

PDOQ

PROJECT DELIVERY QUARTERLY

SUMMER 2017



Construction • Design • Engineering Services •
Environmental Analysis • Project Management •
Right of Way and Land Surveys

PROJECT DELIVERY &

Environmental Sustainability



PROJECT DELIVERY & Environmental Sustainability



I am pleased to present the Summer 2017 edition of the PROJECT DELIVERY QUARTERLY (PDQ).

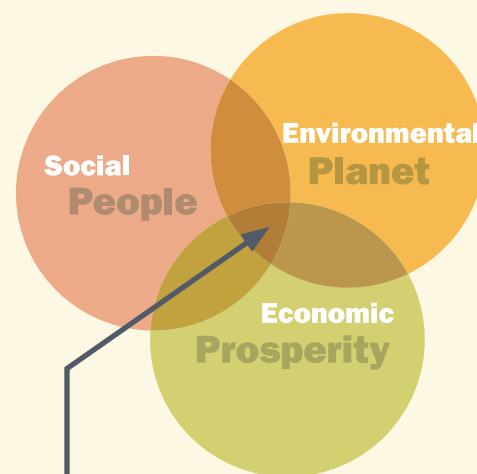
This edition is devoted to a discussion of the environmental components of “sustainability.”

More than ever, our business model and our funding mechanisms require us to apply sustainability principles to our work. As an example, the recently enacted Senate Bill (SB) 1 – The Road Repair and Accountability Act of 2017 (the first significant and stable increase in state transportation funding in more than two decades) includes clear direction to employ features and strategies that promote sustainability. The [California Transportation Commission Implementation Plan for SB- 1](#) states that when beneficial and cost effective, Caltrans and/or local plans and projects “shall include” features and strategies that: reduce greenhouse gas emissions through material choice and construction methods; increase the use of recycled materials; support zero-emission vehicle technologies; strengthen the ability of assets to withstand the effects of climate change; and increase delivery of complete streets elements. As described in the first article of this PDQ edition, SB-1 also establishes the Advance Mitigation Program, a powerful mechanism for Caltrans to deliver environmental mitigation in a holistic and cost-effective manner.

While there are always competing demands that influence transportation decision-making, the primary consideration of a “sustainability approach” is to develop solutions that solve current transportation needs in a manner that preserves resources and quality of life for future generations. Incorporating sustainability principles into transportation system planning, design, construction and operational decisions means balancing choices

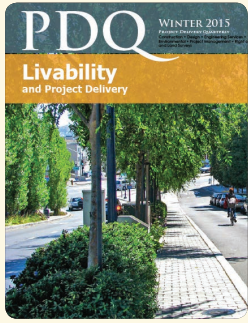
Cover photo: Los Peñasquitos Lagoon, discussed in the “North Coast Corridor” article. Photo by Marc Buehler, Flickr Creative Commons License (CCL).

A sustainable transportation system balances stewardship of **social, environmental, and economic** resources for the long-term public good.



Achieving stewardship that balances all three areas of sustainability requires collaboration with partners.

Sustainability is often defined using the phrase “the triple bottom line” which means that the mission of “sustainability” is to balance long-term stewardship of: the Planet (Environmental Resources), People (Social Resources), and Prosperity (Economic Resources).



WINTER 2015 PDQ

Social/People:

This PDQ edition provided a definition of “livability,” the social component of sustainability. Articles highlighted examples of Caltrans partnerships, activities, and projects that improve livability.



SUMMER 2014 PDQ

Economic/Prosperity:

This PDQ edition focused on Project Delivery’s commitment to “sustainable investments,” highlighting how economic sustainability principles are incorporated into projects and processes.



SPRING 2014 PDQ

Sustainability:

This PDQ edition provided a comprehensive definition of “sustainability” and outlined Caltrans activities related to sustainability.

This edition of the PDQ highlights the environmental component of sustainability. Previous editions covered the other two components of sustainability: “people” (social well-being, or “livability”) and “prosperity” (economic vitality).

among environmental, economic, and social values—the triple bottom line of sustainability.

The public benefits from a comprehensive analysis of return on investments, accomplished by sustainability-related evaluations. A short term gain that does not include a broader range of life cycle considerations may not yield the greatest benefits to the public over the long term. Long-range stewardship requires life cycle evaluations that factor in traditional transportation sector concerns, as well as a broadened concept of “value” which includes other sectors, such as public health and safety, community livability, economic vitality, and ecological health. While it is often assumed that achieving sustainable solutions is only possible through increased spending, a holistic evaluation, particularly at the corridor level, would consider the long term monetary costs and benefits associated with elements such as: clean air and water, high functioning aquatic or terrestrial habitats, and improved public health achieved through increased rates of bicycling and walking.

As all of the articles in this edition demonstrate, Caltrans cannot solve our most pressing sustainability related challenges alone. As we move forward to improve quality of life and transportation services for California’s residents, businesses, and visitors, I thank you for your ongoing commitment to engage in meaningful dialogue and collaboration with partners and stakeholders.

Karla B. Sutliff
Project Delivery Deputy Director
(Chief Engineer)




Advance Mitigation

Improving Ecological and Project Delivery Outcomes

“Compensatory mitigation” describes ecological enhancement, restoration, creation or preservation strategies that help offset the unavoidable ecological impacts of built projects.

Caltrans plays a crucial role in supporting and achieving state and federal environmental goals. Caltrans routinely assesses project-level impacts on ecosystems and strives to design projects in such a way as to minimize, rectify, and reduce the impacts. However, when unavoidable ecological impacts will occur from a transportation project, Caltrans takes action to offset or compensate for the damage to an ecological resource—such as by acquiring land for habitat conservation or creation. Compensating for a project’s unavoidable impacts on ecosystems is called “compensatory mitigation,” and is required by numerous laws such as the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA), the Clean Water Act, the Endangered Species Act (both state and federal), and California’s Fish and Game Code.

Compensatory mitigation traditionally consisted of project-specific responses to offset a project’s impacts on the environment; and the determination of impacts often occurred late in the project development process. Determining the impacts, and developing compensatory mitigation strategies often requires long lead times, introducing risk to project schedule, cost, and scope.



“Advance mitigation is a science-based approach to identify mitigation opportunities to support regional conservation priorities. By considering mitigation development early in the planning process prior to design and permitting phases, proponents can identify higher-quality mitigation opportunities.”

–California Department of Fish and Wildlife

Photo: Elkhorn Slough, District 5. The Elkhorn Slough Early Mitigation Partnership project, received a [2008 Transportation Excellence Award](#) from the Transportation Agency for Monterey County. The project findings inform current development of advance mitigation projects. Photo credit: J. Maughn, Flickr CCL.

“Advance mitigation” describes compensatory mitigation measures that are implemented in advance of project alternative selection, programming, and delivery.

Developing mitigation measures before project alternative selection, programming, delivery, and before project impacts are incurred, is called

“advance mitigation.” Advance mitigation reduces or eliminates mitigation-related project delivery risks since the compensatory mitigation strategies are developed and scheduled independently from individual projects. Advance mitigation also facilitates improved environmental outcomes, through integrated and holistic advance transportation and conservation planning.

