Governor's
Environmental Goals and Policy Report

November 2003

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STATE OF CALIFORNIA

Governor's Office of Planning and Research

Tal Finney
Interim Director

November 10, 2003

To the Members of the California Legislature:

I am transmitting to you the 2003 update of the Governor's Environmental Goals and Policy Report (EGPR). The EGPR forms the framework for state agencies, departments, boards and commissions for developing their own plans and strategies for serving the people of California.

State law, enacted in 1970, requires that the EGPR be prepared and updated every four years. The EGPR was not prepared and adopted until 1978. When Governor Gray Davis signed Assembly Bill 857 (Chapter 1016, Statutes of 2002), he directed the Office of Planning and Research to prepare the first update of the EGPR in the last twenty-five years. That document is now before you.

The EGPR is an overview of state growth and development and a statement of approved state environmental goals and objectives, including those directed to land use, population growth and distribution, development, the conservation of natural resources, and air and water quality. It also describes actions required to implement the state's environmental goals.

This update of the EGPR is consistent with the state planning priorities enacted by AB 857, and enumerated in Government Code §65041.1. OPR is required to report to the Governor and the Legislature regarding the implementation of the EGPR. This report is first due on or before January 1, 2005, and is due annually thereafter. OPR looks forward to working with the Legislature and all state agencies, departments, boards and commissions to achieve the statewide goals and objectives set forth in the 2003 update of the EGPR.

Sincerely,

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EXECUTIVE SUMMARY

The 2003 update of the Environmental Goals and Policy Report (EGPR) of the State of California marks the first time in 25 years that a Governor has attempted to address the issue of growth and development on a statewide scale. It analyzes the current context of our environmental, economic and social setting; the driving forces behind growth and development; and the outside influences that affect many of the State's actions, policies, and programs. Based on this analysis of existing conditions and influences, the EGPR proposes several cross-cutting and integrated goals and policies for the State of California which will allow it to achieve the overarching goal of sustainable development.

Why an EGPR?

All Californians fundamentally want the same basics things. We want a high quality of life for ourselves and our families, now and in the future. We want to feel safe in our communities. We want access to quality education. We want meaningful, well-paying jobs. We want a decent place to live. We want access to the newest technology in information, health, energy, and entertainment. We want freedom that comes with mobility. We want clean air and clean water so that our health is not threatened. We want to be treated fairly and equitably, with opportunities for all to make our lives better.

However, California's resources are not inexhaustible, and current trends indicate that if decisive measures are not taken to prepare for and manage growth, some of the State's most valuable assets will be threatened. The time has come to unify state action towards the preservation of these state assets, assets such as a strong economy, fiscal stability, reliable energy, clean air and water, open space and agricultural land, and our very public health and security.

What This EGPR Hopes to Achieve

The EGPR is about preserving the long-term future of California and actions needed to keep the State, its communities and its citizens prosperous over time. It reflects a commitment by state government to sustainable development and an invitation to local governments, businesses, and individuals to join in this commitment.

The EGPR is about changing the way that state government conducts itself. It makes a distinction between things that should continue to grow or develop—such as jobs, productivity, wages, capital, savings, profits, information, healthcare, education, knowledge, environmental quality and social equity—and things that should not—such as pollution, waste, poverty, and dependence on non-renewable resources.

Sustainable development, in the context of this EGPR, relies on the full consideration of societal, economic and environmental issues in policy and decision making. The concept of sustainability recognizes that the economy, society, and the environment are interconnected and interdependent spheres. All three spheres must be healthy in order for any community to prosper, whether that community is a small town, a big city, or the entire state. The programs, policies, actions of state government should seek to improve all three areas simultaneously rather than viewing each as an independent sphere. Sustainable development is a constant process of balancing all these priorities, ignoring none, and drawing upon the resources, talents and convictions of our people to create a society worthy of our children.

Our Future Is Tied to Sustainable Development

The principle drivers of California's growth and development are population and the economy. Simply put—the landscape is altered by people and their activities. These activities manifest themselves as land use patterns and the infrastructure required to support these uses. Changes in population and growth, and the manner in which these changes are translated into land use and infrastructure, are influenced by global trends, such as climate change and globalization of the economy. They are also deeply influenced by our basic governance structure and the roles that various levels of government play in making land use decisions. The way that we use the land and build infrastructure to support those uses, in turn, affect the environment—broadly defined as both the physical and socioeconomic environment.

The human response to these effects create a feedback loop, influencing the primary drivers, trends, as well as land use and infrastructure. Often, in an attempt to solve one problem, such as air quality, we exacerbate another problem, such as water quality, as shown by the recent MTBE experience.

By demonstrating the interaction between growth and development and the quality of the environment as a dynamic system, this report provides the basis for new state goals and policies that can bring about positive change while minimizing unintended consequences.

How This EGPR Will Be Used

The EGPR serves a variety of purposes. First and foremost, it records the approved goals, policies, and proposed actions of state government related to growth and development, the preservation of environmental quality, the economy, and social equity. It advises the Legislature of statutory actions necessary to implement the goals and policies. It informs other level of governments and the public of the proposed direction of state programs and actions to achieve the goals and policies.

More specifically, it serves as a guide to all state agencies in preparing and evaluating their respective plans and projects. It serves as a basis for judgments about the design, location, and priority of major public programs, capital projects, and other actions, including the allocation of state resources through the budget and appropriations process. Indeed, the annual budget transmitted to the Legislature must include information relating proposed expenditures to the achievement of the goals set forth in the EGPR.

How It Will Be Implemented

The goals and policies are intended to encourage sustainable development through state government actions. Achieving these goals will require collaborative planning at and among all levels of government, with the State taking the lead at times, and acting as a partner at others. Effective implementation will require a carefully crafted implementation program that systematically incorporates the concept of sustainable development into all state plans, programs, and funding decisions.

This EGPR recommends the development of a detailed implementation program that will institutionalize the goals and policies at all levels of state government, resulting in tangible changes in the way that state government operates. Development of this implementation program must begin immediately upon adoption of this EGPR by the Governor. Issuance of a Gubernatorial Executive Order requiring the cooperation of all state agencies, boards and commissions will be the first step in the implementation process.

Moving Forward

The conversation about growth and quality of life is not meant to end with the publication of this EGPR. The goals, policies, and implementation measures contained in this report should not be viewed as a final statement or solution, but rather as the beginning of a new dialogue. Institutional change does not come quickly or easily. It requires dedication and continued refinement over time, and willingness to compromise, to innovate, and to embrace change. Maintaining the status quo is not a viable path to a prosperous future for California. We must work together to ensure that we move forward in a direction that preserves the California dream for generations to come.

CHAPTER 1: INTRODUCTION TO THE EGPR

California is at a crossroads. While our state is still in many ways the embodiment of the California dream, that dream is threatened. Our population will grow tremendously over the next 20 years and beyond, yet our resources already seem stretched to capacity. Our infrastructure systems are strained and aging, and the price tag for needed maintenance, improvements, and new construction is overwhelming. In a state where both housing supply and affordability are at all-time lows, we must find ways to adequately house approximately 11 million new residents by 2020. In addition, we must find ways to equitably provide the needs of current and future residents for jobs, education, health care, food, water, energy, and other necessities of life.

There is much to be proud of in our state, fundamental things that make California great. Our racial, ethnic, linguistic, and cultural diversity is unmatched. Our scenic beauty and excellent climate are valued by residents and visitors alike. Our agricultural industry is the envy of the nation for both its productivity and the diversity of crops it produces. Our spirit of innovation has led to birth of entirely new industries.

All Californians fundamentally want the same basics things. We want a high quality of life for ourselves and our families, now and in the future. We want to feel safe in our communities. We want access to quality education. We want meaningful, well-paying jobs. We want a decent place to live. We want freedom that comes with mobility. We want clean air and clean water so that our health is not threatened. We want to be treated fairly and equitably, to feel that we have the same opportunities as everyone else to those things that make our lives better.

> *"Well-planned growth is the best way to stimulate job creation, forge new transportation and housing options, and continue California's economic prosperity. Wise planning should include an emphasis on compact development rather than sprawl, preservation of farmland and scenic lands, and sufficient transportation, affordable housing and basic infrastructure to support both existing as well as new communities"*
>
> *- Governor's Budget Summary 2000-01*

However, California's resources are not inexhaustible, and current trends indicate that if decisive measures are not taken to prepare for and manage growth, some of the State's most valuable assets will be threatened. The time has come to unify state action towards the preservation of these state assets, assets such as a strong economy, fiscal stability, reliable energy, clean air and water, open space and agricultural land, and our very public health and security.

While we boast the fifth-largest economy in the world, that prosperity does not reach all Californians. There is a growing gap between rich and poor in our state and a disturbing trend toward an hourglass economy where middle-wage jobs are scarce.

The administrative structure of California's state government is ill-adapted to managing equity, economy and the environment holistically. It lacks authority to manage several key resources which Californians are increasingly looking to the State to administrate. Additionally, the state's fiscal structure has become highly vulnerable to economic swings. Since the passage of Proposition 13 in 1978 which froze both the value and rise in property taxes, State revenues have increasingly depended on individual income and capital gains taxes, while spending has been rigidly set through various ballot measures. Consequently, local governments have grappled with increased land development to capture sales tax revenues. How can the governance and fiscal structures be modernized to consistently provide Californians a high level of service and achieve sustainable and equitable growth?

As a result of various actions including Energy Commission building and appliance standards, per-person electricity consumption has grown by only 0.1% since 1976, as compared with 1.7% for the rest of the nation, making California the most electricity-efficient state. In spite of this, electricity demand is expected to grow by 28 to 34% due to demographic and economic forces. How will this need for additional power be met?

California's water resources, and those of neighboring states who provide water to California, are reaching their limit. While half of future population growth will occur in the sunny and arid southland, this area faces decreased entitlements for water. The average annual precipitation will not be sufficient to supply our growing needs. How will we ensure a reliable water supply to accommodate future growth and development?

Productive agricultural valleys of the past, such as Anaheim and Santa Clara, have already been completely lost to urban development. Development pressure has moved to the Central Valley, rich in agricultural land. Prime farmland accounts for 19% of the state's total agricultural land (cropland and grazing land). California urbanized an average of over 45,000 acres per year during the period 1996-2000. Of this new development, one in five acres was on prime farmland and a third occurred on irrigated farmland.[1] What lands should be protected from urban expansion?

Obesity has overtaken smoking-related illnesses in terms of cost to the public health system, and childhood asthma is on the increase. How should our communities and facilities be designed to encourage healthier, less sedentary lifestyles?

The increase in vehicle miles traveled in the state is related to longer commute distances and times rather than increased population. In 2000, 76% of California workers drove to work alone. In the Los Angeles Metropolitan Area in 1999, traffic congestion resulted in 56 hours per year per person lost. What should be done to adjust the distribution of housing and jobs to reduce time lost in traffic?

The state is already experiencing a housing shortage and faces a housing crisis in years to come. In order to accommodate 11 million new Californians in more than 5 million new households, California homebuilders would have to construct an average 220,000 additional housing units annually. The state averaged 141,000 new units per year for the last decade. How will we ensure that our communities provide adequate housing to accommodate its population?

To achieve a sustainable and inclusive California for 2020 and beyond, the State will have to be judicious and clear about making use of its resources and infrastructure to sustain its people, economy and environment. This will require no small investment of ingenuity, but that is exactly what California is known for.

History of the EGPR

The statutory mandate requiring the Governor of California to prepare an Environmental Goals and Policy Report (EGPR) dates to 1970, born of the burgeoning environmental movement that also fueled the passage of the California Environmental Quality Act (CEQA), the California Coastal Act, and other environmental laws. Only two EGPRs have ever been completed, one in 1972 by Governor Reagan and one in 1978 by Governor Brown. The Brown Administration's *Urban Strategy for California* was the only one to be formally adopted and implemented through Executive Order.

Statutory Authority for the EGPR

The EGPR requirement is contained in §65041-§65049 of the California Government Code. According to statute, the report must contain, but not be limited to:

- An overview, looking 20 to 30 years ahead, of state growth and development and statement of approved state environmental goals and objectives, including those directed to land use, population growth and distribution, development, the conservation of natural resources, and air and water quality.

- A description of new and revised state policies, programs and other actions of the executive and legislative branches required to implement statewide environmental goals, including intermediate-range plans and actions directed to natural resources, human resources and transportation.

Statute requires that the EGPR be prepared by the Governor and reviewed every four years. Priority is to be given to the development of statewide land use policy. All state entities are to cooperate in its preparation and maintenance and public input must be sought. The Governor must seek the advice of the State Legislature and consider its comments before approving a final report.

[1] California Resources Agency, Department of Conservation, Farmland Mapping Program.

Once approved by the Governor, the EGPR serves a variety of purposes. It records approved goals, policies, and proposed actions of state government related to growth and development and the preservation of environmental quality. It advises the Legislature of statutory actions necessary to implement the goals and policies. It informs other level of governments and the public of the proposed direction of state programs and actions to achieve the goals and policies. It serves as a guide to all state agencies in preparing and evaluating their respective plans and projects. Most significantly, it serves as a basis for judgments about the design, location, and priority of major public programs, capital projects, and other actions, including the allocation of state resources through the budget and appropriations process. The annual budget transmitted to the Legislature must include information relating proposed expenditures to the achievement of the goals set forth in the EGPR.

The EGPR statutes went unchanged for over 30 years, until the 2002 passage of Assembly Bill 857 (Chapter 1016, Statutes of 2002). AB 857 established three state planning priorities with which the goals and policies of the EGPR must be consistent. These priorities, generally, are:

- To promote infill development and equity by rehabilitating, maintaining, and improving existing infrastructure, particularly in underserved areas, and to preserve cultural and historic resources.

- To protect, preserve, and enhance environmental and agricultural resources, including working landscapes, natural lands, recreation lands, and other open spaces.

- To encourage efficient development patterns by ensuring that new infrastructure supports development that uses land efficiently, is built adjacent to existing developed areas, is in an area planned for growth, is served by adequate transportation and other essential utilities and services, and minimizes ongoing costs to taxpayers.

The intent of these priorities is to promote equity, strengthen the economy, protect the environment, and promote public health and safety in all parts of the state, including urban, suburban, and rural communities.

Building on Past Work

The EGPR represents a multidisciplinary compilation of the best current data and analyses on topics relevant to California's environment, economy, and society, and features contributions by experts from state agencies, local government, the private sector and academic institutions in numerous disciplines. True to the vision established in law, this document endeavors to represent the current state of affairs in California, its inherent challenges and opportunities, and best projections of growth and development that allow us to predict where the state is headed. Based on this context, the EGPR proposes appropriate and far-reaching policy to create a California that maintains and indeed improves its high quality of life.

The EGPR incorporates data and information from numerous independent sources. Among the many documents referred to in this document, the following provided fundamental information and guidance for the EGPR:

California's Five Year Infrastructure Plan, 2001, by the California Department of Finance

Creating a Shared California Economic Strategy: A Call to Action, 2002, by the Economic Strategy Panel of the California Technology, Trade and Commerce Agency

Environmental Protection Indicators for California: Understanding Environmental Conditions Through Indicators, 2002, by the California Environmental Protection Agency

Initial Assessment of the Health and Condition of California's Lands and Natural Resources, 2002, by the Legacy Project of the California Resources Agency

Invest for California, 2001, by the Commission on Building for the 21st Century

The New California Dream: Regional Solutions for 21st Century Challenges, 2002, by the Speaker's Commission on Regionalism

Process and Methodology

Issues of environment, equity and the economy touch on virtually every aspect of society in California, and addressing them requires a comprehensive interdisciplinary approach. A broad cross-section of contributors and information sources was sought to develop this EGPR. The findings and recommendations herein reflect the participation and collaboration of numerous state agencies, local government agencies, business leaders, environmental organizations, non-profit groups and independent researchers, scholars and experts. The Governor's Office of Planning and Research (OPR) managed the development of the report, including the public process.

The structure and content were developed through numerous meetings with advisory groups and individual communication. OPR's State Agency Advisory Group was comprised state agency executive staff representing the breadth of state government functions. The Stakeholders Advisory Group was comprised of representatives of an extensive list of local and regional government organizations, non-profits and advocacy groups representing the spectrum of California's population and interests. In joint and separate meetings, these advisory groups helped define the key issues to be addressed and provided ideas on the best approaches to resolving those issues.

In addition, topical areas were researched and analyzed in partnership with experts in various fields, from academia, the public and private sectors. Through individual communications, internal presentations and reviews of documents and drafts, these specialists helped to ensure rigor and comprehensiveness.

To incorporate perspectives from California's distinct regions, a series of regional dialogues was organized under the sponsorship of the California Policy Reform Network, in collaboration with a coalition of regional organizations with funding from the Hewlett and Irvine Foundations. The particular issues and concerns of rural California were represented by OPR's Rural Focus Group, which advised on best approaches to equitable treatment of rural areas.

Finally, this document also represents a review of hundreds of state plans and policy documents, independent reports and journal articles, white papers, books and electronic sources. Collectively, these reference materials furnished broad themes, hard data, identification of problems and proposed solutions from California and beyond.

OPR maintained an EGPR website throughout the development of the report, to enable the public to follow the process and participate if interested. This website provided background information on the EGPR, the schedule for completing the report, agendas and minutes of all public meetings, and copies of all materials distributed at public meetings.

How the EGPR Will Be Used

This EGPR represents a plan for all of California—its land and its people. At its most specific, the EGPR is intended to guide the work of state government, to reinvent the way it does businesses, and to ensure that it leads the State toward continued economic prosperity, a healthy environment, and greater social equity. It articulates goals and policies intended to streamline and unify the work of state government in its effort to address the long-term needs of Californians through programs that affect the environment in the broadest sense of that term.

To legislators and local elected officials, this document will provide a sense of certainty about how the State will manage its resources. While decisions about resources and growth are often fragmented between and within several levels of government, the State can have a critical leadership role in these decisions through the exercise of its planning and funding authorities. Local officials and planners are encouraged to use the EGPR as a guide to development of their own local intermediate and long-range plans.

Californians should view this document as a commitment to a prosperous future, a blueprint for how the State should grow and excel in all areas, social, economic as well as environmental.

This EGPR sets forth goals and policies that will protect the things that make California great even as we make room for the next generations. When one of a state's major characteristics is its diversity, State policies must be exceptionally flexible and interdisciplinary. State agencies must overcome the arbitrary boundaries that separate

their mandates and work at harmonizing their independent missions into some sensible whole. It is an extraordinary challenge.

The conversation about growth and quality of life is not meant to end with the publication of this EGPR. The goals, policies, and implementation measures contained in this report should not be viewed as a final statement or solution, but rather as the beginning of a new dialogue. Institutional change does not come quickly or easily. It requires dedication and continued refinement over time, and willingness to compromise, to innovate, and to embrace change. Maintaining the status quo is not a viable path to a prosperous future for California. Each one of us has a stake in the future of this State. We must work together to ensure that we move forward in a direction that preserves the California dream for generations to come.

CHAPTER 2: GUIDING PRINCIPLES

The Environmental Goals and Policy Report (EGPR) is about preserving the long-term future of California and what state government must do to keep the State, its communities and its citizens prosperous over time. It reflects a commitment by state government to sustainable development and an invitation to local governments, businesses, and individuals to join in this commitment.

This EGPR is about changing the way that state government conducts itself. It makes a distinction between things that should continue to grow or develop—such as jobs, productivity, wages, capital, savings, profits, information, education, knowledge, environmental quality and social equity—and things that should not—such as pollution, waste, poverty, and dependence on non-renewable resources.

What Sustainable Development Means to California

The following widely-quoted statement from the 1987 report of the World Commission on Environment and Development articulates a sense of opportunity and responsibility for government, business, and individuals that underlies the philosophy of sustainable development reflected in this EGPR.

> "Humanity has the ability to make development sustainable - to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs."

There are other descriptions of sustainable development and many attempts at definition, which reflects the individual and personal nature of its implementation, for ultimately, sustainable development is in the hands of individuals through the personal choices people make.

Sustainable development, in the context of this EGPR, relies on the full consideration of societal, economic and environmental issues in policy and decision making. The concept of sustainability recognizes that the economy, society, and the environment are interconnected and interdependent spheres. All three spheres must be healthy in order for any community to prosper, whether that community is a small town, a big city, or the entire state. The programs, policies, actions of state government should seek to improve all three areas simultaneously rather than viewing each as an independent sphere. Sustainable development is a constant process of balancing all these priorities, ignoring none, and drawing upon the resources, talents and convictions of our people to create a society worthy of our children.

Technology and innovation already play a fundamental role in the California economy and way of life, and will continue to support our efforts at sustainability. As development and growth challenge our resources, society and environment, advanced technologies will undoubtedly contribute to solutions. However, not all of the answers can be provided by technology alone. The adoption of sustainable development as a guiding principle, as articulated in this EGPR, is also needed.

Following a New Path

Sustainable development offers a new path toward providing for the well-being of residents and communities, the health and diversity of the natural environment and the economy, and the future of successive generations.

Sustainable development has already become a part of many California state policies. Its principles are expressed, for example, in Executive Order D-16-00, setting a sustainable building goal for state facilities. This EGPR adopts sustainable development as a guiding principle and doctrine of governance to ensure the due consideration of equity, environment, and economy in actions of the state. It reflects a commitment to sustainable development from state government.

The EGPR is about changing traditional ways of decision-making. If we are to address our problems holistically and comprehensively, the interrelationships among various issues must be understood and acknowledged. We can no longer afford to attack the problems of California as if they were separate and independent.

While state government may be largely organized around single-issue departments, this does not mean that our decisions and actions cannot be multi-faceted, integrative, and collaborative. The actions, plans, and policies of all divisions of state government must be guided by a unifying theme of sustainability.

To achieve this end, the State of California must employ an approach to planning and policy making that involves collaboration among all levels of government, with the participation of the public. Our policies and actions must also be grounded in a long-term vision that shapes our responses to short-term problems. The success of this effort depends on widespread understanding of the critical relationships between people and the environment, and the will of Californians, and in particular their decision makers, to take necessary steps towards a more sustainable future.

Aligning State Actions With Sustainability

State government plans, policies, and actions must be:

- Forward-looking, taking into account long-term implications and the need for sound planning.
- Holistic, taking into account environmental, social, and economic considerations.
- Collaborative and inclusive, encouraging and welcoming the involvement of all citizens (including the traditionally underrepresented), businesses, other stakeholders, and all levels government, including other state entities.
- Practical and results oriented, seeking to make a visible and concrete difference.
- Context sensitive, taking into account the unique circumstances of different geographic areas of the state and the differences between urban, suburban, and rural locations.
- Innovative and flexible, open to trying new approaches and embracing changes to the usual ways of doing business.

As state government, we must strive to:

- Make commitments and choices to preserve the options of future generations to secure a superior quality of life.
- Seek solutions that meet a diversity of needs and that address underlying issues rather than just the symptoms of problems.
- View as interdependent the health of our natural environment, the strength of our diverse communities, and our economic security.
- Fully weigh the costs and benefits of decisions, understanding that the lowest initial cost does not necessarily mean the lowest cost over the long term.
- Use land in ways that meet diverse needs, conserve financial and natural resources, and preserve its ability to meet future needs.
- Continually work to improve our political and economic systems so that they consistently motivate behavior that is economically efficient, socially beneficial, and environmentally sustainable.

Growth and development are influenced by decisions made at many different levels of government and private enterprise. To succeed at sustainable development, the effects of our decisions must be carefully weighed at all levels, taking into account the economic, environmental, and social implications of our actions

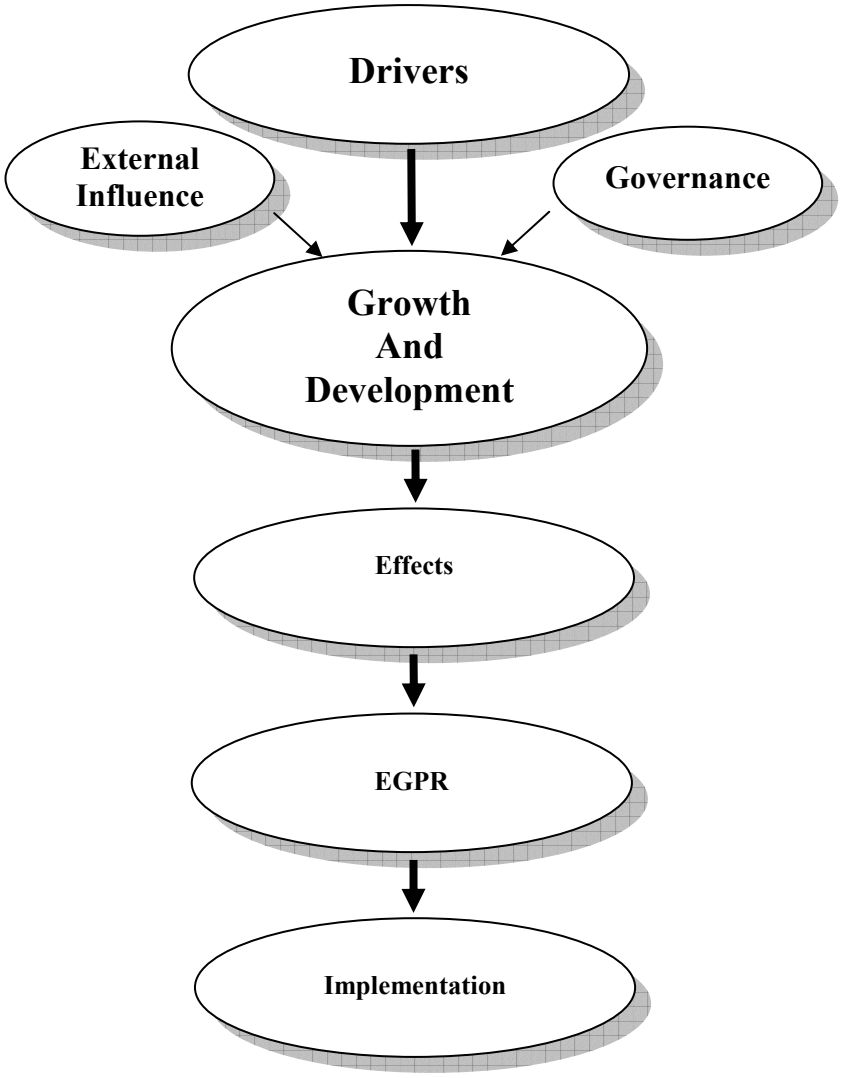
This EGPR provides the state with a framework for addressing growth in a way that secures a sustainable and high quality of life for current and future Californians by strengthening the links between the state's economy, environment, and society. With sustainable development as its guiding principle, the state will be better positioned to anticipate and measure the outcomes of decisions and evaluate choices made.

CHAPTER 3: CONTEXT AND ISSUES

This chapter describes the current state of affairs in California, as they relate to growth and development. It examines the context within which growth occurs, and the direct and indirect consequences of this growth on our economic, physical, and social environment.

The principle drivers of California's growth and development are population and the economy. Simply put—the landscape is altered by people and their activities. These activities manifest themselves as land use patterns and the infrastructure required to support these uses. Changes in population and growth, and the manner in which these changes are translated into land use and infrastructure, are influenced by global trends, such as globalization of the economy and climate change. They are also deeply influenced by our basic governance structure and the roles that various levels of government play in land use decisions. The way that we use the land and build infrastructure to support those uses, in turn, affect the environment—broadly defined as both the physical and socioeconomic environment. This relationship is shown in Figure 1.

Figure 1: Sustainable Development



The human response to these effects creates a feedback loop, influencing the primary drivers and trends as well as land use and infrastructure. Often these responses have unintended consequences. The most well known recent example is MTBE—a gasoline additive. Our economy requires the movement of goods and workers. Our dominant land use pattern and transportation system accomplishes this largely through automobile usage. Automobile engines emit pollutants which affect air quality. Gasoline additives which reduce emissions, such as MTBE, are one response to air quality problems. MTBE, which is stored in underground tanks, is also a groundwater contaminant which migrates easily. Thus, an attempt to solve one problem, air quality, exacerbated another problem, water quality.

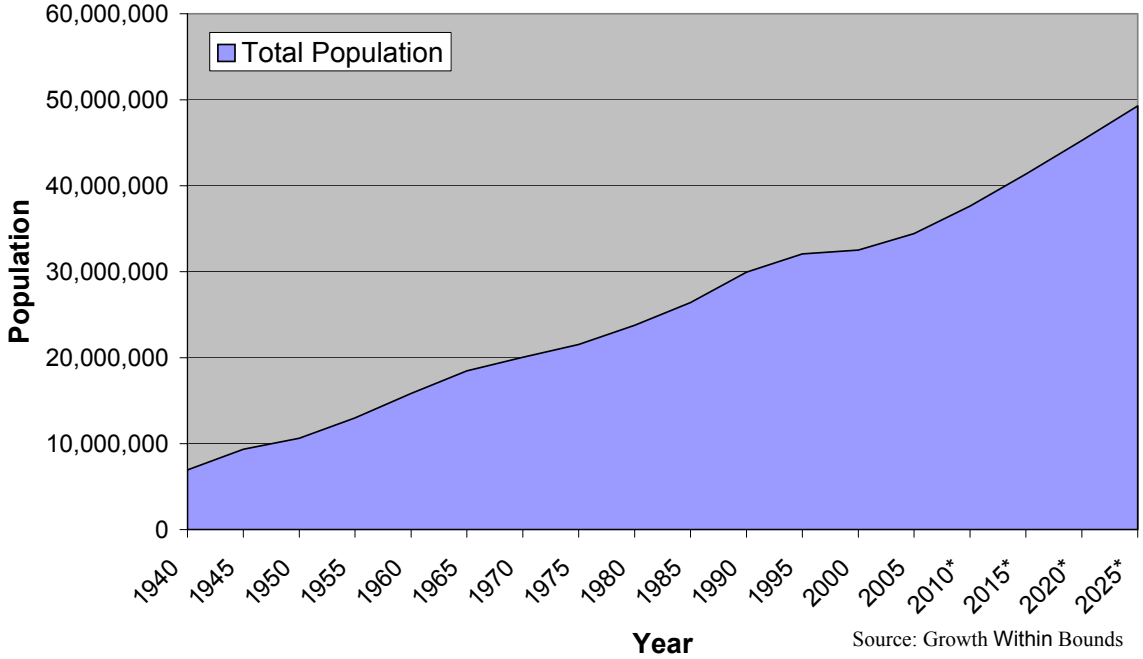
By demonstrating the interaction between growth and development and the quality of the environment as a dynamic system, this chapter will provide the basis for new state goals and policies that can bring about positive change while minimizing unintended consequences. This is in keeping with the idea of sustainable development and the need for state actions to simultaneously consider economic, environmental and equity objectives (the "three E's").

DRIVER OF CHANGE: Population

California's population will grow rapidly in the next 20 to 30 years

There is little doubt that California's future will mean population growth. California is home to 35 million people, more than one and a half times the population of the nation's second most populated state, Texas. By 2020, California's population is expected to reach 42 to 46 million. By 2040, this number grows to approximately 60 million.[2]

Figure 2: Total California Population 1940-2025



Source: Growth Within Bounds

The rate of California's population growth has been extraordinary, tripling in the last 50 years. In the 1990's, the state's total population increased by over 4 million—nearly as many people as currently reside in Montana, Delaware, South Dakota, Alaska, North Dakota, and Vermont combined. Still, California's pace of growth has dropped since the 1980s: despite adding nearly 3.1 million people due to natural increase (the excess of births over deaths) and 2.2 million due to foreign immigration, the state lost 1.7 million migrants to other states. In the years to come, California is projected to add 500,000 new residents annually. Future population growth in California will result primarily from natural growth, as opposed to migration, as shown in Figure 3.

The highest rate of growth will occur in inland counties

California's population is not evenly distributed throughout the state, and neither is its growth. Californian's population has traditionally been concentrated in the coastal areas. While the coastal areas continue to grow, the most rapid change is occurring inland. The high-growth counties will be outside the current metropolitan areas of San Francisco, Los Angeles and San Diego and instead be found in the valleys of Sacramento, San Joaquin and Imperial, heralding tremendous changes in these traditionally rural areas. As shown in Figure 4, 19 of California's 58 counties will see an estimated growth of greater than 50% within the next 20 years.[3]

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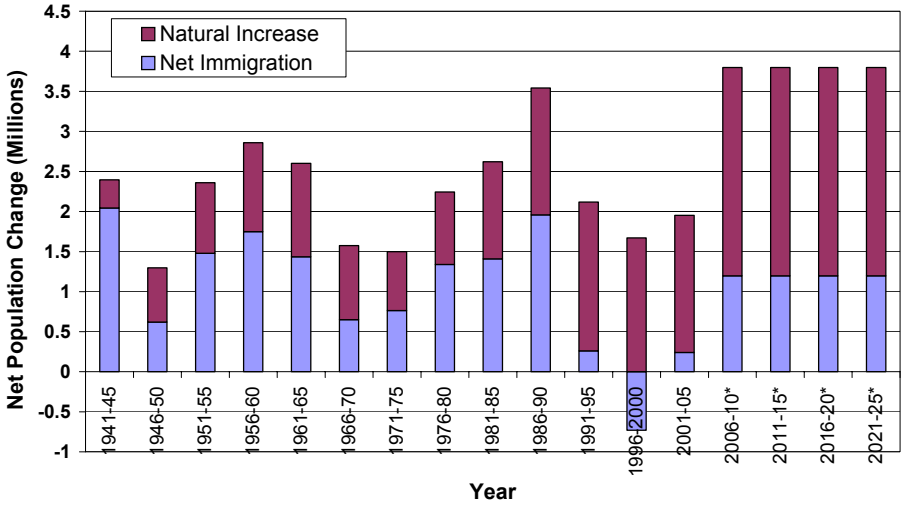
[2] California Department of Finance

[3] California Department of Finance, Demographic Research Unit. *Interim County Population Projections: Estimated July 1, 2000 and Projections for 2005, 2010,2015, 2020.* Sacramento, California, June 2001.

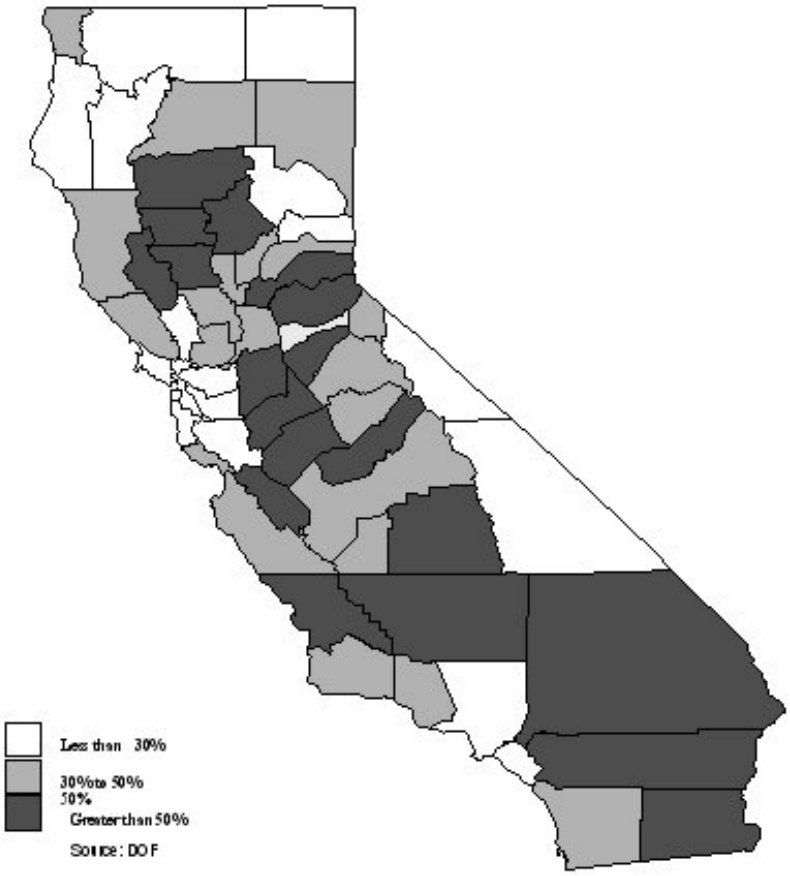
Figure 3: Components of Population Change 1940-2025



California will become increasingly diverse

The fabric of California society is woven of almost every ethnic and cultural group in the world, resulting in a diversity that will continue to progress in the years to come. Already one of the most diverse states in the nation and the world, California now has the distinction of not having any single race or ethnic group in the majority. Nearly five percent of California residents checked more than one race category in the 200 Census, making it home to one in four multiracial Americans.

Figure 4: Projected Percent Increase in Population 2000-2020



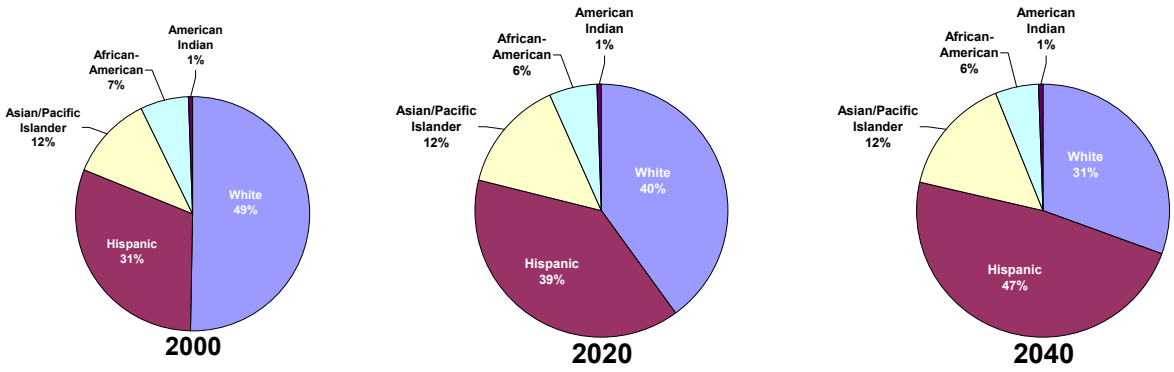
Perhaps the most striking reflection of California's multicultural composition is its language diversity: 39.4% of its residents speak a language other than English at home, compared to a national average of 17.9%, making California first in the nation by that measure. In fact, 79.6% of the residents of the city of Santa Ana speak a language other than English.

Migration plays a critical role in California's evolution, and will continue to do so. In 2001, 280,000 people became legal immigrants in California, 27% of those in the nation.[4] While migration is less predictable as a component of population growth, nearly three out of four foreign migrants come

[4] California Department of Finance.

through family reunification, ensuring a steady flow in the years to come.

