses, interpretations, or conclusions reflected in this report are those of the author(s) and do not necessarily reflect the positions or views of the Resources Legacy Fund.

We would like to thank the following organizations and agencies who contributed their time and valuable insight and expertise to this report. The analyses, interpretations, or conclusions reflected in this report are those of the author(s) and do not necessarily reflect the positions or views of the organizations listed below. **Note that all information presented in this report is anonymous and not attributed to any particular individual, organization or agency unless we received explicit approval to include identifiable information.**

Accelerate Resilience Los Angeles
California Department of Insurance
California Environmental Justice Alliance
California Releaf
California State Water Resources Control Board, Division of Water Quality
California Stormwater Quality Association
Center on Race, Poverty, and the Environment
Climate Resolve
Cultiva La Salud
East Bay Municipal Utilities District
Environmental Health Coalition
Global Cool Cities Alliance
Greenlining Institute
Heal the Bay
Indigenous Peoples Law and Policy Program, University of Arizona, Rogers College of Law
Los Angeles City Department of Public Works, Bureau of Street Services
Los Angeles County Department of Public Health
Los Angeles County Parks Department
Los Angeles Department of Public Works
Nature Conservancy
New York City Mayor's Office of Sustainability
Planning and Conservation League
Rails to Trails Conservancy
Reflo
Safe Routes Partnership
Strategic Concepts in Organizing and Policy Education
Top Leaf Farms
Tree People
Trust for Public Land
Tulsa County Public Health Department
UCLA Luskin Center for Innovation
United States Forest Service

INTRODUCTION

GREEN INFRASTRUCTURE, CLIMATE RESILIENCE, AND HEALTH EQUITY



California is increasingly suffering from climate-related burdens to health. Among the numerous immediate and future impacts of climate change, the California Legislative Analyst's Office's Climate Change Impacts analysis predicts continued and further impaired water quality from extreme precipitation events, more frequent and intense heat waves increasing the risks of heat stroke and dehydration, and degraded air quality due to increasingly pervasive wildfires.[1]

Whether it's floods, fires, heat waves, or other climate disasters, the road to recovery is unequal.[2] Vulnerable populations lack resources to adequately prepare for, respond to, or recover from climate impacts. Structural and systemic inequality and racism have exacerbated climate-related inequities resulting in Black, Indigenous, and people of color (BIPOC) communities bearing the brunt of climate-driven extreme heat, flooding, poor air quality, forest fires, and natural disasters. Low-income and BIPOC communities have been denied the resources and investments needed to build community climate resilience.[3] People of color disproportionately live in places with lower air and water quality, higher incidences of the urban heat island effect, less access to parks and green spaces, fewer and more poorly maintained amenities in public places, and gathering spaces that serve as platforms for community cohesion and social capital.[4] Additionally, these same communities often lack the political power of more affluent communities leading to fewer investments in solutions to address the social drivers of health. Tribal nations in particular were dispossessed of 99 percent of their historical homelands through forced relocation and land theft, which pushed indigenous Americans into marginal lands, and exposed indigenous peoples disproportionately to the effects of climate change.

Beyond direct fatalities and injuries, the health and economic impacts of climate emergencies are far-reaching. Continued degradation of water quality and quantity due to contaminants and droughts will strain agriculture operations, harm farmworker communities, and increase food insecurity. Air pollution will increase deaths and illnesses related to asthma, chronic obstructive pulmonary disease, pneumonia, and contagious diseases such as COVID-19.[5]

Climate Impacts Across California

"Addressing the widespread impacts of climate change represents a significant challenge for the state, and one that will increasingly occupy the Legislature's agenda and require substantial fiscal commitments in the coming years. Effectively responding will necessitate that actions be taken across state government. Therefore, limiting discussion, emphasis, and activities to just the departments and legislative committees that focus on environmental issues will not be sufficient to address the extensive impacts occurring across different policy areas. Some issues cut across various sectors, including the need for: coordination across and within different levels of government, additional information to help guide actions, prioritization of efforts, state-level technical and financial assistance, and a focus on the most vulnerable Californians." - Legislative Analyst's Office of California

Currently, the State of California rates poorly in the quality of its dams, waterways, parks, and stormwater systems which are crucial tools for protecting the health of our communities from the impacts of climate change. Failing infrastructure can lead to polluted stormwater runoff, which not only degrades the quality of water we drink, but it also contaminates the fish and shellfish we eat and contaminates waterways with bacteria harming human beings along with plants and wildlife.

Green infrastructure (GI) should be robustly funded and implemented to provide numerous benefits to communities. There is substantial evidence that GI not only improves water quality, reduces carbon emissions, and protects communities from the impacts of climate change, but is also a critical strategy for advancing healthy, equity, and justice. A substantial body of research supports the implementation of green practices in neighborhoods effectively improves community health by addressing social drivers of health.[6]

Green infrastructure should incorporate parks, trails, and green spaces as a public health equity strategy to improve physical and mental health. Tree canopy, green roofs, and permeable pavements can lessen the impact of heatwaves and the urban heat island effect. Green streets and parks can reduce not only stormwater runoff but also improve air quality and integrate active commuting and recreation to improve health. These are a few of the numerous multi-benefit green infrastructure strategies that should be used to improve health equity at the community level. As California increases investments in infrastructure to address climate change and promote community resilience, it is essential that GI is prioritized as a critical strategy to promote public health and equity. Green infrastructure is an essential strategy to not only modernize water systems, but also improve access to public green spaces, empower communities, and create a long-term sustainable future.

DEFINITIONS

There is a wide breadth of definitions of green infrastructure. For example, some definitions of GI relate to a narrow scope explicitly related to stormwater management. Other descriptions are broader and incorporate both the benefits of climate-resilient infrastructure and the benefits of integrating nature into human infrastructure.

"While the landscape concept of green infrastructure includes stormwater management benefits, stormwater concepts rarely consider the broader landscape. This can mean lost opportunities for more expansive benefits, among them high-quality green spaces, management of diverse environmental risks, and improved urban public health."[7]

- Steward T.A. Pickett

To avoid confusion and siloed noncollaborative green infrastructure initiatives, we suggest using broad, standardized definitions to encapsulate the wide range of interventions being used for green stormwater management, climate resiliency, and community sustainability. Additionally, it is important to acknowledge that conservation and climate-related language has sometimes ignored the importance of environmental and climate justice and Indigenous communities.

Green infrastructure is the umbrella term for an interconnected web of nature-based or nature-mimicking strategies to provide multiple benefits to a system and/or community. For example, strategies such as urban greening, vegetated rooftops, bioswales, and permeable pavement can be used as part of a comprehensive system to promote green stormwater management, reduce urban heat island effects, improve air quality, increase community access to parks and greenspace, and protect historically impacted communities from the impacts of climate change. A particular emphasis should be placed on utilizing vegetated strategies as part of a comprehensive green infrastructure approach. Green infrastructure should be aligned with efforts to protect, restore, and manage natural ecosystems.