Ecological Value and Project Delivery Benefits

Caltrans is pursuing advance mitigation strategies to better align project mitigation with regional conservation priorities; accelerate project delivery; reduce transportation project costs; and streamline regulatory approvals.

Ecological Value

Advance mitigation anticipates that unavoidable impacts will be identified in the future and therefore, compensatory mitigation sites and actions are identified and implemented before projects are completely designed and funded. The selection of mitigation sites independently from transportation projects provides opportunities to consolidate anticipated mitigation from multiple projects into larger, less fragmented sites, providing higher ecological value. The acquisition of larger land parcels, coupled with the long-range planning effort required for advance mitigation, facilitates more strategic and comprehensive regional and watershed focused efforts to protect ecosystems and biodiversity. Advance mitigation also allows for ecological benefits to accrue over a longer period of time, since ecosystem protection, enhancement and/or restoration is initiated before the project impacts occur.

Project Delivery Benefits

Recent data indicate that Caltrans obtains environmental permits on approximately 100 projects annually. Each project may have multiple required permits and agreements (which define the required compensatory mitigation measures) before it can move forward. Based on recent annual reports to the Federal Highway Administration, Caltrans annual mitigation expenditures are estimated at over \$50 million, on average, for federal natural resource requirements (wetlands and endangered species) alone. Caltrans also expends additional resources related to state regulatory requirements.

2001

Federal Highway Administration (FHWA) revised mitigation regulations

FHWA revised regulations to conform to the wetland and natural habitat mitigation provisions in the 1998 Transportation Equity Act for the 21st Century (TEA-21), which included requirements for the use of natural habitat and wetlands mitigation banks and other forms of compensatory mitigation.

2006

Publication of: *Eco-Logical, An Ecosystem Approach to Developing Infrastructure Projects (Eco-Logical)*

Eco-Logical emphasizes an ecosystem approach to infrastructure project mitigation. *Eco-Logical* published by FHWA, the United States (U.S.) Bureau of Land Management (BLM), the U.S. Environmental Protection Agency (USEPA), National Oceanic and Atmospheric Administration (NOAA) Fisheries Service, the National Park Service (NPS), U.S. Army Corps of Engineers (USACE), the U.S. Department of Agriculture (USDA) Forest Service, U.S. Fish and Wildlife Service (USFWS), and other state Departments of Transportation.

With advance mitigation, transportation project costs are expected to be reduced for several reasons. Early purchases of property can be more cost effective: purchasing large tracts lowers the cost per acre; strategic acquisitions can be timed to take advantage of dips in real estate cycles; and fewer land transactions are required to meet mitigation obligations. Permitting activities are streamlined, allowing for more efficient scheduling and expenditures of staff time, since assessment of impacts and compensatory measures can be coordinated ahead of time with regulatory agencies. There is also minimal loss or reduction of ecological functioning because advance mitigation

“A “mitigation ratio” expresses the amount of restored ecological functioning that will be accomplished via mitigation, compared to a measurement of ecological impacts resulting from a project. Mitigation ratios are expressed using a unit measurement, such as acres.

initiates environmental restoration, enhancement, or preservation before project impacts are incurred. Permitting agencies (such as the United States Army Corps of Engineers (USACE), and the federal and state Fish and Wildlife regulatory agencies) consider the time it takes a mitigation project to achieve the targeted level of ecological performance (called “temporal loss”) in

determining mitigation requirements. Reducing or eliminating temporal loss of ecological functioning reduces mitigation ratios, thereby reducing Caltrans project costs.



Caltrans joined coalition to develop Regional Advance Mitigation Planning (RAMP) approach

The RAMP approach allows for prioritized natural resources to be protected or restored as compensatory mitigation before infrastructure projects are constructed, often years in advance. The RAMP coalition is comprised of infrastructure and natural resource agencies, nongovernmental organizations, and academic researchers.

2008

2009

Leadership of RAMP agencies signed or supported a Memorandum of Understanding (MOU)

MOU entered into by Caltrans, California (CA) Department of Fish and Wildlife, CA State Water Resource Control Board, USACE-South Pacific Division, the USEPA, USFWS, and the NOAA Fisheries Service.

Caltrans Advance Mitigation Program

California tested the use of advance mitigation planning and implementation to assess and offset environmental impacts from construction projects.

Findings from projects throughout the state that incorporated advance

“Mitigation banking,” a form of advance mitigation, involves an environmental resource area that has been restored, established, enhanced, or preserved. The resource area is then set aside to compensate for future impacts to in-kind resources resulting from permitted activities, such as construction of transportation facilities.

mitigation strategies, such as mitigation banking projects, revealed several benefits over the traditional process of developing mitigation during the project delivery phase. The findings from these early projects are informing the current development of the Advance Mitigation Program.

Moving forward, advance mitigation proposals will be nominated, reviewed and, if approved, selected for project initiation development and project delivery. Completed

advance mitigation projects will then be available for use as compensatory mitigation for relevant transportation projects. Transportation projects will continue to scope for mitigation costs.

The following paragraphs summarize how Caltrans is implementing advance mitigation through planning processes, establishing policies and guidance, and developing new funding mechanisms. At all stages, successful deployment of the Advance Mitigation Program requires robust outreach and engagement of internal and external stakeholders.

Caltrans renewed the MOU with partner agencies to continue the Statewide Advance Mitigation Initiative (SAMI).

The SAMI MOU codifies an allied effort to develop a statewide advance mitigation initiative- including committing staff resources, identifying mitigation locations, and exploring all appropriate compensatory mitigation solutions consistent with applicable laws, regulations, policies and guidance.

2016

2016 State Highway Operation and Protection Program (SHOPP) include funds for advance mitigation projects

The 2016 SHOPP funds released in spring 2016 are the first funds used to program advance mitigation projects.

2017

SHOPP 2020

The Headquarters Division of Environmental Analysis (DEA) continues to coordinate with the Districts to assess mitigation needs for future transportation projects and propose advance mitigation projects via the SHOPP nomination process.

Planning

Predicting likely future transportation project impacts on natural resources involves a coordinated approach to integrate transportation planning with conservation planning. Successful cross-discipline planning requires uniform, reliable, repeatable and transferrable impact assessment methods to predict potential natural resource impacts from the projects developed in the long-range transportation planning phase. Coordination with resource agencies is essential to develop methods and guidance for identification of conservation priorities that will direct mitigation actions. In turn, these actions and priorities can be incorporated into long range transportation plans, such as Regional Transportation Plans (RTPs), System Planning, Transportation Concept Reports (TCRs), and other planning products. The planning process can also draw on existing natural resource planning tools, such as Habitat Conservation Plans and Natural Communities Conservation Plans when they are developed at the local level.

Policy Development and Governance Needs

Successful deployment of an Advance Mitigation Program requires the development of uniform policy

and guidance that is acceptable to Caltrans and applicable resource agencies. These policies, in the form of formal Memorandums of Understanding (MOUs), Interagency Agreements or guidance documents, must result in a transparent, accountable, reliable and predictable process. Efforts in this area include developing the processes for:

- Tracking the use of advance mitigation credits (or other measurement unit);
- Ensuring that the advance mitigation process does not circumvent the CEQA/NEPA processes;
- Adhering to documented requirements, thereby enabling resource agencies to approve advance mitigation for transportation projects.