Figure 5: California's Language Diversity



Population growth will be especially strong among youth and the elderly

The age structure of California's current population is an important component in understanding its future direction and demands on state services and infrastructure, including housing. California's population is growing rapidly at both ends of the age spectrum. Numerically, the largest segment of California's population is under 20 years of age (Figure 6). This trend will continue, straining our schools and related services. At the same time, the most rapidly growing age group (by percentage) are those 65 and older, followed by the 50 to 64 age group (Figure 7). Californians' median age is rising slowly due to the aging of baby boomers. The increasing age of the state's population will affect the types of services and housing required by Californians.

Figure 6: California Population by Age 1990-2040

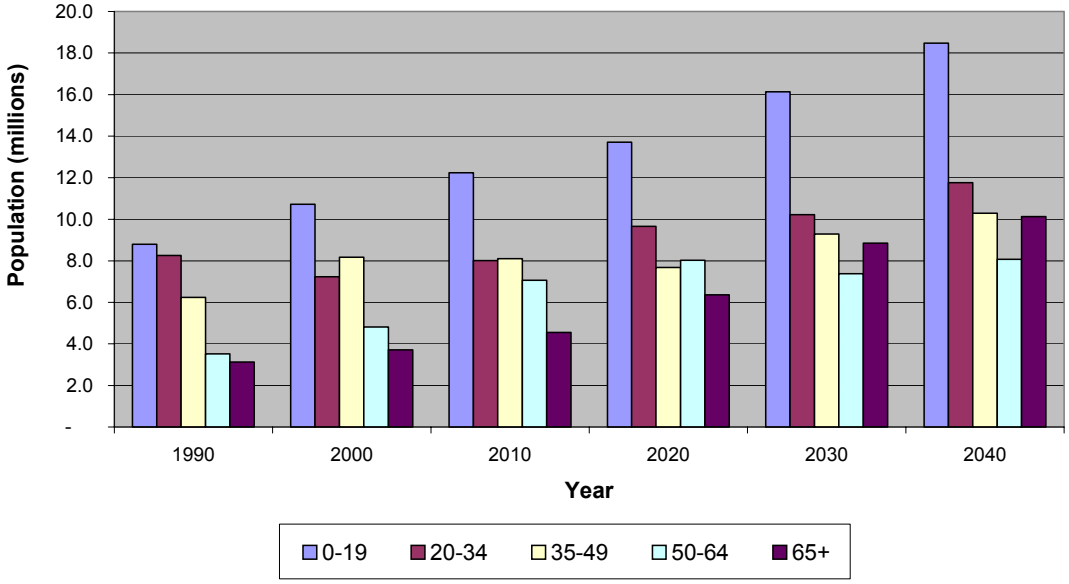
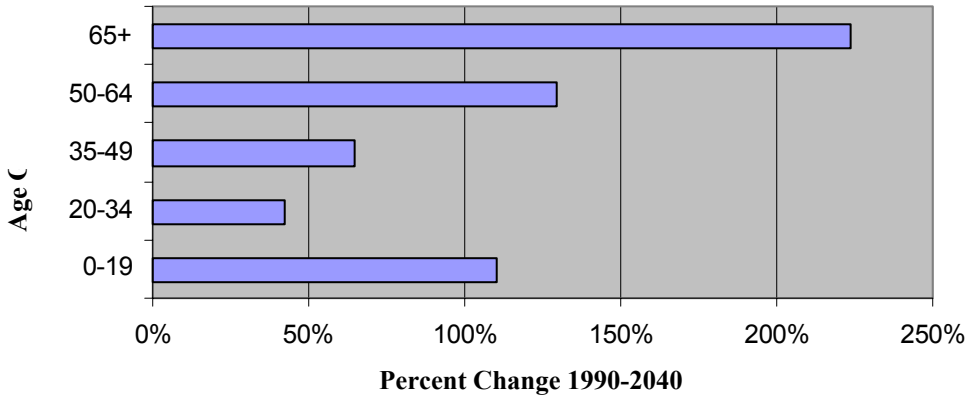


Figure 7: Population Change by Age Group 1990-2040



These age trends are not evenly distributed either by ethnicity or region. Many of the fastest growing ethnic groups are also the youngest.[5] The statewide median age in California is 33, while that among Californians of Hispanic origin is 25, of Asian or Pacific Islander heritage 32, African Americans 31. The counties with the youngest median age tend to be in the central valley and southern California, while the counties in the north and the Sierra foothills tend to be older. For example, the median age in Tulare County is 29.2, while in Trinity County it is 44.6.[6]

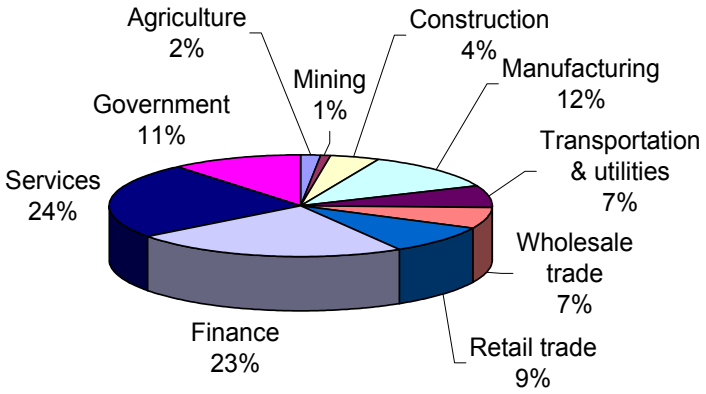
[5] Office of Governor Gray Davis, Office of Planning and Research, Commission on Local Governance for the 21st Century. *Growth Within Bounds*, Final Report. Sacramento, California, January 2000
[6] U.S. Department of Commerce, U.S.Census Bureau, Census 2000 SF1

DRIVER OF CHANGE: Economy

California's economy is the nation's largest

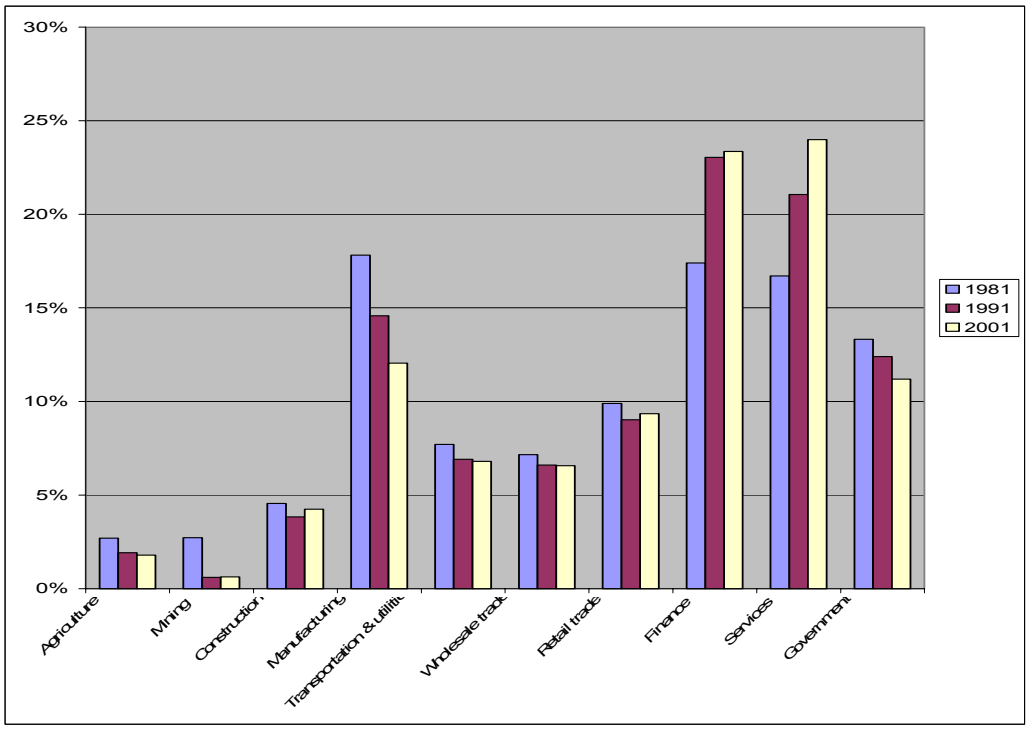
California's economy is the largest in the nation. Its $1,359 billion gross state product (GSP) represents 13% of the United States gross domestic product. New York, the second largest economy in the nation, has a GSP that is 60% of California's.[7]

Figure 8: Gross State Product 2001



As shown in Figure 8, California's economy is dominated by the financial (including insurance and real estate) and the service sectors, although manufacturing and trade remain important components of the California economy.

Figure 9: California Economy 1981-2001



[7] U.S. Department of Commerce, Bureau of Economic Analysis.

Figure 9 shows the components of gross state product over the last 20 years. As can be seen, the share of the financial and service sectors has increased while manufacturing's share has decreased. The service industry includes such diverse sectors as computer and software design, motion picture production, engineering, legal, health care, child care, tourism, recreation and hospitality. The state's agricultural sector, while decreasing relative to the gross state product, still leads the nation. Interestingly, federal, state, and local government have also shrunk compared to the economy as a whole.

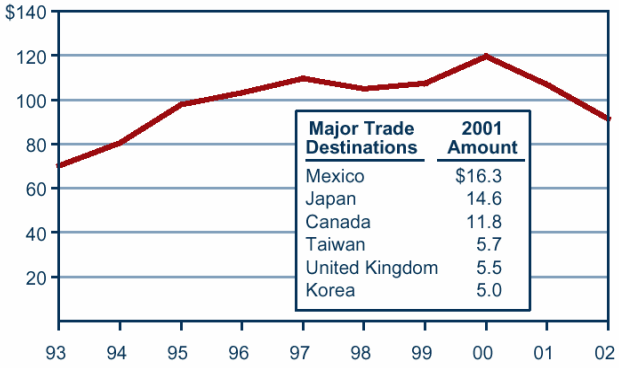
Globalization is a major factor in California's economic success

Foreign trade is an important element of California's economy. Total exports reached a peak of $120 billion in 2000, accounting for 11 percent of the state's total output. Computers and electronics accounted for over half of exports, followed by agricultural products, machinery, and transportation equipment. The drop in exports in 2001 and 2002 reflected the worldwide economic downturn.[8]

Another important aspect of the global economy is foreign direct investment (FDI). FDI includes investment by California companies in foreign facilities and real estate (outward FDI), and investments by foreign companies within California (inward FDI). Although California's share of U.S. FDI, outward and inward, is low compared to our share of the national economy, California exhibits two important characteristics of the new global economy.

First, California companies tend to invest more in service industries than in manufacturing. Second, the manufacturing industries in which California invests tend to be those that use production-sharing, where production and assembly occurs in different locations under the control of a multinational enterprise. This production-sharing pattern is characteristic of technology industries, and is also common in Asia, where much of California's outward FDI is directed.[9]

Figure 10: Total California Exports (in Billions)



Although the dollar amount of foreign investment in property, plants and equipment in California is the highest level of any state, inward FDI is comparatively low to the size of California's economy. Inward FDI in California is higher in wholesale trade; information industries; and professional, scientific and technical services—three currently dynamic areas of the global economy.[10]

California is a state of regional economies

In a state as large as California, it is perhaps more accurate to speak of an "economy of regions," driven by different industry clusters. These regional economies are not necessarily defined by political boundaries, but by common economic interests. In part, this movement to regional economies is a reaction to the pressures of globalization, as international competition for trade has made the need for a regional economic strategy critical to remaining competitive. With barriers to trade and the flow of capital falling, regional groupings and business clusters are now the key players in the global economy.[11]

For example, even with the downturn of the dot com economy the Silicon Valley has remained an internationally-competitive region, with a unique culture of high-tech innovation, that spills over city and county lines. In the Central Coast, agriculture, personal services, and government dominate the economic base. Regions can even

[8] California Legislative Analyst's Office (2002), *Cal Facts: California's Economy and Budget in Perspective.*
[9] Howard J. Shatz, *Business Without Borders? The Globalization of the California Economy*, PPIC, 2003.
[10] Ibid.
[11] Manuel Pastor Jr., Peter Dreier, J. Eugene Grigsby III, and Marta López-Garza (1999). *Regions That Work: How Cities and Suburbs Can Grow Together*. Minneapolis, MN, University of Minnesota Press.

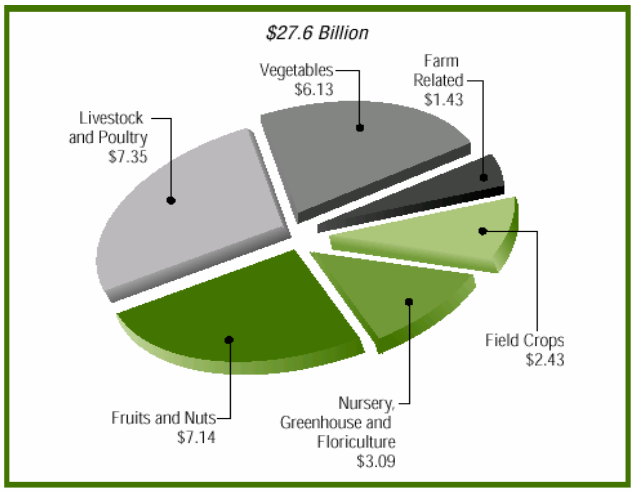
transcend international borders, creating bi-national regional economies such as the San Diego/Baja California region. Successful regions are often marked by highly collaborative relationships between economic agents. Businesses are closely linked through supply and demand relationships, and public-private sector partnerships are common.

The global economy is based on knowledge that uses technology and intellectual capital, in contrast to the manufacturing economy that relied on energy and raw materials as its primary input.[12] Knowledge-based firms in this new economy locate where educated and skilled workers live, where opportunities for lifelong learning exist, and where quality of life is valued. As California found during the recession in the early 1990s, these regions are affected differently by economic changes. At that time, Southern California suffered more job losses than Northern California because of its concentration in the defense industry and related support industries. Currently, Northern California, especially the Bay Area, is suffering more due to its concentration in the Internet and telecommunications industries. California has learned the important role that industry clusters play in our regional economies, both in times of prosperity and decline.

California remains a global leader in technological innovation

Technological innovation has been the mainstay of the California economy since statehood, impacting all sectors. From cutting-edge mining and irrigation creativity at the end of the 19th century to computer and Internet development at the end of the 20th, California's role as a crucible for innovation has made it an engine for continual economic expansion and re-invention for the nation and for the world. The Pacific Theater of World War II placed California in a strategic position to produce ships and aircraft. The industrial boom opened the way for electronic and technological innovation that has become the hallmark of the California economy. Today, the technological economy includes small software-development firms and multinational computer and network corporations, as well as the space industry. California is estimated to have one-quarter of the global space market share, and has a legacy of space expertise, innovation and involvement, yet is no longer considered as the premier player in the global space arena.[13] The headquarters of major technology corporations are migrating elsewhere, lured by attractive incentives and aggressive policies to capture this high-growth economic sector.

Figure 11: California's Gross Cash Income, 2001



Nonetheless, Californians are among the highest-producing and most innovative people in the world. Californians file 13 patents to every 10,000 employees, compared to the national average of 6.3; from 1990 to 1998 the number of patents grew 10%, compared to 3% for the nation. As a result, California attracts the most venture capital per worker in the nation, at $1,192. The intellectual and infrastructure assets of California present a tremendous opportunity to build on and assure the state's continued prosperity, quality of life and global prominence.

Agriculture remains an important sector in California's economy

Its oldest economic sector, agriculture, is also the strongest in the nation, with a production of $27.6 billion in 2001.[14] Between 16 and 19 percent of the

[12] Ibid.
[13] *Space Integration Master Plan (SIMP): Blueprint for California Space Development Priorities* (2002). Sacramento, CA, California Space Authority.
[14] California Department of Food and Agriculture. *Resource Directory. California Agriculture: A Tradition of Innovation.* (2002). Sacramento, California.

production is exported internationally each year, amounting to $6.1 billion in 1999.[15] For certain crops, the Golden State is the nation's sole producer, from almonds and walnuts to nectarines and raisins. Through economic multipliers from machinery to agribusiness, agriculture accounts for 6.6% of the state's annual personal income, and 7.4% of all employment. Agriculture is crucial to certain regional economies of California. In the Central Valley, agriculture accounts for 21% of all income and 25% of all employment.

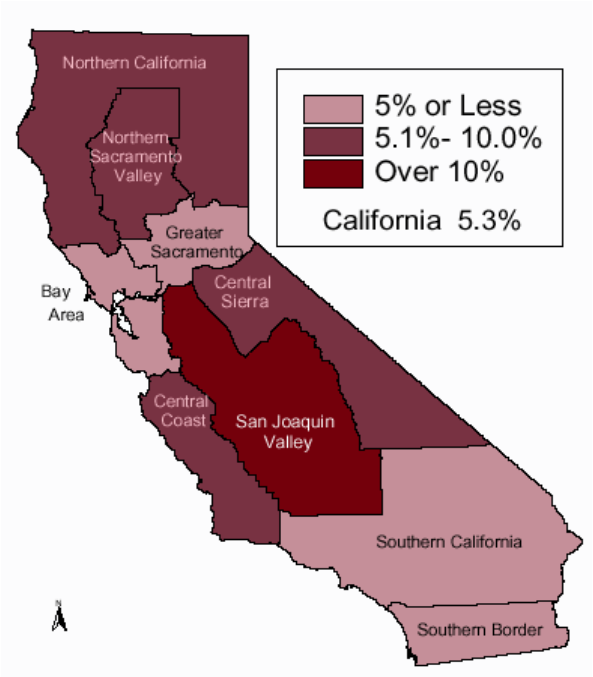
California leads the nation in minority-owned businesses

California leads the nation in its number of minority-owned businesses, with 738,000 firms accounting for 24% of the nation's minority-owned firms, more than double that of second-place Texas. Still, the degree of participation in entrepreneurship among minorities lags behind that of non-minority Californians, with a business participation ratio of 47 minority business owners for every thousand minority residents compared to 111 business owners per thousand non-minority residents.

Most of California's businesses are small but, taken together, they fuel the state economy.

As is the case with the other 49 states, small businesses represent the majority of companies in California. The number of California small employers has increased significantly in recent years, rising from 767,797 in 1990 to 1,022,192 in 2002, representing 98% of the employers in the state. California's annual increase in small employers was 3.7% in 2002, placing the state in second-place after Florida in the number of small business employers. Between 2001 and 2002, new small employers increased 1.5% to 130,840, placing California fourteenth in the nation for growth in new small employers.[16] In addition, California is home to 1,478,000 self-employed individuals as of 2002, a slight decrease over the prior year although still above 1990 number. The number of self-employed in California decreased by 0.7%, less than the national average of almost 1.8%.

Figure 12: Unemployment Rates by Economic Region – Annual Average 2001



The economic impact of small businesses on the California economy is undisputed. In 2000, small businesses in California employed 53% of the state's more than 12 million non-farm sector employees. Small businesses added a net total of 428,607 jobs between 1999 and 2000.[17] In 2002, proprietor's income, which is a partial measure of small business income, amounted to $120.1 billion. This is an increase of 4.9%, slightly higher than the national average.

Californians' productivity is rising, but employment and wage growth are slow

California has approximately 16.5 million jobs. On the whole, employment in the last decade grew only by 0.98%, and wages by 4.17%,[18] even as the GSP grew by an unprecedented 36.6%.[19] In fact, in 1999 the GSP per employee was $64,383, making it eighth in the nation, for which the average was $56,882.

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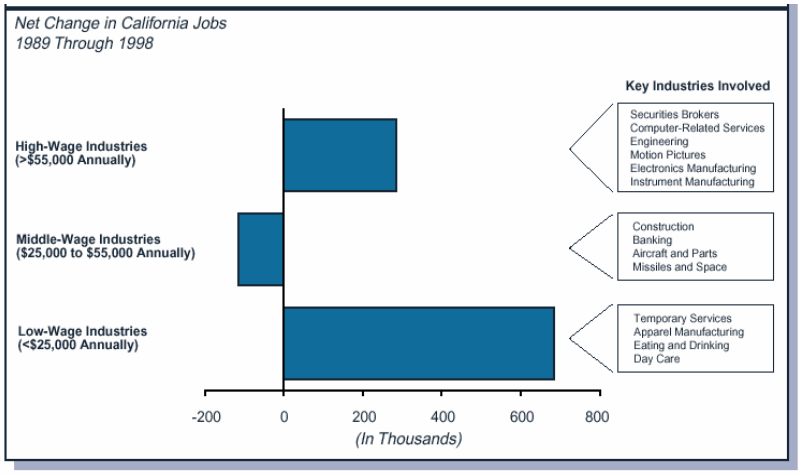
[15] Kuminoff, N. V., D. A. Sumner, et al. (2000). The Measure of California Agriculture. Davis, California, University of California Agricultural Issues Center.
[16] U.S. Small Business Administration, Office of Advocacy, *Small Business Economic Indicators for 2002*, Washington, D.C., June, 2003, from data provided by Bureau of Census and Bureau of Labor Statistics.
[17] Ibid.
[18] Porter, M. E., E. de Fontenay, et al. (2002). *California: Profile of the State Economy*. Washington, DC, Harvard Business School.
[19] U.S. Department of Commerce, Bureau of Economic Analysis Regional Accounts Data.

In 2001, the unemployment rate was 5.3%. However, unemployment varied across regional and ethnic lines. As shown in Figure 12, unemployment is higher in the Central Valley. Although unemployment had been falling for black and Hispanic workers compared to the total population, unemployment in 2001was stiller higher for black, 8.8%, and for Hispanic workers, 7.2%.[20]

Employment growth in California has been centered in the services sector, accounting for over half of the nearly 2.4 million new jobs created in California over the past decade.[21] The remaining job growth occurred in trade, government and construction, consistent with the state's population growth. Continued losses in the aerospace sector and recent declines in commercial high-technology accounted for falling manufacturing employment.

Figure 13: Job Gains in Low-Wage and High-Wage Industries

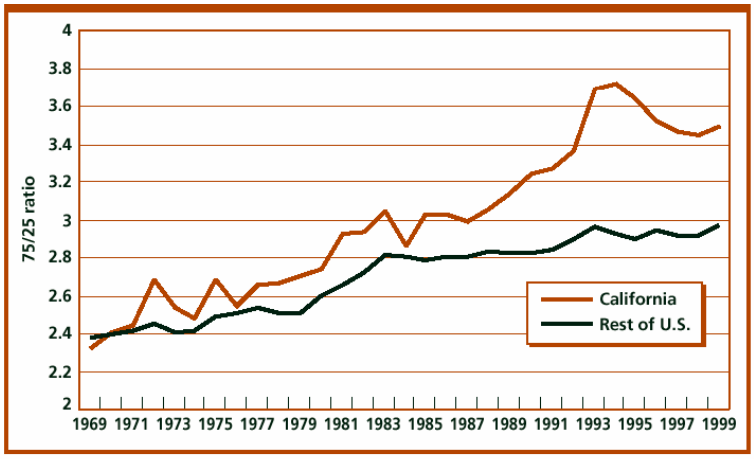


In 2020, total jobs in California is expected to reach over 22 million. Future job growth will continue to be led by the service sector. Projected job growth for construction will be above average for all non-farm employment.[22]

California's economic prosperity is not uniformly distributed

Much of California's economic power comes from its wealth of human capital. Understanding the socioeconomic characteristics of its population is key to recognizing and anticipating the sources of its economic and fiscal strength. Those characteristics are also necessary in assessing the types of services and public infrastructure needed in the future, such as schools for youth.

Figure 14: Ratio of Family Income 1969-1999



Family income inequality has risen sharply in California over the last three decades.[23] The growth in inequality has been more rapid and more sustained than in the rest of the nation, especially in light of California's strong economic growth.

In the years from 1969 to 1999, the ratio of the income of families in the 75th percentile to that of those in the 25th percentile has increased from 2.3 to

[20] California Labor and Workforce Development Agency, Employment Development Department, Labor Market Information Division. *Labor Day Briefing*, 2002.
[21] California Legislative Analyst's Office. *Cal Facts: California's Economy and Budget in Perspective*. Sacramento, California, December 2002.
[22] California Labor and Workforce Development Agency, Employment Development Department, Labor Market Information Division. *Employment Projections by Industry*, 2000-2010
[23] Daly, M. C., D. Reed, et al. (2001). Population Mobility and Income Inequality in California. San Francisco, California, Public Policy Institute of California.

3.5. While this ratio follows business cycles and increases during times of economic recession, it also failed to recover completely during times of economic expansion, leading to the widening gap.[5] The trend in California followed but outpaced that of the nation.

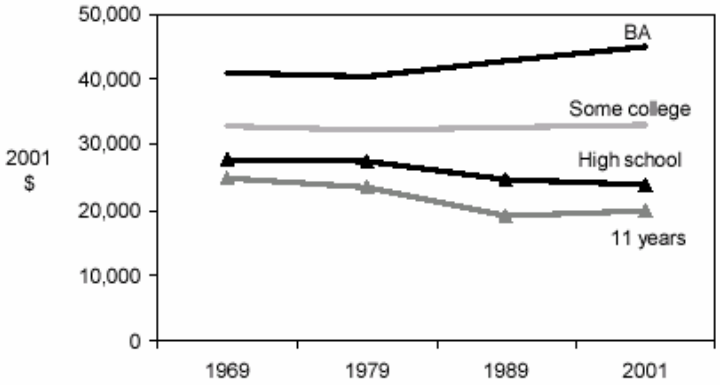
The increase in the wage gap resulted from a combination of income growth at the top of the distribution as well as income losses from the middle and the bottom.[24] Numerous factors have contributed to this trend, including an influx of younger workers and immigrants to California's labor force, industry restructurings, the impact of globalization and technological changes on wages for skilled versus unskilled jobs, and high returns accruing to investors—forces that are likely to remain strong in the future.

Job growth in the California economy are concentrating in the low- and high-wage categories, while the middle-wage industries are declining.[6]

The wage gap is partly due to low educational attainment

A major determinant of income is educational attainment, a factor which also impacts the state's capacity to meet employers' needs. Currently, 20.1% of Californians older than 25 years hold a high school diploma compared to the national proportion of 28.6 %.[25] In fact, 11.5% of Californians have less than a ninth grade education, compared to 7.5% nationally. However, 56.7% of Californians have had some form of higher education compared to 51.7% nationally. This pattern appears to reflect the strong contribution of immigration to California's population, as more than half of Californian adults without a high school diploma come from abroad.[26]

Figure 15: Educational Attainment Versus Income



Source: Author's calculations from the decennial Census (1970, 1980, 1990) and the March CPS, 2001-2002.
Notes: Statistics are adjusted for inflation. Average earnings are based on a statistical model that controls for age, race, ethnicity, and immigrant status. See Reed (1999).

Educational attainment has a strong impact on wages and income. Over the last three decades, the real value of earnings for less educated workers has declined substantially.[27] Whereas a worker with a high-school diploma but no college education earned an average of $24,800 in 2001 dollars in 1969, a similar worker would earn $19,900 in 2001—a decline of 20%.

Though weakening, upward economic mobility continues to be strong

These data suggest certain alarming socioeconomic characteristics among Californians. However, one aspect of California's attractiveness to both residents and immigrants is its enduring capacity for economic growth and development. Indeed, research suggests that the upward wage mobility of Californians has remained strong, though

[24] Williams, B. and D. Vasche (2000). California's Changing Income Distribution. Sacramento, California, Legislative Analyst's Office.
[25] U.S. Department of Commerce, U.S. Census Bureau. *Profile of Selected Social Characteristics 2000 (DP-2)*. Washington, DC, 2000.
[26] Betts, J. R. (2000). *The Changing Role of Education in the California Labor Market*. San Francisco, California, Public Policy Institute of California.
[27] Reed, D. (2003). *The Growing Importance of Education in California*. San Francisco, California, Public Policy Institute of California.

it is now weakening.[28] Indeed, high levels of upward earnings mobility prevailed in all socioeconomic groups in California but were particularly strong among the lowest earners, although half of workers in the bottom of California's wage range were likely to stay there long periods of time, even through unrivaled periods of prosperity for the state.

[28] California Labor and Workforce Development Agency, Employment Development Department, Labor Market Information Division. Wage Mobility in California: An Analysis of Annual Earnings. Sacramento, California, April 10, 2002.

EXTERNAL INFLUENCES

California's population and economic growth are influenced by a number of external forces that are not under the direct control of the State of California. Key external influences are globalization of the economy and global climate change, which are changing the way that California thinks about and participates in development of state, national and international environmental and economic policy. The following section provides perspective on these global factors that affect California's ability to achieve sustainable development

Globalization

Driven by increases in international trade and investment, and aided by advances in information technology, globalization has significant effects on the environment, on economic development and prosperity, on political systems, and on human physical well-being in societies all over the world.

Globalization is a process that has been ongoing for centuries. However, "policy and technological developments of the past few decades have spurred increases in cross-border trade, investment and migration so large that many observers believe the world has entered a qualitatively new phase in its economic development."[29]

Economic Markets

Especially in the past two decades, many industrialized governments have adopted free-market economic systems, negotiated reductions in barriers to commerce and established international agreements to increase trade in goods, services and investment (i.e. NAFTA, EU, ASEAN and WTO). Yet these far more open economic markets have also impacted the need for technological, societal and personal security as the nations and regions tend to become polarized along new conflicts of ideology, religion, and culture.

The role of government has lost some influence to corporate powers, but remains strong and has tended to shift to international organizations such as the UN, (especially WHO, UNEP, and UNESCO) as well as world and regional banks. These organizations attempt to provide social and economic assistance while setting health, climate and environmental standards.

Globalization has increased in the last decade, driven by the profitability it affords companies through global supply chains that produce goods and services wherever they are cheapest to produce, processing them where it is most advantageous and then distributing them to customers throughout the world. In effect, "globalization allows corporations to scour the world for the highest returns and lets them build a truly international workforce. The Internet makes it easier for managers to monitor that workforce, wherever they are, and integrate them into the global networks that large companies are becoming."[30]

Benefits to California

California has been a significant beneficiary of the globalization trend. California is the country's largest exporting state and is also the leading state for attracting foreign direct investment (FDI). In 1999, California exported $109.8 billion in products, up 50% ($36.7 billion) from 1992. In 2000, California accounted for 10.3 percent of all U.S. FDI (followed by Texas with 9.3% and New York with 6%) and had the highest level of affiliate employment.[31]

Although large export companies account for 71 percent of the export value, more than 230,736 of exporters are small or medium sized companies that also participated in the California market in 2002.

Nearly 1.2 million California jobs were supported by goods exports in 1999, an estimated 11.1 percent (119,180 jobs) higher than 1992. U.S. jobs supported by goods exports pay 13 to 16 percent higher than the national average wage. California's exports of manufactured products were up by 52 percent between 1993 and 1999 (from $67.1 billion in 1993 to $101.8 billion in 1999).

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[29] Center for Strategic and International Studies, 2002.
[30] Dow Jones & Company, Inc. "Globalization Meets Creative Destruction," 2003.
[31] U.S. Department of Commerce, U.S. Bureau of Economic Analysis.

Despite the 1991 recession, foreign direct investment in California increased 60 percent in the last decade – from $75.7 billion in 1990 to nearly $121 billion in 2000, with an average annual increase of 4.9 percent. FDI in 2000 continued to increase at 8.3 percent.

In 2000, affiliate book value[32] of property, plant and equipment in California increased to a cumulative total of $120.9 billion, a nearly $10 billion increase over the 1999 level. The substantial increase in FDI over the last decade is primarily attributed to the substantial increase of just over $10 billion by the United Kingdom and $1.2 billion by China. Japan remained our largest foreign investor country in 2000 with $31.3 billion. The UK moved to the number two investor with $23.9 billion while Netherlands dropped to third with $13.9 billion.

The presence of foreign-owned companies in California creates jobs, supports a global movement toward more open markets, and provides Californians with a broader array of products and services. Capital expenditures and research and development spending by investors can upgrade California manufacturing, retain and upgrade cutting edge technology, which can lead to greater worker productivity.

Foreign investors find many benefits to investing in California. The State offers a large and diverse market of 35 million people. It has a highly educated and skilled labor force and one-fourth of the adult population have college degrees. The State's universities and research facilities have supported the development of such industries as biotechnology, environmental technology, information technology, and multimedia and entertainment technology.

California's broad-based economy provides close proximity to a variety of raw materials and intermediate products. Consequently, investors pay lower costs for transportation and materials than if they produce goods for Americans overseas. The state is world renowned for its entrepreneurial culture and high technology skills. Investors can enter the promising fields of biotechnology, multimedia, circuits and software through venture capital and joint venture opportunities with California start-up companies. Finally, California's location on the Pacific Rim allows investors to take advantage of the State's many seaports and airports, as well as direct access to expanding market of Mexico made more accessible through the North American Free Trade Agreement.

Global Workforce

Globalization can certainly result in benefits, but the distribution of those benefits can widen existing gaps in income distribution, potentially putting wealth in the hands of the wealthy at the expense of the poor. Sustainable development policies enacted both in California and abroad can provide a framework by which issues such as distribution of wealth, protection of natural resources and fair treatment of workers can be examined, deliberated and more effective choices can be made.

In North America and Europe, FDI and trade have increased the demand for skilled labor and decreased the demand for less skilled labor. Since 2000, more than two million U.S. manufacturing jobs have been eliminated or moved overseas. Overall, manufacturing's role in the U.S. economy has dropped from nearly 30 percent of GDP after WWII to 14 percent in 2002. Other sectors, especially the service sector related with the manufacturing sector, are also experiencing significant outsourcing overseas.

While manufacturing jobs may be shifting overseas, other economic sectors will see expansion. New clean energy manufacturing industries, such as solar photovoltaics (PV) and wind have created thousands of jobs and hundreds of new businesses. Northern Europe, for example, leads the world in the production of wind turbines while Japan has six major manufacturers of solar PV systems.

Furthermore, these companies have expanded globally into markets such as California where public policy has led the way for clean energy and environmentally sound technologies with value-chain related industries. In California alone, the California Solar Energy Industries Association calculates over 4,000 new jobs were created in the State since the winter of 2002.

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[32] An affiliate is a U.S. business in which there is foreign direct investment. Affiliate book value is the value of property, plant and equipment purchases. Financial assets, which are not included in book value are generally much larger than physical assets.

More traditional industries, such as automobile manufacturing and their suppliers, have seen tens of thousands of new jobs created from international companies. Toyota, for example, has located its North American Headquarters in California, where statewide it employs over 130,000 people. For all of North America, the company has over 270,000 employees and is growing. Honda, Daimler-Chrysler, Sharp, Shell, BP, and other global firms are following closely behind in California employment levels. California's large internal market will remain a magnet for foreign companies, and state policy will continue to attract the best of this new breed of multinational enterprises.

Globalization of companies must mean not only the expansion of their operations, but also a new social-economic commitment to those communities and regions in which these companies are located. When coupled with sustainable development, these same companies express a new dedication to advanced and environmentally sound technologies for clean air, energy, water and land resources. The result is a triple bottom-line impact for the companies and the communities in which they all must live, measuring performance against social, economic, and environmental criteria. This is the form of globalization that will work for California and its citizens, and it is the form of globalization the state must pursue through its policies, planning, and encouragement of socially responsible business.

EXTERNAL INFLUENCES

Climate Change

Climate Change and Sustainable Development

Greenhouse gas emissions contribute significantly to climate change and are a key sustainable development challenge to California's ability to meet its environmental, economic and quality of life objectives.

Among the consequences of climate change are rising sea-levels, changes in precipitation patterns and an increased risk of droughts and floods. These changes threaten biodiversity, existing human development patterns and public health.

What Are Greenhouse Gases?

First identified as a serious threat to human and environmental health in 1960's there is now a general consensus among nations, scientists, and the global business sector that increasing GHG emissions have affected the world climate.

Carbon dioxide, a byproduct of fossil fuel combustion, is the principal greenhouse gas (84%) contributing to global warming. However, other greenhouse gases including methane (8%), nitrous oxide (6%), and what have been called the "synthetic gases" (2%), (hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride), also are important contributors to climate change.

Increased levels of these pollutants are primarily the result of human activities including transportation, manufacturing and energy generation.

Comparative GHG Emissions

The U.S. is the single largest contributor to GHG emissions, representing 25[33] percent of total GHG emissions in the world. California contributes 1.5 percent[34] of the world GHG emission. Other regions in the world contribute the following emissions: Europe (19%.), Eastern Europe (3 %); Western Europe (16%), Asia (37%); China (12 %), former Soviet Union (10 %), and the entire developing world (22 %).

POTENTIAL IMPACTS OF CLIMATE CHANGE

Health: Reduction in air quality and increases in respiratory illness, weather related mortality, infections, and tropical diseases.

Agriculture: Reductions in crop yields, changes and/or eliminations in crop selections, increases in irrigation demands and increases in energy to support water delivery infrastructure. Fish habitat will face increases in temperature, reductions in in-land water flow and saltwater inundation of freshwater.

Water Resources: Increased competition for water based on a reduction in the supply and the quality of fresh water. Increased energy demand to support economic and municipal water resources.

Coastal Areas: Increased erosion of beaches, inundation of coastal wetlands by seawater, increased costs for infrastructure to protect coastal and delta communities.

Habitat and Species: Increased migration, adaptation and extinction in response to changes in temperature, precipitation and ocean current. Related changes to species and habitat that need certain insects to pollinate, or animals which eat certain vegetation or animals that are no longer in the area.

Forests: Changes in forest composition, geographic range of the forest, loss of forest health, productivity and safety from forest fires due to dead trees.

Table 1: United States GHG Emissions by Gas

Carbon Dioxide	83.6
Methane	8.7
Nitrous Oxide	6.1
Synthetic Gases (HFC's, PFC's & SF6)	1.6

[33] U.S. Environmental Protection Agency, Global Warming Web Site, 1998 CO2 Equivalents
[34] California Energy Commission, Greenhouse Gas Inventory Update.

California's emissions per Gross State Product (GSP) are lower than emissions per Gross Domestic Product (GDP) for many industrialized countries, but still higher than others including France, Sweden and the Netherlands. On a per capita basis, California emissions are higher than nearly all developed countries except the U.S. as a whole and Canada.

Compared to other states, California ranks as one of the lowest GHG emitters in the country; only Connecticut and Massachusetts are lower. This can partially be attributed to milder climate and less energy intensive manufacturing. Also important are California's stronger regulations on vehicular emissions, a growing renewable energy industry and innovative energy efficiency programs.[35] Texas, Ohio, Pennsylvania and South Dakota have the highest per capita emissions.

In California, transportation is the largest source of CO_2 (58 %); 37 percent of which is attributed to gasoline for motor vehicles. Mobile sources also emit greenhouse gases other than carbon dioxide, including methane and nitrous oxide. Mobile sources are the second largest anthropogenic source of nitrous oxide in the United States (Michaels, 1998). From 1990 to 1996, while other pollutant emissions have been decreasing, nitrous oxide emissions rose from 13.2 to 16.5 million metric tons of carbon equivalent, a 25 percent increase (U. S. EPA, 2002).