To see the GI definitions that were reviewed in the crafting of the above definition, see Appendix B.

STRUCTURE OF THIS REPORT

The policy agenda is broken into five key content areas that emerged through in-depth interviews with subject matter experts and policy analysis of white papers, reports, case studies, and other policy documents. The five content areas were identified as the primary areas needed for policy changes in funding, planning, and implementing green infrastructure (GI). Areas 2-5 also have corresponding in-depth briefs that provide additional recommendations.

1. Community Partnership & Health Equity Opportunities for Green Infrastructure
2. Cross Agency & Intersectoral Coordination to Enhance Green Infrastructure – Coordination Brief
3. Funding for Green Infrastructure – Funding Brief
4. Regulatory Opportunities to Increase Green Infrastructure – Regulations Brief
5. Research, Data, & Benchmarks for Green Infrastructure - Data Brief

Each section includes high-level framing and challenges influencing the current status of GI in California. After challenges are outlined, a mixture of practical, short-term policy opportunities, recommendations, and long-term guidance are provided to address structural issues to promote the equitable implementation of GI.

METHODOLOGY

A comprehensive assessment was synthesized to identify core policy challenges and opportunities. Thirty sector-related experts were interviewed to understand common policy needs, best practices, and barriers. Additionally, six existing green infrastructure policy platforms were reviewed to further develop and expand analysis from interviews. To further identify barriers and policy opportunities, a policy scan was undertaken by reviewing a substantial number of peer-reviewed articles, white papers, case studies, and reports to strengthen recommendations in the policy agenda. For a high-level synopsis of the GI-related policy platforms, see Appendix A.

PURPOSE

The purpose of this report is to identify policy strategies to advance the use of GI in California as a strategy to improve community climate resilience and advance health equity. With increased allocation of infrastructure funding from the federal and state levels, and a growing understanding of the need to address climate change and health inequities as the public health crises that they are, equitably implemented GI presents an unparalleled opportunity to improve resilience to climate change and address past harms in communities.

This policy agenda has been crafted for a diverse cross-agency and intersectoral audience, from public health and equity advocates, to water and parks districts, from conservation organizations, to environmental justice communities. The recommendations contained in this agenda are indented to provide actionable opportunities for local, regional, and state actors to advocate for funding, regulatory, and administrative changes to advance shared priorities.

GUIDING PRINCIPLES OF POLICY AGENDA

To ensure alignment with the broader goals of increasing community climate resilience and advancing health equity through the funding and implementation of green infrastructure (GI), six guiding principles have been incorporated throughout each policy action area.

1. **Center Community-led, Equitable, Place-Based Strategies** – GI should be used as part of health in all policies approach to decrease race and income-based health and opportunity inequities. Community and equity-led strategies generate community buy-in and maximize benefits by meeting the unique place-based needs to help residents thrive.
2. **Improve Community Health Outcomes and Equity** – A foundational element of GI-related strategies must be to improve community health and promote health equity. Increased climate resilience, improved air and water quality, and access to green and open spaces are among the strategies that should be centered on improving health outcomes among all community members.
3. **Elevate Multi-Benefit Over Narrow Benefit Approaches** – Traditional gray infrastructure serves a single purpose, to move stormwater from one location to another, prioritizing GI provides an opportunity to serve many purposes and elevate numerous benefits, including climate mitigation and resilience, parks access, educational outcomes, green streets, opportunities for physical activity, among others.
4. **Minimize Possible Urban Ecosystem Disservices** – While GI does have numerous benefits to communities and urban ecosystems, disservices are also possible. Community and equity-centered strategies should integrate strategies to minimize disservices such as ecosystem disturbances, allergic reactions, and habitat competition that can be associated with certain GI approaches.
5. **Emphasize Long-Term Sustainability** – GI often requires less upfront capital investments than gray infrastructure. However, GI often requires additional resources and time for long-term maintenance. Using a long-term planning approach is necessary for the success of GI, and should be coordinated with local workforce development programs, building high-road, family-sustaining careers.
6. **Ground Green Infrastructure in Data-Driven Strategies** – Data-driven strategies are required to plan, benchmark, and assess the success of GI. A growing body of research should be utilized and developed to maximize the community benefit of GI.

POLICY AGENDA

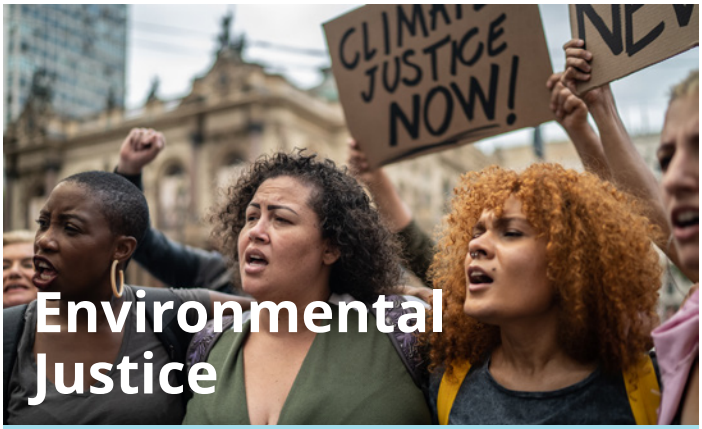
Community Partnership & Health Equity Opportunities in Green Infrastructure

Given the cross-cutting nature of community engagement and partnership across the policy action areas, recommendations for community engagement, co-creation, shared decision-making and participatory budgeting processes have been integrated throughout the four additional policy action areas and associated in-depth briefs. Key policy recommendations to prioritize community engagement and health equity throughout green infrastructure (GI) funding, planning, and implementation are outlined below.

Addressing Past & Ongoing Harms Through Community-Led Green Infrastructure

The inequities in health outcomes, economics, and resources across different communities and neighborhoods are a direct result of historical and ongoing discriminatory and racist policies and systems. Government policies such as segregation through local zoning ordinances and restrictive covenants, redlining and deed restrictions, and urban renewal resulted in past and ongoing systematic disinvestment in communities of color.[8] Indigenous communities were pushed out of their ancestral homelands, through practices of land theft and forced relocation, often to marginal lands with poor infrastructure and high vulnerability to the impacts of climate change.[9] BIPOC communities have fewer parks and neighborhood amenities, worse transportation and stormwater infrastructure, and are more likely to live near harmful industries contributing to poor air, water, and soil quality.[10] Furthermore, BIPOC communities and low-income communities are more vulnerable to the impacts of climate change, and have fewer resources to effectively prepare, respond, or recover from climate related impacts.[11]

Investment in GI projects in which decision-making, planning, implementation, and ongoing operations and maintenance (O&M) are shared between government entities and community provides a critical opportunity to advance environmental and climate justice. Exclusion of community voices and priorities or passive community engagement strategies can exacerbate existing inequities, harms, or results in disservices to the community.