Funding

Funding advance mitigation has traditionally been challenging since advance mitigation must be funded prior to the programming of a transportation project. Mitigation funds were typically programmed into a project's budget and not available until the environmental process had been completed. The creation of the Advance Mitigation Program within the State Highway Operation and Protection Program (SHOPP), addresses historic funding challenges by enabling advance mitigation

Tundra swans, *Cygnus columbianus*. Many migratory birds, including tundra swans, visit [Honey Lake Wildlife Area \(HLWA\)](#). The Honey Lake Mitigation Wetlands Bank, adjacent to HLWA, was an early effort in advance mitigation development. Photo credit: Dick Daniels, Wikimedia Commons.



projects to be managed as stand-alone projects. Passage of [Senate Bill 1-The Roadway Repair and Accountability Act of 2017](#), led to the development of the Advance Mitigation Account in the State Highway Fund—a revolving account which can be directed to transportation projects in the SHOPP or the State Transportation Improvement Program (STIP). Ongoing efforts in the area of reimbursing the advance mitigation account involve clarifying how the federal reimbursement process will work for advance mitigation projects.

Implementation Strategies

Support of the Advance Mitigation Program in the SHOPP is an essential implementation effort. As the 2016 SHOPP moves forward, Caltrans is working with resource agencies to: develop regional assessments of mitigation needs and conservation priorities; develop action plans to meet resource agency priorities for any given suite of project impacts; move mitigation projects to completion and through approval; and track the use of credits (or other measurement unit). Efforts are also being directed to revising the impact assessment methodology, and standardizing it to be compatible with an online geographic information system (GIS) environment. More information about implementation is on page 10: “Caltrans Implementation Highlights.”

Engagement and Outreach

Planning, developing policy, and funding of advance mitigation requires working with the affected state, federal, and local government entities, and public entities such as the mitigation banking community, and non-governmental organizations. The DEA

also coordinates with other functional units within Caltrans, both in HQ and in the Districts, to introduce the new policies, procedures, roles and functions.

To facilitate advance mitigation project proposals, and to support those projects in the delivery process, the DEA visits, and coordinates quarterly meetings with the Districts. Outreach is needed for this new and evolving program to clarify the planning process, program guidelines, and to facilitate collaboration between functional units.

Engaging the environmental resource agencies has been essential to maintaining external support for the Advance Mitigation Program. The DEA regularly meets with these partners on the SAMI process agreement, FHWA programmatic agreement, RAMP and Bay Area RAMP efforts.

Conclusion

Advance mitigation is a powerful mechanism for enabling Caltrans and partners to achieve a shared vision for addressing the health of California’s ecosystems, while cost-effectively developing transportation facilities. Advance mitigation offers broader and more holistic environmental benefits, while substantially reducing risk to project cost, schedule, and scope. By working to ensure that ecological benefits are maximized, transportation services are implemented strategically, and tax dollars are spent effectively, Caltrans is making an enduring contribution to California’s economy, communities, and environment.

For more information, contact Phil Stolarski, Chief, Division of Environmental Analysis (phil.stolarski@dot.ca.gov), or visit the DEA online (<http://www.dot.ca.gov/env/>).

Advance Mitigation

Caltrans Implementation Highlights

Statewide Advance Mitigation Initiative-Process Master Agreement

With support from the California State Transportation Agency (CalSTA) and environmental resource agencies, Caltrans is developing a process agreement pursuant to the interagency Statewide Advance Mitigation Initiative (SAMI) Memorandum of Understanding (MOU), as a means to reduce financial, technical and strategic risks associated with Caltrans investment in advance mitigation. This draft agreement will establish a framework to incorporate partner agencies' review and technical guidance into project planning and development.

Federal Highway Administration Programmatic Agreement

Caltrans is working with Federal Highway Administration (FHWA) to finalize a draft programmatic agreement that clarifies the federal reimbursement process for advance mitigation projects that use federal funds. This will ensure that Caltrans advance mitigation projects that follow proposed guidelines can obtain federal reimbursement as appropriate.

State Highway Operation Protection Program (SHOPP) 2020

The Headquarters Division of Environmental Analysis (DEA) is coordinating with the Districts to assess mitigation needs for future transportation projects, and propose advance mitigation projects via the SHOPP Tool for Headquarters (HQ) concurrence. If projects receive HQ concurrence, they may be nominated for project initiation, development, and programming. The concurrence process is iterative: the Districts and HQ collaborate to ensure that proposed projects meet the Advance Mitigation SHOPP guidelines, and address unmet mitigation needs. The Advance Mitigation Program projects will

integrate into the Asset Management paradigm as described in the 2017 State Highway System Management Plan.

Establishing a Revolving Account

Transportation projects will need to reimburse the Advance Mitigation Program for advance mitigation created and held by Caltrans using a new internal accounting mechanism. Historically, the program was resourced with a funding allocation, however to sustain the program and perpetuate the program's benefits, a no-cost revolving account now needs to be established. Efforts are underway to establish this mechanism either administratively, or through the Department of Finance.

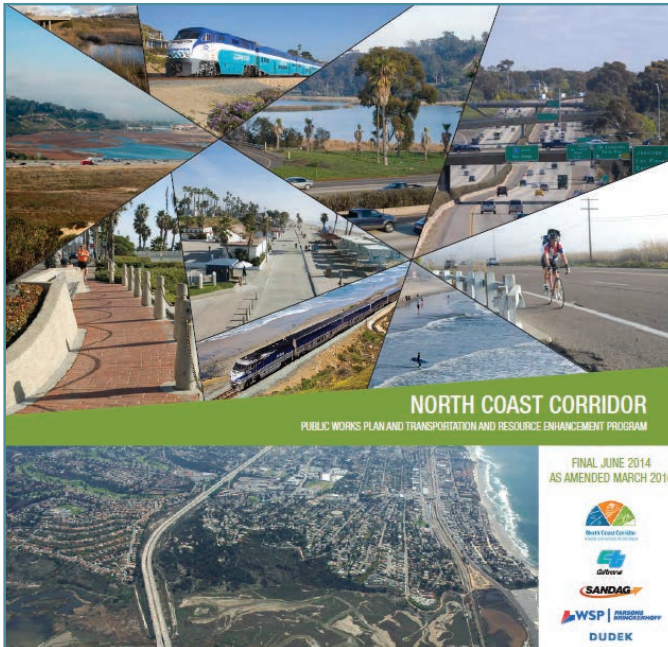
Habitat Mapping

The DEA is developing an internally consistent baseline Geographic Information System (GIS) database to support transportation impact modeling within the State of California. Impact modeling will support Advance Mitigation planning, reporting, and analyses, and includes compiling existing data layers and generating new data products. Development of a Standard Operating Procedure will ensure that Caltrans GIS professionals can update the data in the future, as new information becomes available.