Table 2: California CO_2 Emissions by Sector

Transportation	58
Electrical Power	16
Industrial	13
Residential	9
Commercial	4

Global Effects of Climate Change

In its Third Assessment Report (TAR),[36] the Intergovernmental Panel on Climate Change (sponsored by the United Nations), identified the following impacts of global climate change in the last 100 years:

- **Areas Affected by Climate Change:** Temperature changes appear to be more identifiable in the Northern Hemisphere continents. A few areas of the globe have not experienced much change in temperature, primarily in the oceans of the Southern Hemisphere and the continent of Antarctica.

- **Temperature Changes:** From 1950 to 1993, nighttime daily minimum temperatures over land increased 0.2 °C. Daytime increases in temperature over land increased only 0.1 °C. The freeze-free season in many mid- and high-latitude regions in the Northern Hemisphere, including California has also lengthened.

- **Rainfall Changes:** Precipitation increased by 0.5 to 1 percent per decade over most of the mid- to high- latitude areas of the Northern Hemisphere continents. In the tropical land areas,

THE NAPA EXPERIENCE

In Napa, a similar trend of increased temperatures at night and during spring (1951-1997) was observed. The result was about a 20-day reduction in frost occurrences and an increase of the growing season length. So far, this change has been beneficial to grape growers, and has increased the quality of the wine produced in this region, but further warming may result in an increase of fungal and vector-borne disease outbreaks (Nemani, White et al. 1999).

[35] California Energy Commission, "Climate PIEREA Change Research, Development and Demonstration Plan", April 2003, pgs. 22-24.

[36] The Third Assessment Report (TAR) issued in 2001 by the Intergovernmental Panel on Climate Change (IPCC), sponsored by the United Nations World Meteorological Organization and the Environmental Program. Third report is comprised of three volumes: Science; Impacts and Adaptation; and Mitigation. The first report was issued in 1991, the second in 1996. Temperatures were first consistently recorded beginning in 1861. Scientists first identified climate change in 1882.

rainfall increased 0.2 to 0.3 percent. Rainfall decreased over much of the Northern Hemisphere sub-tropical regions (19N to 30N). No comparable changes have been detected in the Southern Hemisphere.

- **Snow Cover:** There has been a 10 percent reduction in the extent of snow cover since the late 1960s and a widespread retreat of mountain glaciers in non-polar regions, including the Sierra Nevada Mountains.

The TAR concluded that most of the observed warming over the past 50 years was likely due to the increase in GHG concentrations attributed to human activities. A recent report prepared by the U.S. National Academy of Science at the request of the Bush Administration also confirms this finding. [37]

Even temporary disruptions to infrastructure systems can threaten the health and economic security of individuals, communities, and the state. For example, 1998 El Niño-related storms shut down major rail lines and interstate highways, severed communication and power lines, ruptured gas and oil pipelines, overwhelmed sewage systems, and damaged water supply systems. Economic impacts across the U.S. were estimated to be on the order of $25 billion, and those in California were estimated to be $1.1 billion[38].

Another aspect of climate change is its extreme weather effects, such as hurricanes, floods and droughts. Total global direct losses related to natural disasters for 1995 to 1999 is estimated at $340 billion as compared to 1985-99 at $135 billion or 1975 to 1979 at $70 billion. Based on current trends, annual losses worldwide could reach $150 billion by 2010.[39]

Climate Change Impacts in California

Current scientific understanding indicates that the character of climate change in California may be expressed in abrupt shifts, greater variability, and an increased number of "extreme events," rather than long-term, gradual changes in trends.[40]

California's principal water source, the snow pack of the Sierra Nevada is less reliable as a result of global warming. Warmer winters have led to reduced snow pack and earlier snow melts. CalEPA estimates that spring run-off has decreased by 10 percent in the last century.

> "You don't have to look far to see where California could be affected by global warming. From our seaside communities to our low-lying agricultural land to the Tracy pumps that send fresh water south, we could be affected by a relatively small rise in sea level... California's snowpack, our State's greatest natural reservoir, is already less reliable than it was just a few decades ago. "
>
> *Gray Davis, Governor*

California's sea level is rising along the California coast. It is estimated to have risen by 7 inches in the last 150 years and will continue to rise exponentially. Higher sea levels will not only affect developable land along coasts, but also raise concerns over inland levee stability and salt water intrusion into deltas and other waterways. Based on current trend analysis, the sea is expected to rise between 4 and 35 inches by 2100.[41]

The U.S. Response to Climate Change

Although the United States signed, but has not ratified the Kyoto Protocol, it has adopted a number of voluntary GHG mitigation programs, research and development programs and a selection of energy policies that focus on energy efficiency and renewable energy.

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[37] California Energy Commission, Climate PIEREA Change Research, Development and Demonstration Plan, Global and Regional Climate Change Executive Summary Section, April 2003
[38] California Energy Commission, Climate PIEREA Change Research, Development and Demonstration Plan, Economic Impacts subsection, April 2003 (N OA A 2002)
[39] UNEP FI report on insurance
[40] California Energy Commission, Climate PIEREA Change Research, Development and Demonstration Plan, Global and Regional Climate Change Executive Summary Section, April 2003
[41] UN sponsored Intergovernmental Panel on Climate Change (IPCC) predicts a 4 to 35 inch rise of sea level by 2100.

Some of these policies have been criticized as having very little success in stabilizing, let alone reducing, GHG emissions.[42] In fact, U.S. GHG emissions increased almost 12 percent between 1990 and 2001, and are projected to increase another 12 percent by 2012.

In February 2002, President Bush announced a new climate change strategy that sets a voluntary "greenhouse gas intensity" target for the nation, expands existing programs, encourages companies to voluntarily report and reduce their greenhouse gas emissions, and proposes increased federal funding for climate change science and technology development.

While some elements of the strategy may encourage some companies to voluntarily reduce GHG, the 18 percent reduction target (2003 to 2012) will actually allow net emissions to increase 12 percent over the same period.[43] Some analysts have stated that in real terms, emissions will continue to grow at nearly the same rate as at present.

California's Response to Climate Change

California has been actively taking steps towards reducing greenhouse gas emissions. One major step is the establishment of the California Climate Change Registry to inventory and confirm actual reductions in carbon emissions by businesses and governments.

The California Climate Change Registry

The California Climate Change Registry[44], is a non-profit organization financially supported by businesses, environmental groups and the State of California. As of July 16, 2003, 35 organizations and companies, representing over $140 billion in annual revenues, are participating in the program. Participants include large and small companies, investor owned utilities, educational institutions and government agencies. Companies represented include, among others, the auto industry, mining, petroleum, high technology and commercial printing.

ROLE OF THE REGISTRY

"The registry has developed protocols and software tools for helping companies document their greenhouse gas emissions. These protocols are a gold standard in the increasingly important world of measuring and verifying efforts to minimize climate change."

Winston Hickox, California EPA Secretary and Registry Board Member.

In joining the Registry, participants agree to inventory and report their greenhouse gas emissions. Reporting is verified by a third party to ensure consistency and credibility of the information in the Registry.

This Registry will be the likely vehicle for California's participation in a future international emission trading market. On July 24, 2003, The European Commission adopted standards for its registry. Through these two registries and others around the world, organizations which reduce their greenhouse gases can register the reduction and establish a carbon credit which can be traded to others.

Regional Strategy For GHG Emission Reductions

Governor Davis has joined two other Western Governors, Governor Gary Locke of Washington and Governor Ted Kulongoski of Oregon, in the development and implementation of a coordinated strategy to reduce GHG emissions. These three Governors are seeking border to border solutions which collectively will set a standard for the rest of the nation. Key initiatives include, but are not limited to, the:

- Use of the state's combined purchasing power to obtain fuel-efficient vehicles and low-rolling resistance tires.
- Reduction in the use of diesel generators by ships in western ports.
- Development of emission-free truck stops along Interstate 5 Corridor from Mexico to Canada.

[42] Pew Center on Global Climate Change.
[43] Ibid.
[44] SB 1771 (Byron Sher), Chapter 1018, Statutes of 2000

- Removal of barriers to and the encouragement of renewable electricity generation resources and technologies.
- Collaboration on improved scientific tools to more precisely measure the impact of climate change.

The Governors are committed to continuing to working together to develop other strategies that will enhance the work each is already doing in their own state on GHG Emission and climate change.

Other Key California Responses to GHG Emissions and Climate Change

- Requires the California Air Resources Board to adopt new Vehicle Emission Regulations[45] for cars and trucks sold in model year 2009 and beyond that achieve maximum feasible and cost-effective reduction of GHG emissions from motor vehicles. These new emission reduction standards are the toughest in the world today and will represent a very significant step toward reducing total GHG emissions in California.

- Established the Renewable Energy Initiative to support the development of the renewable energy industries: Solar, Wind, Biomass, and Hydrogen.
- Adopted a Renewable Portfolio Standard [46] which requires that each of the State's three-investor owned utilities increase their renewable portfolio to 20 percent by 2010. Previously, Governor Davis had supported the California Energy Commission's Renewable Investment Plan goal of increasing the State's renewable energy consumption from 12 to 17 percent by 2006. As of January 2003, the State's consumption of renewable energy was 10 percent.

CALIFORNIA GHG EMISSIONS FROM ELECTRICITY

Electrical utilities are responsible for 16 % of GHG emissions in CA. Imports of electricity from out-of-state power plants increase emissions to 28%.

Innovations in energy generation provide direct benefits to our air quality and GHG emission levels.

- Established the California Consumer Power and Conservation Finance Authority[47] and California Alternative Energy and Advanced Transportation Finance Authority, which will finance renewable energy facilities, among other facilities.

- Sponsored First and Second annual Arie Haagen-Smit Symposium – an international GHG conference which includes participation from academics, businesses and public policy makers.

State Research in Climate Change

California currently expends more than $40 million annually in the support on research of renewable technologies through the Public Interest Energy Research Program (PIER) sponsored by the California Energy Commission. Funding for the program is generated through an assessment of the State's investor owned electric utilities.

The mission of the PIER Program is to develop cost-effective approaches to evaluating and resolving environmental effects of energy production, delivery, and use in California, and to explore how new energy applications and products can solve environmental problems.

The PIER staff, in collaboration with scientists from various California research institutions and state agencies, have also developed a 10-year climate change research work plan. Completion of the research identified in the work plan will require multi-agency cooperation and partnerships with key academic institutions such as the University of California.

Other State entities involved in climate change research include the California Air Resources Board which is sponsoring research to understand the formation, transport, and deposition of aerosols (small particles) and its

[45] AB 1493, Pavley, Chapter 2002, Statutes of 2001
[46] SB 1075 (Sher), Statutes of 2002
[47] SB 1X 6 (2001)

relationship to climate change at the regional and global levels, as well as to conduct technology surveys and assess economic impacts.

Integrated Approach to Climate Change

To re-direct the trends in global warming, maintain forests and other vital natural ecosystems, and sustain and grow our economies, it is clear that there must be changes in global patterns of production, consumption and distribution of resources.

Poor communities whether they are in rural areas of California or developing areas of Ghana need to have a plausible likelihood of increasing their quality of life. Otherwise, they will make decisions which could negatively impact the long-term health of the planet by approving industries which pollute the land, overuse natural resources and significantly contribute to climate change.

Similarly, exclusively placing the burden of reducing GHG emissions on industry without support for new technologies, equitable regulatory frameworks and reasonable timeframes will not succeed.

An improved environment is dependent upon an integrated and global approach to climate change. Each component of sustainable development (social, economic and environmental) will need to be addressed or the imbalance will ultimately drag down the other components.

GOVERNANCE

Californians look to their state government for leadership on many important issues associated with quality of life, including education, transportation, water delivery, power, parks, libraries, and services to protect public health and safety. These issues are all affected by land use and development choices. While California's local governments are largely responsible for land use and development decisions, federal, state and other government policies do have an impact on local development patterns. This section briefly describes the governance structure in California, and the role state government can play in effecting positive change.

Historical Perspective

California's government structure has evolved from a time when resource-based, small-town economies dominated the state, to the present, in which large-scale metropolitan population centers drive regional economies. In the 19th century, county governments were created to organize governmental services at a broader level than the small town. This structure was appropriate to the resource-based economies of that time. At the turn of the 20th century, when California's largest cities were emerging, the State adopted "home rule," a governing structure based on the belief that decision making is best made at the local level, closest to the citizens.

> As California enters a new millennium, we find ourselves at a crossroads. Faced with surging growth, dynamic change, and greater diversity than the world has ever known, the time is right for California to set a new course. We must start by examining the system of governance (the way that government is organized and operates) and we must establish a vision of how the state will grow. As a state, we need to ask ourselves if our existing system can carry us for another century.
>
> - *Growth Within Bounds*, Report of the Commission on Local Governance for the 21st Century

In the post-World War II era there was tremendous suburban development and investment in infrastructure to service these new growth areas. California planned and built its major highway systems and the State Water Project, both of which allowed for development to expand into rural areas that had once been considered remote. In reaction to this rapid, unplanned suburban growth and its consequences, Local Agency Formation Commissions (LAFCOs) were created in the 1970's to encourage more strategic and collaborative planning within counties.

The environmental movement of the 1970's resulted in new federal and state institutional, policy, and regulatory frameworks to improve air and water quality, preserve natural resources, and protect endangered species. The 1980's brought devolution of many federal government responsibilities to the state level. In many program areas, these new responsibilities were passed on to local governments, particularly counties, increasing their financial and governing responsibilities.

Basic Governmental Structure

Decision making on most issues in California is divided or shared among federal, state, regional, and local governmental entities. The federal and state governments often set the broad framework for land use, environmental, economic/fiscal, and social policy. Implementation is generally the responsibility of local government (cities and counties). The federal and state government often does not coordinate their policies with each other and with local governments and regional agencies, just as local governments often do not coordinate with each other.

<u>Federal Government</u>

The federal government is not directly involved in California land use and growth decisions, either at the state or local levels. It does, however, have a strong influence on these issues through its ownership and management of approximately 48 million acres (or about 48 percent) of land in California, through laws such as the Clean Water Act and the Federal Endangered Species Act (FESA), and through infrastructure investment.

In counties whose local economies are tied to activities on federal land or contain large amounts of federal land, federal policies impact the level of economic activity on the land and the amount of land available for development.

Federal lands are also exempt from property taxes, which means that these lands do not generate tax revenue for local governments. Federal regulatory influences in rural areas (such as FESA) can even restrict the ability to develop private land.[48] All of these policies affect the ability of local governments to raise revenues and provide services and amenities to residents.

Although most federal lands are located in rural counties, federal ownership does extend into some metropolitan areas. Military facilities occupy over three million acres of land in California, much of it in the state's fastest growing counties.[49] These facilities both beneficially and adversely affect neighboring communities. They can increase economic activity, but they also remove land from tax rolls. Although local communities have no direct control over development and land use on federal lands, local land use policies can result in encroachment of private development around military facilities, thereby influencing military activities.

Federal air, water, and species regulations also affect community development patterns and land use decisions. Air quality requirements can limit economic development in unattainment areas, as well as result in the loss of federal funding. Water quality and species regulations may limit where development can occur or drive up the cost of development through costly impact reports and mitigation requirements.

Infrastructure funding in the form of highways, transit systems, water systems, dams, affordable housing, and urban renewal monies can influence local development patterns and land use decisions. Decisions about the location and capacity of infrastructure are often made by the federal government and not by local communities. These federal decisions can significantly impact local economies and influence the rate and pattern of future growth throughout the state. For example, the placement of major highways and transit systems affects the ability of people to get to their jobs and of businesses to move goods and supplies.

State Government

The State has over 140 separate departments and agencies, each with its own mission and statutory authority to provide services, protect resources, and/or set broad state policy in single issue areas. Although direct control over land use lies with local governments, the State of California plays a significant role in growth and development through land ownership, natural resource management activities, enforcement of statewide environmental laws, and promulgation of guidelines for various land use approval processes. The State currently owns or controls approximately 2.5 million acres (or about 2.5 percent) of land in California, most of it in the state park system and some of it as conservation easements. Through its programs for agricultural land, parks, open space, and natural land preservation, the State ensures conservation of important natural resources. State planning and environmental laws establish minimum requirements for local governments to follow as they make long-range and project-level land use decisions.

California's environmental programs are the responsibility of the Resources Agency and the CalEPA. The Resources Agency is responsible for the stewardship, conservation, management, and enhancement of natural resources, including land, fish, wildlife, and forests. CalEPA addresses the areas of environmental protection, water and air quality, and hazardous waste clean-up. As in other state boards, commissions, departments, and agencies, there is overlap in these two agencies. For example, the Department of Conservation in the Resources Agency has authority over the "bottle bill" program, but the Integrated Waste Management Board in CalEPA has authority over solid waste reduction and recycling. This is but one example of the intricate and complex structure of state government, a structure that divides functions and responsibilities and yet provides for overlap.

There are three unique state agencies with regulatory control over local land use. The San Francisco Bay Conservation and Development Commission, the State Coastal Commission, and the Tahoe Regional Planning Agency were created in the late 1960's and early 1970's as a result of the environmental movement. These organizations address regional environmental and land use issues that transcend local political boundaries.

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[48] Fulton, William. *Guide to California Planning*. 1999.
[49] University of California at Berkeley, Institute of Urban and Regional Development, Working Paper 2001-11, Forecasting and Mitigating Future Urban Encroachment Adjacent to California Military Installation: A Spatial Approach

Tribal Governments

Native American Indian tribes are recognized by the U.S. Constitution as sovereign governments with the power to govern themselves. The Constitution gives authority over Native American Indian affairs to the federal government and limits states' ability to control activities on tribal lands. There are 109 federally recognized tribes in California, and 50 others that are petitioning for federal recognition. Not all federally recognized tribes own land, but those that do generally own land within the boundaries of a reservation.

Tribes, as sovereign governments, are not required to follow local land use laws. This has become a land use and environmental issue, as tribes have increased economic development activities on their lands, especially in the form of gaming and related development. Federal law allows federally-recognized tribes to engage in gaming activities, but only after the tribes successfully negotiate gaming compacts with the affected states. There are currently 53 operating casinos and 23 proposed casino sites in California.[50] With additional tribes currently petitioning for federal recognition, there is a potential for additional gaming development in the State.

Tribal gaming facilities can beneficially or adversely impact the surrounding communities, just as local development may impact nearby tribal lands. In California, gaming tribes are required to address the potential environmental impacts of their gaming facilities in accordance with state-tribal compact provisions and tribal ordinances. Furthermore, if federal or state approvals are required for the construction of a gaming facility, the state or federal agency may also be required to evaluate the environmental impacts of the facility through the NEPA and CEQA processes. Although many tribes and local governments have been able to work cooperatively to address off-reservation impacts of gaming, some local governments have experienced an inability to adequately mitigate adverse impacts on territory within their jurisdiction.

Another California Native American issue that is affected by local land use planning and development decisions is Native American sacred sites. These are places of cultural and spiritual significance to native peoples. The location of sacred sites is often not identified or made public, making it difficult to appropriately consider the impacts of state and local planning and development decisions. Recent state legislation sought to create a registry of these sites and a process for identifying and mitigating impacts of new development on sacred sites. Legislative proposals like Senate Bill 18 (2003) signify a growing recognition of the need to protect sacred sites as an important California cultural resource.

State, federal and local governments are increasingly aware of the need to develop better relationships with tribal governments to minimize the environmental and social effects of tribal activities on off-reservation lands and to maximize positive outcomes. The State, in particular, is making attempts to engage tribal governments as active participants in the dialogue about growth and land use issues.

Local Government and Special Districts

Californians are governed by over 5,560 units of local government. In the area of growth and development, especially where land use and infrastructure are concerned, local decision making significantly shapes our communities, the environment, and our quality of life.

Cities and counties regulate growth and development, and manage natural resources through local land use decisions, a result of the police powers granted by the State Constitution. By law, all local land use decisions must be guided by general plans, which articulate policies and long-range goals for growth and development. However, general plans are often amended and are not updated often enough to reflect

Table 3: Number of Local and Regional Governments

Local and Regional Governments, by Type	Total
Counties	58
Cities	477
Local Agency Formation Commissions	58
Councils of Government	30
Community Redevelopment Agencies	413
School Districts	1,056
Community College Districts	72
Special Districts	3,400
TOTAL UNITS OF GOVERNMENT	**5,564**

[50] California State Association of Counties (CSAC) Fact Sheet on Indian Gaming in California (as of 6/20/03).

long-term community needs, for a variety of reasons. This, along with economic factors that will be discussed below, often results in inefficient development patterns with high infrastructure and resource costs. Regional and countywide agencies, such as councils of governments (COGs) and LAFCOs, participate in the local growth and land use dialogue. However, their limited regulatory or planning authority often restricts their ability to influence local growth agendas.

Some special districts, such as school districts and water districts, have decision making authority independent of cities and counties. Their decisions regarding facility siting, infrastructure construction, and service delivery can be inconsistent with local growth policy. The location of new schools, for example, has an important influence on land use, but siting decisions are not always made in cooperation with local land use planning agencies. This is the source of one of the most volatile and troublesome problems in California land use planning.

Inter-Jurisdictional Collaboration

California's government structure is made up of numerous single-purpose agencies that are not designed to address complex and interconnected growth issues that cut across jurisdictional boundaries. Increasingly, government agencies are addressing this problem by engaging in multi-jurisdictional cooperation to devise and implement effective regional solutions that rely on an integrative approach. The region, whether defined as an air basin, a watershed, or a habitat area, is an effective organizing principle for intergovernmental collaboration on land use and environmental protection. This is because the region is the scale at which economies operate and most of our social interactions take place, therefore it is also the appropriate setting for integrating economic, social, and environmental goals and strategies.[51]

> Fundamentally, in a world of accelerated and complex change, only nimble and well-networked communities will thrive. With finite resources, basic economic, land use and infrastructure systems must be cost-effective and resource-efficient. Decision-making in the public and private sectors must be information-driven, strategic, collaborative, inclusive and rewarded for performance. On most of the questions affecting the economy and quality of life, these decisions are best made at the regional level, and state policies and practices should be reformed and aligned to support better decisions for improved regional outcomes.
>
> - Final Report of the Speaker's Commission on Regionalism, 2002

There have been some promising examples of multi-jurisdictional collaboration, for example: federal transportation planning and funding coupled with state legislation to encourage regional planning (SB 45). Multi-jurisdictional, regional planning processes such as the Riverside County Integrated Plan have attempted to involve the federal, state, and local governments in collaborative county-wide planning for transportation systems, habitat conservation, and population growth. However, regional collaboration is not yet the routine behavior of federal, state, and local government agencies.

Civic Participation and Community Involvement

When state, local and regional governments do not coordinate their land use planning policies and plans, it can result in poorly planned and inefficient development. Experience with poorly planned development has created public distrust in the ability of government to do a better job of managing growth. The widespread use of "ballot box planning" through local land use initiatives is one reaction of voters to unpopular local planning decisions. Land use initiatives can impact the effectiveness of local land use planning by focusing the public's attention on one controversial project or issue, rather than a balanced overall planning process.[52]

The involvement of stakeholders, including community residents, in issues of land use and development is increasingly important for effective planning and implementation for a variety of reasons. Growth initiatives, the increasing conflict over land as a scarce resource, the competition for public funding resources between various land uses such as new development and redevelopment, and the potential for litigation which can make development

[51] Speaker's Commission on Regionalism. *The New California Dream: Regional Solutions for 21st Century Challenges.* January 2002.
[52] Ibid.

costs prohibitive, all demand new ways of engaging community members and stakeholders in planning and land use decision making processes.

A variety of models have been developed by a number of local governments and civic groups to increase meaningful participation in land use planning processes, including regional and community visioning processes, stakeholder negotiation processes, and interactive community outreach and education activities. These processes provide input to decision makers, allow participants to help set goals and priorities, and encourage a shared commitment to planning and land use policies by the public, private, and civic sectors of a community or region. This is increasingly important for effective implementation of complex and sometimes controversial land use and development projects and plans. The State can learn from these examples to improve public participation and involve local elected bodies in the decision making process for state agency plans and projects.

Government Finance

Revenues for California state and local governments come from a combination of taxes, fees for services, and intergovernmental transfers between federal, state and local agencies. Traditionally, government at the state level is broadly responsible for financing basic health and human services, protecting consumers and the environment, providing for public education, promoting job and economic development, supervising the justice and correctional systems, and constructing major statewide infrastructure. Local governments, on the other hand, provide direct services to the people, under the general rules established by the State.[53]

Cities have broader revenue generating authority and are subject to less control by the State than are counties. Counties have the least revenue flexibility. They have smaller tax bases than cities but the State requires them to provide regional health, welfare, and criminal justice services. These requirements fall on counties because they are creations of the State and are responsible for implementing state policies in these areas. Many special agencies, including redevelopment agencies, special districts, and assessment districts, have independent sources of revenue that partially shield them from fluctuating revenue sources.[54]

A study by the Public Policy Institute of California found that the loss of local control over how revenues are spent has been quite pronounced. This is especially true in counties, whose funding from discretionary revenues based on property taxes has fallen to around 10 percent (as compared to 80 percent in 1916).[55]

Effect of State-Local Fiscal Relationship

California's current fiscal structure builds in instability and incentives for inefficient land use patterns. In June 1978, California voters passed Proposition 13, an initiative that rolled back property valuations to 1975 levels as a means to stop sharply rising property taxes. The initiative also capped property tax increases to 2 percent yearly for both individuals and businesses. A consequence of Proposition 13 was the shift of control over property taxes from local government to state government. This led to a local reliance on sales tax and fees, thus removing the incentive structure for rational local land use planning. When billions of property tax dollars were shifted from local coffers in the recession of the early 1990's (also known as ERAF), local collaboration was often replaced with local competition for sales tax dollars. This distorted the land use decision making process even further, creating disincentives for local governments to approve housing projects, in general, and affordable housing, in particular.

> Local governments face unprecedented challenges, both in their ability to deliver the level of services demanded by their citizens and in their ability to finance these services.
>
> - *Growth Within Bounds*, Report of the Commission on Local Governance for the 21st Century

[53] Commission on Local Governance for the 21st Century. *Growth Within Bounds*. January 2000.
[54] Fulton, William. *A Guide to California Planning*. 1999.
[55] Public Policy Institute of California. *The State-Local Fiscal Relationship in California: A Changing Balance of Power*. 1999.

Other initiatives further limited state and local governments' ability to raise, allocate and spend public monies. Proposition 4 in 1979 limited the growth of state and local spending. In 1986, Proposition 62 revised the vote requirements for passing local taxes. Proposition 98 in 1988 set minimum levels of spending for K-14 education.[56] Proposition 218, passed in 1996, further restricted local government's ability to raise taxes and assessments for capital projects and operating expenses. These changes and how government has adapted to them has led to a skewed system of government finance.

The five primary sources of income for local governments include property taxes, sales taxes, vehicle license fees, state subventions, and fees. Because of the cap on property taxes, high-end housing growth is lucrative for cities while most housing developments represent a net drain on city fiscal resources. To provide local services, cities are often trapped in a position of pursuing commercial development, especially large retail centers or auto malls ("fiscalization of land use"). The fiscal environment has effectively resulted in institutionalized inequity between communities and increased inefficient development, which favors the construction of large-scale commercial and high-end housing developments.

Personal and business income taxes are collected exclusively by the State. These funds are highly vulnerable to economic cycles of recession and recovery, directly impacting the services the State and counties offer. Paradoxically, these same public services can be crucial to weathering economic downturns and facilitating economic recovery, by ensuring that educational, health, and job services are maintained.

State Role in Effecting Change

Because of the divided nature of decision making in California, the State's direct influence over land use and development patterns is limited. However, this influence can be decisive. What the State retains in discretionary decision-making authority can effectively be used to leverage change throughout the state and in other units of government. It is particularly in times of fiscal difficulty that strategic planning and prioritization become crucial. Efficient development today can ensure that fiscal and environmental resources are preserved now and in the future.

> Smart Planning for California's Future: California must accommodate another 12 million people in the next 20 years. Local communities and the State must work cooperatively to support this growth and protect the quality of life in California, especially in the face of prior unplanned growth. Well-planned growth is the best way to stimulate job creation, forge new transportation and housing options, and continue California's economic prosperity.
>
> - Governor's Budget Summary, January 2000

The State of California can effect change by providing leadership in the areas of interagency and regional collaboration. It can require state agencies and departments to work in partnership with local governments to develop and implement clearly articulated state goals and policies around growth and development that are relevant to California's communities. These goals and policies must be reflected in state plans, programs and capital projects, as well as in the technical assistance and advice that the state offers to local governments in the form of statewide guidelines on CEQA compliance, LAFCO decisions, and general plan formulation.

State agencies recognize the need for better coordination among themselves, and their respective plans, policies, and project activities. Many state agencies and departments have established inter-agency working groups to discuss coordinated approaches to statewide issues such as watershed management, transportation project delivery, and information management. These efforts may be useful venues for discussing and reconciling overlapping and conflicting departmental policies and programs.

> Consequently, broad recommendations are also provided regarding the necessity to reform the state-local fiscal balance, the need for the State and local governments to adopt smart growth policies, and ways to promote accessibility and understanding of government. Together, these recommendations comprise a blueprint for California's transition to the new millennium.
>
> - *Growth Within Bounds*, 2000

Our mature urban areas can become the cutting edge

[56] Shires, M.A. (1999). *Patterns in California Revenues Since Proposition 13*. San Francisco, California, Public Policy Institute of California.

laboratories for a new kind of planning that focuses on re-planning urban and suburban areas rather than continue inefficient development patterns. The state can facilitate this re-planning effort by creating regulatory and funding incentives for local governments and other partners and bringing to bear the State's resources in this effort. The new state planning priorities in AB 857 are a rallying cry to begin.

The State must assist local governments to deal with several key challenges of local governance, including:

- Developing clearly articulated state goals and policies around land use and development ,
- Providing greater certainty in local finance sources,
- Making government (and governance) more transparent and collaborative,
- Encouraging and rewarding inter-jurisdictional and regional collaboration,
- Regaining the public's trust in government's ability to plan and govern, and
- Reviewing the legal framework within which local government operates to eliminate arcane and biased requirements and incentives for inefficient development.

GROWTH & DEVELOPMENT: Land Use

Land use is a finite resource with complex implications

In order to understand how California's population and economy impact the environment, we have to look at land use. How land is used has profound impacts on natural resources, habitat, air and water quality, human health and safety, and ultimately, quality of life.

Prior to World War II, urban development in California was typically centered on a downtown core, with nearby residential areas—so called streetcar suburbs which were both walkable and followed public transit lines. Almost all of the downtowns and neighborhoods in California's best-loved cities were built in this period, including large areas of San Francisco, San Diego, Beverly Hills, Rancho Palos Verdes, Westwood, Pasadena, Modesto, Chico, San Mateo, Santa Barbara, Carmel, Sonoma, and Sacramento. These places were built by land developers, intent on making a profit while creating great places for people to live. In both endeavors they were very successful – so successful in fact that these places remain to this day the most valuable real estate in California.[57]

California Facts:

- California's land area is 99,813,950 acres. Including water area, California's total area is 104,765,120 acres, or 163,695.5 square miles.
- The largest county in California is San Bernardino, 12,867,390 acres.
- The smallest county, excluding San Francisco, is Amador, 387,010 acres.

After World War II, the development pattern in California, and the United States as a whole, was one of decentralization, suburbanization and separation—the pattern characterized as sprawl. Massive investments in highway infrastructure lowered the relative cost of transportation and facilitated expansion into outlying rural areas.[58] Governmental policy supportive of suburban-style housing and rising personal incomes further fueled the construction of new subdivisions. Other factors encouraged urban flight: the decentralization of employment made possible by new highways, and real and perceived problems of safety and education. This led to further disinvestment in the urban core.

Measuring sprawl

Sprawl is difficult to define, but most people would agree, to paraphrase Supreme Court Justice Potter Stewart, we know it when we see it. Some of the more common ways we define and measure sprawl are:

- Overall urban density
- Rate of urban land expansion versus rate of population growth
- Rate of conversion of agricultural lands and other open space
- Growth of vehicle miles traveled versus rate of population growth
- Economic activity or tax share of central places versus urban fringe
- Central city share of urban population
- Decentralization of employment

By any of these measures, the dominant land use pattern today can be called sprawl. While California has perhaps personified the automobile-centered suburban lifestyle, California today is in some ways bucking the national trends of sprawl. California has one of the highest urban densities in the United States. The growth of vehicle miles traveled (VMT)—an important barometer of sprawl—while exceeding our population growth, is lower than metropolitan areas such as Atlanta and Pittsburgh. Nationally, the growth of developed land has exceeded population growth by a factor of 2.6.[59] Several of California's major metropolitan areas, such as Los Angeles and

[57] Robert Alminana, Paul Crawford, Andres Duany, Laura Hall, Steve Lawton, & David Sargent. (2003). *White Paper on Smart Growth in California*. Santa Rosa, California, Fisher & Hall Urban Design
[58] U.S. Environmental Protection Agency, *Our Built and Natural Environments*, EPA 231-$-01-002, 2001.
[59] Ibid.

San Francisco have expanded at the same rate or lower than the rate of population growth.[60] Robert Wassmer has said that "on average, California is neither extreme in terms of excessive sprawl, or in terms of lack of sprawl."[61]

Housing development leads land consumption

Between 1980 and 1997, California builders and developers produced 2.8 million new housing units, one for every three new Californians. In spite of this astonishing production, California nonetheless chronically under-produces housing, and will require that an additional 220,000 units be built each year for the next twenty years to face demand and stabilize housing costs.[62]

Half of California's land is under public ownership

Of California's approximately 100 million acres of land, approximately 52 million are publicly owned. Forty-eight million are owned by the federal government, including the Bureau of Land Management and the Department of Defense. Three million, three hundred thousand acres are owned by state and local government. The remaining 700,000 acres are tribal lands or owned by non-governmental organizations.[63]

Due to the constraints of public ownership and geographic unsuitability, development pressure is concentrated in certain areas. The coastal valleys, where most of California's population lives, will continue to experience growth. The most rapid rate of growth, however, will be felt inland, in the agriculturally rich Central Valley, and the ecologically sensitive Sierra foothills.

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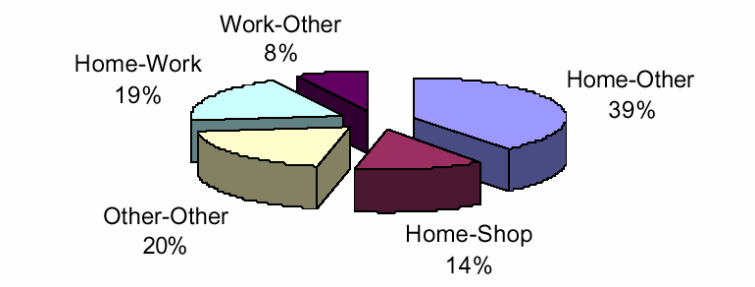
[60] Fulton, W., R. Pendall, M Nguyen and A. Harrison, *Who Sprawls the Most? How Growth Patterns Differ Across the U.S.*, Brooking Institute, 2001.
[61] Robert W. Wassmer, *Defining Excessive Decentralization in California and Other Western States*, Senate Office of Research, 2002.
[62] Kuminoff, N. V., A. D. Sokolow, et al. (2001). *Farmland Conversion: Perceptions and Realities*. Davis, California, University of California Agricultural Issues Center.
[63]

Figure 16: Public and Conservation Lands in California

Inefficient land use leads to resource waste

The development of new housing away from job centers has significant implications for the quality of life, economy and environment for all Californians. As low-density residential development is created further away from urban employment centers, workers face longer commute times and gridlock, as well as a degradation of air quality.[64] In turn, these reduce the amount of time for personal, family and civic activities, while exacerbating needs for child and senior care. At the same time, disinvestments in the urban core of many of our major cities and older suburbs wastes prior investments and impairs economic growth.

Figure 17: California 2000-01 Weekday Trip Type Distribution

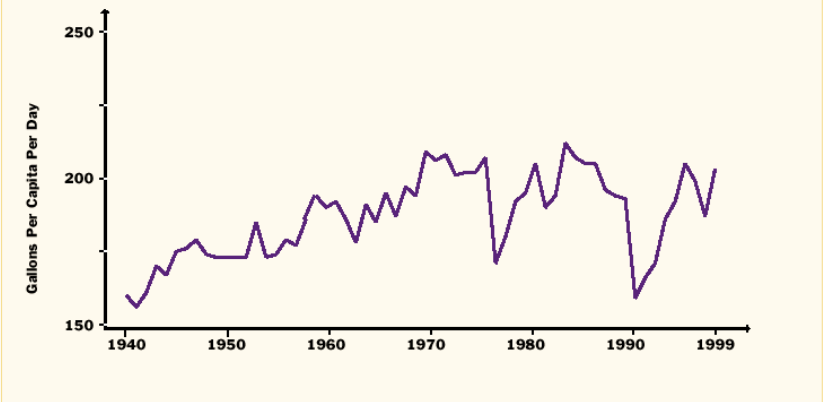


Source: California Department of Transportation 2000-2001 Statewide Household Travel Survey

According to a study by Mathew Kahn, suburban development patterns consume 58% more land and increase vehicle mileage by 31% compared to a comparable urban household.[65] This inefficient use of land causes reduction and fragmentation of both natural habitat and working landscapes. Wetland habitat is lost either through direct conversion or is impaired by changes in hydrology. Urban development also affects water quality in numerous ways, including groundwater recharge and natural flood functions. The increase in impervious surfaces (roads, parking lots, rooftops, etc.) creates additional urban stormwater—a major source of water quality impacts.

The efficient use of land is intricately intertwined with the efficient use of water. Because California's urban growth is shifting from densely urbanized coastal areas to more arid inland regions, urban water use will climb at a faster rate in response to the warmer, dryer climatic conditions inland.[66] Water is a resource which may be especially affected by global climate change.[67]

Figure 18: Statewide Average Urban Per Capita Water Production



Past droughts have challenged Californians to enact permanent water conservation techniques, which has led to a "hardened demand" in water use, meaning that the ability to further reduce usage in response to future droughts is lessened. In turn, the land use patterns chosen for development now will have lasting impacts on the future need and distribution of water.

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[64] Office of Governor Gray Davis, Commission on Building for the 21st Century. *Invest for California, Strategic Planning for California's Future Prosperity and Quality of Life*. Sacramento, California, September 2001

[65] Mathew E. Kahn, *The Environmental Impact of Suburbanization*, Journal of Policy Analysis and Management, Vol. 19, No. 4 569-586 (2000).

[66] California Resources Agency, Department of Water Resources. Preparing for California's Next Drought, Changes Since 1987-92. Sacramento, California, July 2000.
U.S. Department of the Interior, Bureau of Reclamation. Water 2025: Preventing Crises and Conflict in the West. Washington, DC, May 5, 2003.