Environmental Justice

Environmental Justice can be defined "as actions taken to prevent future or current harm, increase or rebuild the relational value of residents to both the environment and the city, and repair the processes that have led to environmental injustices."[12] Hoover et. Al. (2021)

To date, many GI planning processes have lacked meaningful and authentic community engagement, and have not prioritized health equity and environmental justice. While GI has the potential for a multitude of health, social, and environmental benefits, when authentic community engagement is not integrated into planning processes, there is a potential for significant economic and environmental injustices to communities that have been historically and disproportionately impacted by inequities, including gentrification and displacement.

Community Engagement Strategies for Equitable Green Infrastructure

The following community engagement strategies should be integrated through GI programs and funding streams at the local, state, and federal level. These recommendations have been integrated throughout the policy action briefs (Coordination, Funding, Regulatory, and Data).

Establish Equitable Green Infrastructure Siting & Investment Practices

- State and local agencies and departments, including the California Department of Transportation and municipal transportation authorities, Regional Water Quality Control Boards (Water Boards), California Natural Resources Agency, California Department of Parks and Recreation and local parks departments, and school districts, among others should prioritize GI investments and projects in communities disproportionately impacted by poor air quality and urban heat island (UHI) effect, climate impacts, limited access to parks and greenspace, and poor health outcomes. (See Funding Brief for more information).
  - > Agencies and departments should use existing tools to advance equitable GI investments, including: the Public Health Alliance of Southern California's California Healthy Places Index® (HPI) and the Office of Environmental Health Hazards Assessment's CalEnviroScreen.
- Green infrastructure implementing agencies and departments should collaborate with prioritized community residents, organizations, and leaders to learn about community priorities, prior to beginning the planning or design process.

Integrate Robust Community Engagement Plans in Green Infrastructure Implementation & Investment Plans

- State and local agencies involved in GI projects should develop robust community engagement plans, timelines, and resources for community participation. Agencies should be intentional about designing plans that shift engagement toward increasingly equitable strategies on the spectrum of community engagement. (See Figure 1).
- Community engagement should take place throughout the budgeting, planning, designing, implementation and O&M phases of the GI project. Strategies should include processes that center community lived experience, including neighborhood walk-throughs, and participatory needs and assets mapping and assessment.
  - > Community engagement plans can include the development of Community Advisory Boards comprised of residents and community leaders. The Community Advisory Boards should be involved throughout the lifecycle of the project and are directly involved in decision-making related to the project.

- The city of Gary (IN) Department of Green Urbanism and Stormwater developed a Community Engagement Process for Urban Stormwater Programs, which outlines strategies for direct community engagement, including fostering relationships with community partners and leveraging GI with ongoing community efforts.
- The Environmental Health Investigations Branch (EHIB) of the California Department of Public Health (CDPH) provides a helpful guide for authentic community engagement and environmental justice.
- The U.S. EPA's Green Infrastructure in Parks: A Guide to Collaboration, Funding, and Community Engagement provides further best practices on community engagement.

FIGURE 1

THE SPECTRUM OF COMMUNITY ENGAGEMENT TO OWNERSHIP

Facilitating Power

▸▸▸▸▸▸ INCREASED EFFICIENCY IN DECISION-MAKING AND SOLUTIONS IMPLEMENTATION ▸▸▸▸▸▸ EQUITY

STANCE TOWARDS COMMUNITY	IGNORE 0	INFORM 1	CONSULT 2	INVOLVE 3	COLLABORATE 4	DEFER TO 5
IMPACT	**Marginalization**	**Preparation or Placation**	**Limited Voice or Tokenization**	**Voice**	**Delegated Power**	**Community Ownership**
COMMUNITY ENGAGEMENT GOALS	Deny access to decision-making processes	Provide the community with relevant information	Gather input from the community	Ensure community needs and assets are integrated into process & inform planning	Ensure community capacity to play a leadership role in decision-making and the implementation of decisions.	Foster democratic participation and equity through community-driven decision-making; Bridge divide between community & governance
MESSAGE TO COMMUNITY	***Your voice, needs & interests do not matter***	***We will keep you informed***	***We care what you think***	***You are making us think, (and therefore act) differently about the issue***	***Your leadership and expertise are critical to how we address the issue***	***It's time to unlock collective power and capacity for transformative solutions***
ACTIVITIES	Closed door meeting Misinformation Systematic Disenfranchisement Voter suppression	Fact sheets Open Houses Presentations Billboards Videos	Public Comment Focus Groups Community Forums Surveys	Community organizing & advocacy Interactive workshops Polling Community forums Open Planning Forums with Citizen Polling	MOU's with Community-based organizations Citizen advisory committees Collaborative Data Analysis Co-Design and Co-Implementation of Solutions Collaborative Decision-Making	Community-driven planning and governance Consensus building Participatory action research Participatory budgeting Cooperative models
RESOURCE ALLOCATION RATIOS	**100%** Systems Admin	**70-90%** Systems Admin **10-30%** Promotions and Publicity	**60-80%** Systems Admin **20-40%** Consultation Activities	**50-60%** Systems Admin **40-50%** Community Involvement	**20-50%** Systems Admin **50-70%** Community Partners	**80-100%** Community partners and community-driven processes ideally generate new value and resources that can be invested in solutions

Source – Facilitating Power: the Spectrum of Community Engagement to Ownership

Equitable Community Engagement

Equitable engagement is a combination of processes that support the participation of people of color, immigrant, and refugee communities, and low-income people in neighborhood groups' outreach and public engagement processes. This type of engagement is about building strong and sustainable relationships and partnerships. Creating trusting relationships, increasing accessibility to facilities and services, and providing a range of opportunities to become involved are key actions that reflect on organizational attitudes and values about developing equitable engagement.

One of the key components of making engagement processes responsive, inclusive, and culturally appropriate is building the capacity of your organization to understand the implications of race, culture, and socio-economic status of decision-making. For community engagement to flourish, government entities and neighborhood groups alike must be open to organizational changes that are responsive to community insight and allow for shared power between communities and the organizations that serve them. Authentic community engagement cannot be about just involving more numbers of people; it needs to lift up underrepresented voices and incorporate them into decision-making processes. – Seattle Department of Neighborhoods

- Community engagement plans should ensure barriers to community engagement and participation are mitigated as much as possible. Including the following:
  - > Compensate residents and community-based organizations for their time and expertise.
  - > Host meetings, strategy sessions, etc. during hours preferred by communities (e.g., after work hours or on weekends).
  - > Host meetings and events in convenient places where the community already gathers and is accessible to walking, biking and public transit.
  - > Provide travel stipends, meals, and childcare during community meetings.
  - > Increase language access through translated materials and translation services provided at meetings.