Regional Conservation Investment Strategy Development

Following passage of Assembly Bill 2087 in 2016, Caltrans anticipates participation in the development of Regional Conservation Investment Strategies (RCIS's) in various areas across the state. RCIS's are intended to facilitate mitigation crediting agreements with California Department of Fish and Wildlife (CDFW), allowing Caltrans to propose advance mitigation projects that meet CDFW requirements for mitigating project impacts.

District 11: North Coast Corridor



The North Coast Corridor in San Diego County provides access to 27 miles of coastline—home to some of California’s largest remaining coastal wetlands and most treasured coastal resources.

Caltrans participated in a collaborative effort to integrate long-range transportation planning with environmental planning priorities to protect and enhance coastal ecosystems.

To address growing transportation demands along the environmentally sensitive **North Coast Corridor (NCC)** in northern San Diego County, the San Diego Association of Governments (SANDAG) and Caltrans collaborated with the California Coastal Commission, local cities, resource agencies, and the public, to integrate long-range transportation with environmental planning priorities.

The effort resulted in the “**NCC Public Works Plan/Transportation and Resource Enhancement Program**” (**PWP/TREP**), a blueprint for implementing a \$6-billion, 40-year program of rail, highway, transit, bicycle, pedestrian, and coastal resource improvements that span the coastline from La Jolla to Oceanside.

The PWP/TREP addresses critical transportation improvements on the NCC, while preserving and enhancing ecologically vital resources, and coastal scenic character—the very qualities that make the corridor an attractive place to live, work, and visit. The necessary transportation improvements in the NCC are complex, crossing numerous jurisdictional boundaries, and will be implemented in phases. The following pages highlight the enormous ecological value that will be preserved and enhanced as a result of the comprehensive and forward thinking projects outlined in the PWP/TREP.

*The above text adapted from the NCC PWP/TREP:
http://www.dot.ca.gov/dist11/Env_docs/I-5PWP/2016/march/nccpwptreptfull.pdf*

Resource Enhancement and Mitigation Program Overview

North Coast Corridor

The North Coast Corridor (NCC) includes nearly 30 miles of coastline

that is recognized for a number of unique and significant marine and environmentally sensitive habitat areas. The Public Works Plan (PWP)/Transportation Restoration Enhancement Program (TREP) planning area extends from the Coastal Zone boundary to the Pacific Ocean and from La Jolla Village Drive in San Diego in the south, to Harbor Drive in Oceanside/Camp Pendleton Marine Corps Base in the north.

The coastal watersheds, lagoons, and upland areas in the corridor provide a range of diverse habitats and ecosystems that support a variety of plant and wildlife species. Due to the proximity of the PWP/TREP projects to sensitive habitats and species living along the corridor, not all impacts to coastal resources can be avoided.

SANDAG and Caltrans have long coordinated with the regulatory and resource agencies through the NCC Project environmental review and permitting processes. The PWP/TREP Resource Enhancement and Mitigation Program (REMP) was developed to identify compensatory mitigation opportunities to address these unavoidable impacts, and to implement projects that benefit existing natural resources, which

exceed standard ratio-based compensatory mitigation programs. The PWP/TREP planning area has been defined as the Service Area for compensatory mitigation opportunities needed to offset impacts associated with approved PWP/TREP transportation infrastructure and community enhancement projects.

The proposed REMP employs a combination of measures to mitigate for coastal resource impacts of the projects. The constrained, primarily built-out condition of the NCC leaves few opportunities for the land acquisition that is typically necessary to implement traditional, ratio-based compensatory mitigation. However, the NCC is home to six major lagoon systems which represent some of southern California's most significant coastal natural resource areas. These lagoon systems, associated upland habitat, riparian wetland interface, and their contributing watersheds, provide large contiguous areas that support sensitive habitats for a variety of plant and wildlife species, while also providing water quality, flood control, groundwater recharge, and recreational benefits.

The NCC's lagoon systems and their habitats are biologically unique and cannot be replicated elsewhere. As such, the REMP focuses on opportunities to protect the NCC's lagoon systems from potential future degradation and to expand, restore, and/or enhance habitat within these systems.

This approach requires comprehensive solutions that focus on ecosystem-wide enhancements, including preservation, restoration, and long-term management. The REMP approach results in greater benefits to coastal resources throughout the corridor than if only ratio-based, project, and site-specific compensatory mitigation were employed. Compensatory mitigation projects were evaluated and implemented at the regional scale and in advance of project impacts.

The REMP includes options for allocating funds from SANDAG's Environmental Mitigation Program (EMP) for a variety of regionally significant mitigation opportunities, including the establishment, restoration, enhancement, preservation, and long-term management of coastal wetlands and adjacent riparian areas, other transitional habitats, and upland habitat areas. These mitigation activities include: 1) acquisition of habitat parcels for the REMP that will help protect and enhance NCC lagoon system and watershed functions and services; and meet "no net loss" goals through establishment and restoration, 2) acquisition, preservation, and if necessary, enhancement, of parcels which contribute to regionally significant resources, including upland habitat areas, 3) planning and implementation of regionally significant lagoon restoration projects, 4) providing long-term non-wasting endowments for two regionally significant lagoons to fill funding gaps for maintenance and management activities, and 5) funding a Scientific Advisory Committee to provide technical support for the design, implementation, and monitoring of the suite of mitigation activities described in the REMP.

The design of bridges that cross lagoons entailed intensive hydraulic and sediment transport analyses to enable full tidal exchange, restoration/improvement of wildlife movement, and to maximize the avoidance and minimization of direct and indirect impacts of the I-5 widening project—as required by the resource and regulatory agencies. These optimized bridges and increased lagoon

channel cross sectional areas protect existing tidal lagoon system functions and do not constrain future options for restoring tidal flows to lagoons that are currently restricted. The optimized bridge lengths and channel configurations are included in the REMP; however, funding for these enhancements will be provided through capital expenditures.

Program Overview

For the Coastal Commission, the REMP provides for mitigation planning and implementation through the PWP and TREP process to effectively mitigate NCC project impacts in a manner that addresses regionally significant resource needs. For the USACE, the REMP is being utilized as a Planning Level Compensatory Mitigation Plan for permitting individual projects within the NCC that are authorized to use one of the described compensatory mitigation sites. In addition, the REMP is being utilized to guide the development of detailed site-specific Habitat Mitigation and Monitoring Plans (HMMPs) for each of the compensatory mitigation sites in order to support permittee-responsible advance mitigation. For the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), National Marine Fisheries Service (NMFS), and the San Diego Regional Water Quality Control Board (RWQCB), the REMP is being utilized as the overall compensatory mitigation package for the covered projects. However, pursuant to each agency's jurisdictional authority and purview, agency-specific permits or consultations may result in additional requirements or procedures to be followed for project impacts and mitigation sites. Overall, the REMP provides the planning and implementation framework to ensure that the most valuable, high quality compensatory mitigation opportunities in the NCC are identified, secured, and prioritized for implementation in a manner that cost-effectively utilizes available mitigation funding to maximize benefits to the natural resources within the NCC.