[67] California Resources Agency, California Energy Commission. Climate Warming and California's Water Future. Davis, California, March 20, 2003

It is readily apparent that the extent of population and economic growth in California is placing ever-increasing pressures on agricultural, recreational and habitat lands, but the benefits we derive from these lands merit that they be used conservatively and effectively.

California has numerous vacant and underutilized lots

New housing is currently being built in primarily low-density, automobile-dependent developments, which leads to more rapid consumption of land as well as resources such as fuel, and degradation of air quality. Such new developments at urban edges or beyond are costly to local governments because of their demands on infrastructure extension. But not all new housing and development need occur on raw land.[68]

A significant amount of land exists within existing urban cores which could be developed as "infill". Infill projects take three forms: vacant lot use, redevelopment and re-use of previously developed sites, and rehabilitation of existing development. Unfortunately, due to the way land is inventoried, we do not have accurate information about infill's potential for meeting California's future housing needs. Empty and contaminated lots and abandoned buildings in inner cities and older suburbs are estimated to constitute 5 to 10% of California's urban real estate (260,000 to 520,000 acres). John Landis has estimated that up to two thirds of the Bay Area's housing need could be accomodated through infill.[69] Similar studies are underway in Los Angeles to determine the amount of development which can be accomodated in existing urban areas. [70]

The California Chamber of Commerce strongly believes that the revitalization of abandoned contaminated land ("brownfields") will promote economic enterprise and land efficiency in urban areas, especially in inner cities where economic development is needed most, but estimates that liability risk remains the single biggest obstacle to this end.[71] But prioritizing infill development also creates opportunities where urban services such as water, sewer, transportation and other services have already been provided.

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[68] California Business Transportation and Housing Agency, Department of Housing and Community Development. *Raising the Roof - California Housing Development Projections and Constraints 1997 - 2020*, Statewide Housing Plan Update Appendix. Sacramento, California, May 2000.
[69] John Landis, CCRL Infill Housing Roundtable, July 15, 2003.
[70] Two such studies are the Los Angeles Infill Working Group (funded by a Caltrans grant) and SCAG's Compass Project.
[71] California Chamber of Commerce (2003). *California Business Issues and Legislative Guide*. Sacramento, California.

GROWTH & DEVELOPMENT: Infrastructure

Infrastructure: The invisible underpinnings of success

Statewide population growth will drive expansion in every sector of the Californian landscape. Infrastructure development and maintenance will be essential to supporting California's growing social and economic needs. Infrastructure is an often invisible factor that ties together all the various aspects of a strong and sustainable society. Through their collective investment, the people of California have provided for themselves a network of amenities and resources that support its social, economic and natural development. The interconnected systems of infrastructure provide the framework for the flow of goods, services and ideas.

Infrastructure can be categorized into following building blocks that contribute to the state's prosperity and quality of life:

- Transportation
- Educational facilities
- Water
- Open space
- Public facilities
- Energy
- Technology

Since the early 1960's when investment in infrastructure constituted nearly a quarter of the state's general fund expenditures, state capital outlays have consistently failed to keep pace with population growth. The discrepancy between expenditures and population has been even more dramatic since 1970. Some of this is due to conservation efforts, such as water conservation instead of new storage and conveyance facilities. Much of it is simply due to neglect.

Infrastructure components can work harder for us

None of these elements stands alone from the others, and in fact, all are intimately interconnected. Achieving efficiency and sustainability relies on linking these elements to minimize resource waste. Each of these elements carries land use implications, depending on how they are designed and connected to the other elements. For example, public facilities built away from existing infrastructure will draw further development around them, and require the development of new infrastructure construction around them to deliver water, transportation and energy.

Achieving synergy between these elements of infrastructure, even making various components fulfill multiple infrastructure roles, is the key to natural resource preservation, to ensuring public goods are used to serve people equitably, and to making the most of tax dollars. Every element of infrastructure requires extensive and complex planning and management, functions traditionally conferred on government.

In California, the responsibility to provide infrastructure falls heavily on local governments. However, the State plays an important role in providing certain backbone infrastructure and providing funding for infrastructure. The Legislature has declared that infrastructure to be included in the state's Five Year Infrastructure Plan should follow three planning priorities (AB 857). These priorities are infill development, conservation of open space and working landscapes, and compact and efficient development where infrastructure is available.

Transportation

Transportation projects heavily influence the siting of future housing, as well as businesses and public amenities. By lowering the relative cost of transportation, government investment in transportation facilities has a profound influence on future land use. The federal and state investments in our highway system supported the decentralization of jobs and housing in the second half of the twentieth century.

Transportation infrastructure includes roads, airports, ports, rail, waterways, and bicycle and pedestrian facilities. The relative importance of these facilities has changed. While rail and ports continue to be important modes of goods movement, regions well served by highways and airports have seen their economic fortunes rise.

In 2000, the value of air cargo moving through California's airports was $173 billion.[72] Uncontrolled development impacts this important element of the transportation infrastructure in the form of residential development adjacent to airports. Not only do these encroachments impinge on the airport's potential of developing additional land for aviation users and aviation-related businesses, it may also inhibit growth of the airport operations due to noise or safety concerns, and in some cases can lead to closure of the airport.

Highway investment and decentralization has provided many economic benefits, but it has come at a cost. Inefficient land use patterns greatly increase automobile dependence, which in turn increase fuel consumption and congestion, and decrease air quality. Automobile dependence also inevitably marginalizes already disenfranchised communities. Automobile-centered developments also promote unhealthy sedentary lifestyles, and inefficient land use patterns make designing alternative transportation choices more difficult, as people follow increasingly random routes from homes to jobs to services.

Certain areas of the state are clearly over capacity in their roads and freeways, and severely constrained in their ability to meet demand with new road construction. The Federal Highway Administration has estimated that nearly half of California's urban highways are congested.[73] Building our way out of this dilemma is not possible without re-examining our land use choices. Studies of "induced demand" show that road expansion leads to changes in travel and development behavior which soon eliminate the short term benefits of expanded capacity.[74]

However, moving towards a balanced, sustainable system that offers safe and attractive transportation options such as biking, walking and public transit could enhance the State's mobility, and offer choices to those who cannot or choose not to drive.

Educational facilities

Schools are an important part of our "bricks and mortar" infrastructure, but are also an educational reform, human health, and sustainable planning issue. Schools that are properly sited and designed enhance educational quality and student performance. Schools can act as anchors for their surrounding communities. Educational facilities and educational quality, taken together, can be used strategically to leverage community renewal.

Because of California's growing number of youth, K-12 and higher education facilities will have to be developed at a brisk pace in the near future. It is estimated that the State needs to build seven new classrooms per day for five years to keep pace with this demand.[75] At the same time, certain urban areas have simply run out of open land for 10-20 acre K-12 facilities and playfields. While the need exists for more school capacity, a majority of our existing school facilities are 25 years or older.[76]

Educational quality is a primary consideration when families select homes for purchase. However, schools and universities themselves have specific demands for land. School sites have increased in size over the years, as a means of cutting costs by maximizing facilities' student capacities. However, standards for large school sites have driven new school construction onto open land at urban fringes, further driving development outward. "School sprawl" is another challenge for responsible land use planning. Additionally, the distance and size of schools has made it difficult to transport students by means other than the automobile.

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[72] California Business, Transportation and Housing Agency, California Department of Transportation, Division of Aeronautics. *Aviation In California: Benefits to Our Economy and Way of Life,* 2003

[73] California Business Transportation and Housing Agency, California Department of Transportation, *California Transportation Plan 2025, DRAFT*. Sacramento, California, September 25, 2002.

[74] Robert Cervero, "Road Expansion, Urban Growth, and Induced Travel," *Journal of the American Planning Association*, Vol 69, No. 2, Spring 2003, pp. 145-163.

[75] Commission on Building for the 21st Century, *Invest for California*, Sept. 2001.

[76] Ibid.

Nationwide, people are beginning to understand the importance of schools in the life of local communities. Small, neighborhood based schools are better positioned to respond to the demand that schools be more accountable in their performance and more integrated into their communities.[77] Joint-use of school facilities, such as playfields and swimming pools that also serve neighborhood recreation programs are becoming more common. The joint and community use of parks, schools, and playgrounds is necessary to optimize the use of scarce land and public resources. Schools can contribute to the quality of life for neighborhood residents by providing access to recreational facilities, meeting rooms and community centers.

New school design needs to minimize lifetime costs, in terms of energy, water and transportation costs. California has already embarked on the path to resource efficiency in its schools, through such programs as the Energy Commission's Bright Schools Program and the Collaborative for High Performance Schools.

Even as we seek to use resources more efficiently, the sheer dollar amount required for educational facilities is daunting. The Department of Education estimates a cost of $19 billion for new construction and deferred maintenance from 2000 to 2005. The passage of school construction bonds shows Californians' commitment to this undertaking. However, our current system of funding does not necessarily meet our needs. The State provides 40% of the cost for school construction and modernization. This funding is often allocated on a first come first served formula. This system favors school construction at the urban fringe, where suburban school districts do not have the land constraints and design challenges of urban districts. This system also makes financial and construction planning difficult for school districts, since it is difficult to predict when the state share of funding will be available.[78]

When school construction lags behind student enrollment, the most popular answers to overcrowding are the use of multi-track, year-round calendars, portable classrooms, and forced busing. Each of these comes with educational, environmental, and health concerns. Multi-track calendars allow schools with burgeoning enrollments to house more students without building additional facilities but do not afford students the opportunity to cover the entire curriculum as effectively as students on a traditional calendar. The Concept 6 multi-track calendar, for example, increases a school's capacity by 50%, but reduces the school year from 180 instructional days to 163. Temporary portable classrooms eliminate much-needed recreational space from school campuses and may be a significant source of exposure to airborne toxic chemicals and molds. Busing students to schools with more space can reduce student academic achievement, impedes parental involvement, cuts into recreation and exercise time, and exposes students to diesel and other air toxins.

As we face the need for more and better schools, the opportunity is present today to re-think the design and siting of educational facilities and to provide stable and responsible financing mechanisms.

Water

California's water infrastructure has been crucial to its development and success. The miles of reservoirs, levees and aqueducts, and the hundreds of watersheds which feed into them, constitute a vital asset. Also part of the water infrastructure are the Sierra and Rocky Mountain snowpack which sustain the State during its dry season, as well as wild rivers and wetlands that carry and purify water before it reaches surface and groundwater storage banks.

Like other elements of infrastructure, water infrastructure requires extensive planning and management to respond to Californians' shifting needs, from urban and commercial needs to those of its agriculture and wildlife. By some estimates, it can take 20 years or more to plan finance, and construct supplemental water supplies.[79] Increased competition for water, and the question of water deliveries from the Colorado River makes it imperative that we use our water resources wisely.

Californians' response to the drought of the late 1980's demonstrated the power of conservation efforts. Nonetheless, with its continuing growth and the prospect of cyclical droughts, fundamental conservation approaches are needed. Efficient use of land inexorably leads to water conservation, as smaller lot sizes and structures require

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[77] Local Government Commission, *New Schools for Older Neighborhoods*, January 2002.
[78] California Legislative Analyst's Office, *A New Blueprint for California School Facility Finance*, May 2001.
[79] Commission on Building for the 21st Century.

less water for landscaping, cleaning and cooling. It also reduces development pressure on the natural areas, which sustain the water infrastructure, such as wetlands and floodplains.

Open space

Through regular bond measures, Californians have expressed their desire to ensure the preservation of land for recreation and for conservation. These lands serve multiple purposes, by supporting not only the recreational needs of residents, but also providing tourism and rural economic development opportunities, and act as a natural cleansing system for the air and water upon which we depend.

Urban and rural open space requirements will increase as California's population continues to grow. Providing more shared amenities such as parks and recreational sites also offsets the need for large individual housing lots. Additional open space lands will be needed, especially in a cohesive network that better supports wildlife and can accommodate more facilities such as campgrounds. The conservation of land also requires that long-term management be put into place to ensure their viability into the future.

Public buildings

Public buildings come in every size, shape and function. Public buildings are owned and constructed by every level of government, from federal agencies to special districts. From forestry and fire stations in remote locales to county courthouses, these buildings serve the needs of Californians in innumerable, often invisible ways. The siting of public buildings has a direct impact on local development. Government services serve and employ people whose housing, transportation and spending patterns have impacts on neighboring communities.

In the post World War II era, government buildings followed the trend of other office construction, by decentralizing and gravitating to outlying areas. Recently, however, both the state and federal governments have realized the importance of public buildings in maintaining our communities, and directed agencies to give priority to downtown locations when making siting decisions.

As with other public facilities, population growth will require more construction of such edifices, and better ones as well. For example, over half of the state's courthouses were built prior to 1970. The deferred maintenance on our libraries has reached $2 billion[80].

By incorporating the latest technology in architectural design, these structures can be energy, water- and resource-wise. Appropriate siting of public buildings can contribute to community revitalization.

Energy

Energy is provided to Californians through a combination of public and private investment. Numerous sources of energy are used to power homes and businesses, transportation and communication, through power plants and refineries, transmission lines and distribution networks. California's energy portfolio, its assortment of power sources, includes oil, coal, gas, biomass, geothermal, hydroelectric, nuclear, solar and wind sources, almost half of which comes from within the state.

California is already the most energy-wise state in the West and the energy crisis proved Californians' ability to further conserve this resource. Nonetheless, the state is at a crossroads with its energy infrastructure, and must make crucial decisions to remove California from a crisis situation into one of ample energy supply. This requires that California not only expand its energy infrastructure, but also make development choices which minimize its future need for energy.

To this end, California has championed such technological breakthroughs as renewable energy, sustainable building and high-efficiency automobiles. To ensure future energy sustainability, California will have to deploy other new technologies that provide clean and renewable sources of power and promote efficient and cost-effective use. In addition, certain systemic changes are now needed to make optimal use of energy and other resources. By

[80] Ibid.

consolidating housing, educational, commercial and employment centers and expanding the use of clean, distributed sources of energy, California can reduce the energy and cost needed to expand and service the growing energy infrastructure.

Technology

California's technology infrastructure is perhaps the most diffuse, imperceptible and rapidly evolving segment of its infrastructure. It includes research and development, which occurs at the state's universities, institutes and private firms and has continually placed California at the center of innovation and information development for the world. It includes the system of libraries and databases, which collect, organize and maintain access to information. It includes the vast communication networks, computers and servers, telephones and cell phones, television and radio, satellites and transmission towers, which deliver information.

The technology and information infrastructure of the state is enormously complex, yet it is intrinsic to the cutting-edge success of California as an international powerhouse of innovation. The physical infrastructure needed for technology includes land-line and wireless connections largely built by the private sector, with the involvement of the State in maintaining fair and competitive markets, encouraging investments and providing Californians with skill development. The technology infrastructure holds the promise of providing Californians greater access to services in remote locations, and new venues for entrepreneurship. It also demands that the digital divide that separates socioeconomic groups be addressed, and that the State develop its own technological capabilities.

One of the most promising ventures in information infrastructure is the deployment of broadband technology. Broadband telecommunications can be used to carry multiple modes of communication—Internet, voice, music, video, television and computing—at high rates of speed. California has been a leader in this innovation, but California's competitors, such as Canada, Japan and South Korea, are rapidly structuring broadband networks to expand their own high-technology industries as well as support business, education, health care and entertainment.

TRENDS AND EFFECTS OF CHANGE

EFFECTS: Equity

Sustainable development attempts to reduce the negative impacts associated with development of our land and our communities. It does this by attempting to balance the effects of development on the environment, the economy and equity, or the "Three Es". Equity is the least understood and most overlooked of these three, perhaps because it is the hardest to define and measure. Equity is achieved when State and community resources are equally distributed to, and accessible by all regimes and segments of the population. Equity is often referred to as social equity, but the topic of equity includes economic and environmental issues when they are related to quality of life. In order to achieve an environmentally, economically, and socially sustainable California we must invest in our social capital—the people of California. The return on this investment are Californians that are financially and physically secure; educationally prepared for meaningful jobs; engaged in social networks (i.e., family, community, workplace, government processes); physically, mentally, and emotionally healthy; and that are the stewards of our environment. Investment in our social capital increases the potential for civic involvement, economic growth, and personal well-being—a high quality-of-life.

Land Use and Equity

The population of California is projected to grow dramatically over the next few decades. There will be increasing growth pressures and health risks as a result of additional housing, roads, schools, public buildings, waste products, energy needs, and vehicle miles traveled. Where development and infrastructure are placed and who will suffer or benefit from these decisions affects all other equity issues and is often referred to as Environmental Justice (EJ). The history of the environmental justice movement, and State of California EJ policy will be discussed later in this section.

The primary purpose of land use planning, and the source of government authority to engage in planning, is to protect the public health, safety, and welfare. Incompatible land uses are uses or facilities that may create health, safety, and welfare issues for a community. Environmental inequities occur when incompatible land uses disproportionately affect a particular socioeconomic segment of the community.

Traditionally, zoning has attempted to minimize health and safety risks by segregating land uses. While some uses will always be incompatible with each other, taking single-use zoning too far may have negative consequences. Rigid separation of land uses has resulted in socioeconomic segregation and inefficient land use patterns, causing dependence on the automobile, inefficient use of natural resources, and high environmental costs in the form of air and water pollution.

TYPES OF ENVIRONMENTAL INEQUITIES

Procedural Inequity – This is the extent to which governing rules, regulations, and evaluation criteria are applied uniformly. Examples of procedural inequity are "stacking" boards and commissions with biased interests, holding hearings in remote or difficult to reach locations, failing to publicize events to affected populations, and using English-only material to communicate to non-English speaking communities.

Geographical Inequity – An example of this is when some neighborhoods, communities, and regions receive all the costs of development and economic growth, such as the burdens of waste disposal, pollution, noise, and traffic, while other communities receive all the benefits, such as jobs and tax revenues.

Social Inequity – This occurs when undesirable uses are located in neighborhoods and communities where residents have less political and social capacity to protest these sitings.

Adapted from Robert D. Bullard, "Waste and Racism: A Stacked Deck?" Forum for Applied Research and Public Policy. Spring 1993.

Inequitable land use, where poor communities are isolated from jobs or education or bear the burden of incompatible land uses, creates pockets of poverty. Lack of community resources, or undesirable land uses cause property taxes to decrease. As crime increases and reduced local spending power diminishes, businesses move out and local revenues further decrease. Resource allocation decisions may create pockets of poverty where poor residents are trapped; they cannot afford to move so they do not have access to jobs or education. These communities do not exist in isolation.

The social services demanded by these areas drains resources from other parts of a community causing the region, and ultimately the state, to suffer.

As the state's population grows, and the *minority* is no longer the minority in number, it is imperative that decision makers address the increasing disparities between the *haves* and the *have nots.*[81] California must equitably meet the growing demands for housing, workforce development and education, health and safety, and preservation of the natural environment to ensure a high quality of life for all the State's residents and keep our economy strong. The following are some of the key disparities that we must address to make advances toward equity and the broader goal of sustainable development.

Economic Inequity

Wage gaps (or income disparities) between ethnic groups are an indicator of economic inequality. In California, wage gaps exist between racial and ethnic groups and are likely to persist.[82] Wage gaps contribute to disparities in many other measures of well-being, such as educational attainment, poverty, health status, disproportionate shares of environmental burdens, and unequal access to public benefits.

Educational and occupational differences are the largest determinants in wage gaps between Latinos, Whites, African Americans, and Asians in the state. For example, both Hispanic and African American employees have lower educational attainment and thus, often hold lower-paying jobs.[83] Hispanic and African American employees, if afforded the same education levels and occupations as white employees, would enjoy substantially higher wages.[84]

An educated workforce attracts businesses. High-growth industries, the ones responsible for most of the economic growth in California, employ the largest share of the highly-educated workforce. In urban and rural schools, which serve high concentrations of poor and ethnic students, researchers estimate that as many as half of high school seniors leave school without the skills they need to succeed in further education or the world of work.[85] Improvements in the K-12 public school system, especially in under-performing school districts, could have a high payoff in equalizing educational attainment and closing the wage gaps. Higher wages translates into increased spending power. Both contribute to a strong California economy.

Housing & Transportation

The lack of affordable housing is a significant problem for low-income populations in the State. Rising housing costs force over 60 percent of low-income renters to pay more than 50 percent of their income for housing. California's homeownership rate continues to drop and is one of the lowest in the nation. Disinvestment in center cities and older suburbs has also depressed housing values and hindered wealth creation for the poor who are most likely to own properties in these areas.[86]

The high cost of housing is a major economic problem when coupled with rising transportation costs caused by increasing separation of housing from jobs centers and the lack of affordable transportation options to connect the two. Transportation is now the highest expense for households after housing, consuming 19.3 percent of the average household income.[87] Owning an automobile is the single biggest factor for predicting a person's ability to find and

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[81] Pellegrini, Frank. "The Coming of the Minority Majority." *Time Magazine*. August 31, 2000.
[82] Reed, Deborah and Jennifer Cheng. Racial and Ethnic Wage Gaps in the California Labor Market. Public Policy Institute of California. 2003.
[83] Ibid.
[84] Ibid.
[85] *The California Master Plan for Education*. Joint Committee to Develop a Master Plan for Education – Kindergarten through University. July 2002.
[86] Funders' Network for Smart Growth and Livable Communities, Translation Paper Number One, *Opportunities for Smarter Growth: Social Equity and the Smart Growth Movement*. December 1999.
[87] Driven to Spend: The Impact of Sprawl on Household Transportation Expenses (2000). Washington, DC, Surface Transportation Policy Project.

retain a job. The necessity of automobile ownership forces low-income families to spend scarce resources on this mode of transportation and may be the single greatest barrier to home ownership and wealth creation.[88]

Inequity in Education

Inequity in the educational system occurs in terms of the quality of education (inside the classroom) and in terms of the quality of an educational facility's physical structure and amenities (the classroom itself). Both affect the ability to learn. California's rapid population growth has many impacts on the K-12 education system including: shortages of schools, overcrowding, and inadequate resources made even more scarce due to the growing number of schools. These problems are most pressing in low-income, urban and rural school districts, where existing capacity and the quality of the learning environment has been diminished by years of deferred maintenance and the failure to modernize.[89] Because of the lack of resources and the other challenges of teaching in these schools, urban and rural schools have more difficulty attracting quality teachers.

> "Public education is a vital interest of our state in that it provides Californians with the capacity, knowledge, and skills to sustain our system of government, to foster a thriving economy, and to provide the foundation for a harmonious society."
>
> *~The California Master Plan for Education*, July 2002

Schools that are properly sited and designed enhance educational quality and student performance. Schools can act as anchors for their surrounding communities and provide an important asset to the entire community in the form of civic and open space. Because of California's growing number of youth, K-12 and higher education facilities will have to be developed at a brisk pace in the near future. We need to build seven new classrooms per day for five years to keep pace with this demand.[90] At the same time, certain urban areas have simply run out of open land to accommodate the large and inflexible size requirement of 10 to 20 acres per K-12 school facility. The challenge is to construct multipurpose school facilities that educate students and provide amenities to their communities.

> About one in three California school children attends an overcrowded school or a school in need of modernization.
>
> *~Commission on Building for the 21st Century*

Without quality schools, there can be no meaningful educational reform inside the classroom. Reinvestment in existing school facilities in urban, suburban and rural areas is critical to educational equity.

Inside the Classroom

It is noteworthy to point out some trends about our State's children. The success of its students will have major implications for the success of the State's economy.

- Over 40 percent of Latino and African American students who entered high school in 1996 did not graduate four years later.
- Among the graduates of California public high schools, white students are roughly twice as likely as their African American and Latino peers to attain CSU and UC eligibility—a relationship that has existed since 1983.
- Women of all races and African American and Latino men are under-represented in science and technology occupations and industries.
- In urban and rural schools, which serve minority students in higher concentrations, researchers estimate that as many as half of high school seniors leave school without the skills they need to succeed in further education or the world of work.

Adapted from the Joint Committee to Develop a Master Plan for Education-Kindergarten through University. "The California Master Plan for Education," July 2002.

Educational inequity is not just an educational reform issue. If Californians' future prosperity—in terms of family income or wages—is directly related to educational

[88] Transportation Costs and the American Dream: Why a Lack of Transportation Choices Strains the Family Budget and Hinders Home Ownership (2003). Washington, DC, Surface Transportation Policy Project.
[89] Ibid.
[90] Commission on Building for the 21st Century. *Invest for California.* September 2001.

attainment, educational inequity is also a human health and sustainable development issue. Identifying the causes of this inequity is necessary to ensure that individuals are able to develop the skills to sustain high-quality lives and play a meaningful role in the State's economic development.

Health Disparities in Low-income Populations and People of Color

Inefficient land use patterns have diminished the quality-of-life for Californians by degrading the environment and leading to serious health risks. Poor environmental quality has its greatest impact on people whose health status already may be at risk, especially poor and low-income children who lack health insurance (24.8% and 21.8% uninsured, respectively).[91]

Inequity in land use planning is partly to blame for health disparities in California, as health disparities are highest among low-income and communities of color—those with the least access to healthcare and information, governmental decision-making, and social, economic, and environmental resources. Although these health disparities are attributable to a number of other factors, including genetics, health problems are exacerbated by low wages, lack of educational attainment, poor housing conditions, poor access to health care facilities, and environmental injustice. In poor communities where all these conditions exist simultaneously, health disparities are an urgent problem. A separate, but related, equity issue is environmental justice, which is defined in California law as the fair treatment of all people with respect to the adoption, implementation, and enforcement of environmental laws, regulations, and policies.

Environmental Justice

The Environmental Justice (EJ) movement has become a multi-issue and multi-racial grassroots community movement that has been embraced by state governments and the Federal government. The movement started as a reaction to a host of complaints including:

- unequal enforcement of environmental, civil rights, and public laws;
- differential exposure of minority and low-income populations to health risks in the home, school, neighborhood, and workplace;
- faulty assumptions by government agencies and private entities in calculating and assessing risks to minority and low-income populations;
- discriminatory zoning and land use practices; and,
- exclusionary policies and practices that limit the effective participation by minority and low-income residents in governmental processes.

> Environmental justice means "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies." Government Code § 65040.12(c)

The roots of the movement lie in diverse political movements including the civil rights movement, the grass roots anti-toxics movement of the 1980s, and, to a lesser extent, the traditional environmental movement.[92]

In response to charges by EJ activists, several investigations and studies were undertaken, which lent support to the concept of environmental injustice. A 1983 report by the U.S. General Accounting Office found that in the US Environmental Protection Agency-Region IV three of four major hazardous waste facilities were located in predominantly African American communities. Largely in response to findings such as these, in 1994 President Clinton signed Executive Order (EO) 12898, "Federal Actions to Address EJ in Minority Populations and Low-Income Populations."[93] Among other things, the EO 12898 directed federal agencies to incorporate environmental justice into their missions. In a memorandum accompanying EO 12898, President Clinton underscored existing

[91] E. R. Brown et al. "The State of Health Insurance in California: Findings from the 2001 California Health Interview Survey." UCLA Center for Health Policy Research. 2002.
[92] Luke Cole and Sheila Foster. (2001) From the Ground Up: Environmental Racism and the Rise of the Environmental Justice Movement.
[93] Clifford Rechtschaffen and Eileen Gauna. (2002) Environmental Justice: Law, Policy & Regulation.

federal laws that can be used to further environment justice. These laws include Title VI of the Civil Rights Act of 1964 and the National Environmental Policy Act (NEPA), among others.

The movement also revealed the inequities that existed in land use and environmental decision-making. Although the original EJ movement was focused on permitting and siting decisions by government agencies, most EJ advocates today define EJ more broadly. The EJ concept has moved beyond the natural environment and applies to virtually all aspects of peoples' lives. From this vantage point, EJ cannot be severed from all other aspects of government decision-making, whether that is in the realm of economic development, transportation, housing, energy, or the natural environment.

The State's Response to Environmental Justice

EJ programs established by state and federal government entities have been, in fact, responses to environmental injustices that have been documented and highlighted by EJ activists. Environmental justice became part of California's laws through legislation enacted between 1999 and 2002. The term "environmental justice" was formally defined when Governor Davis signed Senate Bill 115 (Solis, Statutes of 1999), the first EJ legislation in California. This bill also designated the Governor's Office of Planning and Research (OPR) as the agency charged with coordinating the state's efforts for environmental justice programs. It also required the California Environmental Protection Agency (Cal/EPA) to take specific actions in designing its mission for programs, policies, and standards within the Agency.

In 2000, Governor Davis included a specific appropriation to Cal/EPA for its environmental justice program, and also signed Senate Bill 89 (Escutia, Statutes of 2000), which established a procedural framework for pursuing EJ, and created the Interagency Working Group on Environmental Justice. It also created the Advisory Committee on Environmental Justice, made up of external stakeholders, to assist the Working Group in developing a strategy to identify and address environmental justice gaps in Cal/EPA programs. Additionally, Senate Bill 828 (Alarcon, Statutes of 2001) established a deadline for the Cal/EPA Boards, Departments and Offices to identify and address gaps in their programs that may impede the achievement of environmental justice. Assembly Bill 1553 (Keeley, Statutes of 2001) required OPR to establish guidelines for incorporating environmental justice into the general plans adopted by cities and counties. Also, Senate Bill 1542 (Escutia, Statutes of 2002) required the CA Integrated Waste Management Board (CIWMB) to provide environmental justice models and information to local jurisdictions for siting landfills and for new and expanding solid waste transformation or disposal facilities, submitted after January 1, 2003, required local jurisdictions to describe actions taken to solicit public participation by affected communities, including minority and low-income populations. SB 1542 also expanded the representation of the Advisory Committee with an additional four members to a total seventeen members on the Committee. Finally, Assembly Bill 2312 (Chu, Statutes of 2002) established an Environmental Justice Small Grant Program, administered by Cal/EPA, to provide grants of up to $20,000 to local community nonprofit organizations for projects that address environmental justice issues.

EJ efforts in California have primarily taken the form of implementing the EJ legislation that has been enacted. Other activities that state agencies are engaging in include: forming standing committees and advisory groups to coordinate the state's EJ efforts, training on the fundamentals of EJ, partnerships with local, regional and federal agencies, and internal EJ policy development.

Broadening the scope of EJ has challenged the way that some government agencies narrowly approach decision-making. Differences exist among government agencies' perception of their authority with regards to environmental justice goals. While some agencies are unaware of the discretionary authority they possess to advance EJ, others have chosen to use their authority to promote EJ in California.

What's the Public got to do with it?

Meaningful public participation in decisions that affect our communities and our lives is critical to achieving true environmental justice. This is especially relevant for the minority and low-income populations of the State, specifically referenced in California's enabling EJ legislation, SB 115. It is essential for all public agencies to carefully review their decision-making processes to ensure that all affected segments of the community have an

opportunity to participate in decisions that impact their lives. Knowing our state's communities—who they are and what their needs are—is critical if public agencies are to work toward a common goal of serving the people of this State and meeting their diverse needs.

EFFECTS: Air Quality

Since humans first harnessed fire for cooking and heating, air pollution has been one of the major environmental effects of growth and development. This has held true through the industrial revolution and still holds true today. Air quality affects both human health and ecology, as described in other sections of this chapter. Air pollution emissions along with climate, topography, meteorology, and pollutant transport strongly influence the air we breathe on any given day.

Air quality indicators

A number of air pollutants, coming out of a variety of industrial processes and the motor vehicles that we use, impact the health of California residents. Air monitoring shows that over 90 percent of Californians breathe unhealthy levels of one or more air pollutants during some part of the year.[94]

To protect public health, the California Air Resources Board (ARB) has established health-based ambient air quality standards to identify outdoor pollutant levels that are considered safe for the public - including those individuals most sensitive to the effects of air pollution, such as children and the elderly. To achieve these standards, ARB and the local air pollution control and air quality management districts (air districts) implement a comprehensive control strategy to reduce emissions. The two pollutants that are of greatest concern to public health are ozone and particulate matter.

Ozone

Ozone is a colorless and odorless gas and is the chief component of urban smog. It is not directly emitted from motor vehicles or industrial operations, but is formed when oxides of nitrogen (NO_x) and reactive organic compounds (ROG) react in the presence of sunlight. Ozone levels are the highest in summer, when hot sunny days provide conditions conducive to ozone formation. Ozone impacts lung function by irritating and damaging the respiratory systems. In addition, ozone can cause damage to vegetation, buildings, rubber, and some plastics.

Figure 19: Days Over the state Ozone Standard 1980-2002

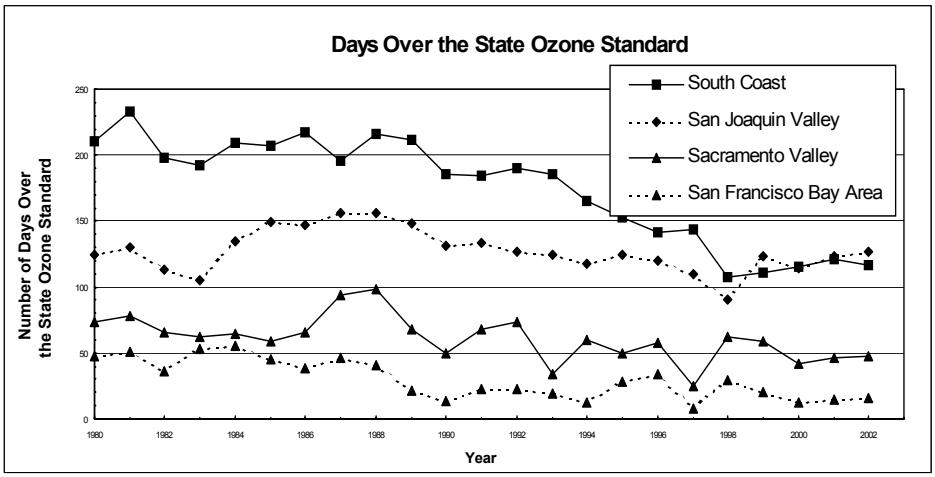


Figure 19 illustrates the progress that has been made in reducing ozone. It shows the number of days each year that the State ozone standard was violated in four of the most populated areas of California. The South Coast Air Basin, home to 40% of California's population, has the most severe ozone air quality problem in the nation. Over the last twenty years, the number of days that the standard has been violated in the South Coast Air Basin has decreased approximately 50%. The Bay Area and Sacramento Valley have also seen improvement, although not as dramatic as that in the South Coast. The San Joaquin Valley has not made as much progress as the other areas, but has been able to keep ozone levels steady in the face of increasing population and vehicle miles traveled.

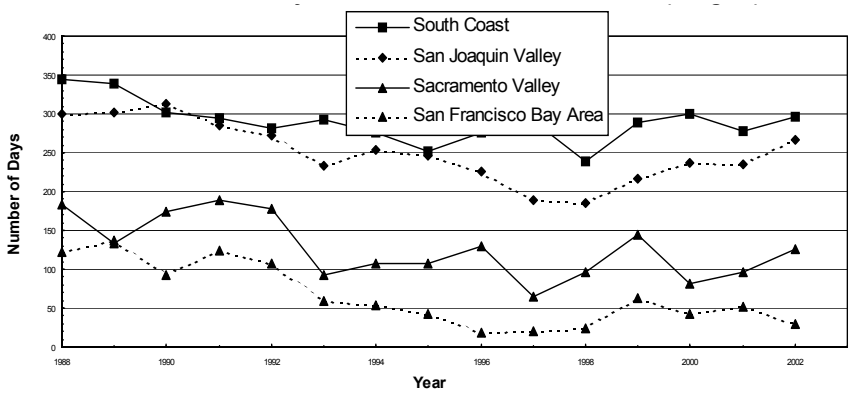
[94] California Air Resources Board.

Particulate matter

Another major pollutant throughout California is particulate matter (PM). Particulate matter is a mixture of particles and droplets that vary in size and chemical composition. Particulate matter includes "coarser" particles, those between 10 and 2.5 microns, and "fine" particles, less than 2.5 microns, known as $PM_{2.5}$. PM can be directly emitted into the air in the form of dust or soot, or similar to ozone, can be formed from the reaction of other gases in the atmosphere. PM has been linked to premature death among people with heart and lung disease. In addition, exposure to PM can increase the number or severity of asthma attacks, and aggravate existing heart and lung conditions.

The figure below shows the number of calculated days during which the State PM_{10} standard was exceeded for each year. Unlike ozone, which is monitored every day, PM_{10} is typically monitored every six days. Therefore, this graph indicates the number of days each year that it would be expected that the PM_{10} standard would be exceeded. As shown, PM_{10} continues to be a major problem in most areas of California. All areas have been holding steady or decreasing with respect to the number of days that the PM_{10} standard was exceeded. However, progress has not been as dramatic as with ozone. As with ozone, this progress is due in part to reduction of emissions from vehicles and stationary sources. Nevertheless, unhealthy PM_{10} levels still occur frequently in all major urban areas of California.

Figure 20: Calculated Days Over the State 24hr PM10 Standard



Emissions and trends

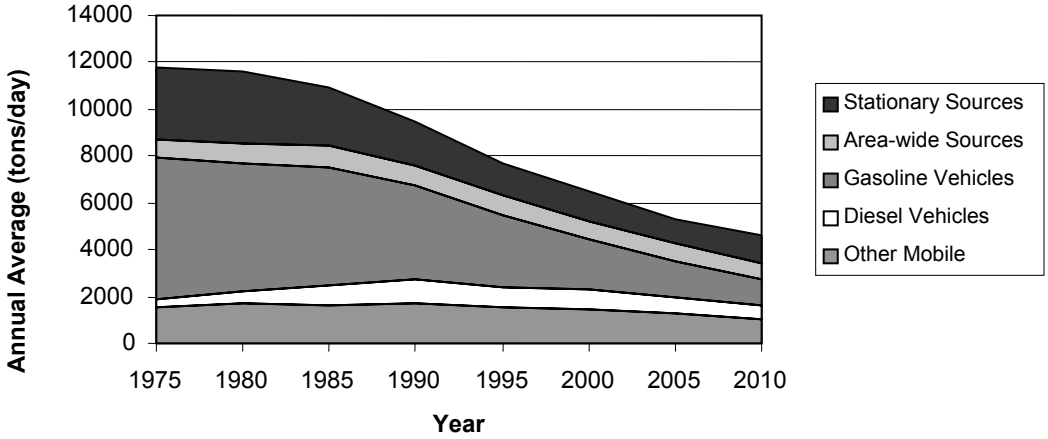
Air quality is closely tied to air pollution emissions, so an inventory of the emission sources is necessary to understand and control the key contributors. Sources of air pollution include mobile sources, such as automobiles, trucks, off-road vehicles, boats, and airplanes; point sources such as power plants, refineries and factories; and area sources such as paints, consumer products, and pesticides. Once an inventory is developed and control programs are in place, emission trends are a useful tool in assessing the progress of the program to improve ambient air quality.