Align Green Infrastructure Projects with Restorative Justice Policies and Practices – in order to maximize the potential benefits of GI, particularly in communities that have been harmed by current and ongoing discriminatory police and practices, it is important to align GI projects with local policies to support equitable community development.

- Municipalities in partnership with residents, community-based organizations, and other community leaders should develop a strategic plan for neighborhood stabilization. The plan should identify opportunities and strategies to strengthen community assets, and mitigate any potential for green gentrification and displacement as a result of investments in neighborhoods. (See Box on the following page for more information).
- Strengthen the local economy through the establishment or expansion of local workforce development programs focused on GI related fields and careers. (See Funding Brief for more information).

Green Infrastructure & Anti-Displacement Strategies

Low-income and BIPOC communities have less access to quality and safe parks, green space, and urban forests than their wealthier, whiter counterparts, perpetuating health and social inequities. Investment in green space and parks, when designed in partnership with existing residents and communities, can provide innumerable benefits for communities, especially those who have been denied access historically.[16] It is critical to recognize and understand community concerns, and market forces associated with green gentrification and displacement in urban greening initiatives, including the implementation of green infrastructure. Concerns include increases in property taxes, changes to neighborhood character, and the displacement of low-income, long-term residents. The Prevention Institute's People, Parks, and Power: A National Initiative for Green Space, Health Equity, and Racial Justice provides guidance on advancing park equity without harming communities through gentrification and displacement. There is also tension regarding the need for increased affordable housing development in urban areas, while also preserving parks and open spaces, particularly in dense areas with limited access to green space, underscoring the need for integration of green infrastructure and green space into the development and improvement of affordable housing projects (see Coordination Brief for more information).

The California Air Resources Board released a White Paper on Anti-Displacement Strategy Effectiveness and concluded that for California specifically, "the literature suggests that not all public investments will lead to displacement," however, there is a need for ongoing robust assessment and evaluation of anti-displacement strategies, particularly as it relates to displacement by race/ethnic groups.[17] The Urban Displacement Project houses a robust body of research, tools, and case studies that examine the relationships between climate mitigation efforts, community investments, and gentrification and displacement. The following recommendations should be considered by the State and local governments.

- State should include requirements for anti-displacement policies, with priority for neighborhood stabilization, tenant protections, and affordable housing preservation programs in competitive funding programs.
- State should conduct a comprehensive inventory of anti-displacement policies and programs by jurisdiction.
    - > The Urban Displacement Project provides robust data and maps related to gentrification, displacement, and neighborhood stabilization strategies.
- Identify opportunities in existing and planned programs to collect data and conduct robust evaluations on the impacts of investments on gentrification and displacement.
- Local governments should develop strategic plans for neighborhood stabilization.

- Coalitions of neighborhood associations and community-based organizations should negotiate Community Benefits Agreements (CBAs) with developers, which can provide essential structure for ongoing engagement, co-development, and shared decision-making throughout the lifecycle of the GI project. Community Benefits Agreements establish shared agreements and policies to ensure the local community benefits, and holds developers and agencies accountable. CBAs should include the following:
  - > Specific, concrete, and meaningful benefits for the community.
  - > Clearly defined, formal means by which the community can hold the developer, and other entities, accountable to their obligations.
  - > For best practices, see Community Protections and Agreements by the Georgetown Climate Center and Common Challenges in Negotiating Community Benefits Agreements – and – How to Avoid Them by the Partnership for Working Families and the Community Benefits Law Center.
  - > One example of implementing a Community Benefits Agreement is the Union Square Neighborhood Council of Somerville, Massachusetts which established terms for housing, workforce development, and environmental sustainability.
- In alignment with the California 30x30 Initiative and Governor Newsom's proposal of establishing a $100 million opportunity that includes funding for Tribes to purchase and restore ancestral homelands, the state and municipalities should engage in the following efforts to embed equity in GI and natural resources protection, management, and restoration.
  - > The state should allocate additional funding for the indigenous purchase of land that prioritizes GI in any infrastructure development.
  - > The state should return dispossessed land and prioritize indigenous self-autonomy, knowledge, and stewardship as both a starting point to redress indigenous peoples' cultural oppression and critical strategy for climate resilience. Incorporating indigenous knowledge, such as agro-ecological and landscape intervention, as part of green infrastructure to actively manage landslides, stormwater runoff, and riverine flooding are all crucial to protect urban and rural communities.

Cross-Agency Coordination & Collaboration to Accelerate Green Infrastructure

Experts indicated significant challenges regarding coordination between the various agencies involved in developing and implementing green infrastructure (GI). Different state, regional, and local agencies have varying resources, and technical expertise related to their specific mandates and responsibilities, which tend to be fairly narrow in scope (e.g., managing stormwater, improving air quality, maintaining roadways, etc.). Agencies tend to have limited funding, with specific monitoring and reporting requirements and clearly mandated outcomes. Implementing GI projects often requires blended funding coming through multiple agencies, more expansive data collection and monitoring, and more holistic outcomes related to community climate resilience, public health, and social equity. Therefore, green infrastructure projects generally require more collaboration than many gray infrastructure approaches. Furthermore, different agencies and departments at the state and local levels may have vastly different budgets, staff capacity and expertise, and insurance required for GI design, implementation, and ongoing maintenance and stewardship.

The State should develop a standing structure and framework for collaboration of all agencies involved with the planning, implementation, and maintenance of green infrastructure. The assignment of a dedicated coordinating agency to set goals, provide technical assistance, and hold partners accountable will help advance GI across the state. California has several robust initiatives and plans aimed at conserving natural lands, increasing access to parks and open spaces, and increasing Complete Streets implementation in transportation projects. California's 30x30 Initiative outlines 10 strategies to achieving the overall goal of conserving 30% of California's land and coastal waters by 2030, and includes expanding access to nature as a key objective. However, California 30x30 is entirely focused on nature-based solutions[18], and stops short of providing strategic guidance on expanding green infrastructure strategies more broadly. Additionally, the Outdoors for All Initiative, which includes a "$1 billion investments in access-related infrastructure and programs, especially for disadvantaged communities,"[19] is a critical step in addressing park and greenspace inequities, but does not include more expansive goals or strategies to increase GI (as of May 2022). Furthermore, the Department of Transportation issued a policy requiring the inclusion of complete streets[20] features in all new projects, which is critical in advancing climate, public health, and equity goals, but as with the other referenced initiatives does not explicitly include GI as a required component. Therefore, the State should invest in the development of a Comprehensive Green Infrastructure Strategy.