Funding

The TransNet Extension Ordinance approved by the San Diego voters in November 2004 established an EMP for the advancement of mitigation of regional and local transportation project impacts on resources. The REMP supports the region's comprehensive regional mitigation strategies including those included in the TransNet EMP. The REMP will be utilized by the resource and regulatory agencies in permitting transportation projects within the NCC. The REMP prioritizes expenditure of EMP funds on a corridor-wide level (with an emphasis on establishment, restoration, enhancement, and preservation of sensitive NCC habitats) in advance of impacts through funding system-wide restoration plans, endowments, and the Scientific Advisory Committee.

Working Group

The PWP/TREP includes the formation of a REMP Working Group (Working Group) that includes SANDAG, Caltrans and resource and regulatory agency personnel directly involved in permitting of transportation projects, including but not limited to the USFWS, USACE, EPA, NMFS, CDFW, California Wildlife Conservation Board, RWQCB, Coastal Conservancy, and the Coastal Commission. The Working Group provides oversight and advisory assistance in prioritizing compensatory mitigation timing and implementation; developing and reviewing of the site-specific HMMPs; and ensuring specific REMP requirements are achieved. The Working Group is charged with prioritizing and coordinating disbursement of REMP funds for the San Elijo or Buena Vista Lagoon Restoration Projects. The Working Group may advise SANDAG and Caltrans on potential resource benefits of new compensatory mitigation opportunities that may be determined necessary as contingency measures and/or warranting consideration for incorporation into the REMP given their unique value.

Stakeholder and Agency Participation

REMP opportunities and asset evaluations were identified and developed in coordination with various

NCC natural resource stakeholders and resource and regulatory agencies. In consultation with these entities, SANDAG and Caltrans have identified several categories of mitigation opportunities, as well as a variety of resource protection options to address regionally significant needs. In some cases, the opportunity to implement site-specific compensatory mitigation efforts has already been secured via land acquisition of suitable restoration sites.

In coordination with stakeholder groups and resource and regulatory agencies, SANDAG and Caltrans have identified two large-scale lagoon restoration and enhancement projects (San Elijo and Buena Vista lagoons) and one large-scale lagoon establishment project (San Dieguito W-19 property). Technical studies and environmental documents for these projects are being developed and the various stakeholder groups and resource and regulatory agencies are considering implementation of these projects, depending on the alternative chosen, for compensatory mitigation for the NCC transportation projects. SANDAG and Caltrans have been assisting through participation in project planning and provision of funds for technical and environmental studies. In coordination with resource and regulatory agencies, SANDAG and Caltrans funded hydraulic and sediment transport studies to analyze I-5 and intercity rail bridge designs at the corridor lagoons to maximize avoidance and minimization of impacts, reduce tidal muting, and restore/improve wildlife movement. These optimized bridge designs, in concert with expanded channel dimensions, allow for possible future establishment, restoration, and enhancement of tidal wetlands and improved water quality within the lagoons.

The suite of mitigation options considered in the REMP fall under these categories: 1) *Temporary Impacts* (temporary impacts to natural resources due to activities such as vegetation clearing, access for road construction, staging, diversions, etc.); 2) *No Net Loss Pool* (Establishment and Restoration/Re-establishment and Rehabilitation); 3) *Enhancement Pool* (Restoration, Enhancement and Preservation); and 4) *Contingency Pool* (Endowment and Restoration Infrastructure).



Conclusion

The overall goal of the REMP is to enhance and restore the biodiversity and habitat functions and services of critical ecological coastal resources within the NCC as compensatory mitigation in advance of unavoidable impacts associated with planned PWP/TREP projects.

All compensatory mitigation sites include long-term non-wasting endowments to fund management in perpetuity. Funding for projects included within the REMP is directed to those sites that address the most critical ecological needs in the NCC while respecting the project phasing; the mitigation needs identified in the PWP/TREP; anticipated compensatory mitigation requirements by regulatory agencies; and the voter-adopted TransNet Expenditure Plan's EMP budget for the NCC. The resource mitigation program is intended to be flexible and adapt to future changes in opportunities, while promoting mitigation in advance of impacts.

The opportunities identified within the REMP, including early acquisition of sites containing high-value habitat for long-term preservation, will be phased ahead of, or concurrent with, unavoidable impacts from planned PWP/TREP projects.

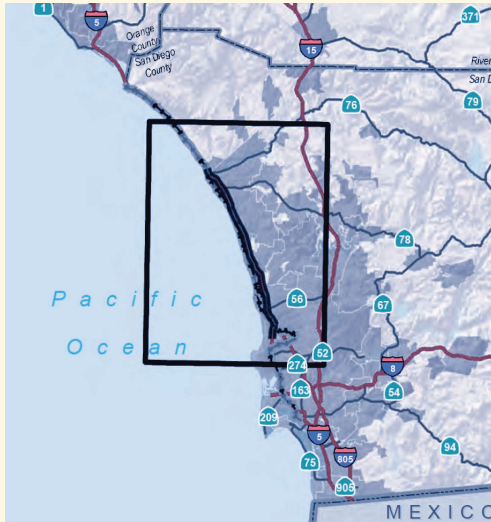
Implementing the REMP and individual compensatory mitigation sites in advance of unavoidable impacts will serve to provide high ecological value while still reducing typically required mitigation ratios (by reducing the uncertainty of location, type, and quantity of mitigation, and reducing temporal loss of habitat acreage, functions, and services from construction-related impacts). In addition, phasing transportation facility infrastructure at sensitive locations has been specifically designed to avoid and minimize impacts, protect existing lagoon system functions and services, and to allow for future large-scale lagoon restoration projects.

The following pages graphically illustrate the tremendous gains achieved through advanced integration of transportation and ecological planning and project implementation along the North Coast Corridor.

North Coast Corridor

Resource Enhancement and Mitigation Project Map

The projects shown on the map below are described on the following pages.



Graphic based on imagery from: [North Coast Corridor Public Works Plan and Transportation and Resource Enhancement Program](#)

b) Hallmark East

Mitigation activities include removal of invasive exotic plants, and restoration of southern willow scrub wetland, coastal brackish marsh/freshwater marsh, and coastal sage scrub.

d) Batiquitos Bluffs

These parcels will be used as mitigation for projects and/or will be preserved in place as mitigation for temporary impacts. This property enhances the Batiquitos Lagoon Ecological Reserve and surrounding habitat.



a) Hallmark West

This project excavated fill to re-establish tidal salt marsh, restoring important ecological functions associated with tidal hydrology. The additional sub-tidal channels and low marsh/mudflat increase tidal flushing and provide important foraging habitat for a number of bird species.

c) La Costa

Mitigation activities emphasize preservation and management of native upland vegetation communities to protect California Gnatcatcher habitat, sensitive plants, and cultural resources.

The North Coast Corridor (NCC) Public Works Plan/Transportation and Resource Enhancement Program (PWP/TREP), prepared jointly by San Diego Association of Governments and Caltrans, “is a single integrated document that establishes a framework for comprehensively planning, reviewing, and permitting of the NCC’s transportation, community, and resource enhancement projects. The PWP/TREP allows these improvements to be analyzed as an integrated system, with the goal of optimizing the suite of improvements so that transportation goals are met in a manner that maintains and enhances public access to coastal resources and recreational facilities, and sensitive coastal resources are protected and enhanced wherever feasible.”