Emission trends for ozone precursors

As previously discussed, ROG and NO_x are the precursor pollutants to the formation of ozone. Emissions of reactive organic gases (ROG) and NO_x are shown below[95]. Significant progress has been made in reducing ROG and NOx emissions in California, largely as a result of the State's on-road motor vehicle emission control program. Substantial reductions have also been achieved in stationary fuel combustion source categories. Stationary source NO_x emissions dropped by 41 percent between 1980 and 1995. Future reductions are still needed and will have to come largely from mobile sources. Emission standards for on-road motor vehicles were introduced in 1971 and followed in later years by the implementation of more stringent government standards and the introduction of three-way catalysts. NO_x emissions from on-road motor vehicles have declined by over 31 percent from 1990 to 2000.

[95] California Air Resources Board, *DRAFT 2003 Air Quality and Emissions Almanac*, July 2003.

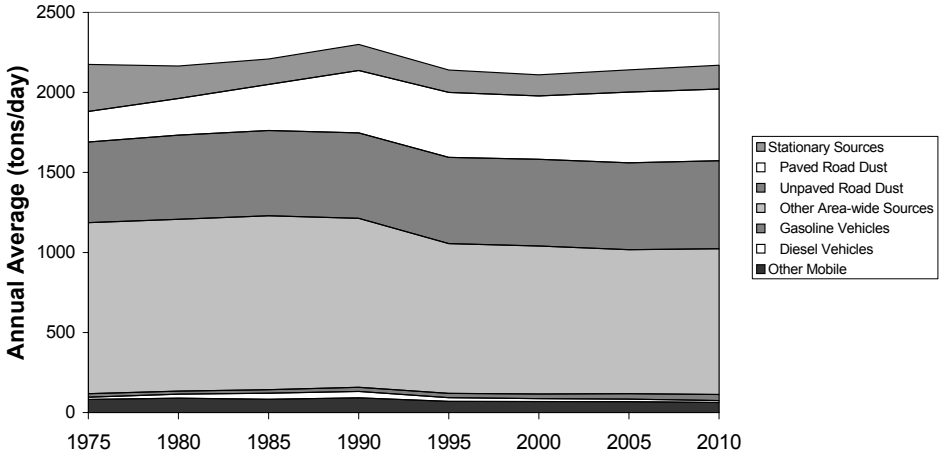
Figure 21: Statewide ROG and NOx Emission Trends



Particulate Matter (PM_{10}) Emissions

As previously discussed, PM_{10} is a major health concern. As shown below, directly-emitted PM_{10} increased from 1975 to 1990, decreased slightly from 1995 and 2000, and is projected to slowly increase after 2000. PM_{10} emissions are dominated by area-wide sources. Emissions from paved road dust more than doubled between 1975 and 2000. Unpaved road dust emissions increased slightly, while other area-wide sources decreased slightly. The increase in emissions of unpaved and paved road dust were due to increased vehicle miles traveled (VMT) over these roads. Exhaust emissions from diesel vehicles dropped by 56 percent from 1990 to 2000 due to more stringent emissions standards and the introduction of cleaner burning diesel fuel. PM_{10} emissions from stationary sources are expected to increase slightly in the future due to industrial growth.

Figure 22: Statewide PM_{10} Emission Trends



The PM_{10} emissions inventory includes only directly-emitted particulate emissions. However, particulate matter can also be formed in the atmosphere. This secondary PM_{10} is formed by reactions that are driven by emissions of ROG, NOx, and sulfur dioxide (SO2). In urban areas (or on a seasonal basis), secondary particulate matter may be the dominant contributor to PM_{10} levels. As a result, PM_{10} control strategies need to account for the relative contribution of both secondary and directly emitted particles.

Toxic Air Contaminant (TAC) Emissions

Toxic air contaminants (TACs) are air pollutants that may cause serious adverse effects on human health or the environment. TACs vary in their form, toxicity, and exposure-response relationship. The ARB tracks 243 TACs, including benzene, hexavalent, chromium, formaldehyde, perchloroethylene, and diesel particulate matter (Diesel PM). TACs have a wide range of effects, ranging from nausea, irritation of the eyes, nose or skin, to cancer. Other effects may include neurological, immunological, reproductive, developmental, and respiratory problems. Diesel particulate matter accounts for about 70% of the total TAC cancer risk in urban areas.[96] Diesel PM is emitted from both mobile and stationary sources, all of which use diesel-fueled internal combustion engines. Mobile sources account for over 90 percent of the emissions. Other sources include shipyards, warehouses, heavy equipment repair yards, and oil and gas production operations.

Regulatory response

Great strides have been made in improving our air quality. All of California now meets or exceeds state and federal standards for nitrogen dioxide, sulfur dioxide and lead. However, most Californians live in regions with unhealthy levels of ozone, particulate matter, or carbon dioxide.[97]

As a result of California's comprehensive control program, and in spite of a significant increase in vehicle miles traveled and population growth, considerable progress has been made in reducing public exposure to unhealthy ozone levels in many urban areas. State and local air quality plans now being developed and implemented will further reduce emissions and establish a framework for continuing to make progress towards attainment of the State ozone standard throughout California. Air quality plans for particulate matter now being developed and implemented will enable us to continue to make progress towards attainment of the health-protective state PM_{10} standard.

Relation to growth and development

Our growing population and economy contribute to increases in emissions from all the varied sources of pollution, from on- and off-road vehicles, to lawn and garden equipment, to industrial fuel combustion, to paints and consumer products. More people mean more houses to build, lawns to mow, goods to move, and cars to drive.

The number of cars per driver has increased from 0.7 to 1.0 in the last 30 years, and while household size has decreased, the number of cars per household has doubled.[98] Meanwhile, as the average time of the job commute has remained relatively constant, commute distances have been rising. The link between land use patterns and air quality is vehicle miles traveled (VMT). According to the California Transportation Plan, VMT will grow twice as fast as California's population from 1990 to 2020.[99] The Federal Highway Administration estimates that between 1983 and 1990, 36 percent of VMT growth was associated with demographic and market changes that allowed more

[96] California Environmental Protection Agency. *EPIC: Environmental Protection Indicators for California*. April 2002
[97] Ibid.
[98] California Business Transportation and Housing Agency, California Department of Transportation, Division of Transportation Planning. California Travel Trends and Demographics Study, Final Report. Sacramento, California, December 2002
[99] California Business Transportation and Housing Agency, California Department of Transportation, California Transportation Plan 2025, DRAFT. Sacramento, California, September 25, 2002.

families to own multiple cars and more individuals to drive on a regular basis. The remainder was attributed to land use changes that increased the average trip distance and the number of trips made.[100]

The automobile is still the largest source of smog-forming pollutants in California. Government control of automobile emissions started over a quarter century ago, resulting in significant progress in cutting car emissions. But the reason growth has not overwhelmed our air quality progress is not passenger car strategies alone but the systematic control of almost all sources air of pollution, from trucks to lawn mowers to jet skis to household cleaners. For example, new on-road heavy-duty trucks emit only a fraction of the smog-forming and toxic emissions they did 15 years ago.

Travel behavior has also become more complex, as an increasing proportion of passenger vehicle trips are taken elsewhere than for work. Because of the unpredictable nature of non-work trips, at this time privately owned vehicles best serve them. These facts indicate the importance of promoting urban form and community designs which offer transportation choices other than the automobile.

Designing housing and commercial development around greater transportation choice is one way to resolve the conflict between housing and mobility for the future and attack the underlying causes of air pollution. Low-income communities are especially reliant on alternative transportation modes, along with the young, the elderly and the disabled.[101] By working to overcome the spatial mismatch between jobs, transportation, housing and services, California can reduce VMT and related emissions, as shown below:

- SCAG has estimated that a modest redistribution of jobs and housing would result in an 8.5% reduction in VMT and a reduction in ROG of 45.5 tons.[102]
- A study of Kings County, Washington showed that mixed-use neighborhoods had substantial increases in non-motorized work trips, from 3.9% to 12.2%. The share of walking compared to total weekday trips was as high as 18.1% in some compact mixed-use neighborhoods.[103]
- A study of travel and emissions in San Diego showed that per capita VMT for infill development was 52% of greenfield VMT, while NOx and particulate matter emissions were 58% of greenfield emissions.[104]
- Transit use rises significantly at a threshold development density of about 7 households per acre.[105]

While many studies have shown the impact of urban and suburban form on passenger car VMT, much more needs to learned about the impacts of development patterns on other major sources of air pollution, such as heavy-duty trucks, to help determine how to better manage the emissions growth of these sources. Land development patterns and emission controls that reduce air pollution from all sources are both needed to help offset the impacts of growth and make our air safer and healthier.

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[100] FHA *1990 Nationwide Personal Transportation Survey*, quoted in U.S. EPA, *Our Built and Natural Environments,* 2001.
[101] Business Transportation and Housing Agency, California Department of Transportation, Division of Transportation Planning. *California Travel Trends and Demographics Study*, Final Report. Sacramento, California, December 2002.
[102] Southern California Association of Governments, *The New Economy and Jobs/Housing Balance in Southern California,* April 2001.
[103]Rutherford and Wilkinson, "Travel Impacts of Urban Form: Implications from an Analysis of Two Seattle Area Travel Diaries," cited in U.S. EPA, *Our Built and Natural Environment*.
[104] Anderson and Schroeer, *The Impacts of Infill Vs. Greenfield Development: A Comparative Case Study Analysis*, cited in U.S. EPA, *Our Built and Natural Environment*.
[105] John Holtzclaw, *How Compact Neighborhoods Affect Modal Choice - Two Examples*, Sierra Club, www.sierraclub.org; and Pushkarev and Zupan, *Public Transportation and Land Use Policy*, summarized on www.travelmatters.org.

EFFECTS: Availability and Quality of Water

Water is critically important to both the state's economy and the ecosystems which ultimately underpin both economic productivity and quality of life. Its scarcity or abundance has historically created both physical impacts and human conflicts. California's elaborate system of reservoirs, canals, aqueducts, and other engineered facilities is matched only by the even more elaborate set of laws and policies that govern the state's most contentious resource.[106] The state's water systems have made the Central Valley one of the nation's most productive agricultural regions and enabled the human settlement of areas that once were cut off from water.

The miles of reservoirs, levees and aqueducts, and the hundreds of watersheds that feed into them, constitute a vital part of California's infrastructure. Also part of the water infrastructure are the Sierra and Rocky Mountain snow pack which sustain the state during its dry season, as well as wild rivers and wetlands that carry and purify water before it reaches surface and groundwater storage banks. Like other elements of infrastructure, water infrastructure requires extensive planning and management to respond to Californians' shifting needs, from urban and commercial needs to those of its agriculture and wildlife.

California's Water - Now And In The Future

Water in California is used primarily for urban (homes and businesses), agricultural, and environmental purposes. Our current population, irrigated agricultural lands, and environmental needs require over 80 million acre-feet (maf) of water in a normal year (59 maf in a drought year).[107] As the state's population continues to grow, urban uses of water are steadily increasing. Meanwhile, agricultural demand has declined due to improved efficiencies in irrigation and, to a certain extent, due to conversion or fallowing of agricultural land. Dedicated water for the environment (e.g., instream flows) is on the increase.

The state's population is growing by approximately 500,000 people a year and by 2020 is expected to reach nearly 46 million. The sunny, arid south will account for half this growth. The State faces considerable uncertainties about the future of our water resources, including the effects of groundwater contamination on our drinking water supplies and impacts of global climate change on the Sierra snowpack. Much of our data is incomplete and analytical tools not capable of fully answering all the questions about future water supply and how to ensure its quality for beneficial uses. Groundwater is being unsustainably overdrafted in some areas, but there is incomplete information on how much and where. Although we know we will experience periodic droughts, we cannot predict when they will occur or how long they will last. Further exacerbating the situation, California is being forced to reduce its use of Colorado River water from approximately 5.2 million acre-feet per year to 4.4 million acre-feet per year.

Predictions about the ever-growing demand for water and unreliable and diminishing supply have forced water managers throughout the state to look at alternative water supply options. These include water marketing, water banking and conjunctive use, water conservation, water recycling, seawater desalination and the retirement of agricultural lands. California's water problems have made alternative methods of augmenting supply, including more efficient use of available water, key to the future management of the resource. There have also been moves to link growth (development approvals) to water supply availability. A combination of these methods will likely be needed to meet increasing demand.

Regional integrated resources planning will probably play a larger role in water management in the future. Throughout much of California, stakeholders are working together in their regions and watersheds to develop water management programs that provide multiple benefits and achieve multiple objectives.

Where does our water come from?

The state's three main sources of water are surface water (which is often diverted or extracted and stored in reservoirs), groundwater, and imported supplies (principally from the Colorado River).

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[106] Robert Wilkinson and Teresa Rounds. (1998) *Climate Change and Variability in California: White Paper for the California Regional Assessment*.
[107] Office of Governor Gray Davis, Office of Planning and Research. *General Plan Guidelines*. 2003.

Nearly 75 percent of the state's available (surface) water originates in the northern third of the state, while 75 percent of the demand occurs in the southern two-thirds of the state. A complex and sophisticated water storage and transport system, composed of federal, state and locally owned dams, reservoirs, pumping plants and aqueducts transport large portions of the state's surface water hundreds of miles from the source to the areas of demand.

Water is in greatest supply during the winter and spring, while the greatest demand for water occurs in the summer. Because of this, and due to the fact that California is earthquake-prone, the state must have secure water storage facilities, dispersed in many locations.

Surface Water

Distribution of the State's water supplies varies geographically and seasonally. Water supplies also vary climatically through cycles of drought and flood. Average annual precipitation is about 23 inches, corresponding to a volume of nearly 200 million acre-feet over California's land surface. About 65 percent of this precipitation is consumed through evaporation and transpiration by trees and other plants. The remaining 35 percent comprises the State's annual average runoff of about 71 million acre-feet (maf). Less than half of this runoff is depleted by urban and agricultural use. Most of it maintains ecosystems in California's rivers, estuaries, and wetlands. Available surface water supply totals 78 maf when out-of-state supplies from the Colorado and Klamath Rivers are added.

Surface water is collected in reservoirs ("developed water"), and distributed through a complex system of canals and pipelines from the place of origin to the place of use.

Groundwater

Groundwater supplies a major part of California's water needs. In an average year, groundwater meets about 30 percent of California's urban and agricultural water demands. In drought years, this percentage increases to more than 40 percent. In 1995, an estimated 13 million Californians or nearly 43 percent of the State's population were served by groundwater. The demand on groundwater will increase significantly as California's population grows to a projected 46 million by the year 2020. In many basins, our ability to optimally use groundwater is affected by overdraft and water quality impacts, or limited by a lack of data, management, and coordination between agencies.

Of an estimated 850 million acre-feet of water stored in California's underground aquifers, only about 250 million acre-feet can be economically and practically used. Eighty percent of the state's pumped groundwater goes towards agricultural irrigation. The greatest amounts of groundwater extraction occur in the Central and Salinas Valleys and in the Southern California coastal plain.[108]

California leads the nation in groundwater withdrawals, pumping about 16.6 million acre-feet annually, according to DWR. Additionally, groundwater is the sole source of drinking water for many cities. Unlike most other Western states, however, California has no statewide management program or permit procedure to regulate groundwater appropriations. Local entities may voluntarily develop groundwater management plans in unregulated basins, and all major urban areas must develop an Urban Water Management Plan that must address groundwater as well as surface water supplies.

Imported Water

California annually receives about 1.4 million acre-feet in runoff from Oregon and 4.4 million acre-feet from the Colorado River. Water from the Colorado River Basin supplements in-state supplies and provides about 14 percent of the state's total water. As of 1997, it provided more than 60 percent of the 8.4 maf used in southern California.[109] Southern California in recent years has used more than its 4.4 maf share - up to 5.3 maf in some years. The Colorado River Water Use Plan ("4.4 Plan") is intended to reduce the use of Colorado River water by about 800,000 acre-feet per year.

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[108] California Resources Agency, Department of Water Resources. *Preparing for California's Next Drought*. 2000.
[109] Robert Wilkinson and Teresa Rounds. Climate Change and Variability in California: White Paper for the California Regional Assessment. 1998.

Agencies Involved in Planning and Delivering Water

California's water is regulated through a highly decentralized system of governance involving state and federal agencies, thousands of local governments, and private water suppliers. This decentralization has a major influence on daily management, planning, and policy-making. State agencies generally administer the permitting, long-range planning, and management of large public works projects that deliver water from the north to the south. Cities and counties perform the land use planning functions that determine where and how growth and development will be distributed over the landscape. Yet water districts hold the actual responsibility for delivering water to the user.

The State Water Resources Control Board and the Department of Water Resources are the two key state agencies that play a significant role in water distribution in California. The former has permitting jurisdiction over all surface waters and subterranean streams, but no permit authority over groundwater. The latter consolidates water planning, development and management, and operates the State Water Project.

Our primary water suppliers are municipal government agencies, special districts, and private water companies. The public purveyors include the very large, regional water agencies like the Metropolitan Water District of Southern California (MWD) that serve large geographic areas. Other water districts only encompass a portion of one jurisdiction, whether that is a county or city. Still others are the municipal governments themselves, which provide water service to their own residents.

Hundreds of water utility districts supply Californians with water purchased by contract from the state or the US Bureau of Reclamation, bought wholesale from another water agency, or developed with local resources. It is estimated that there are more than 3,700 public and private agencies in California dealing with some aspect of water supply, use or treatment, the largest being MWD.

Local Agency Formation Commissions (LAFCOs) are regional/countywide planning agencies that perform municipal service reviews on a regular basis, providing an opportunity to comprehensively evaluate the manner in which water services (and other services) are delivered to developing areas of the State.

Who Are the Players?

Cities
Counties
Special Districts
Private Water Companies
LAFCOs
SWRCB
DWR
DHS
USBR

Future planning for adequate water supplies depends, in part, on understanding the future demand created by new development, including urbanization. However, planning processes for water and land use have been structurally isolated, with planning for each being conducted by different agencies, at different times, by different methodologies, in pursuit of different goals and objectives as established by their varied constituencies. Cities and counties are required by law to adopt long-range general plans for the physical development of their communities, while certain large water districts are required to adopt an Urban Water Management Plans to protect and manage urban water supplies and encourage efficient use of water resources.[110] New laws such as SB 221 and SB 610 (statutes of 2001) require better water supply data to be developed and require better communication between local governments and water districts in the planning of major new development.

The quality of our surface and groundwater

Water quality is regulated by several state agencies, including the State Water Resources Control Board and its nine regional boards and the Department of Health Services. The former administers laws such as the federal Clean Water Act and California Water Code, and implements both state and federal clean water funding programs for water quality improvement projects, including the Clean Water Grant Program which funds construction of waste treatment facilities. The latter administers the federal Safe Drinking Water Act (SDWA), which establishes enforceable maximum contaminant levels for various pollutants in drinking water.

[110] Only about 5 percent of the approximately 8,000 water districts in California are required to prepare an UWMP, but these districts provide service to a significant portion of the state's population.

Water quality concerns are expanding to all parts of the state, especially areas that rely on groundwater for their water supply. Water supplies have been contaminated by both manmade and natural hazardous substances. Major sources of water pollution are related to the major sectors of our economy, some of which are legacies of previous generations, such as mining.

Non-point source pollution (polluted surface runoff) is the leading cause of water quality problems in the state and is the most significant water quality challenge today. Communities throughout the state are being faced with stricter requirements on urban stormwater runoff and some rural runoff.[111] Water quality regulations have evolved from focussing on "point sources" to "non-point sources" which include runoff from urban areas, roads, agricultural fields, timber operations, and other sources.

Pesticides are a class of pollutants associated with agricultural and urban runoff, as well as groundwater contamination, particularly in agricultural regions of the state. Stormwater runoff from urbanized areas (impervious surfaces) is another major source of non-point-source pollution.

Controlling non-point pollution is very difficult because it is diffuse and only minimal regulatory measures exist. In recent years, control over non-point pollution sources has increased interest in watershed management, which is believed to offer a more holistic approach to managing the water and land use within a watershed and to prevent pollution. The extent and effect of non-point source pollution is demonstrated by the pollutant nitrate, which has caused the closure of more public water supply wells in California than any other contaminant.[112] Nitrate pollution generally comes from agricultural runoff, and septic tanks.

Point source pollution can also be dramatic, as shown by the effect of MTBE on groundwater quality. The MTBE issue demonstrates the importance of developing cross-media and cross-organizational strategies for addressing non-point source pollution, including watershed management approaches.[113]

The extent of water pollution from both point and non-point sources is demonstrated by the number of beach closures and postings. California had over 1,000 beach mile days of postings and 323 beach mile days of closures in 2002, up from the previous year.

Monitoring conducted since the 1970's demonstrates that a significant amount of our groundwater resources are also contaminated. Overpumping of coastal aquifers has created problems with seawater intrusion inland, contaminating groundwater and making it unavailable for use. Many drinking water wells have been shut down due to unacceptable concentrations of contaminants in groundwater.

Drinking water delivered to consumers is a highly regulated commodity. Meeting drinking water standards continues to be a challenge for water managers due to continually changing source water flows and quality. Statewide monitoring of about 20,000 public water supply wells and surface water sources of drinking water shows a slight decline in the overall low numbers of sources contaminated by natural and manmade substances. The Department of Health Services establishes maximum contaminant levels (MCLs), which are health protective limits for contaminants in drinking water. Exceedances of MCLs on a statewide basis are relatively uncommon, but when they occur on a localized basis they can be significant because the water source may be shut down or expensive treatment of the water may be required.

Effects of Urban Development Patterns

The way in which we use the land—the types of use and the level of intensity—has a direct relationship to water supply and quality. In most large metropolitan areas across the United States, the amount of land developed for urban uses rose more than twice as fast as the population did between 1950 and 1990. Direct environmental impacts of this development pattern include coverage of large amounts of land with impervious surfaces, inefficient use of limited water supplies, and degradation of water resources and water quality. Large amounts of impervious surfaces

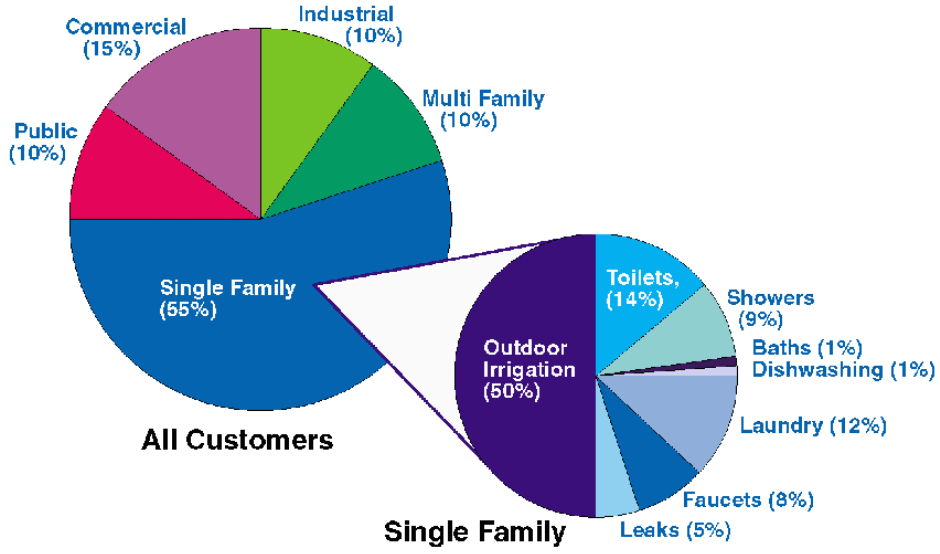
[111] Urban runoff is considered a point source under federal regulations.
[112] John Andrew, Statewide Water Planning, Department of Water Resources, 2003.
[113] California Environmental Protection Agency, State Water Resources Control Board and Regional Water Quality Control Boards. *Strategic Plan: A Vision for the Future*. Sacramento, California, November 2001.

lead to the degradation of water quality by increasing surface runoff, altering regular stream flow and watershed hydrology, reducing groundwater recharge, and increasing stream sedimentation.

A smaller urban footprint, with a corresponding reduction in impervious surface, generates less surface runoff and sediment load, and minimizes intrusion into watersheds and groundwater recharge areas that receive the runoff and sediment. Less interference with natural systems can also reduce the frequency and severity of flood events, which can carry urban pollution into waterways. An associated benefit of a smaller urban footprint is the reduction of exterior landscape areas, especially in residential areas. Outdoor irrigation needs of single family residential development make up a significant proportion of overall residential water use. By reducing the amount of exterior landscaping or by using water efficient plant material in landscaping, residential water use can be substantially reduced.

Low Impact Design (LID) is a term used to describe a form of environmentally sensitive land use design which protects water resources, among others. Because the percentage of impervious cover in a watershed has been shown to be a reliable predictor of water quality degradation and stream channel destabilization, a primary design goal of LID is to minimize the overall impervious cover within the watershed.[114] The concept of more compact design that minimizes impervious surfaces and maximizes open or green space is consistent with new state planning priorities that discourage sprawl and promote more efficient land use patterns.[115]

Figure 23: Residential Water Use



Past commercial and industrial development in our urban areas has also left a legacy of brownfields contamination, which contributes significantly to water pollution. Brownfield remediation is typically difficult to accomplish due to high costs and liability associated with the cleanup.

[114] California Environmental Protection Agency, State Water Resources Control Board, Division of Water Quality. White Paper: Planning to Protect Water Quality. 2003.
[115] AB 857, Statutes of 2002.

How has the State responded?

The challenges posed by population growth and climate change will add to the already difficult physical and economic constraints on water. The State is responding to the challenge in numerous ways, including regulatory and funding mechanisms to address water supply and quality issues. For example, CALFED, a coalition of federal and state entities, along with stakeholder groups, is working to resolve issues in the Sacramento-San Joaquin Delta. The CALFED plan addresses the major areas of ecosystem quality, water supply, water quality, and levee stability in order to improve Delta conditions through a series of actions over the next 30 years.

Water managers have focussed on developing alternative sources in order to meet the growing demand for water without the availability of traditional means (e.g., dams and reservoirs). These include conjunctive use of surface and groundwater, water marketing and water transfers, urban and agricultural water conservation programs, increased reliance on groundwater supplies, groundwater banking, water recycling, and new technologies such as sea water desalination. In 2000, California voters passed Proposition 13 which allocates nearly $2 billion for providing close to a million acre-feet of new dry-year water supply for the state, through some of the aforementioned techniques.

Response: Water Quality

Under the Clean Water Act, Total Maximum Daily Loads (TMDLs) are becoming an integral part of both federal and state regulations of pollutants in waterways. The Clean Water Act requires states to identify impaired water bodies and prepare TMDL studies and plans to reduce pollutant loads in the watersheds and clean up the impaired water bodies. California is currently working to establish these limits on waterways throughout the state.

In addition to TMDLs, a number of efforts are being undertaken to reduce the number of toxins affecting the state's waterways. The Safe Drinking Water and Toxic Enforcement Act of 1986, known as Proposition 65, prohibits companies from deliberately releasing chemicals known to cause cancer or birth defects into the environment. The Department of Pesticide Regulation administers programs to prevent and monitor surface and groundwater pollution from pesticides.

The SWRCB is attempting to expand or improve its monitoring, permitting and enforcement activities. Regional Water Quality Control Boards are now implementing a comprehensive plan for the Surface Water Ambient Monitoring Program (SWAMP) and Groundwater Ambient Monitoring and Assessment (GAMA). SWAMP is a relatively new program that will provide additional information to comprehensively assess all waters of the state and provide more effective protection. The SWRCB also manages funding programs for water quality, including the Clean Water Bond program (Proposition 13) and the Watershed Bond program.

Numerous state water quality monitoring programs have been put in place to protect public health and safety. California has one of the most highly developed beach monitoring and notification programs in the nation.[116] The state's Clean Beaches Initiative, launched in 2001, is a campaign to clean up California's beaches using funds dedicated to developing reliable monitoring tools to quickly identify threats to public health and pinpoint sources of pollution. In addition, bond funds are provided to local agencies to reduce or eliminate causes of beach closures and postings. The State, local agencies and citizen groups and the Beach Water Quality Workgroup continue to track and eliminate sources of pollution on our beaches.

CalEPA's EPIC program is the first of its kind to establish indicators of environmental health, including indicators for surface and groundwater quality, that can be measured and monitored. An important outcome of the first EPIC report is the recognition that current data is insufficient to fully determine the quality of our state's water.[117] Expansion and improvement of data collection and tracking efforts are needed to assist public agencies in water planning and resource management.

Response: Water Supply

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[116] U.S. Environmental Protection Agency. *Draft Report on the Environment*. Washington DC,2003.
[117] California Environmental Protection Agency. *EPIC: Environmental Protection Indicators for California*. April 2002

In response to environmental damage, both the courts and Congress have established requirements for restoration of ecosystems and species, which fundamentally change water allocation in California. Widely divergent perspectives exist regarding response strategies to our impending water supply problems. Some believe we need to build more dams. Others see a need for improved efficiency and greater use of market signals that more closely reflect true costs of the resource.

Californians' response to the drought of the late 1980's demonstrated the power of conservation efforts. Water use efficiency and water recycling have become major sources for communities to stretch their available supplies and enable growth without costly or environmentally damaging water projects. Nonetheless, with its continuing growth and the prospect of cyclical droughts, fundamental conservation approaches are needed.

The Department of Water Resources has engaged in numerous planning and research activities carried out collaboratively with stakeholders and the public. Among these are the Floodplain Management Task Force, the Desalination Task Force and the Recycled Water Task Force. In addition, DWR is currently preparing the five-year update of the California Water Plan, last issued in 1998, which will serve as a strategic planning tool to assess the current and future state of our water supply and water quality. The new Water Plan will for the first time address the entire hydrologic cycle for a better understanding of water supply issues. It will consider alternatives to managing our water supplies, in response to uncertainties about future patterns of growth and external effects on water resources, such as climate change.

The Recycled Water Task Force, formed jointly by DWR and the SWRCB, was charged with investigating opportunities for and constraints and impediments to increasing the use of recycled water. In its report to the Legislature in June 2003, the Task Force identified 26 issues and related recommendations to increase California's recycled water usage. The report estimated that there is a potential to increase the amount of recycled water use in California from the current level of approximately 500,000 acre-feet annually to about two million acre-feet annually by 2030. However, to achieve that potential, Californians will have to invest approximately $400 million annually for additional infrastructure to produce and deliver the recycled water.

Recent laws such as SB 221 and SB 610 recognize the critical relationship between land use and water. These laws require coordination between local governments and water agencies in assessing water availability before approving large scale development, based on adequate water supply data. But these laws only focus on supply. Water management planning, which recognizes the interconnected issues of water supply, water quality, wastewater treatment and disposal, flood management, watershed management and stormwater management, is needed to comprehensively address all aspects of water supply and quality.

Over the last few years, California voters and the Legislature have provided significant funding to local agencies for conjunctive use projects, groundwater recharge facilities, groundwater monitoring, and groundwater basin management activities under Proposition 13 and the Local Groundwater Management Assistance Act of 2000. Most recently, the 2002 passage of Proposition 50 will result in additional resources to continue recent progress toward sustaining our groundwater resources through local agency efforts. We are beginning to see significant benefits from these investments. Effective management of groundwater basins is essential because groundwater will play a key role in meeting California's water needs.

New Planning Approaches: Watershed Planning and IRP

A watershed is a geographic area in which all the water drains to a common water body, and may be as small as a few acres or as large as several states. Effective watershed planning and protection provides benefits for multiple agencies that may have varied objectives and needs for the resources.

Protecting, restoring and cleaning up the state's watersheds, rivers, streams, lakes and coast through investment in watershed partnerships that use a community-based collaborative approach is a state objective. The Integrated Watershed Management Program, initiated in May 2003 with the signing of a memorandum of understanding between the Resources Agency and CalEPA, is a region-based multi-jurisdictional program that attempts to integrate state and local efforts in watershed policy development, funding, and implementation.

California has increasingly been moving towards a system of integrated water management planning based on regions. Under this evolving system, each region can decide on a different mix of management strategies appropriate to its needs and resources. Regional water planning is integrated across resources and jurisdictions, recognizing that natural watersheds do not neatly follow political boundaries. Planning efforts should by necessity cross not only state and local political boundaries, but also national boundaries where appropriate. Water use and runoff from border areas of Mexico are examples of issues that impact watersheds shared with California.

The state is now placing more emphasis on planning that provides for coordination and improved efficiency and flexibility in the actions of local agencies and governments within a region, and reflects regional diversity and values in setting management objectives. This emphasis is reflected in several laws passed in 2002. SB 672 and SB 1341 direct updates to the California Water Plan to increase its focus on integrated regional water planning. SB 1672 authorizes regional water management groups to prepare and adopt regional plans that are then considered by the state in making decisions about grants and loans. SB 1938 requires that agencies seeking funding for groundwater projects coordinate with other local entities. Additionally, the state's voters approved Proposition 50 in 2002, which provided funding to integrated regional water management.

Examples of regional water planning efforts already underway include efforts in the Santa Ana River Valley Watershed, a fast growing region in southern California. The Santa Ana Watershed Project Authority (SAWPA), a joint powers authority, developed the Integrated Watershed Plan which identifies long-term strategies for assuring an adequate water supply for all the region's uses. The Monterey Bay National Marine Sanctuary (a federal agency), regional farm bureaus, local farmers and ranchers, resource conservation districts, University of California, and other agencies have established a voluntary system to reduce non-point-source pollution in water that drains into the bay.

Many water agencies have embraced Integrated Resource Planning (IRP) as a way to develop a least-cost, long-term plan that meets the reliability standards of water suppliers and addresses both water demand and supply. IRP accepts the notion that developing new sources of supply by building new waterworks has been significantly restrained by the public's appreciation of the environmental impacts of such development. As an example, the major objective of MWD's IRP was developing a comprehensive water resources plan that ensures reliability, affordability, water quality, diversity of supply, and adaptability for the region, while recognizing environmental and political constraints to resource development.[118]

[118] Metropolitan Water District of Southern California. *Southern California's Integrated Water Resources Plan*. 1996.

EFFECTS: Conservation of Habitat and Species

California's wildlife habitat and the ecosystems that they are a part of provide resources that are critical to the overall health and sustainability of the state. Among the many societal benefits of a healthy ecosystem are open space and recreation, tourism, research and education, natural recharge of our air and water, flood protection, and soil conservation.

The habitats and species that make up California's ecosystems and comprise the unique bioregions of the state are significant conservation priorities on a global scale. Collectively, most of the ten bioregions are part of the "California Floristic Province", one of twenty-four global hot spots for terrestrial biodiversity in the world. These twenty four hot spots cover only 2% of the world's land surface, and include 45.9% of the endemic (those found only in specific regions) plant species. As is true of other biodiversity hotspots, California has lost 70 to 99% of eight key vegetation types that account for much of this biodiversity[119]. There has been a continuing set of pressures and challenges to these natural resources, most of them human induced. These threats have forced a unique regulatory and investment response by both the state and federal governments and a stewardship obligation on private and public landowners.

California's Bioregions: The Basis for the Diversity of Habitats and Species

California's 100 million acres contains a tremendous natural diversity. This diversity can best be explained in terms of the different natural regions (bioregions) of the state, each with unique combinations of climate, vegetation, and geology. These regions include the Klamath/North Coast, the Modoc, the Sacramento Valley, the Sierra, the Bay/Delta, the San Joaquin Valley, the Central Coast, the South Coast, the Mojave, and the Colorado Desert.

Figure 24: California's Bioregions

The Klamath/North Coast, the state's wettest climate, is dominated by forest (firs, pines, redwood, oaks, tanoak, and various intermixes of these species) and chaparral. In the Modoc, juniper and sagebrush cover much of the eastern side of the region, while yellow and Jeffrey pine, white fir, mixed conifer, and cedar are common in the more mountainous western areas. The Sierra Nevada, the major mountain range in the state, rise from annual grasslands in the lower elevations, through oak woodlands and chaparral, transitioning to pine fire and mixed evergreen to alpine tundra at the high elevations.

Most of the Modoc and Sierra drain into the Central Valley, which is often considered as two separate valleys: the Sacramento Valley and the San Joaquin Valley. Both of these valleys are covered mostly by cropland, interspersed with greatly reduced patches of riparian areas, freshwater marshes and vernal pools, and oak woodlands. The Central Valley, in turn, drains (for the most part) through the Sacramento-San Joaquin Delta and the San Francisco Bay. The Bay/Delta region itself transitions from Central Valley habitats in the east to mixed hardwoods, grasslands, valley oak and redwoods in the western portion.

The Central Coast includes grasslands, chaparral, mixed hardwoods and redwood forests. The South Coast, a highly urbanized region with much of the state's population, supports chaparral and grassland habitats at lower elevations, with oaks, pines, and mixed evergreen forest in mountainous areas.

[119] Mittermeier, Myers, Gustavo A.B. da Fonseca, Olivieri, *Biodiversity Hotspots and Major Tropical Wilderness Areas: Approaches to Setting Conservation Priorities,* Conservation Biology, Pages 516-520, Volume 12, No. 3 June 1998.

The state has two distinct desert regions, the Mojave and the Colorado (named after the Colorado River), which are different in rainfall, elevation, and dominant vegetation. The Mojave region includes creosote bush, desert saltbush and Joshua trees, while the Colorado Desert contains sandy desert, desert scrub and desert wash.

California's Plants and Animals

California ranks first among all 50 states in plant and animal diversity, and the number of rare species. These species serve as indicators of habitat health, which also sustains the human population through basic functions such as air and water recharge.

Plants - California is incredibly rich in plant species. The most recent floristic inventory of the State includes 5,800 species. This is 14% more species than are found in all of the central and northeastern U.S. and adjacent areas of Canada, an area six times the size of California. About 24% of these species are endemic, that is, they are found only in California and nowhere else. Within the California floristic province (most of California west of the Sierran crest), almost half of the species are found nowhere else in the world.

Invertebrates - California has a rich terrestrial and aquatic invertebrate fauna. A conservative estimate of California's insect fauna is 27,000 to 28,000 species. This does not include other arthropods, nor does it include mollusks or other invertebrate phyla. The total count of invertebrates for California is probably in excess of 50,000 species.

Fish – One hundred fish species can be found in California (west of the Sierran crest). This includes both native and introduced fish species. Of the 52 native species, more than half (60%) are found only in California. Most of the remaining species are confined to the Pacific Coast.

Amphibians - California currently has 77 amphibian species. At least 43 (56%) of these species are found only in California. The current status of native true toads and frogs is of particular concern, because during the past 25 years, 40% of the toad species and 88% of the frog species have disappeared from half or more of their historical California ranges. The decline is especially significant in southern California, where all of the native frogs are either extirpated or on the verge of extinction.