RECOMMENDATIONS TO ENHANCE COORDINATION FOR GREEN INFRASTRUCTURE

1. **Enact legislation mandating the Office of Planning and Research (OPR) to develop a comprehensive Green Infrastructure Strategic Plan.** Given the cross-agency, multi-benefit opportunities of widely implemented GI, OPR is the most well-suited state agency to convene and coordinate other agencies and stakeholders for GI advancement. Legislators should develop legislation mandating OPR to convene partner agencies and develop and implement a Comprehensive Green Infrastructure Strategic Plan.
2. **Establish the California Green Community Schoolyard Initiative.** The Office of Planning and Research, through the proposed green infrastructure workgroup, should identify and implement strategies to accelerate green community schoolyards statewide. Vastly increasing the number of community accessible green schoolyards across the state is a critical strategy to improve park equity and public health, climate mitigation and resiliency, and air and water quality.
3. **Enact legislation and provide funding to require local jurisdictions to develop and implement Local Green Infrastructure Strategies.** Local government agencies, in partnership with community-based organizations and other stakeholders should develop comprehensive green infrastructure plans.
4. **Coordinate with Local Health Jurisdictions to enhance the health and equity benefits of GI.** Local Health Jurisdictions will be tasked with a vital role both improving community resilience to climate change, and improving health outcomes during the ongoing effects of climate change. Local Health Jurisdictions should be funded to participate in cross-agency collaboration to advance GI.

See the Coordination Brief for more in-depth context and policy recommendations.

Increase Funding Sources to Accelerate Green Infrastructure Implementation

The greatest barrier to the advancement of green infrastructure (GI) is inadequate funding. Far more funding is available for traditional gray infrastructure than for green infrastructure. While there are several state-level funding sources dedicated to GI, such as the Green Infrastructure, Urban and Community Forestry, and Urban Greening grant programs, the available funding is woefully inadequate to meet the state's need to meaningfully integrate GI into relevant new and upgrade infrastructure projects. By one estimate, Los Angeles alone would need $20 billion to complete street-by-street GI retrofits.[21]

Insufficient funding is further aggravated by restrictions on available funding streams – particularly for stormwater management – that deprioritize, impede, or even prohibit GI projects. A report from the Public Policy Institute estimated that California's stormwater funding needs were in the range of $1 to $1.5 billion across the state, but actual resources were approximately $500 to $800 million.[22] Another major barrier to increasing the use of GI throughout the state is a lack of ongoing funding for operations and maintenance (O&M) in the majority of available funding streams, despite the need to maintain rain gardens and bioswales, urban trees and forests, and parks.

While the majority of federal and state grants and loans only fund initial capital investments, local revenue streams such as tax revenue and utility fees can provide a sustainable source of funding for operations and maintenance.[23]

To expand and the normalize the use of GI, the state must begin to increase dedicated and sustained funding streams, including the Green Infrastructure, Urban Greening, and Urban and Community Forestry grant programs. Local governments also need to identify and implement strategies to establish sustained local funding for GI, including stormwater management projects, parks and open space, tree canopy and urban forests, permeable pavements and other GI elements. Additionally, government entities and regulatory bodies can pass policies and establish regulations that support the sustainability of GI projects, including classifying the operations and maintenance costs of GI as essential to the infrastructure, and collaborating with diverse local agencies to optimize the economic and social benefits of GI projects. When crafting policies and funding programs related to GI, it is essential to consider support for co-creation with the community, assessment of the long-term benefits and impacts, as well as ongoing O&M costs.

RECOMMENDATIONS TO INCREASE FUNDING FOR GREEN INFRASTRUCTURE

1. **Fund operations and maintenance (O&M) costs across funding streams for green infrastructure.** Strategies may include authorizing the use of capital investments for O&M, and establishing local, sustainable funding streams that can be used for ongoing O&M.

2. **Adopt strategies to increase braiding and blending of funding** from federal, state, local and private funding sources to increase resources for and implementation of GI. Municipalities can establish a joint benefits authority (JBA) to identify and pursue funding sources would be advantageous. A JBA can also minimize redundant processes across departments, streamline funding applications, project planning and design, and improve coordinated community engagement for GI projects.

3. **Invest in local workforce development programs** with a particular focus on GI related careers. The California Workforce Development Board should explicitly integrate GI-related careers across its workforce initiatives, including the High Road Training Partnership, High Road Construction Careers, the Workforce Accelerator Fund, Regional CA, and the Prison to Employment programs.[24] In alignment with this effort GI projects should be required to include project labor agreements (e.g., local hiring practices) and community benefit agreements.[25]

4. **Leverage existing local funding programs, projects, and government operations for green infrastructure.** GI should be integrated into municipal planning processes and government operations, existing funding streams, programs, and projects, including local and regional parks, street services, public works, schools, and transportation projects. There are numerous regular projects and expenditures occurring at the local level that should include prioritization of GI. Embedding GI features into existing local agency expenditures and plans reduces the cost of planning for and developing new GI.

5. **Create new local funding streams for GI**, including new local taxes, green bonds, among other funding and financing strategies.

6. **Establish dedicated stormwater management funding** by addressing current barriers (e.g., Prop 218), and establishing new revenue streams, including stormwater utility fees, developer impact fees, and stormwater credit trading programs.

7. **Increase existing state funding streams for GI**, including stormwater management, and the Natural Resources Agency's Green Infrastructure and Urban Greening grant programs, and CalFire's Urban and Community Forestry grant program to expand offerings of multi-year funding allocations needed for GI projects.

8. **Explore and establish new state funding streams for GI**, including climate resilience bonds, and land banking as opportunities to expand the use of GI.

9. **Increase the use of federal funding for GI**, including federal funding programs that currently fund water infrastructure, stormwater management, transportation, and related programs. Funding for GI should also be included in federal funding programs that focus on parks, housing, and community development in order to maximize the public health and equity benefits of GI.

10. **Establish incentives and fees to increase private funding in GI**, including financial and development incentives, and development fees.

11. **Embed equity into incentives and requirements.** Incentive programs should provide enhanced financial incentives for GI projects in communities disproportionately impacted by inequities, including a lack of tree canopy, parks, access to green space, and climate-related impacts, such as urban heat island effect, high flood risk, risk of combined sewer overflow, etc.

12. **Include funding for GI in innovative community investment strategies from public and private health insurance and healthcare systems** as a part of investing in the social and environmental drivers of health

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See the Funding Brief for more in-depth context and policy recommendations.