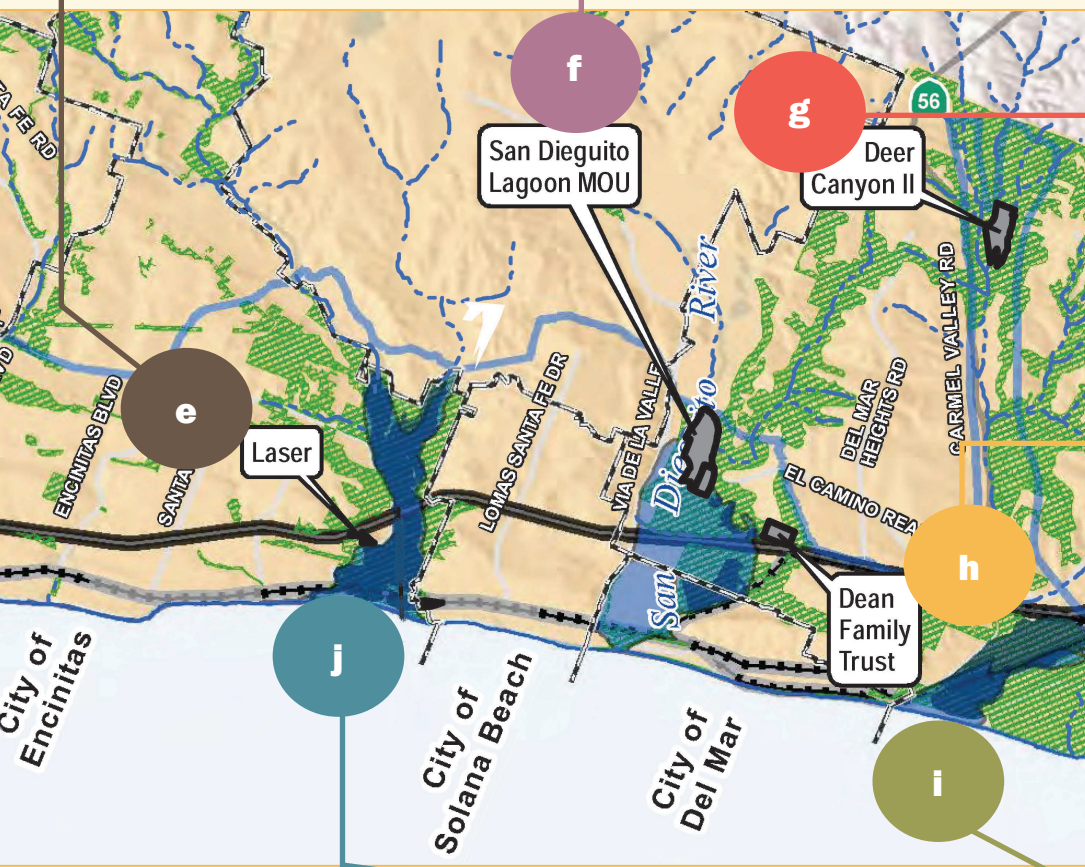
e) Laser

This project will preserve and manage native upland vegetation communities to protect occupied California Gnatcatcher habitat, sensitive plants, and cultural resources.

f) San Dieguito W19

The proposed project will restore salt marsh, brackish marsh, and native upland habitats. It also offers opportunities for public access, including trail links to the Coast to Crest Trail.

-  Mitigation Sites
-  Land Preservation Area
-  Coastal Zone Boundary
- Coastal Zone Appeal and Permit Areas**
 -  Coastal Commission Permit Jurisdiction
 -  Lagoon



g) Deer Canyon II

This project creates coastal sage scrub habitat suitable to support California Gnatcatcher, and will be managed as open space in perpetuity.

h) Dean Family Trust

The Dean Mitigation Site supports California Gnatcatcher and rare plants. Mitigation activities emphasize restoration of existing disturbed upland habitat, and preservation of existing high quality upland habitat through site protection.

j) San Elijo Lagoon Restoration

San Elijo is a 900+ acre lagoon system. Mitigation activities include restoring the hydrological regime and the marsh habitat—converting middle and high marsh habitat to mudflats and low marsh habitat.

i) Los Peñasquitos Lagoon

Los Peñasquitos Lagoon (LPL) is a State Marsh Natural Preserve located within the Torrey Pines State Natural Reserve. A management priority is to maintain tidal connectivity within the lagoon channels, thereby protecting flora, fauna, and ecosystem services.

North Coast Corridor

Resource Enhancement and Mitigation Project List

a

Hallmark West

This mitigation site is located along the shoreline of the eastern basin of Agua Hedionda Lagoon. The project excavated fill on Caltrans and adjacent California Department of Fish and Wildlife (CDFW) property to re-establish approximately four acres of tidal salt marsh. The additional sub-tidal channels and low marsh/mudflat will increase tidal flushing and provide important foraging habitat for a number of bird species. The additional mid and high marsh areas form contiguous salt marsh with the adjacent salt marsh habitats. Re-established and rehabilitated tidal salt marsh (4.01 acres and 0.79 acres, respectively) will have similar species composition and structure as observed in representative salt marsh habitat found within Agua Hedionda lagoon near the compensatory mitigation site. In addition, approximately 0.33 acres disturbed freshwater marsh/riparian habitat will be enhanced, and 5.7 acres of coastal sage scrub will be restored and/or enhanced.

b

Hallmark East

Mitigation activities include removal of invasive exotic plants on-site to restore 0.74 acres of southern willow scrub wetland. The project enhances 0.57 acres of coastal brackish marsh/freshwater marsh. Approximately 0.9 acres of coastal sage scrub will be established in disturbed areas, and 1.26 acres of disturbed coastal sage scrub will be restored. The remaining 0.98 acre of good quality coastal sage scrub will be enhanced through weed removal. Previously, the site had two areas of

relatively good quality coastal sage scrub with a drainage flowing through the site but slopes surrounding the drainage were covered almost exclusively in invasive and exotic plants. The wetland area was cleared of exotics and replanted with willows (*Salix* spp.), mule fat (*Baccharis salicifolia*) and cottonwoods (*Populus fremonti*). Approximately 0.75 acres of nonnative grasses and broad leaf plants were removed and replaced with purple needlegrass (*Stipa pulchra*).

c

La Costa

This preservation parcel is located east of Interstate 5 (I-5), across from Batiquitos Lagoon. The proposed preservation and management of the native uplands vegetation communities protects:

- Occupied California Gnatcatcher habitat
- Chaparral and coastal sage scrub habitat and ecosystem continuity between adjacent coastal wetlands and native uplands;
- Sensitive plants and cultural resources;
- Wildlife connectivity with Batiquitos Lagoon and open space that connects Encinitas Creek and other drainages to the lagoon and the Pacific coastline;
- Scenic quality and landscape character associated with the natural topography.