Reptiles - California has 81 reptile species. Fourteen of these species (15%) are found only in California or lands immediately adjacent to the state. In addition, many species have one or more subspecies with limited ranges that include a portion of California.

Birds - California is rich in bird species, with 581 recorded either breeding or wintering in the state. Two hundred and ninety-three species breed in the state, with 21 species found only in California or nearby areas. In addition to the breeding birds, many of which are year-round residents, 289 species of birds that breed in northern areas spend the winter in California because of its relatively mild winter weather and rich food resources. The great majority of the Pacific Flyway's migratory and overwintering waterfowl depend upon habitat in California's Central Valley. One of the central threats to bird species are invasive predators, loss of riparian habitat and loss of wetland and other overwintering areas.

Mammals - There are 181 species of terrestrial and flying mammals that regularly occur in California, 29 of which are endemics whose entire ranges are limited to California or to California and portions of another state and Baja California.

Pressures on Habitat and Species

The status and trends of species and habitats are either maintained or altered by both natural processes and human demands on natural resources. Examples of natural processes are wildland fires and flooding, which help maintain certain habitats under natural regimes. Human-induced processes, such as an increasing population, drive the demand for different uses, and increased consumption of natural resources. Population demands on natural resources have caused a need for better management practices of those resources, including the management of working landscapes. The expansion of urban, suburban, and rural residential areas results in the most lasting changes in the terrestrial landscape. Recent trends indicate that a significant amount of habitat degradation is occurring due to parcelization, the division of land for low-density rural development in forests and rangelands.

Diversion of water for crops, drinking water, power, and flood control has long lasting effects on aquatic ecosystems. Timber harvest, livestock grazing, mining, air and water pollution, and recreation affect both terrestrial and aquatic systems. Particularly challenging agents of change throughout California are invasive species (plants, animals, and fungi), which are important factors for both aquatic and terrestrial environments.

Effects of These Pressure on the Resource

The natural landscape of California has changed dramatically during the past 200 years. These changes can be summarized in terms of changes to water flow and quality, habitat loss and degradation, endangerment of species, and climate change.

Water Flow

Today, almost all of California's rivers are dammed and fed into federal and state water distribution systems, providing water for the state's intensive agriculture and extensive urbanization. Water of sufficient quantity and quality is a major limiting factor for wetlands and wildlife populations in the Central Valley. Anadromous fisheries of the coastal and Sierra watersheds have much-reduced runs of salmon and other native fishes. Increased channelization of the lower Colorado River appears to have led to floodplain groundwater declines and reduced riparian cottonwood forests.

Water Quality

The State Water Resources Control Board has identified 679 lakes, rivers, and streams that do not meet applicable water quality standards. Types of water impairments include sedimentation, nutrient loading, temperature, organic enrichment, low dissolved oxygen, turbidity, pathogens, low pH, inorganic substances (mercury, diazimon), trash, and exotic species. These impairments are due to such factors as timber harvest, road construction, land development, urban runoff/storm sewers, hydromodification or channelization, streambank modification/destabilization, drainage/filling of wetlands, and accelerated erosion/siltation.

Habitat Loss

Habitat losses have been most significant in those areas that attract agriculture, grazing, cities (urbanization), and timber harvest. Noss and Peters (1995) report significant reductions in the native vegetation of several westside California plant communities and formations.

Table 4: Percentages of Habitat Losses

Community/formation	Vegetation reduced (percent)
Native grasslands	99
Needlegrass steppe	99
Southern San Joaquin Valley alkali sink scrub	99
Southern California coastal sage-scrub	70-90
Vernal pools	91
Wetland	91
Riparian woodlands	89
Coast redwood forest	85

Endangered plant communities in southern California include grasslands, coastal sage-scrub, riparian woodlands, and estuarine wetlands. Urban development has claimed much of the southern coast and the area around San Francisco Bay. Wetlands in California historically have hosted one of the largest concentrations of wintering waterfowl and other migratory birds in the world. Since 1800, more than 95% of the historical wetlands in California have been destroyed or modified. Closely associated with the historical wetlands were extensive riparian forests that flourished among wetlands and along waterways. Recent estimates indicate that only about 11% of the original riparian forest remains in the Central Valley.

Habitat loss has compounded the effects of natural stressors such as disease and predation. Maintaining the richness of California's species diversity depends on supporting enough of the habitat for these species to thrive. Isolated resource preserves and preserves that are too small cannot fulfill their purpose of providing healthy biological communities. Maintenance and preservation of wildlife corridors and migratory routes are also important for the continued health of biological communities.

Terrestrial Habitat Degradation

Another major effect of growth on California's habitats is degradation of habitat quality. Degraded habitats lose their ability to support species and natural processes. Timber harvest, low-density rural residential development, and roads have fragmented habitats. These changes reduce habitat quality for species that depend on large intact natural areas. Water diversions weaken populations of water-dependent species, particularly in the more arid areas. Poor grazing practices increase invasive species and damage riparian habitats. Fire suppression prevents re-germination of fire-dependent plant species and promotes the invasion of other species less tolerant of fire.

Invasive species have replaced populations of native species, altered ecosystem processes such as fire, water supply, and nutrient cycling, and hybridized with native species. For example, about a third of the Channel Islands' endemic flora is listed as endangered or is likely to be listed soon, due to the presence of introduced mammals on the islands. The invasion of cheatgrass in the Great Basin, which overlaps into California, caused drastic changes in fire regimes and secondary plant succession.

Threatened or Endangered Species

Despite evolving efforts over the last three decades to protect species from becoming extinct or endangered, the list of threatened or endangered species continues to grow. In 1987, 91 animals were listed as threatened, rare, or endangered by either the state or federal Endangered Species Acts. That number increased to 150 animals by July 2003, a 160% increase. Likewise for plants, the numbers during the same period expanded from 118 to 399, a 338% increase.

How the State Has Responded

State government has been responding to these changes to our ecosystems in a variety of ways. Most of the activities of the departments within the Resources Agency are targeted at maintaining the state's natural resources in some way or other. Government uses various approaches, including investments and regulations to help manage and preserve habitats and species.

Investments

State agencies invest funds in a variety of ways to protect, manage, and enhance natural resources. Voters have demonstrated their keen interest in protecting and preserving habitat, as evidenced by the passage of several parks and wildlife bond acts in recent years, directing agencies to acquire or restore various lands throughout the State. Acquisition for state lands, easements on private lands, or grants to local governments for acquisition/easements are activities carried out by the Wildlife Conservation Board, Department of Parks and Recreation, California Coastal Conservancy, and other departments. Each of these departments also invests in managing and enhancing resources on their respective lands. Almost every department within the Resources Agency conducts restoration activities.

State agencies are also taking more strategic approaches to planning for habitat conservation. The Department of Fish and Game's Natural Community Conservation Planning (NCCP) program is a relatively new tool to protect habitats over large landscapes in conjunction with local governments, through land use planning. These NCCP plans are in process in the South Coast, Central Valley, San Francisco Bay Area, and North Coast.

Greater interagency collaboration and sharing of information about conservation strategies is needed. Many agencies, including state, federal, and local agencies, are collectively engaged in watershed planning efforts throughout the state. These plans seek to find ways to provide for both human and natural needs from watersheds. The Resources Agency has initiated the California Legacy Project to provide a statewide strategic framework for

individual state departments seeking to make the best use of their limited conservation investment funds. The Legacy Project provides important mapping information that can also be used by local governments to make conservation management decisions.

With approximately 50% of the state under federal management, the Department of Fish and Game has participated in advising federal land managers of the Bureau of Land Management and U.S. Forest Service as they develop large area management plans for federal lands. The other half of the State, except for state lands, is in private ownership and plays an important role in conserving habitats and species. Several agencies, both state and federal, have initiated private landowner incentive programs. These programs provide either financial or technical assistance to landowners interested in managing their lands for their natural values.

State departments also recognize that many of these activities require a good scientific understanding of the location of natural resources, their status and trends, as well as their long-term conservation and management needs. Many departments are dedicating what limited funds they can into inventory, monitoring, and research, although the need for such information always seems to outpace the availability of funding. This has left significant gaps in the current information necessary to protect the state's species and habitats.

Regulations

The State also has responsibility for developing and enforcing regulations that protect species and habitats. Two key tools are the California Endangered Species Act (CESA) and the California Environmental Quality Act. CESA activities at the Department of Fish and Game include research, management, and monitoring programs, participating in recovery planning, and working cooperatively with the federal government, other state and local agencies, landowners, and the public in various ways to further conservation.

Other regulations include the key regulations in the Fish and Game Code, the Public Resources Code, and the Forest Practices Act. Examples of direct state regulation under the Public Resources Code include the California Coastal Act of 1976, the Bi-State Tahoe Regional Planning Commission in the Lake Tahoe watershed and the Bay Conservation and Development Commission which permits and regulates development within and around a narrow perimeter of San Francisco Bay.

In addition, state and federal water quality regulations, pesticide regulation, air quality regulation and toxic substance control discussed in other parts of this report are designed to protect both public health and biodiversity.

EFFECTS: Agricultural Land and Working Landscapes

By 2040, it is estimated that California's population will grow to 59 million. Whether the expected 24 million new neighbors are accommodated at existing densities or housed according to more efficient patterns of growth, more land and water will need to be consumed. Under existing development patterns, this land and water will come at the expense of California's working landscapes – farmlands, grazing lands and timberlands.

The loss of these lands does not just impact food and fiber, but also impacts state and local revenues and jobs. California's working landscapes offer other critical environmental benefits to California including scenic open space, flood protection, groundwater recharge, wildlife habitat, recreation, agri-tourism, renewable energy, carbon offsets and climate control.

Redirecting this trend in the conversion of working landscapes will require identification of challenges that go beyond simply protecting these lands through existing voluntary conservation programs. Rural communities have financial and social needs that current conservation programs do not entirely address. Farmers and ranchers face a myriad of challenges in trying to maintain our working landscapes as viable economic enterprises. The challenges include competition for water, encroachment of incompatible development, a growing array of environmental regulations requiring specialized licenses, permits and certifications, competition from producers from out-of-state and abroad, and federal farm policies that are more applicable to Midwestern and Southern agricultural industries.

This section addresses how growth and development pressures have affected California working landscapes, including the potential loss of important environmental resources.

Inventory of California's Working Landscapes

California contains 100 million acres of land, of which approximately half is privately held. Of these privately held lands nearly 60 percent, or roughly 27 to 28 million acres, is in some type of agricultural production. Of the 31 million acres of California forest, 17 million acres are considered commercial forest.

Defining Terms

Working Landscapes

Farmlands, croplands, grazing lands, timber lands

Prime Farmland (P)

Farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Farmland of Statewide Importance (S)

Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date. Download information on the soils qualifying for Farmland of Statewide Importance.

Unique Farmland (U)

Farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include nonirrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.

Farmland of Local Importance (L)

Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee. Download a complete set of the Farmland of Local Importance definitions in PDF format.

Grazing Land (G)

Land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The minimum mapping unit for Grazing Land is 40 acres.

Source: Department of Conservation

The California Farmland Mapping and Monitoring Program (FMMP), which has mapped 90 percent of the State's farmland, reports that at least 11 to 12 million of these agricultural lands qualify as *Farmland of Statewide Importance*, largely cultivated and irrigated cropland, with the balance in grazing land.

Of these croplands, less than half, four to five million acres, are considered *Prime Farmland*. Thus, only approximately 15 percent of the State's agricultural land, and less than 5 percent of its total land, is free from physical limitations to its agricultural use, i.e., *Prime Farmland*. This is roughly equivalent to the number of acres now dedicated to urban land uses in the State.

However, to limit the discussion of valuable farmland to just *Prime Farmland* would be a mistake in California. According to the FMMP, *Unique Farmland* is land with poorer quality soils, but produce high value crops. Often, these soils produce the very crops for which California is known around the world. *Unique Farmlands* support some of the best avocado, artichoke, strawberry and vineyard farms in the State because of their "unique" combination soil, relief and climate. A relatively small amount of this farmland category, approximately one million acres, has been mapped in California.

Agricultural Performance in the Face of Growth Pressures

While California is undergoing intense pressure to urbanize its valuable agricultural land, it nevertheless continues to outperform all other states in the U.S. in its volume and range of agricultural production. For 50 years running, California has been the nation's number one agricultural state. In 2002, California farm-gate agricultural sales were nearly double that of its next competitor, Texas. Eight out of the nation's top ten agricultural counties – Tulare, Fresno, Monterey, Kern, Merced, San Joaquin, Stanislaus and San Diego -- are from California. Indeed, if California were a nation of its own, it would rank in the top 10 agricultural nations of the world.

In 1997, California's agricultural land base comprised just <u>three percent</u> of the nation's total. Yet, these farms and ranches produced more than three times their share of the nation's gross agricultural cash receipts and receipts from agricultural exports (13 percent each). This amazing production of food and fiber is done with very little help from U.S. farm subsidies. For example, while Texas received USDA subsidies between 1996 and 2001 of $7.7 billion, California growers received only $2.8 billion in subsidies over the same period.

Not only is California's agricultural production large and efficient, but it is diverse. California growers produce more than 350 different commodities. California leads the nation in the production of 77 of these commodities. California is the near sole producer of two dozen crops, of which 13 are exclusively produced in California. These include such delicacies as almonds, olives, walnuts, raisins, artichokes and figs. California provides more than 50 percent of this nation's fruits, nuts and vegetables. Even in the production of mainstay commodities, California is dominant; California leads the nation in dairy production, producing 33.8 million pounds of milk and cheese in the year 2000 and providing one out of every six glasses of milk consumed in the U.S. California's top two commodities – one a staple, milk, and the other a specialty crop, grapes -- demonstrate the diversity and strength of this State's agricultural production.

Environmental Value of Working Landscapes

The table below displays the value and diversity of commodities in the top ten agricultural counties and the acres of agricultural lands that have been converted to urban uses from 1990 to 2000. These figures also illustrate that a vastly disproportionate amount of the 200,802 acres of the best farmland urbanized occurred in our most productive agricultural counties.

In addition, continuing development in rural areas risks more than the State's ability to produce food and fiber. California's rural landscape is a working and economic landscape that currently provides many other public and environmental benefits including water management, wildlife habitat, scenic open space, energy products, carbon offsets, recreation and flood protection. In addition, California's working landscapes support the third most valuable timber industry in the nation at $1 billion annually, and the fifth-ranking beef production in the country. Further, with more support for land stewardship, working lands can play an even greater part in meeting our environmental objectives in the future.

Table 5: California's Top 10 Agricultural Counties and Farmland Conversion (Dollars in Millions)[120]

2001 Rank	*County*	*Farmland Acres Converted 1990-2000*[121]	*2001 Value*	*2000 Value*	*1999 Value*	*Leading Commodities*
1	***Tulare***	***20,947***	***$3,492***	***$3,067***	***$3,076***	***Milk, Oranges, Cattle and Calves***
2	***Fresno***	***26,506***	***$3,215***	***$3,421***	***$3,566***	***Cotton, Grapes, Poultry***
3	***Monterey***	***13,782***	***$2,746***	***$2,923***	***$2,369***	***Lettuce, Broccoli, Strawberries***
4	***Kern***	***75,652***	***$2,254***	***$2,212***	***$2,129***	***Grapes, Milk, Citrus***
5	***Merced***	***1,644***	***$1,703***	***$1,539***	***$1,534***	***Milk, Chickens, Cattle and Calves***
6	***San Joaquin***	***9,846***	***$1,390***	***$1,349***	***$1,353***	***Grapes, Milk, Cherries***
7	***Stanislaus***	***3,811***	***$1,353***	***$1,197***	***$1,208***	***Milk, Almonds, Chickens***
8	***San Diego***	***17,735***	***$1,290***	***$1,254***	***$1,223***	***Nursery, Flowers, Avocados***
9	***Riverside***	***55,890***	***$1,125***	***$1,049***	***$1,197***	***Milk, Nursery, Grapes***
10	***Ventura***	***2,553***	***$1,054***	***$1,047***	***$1,059***	***Lemons, Celery, Strawberries***

Source: California Department of Food and Agriculture, 1999, 2001 and Department of Conservation.

Water Management

While the water needs of cities and ecosystems are relatively inflexible, with planning and compensation, agriculture can adapt to and recover from temporary water transfers without a loss in long-term productivity. Thus, agricultural land offers an important and flexible tool for water management in California.

As an example, the California Bay-Delta Authority, established to deal with California's long-term and immediate water management challenges has established the Environmental Water Account. A key component of the Account's operation is the temporary transfer of water from agricultural users to meet environmental water needs. The proposed water transfers would be accomplished by paying the landowners or water districts to fallow their lands for the temporary use of their water. The fallowing provides the grower with income to sustain future farming operations, perhaps generates an opportunity for short-term habitat creation on the idled land, and provides water to meet immediate or future in-stream ecological needs.

Flood Protection

Agricultural landowners also provide an important benefit to their urban neighbors in flood protection. Agricultural lands absorb rainfall and provide for the temporary retention of surface runoff, reducing the volume and elevation of peak storm flow. As these lands are paved, both the volume and the intensity of runoff increase, increasing the likelihood for flooding downstream.

With reduced tax revenues available to construct new, and maintain and improve existing levees and dams, California is turning to alternative flood control strategies, including the protection of agricultural land to protect remaining floodplains and basins. The Department of Water Resources recently announced grants to acquire conservation easements that prevent the development of floodplains and compensate agricultural landowners for allowing their lands to occasionally flood. Under this approach, agricultural landowners are compensated for farming their lands in a "flood-friendly" manner, foregoing the urban development of their lands, and the occasional loss of crops and farm improvements to flooding.

[120] Farmland Conversion Statistics from published figures in California Farmland Conversion Reports 1990-2000.
[121] 1990-2000 Irrigated Farmland Change. Changes to Irrigated Farmland includes the total affect of urbanization as well as land converted to rural residential, mining ecological restoration, and land converted to or retired from agriculture. From Department of Conservation.

Groundwater Recharge

In a normal rainfall year California derives about 30 percent of its water from groundwater sources[122]. In drought years the reliance on groundwater is greater. Most groundwater aquifers rely on recharge from the infiltration of rainwater and snowmelt. Agricultural lands in certain locations also serve to absorb surface water and recharge aquifers. Agricultural lands have also been dedicated to serve as permanent or intermittent groundwater recharge basins, where captured runoff water is allowed to percolate into the ground for subsequent use. When not flooded for recharge, these lands can continue to be farmed.

Increasingly, groundwater storage of surface water is being used as a water-banking tool. For example, seasonally surplus water is being storage by the Metropolitan Water District of Southern California in groundwater basins of Kern County, for subsequent use during surface water deficits. Again, agriculture provides the lands over which water is spread for groundwater storage. Additional agricultural areas could be identified for similar water banking opportunities.

Wildlife Habitat

Land development in California, including agricultural land development, has come at the expense of natural wildlife habitat. Suburban and industrial development offers, for most intents and purposes, limited opportunity for the restoration of wildlife habitat. On the other hand, agricultural land -- though often intensively worked -- provides a wide range of opportunities for wildlife habitat while under cultivation. Alfalfa fields serve as rich foraging ground for raptors; rice fields are typically dotted with egrets, stilts and migrating ducks and geese; where maintained, riparian corridors and field hedgerows provide cover for a variety of species including beneficial insects; tail-water return ponds, particularly where vegetated, offer wetland habitat for birds and mammals; and harvested fields can provide cover, foraging, feed and nesting ground for a variety of birds.

Scenic Open Space

California planning law requires local governments to plan for the provision and conservation of open space in their general plans. Among the types of open spaces enumerated are resource producing and scenic open spaces. Working landscapes fit both categories. When describing the importance of agricultural land as scenic open space, the Williamson Act speaks of aesthetics, positive affects on urban property values, and the green relief from the urban setting. While urban dwellers may not necessarily have access to agricultural land, they derive value from its existence in proximity to their homes and communities.

Agricultural open space also serves as an urban separator or greenbelt. Greenbelts have positive land use planning benefits that include assisting in the retention of community identity, providing a clear limit to urban development, and reducing the opportunities for leapfrog development that increase the costs to communities of providing public services.

Recreation

California's working landscapes play a valuable role in providing recreational opportunities for all residents, and generating an alternative stream of income for growers. Currently, working landscapes serve as a primary location for fall and winter bird hunters. Increasingly, communities and growers are recognizing the economic and educational value of more actively providing free and purchased recreational experiences for non-agricultural residents.

For example, growers in Yolo, Solano and Napa Counties have joined to promote agriculturally related recreational opportunities. One participant, a rancher in Yolo and Solano Counties, offers overnight visits, including a hoe-down, barbecue and a horseback tour of the ranch to tourists, school children and college students and researchers.

[122] Department of Water Resources in 1998 (Bulletin 160)

Their goal is to increase ranch income, inform consumers about the challenges and benefits of agriculture, and gain additional knowledge to better manage their lands[123].

Renewable Energy Production

The importance of having a diverse and reliable supply of energy was dramatically demonstrated to California residents when they were hit with widespread power outages and high prices in 2000. California agriculture has the potential to help bring diversity and sustainability to California's energy supplies. While oil is a nonrenewable resource and new hydroelectric and nuclear power remains unpopular with voters, the technology and capacity to generate biofuels from agricultural products is available today. Throughout California there are examples of forest and agricultural trimmings and livestock waste being digested or burned to generate gas and liquid fuel.

In addition, with California's long growing season, there is great potential to actually grow crops strictly for their value as an energy source. Corn, sugar cane, sorghum and other crops are being grown and processed to meet the needs for an alternative to MTBE as a fuel oxygenate. Although a limited number of vehicles currently run on bio-diesel and ethanol, there are great opportunities for a thriving agro-energy industry which would help provide new jobs, cleaner air, a renewable source of solar energy, and greater energy self-sufficiency, as well as provide growers with another source of income to help keep their lands in production.

Carbon Offsets

As documented elsewhere in this report, human-induced global climate change poses potentially catastrophic environmental and economic impacts on Californians. Deforestation, industrial and automotive pollutants and agriculture have been named as some of the human sources of increased carbon dioxide in the atmosphere. However, agriculture is a natural collector for carbon dioxide.

Reduced tillage, improved range and grasslands and other agronomic practices can improve the carbon content in soils as carbon dioxide is taken by plants from the air and deposited in the soil as organic matter. According to the USDA, the "total carbon sequestration and fossil fuel offset potential of U.S. cropland is estimated to be 154 million metric tons of carbon per year or 133 percent of the total emissions of greenhouse gases by agricultural and forestry activities. Many view land-based carbon sinks as buying valuable time to address the more significant challenge — reducing greenhouse gas emissions.[124]"

Mineral Resource Conservation

California is known for its gold, but its most valuable mineral resource today may be the sand and gravel that the 49ers cast aside. California's expanding population consumes millions of tons of aggregate each year for home foundations, sidewalks, patios and streets. Most of this aggregate comes from alluvial deposits underlying the rich agricultural soils of California's river valleys.

California has, perhaps, the most stringent mine reclamation laws in the Nation. Under California's Surface Mining and Reclamation Act, local governments can require miners to reclaim mined agricultural lands back to their original productivity. Therefore, in California, agricultural land not only provides conjunctive beneficial uses, such as wildlife habitat, but also sequential interim benefits in the form of minerals. Once urbanized, though, the options for using these farmlands for food, wildlife or mineral production are gone.

Challenges of Rural Communities

California's current structure for the funding of local government services has left rural cities and counties with little alternative for new revenues outside of developing their working landscapes. Rural communities are often under pressure to approve retail development for sales tax generation and more up-scale residential development to satisfy

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[123] "Charting a new crop: Harvest Trails map highlights rural tourism in Yolo, Solano, and Napa." Sacramento Bee. September 22, 2003. Page B1.
[124] Soil Carbon Sequestration: Frequently Asked Questions, USDA Global Change Fact Sheet

the growing tide of previous urban dwellers drawn to rural communities by the lower cost of living and higher quality of life.

However, as residential development moves out from the city and town centers, farmers and ranchers increasingly encounter neighbors who do not approve of standard farming practices. In the Central Valley, residents in a number of counties have tried to stop the siting of new dairies and what they believe are incompatible agricultural uses near urban and suburban areas. As a result of these urbanization pressures, over the last decade previous rural farming centers like Fresno have experienced significant growth from a population of 217,346 in 1980 to 426,900 in 2000. Fresno is now the sixth largest city in the State ahead of Sacramento and just behind San Diego.

Although some programs like the Williamson Act provide tax breaks to landowners and local government in exchange for agricultural conservation efforts, most open space and environmental conservation programs offer little in the way of reliable rebates to local governments. This leaves communities with no added resources to compensate for their losses in property taxes, cost of managing the resources, or other impacts of easements as they struggle to define their own development patterns.

Since the 1990's, state and local legislators have wrestled, mostly unsuccessfully, with a restructuring of local government funding mechanisms that break the linkage between land use decisions and revenue raising. Success in this area would be a great step toward reversing the trend in agricultural land conversion.

Using a different approach to limiting land conversions, in 2001 a new law took effect which increased the role of the Local Agency Formation Commission (LAFCO) to discourage the conversion of agricultural lands, particularly as it relates to LAFCO approvals of extensions of municipal services and/or annexation of agricultural lands into cities. Anecdotal evidence suggests that some communities' quest for more revenues has led to liberal interpretation of the new law. The FMMP has not completed the Farmland Conversion Report for 2000-2002 so the impact of this new law is yet to be evaluated.

Maintaining working landscapes and all the economic, social and environmental benefits associated with them will require dealing with the fundamental issues surrounding local government finance. Additionally, preservation of these lands will require the development of an environmental protection program which places monetary value on maintenance of watersheds, carbon sequestration, habitat for endangered species, and the other important environmental benefits that working landscapes provide.

Competition for Land

For all of the bounty of food and fiber, and the myriad of environmental benefits that agriculture provides, there are serious challenges to its future within California including loss of important agricultural lands, conversion of agricultural lands for conservation and open space and competition for water with urban and environmental users.

Urbanization of Croplands

From 1998 to 2000, conversion of all farmlands exceeded 90,000 acres. Prime agricultural lands accounted for 19 percent of the 92,258 new urban acres. This represents a 30 percent increase over the previous reporting period of 1996 to 1998. Much of this growth during the report period was occurring in the state's most productive regions, including the San Joaquin Valley and the Central Coast. In San Joaquin County 2,037 out of the 2,555 new urban acres occurred on irrigated farmland (80%), and in Merced County where the figure was 84% (874 out of 1,040 acres).

California annually urbanized an average of more than 45,000 acres of open land during the period of 1996 to 2000.[125] Of this new development, nearly a third occurred on irrigated farmland; one in five acres urbanized was Prime Farmland. In total, over the four years from 1996 to 2000, more than 80,000 acres of irrigated farmland was converted to urban uses.

[125] California Department of Conservation

While the loss of 80,000 acres represents only slightly less than one percent of California's total irrigated agricultural land base, the impact is disproportionately on the best land. Also, to argue that the loss is relatively insignificant is to ignore incremental demise – one acre at a time -- of agriculture in the Los Angeles Basin (Los Angeles County was California's number one agricultural county only a generation ago) and the Santa Clara Valley in less than a century. The loss of 80,000 acres is a significant cumulative loss when planning for sustainability over generations.

Another response to growth and development pressures in important agricultural counties like Stanislaus and San Joaquin is that as prime agricultural lands are lost, new croplands on steeper, lower quality soils are established.[126] These lower quality lands require more inputs, pose greater environmental risks, and likely result in more wildlife habitat conversion. In addition, while the land converted to urbanization supported a variety of crops, with an emphasis on field and row crops, the newly established agricultural land was planted predominantly to tree crops, representing a loss in flexibility needed by growers to adapt to a constantly changing market.

Ranchettes or Ranches?

While California's agricultural land protection policies have largely focused on farmland conversion and protection, there is also a serious loss of grazing lands used for beef production, the fifth leading agricultural commodity in sales value. The Sierra-Nevada Mountain and Coast Range foothill counties are among the fastest growing counties in the State, but also contain some of the best rangeland.

Conversion subdivides rangeland into rural ranchette lots too small to ranch profitably. Minimum parcel sizes on these lands are often zoned at 40 acres. At a few thousand dollars per acre, such parcels are well within the reach of retiring urban professionals looking for a rural retreat or retirement home.

Conversion of grazing lands to ranchettes is difficult to track. Non-federal rangeland areas in California decreased around 624,000 acres from 1982 to 1997, an average rate of 42,000 acres per year.[127] From 1998 to 2000 California lost 53,263 acres of rangeland. This trend has serious implications for the beef industry, fire protection, watersheds and wildlife.

California's timber production regions are also being affected by growth and development pressures. The state ranks third in the nation in timber production[128] with an annual economic value of over $1 billion. Of the 31 million acres of California forest, nearly 17 million acres are commercial forestland[129] producing more than two billion board feet yearly[130]. From 1969 to 1998, approximately 113,000 acres were converted from private timberland to other uses.[131]

Over the last three decades, 56% of all acres of timberland conversion were for grazing, 24% for subdivisions and the remaining 20% for other agriculture, mining, water development, recreation and other uses.[132] Although slightly less than 25 percent conversion to subdivisions may seem minimal, taking a longer view of high conversion rates for grazing lands to urban uses indicates that the elimination of forest is just a first step toward loss of natural lands for urban purposes.

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[126] 1990 study funded by the Department of Conservation, The Impacts of Farmland Conversion in California documented two types of farmland conversion in San Joaquin, Stanislaus and Ventura Counties over parts of two decades. Approximately 30,000 acres of cropland was converted to urban uses from the mid-1970s to the mid-1980s. However, crop reports identified a net loss of 5,000 to 10,000 acres of cropland was experienced.
[127] The USDA's National Resource Inventory.
[128] California Resources Agency, California Department of Forestry and Fire Protection, Fire and Resource Assessment Program. *Characteristics of the Range Livestock Industry*. Sacramento, California, December 20, 2002.
[129] California Resources Agency, California Legacy Project. Initial Assessment of the Health and Condition of California's Lands and Natural Resources. Sacramento, California, December 6, 2002.
[130] California Department of Finance. *California Statistical Abstract*. Sacramento, California, December 2002.
[131] California Resources Agency, California Department of Forestry and Fire Protection, Fire and Resource Assessment Program. *Timberland Conversion in California from 1969-1998:Technical Working Paper 1-01-01,* by Tian-Ting Shih, Forest Economist , page 1.
[132] Ibid.

Further, the Department of Forestry and Fire Protection estimate that if development continues to occur under the historic conversion patterns, approximately 2.7 million [more] acres of private forests and rangelands will be lost over the next 40 years[133].

Conversion to Public Open Space

As California's population continues to grow, the demands for resources that are important to quality of life also grow. These resources include open space for recreation and wildlife habitat. At the same time, however, the urban expansion that accommodates the new residents consumes not only agricultural land, but also these other forms of open space.

To meet the public demand for wildlife conservation and restoration, state and federal agencies have in recent decades relied upon voter-approved bond funding to acquire and restore lands for wildlife habitat and public recreation. Often the restoration has come at the expense of agricultural land. The Department of Conservation reports that over the last decade, more than a quarter-million acres of Williamson Act protected land has been acquired by public agencies for a variety of uses.

Public consensus supports the protection and enhancement of biological diversity in California and the creation of new recreational opportunities. However, the cost of lost agricultural tax revenues, jobs and production, as well as the increased public land management costs, argue for a working landscape alternative to providing these public benefits. More specifically, the alternatives should compensate affected local communities for both the environmental resources they provide for the benefit of the rest of the state, and the development of policies that ensure the continued viability of working landscapes adjacent to natural conservation preserves.

Competition for Water

Perhaps more of a challenge to the state's agriculture than the loss of its land base is the increasing competition for its water. The state's growing population requires new water as well as new land. The recent clash between urban, environmental and agricultural communities in the Imperial Valley -- where the large scale retirement of agricultural land was proposed to free water for San Diego County residents and Salton Sea wildlife -- dramatizes the kind of competition for water that farmers throughout the West are, or will be facing.

Challenges of Farmers, Ranchers and Workers

Federal, state and local regulations pose two challenges to agricultural sustainability. One is the cost and time of understanding and complying with regulations. The other challenge is in the lack of belief by the regulated that all their efforts are actually resulting in more environmental protections.

While the Endangered Species Acts may dominate the headlines, the issue of regulatory burdens and hurdles are much broader. Local grading ordinances, streambed alteration permits, zoning restrictions, pesticide handling requirements and many other procedural mandates present costly and time-consuming barriers to conducting agricultural business. In a 2000 staff report to the Solono County Board of Supervisors, staff identified over 30 federal, state and locally required permits and regulations affecting farmers and ranchers in Solano County.[134]

Some policy makers have suggested that there should be an integrated environmental management program developed that pulls together all the environmental mandates into a single comprehensive program, administered through a one-stop shop, emphasizing the use of effective low environmental impact techniques to meet both the needs of the farmer and the state's environmental objectives.

National Farm Policy

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[133] California Resources Agency, California Department of Forestry and Fire Protection, Fire and Resource Assessment Program. The Changing California: Forest and Range Assessment 2003. Sacramento, California, April 2003.

[134] Solano County Summit on Agriculture: Report to the Board of Supervisors. June 20, 2000. 93 pp.

National farm policy has focused on the support and management of staple farm products such as wheat, corn, soybeans, rice, cotton and milk. Though California produces most of these commodities, approximately two-thirds of the value of this state's production comes from specialty crops. As a result, contrary to the stereotype, California growers receive very little in the way of crop subsidies compared to other major farm states. For example, California growers receive barely a third of the U.S. farm subsidies that the State of Texas receives, while producing nearly twice the value in agricultural production. Further, California out-produced the 24 smallest agricultural states on less than 20 percent of the federal farm subsidies[135].

With the myriad regulatory, growth and environmental pressures facing America's top agricultural state, it would make sense that California growers would receive financial and technical support from the nation's farm conservation programs. However, California growers have, on average, received only two to four percent of Farm Bill conservation assistance funds, even though they produce more than six times their state share of the national farm output in sales value, and contribute an even greater portion of total U.S. farm exports.

Decline in Agricultural Income

Both national farm policy and the liberalization of trade have been blamed for the dramatic decline in farm income in recent years. Since 1996, prices for primary agricultural exports have fallen by 40 percent. These crops account for approximately 30 percent of California's agricultural income. California's specialty crop growers have also experienced increased competition from growers in China, New Zealand, Chile and other developed and developing countries[136].

Growers in California, though efficient and innovative, face competitive disadvantages with growers from developed countries where farm income supports and other subsidies remain high while American farm policy has moved towards a more unregulated free market particularly as it relates to commodities grown in California. In developing countries, environmental, food safety and labor regulations are typically much less stringent than those in California, resulting lower production costs and crop prices.

Pursuing a sustainable development agenda offers California unique opportunities in creating a more equitable playing field with other countries that currently have lower environmental and labor standards. By educating the public on the value of sustainable agricultural practices and advocating for these standards at the World Trade Organization, California producers can become leaders and models and potentially derive new income from organically farmed products and alternative energy production.

The Agricultural Generation Gap

Agricultural land conversion is also fueled by the aging of farm owners and low rates of farm transfer to their children. Each year there are fewer farmers to manage California's working landscape.

The average age of American farmers in 1997 was 54 years, up from 53 years five years earlier[137]. A more telling statistic about the graying of America's farmers is that in 1954, 37 percent of farmers were over the age of 55 years. In 1997, this number had increased to 61 percent. At the other end of the distribution curve, in 1954, 15 percent of American farmers were under the age of 35 years. In 1997, this figure had dropped to eight percent[138].

There are many reasons for the aging of farm ownership and the resultant sale of farms and ranches. They include: smaller farm families, declining farm numbers, greater opportunities in other professions for each succeeding

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[135] California Department of Food and Agriculture. 2003. *California: America's Agricultural Leader*. 1 page fact sheet

[136] Ikerd, John. July 27, 2002. *New Farm Bill and U.S. Trade Policy: Implications for Family Farms and Rural Communities*. Presentation at "Grain Place" Farm Tour and Seminar, Aurora, Nebraska

[137] According to the USDA Economic Research Service,

[138] U.S. Department of Agriculture, Economic Research Service, Briefing Room. "Farm Structure: Questions and Answers – How Does the Age of Farmers Differ from that of Other Members of the Labor Force?"

generation, the tax and familial difficulties of intergenerational transfer of farms and ranches, and the huge financial and knowledge capital investment required for a successful farm or ranch start-up.

If ranchers don't want to ranch anymore, farmers don't want to farm anymore, and local governments are looking for new revenue streams, it is not surprising that California is experiencing a 30 percent increase in urbanization of agricultural land from 1998-2000. Redirecting current trends in growth and development on working landscapes will require addressing the three primary drivers of agricultural land conversion: an ineffectual tax structure that hits rural communities particularly hard, the lack of financial compensation for environmental benefits and the current economic challenges facing the agriculture industry.

EFFECTS: Open Space

California's open space resource is a fundamental component of our basic infrastructure, one that provides important social, environmental and economic benefits for all communities, whether urban, suburban, or rural. Open space conservation is a critical component of any state-level quality of life agenda. It is estimated that 80 percent of California's land area is open space of one form or another, primarily due to federal and state landholdings.

What is Open Space?

The term open space is often used to refer to all lands that are not devoted to urban development. As used in this report, it includes public and private lands that provide a variety of public benefits, through passive and active use. It includes **recreation** lands such as parks, trails, beaches, and greenbelts that provide important recreational and health benefits to residents. It includes land necessary for resource **conservation** such as ecosystem preservation, groundwater recharge and mineral extraction. Open space lands are often designated to minimize development in areas of potential **hazards** such as flood plains, fire hazard zones, geologic hazard zones, airport flight zones and transmission line corridors. Open space protects landscapes that contain important **visual** resources such as scenic highway corridors and community separators. It also is an important means to protect **historic, cultural, and sacred** resource areas. As used here, it does not include agricultural lands and other working landscapes, or lands primarily dedicated to wildlife habitat protection.

Benefits of Open Space

Not only do our parks and open spaces provide opportunities to renew the mind and body, preserve our history and cultural heritage, protect the state's natural beauty, and conserve resources, they provide very real economic benefits in terms of income created through the attraction of industries such as the motion picture film industry, tourism, and outdoor sports. Parks and recreation improve surrounding real estate values, create quality jobs, and contribute to the economic vitality of communities, which, in turn, increase tax revenues.[139] The economic impact of our state parks alone is dramatic.