State and Local Policies & Regulations to Advance Green Infrastructure

Regulatory and legislative tools to increase implementation of green infrastructure (GI) are important because they often yield faster and surer results than could be achieved solely with projects on publicly owned lands or voluntary measures by private landowners. Current regulatory and legislative approaches do too little to encourage, incentivize and support the much-needed expansion of GI.

There are few mechanisms to encourage, let alone require, the use of GI in various state, local policies, regulations, or programs. Use of GI is not prioritized in current regulatory structures, including the municipal separate stormwater system (MS4). While many state and local programs, including stormwater and transportation regulations, allow the use of GI in meeting program requirements and goals, the current structure and priorities of existing programs are too narrow to achieve the broad implementation of GI needed to advance community climate resilience and health equity. Furthermore, narrow, sector-specific standards and overall lack of standards for GI, has failed to produce innovations that would yield broader health, climate, and equity benefits.

Robust state and local legislation and regulations present the opportunity to create a strong framework to prioritize GI in stormwater management and other sectors. Regulations and requirements should also prioritize GI over gray infrastructure whenever possible. Key opportunities for expanding GI through regulation include changes to municipal separate stormwater system (MS4) permitting and regulations, state building codes, state and local policies and programs.

RECOMMENDATIONS TO IMPROVE REGULATORY SYSTEMS FOR GREEN INFRASTRUCTURE

1. **Integrate prioritization of GI into MS4 permitting.** The State Water Board, Stormwater Program should update stormwater permitting requirements, standards, and accountability processes to prioritize the use of GI whenever possible in regional Stormwater Management Plans.
2. **Develop a public health and equity assessment for MS4 Permits.** The Water Boards should develop a framework to assess the public health, climate justice, and equity impacts and benefits of MS4 permits that can be included with the permittee's final permit application.

3. **Pass legislation requiring prioritization of GI in all relevant state-funded infrastructure projects** – Green Infrastructure should be mandated as the default in all relevant infrastructure developments or improvements, including stormwater management, transportation infrastructure, commercial and residential construction, school construction or improvements, and parks.

4. **Prioritize GI in building codes.** The Statewide Construction General Permit should be updated to require the use of GI for stormwater management, and require a justified exemption for the use of gray infrastructure.

5. **Pass Land Bank enabling statutes.** A land bank is a "*governmental or nonprofit authority created to acquire, maintain, and stabilize vacant, abandoned, and tax-delinquent properties while working with other entities to promote the productive reuse of the properties*."[26] As of 2022, 17 states had land bank enabling statutes, California is not among them.[27] Land banks provide a mechanism to preserve limited available land for community benefit as opposed to private development. Land bank enabling statutes should be used as a strategy to increase GI for community benefit in under-resourced communities.

6. **Mandate ongoing investment in brownfield and grayfield remediation.** Brownfields and grayfields[28] are often the only available land in dense urban environments and can provide space for community preferred uses, such as parks or greenspace. Funding for remediation should include priorities for local workforce development, community input for future use, and integration of GI in development.

7. **Pass local ordinances requiring implementation of Green Streets.** Local governments should enact policies requiring the implementation of green streets within their jurisdictions. Green streets include GI elements as part of an integrated multi-modal transportation system that emphasizes pedestrian and bicyclist safety, traffic calming, and public transit oriented design.

8. **Develop and disseminate guidance for climate smart roofs** – State agencies and departments, including the Building Standards Commission, should develop guidance for municipalities regarding the design and installation of green roofs as a climate smart building practice.

See the Regulations Brief for more in-depth context and policy recommendations

Enhanced Research, Data, & Benchmarks to Advance Green Infrastructure

Gaps in current data, metrics, and shared benchmarks limit both implementation of green infrastructure (GI) and the ability to effectively monitor performance and broader impacts. There are numerous tools and resources that allow for the assessment of GI in the context of stormwater management, including runoff volume reduction, pollutant removal, and groundwater recharge. These tools include the Runoff Reduction Method, National Pollutant Removal Performance Database, and Prospects for Enhanced Groundwater Recharge, respectively. There are also tools that assess the impacts of other GI elements, such as the carbon sequestration potential of street trees, i-Tree Design Calculator, and the energy demand reduction potential of green roofs, Cost Benefit Evaluation of Ecoroofs. There are numerous other valuation assessments and resources for GI, especially in the context of GI for stormwater management.[29]

Use of these tools for GI projects, beyond stormwater management, is limited due to a lack of comparability across different tools/assessments due to the use of different data and different indicators. Additionally, there is currently insufficient data and methodology to develop tools to measure the public health and equity impacts, such as mental health benefits, or increased community cohesion associated with exposure to GI, or access to public green space. This relates to the broader issue of valuation, or assigning a set value to an outcome's worth, to "intangible" benefits such as mental and social wellbeing, while there are clear values assigned to reduction in water pollutants, or energy use.

These gaps in valuation data and limitations of existing tools often lead to maintenance of the status quo, gray infrastructure, and missed opportunities to leverage resources to expand the use of GI. Furthermore, the different mandates, priorities, and projects across different state and local agencies, such as runoff reduction, greenspace access, or vehicle-miles-traveled reduction, contribute to challenges comparing and/or integrating metrics across agencies. Additionally, depending on the agency and GI project or element, there may be very different costs and benefits, for example, the installation of rain barrels has different costs and benefits than a new community park.

RECOMMENDATIONS TO IMPROVE DATA, TOOLS, & STANDARDS FOR GREEN INFRASTRUCTURE

1. **Develop GI research agenda.** The Office of Planning and Research (OPR) in coordination with academic partners, community-based organizations, and local agencies should develop a GI research agenda that includes the following: research on the health and social benefits of GI, current gaps in GI impact data, and assessment of existing and needed granularity of GI-related data, specifically related to health and equity.
2. **Develop tools and metrics to standardize assessment of GI projects.** Based on the quantification and valuation research of GI benefits, OPR and partners should develop a tool(s) that can be used across state, regional, and local agencies and other entities to assess the full benefits of various GI elements.
3. **Develop standard practices for GI data collection and use** - There is an existing body of literature that presents the various benefits of GI, as it relates to stormwater management, including those related to water quality and quantity, air quality, flood risk reduction, climate resilience, habitat and wildlife, and community benefits, however there are still significant gaps and certainly no standard practices across agencies for collecting and disseminating data related to GI projects. [30]
4. **Fund local and regional assessments and plans.** The State should provide funding to local agencies, to conduct local and/or regional GI assessments, including private and public land.
5. **Establish Multi-Benefit Project Benchmarks & Goals** – The State, spearheaded by OPR, in collaboration with other agencies and departments, should establish guidance and benchmarks for multi-benefit infrastructure projects, to drive investments away from single-purpose projects and increase the use of GI to meet these multi-benefit standards.
6. **Establish Cross-Cutting Equity Goals** – The Office of Planning and Research, in partnership with other state agencies and departments, community leaders, and community-based organizations need to develop equity standards and guidelines that can be applied across relevant GI projects to ensure that benefits are maximized in communities disproportionately impacted by climate impacts, poor access to greenspace and tree canopy, and the UHI effect, and aging and insufficient stormwater management infrastructure.
7. **Enhance park and greenspace access and quality benchmarks** – The Department of Parks and Recreation and the Natural Resources Agency, in partnership with other relevant agencies and departments, needs to establish statewide park and greenspace access and quality standards in alignment with the Parks for All Californians goals.