Rehabilitation will include removal of ornamental planting and replacement with appropriate native species.

d

Batiquitos Bluffs

The property is located southeast of Batiquitos Lagoon in the cities of Encinitas

and Carlsbad. The combined 50.5-acre parcels will be used as mitigation for projects identified in the PWP/TREP, and 3.7 of those acres have restoration potential. The remainder of the acreage is already good quality upland and wetland habitat that will be preserved in place as mitigation for temporary impacts. The subject property enhances the Batiquitos Lagoon Ecological Reserve and the surrounding habitat.

e

Laser

These parcels are located west of I-5, across from San Elijo Lagoon. The proposed preservation and management of the native uplands vegetation communities protects:

- Occupied California Gnatcatcher habitat;
- Sensitive plants, coastal sage and bluff habitats, and ecosystem continuity;
- Increased native upland buffer between I-5 and San Elijo Lagoon and surrounding native open space— which connect Encinitas Creek and other drainages into the lagoon and Pacific;
- Scenic quality and landscape character associated with natural topography adjacent to San Elijo Lagoon.

The proposed rehabilitation of the site will include removal of ornamental planting and replacement of nonnative species with appropriate native species.

f

San Dieguito W19

This mitigation site is 127 acres. The proposed project would restore 50+ acres of salt marsh habitat and 15 acres of brackish marsh and native upland habitats. The site provides the opportunity to reestablish and/or substantially

The following mitigation sites and associated projects are part of the NCC Resource Enhancement and Mitigation Project List. Project activities are ongoing, or are planned for a future date. See the map on the previous page for site locations.

rehabilitate large portions of the area that historically supported coastal wetlands. In addition, recent public acquisitions of the western river valley's floodplain areas and surrounding uplands provide opportunities to restore native grasslands, coastal sage scrub, and other upland habitats, as well as freshwater marsh habitats that support Light-footed Ridgway's Rail. The project also offers opportunities for public access and interpretation/education including trail links to the Coast to Crest Trail. The proposed mitigation project will complement another restoration project (the San Dieguito Wetland Restoration Project) and will help achieve the overall vision of the restored San Dieguito Lagoon system.

manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*) were transplanted on-site. The goal of the mitigation is to permanently retire development potential of the site, preserve existing high quality upland habitat through site protection (easements and fence), and to improve existing disturbed upland habitat through exotics removal, and active restoration to increase native species cover and diversity.

proposed activities will:

- Enlarge the tidal prism to increase area of tidal expansion in the lagoon.
 - Improve water quality with restored tidal circulation, thereby reducing public impacts (from beach closures due to high bacteria counts, and transmission of mosquito-borne disease).
 - Ensure no adverse change to current flood protection, especially for existing infrastructure and adjacent development.
 - Provide a natural gradient of habitats that considers climate change, anticipated sea level rise, heterogeneity of habitats, and tidal channels of various orders.
 - Enhance habitats for native species, including rare and endangered species.
- The provision of endowment funds for future lagoon maintenance includes:
- A cost-effective management and maintenance plan for supporting the proposed habitat enhancements, curtailing growth and expansion of exotic species, and maintaining regular tidal flow.
 - Design and implementation of a biological and hydrological monitoring program to assess the success of restoration efforts and facilitate adaptive management decisions.
 - Maintenance of lagoon public access and educational opportunities consistent with resource protection needs and requirements.



Los Peñasquitos Lagoon (LPL)

LPL is a State Marsh Natural Preserve located within the Torrey Pines State Natural Reserve in north county San Diego.

Once a pristine salt marsh, the Lagoon is now considered a managed system in an urban setting. Extended inlet closures have become a common occurrence with some lasting over a year, and occur more frequently due to railway alignments through the lagoon. The Los Peñasquitos Lagoon Enhancement Plan and Program has identified maintaining tidal connectivity within Lagoon channels as a management priority to protect the Lagoon's flora and fauna, as well as ecosystem services. SANDAG provided a \$4 million non-wasting endowment to maintain the mouth of the lagoon in perpetuity.



San Elijo Lagoon Restoration

San Elijo is a 900+ acre lagoon system, where approximately 500+ acres is proposed for restoration. The project includes restoring the hydrological regime and the marsh habitat, and converting middle and high marsh habitat to mudflats and low marsh habitat within San Elijo Lagoon. The



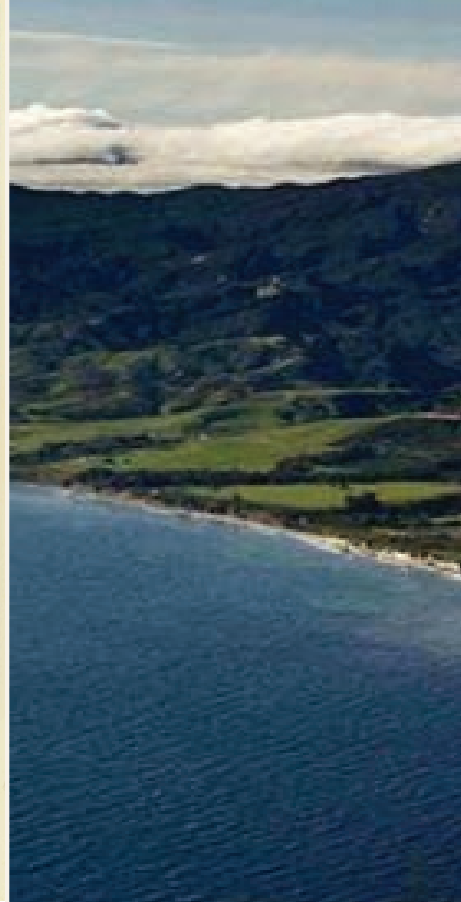
Deer Canyon II

The 17.9 acre mitigation site is located south of State Route (SR) 56 and south of McGonigle Canyon. Site restoration includes removal of nonnative species, installation of a temporary irrigation system and planting of coastal sage scrub that provides habitat for the threatened coastal California Gnatcatcher. The parcel will be managed as open space in perpetuity.



Dean Family Trust

This mitigation site is approximately 21.6 acres. Restoration activities at this site include removal of a large number of exotic plants and replanting the site with coastal sage scrub and southern maritime chaparral species. The site supports California Gnatcatcher and a few rare plants. In addition, three individuals of the endangered Del Mar



*In Fred Farr — at the most magnificent spot —
the very "Continents' End" — with appreciation for your
genius Hospitality — Lady Bird Johnson
September 1966*

State Scenic Highways

Partnering with Locals to Preserve Natural Scenic Landscapes

Over 50 years ago, long before the term “sustainability” was in common usage, Senator Fred Farr and others in the California Legislature created the State Scenic Highway System “to protect the social and economic values provided by the State’s scenic resources.” The program, managed by the Caltrans Landscape Architecture Program, exemplifies balanced stewardship of

social, ecological and economic resources. The preservation of scenic vistas improves quality of life, encourages development that is mindful of ecological functioning, and encourages tourism along the route—a boon to the local economy.

The Legislature directed Caltrans to create and administer the Scenic Highway program, and as the recent dedication of Topanga Canyon in Los Angeles County and the Gaviota Coast State Scenic Highway in Santa Barbara County highlight— the designation of scenic highways is fundamentally a partnership activity. For an eligible route to become an officially designated State Scenic Highway, local communities must demonstrate that their local codes and ordinances will ensure the preservation of visual quality, and encourage development that is undertaken with sensitivity to the surrounding environment.