Table 6: Impact of State Parks on Local Economies, July 2001-June 2002[140]

Visitor Spending in local communities	$2.6 billion
Total sales by businesses in local communities	$6.65 billion
Gross sales for independently run concessions	$89.3 million
Jobs supported directly and indirectly	10,000

Parks and green space are the city's lungs, essential components of its health and quality of life. Parks and green space clean the air, purify pollutants from the ground, break the heat, and breathe life into the neighborhood. Parks are a democratic commons that bring people together as equals. Parks, playgrounds, and recreation programs help prevent gang violence, crime, prostitution, drug abuse, teen sex, and unwanted teen pregnancies.[141]

Beaches are one of California's most valuable public assets. According to a 1997 study, "The Economic Value of Beaches," coastal-related recreation spending represented almost 3% of the total economic activity in California in 1995, and allowed for the creation of more than 500,000 jobs, over 3.5% of statewide employment.[142] In addition, the study demonstrated the coast's high intrinsic value to California residents. According to the study, Californians

[139] Robert García et al., The Heritage Parkway in the Heart of Los Angeles (2003).
[140] California State Parks. *The State Park System Plan 2002*, Part I.
[141] Robert García et al., The Heritage Parkway in the Heart of Los Angeles (2003).
[142] Robert García, Erica S. Flores, Katrina McIntosh, and Elizabeth Pine (2003). Equal Access to California's Beaches: Strategies from the Urban Park Movement.

value beaches at $942 million per year.[143] The present value of future income from state beaches is approximately $17.5 billion.[144]

Acquisition, Ownership and Management of Open Space

California's open space lands are acquired, owned, and managed by numerous entities including the federal, state, and local governments, special districts, non-profit organizations and private landowners. Funding for open space acquisition and management comes from a similarly wide variety of sources. On the whole, Californians readily express a keen interest in protecting our recreational and open space lands, as evidenced by the passage of recent bond initiatives to acquire and improve state and local parks, and for preserving historical and cultural resources.

The federal government is perhaps the State's most important player in protecting open space. In California, there are 4.5 million acres of state trust land, and almost 48 million acres, or approximately 47 percent of California's land area, in federal ownership (primarily held or managed by the Bureau of Land Management, the National Park Service, the U.S. Forest Service, and U.S. Fish and Wildlife Service). Virtually all of this land can be regarded as open space of one type or another.[145]

Although the federal government may be the largest owner of open space in California, most strategic open space acquisitions are made by state government, local and regional agencies, and non-profit land trusts. The State owns and manages 273 state parks, containing a total of 1.45 million acres (as of 2001-02), which provides for multiple uses including habitat conservation, active recreation, and cultural resource protection. The state park system is the most ecologically diverse system of protected lands in the state and contains almost one-fourth of California's scenic coastline.[146]

A few statistics on usage of state parks:

- The State's population grew 25 percent between 1987 and 2002, but visitation to state parks increased more than 50 percent during the same period. Attendance is now at record levels.
- In 2001-02, 85 million people visited California state parks.
- 86 percent of California's state park visitors live in California.
- The most visited state parks were state beaches (nearly 40 million visits in 2001-02).
- Coastal beaches and campgrounds are among the most heavily used facilities of the state parks system.

The ownership of coastal lands follows slightly different rules from other open space. In California, all land below the mean high tide line is public, and therefore cannot be bought or sold.[147] Management and protection can be conducted by numerous entities.

Open space is preserved through a complex and decentralized system, which tends to encourage reactive or ad-hoc open space protection at the local level, and in some cases, large-scale acquisitions based on different strategic objectives (e.g., natural resource conservation versus recreation use).

Open space is designated or protected using a variety of tools including: purchase of the property, or development rights on the property, by a public agency or non-profit organization; favorable tax treatment of private property if land is retained in some form of open space; and regulation by public agencies of the use of private property to prohibit certain uses (such as urban growth boundaries and zoning regulations).

Land acquisition has become a laborious, expensive and time-consuming process. Acquisition of land or the development rights on the land is often accomplished through the use of bond measures and private donations from land trusts and

[143] Katherine E. Stone, (2000) *Sand Rights: A Legal System to Protect the "Shores of the Sea" 29 Stetson L. Rev.* 709, 711.
[144] Robert García, Erica S. Flores, Katrina McIntosh, and Elizabeth Pine, Equal Access to California's Beaches: Strategies from the Urban Park Movement (2003).
[145] Hollis, Linda E. and Fulton, William. *Open Space Protection: Conservation Meets Growth Management*. For the Brookings Institution Center on Urban and Metropolitan Policy. April 2002.
[146] California State Parks. *The State Park System Plan 2002*, Part I.
[147] *Lechuza Villas v. California Coastal Commission, 60 Cal. App. 4th 218 (1997); Ca. Civil Code Section 670 and 830.*

conservancies. Escalating land costs due to development pressure, especially in urban areas and on the urban fringe, make it difficult to rely on land acquisition for preservation of open space.

Although some federal funds are available for open space acquisition, more often it is accomplished using state, regional, and local public funds that are often approved in the form of bonds or taxes. Increasingly, non-profit land trusts are using funds provided by foundations and philanthropic organizations. Often, several independent sources of funding are needed and several agencies or organizations may play a role in a single land conservation transaction, making the system complicated and decentralized and difficult to estimate the amount of acreage protected through state and local programs.

State Parks serves a significant role in open space management and planning of state owned lands. Local governments and special districts have a strong role in open space planning, acquisition and management. Local and regional agencies use a variety of tools to protect open space, including regulatory tools such as zoning, urban growth boundaries, and transfer of development rights programs. Sonoma and Marin counties, for example, have undertaken aggressive open space acquisition programs implemented by special districts established for that purpose.[148] The San Francisco Bay area's Greenbelt Alliance, a land conservation organization, works with non-profits and local government to encourage compact urban development as a means to protect farmland and open space. To date, it has preserved more than 600,000 acres, some of it farmland.

Pressures on Open Space

The increasing number of people and the changes in interests and needs brought about by changing demographics, together with fiscal and economic influences, puts enormous pressure on California's natural resources in general and open space resources in particular.

Population growth: The demands on our urban and rural open space resources will continue to grow as California's population grows. Population growth and human activities on the land create pressure on open space in several ways. Growth and development cause the loss of open space through direct conversion of open space to other uses and at the same time increase the demand for open space because of the needs of a growing population. Urban encroachment also creates land use compatibility issues, impacting the quality of the remaining open space lands through visual degradation, noise disturbance, and air and water pollution.

The pace of development needed to accommodate population growth threatens to consume the open space that sets apart communities and gives them identity, and makes acquisition and preservation of that open space more costly and difficult. Millions of people live in urban areas where local open space is already scarce, or where the population has overwhelmed the resources through over-use.

Patterns of urbanization: As California's population grows, the population has become increasingly concentrated in existing urban areas and is spreading further into suburban and rural areas, creating unique pressures on and need for open space resources in these different settings.

Urban areas are experiencing increasing population density, consuming the remaining open spaces and decreasing the supply of open space. Increasingly, residents of urban areas do not have access to urban parks and contact with natural settings is increasingly difficult. Significantly, adolescents living in urban areas are less likely to participate in regular physical activity than adolescents living in suburban areas.[149]

Many Californians are moving away from high-cost, high-density regions to inland valleys and Sierra Foothills, where new urban and suburban growth typically takes the form of low-density, automobile-dependent development, which has led to more rapid consumption of land as well as resources. This land use pattern places open space at

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[148] Between 1990 and 2000, the Sonoma County Agricultural Preservation and Open Space District has protected approximately 25,000 acres at a cost of approximately $50 million, using funds generated by a one-quarter percent local sales tax. Much of this land was purchased as "community separators" designated in the county general plan. Marin County established its program in 1980 and has protected approximately 27,000 acres.

[149] UCLA Center for Health Policy Research, Diabetes in California: Findings from the 2001 California Health Interview Survey (April 2003).

greater risk of conversion and locates population centers further from open space, making it more difficult for people to have access to the resource.

Changing demographics*:* Statewide demographic projections show that over the next 30 years, the state's population will continue to become more diverse. Public opinion polls already show that changing demographics means a demand for more diverse outdoor experiences and more heightened interest in open space. People from different racial and ethnic groups use parks differently, constructing meaning for public open space based on their own values, cultures, histories and traditions.[150]

Senior citizens and youth will become major sectors of the population, increasing the already high demand for open space, especially for parks and recreational use. The percentage of children under age 18 will grow to levels not seen since the 1970's, increasing the demand for facilities such as schools and parks.[151] Changing demographics will necessitate adjustments in the amount and distribution of our open space resources to make them accessible to changing population needs. A shift in use and recreation preferences means the State and other recreational open space providers will need to provide more services and more diverse services.

Effects on the Resource

Because of new population growth and land development associated with it, we are seeing increasing threats to historical and cultural resources, biological diversity, and local economies, which are often dependent upon protection of open space.

California is converting an average of 42,500 acres of agricultural land and open space to urban uses each year.[152] Urban parks are becoming increasingly scarce and demand already outstrips supply. A recent statewide survey on Californians and the environment showed that 64% of Californians say that poorer communities have less than their fair share of well-maintained parks and recreational facilities.[153]

As population rapidly expands into remaining open spaces, pressures increase in the periphery of urbanized areas as well as on rural undeveloped lands. One of the consequences of continuing growth on the urban periphery and in the open spaces between towns is that distinct communities are disappearing. Economic use of rural open space is threatened by the effects of urban sprawl, including rural parcelization. The very character of rural communities and the lifestyle that they offer, which are so inextricably tied to the open space setting in which they exist, are also being threatened.

Development and in-adequate infrastructure has placed strains on the state's limited open-space resources resulting in degradation, as evidenced by the number of beach closure days. For example, in 1999, there were 694 beach closure days and 4,186 beach warning days, due to bacterial contamination.[154] Overuse also means that public agencies must invest even greater resources for maintenance of the open space. Over the past 15 years, neither funding nor staffing for the state parks system has kept pace with the growth in park acreage or state population.[155]

Resource conservation areas such as mineral and aggregate rich areas are being threatened by sprawl. Areas that have been historically dedicated as open space because of potential hazardous conditions (floodplains, fire hazard, and seismic activity) are under pressure to be converted to urban uses to accommodate a growing population. Housing developments are encroaching into floodplains, wildfire, and seismic hazard areas throughout the state.

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[150] Anastasia Loukaitou-Sideris, "Urban Form and Social Context: Cultural Differentiation in the Uses of Urban Parks", Journal of Planning Education and Research, 14, 89-102 (1995).
[151] California Department of Finance.
[152] California Commission on Building for the 21st Century. *Invest for California: Strategic Planning for California's Future Prosperity and Quality of Life.* September 2001.
[153] Mark Baldassare, Public Policy Institute of California, Statewide Survey: Special Survey on Californians and the Environment vi (June 2002).
[154] California Commission on Building for the 21st Century. *Invest for California: Strategic Planning for California's Future Prosperity and Quality of Life.* September 2001.
[155] California State Parks. *The State Park System Plan 2002*, Part I.

Open space that protects historical, cultural and Native American sacred sites are increasingly being threatened by sprawl development patterns throughout the State.

Urban Parks: Certain populations and urban dwellers are increasingly under-served by parks. The need for more parks in urban areas is great, but available land is scarce and development pressures drive up land costs in and near urban areas, making it difficult for public agencies to acquire open space. Access to parks and the opportunities for healthy exercise they provide is significantly lower in minority communities than in wealthier communities.[156]

As our population increases, the number of people at the lower end of the income scale is increasing at a disproportionately higher ratio. Recreation becomes a crucial quality of life issue for people with lower incomes, and people with lower income rely more heavily on public recreational facilities.[157] The Center for Law in the Public Interest has documented the particular effects of inadequate recreation facilities on low income and minority populations in Los Angeles.[158]

Because there has been little new construction of parks in poorer neighborhoods, those areas benefit little from the state Quimby Act, which requires developers to pay fees toward park development near new projects. Many existing urban parks are heavily used and require more maintenance and more staff. The criteria and methods of administration of urban parks have an adverse disparate impact because they fail to take into account the needs of the poorest neighborhoods, which are disproportionately communities of color.[159]

Although the National Park Association standard is 6 to 10 acres of neighborhood and community parks per 1,000 people, many local governments have adopted lower standards through their general plan policies. In many communities, especially in urban areas, local governments are not able to achieve even the lower park standards for their residents due to insufficient land and financial constraints.

Local officials virtually abandoned public recreation in the wake of Proposition 13, which cut funding for local services. It also adopted the practice of apportioning its park budget through a formula based on park size – which favors disproportionately wealthy, non-minority areas – while encouraging parks to operate as businesses based on user fees. Since the wealthier areas of a city have disproportionate shares of park area and fee generating facilities, this has entailed a regressive redistribution of park resources. The result is 'recreational apartheid' and a deterioration of public space in the inner city as parks become increasingly run down, unsupervised and dangerous."[160]

California needs to improve the livability of our urban areas by development of urban parks and recreation areas. This can be done, in part, by providing incentives for brownfield cleanup and reuse initiatives that could allow development of parks and open space on empty and underutilized lots in inner cities and older suburbs. Brownfields are estimated to constitute five to ten percent of California's urban real estate.[161]

How Have the State and Others Responded?

Open space protection efforts - federal, state, regional, local and private - have become a centerpiece of California land use policy and are functioning in concert with efforts to manage urban growth more than ever before. Although states and metropolitan areas have been preserving open space for a variety of purposes since the mid 19th century, they have been adopting open space initiatives in near record numbers over the last decade.

California has a long-standing tradition of environmental leadership as exemplified by our State commissions and conservancies that protect our parks, our lakes and rivers, our coast, and other important land resources. To date, a

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[156] *California Today*, Volume 33, Number 3, July 2003, PCL.
[157] California State Parks. *The State Park System Plan 2002*, Part I.
[158] Garcia, Robert, et al. *Dreams of Fields: Soccer, Community, and Equal Justice*. 2002.
[159] Jocelyn Stewart, "Officials Resort to Creativity to Meet Need for Parks," L.A. Times (June 15, 1998).
[160] Mike Davis, City of Quartz 308 (1990).
[161] California Commission on Building for the 21st Century. *Invest for California: Strategic Planning for California's Future Prosperity and Quality of Life.* September 2001.

good amount of state attention has focused on the purchase of open space and farmland, an agenda that is costly both in terms of taxpayer dollars and in economic development. Lack of strategic implementation of these programs has produced, in many cases, fragmentation of our open space and working landscapes, placing even greater pressure on remaining farms, forests, parks and open space.[162]

Improved stewardship is needed to overcome these problems and create a legacy for the future. The Resources Agency's Legacy Project provides a framework for a statewide resource conservation strategy and provides a tool for state agencies to make wise conservation investments in an era of diminishing funding resources. As part of its work, the Legacy Project has created the California Digital Atlas that provides a tool for local decision makers to identify important conservation areas. Future products of the Legacy Project will include an assessment of the "health and condition" of our rural recreation and urban open space lands.

The State influences open space conservation and development in numerous ways, including direct regulation of activities in the coastal zone, by purchasing and managing important resource lands, and by setting tax policies that set a framework for how local governments make land use decisions. The State Department of Parks and Recreation has set a goal of expanding the landholdings of the state park system by 350,000 acres, from 1.4 million to 1.75 million acres, by 2020. State Parks serves a significant role in open space planning. The State Parks mission is to provide for the "health, inspiration and education of the People of California," and to do this by "creating opportunities for high-quality outdoor recreation" and "protecting its most valued natural and cultural resources."[163] To fulfill its mission State Parks is committed to strategic initiatives to provide additional outdoor recreation opportunities that keep pace with the needs of California's growing, diverse population and changing lifestyles, to become more relevant in the major population centers of the State, and to increase its relevancy for a large portion of the public.[164]

California is one of the national leaders in open space acquisition programs and voters have approved historic sums of bond funds for open space and related land protection programs. In 2000, Californians passed Proposition 12[165], a $2.1 billion bond act for parks and open space. Funds from Prop 12 enabled the state to acquire nearly 66,000 acres of parkland. The largest state park bond act, Proposition 40, was passed in 2001, providing another $2.6 billion to provide needed parks and recreation services, for a total of $4.7 billion in bond funds over the past 3 years. Proposition 40 represents a major step towards meeting the need for more parks in park-poor communities. These funds have leveraged additional funds through matching grants for local parks and recreation.

The State Department of Parks and Recreation provides financial and technical assistance to local governments and has coordinated development of outdoor recreation facilities in urban areas. During the last 35 years, the State has administered more than $1.8 billion in local assistance grants. Under the Urban Parks Initiative, thousands of acres of urban parks and open space were purchased in the underserved Los Angeles region (including the Cornfields and Taylor Yard).

In 1999, the state dedicated $157 million to reduce a deferred maintenance backlog of over $700 million in the State Park System. The Department has completed 820 of the program's 1,469 facility maintenance projects.

Regional and local programs have increased in size and number, and the impact of private land trusts has doubled as well. Non-profit land trusts and philanthropic institutions have become important players in open space preservation. Groups like the Trust for Public Land, the Nature Conservancy, and The Conservation Fund are helping communities throughout the U.S. to develop local and regional plans for systems of open space. In 1998, the David and Lucile Packard Foundation began a five-year $175 million program (the Conserving California Landscapes Initiative) to protect open space, farmland and wildlife habitat in the Sierra Nevada, Central Valley, and Central Coast regions. This program has resulted in the protection of over 327,000 acres of land as of November 2000. In April 2001, the foundation granted $50 million to the Peninsula Open Space Trust to help conserve 20,000

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[162] Salkin, Patricia E. et al. *Conservation of Private Lands: Conservation Meets Growth Management*. April 2002.
[163] *The Seventh Generation: The Strategic Vision of California State Parks* (2001).
[164] Ibid.
[165] Proposition 12 is also known as the Safe Neighborhood Park, Clean Water, Clean Air and Coastal Protection Bond Act, passed in March 2000.

acres in San Mateo County which are believed to be the only undeveloped coastline next to a major metropolitan area remaining in the world.

The California Coastal Commission is the agency charged with implementing the California Coastal Act through its planning and regulatory processes. The Commission sets statewide policy on issues affecting public access to the coastal zone.[166] The California legislature and Governor Davis recently reaffirmed principles of coastal access through the passage and signing of Senate Bill 1962 (Polanco), which provides a legislative safety net for public access to the beach. Proclaiming that "California's coast line belongs to the people," Governor Gray Davis signed the legislation. Hundreds of offers to dedicate (OTD) easements for access to the beach along the California coast are at risk of expiring because they have not yet been enforced by the state.[167] SB 1962 requires the Coastal Conservancy to accept OTDs within three months of their expiration date and exempts that action from General Services and Public Works Board review. SB 1962 also requires the Coastal Conservancy to report to the Legislature annually on its progress on accepting and opening OTDs for public use.

California utilizes volunteer resources though the state's national service commission, the Governor's Office on Service and Volunteerism, to help develop, maintain and restore trails. AmeriCorps members living in California's National and State Parks and US National Forests for five months, repair backcountry trails destroyed from flooding or erosion, establish defined trails in protected areas, and build retaining walls to protect existing trails. Members in this statewide program have served more than 1,200,000 hours and have restored 6,000 miles of wilderness trails.

Numerous approaches are available to protect and conserve open space and parklands, but state-local partnership is necessary to achieve success. Local government must be empowered to partner with state-level conservation strategies. The state must also engage the non-profit community as a conservation partner.

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[166] *California Coastal Commission, Public Access Action Plan, at 8.*

[167] Although most of the potential accessways are lateral accessways, vertical accessways are generally the ones that lead to legal battles. *Kenneth R. Weiss, State Shifts on Access to Beaches; Ocean, L.A. Times, Oct. 26, 2001.*

EFFECTS: Human Health Impacts of Development Patterns

Our natural and built environments (where we live, work, play, and learn) greatly impact the health of Californians and our communities. The natural environment includes the air, water, and soil through which exposure to chemical, biological, and physical agents may occur. The built environment includes housing, transportation system, urban development, industry, agriculture and other land uses, and results in exposure to conditions such as work-related stress, injury, violence and barriers to mobility. A recent national study established a direct association between the form of the community and the health of the people who live there.[168]

More specifically, growth and land use patterns affect the population's health in a number of ways. These range from reductions in physical activity (because modern suburbs create auto-dependence and discourage walking and other forms of physical activity), to automobile accidents, pedestrian fatalities, mental stress, urban heat islands, and air and water pollution.

Health of our State

Despite numerous successful initiatives and programs aimed at curbing illnesses, mortality rates, and health disparities in low-income populations and people of color, many Californians remain at risk for various health impacts that can be linked to our physical and social environments. Although the health problems outlined in this section may be, in part, due to changes in our activity patterns and physical environment associated with current development patterns, they are also linked with other lifestyle factors such as diet, exercise, smoking, alcohol abuse, and stress. Nevertheless, some of the state's most critical health concerns are related to land development patterns including cancer, obesity, diabetes, asthma, and other respiratory diseases.

Cancer

From 1988 to 1999, the overall cancer incidence rate has decreased by about 10 percent among both men and women.[169] Nevertheless, each year in California, over 128,000 people are diagnosed with cancer, recognized as the second leading cause of death for Californians.[170] Although the specific cause of cancer is unknown, it is thought that some combination of genetic and environmental factors play a role in the development of the disease.[171] Recent evaluations have focused on identifying risk factors such as smoking, diet, inactivity, and obesity, which may be associated with about two-thirds of all cancer deaths.[172]

Asthma and Other Respiratory Diseases

Over 90 percent of Californians breathe unhealthy levels of one or more air pollutants during certain parts of the year.[173] Air pollution impacts on human health make it one of the greatest environmental concerns in California—particularly in the Los Angeles Basin and the Central Valley. Asthma and other respiratory diseases are on the rise, which when coupled with unhealthy air (e.g., ozone, sulfur dioxide, and particulate matter) only exacerbates these health problems. The UCLA California Health Interview Survey revealed that more than one-fifth of young children diagnosed with asthma had an asthma-related emergency room visit during 2001. The rate was 33.7% for children age 1-2 years.[174] Asthma is worsened by poor air quality, lack of medical insurance and lack of access to health care. Again, despite improvements in air quality in California's major urban areas, unhealthy levels of ozone still occur in

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[168] *Measuring the Health Effects of SPRAWL: A national analysis of physical activity, obesity, and chronic disease.* Smart Growth America and Surface Transportation Policy Project. September 2003.
[169] Office of Environmental Health Hazard Assessment
[170] California Environmental Health Surveillance System Working Group – Technical Overview, Information Profile: California Cancer Registry. May 29, 2003.
[171] California Health and Human Services Agency, Department of Health Services, Environmental Health Investigations Branch. *Environmental Health Indicators*, July 2002.
[172] Office of Environmental Health Hazard Assessment
[173] EPIC
[174] Moira Inkelas, et al. The Health of Young Children in California: Findings from the 2001 California Health Interview Survey. UCLA Center for Health Policy Research. July 2003.

nearly all major urban areas of the state. The potential effects of poor indoor air quality that is attributable to the built environment (e.g., wall-to-wall carpet, mold, etc.) may also have implications for asthma prevalence in California.

Obesity and Diabetes

Over half of California's adults are either overweight or obese and about one in three children and one in four teens are at risk of becoming overweight or are already overweight. Over two million Californians have diabetes, which has consistently ranked among the top ten causes of death in California and the U.S.[175] Obesity contributes to the rising rates of Type 2 diabetes[176] in adults and to a dangerous new phenomenon—Type 2 diabetes in children, which can cause serious health complications including heart disease, blindness, kidney failure and lower-extremity amputations. Obesity is a major contributor to heart disease, diabetes, stroke, degenerative arthritis and some types of cancer.

According to the Department of Health Services, the number of persons with diabetes will outpace the growth of the California population over the next 25 years, doubling by 2020 to over 2 million Californians. Modification of lifestyles, especially for those at greater risk for Type 2 diabetes, is one of the ways to mitigate this health care crisis. Risk factors for diabetes include obesity and sedentary activity, in addition to heredity and other factors. Obesity, a widely recognized health risk, has not been given the same attention as other risks, including smoking and alcohol abuse. Nevertheless, obesity is a major health problem in California, which is exacerbated for those that are aged or living in poverty.

SPECIAL REPORT:
HEALTH EFFECTS OF SPRAWL

A national study compared the county sprawl index to the health characteristics of more than 200,000 individuals living in the 448 counties studied, using a large national health survey, the Behavioral Risk Factor Surveillance System (BRFSS), which is maintained by the Centers for Disease Control and Prevention (CDC).

Body Mass Index – People in more sprawling counties are likely to have a higher body mass index (BMI), a standard measure of weight-to-height that is used to determine if people are overweight or obese.

Chronic Disease – There is a direct relationship between sprawl and chronic disease.

Activity Level – People in sprawling areas walk less for exercise, which may help explain the higher obesity levels.

Adapted from "Measuring the Health Effects of Sprawl: A national analysis of physical activity, obesity, and chronic disease." Smart Growth America and Surface Transportation Policy Project. September 2003.

Land Use Decisions are Public Health Decisions

The State's growing population translates into an increased need for housing, services, and jobs. In California, the response to the demand has been sprawl type development and a greater dependence on the automobile. The number of cars per household is increasing and people are driving more, increasing vehicle miles traveled (VMT) and related air pollution. The health implications for VMT growth are illnesses induced by unhealthy levels of air pollutants, incidence of traffic accidents, and sedentary lifestyles caused by automobile dependence.

Land Use and Community Design

Although these impacts on human health are driven by a number of complex and inter-related factors, land use can and has played a primary role in the health of our population. The predominant sprawl development patterns of many of our communities have adapted residents to inactive lifestyles, compounding the sedentary habits encouraged by our television-, fast-food-, and auto-dependent culture. Sprawl has discouraged physical activity such as walking and biking, increased dependence on the automobile for mobility, and contributed to an increase in VMT, the number one source of air pollution in California.[177]

[175] California Health and Human Services Agency, Department of Health Services, Diabetes Control Program. Diabetes Data: Prevalence and Risk Factors.1995.
[176] Type 2 diabetes account for about 90% to 95% of all diagnosed cases of diabetes in the U.S., whereas Type 1 diabetes accounts for the other 5% to 10%.
[177] EPIC

Other environmental design variables, such as the condition or existence of safe pedestrian routes, streetlights, roadway design, and crime level, are also determinants of physical activity.
The design of our communities can present barriers for mobility, especially for the elderly and disabled, thereby discouraging physical activities such as walking and biking. In communities where sidewalks are not available or poorly maintained and where essential services are not located close to homes, mobility choices are limited. Older adults cite poor sidewalks and distances between destinations as major obstacles to walking as a form of transportation.[178] Lack of sidewalks/curbs and poorly maintained sidewalks/curbs can also result in greater potential for injury to pedestrians. Land use decisions need to consider urban design as a method of increasing mobility choices and public safety, especially for those segments of the community who must rely on alternatives to the private automobile.

Environmental Contaminants

Toxic air contaminants (TACs) may cause serious long-term effects, such as respiratory diseases, nervous system and reproductive problems, and cancer. Most TACs have no known safe levels, and some may accumulate in the body from repeated exposures.[179]

Chemical hazards—chemical pollutants in air, water, food and soil—known to be toxic to humans are exposures of concern. More specifically, some hazards of concern include exposures to mercury (in fish from water bodies that contain high levels of mercury), lead (present in lead-based paint in buildings), and asbestos containing materials (also in older buildings and present in the natural environment). Development of facilities and uses that emit TACs, mercury, lead, and other chemicals (i.e., pesticides, arsenic, hexavalent chromium, and other hazardous substances) in close proximity to human activity centers can pose significant health concerns such as cancer, birth defects, infertility, and learning disabilities.

Despite the resources spent on pollution abatement and control in California, many hazardous sites still remain. Minimal research has been done to evaluate the health risks associated with chronic low-level exposures to hazardous substances, resulting in an inability to evaluate and manage such sites effectively and to evaluate the health status of residents living near such sites.

Response to the Health Impacts

Several state agencies have programs and initiatives in place to clarify the linkages between environmental pollution and human health, in an attempt to mitigate health impacts induced by economic and population growth. The California Environmental Protection Agency and Resources Agency, in a concerted effort with stakeholders, published the first report on Environmental Protection Indicators for California (EPIC) in 2002, which identifies specific indicators to track environmental conditions over time. The Environmental Health Investigations Branch of the Department of Health Services (DHS) also published the California Environmental Health Indicators report in 2002, a first attempt at developing a list and obtaining data on specific environmental health indicators for California. The report emphasizes that environmental contaminants in sufficient doses affect health via existing pathways of food, air, or water, with entry into the body mediated by a complex interplay of genetic and social factors.[180]

Another effort includes the California Environmental Health Tracking Program (CEHTP). The CEHTP is a collaborative initiative of the Division of Environmental and Occupational Disease Control of the Department of Health Services (CDHS-DEODC), the Office of Environmental Health Hazard Assessment (OEHHA), and the University of California. It involves the systematic collection, integration, analysis, interpretation, and dissemination of data about environmental hazards and exposure to environmental hazards. The CEHTP originated with funding from the U.S. Congress to the Centers for Disease Control and Prevention (CDC) to develop a

[178] *Traffic Safety Among Older Adults: Recommendations for California,* Center for Injury Prevention Policy and Practice, College of Health and Human Services, San Diego State University.
[179] EPIC
[180] California Health and Human Services Agency, Department of Health Services, Environmental Health Investigations Branch. *California Environmental Health Indicators*. July 2002.

nationwide environmental health tracking network and to increase environmental health tracking capacity within state and local health departments. To that end, CDC awarded California a three-year grant to support the development of an Environmental Health Tracking Network (EHTN). By developing new information about the links between health and environmental factors, California may be able to replace costly treatment of chronic disease with cost-effective prevention.

The California Department of Transportation and California's Metropolitan Planning Organizations have adopted policies and incentives to improve community design and provide transportation alternatives to the private automobile. These incentives include grants to encourage transit-oriented development, walkable and bikable communities, compact mixed-use development, infill development, and other sustainable community design measures. San Diego leads the way with the development of its "city of villages" concept, in which neo-traditional urban villages feature walkable street patterns and a mixture of parks, transit, shops and services close to residences.

Additionally, in cooperation with thirty five public and private partners involved in children's issues, the Joint Venture: Silicon Valley Network has begun to measure the impact of land use and development patterns on the well-being and school readiness of children age 0 to 5, as part of its overall Index of the quality of life in the region.[181]

Despite advances in our ability to detect and treat various health problems, the old axiom remains true: an ounce of prevention is worth a pound of cure. Part of the prevention is to make our built environment more livable and designed to accommodate healthy lifestyles. Efforts to reduce the number of automobile trips, reduce air emissions associated with vehicular travel, increase walkability, and develop communities that are safe for pedestrians will serve only to improve human health.

[181] *2003 Index of the Silicon Valley*.

EFFECTS: Social and Cultural Impacts of Development

One of the most widely recognized effects of continued growth and development is one of the hardest to quantify: our sense of community. Our physical environment has profound effects on the way we interact with one other. Development has important implications for our sense of community, our cultural identity, our sense of history, and even our personal safety. Certain land use trends can even have neighborhood effects on children and families which shape the future of a community and its members. These effects include the quality of local public services, socialization by adults outside the family, peer influences, social networks, exposure to crime and violence, and physical and psychological isolation (i.e., from jobs, transportation, and people).[182] All of these effects, in combination with other variables play a role in determining the character of our neighborhoods.

A Sense of Place

A successful community has a sense of place. In recent years, the lack of "place" identity has been a criticism of suburban development. Urban designers have long understood the importance of creating public spaces in our towns and cities and to centrally locate our cultural and civic institutions to achieve a sense of place. The town square is not just an idyllic vision of colonial America, but a historically valid placemaking tool. The town square may no longer be common in California's cities, but efforts to strengthen our downtowns and village centers still depend on creating a critical mass of activity and providing opportunities for interaction—in sidewalk cafés, plazas, pedestrian shopping malls, or in downtown sports stadiums.

The link between suburban development and a decline in "social capitol" has been studied in Ireland by Keven Leyden, who found a relationship between auto-dependent suburbs and declining civic engagement.[183]

Historic Preservation

Neighborhoods

Very few communities have a historic preservation element in their general plans.[184] Often, historic preservation is a secondary consideration in land use decisions. Historic preservation, when integrated into the broader public policy arena of land use planning and decision making, can constructively contribute to the resolution of land use planning and related socioeconomic issues in the State.

Some of the unintended effects of decentralization and urban renewal are the disinvestment in older urban areas or even the total loss of our historic neighborhoods. The value of these areas is represented in both the built environment and the cultural landscape. For example, San Francisco's Chinatown features Asian-inspired pagodas and narrow alleys crowded with merchants whose wares define the sights and scents of this ethnic enclave. Similar communities in other parts of California have vanished or are in decline. Stockton's Little Manila, one of the largest Filipino communities outside of the Philippines in the 1940s, has been reduced to three historic buildings that are at risk of demolition.[185] Whereas, prior to World War II, there were over 40 distinct Japanese American communities throughout the United States, today these neighborhoods remain only in San Francisco, San Jose, and Los Angeles. Revitalizing urban areas and promoting infill development without destroying our historic resources is a challenge.

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[182] "Transforming Neighborhoods into Family-Supporting Environments: Evaluation Issues and Challenges." Annie E. Casey Foundation's March 1999 Research and Evaluation Conference.
[183] Kevin M.Leyden, "Social Capital, Civic Engagement and the Power of Planning, " California American Planners Association Conference, October 7, 2002.
[184] California Resources Agency, Department of Parks and Recreation, Office of State Historic Preservation, *Comprehensive Statewide Historic Preservation Plan for California 2000-2005*.
[185] America's 11 Most Endangered Historic Places 2003, National Trust.

State and Federal Responses

These challenges are met with action on both the federal and state levels. The federal government recognized the importance of historic preservation with the passage of the National Historic Preservation Act in 1966 and provision of tax credits for property owners who restore historic buildings. The California Environmental Quality Act also specifically recognizes the importance of cultural and historical resources by requiring the analysis of the impacts of development projects on cultural and historic resources.

California joined a growing national movement in 1985 to improve the quality of life in America's towns, cities and neighborhoods by restoring the economic health of main streets' historic, traditionally designed central business districts. The California Main Street Program, developed by the National Trust for Historic Preservation's National Main Street Center, strives to ensure the district's place as the heart of a community. Since 1985, downtowns and neighborhood commercial districts in the California Main Street network have generated 6,887 new businesses and created 24,508 new jobs. In 2000, the National Main Street Center estimated that for every dollar a community invests in the operation of its Main Street program, $39.96 are reinvested in the district; and that the average cost per job created in a Main Street district is $2,504 making Main Street one of the most effective economic development programs in the country.[186]

In response to legislative action in 1979, the California Department of Parks and Recreation, Office of Historic Preservation, undertook cultural resource surveys to improve representation of ethnic minority properties. These surveys focussed on California's five largest minority groups (Native-, African-, Chinese-, Japanese-, and Mexican-Americans). This information on ethnic history and associated sites identify and evaluate ethnic properties, which have generally been underrepresented on historic property surveys.[187]

Our historic neighborhoods are tangible reminders of our shared past. By taking measures to protect them today and for future generations, historic preservation can contribute to a sense of place in our cities and neighborhoods.

Sacred sites

Not all culturally significant resources are in towns and cities. The issue of Native American traditional tribal cultural sites (sacred sites) in California has been the focus of intense debate. While historical and archeological resources receive some protection from California's environmental protection laws, sacred sites often fall between the cracks.

California had the largest aboriginal (Native American) population in North America before contact with non-Native Americans. Several legislative attempts have been made to recognize, list, and help protect Native American Sacred Sites, including Senate Bill 1828 (Burton, 2002) and Senate Bill 18 (Burton, 2003). Both of these proposals looked to heighten awareness of the importance of sacred sites in California's cultural and spiritual history and as a resource that should be protected for future generations. Because exact site locations are not always shared by tribes and because locations are not always distinguished by artifacts or burial remains, these traditional tribal cultural sites of the approximately 140 federally recognized and non-recognized tribes in California often go unrecognized. Native American tribes, the first true trustees of the land that is now California, assign sacred significance to many landscapes that were part of their traditional spiritual and ceremonial practices.

Sacred sites are not necessarily identifiable by archeological, burial, or cultural artifacts but may simply be a location or area where sacred ceremonies or practices historically took place and in many cases continue or would continue to take place if circumstances allowed. Many sites are significant to the tribes' culture and society and to their continued identity as a people. Some of these sacred sites are significant not only to individual tribes, but are also believed to hold significance for the continued well being and spiritual health of the planet.

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[186] California Technology, Trade, and Commerce Agency. Business and Community Resources, California Main Street Program. *Revitalizing California's Downtowns and Neighborhoods*.
[187] California Resources Agency, Department of Parks and Recreation, Office of Historic Preservation. *.Five Views – An Ethnic Historic Site Survey for California*. December 1988.

Public Safety and Crime

Just as the importance of placemaking seems to have been "rediscovered" by the public and policymakers, so too the relationship between environment and safety is receiving more attention. Planners and lawmakers alike are analyzing the effect of the built environment on crime. Crime was once characterized as an urban problem, but has spread to the suburbs. Whether urban or suburban, community design matters.

One approach to this issue is called Crime Prevention Through Environmental Design (CPTED). The basic premise of CPTED is that proper design and effective use of the physical environment can lead to a reduction in the incidence and fear of crime, thereby improving the quality of life. Design strategies include natural surveillance (eyes on the street), walkable environments, demarcated public and private space, and mixed-use development that creates high levels of activity.[188]

One notable program, funded through the Governor's Office on Service and Volunteerism (GOSERV), works to address the issue of crime in our communities through one on one contact. Specially trained AmeriCorps members work in more than 20 counties to reduce the incidence of child abuse and neglect. Members provide in-home visitation services to more than 3,700 families with children aged 0 to 5 years who have been identified as being at risk of abuse or neglect. Members visit families with a history of domestic violence or substance abuse problems and provide direct services to children and families in schools and community centers. According to a recent study, incidents of child abuse and neglect decreased 24 percent where AmeriCorps members served.

Also through the support from GOSERV, Citizen Councils bring together local first responders with volunteer groups to develop community action plans and identify local resources needed during emergencies. Through the Community Emergency Response Team program, volunteers learn basic first aid, how to assist firefighters and local law enforcement and develop family emergency plans.

Social Impacts of Land Use Patterns

Land use decisions are primarily a local government responsibility. However, federal and state laws and programs, such as fair housing and anti-discrimination laws, provide protection for individuals with special needs (i.e., those with physical, developmental, and mental disabilities), the youth, the homeless, and the elderly so they can live and participate in the community instead of being isolated in institutional settings. Balancing the rights of individuals with special needs to live in the community and the rights of neighbors to preserve the integrity of their neighborhood is an important issue in land use regulation.

<u>The Homeless</u>

According to the Department of Mental Health (DMH), at least 150,000 people are homeless in California and studies indicate that at least one-half are disabled with mental illness, medical problems, other health conditions, or special needs. The presence of homeless persons on our streets and the existence of unsafe, unsanitary housing constitute conditions that increase public health and safety problems. Without treatment or medication, many homeless persons end up in our legal and law enforcement systems.