See the Data Brief for more in-depth context and policy recommendations

CONCLUSION

California is increasingly suffering from climate-related burdens to health. Whether it's floods, fires, heat waves, or other climate disasters, the road to recovery is unequal.[31] Vulnerable populations lack resources to adequately prepare, respond, or recover from climate impacts. Structural and systemic inequality and racism have exacerbated climate-related inequities resulting in Black, Indigenous, and people of color (BIPOC) communities bearing the brunt of climate-driven extreme heat, flooding, poor air quality, forest fires, and natural disasters. Low-income and BIPOC communities have been denied the resources and investments needed to build community climate resilience.[32] People of color disproportionately live in places with lower air and water quality, higher incidences of the urban heat island effect, less access to parks and green spaces, fewer and more poorly maintained amenities in public places, and gathering spaces that serve as platforms for community cohesion and social capital.[33] Additionally, these same communities often lack the political power of more affluent communities leading to fewer investments in solutions to address the social drivers of health. Furthermore, the State of California rates poorly in the quality of its dams, waterways, parks, and stormwater systems which are crucial tools for protecting the health of our communities from the impacts of climate change.

Green infrastructure should be used to provide safer and more affordable water than traditional gray infrastructure. There is substantial evidence that GI not only improves water quality but also reduces carbon emissions and protects communities from the impacts of climate change but is also a critical strategy for advancing healthy, equity, and justice. A substantial body of research supports the implementation of green practices in neighborhoods effectively improves community health by addressing social drivers of health.

Green infrastructure should incorporate parks, trails, and green spaces as a public health equity strategy to improve physical and mental health. Tree canopy, green roofs, and permeable pavements can lessen the impact of heatwaves and the urban heat island effect. Green streets and parks can reduce not only stormwater runoff but also improve air quality and integrate active commuting and recreation to improve health. These are a few of the numerous multi-benefit green infrastructure strategies that should be used to improve health equity at the community level. As California increases investments in infrastructure to address climate change and promote community resilience, it is essential that green infrastructure (GI) is prioritized as a critical strategy to promote public health and equity. Green infrastructure is an essential strategy to not only modernize water systems, but also improve access to public green spaces, empower communities, and create a long-term sustainable future.

APPENDICES

APPENDIX A: REVIEWED GREEN INFRASTRUCTURE POLICY AGENDAS

Green Infrastructure Policy Platform Synthesis

As California is increasingly suffering from climate-related burdens to health. Among the numerous immediate and future impacts of climate change, California's Legislative Analyst's Office's Climate Change Impacts analysis predicts is continued and further impaired water quality due to runoff from extreme precipitation events. As the need for green infrastructure to protect communities becomes increasingly apparent, a comprehensive research analysis was synthesized to identify core policy challenges and opportunities. A review of six green infrastructure policy platforms helped identify common challenges and recommendations for green infrastructure design, planning, and implementation. This document provides a brief overview of some key themes from the policy platforms.

Agendas Reviewed

- National Recreation and Park Association: Greener Parks for Health: Green Infrastructure as a Strategy for Improving Equity and Community Well-Being
- Prevention Institute - 2021: Changing the Landscape: People, Parks, and Power
- PolicyLink: Advancing Park Equity in California
- Mid-America Regional Council - 2019: Policy, Planning & Action: Regional Green Infrastructure Policy Framework
- Environmental Protection Agency, 2014 – Enhancing Sustainable Communities with Green Infrastructure
- National Parks and Recreation Association - 2021 – Legislative Platform

Common Themes Across Agendas

- **Equity** - Green infrastructure is presented as an opportunity for equitable community development. Investments, design, planning, and implementation should include authentic community engagement to uplift the benefits of nature without the disservices of green infrastructure, such as green gentrification.
- **Funding/Financing** - Robust, flexible funding is needed to design, plan, and manage projects to successfully implement green infrastructure. Funding and financing must be multi-jurisdictional and cross-sectoral. While green infrastructure often requires lower initial capital costs than gray infrastructure, it often requires higher levels of funding needed for ongoing maintenance.
- **Investment in Parks and Green Space** - Parks are an essential strategy for improving the health and equity of communities. Beyond managing stormwater, parks and greenspaces provide residents with the health benefits of nature. A special emphasis should be placed on providing parks and greenspaces in low-income and BIPOC communities that often do not have the same access as more affluent communities.
- **Multi-Benefit** - Green Infrastructure is an opportunity to address numerous Social Drivers of Health compared to traditional gray infrastructure. Beyond stormwater management, projects should promote broad benefits such as improved water, soil, air quality, physical and mental health equity, and community development.
- **Stormwater Development** - The primary purpose behind green infrastructure is to improve the management of stormwater.

Common Themes Across Most Agendas

- **Workforce Development** - Most agendas emphasize the opportunity and need to incorporate green workforce development as part of green infrastructure. Workforce development is a crucial strategy for repairing historic and ongoing inequities and revitalizing community economic strength.
- **Regulatory/Land-Use Frameworks** - Land use frameworks, zoning, regulations, and ordinances are essential tools to prioritize mixed use, innovative approaches to green infrastructure developments that provide numerous benefits to communities. Regulatory frameworks must be updated to incorporate flexibility to use natural processes for urban and rural development and include explicit language to move away from traditional gray infrastructure to green approaches.

Special Emphasis in Individual Agendas

- **Cross-Agency and Sectoral Coordination** - Policy Planning & Action by the Mid-America Regional Council emphasized the need for cross-agency and cross-sectoral coordination. Standardized guidance and best practices are crucial to project implementation.
- **Brownfield/Hazardous Waste Sites** - The EPA's Enhancing Sustainable Communities with Green Infrastructure emphasized the importance of including brownfields and hazardous waste sites in planning. The cleanup of brownfields and other hazardous waste sites is a significant opportunity to remove water and soil pollution and convert spaces – often in dense urban environments - into community assets.