Today, California’s 62 State Scenic Highways, spanning more than 1350 miles, are great travel routes and places to visit, but they are much more—they





also demonstrate that preservation of natural beauty and visual quality ([as required by CEQA and NEPA](#)) can improve quality of life for residents and visitors, while invigorating the local economy. A designation as a State Scenic Highway is an expression of a shared vision between Caltrans and scenic highway communities to balance transportation services, and local land-use activities, with sensitivity to scenic vistas and the natural environment.

The first State Scenic Highway, 72 miles of California Highway 1 near Big Sur, was officially designated in 1965. The dedication ceremony, attended by Senator Frank Farr, and California Governor Edmund “Pat” Brown, received national recognition due to the attendance of First Lady, Claudia “Lady Bird” Johnson. The First Lady was an early, and life-long advocate for scenic quality, and beautifying the nation’s cities and highways. Her tireless work supporting passage of the Highway Beautification Act of 1965 resulted in the Act’s nickname: “Lady Bird’s Bill,” an enduring moniker to this day.

Lady Bird championed the preservation and restoration of scenic beauty as an essential aesthetic experience which also benefited quality of life, ecological health, civic pride, and national identity. Speaking at a “Conference on Natural Beauty” that was held in the White House in 1966, she said: “How we treat our land, how we build upon it, how we act toward our air and water will in the long run tell what kind of people we really are...I suggest that perception of beauty, and action to preserve and create it, are a fundamental test of a great society.”

For more information, contact Keith Robinson, Principal Landscape Architect (keith.robinson@dot.ca.gov), or visit the Landscape Architecture Program online (<http://www.dot.ca.gov/design/lap/>).

Photo previous page: Senator Fred Farr with Lady Bird Johnson in Big Sur, California, next to the plaque commemorating California Highway 1 as the first State Scenic Highway. California Governor Edmund “Pat” Brown is pictured on the right.

Photo credit: [California State University, Monterey Bay Archives and Special Collections](#)

Top photo this page: Gaviota Coast Scenic Highway in Santa Barbara County, officially designated in 2016. Middle photo: View along State Route 52 in San Diego officially designated in 2016. Bottom photo: Topanga Canyon State Scenic Highway dedication ceremony in June 2017.



Roadside Trees and Plants: High Value Investments for the State Highway System

“IF YOU LOOK AT A TREE, and think of it as a design assignment, it would be like asking you to make something that makes oxygen, sequesters carbon, fixes nitrogen, distills water, provides habitat for hundreds of species, accrues solar energy’s fuel, makes complex sugars and food, changes colors with the seasons, creates microclimates, and self-replicates.”

— William McDonough,
American Architect

ROADSIDE TREES & PLANTS

are a low cost investment that improve ecological health, economic prosperity and community quality of life. Native and site appropriate trees and plant provide value by:

SUPPORTING POLLINATORS & WILDLIFE

Trees and plants provide essential food and shelter for pollinators and wildlife.

“Plantings of diverse vegetation support pollinators, beneficial insects, birds and other wildlife. Plantings can provide corridors, cover, nesting sites, and food sources.” - United States Department of Agriculture (USDA) National Agroforestry Center

TREATING STORMWATER

Trees, vegetation and their associated soils are often referred to as “green infrastructure” due to their ability to treat stormwater runoff and facilitate infiltration of precipitation on-site. The top left photo shows a planted median designed to treat storm water in San Luis Obispo County.

“The planting of trees means improved water quality, resulting in less runoff and erosion. This allows more recharging of the ground water supply.” -USDA Forest Service

CLEANING THE AIR

Through the leaf structures that facilitate photosynthesis and gas exchange, trees remove gaseous pollutants from the air such as

ozone, sulfur dioxide, nitrogen dioxide and carbon monoxide. Trees also intercept particulate matter, preventing it from being airborne. Airborne particulates can exacerbate health conditions such as asthma.

In 1994, trees in New York City removed an estimated 1,821 metric tons of air pollution at an estimated value to society of \$9.5 million. -D. Nowak, USDA Forest Service

COOLING THE AIR

By providing shade to adjacent buildings and pavement, and through the natural processes of water absorption, water loss, and plant respiration, vegetation cools the air.

“The net cooling effect of a young, healthy tree is equivalent to ten room-size air conditioners operating 20 hours a day. -U.S. Department of Agriculture

CONSERVING ENERGY

Trees that provide wind-blocks in winter, and shade for buildings and streets in summer can significantly reduce energy consumption. In hot weather, unshaded roofs and



pavements can be heated to temperatures far above that of the surrounding area, creating what are called “heat islands.” Heat islands increase summertime peak energy demands through increased use of air conditioning.

“Trees properly placed around buildings can reduce air conditioning needs by 30 percent and can save 20–50 percent in energy used for heating.” -USDA Forest Service

PROVIDING FISCAL BENEFITS

The environmental services provided by trees and vegetation provide monetary benefits to communities, and the state.

The monetary value of the environmental benefits provided by public trees “..including energy savings, stormwater-runoff reduction, improved air quality, and reduced atmospheric carbon dioxide, are up to three times greater than tree care costs.” - Piedmont Community Tree Guide

“There are about 60– to 200-million spaces along our city streets where trees could be planted. This translates to the

potential to absorb 33 million more tons of CO2 every year, and saving \$4 billion in energy costs.” -National Wildlife Federation

INCREASING LAND VALUES

Trees and landscaping add to the aesthetic appeal of communities which contributes to higher occupancy rates and property values.

“Landscaping, especially with trees, can increase property values as much as 20 percent.”

- International City/County Management Association

IMPROVING HUMAN HEALTH

Trees and plants provide public health benefits related to improved air and water quality. Trees can contribute to improved cardiovascular health and reduce stress by encouraging people to walk outside. Research also shows that views of trees and vegetation can significantly boost immune system functioning.

“People who live in areas with higher street tree density report better health perception and fewer cardiometabolic conditions

compared with their peers living in areas with lower street tree density.”-Scientific Reports, July 2015

A study centered on a suburban Pennsylvania hospital found that “patients with bedside window looking out on leafy trees healed, on average, a day faster, needed significantly less pain medication and had fewer postsurgical complications than patients who instead saw a brick wall.” -D. Franklin, Scientific American

PROVIDING NATURAL BEAUTY & “SENSE OF PLACE”

Trees and vegetation add to the aesthetic appeal of highways, streets, and communities. As the photos on these pages illustrate, trees and plants contribute to a unique “sense of place,” –providing a connection to nature, the seasons, and community identity.

“Association with beauty can enlarge man’s imagination and revive his spirit...What a citizen sees every day is his America. If it is attractive it adds to the quality of his life. If it is ugly it can degrade his existence.” -President Lyndon B. Johnson



SUMMER 2017

PDOQ

Photo: Bixby Bridge on State Scenic Highway 1, in Big Sur.
Photo credit: Kārlis Dambrāns, Flickr CCL