Moving Forward

Green Infrastructure presents a valuable opportunity for communities to improve resilience to climate change's current and future impacts. Green Infrastructure also provides a broader range of benefits to residents compared to traditional gray infrastructure approaches.[1] Applying the health benefits of nature to urban and rural stormwater management is a crucial public health strategy to meet residents' needs in the current and evolving landscape. Benefits include improved physical and mental health, enhanced air, water, and soil quality, increased access to greenspace and parks, and equitable economic development. While the benefits of green infrastructure are numerous, sustainable funding, cross agency and sectoral collaboration and community partnership are required for projects to maximize benefits and avoid disservices.

There are also key research and policy practice gaps that should be addressed. There is a lack of data and standards for quantifying the extensive benefits of green infrastructure.[2] A lack of standardization language and shared knowledge has led to a wide variety of definitions and understanding of green infrastructure, making communication challenging.[3] Future research and analysis should also focus on the impacts of particular green infrastructure designs for context-specific recommendations.[4]

1. https://www.epa.gov/green-infrastructure/benefits-green-infrastructure
2. https://www.tandfonline.com/doi/full/10.1080/1331677X.2021.1893202
3. https://www.mdpi.com/2071-1050/11/11/3182/pdf
4. https://besjournals.onlinelibrary.wiley.com/doi/10.1111/1365-2664.13475

APPENDIX B: RESEARCHED DEFINITIONS

i. **Environmental Protection Agency** - Green infrastructure [is defined] as "the range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspirate stormwater and reduce flows to sewer systems or to surface waters.

ii. **World Green Infrastructure Network** - Green Infrastructure refers to any vegetative infrastructure system which enhances the natural environment through direct or indirect means. It describes the network of green spaces and water systems that deliver multiple environmental, economical and social values and benefits for sustainable urban development. Green Infrastructure includes green roofs, living walls, parks and reserves, backyards and gardens, waterways and wetlands, streets and transport corridors, pathways and green corridors, squares and plazas, sports fields and cemeteries. Green Infrastructure provides and connects vital ecosystem services which contribute or enhance urban sustainability and the natural environment.

iii. **Natural Resources Defense Council** - Green infrastructure encompasses a variety of water management practices, such as vegetated rooftops, roadside plantings, absorbent gardens, and other measures that capture, filter, and reduce stormwater. In doing so, it cuts down on the amount of flooding and reduces the polluted runoff that reaches sewers, streams, rivers, lakes, and oceans. Green infrastructure captures the rain where it falls. It mimics natural hydrological processes and uses natural elements such as soil and plants to turn rainfall into a resource instead of a waste.

iv. **National Parks and Recreation Association** - Green infrastructure is a set of natural features (e.g., trees, bioswales and rain gardens) that provide environmental benefits to a community (e.g., reducing flood risk, storing and treating stormwater, reducing the urban heat island effect and filtering air). Done well, green infrastructure can also enhance human health and provide environmental and social benefits through increased economic development, reduced energy use and other functions that communities need.

v. **Prevention Institute** - Parks and green spaces are essential community infrastructure that protect public health by providing opportunities for physical activity, time in nature, social connection, and respite. Green spaces also filter air, remove pollution, buffer noise, cool temperatures, filter stormwater, and replenish groundwater. Green spaces should serve every community in a fair, just, and safe manner.

vi. **PolicyLink** - Parks and open spaces are markers of healthy communities. Well-funded and maintained parks can serve as community gathering spaces, attracting residents of all ages to exercise, relax, and engage with nature. Strong programming and organized activities in open spaces facilitate community cohesion and encourage community members to form deeper connections with one another. By providing spaces for physical activity, parks play an important role in the prevention of obesity, diabetes, and other chronic health problems. Researchers have found that the health benefits of parks are not limited to physical health, but also extend to mental and emotional health.

vii. **Mid-America Regional Council** - Green infrastructure is not a new idea. It is an all-inclusive name for how natural environmental elements can be easily incorporated into the built environment. The elements that make up green infrastructure are straightforward: trees, rain gardens, native landscaping, green roofs and bioretention features. These elements can be deployed in various combinations in commercial, residential and natural settings.

ENDNOTES

1. https://lao.ca.gov/reports/2022/4575/Climate-Change-Impacts-Crosscutting-Issues-040522.pdf
2. https://oag.ca.gov/environment/climate-change/unequal-impacts
3. https://www.frbsf.org/community-development/publications/community-development-research-briefs/2021/december/climate-related-risks-faced-by-low-and-moderate-income-communities-and-communities-of-color-survey-results/
4. https://link.springer.com/article/10.1007/s42532-020-00070-3
5. https://lao.ca.gov/reports/2022/4575/Climate-Change-Impacts-Crosscutting-Issues-040522.pdf
6. https://depts.washington.edu/hhwb/
7. openacessgovernment.org/children's-health/125608
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10. https://link.springer.com/article/10.1007/s42532-020-00070-3
11. https://oag.ca.gov/environment/climate-change/unequal-impacts
12. tandfonline.com/doi/full/10.1080/1523908X.2021.1945916?src=recsys
13. tandfonline.com/doi/full/10.1080/1523908X.2021.1945916?src=recsys
14. journals.sagepub.com/doi/10.1177/0309132518803775
15. Green gentrification describes the phenomenon in which environmental cleanup, restoration, and neighborhood greening prepare the ground for displacement of existing communities.
16. https://www.americanprogress.org/article/the-nature-gap/
17. https://www.urbandisplacement.org/wp-content/uploads/2021/08/19RD018-Anti-Displacement-Strategy-Effectiveness.pdf
18. Nature-Based Solutions are actions that work with and enhance nature to help address societal challenges. This term is an umbrella concept being used across the world to describe a range of ecosystem-related approaches that protect and restore nature to deliver multiple outcomes, including addressing climate change, protecting public health, increasing equity, and protecting biodiversity – Pathways to 30x30 California: Accelerating Conservation of California's Nature
19. https://resources.ca.gov/Initiatives/Access-for-All
20. Complete Streets *provide mobility for people of all ages and abilities, particularly those who are walking, biking, using assistive mobility devise, and riding transit. Complete streets offer several benefits, including enhancing safety and creating more sustainable transportation options to decrease dependence on driving and improving public health by encouraging active transportation like walking and biking.* – CalTrans
21. https://deeply.thenewhumanitarian.org/water/articles/2016/12/08/the-race-to-turn-stormwater-from-gray-to-green
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25. https://laincubator.org/wp-content/uploads/LACI-GREEN-JOBS-REPORT.pdf
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28. Grayfield refers to land that is underutilized due to disinvestment and is often primarily asphalt.
29. epa.gov/green-infrastructure/green-infrastructure-cost-benefit-resources#costbenefitanalysis
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32. https://www.frbsf.org/community-development/publications/community-development-research-briefs/2021/december/climate-related-risks-faced-by-low-and-moderate-income-communities-and-communities-of-color-survey-results/
33. https://link.springer.com/article/10.1007/s42532-020-00070-3