DMH has developed and implemented two major State-funded programs, both part of the Governor's Mental Health Initiative, to address the housing and related service needs of very low income individuals with mental illness. Both programs provide housing and support services to individuals with mental illness who are homeless or at risk of homelessness. In addition, the DMH administers federal grant funds that are used to address the housing and service needs of this same target population.

Several state programs have implemented important "best practices" that have proven effective in enabling homeless individuals with mental illness to obtain and remain stable in housing. These programs include the Integrated Services for Homeless Adults with Severe Mental Illness Program, Supportive Housing Initiative Act (SHIA) Program, Program for Assistance in Transition from Homelessness (PATH), and other supportive housing programs, among others.

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[188] Zelinka, Art and Dean Brennan, *Safescape*, APA Planners Press, 2001.

The Disabled

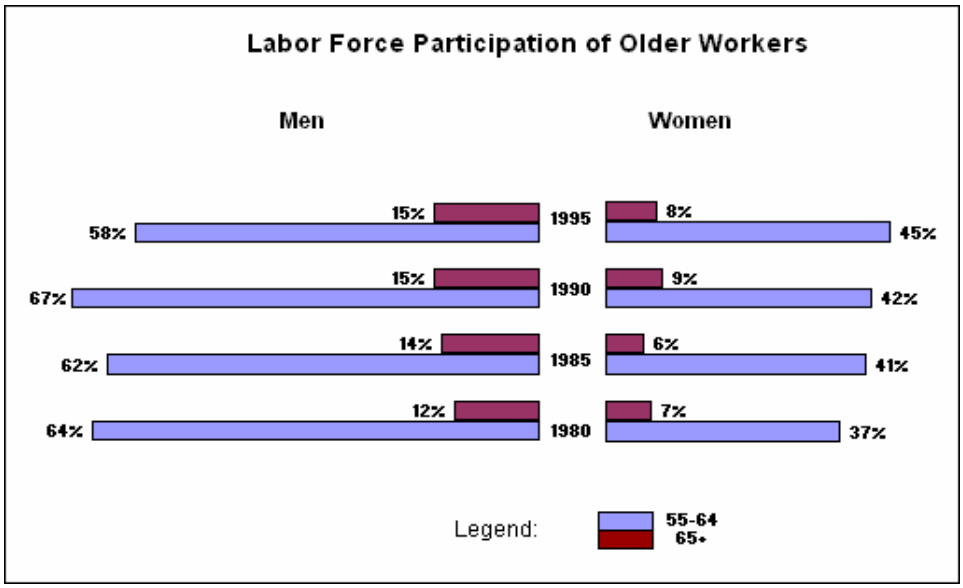
The impact of mental disorders on the economic and emotional health of California is enormous. Mental health problems affect nearly all families from all socioeconomic groups. Nearly 5.3 million Californians experience a mental disorder in any given year, with over 800,000 individuals experiencing a serious mental illness such as schizophrenia, major depression, and manic depressive illness that affects their ability to function.[189] Nationwide, mental illness is the leading cause of disability.

More than 6.6 million California residents of all ages have some type of disability, and that number is projected to exceed 11 million by the year 2010. Californians with disabilities are an important and integral part of our society, making significant contributions to the growth and progress of the state. The Americans With Disabilities Act (ADA) of 1990 is a comprehensive civil rights act for people with disabilities which guarantees equal access to employment, education, public transportation, telecommunications, public accommodations and commercial facilities. The ADA benefits an estimated 49 million Americans, including nearly 4.5 million Californians with some 900 known disabilities, who require housing and jobs free of physical and social barriers.

The Elderly

Our built environment must also support physical, mental, emotional, spiritual, and social resilience in individuals and families as they age. The average age in California is rising rapidly, with the fastest growing age group (by percentage) being those 65 and older. Our infrastructure needs to respond to this age shift while supporting people of all ages and abilities. Another changing dynamic in the aging population is the gender composition of California's older workers. The retirement age for men and women is also changing. Nationally, in the early 1990s the median age of retirement steadily decreased to age 62 for men and women. This trend may change as more Baby Boomers choose to stay in the work force past the "traditional" retirement age.

Figure 25: Labor Force Participation of Older Workers



Source: Department of Aging – Statistics & Demographics

[189] Mental Health Association of California.

Youth

A set of five guidelines were established by the Search Institute[190] that identified and measured young people's experiences of 40 "developmental assets," or critical needs for healthy development. This framework of 40 developmental assets are positive experiences, relationships, opportunities, and personal qualities that young people need to grow up healthy, caring, and responsible. Specifically, these guidelines include:

> "In order for teens to develop a sense of place in their communities and have a real stake in its development, they often need support to achieve social, academic and employment success."
> ~ *Governor Gray Davis*, Press Release, June 26, 2001

1. Ongoing relationship with a caring adult;
2. Safe places and structured activities;
3. Healthy Start;
4. Marketable skills through effective education; and
5. Opportunity to serve.

Statistics show that children with mentors demonstrate solid improvements, especially in the areas of academic performance and are less likely to be involved with gangs, violence, teen pregnancy, alcohol and drug use.[191] As discussed previously, the educational attainment of our children is also a human health issue. It is vital for youth to be mentored in the direction of becoming productive and engaged citizens that contribute to the larger society.

The Governor's Mentoring Partnership (GMP) was formed to help address the social ills of youth in California. The GMP works in partnership with state departments, community-based mentoring organizations such as Big Brothers/Big Sisters, Communities in Schools, mentoring coalitions and volunteer centers to encourage and facilitate opportunities for business, community and education partnerships and collaboratives in support of mentoring.

The California Workforce Investment Board (CalWIB) established a State Youth Council, which includes experts on youth development, policy and programs, as well as youth representatives, to provide leadership for youth development. The Youth Council Institute (YCi), also established by CalWIB, assists California's 50 Youth Councils in creating comprehensive, local youth-serving systems. YCi is supported by the CalWIB and managed by New Ways to Work and its partner, the California Workforce Association (CWA).

[190] The Search Institute is an independent, nonprofit, nonsecretarian organization whose mission is to advance the well-being of adolescents and children.
[191] Office of Governor Gray Davis, Governor's Mentoring Partnership.

EFFECTS: Energy Resources and Use

Choices about the use of land impact water and air quality, energy use, transportation, waste, telecommunications and the sustainability of all ecosystems. These choices all have ramifications for energy generation, transmission, and consumption, which have direct and indirect impacts on our economy, our environment, and our quality of life.

California is the second largest consumer of energy in the U.S. -- only Texas uses more energy annually. The state has long been a leader in the efficient use of energy -- California's 12% of the U.S. population uses only 7% of the electricity. While California has one of the lowest (48th) rates of per capita energy consumption and CO_2 emissions in the nation, the state is nonetheless a large contributor to CO_2 emissions in the world (1.5%).

Since most of the energy used in California is consumed in transportation, state, local and regional decisions about transportation infrastructure and mobility choices can have a tremendous impact on the future of energy use and its attendant consequences. While these decisions may currently meet immediate needs, they must be linked to an overall transportation strategy reflecting policy directions for the future, as infrastructure development sets a course for the long term.

Our current usage patterns of energy are not sustainable over the long term, and expose the state to significant risks of supply disruption, price volatility, and environmental degradation. New approaches are already being developed, but more remains to be done.

Meeting California's Energy Needs

Energy needs can be met in a variety of ways to minimize or even reduce the negative impact on our natural resources, including the development and use of natural gas and renewable resources.

The Department of Finance (DOF) estimates that California will add 500,000 new residents annually. The California Energy Commission (CEC) estimates that annual energy consumption is growing at 1.4% per year. Meeting the energy needs of today's 35 million residents combined with the expected growth in population will require a combination of energy approaches including changes in energy consumption patterns; new power plants, transmission lines, storage facilities, and fuel sources; and an increase in renewable energy production.

Table 7: Percent Energy Consumption of the California Energy Use Sector

California Energy Use Sector	Percentage Energy Consumption
Transportation	43
Industrial	30
Residential	16
Commercial	11

Some communities are looking to distributed generation facilities to meet their energy needs because of their remote location, their need for backup generation, to increase reliability, power quality, and security, or their desire for a specific type of on-site energy generation with superior environmental characteristics such as solar, biomass, or wind, or to facilitate the commercialization of new clean technologies such as micro-turbines, fuel cells and hydrogen.

California's energy system is constrained by the delivery systems for electricity and natural gas. For electricity, these limitations include congested transmission paths, local reliability problems such as in the San Francisco and San Diego areas, and insufficient transmission capacity to accommodate all of California's potential renewable generation.

In the spring of 2003, California's three principal energy agencies adopted the "California Energy Action Plan" whose goal is to: "ensure that adequate, reliable and reasonably-priced electrical power and natural gas supplies, including prudent reserves, are achieved and provided through policies, strategies, and actions that are cost-effective and environmentally sound for California's consumers and taxpayers."

California's Energy Action Plan identifies six areas of critical need:

- Conservation: Optimize energy conservation and resource efficiency including implementation of a voluntary dynamic pricing system to reduce peak demand by as much as 1,500 to 2,000 MW by 2007.
- Renewable Energy Production: Accelerate the State' goal for renewable generation including the facilitation of an orderly and cost effective expansion of the transmission system to connect potential renewable resources.
- Match Supply to Growth Projections: Ensure reliable, affordable electricity generation including the addition of new generation resources to meet anticipated growth.
- Upgrade Infrastructure: Upgrade and expand the electricity transmission and distribution infrastructure.
- Distributed Generation: Promote customer and utility owned distributed generation including the promotion of clean, small generation resources located at load centers.
- Ensure Supply of Natural Gas: Ensure reliable supply of reasonably priced natural gas including identifying new gas transmission, distribution and storage facilities.

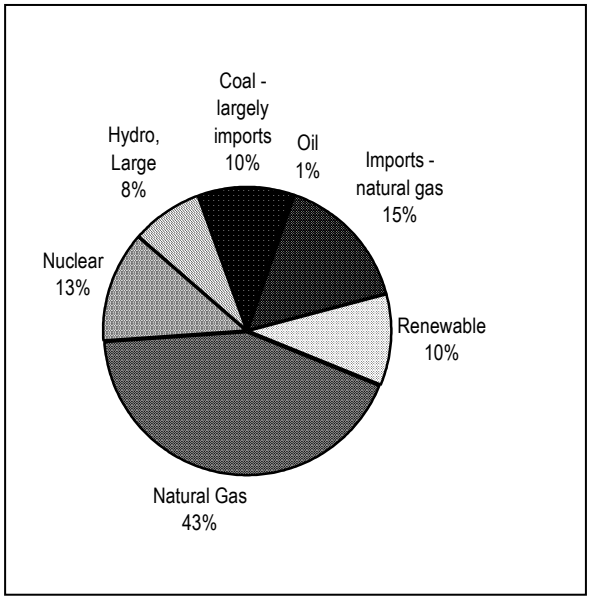
California's Electricity Needs

Meeting peak demands for electricity and creating reliable, affordable and environmentally acceptable energy systems, requires measures and public policies well beyond supply- and demand-side conventional answers.

Californians consume 273,000 gigawatt-hours of electricity per year. The primary consumers of electricity in California are commercial (36%), residential (31%), industrial (21%) and agricultural (6%).

Over the last decade, between 29 and 42% of California's in-state electricity generation used natural gas. Some of our electricity is imported from coal-fired power plants in neighboring states (together with the 10% in-state power). So while California meets its air quality standards, we are financing the degradation of air quality in neighboring states. The following chart illustrates the fuel types used to generate electricity in California.

Figure 26: Fuel Sources for Electricity Generation



Peak electricity demand is growing at about 2.4% (1,400 MW) per year, primarily driven by the use of air conditioning and other cooling devices. To meet this level of increased demand, it will take the equivalent of three new 500-megawatt power plants each year. The California Power Authority (CPA) and the California Public Utility Commission (CPUC) prefer to broaden energy supply resources by increasing reserve margins to 15 to 18% primarily through the development of renewable energy production.

On the supply side, the challenge is to develop additional capacity sufficient to meet expected peaks, while emphasizing renewable generation, and facilitate the use of hydrogen as the energy carrier of choice. Such a strategy will minimize the need for, and moderate the costs of, new natural gas-fired electricity generation, gas supplies, gas and other energy storage, gas pipelines and electricity transmission. The October 2002 report, "Strategies for a Comprehensive Renewable Energy Plan[192]," concludes that this is well within the range of feasible growth of the renewable energy industries.

On the demand side, the challenge is to give residential and business customers the tools, appliances, education and incentives to manage their annual and peak electricity demands. This can be accomplished through the continued support of cost-effective energy efficiency and demand-shifting investments by all electricity consumers. The availability of accurate and timely energy consumption and pricing data is key to enabling customers to reduce

[192] Office of Governor Gray Davis, Office of Planning and Research. "Strategies for a Comprehensive California Renewable Energy Policy," October 2002.

demand during peak times and to convey to consumers the real economic costs of energy. Effective deployment of these strategies can dramatically mitigate, or even eliminate, the need for additional peak capacity.

Distributed generation has elements of both supply and demand side strategies, and is an important option that can provide high quality power and energy security, while enhancing environmental quality and hardening the electricity infrastructure. Onsite generation for onsite use (electricity and heat) will also reduce load on grid infrastructure. The challenges here are to bring promising emerging technologies to cost-effective commercial status, and to minimize the regulatory burden of connecting these resources to the grid.

California's Natural Gas Needs

Natural gas is consumed directly by end users as a fuel in the residential, commercial, industrial sectors, and to a lesser extent in the transportation sector. Cold winter weather is a major driver of this end use demand for gas. Another major end use of natural gas is as a feedstock in the industrial sector. Increasingly, natural gas is an important fuel for the generation of electricity.

The consumption of natural gas for electric generation is the largest driver of the long-term trend of increasing demand for natural gas. To complicate matters, there can be large annual variations in natural gas demand for electric generation because gas-fired generation is the system's marginal source of electricity. That is, the last generators to be brought on line when the system is operating near peak are gas-fired units. Generally higher temperatures and low availability of hydroelectric (or other) generation resources are made up by increased gas-fired generation. Conversely, gas-fired generation will be cut back if temperatures are milder and other generation supplies are abundant.[193]

The CEC's forecast for natural gas demand shows it growing at a rate of 0.6% per year in California from 2003 to 2013. This represents less than half of the annual rate by which total U.S. natural gas demand is projected to grow during the same period. This forecast includes the impacts of natural gas energy efficiency programs, and assumes that the current levels of funding for utility energy efficiency programs will continue through 2011, as authorized by the California Legislature. Gas demand for electricity generation remains the fastest growing segment of California's natural gas demand. Over the same period, natural gas demand for electric power generation will grow at an annual rate of 1.5%, more than twice the average rate.[194]

California imports 23% of its electricity and 83% of its natural gas. Natural gas is the major fuel for electricity generation, so although we directly import roughly a quarter of our electricity, a high percentage of the fuel for in-state generation is also imported, meaning that the fraction of imports is actually much larger. Because natural gas-fired generation dominates California's electricity mix, increased prices for natural gas directly translate to higher electricity prices.

End-use gas demand for heating peaks in winter and is lowest in summer, which is the opposite of the seasonal pattern of gas demand used for electricity generation. This creates a double peak for natural gas, with the growing summer peak coming when gas has traditionally been pumped into storage.

As natural gas demands grow and transmission and storage capacity remains limited, natural gas markets become more volatile and result in higher prices in both the natural gas and electricity markets. This was one of the key elements that caused the California Energy Crisis (2000-2001). When power supplies run short, the highest polluting generators tend to be the last ones brought online. In short, the state's dependence on natural gas as its primary source for electricity generation is placing it at great risk of supply disruption, price volatility, and a reduction in normal environmental safeguards. As hydrogen comes into greater use as a fuel for both stationary and mobile applications, it will be important to emphasize renewable sources rather than natural gas to produce the hydrogen.

One strategy California is using to gain more control over the price of electricity is to invest more heavily in renewable generation technologies, which diversifies the State's electricity generation portfolio.

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[193] California Energy Commission, Electricity and Natural Gas Analysis Report, August 2003, p. 43.
[194] Ibid, pp. 79-80.

Lawrence Berkeley National Laboratory, in its August 2003 Report, "Accounting for Fuel Price Risk" finds that "…the fact that renewable generation provides long-term price stability is beyond reproach. As long-term price stability is undoubtedly valued to some degree by end-use customers, the 'hedge value' of renewable generation should help to justify continued and new policy support for renewables. …Policymakers should begin to explore practical mechanisms ... to incorporate that value into decision-making processes, thereby enabling renewable energy to capture the value of the price stability benefit it provides to the market."[195]

California's Transportation Fuel Needs

Smart Growth America, a coalition of some 100 groups concerned with land use and metropolitan expansion, reports that "The almost single-minded focus on highway development from the 1950s through the 1980s encouraged spread-out housing, and made it easy for businesses to locate in remote office parks, far from traditional, walkable downtowns. As a result, the automobile became almost the only way to travel, and traffic increased exponentially, bringing with it congestion and frustration. Sixty-nine percent of the increase in traffic can be attributed to factors associated with sprawl."[196]

California faces a future of increasing petroleum dependence, supply disruptions and price volatility according to the CEC's report, *Reducing California's Petroleum Dependence*.[197] California ranks first in the U.S. in gasoline consumption and 2nd in jet fuel consumption. At the beginning of this decade, California had a population of 33.8 million people, driving 24 million registered vehicles, and consuming 16.4 billion gasoline equivalent gallons a year of gasoline and diesel fuel.

Gasoline and the Environment

Gasoline and the use of other petroleum-based fuels is also a significant contributor to green house gas (GHG) which is linked to climate change. Transportation (57%) is the single highest activity related to GHG emissions in California.

By 2020, the forecast indicates that 45.5 million Californians will have 31.5 million registered vehicles consuming 24.2 billion gasoline equivalent gallons of gasoline and diesel fuel. Meanwhile, vehicle miles traveled will increase from 313 billion miles in 2002 to over 440 billion in 2023 -- a 40% increase.

If this consumption occurs, it would require Californians to accept major expansions in petroleum refinery and delivery infrastructure, further dependence on foreign energy supplies, decreased environmental quality, and reductions in public health.

Although California is the fourth largest oil-producing state in the United States, refining 1.9 million barrels a day, this increasing demand for petroleum fuels presents two serious supply challenges. First, California's production of petroleum has been declining by about 2% a year. As a consequence, the state has become a significant importer of petroleum products. In 2001, roughly 49.4% came from in-state oil production, 21.3% from Alaska and 29.3% from foreign sources. Second, the state's crude oil refining capacity and marine terminal infrastructure are becoming insufficient to handle our growing need for imports.

Iraq and Saudi Arabia are or have been the two largest sources of California's foreign imports. Recent disruptions in foreign petroleum and gasoline supplies have harmed the state's economy and led to peaks in gasoline prices. For example, the loss of oil production from Venezuela in 2003 temporarily caused oil prices to rise, leading to high gasoline prices. In addition, in early 2003, concerns about military conflicts in Iraq also resulted in a spike in world oil prices.

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[195] Bolinger, Mark, Wiser, Ryan, and Golove, William, Lawrence Berkeley National Laboratory, "Accounting for Fuel Price Risk: Using Forward Natural Gas Prices Instead of Gas Price Forecasts to Compare Renewable to Natural Gas-Fired Generation", August 2003, p. 65.
[196] Smart Growth America, Elements of Smart Growth – Transportation. www.smartgrowthamerica.com,.
[197] "Reducing California's Petroleum Dependence," Joint Agency Report, California Energy Commission and Air Resources Board, August 2003, P600-03-005F.

These conditions, in combination with marine and distribution infrastructure limitations, have made the California gasoline market increasingly unstable. As long as demand for transportation fuels continues to grow, California's gasoline supply will be subject to rapid and frequent price volatility.

To reduce the energy dependence on petroleum, the state is giving appropriate credit in compliance with emission standards for the effects of efficiency, supporting the development of fuel cell propelled vehicles, and investing in a hydrogen-fueled transportation infrastructure. The California Air Resources Board (CARB) for example, has taken the lead in these areas through the creation of the California Fuel Cell Partnership (1999) and the co-founding of the California Stationary Fuel Cell Collaborative.

The CEC and ARB are calling for a 15% reduction in demand for gasoline and diesel from 2003 levels, a doubling of fuel economy standards for automobiles and light trucks, and an increase in use of non-petroleum fuels to 20% by 2020 and 30% by 2030.[198]

Energy Efficiency Standards for Buildings

The Energy Efficiency Standards for Residential and Nonresidential Buildings (2001 Title 24, Part 6) were initially established in 1978 and were updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods of design and construction. Significantly updated standards were adopted by the CEC in 2001[199] to further reduce California's electricity demand particularly aimed at reducing peak electricity consumption.

The energy efficiency building standards enforced through construction audits along with efficient appliances have saved more than $20 billion in electricity and natural gas costs since their inception. It is estimated the standards will save a total of $57 billion by 2011.

Energy Infrastructure and Related Issues

In looking at California's energy infrastructure, it is important to understand how it connects with the U.S. and with North America.

Petroleum

Cross border oil flows are very important to the North American economy. Canada and Mexico are key suppliers of crude oil to the United States. Oil products flow back and forth among the countries conveyed in trucks, pipelines, and by ship. [200]

A large network of crude oil pipelines connects producing areas with refineries that are located in the San Francisco Bay area, Los Angeles area and the Central Valley. Major ports in northern and southern California receive Alaska North Slope and foreign crude oil for processing in many of the state's 21 refineries.

Though much of the oil infrastructure in North America is well developed, there are continual new structural requirements for exploration, development, production, refining, transport, and storage. These needs present important issues for investment, trade, and development.

Natural Gas

Key forms of natural gas infrastructure include production, storage, and transport (pipelines and tankers). Currently there are no large liquefied natural gas (LNG) facilities in California, but a number of active proposals are pending, which if approved will construct new forms of infrastructure: LNG liquefaction or regasification plants and marine terminals. Because of the emerging role of natural gas in many markets, North America's natural gas infrastructure has grown considerably and will continue to grow.

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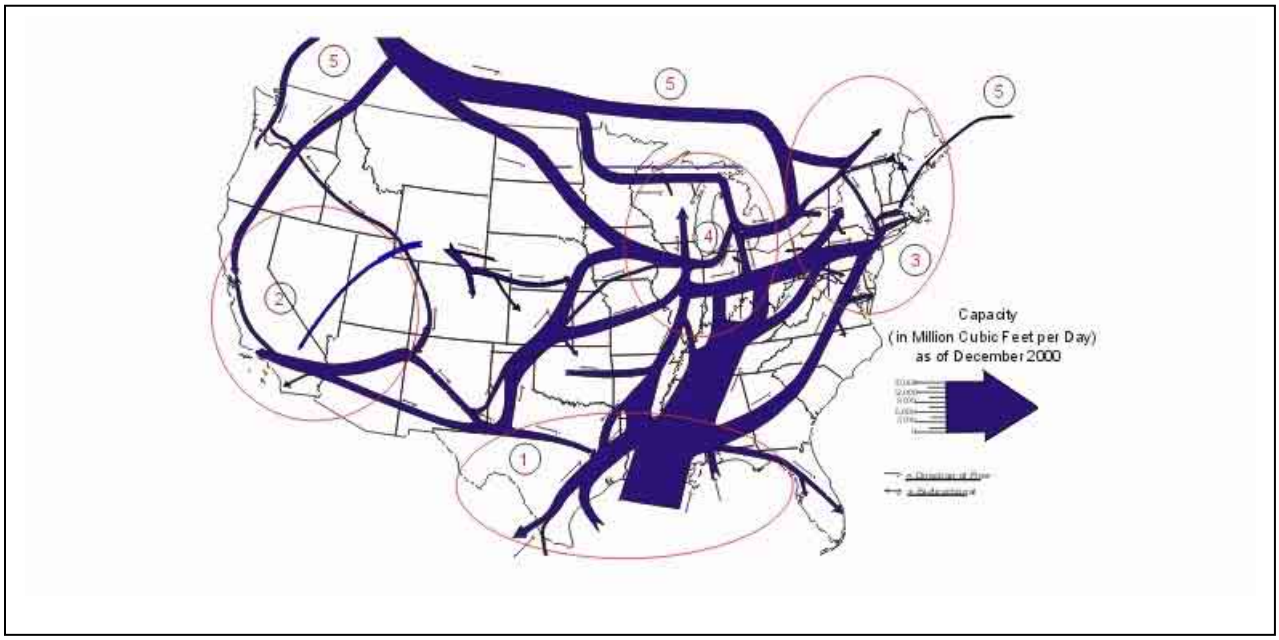
[198] Ibid.
[199] AB 970, Chapter 329, Statutes of 2000
[200] *The Energy Picture*, North American Energy Working Group, EIA, June 2002

Pipelines carry natural gas in both directions between Canada and the United States and between Mexico and the United States. Canada's gas flows to the United States through several major pipelines feeding U.S. markets. Below is an illustration of the natural gas capacity and inter-connectivity serving the U.S. including California. The thicker the line, the more flow along the line. The critical and potentially constrained links to California are apparent. Even if California does not construct LNG terminals to help meet growing use of natural gas, additional LNG capacity may be built outside the state and outside state control but still intended to supply state demands.

Figure 27: Natural Gas Pipeline Capacity Serving the U.S. Marketplace[201]



Coal

North America has one of the largest coal reserves of any region -- 2,565 billion metric tons. The three largest coal-producing States are Wyoming, West Virginia, and Kentucky. Coal is transported mainly by rail. The combustion of coal is typically in boilers making steam, which then turns steam turbine generators to make electricity. Without proper emissions control, coal-fired electricity generation is one of the more polluting sources of power. Even with suitable control of criteria pollutants, coal combustion emits higher levels of fossil greenhouse gas as CO_2 per kWh compared to most other sources. Although coal is not the major fuel for electricity generation in California, it is a much more significant fuel for states and countries from which we import 15% of our electricity.

Electricity

There is a continual need for new investment for electricity plant development, transmission, and distribution. The North American Working Group, a multilateral task force on electricity generation between the U.S., Mexico and Canada has identified reliability of supply as a major concern in its 2002 report.

One of the key infrastructure issues for North America is interconnectivity of transmission. North America has major electric power grids but does not have an overall, comprehensive grid. The three major systems — the Eastern Power Grid, the Western Power Grid, and the grid within the Electric Reliability Council of Texas - have limited cross-grid interconnection capacity. This is an advantage in the event of a grid failure, but a disadvantage in the context of interconnectivity for the purpose of trading and providing mutual support. In addition, there are

[201] Ibid.

interconnection compatibility issues particularly between Mexico and the United States. San Diego Gas and Electric Company has several programs underway to improve connectivity.

When the Energy Crisis hit California in 2000/2001 the State faced several challenges including that the lack of facilities to generate electricity, inability to reliably import electricity from other states, and the poor condition of the transmission system. There were certain areas within the state where transmission was hampered, i.e. from North to South through the San Joaquin Valley (Path 15) and between Southern California Edison and San Diego Gas and Electric Company (Path 44).

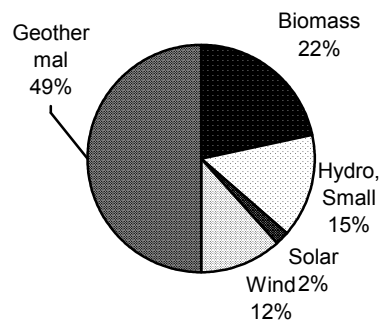
California is currently working on transmission improvements both in-state and cross-border. There are several studies underway by San Diego Gas and Electric (SDG&E) and Mexico's Federal Electricity Commission (CFE) for new interconnections for generation between California and Baja California. CFE expansion plans also include generation additions in Mexico. Increasing reliance on cross-border transmission (increasing imports) should not be done at the expense of the environment, but rather developed sustainably.

In the short-term, SDG&E 230/138 kV reinforcements are increasing the import capability for Mexico by 200 MW to 400 MW. For the longer term, SDG&E is planning a 500 kV line from Rainbow to the Imperial Valley which will connect with Baja California. While attention must be given to maintaining an adequate transmission infrastructure, much of the need for new transmission can be alleviated through the development of distributed technologies that also have the capability of improving overall efficiency through the combined generation and use of heat and power.

Sources of Renewable Energy

Although renewable energy offers a wide variety of environmental benefits it still represents a small portion of the nation's electricity (6%).[202] Of the 6%, biomass and hydroelectric represent 90% of all renewable energy use in the US.[203]

In California, renewables represent 10% of the energy consumed in 2001. The largest sources of renewable energy were geothermal energy and biomass. As identified above, The Energy Action Plan makes a number of recommendations relative to renewable energy, reflecting its importance to California's future energy supply.



California's Renewable Energy Sources

In 2002, the Governor signed the Renewable Portfolio Standard (RPS)[204] to require investor owned utilities to annually increase renewable energy generation by the equivalent of 1% of sales (approximately 1,700 MW) with an aggregate goal of 20% of retail sales of electricity by 2017. The State is aggressively implementing this policy with the intention of meeting the standard by 2010 which will require development of 4,200 MW of new renewables over the next seven years. Accommodating this growth, as well as any expansion in overall growth in electricity use (if the state cannot successfully constrain growth in demand through conservation), can be achieved through renewable energy generation according to a number of studies including the 2002 report by the Interagency Green Accounting Work Group, "Strategeis for a Comprehensive California Renewable Energy Plan. "<\1

Solar Energy

The two most prevalent forms of solar-electric conversion are solar photovoltaic panels and solar thermal-power plants. Solar tends to be relatively more expensive power (12 cents to 25 cents per kWh); but is generally available at peak usage periods where electricity costs are also higher. To date there are few large scale, grid connected solar

[202] 2001, Department of Energy, www.doe.gov
[203] *Strategic Opportunities for the Great Central Valley*, Great Valley Center, Reflects 2001, page 7
[204] SB 1078 (Sher), Chapter 516, Statutes of 2002

power plants in California; however PV connectivity to the grid has increased substantially in recent years. Between 1981 and 1989 a total of 2.7 MW were connected. From 1990 to 1999, 6.6 MW were connected. From 2000 to 2003, 34.7 MW have been connected for a total added capacity of 44 MW.

Biomass Energy

Biomass is organic matter (e.g., wood from trees, crop residues, animal manure, fruit and nut pits and shells, organic fraction of solid waste, dedicated energy crops) that can be used as a fuel to generate electricity or gas and liquid fuels for transportation and other purposes (methane, hydrogen, ethanol, biodiesel, FT liquids). Careful design is needed to ensure the conversion of biomass meets air quality requirements and that land and natural resource goals are met, but there are substantial environmental advantages to biomass utilization as a renewable energy source. Biomass energy reduces pollution from open field burning and landfilling of solid wastes, and iscritical in the rapid recyling of atmospheric carbon dioxide and oxygen.

Wind Energy

Wind energy is the fastest-growing renewable energy source in the world and among the cheapest sources of renewable energy (4 to 6 cents per kWh). Recent modifications in wind turbine design have reduced avian wildlife hazards and noise and improved performance.

Hydroelectric Energy

The energy of flowing water can be captured to produce hydroelectric power. In California, dams are used primarily for water storage and release based on residential, commercial and agricultural needs. Hydroelectric power generation can respond rapidly to changing electrical demand and is a prime source of peaking power. Pumped hydro systems can be used with other sources of energy, such as wind, to store water during off-peak demand periods for later release during higher value on-peak periods.

Hydrogen Energy

Hydrogen is the most abundant element on the Earth but does not appear naturally in the form it is needed as fuel. Most of the hydrogen that can be extracted as fuel resides in water and biomass. Other energy sources are needed to separate the hydrogen. The two most popular methods to separate hydrogen from other molecules is steam or autothermal reforming of fossil fuels (such as natural gas) and biomass, and electrolysis of water. Fuel cells are electrochemical devices that convert hydrogen directly to electricity (projected to be in the range of 10 to 12 cents per kWh). Great debate exists as to which are the appropriate conversion fuels. The U.S. government's current policy is to use coal, natural gas and nuclear energy to make hydrogen. Sustainable production of hydrogen will utilize renewable energy resources, an approach recommended by the International Association on Hydrogen Energy.[205]

Geothermal Energy

Geothermal energy uses the Earth's internal heat for producing electric power and heating and cooling buildings. Geothermal is relatively cost effective (2 to 8 cents per kWh), and will likely be among the first of the renewable resources to show significant capacity additions in the near term. However, its availability is limited. In California, many of the geothermal sites (and potentially other renewable energy sites) are considered sacred sites by local Native Americans making development of geothermal power plants very challenging.

Strategies in the Public Interest

The need for public policy strategies and actions arises because the private market does not adequately provide the mechanisms necessary to respond to and absorb system disruptions. This is in part because many of the decisions necessary to increase supply and demand responsiveness entail regulatory oversight and approval (e.g., setting RPS

[205] International Association for Hydrogen Energy, Coral Gables, Florida.

standards, GHG requirements, pipeline capacity, gas and other energy storage, and demand responsive pricing, among others).

This inability to respond effectively is further exacerbated by the fact that many supply-side players profit from market volatility. Public interest energy strategies are therefore needed to address these gaps and prepare for the unknowns in the future. Also needed are "civic markets," cooperative arrangements between the public and private sectors, to create, plan, implement, and oversee private sector development.[206] An example of this can be found in the recent accommodation of wind energy production by the Independent System Operator.[207] The following are key issues to consider.

Market Structure

Near term electricity supplies are anticipated to be stable according to the Energy Commission in its *2002-2013 Outlook*. Over the long term; however, the Energy Commission expresses concern over the structure of the market and its "ad hoc" nature that was created to respond to the Energy Crisis of 2000/2001. The market structure could be designed to effectively implement many of the policies described here.

Access to Imported Energy

As neighboring states experience population growth, the availability of imported electricity at peak demand times could decrease, i.e., the price would increase, perhaps dramatically. Strategies to address this include renewable resource development, particularly solar, and demand responsiveness.

Reducing GHG Emissions

State government acted to strengthen emission standards for new vehicles and is supporting renewable energy resource development. However, research and regulatory review to support renewable energy, a new hydrogen infrastructure, and distributed generation systems, along with funding to support these ongoing efforts remain.

Energy Production and Waste Management through Biomass

Energy production from biomass must also be recognized as an integral part of California's waste management strategy. Increased attention on the economic environment that brings waste streams to biomass energy conversion plants is important to an expanding biomass industry and to reducing the environmental impacts of waste disposal.

Future of Energy

As California's population grows, energy demand for transportation, housing and businesses will also rise unless there are changes in consumption patterns. Sustainability can be increased through increased investments in renewable and hydrogen energy systems. Sustainability can also be enhanced by improving energy use efficiencies and reducing overall demand. The state need not rely on current approaches to energy supply and use, but instead has the opportunity to substantially alter our approach for the better.

Energy Security – Business Climate

Although Californians did an excellent job in staving off electricity outages in the summers of 2000 and 2001, the State will still need to address the perception that there is not sufficient electricity to run industry. The resources exist in the state to change this perception, what is needed is the will and the financial environment to make it happen.

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[206] Clark, Woodrow., and Lund, Henrik, ""Civic Markets," *International Journal of Global Energy Issues*, Interscience, London, UK, Dec. 2001.
[207] Clark, Woodrow, and Morris, Gregg, "Public Private Partnerships: The Case of Intermittent Resources," *Energy Policy*, Elsevir Press, London, UK, Dec. 2002.

Energy Security - Terrorism

Concerns over energy security are increasing. California's current heavy reliance on transmission systems for electricity, oil, and gas creates substantial vulnerability to terrorism. Expansion of the use of distributed generation power facilities, renewable energy, and hydrogen are alternatives to be considered in improving California's energy security.

California has embarked on a new era in energy, with resources and means to transform to a renewable and sustainable state. Achieving this over the coming decades will require an enduring policy and a continuing commitment to the goals of sustainable development.

EFFECTS: Public Safety and Emergency Preparedness

The need to quickly and capably respond to threats to public safety has never been greater. California is a state that faces multiple threats to public safety, both natural and man made. These include a variety of natural disasters in recent history. Since 1950, California has experienced 1,064 proclaimed states of emergencies including floods, earthquakes, fires, civil disturbances, landslides, energy shortages, storms, epidemics, droughts, and agricultural emergencies. There have also been 18 major disasters over the past 14 years[208]. Most recently, the threat of terrorist activities has heightened the need for homeland security.

Ironically, there is a growing trend of placing housing in harms way. Now, more than ever, the state's population is shifting into areas prone to flooding and in close proximity to fire threats. Residential development is also inching closer to high risk land uses such as airports and military facilities. This trend is inconsistent with sustaining healthy and safe communities and puts pressure on sustaining healthy local economies. As houses pop up nearby, the safe operation of airports and military facilities are jeopardized.

Trends

Several trends have emerged over the last several decades that have created particular challenges to the state's emergency preparedness system. In particular, population growth, local planning and development decisions, the escalating costs of natural disasters, and the greater threat of terrorist activities have placed our emergency response system under pressure.

Population growth and local planning decisions

The surging state population is leading to greater pressures on the state's public safety and emergency preparedness systems. Lands once considered unsafe for development due to the threat of floods, fire, and earthquakes, are now being developed via local government decisions to accommodate the growing resident base.

During the 1997 California flood, 48 of the 58 counties were declared disaster areas. Nine people were killed during this event and 120,000 people were evacuated from their homes. Overall, 23,000 homes were impacted, damage approached $2 billion, and the disruption to the state's economy exceeded $5 billion[209]. Much of the damage occurred to property located in flood prone areas. Yet despite this incredibly damaging incident, it is projected that locally approved development will place millions of additional residents in flood prone areas[210]. In Southern California alone, many of the alluvial fan floodplains are identified for future development.

Wildfires, on the average, burn a quarter million acres of forest and rangeland annually in California. However, due to local government decisions, structures are being built in areas with significant wildland fire threat. It is estimated that 7.8 million acres of California are developed within the wildland urban interface. Approximately 920,000 of these acres are exposed to an extreme fire threat, 3.4 million acres are faced with a very high threat, and 1.2 million acres are faced with a high threat[211]. There are approximately 11.8 million homes in these threatened areas, of which 4.9 million are exposed to high or greater fire threat. The majority of these homes at risk are located in urbanized areas. Many of the locations of greatest concern for fire threats are in the Los Angeles basin and the western flank of the Sierra Nevada. Clearly, housing development in fire prone areas is continuing at a rapid pace[212].

Earthquakes are California's greatest long-term natural threat. California's vulnerability to earthquake disaster is increasing at breath-taking pace due to poor growth and development decisions. Currently, more than three quarters of California's population and infrastructure lie in earthquake prone areas (Figure 1). Effective risk management

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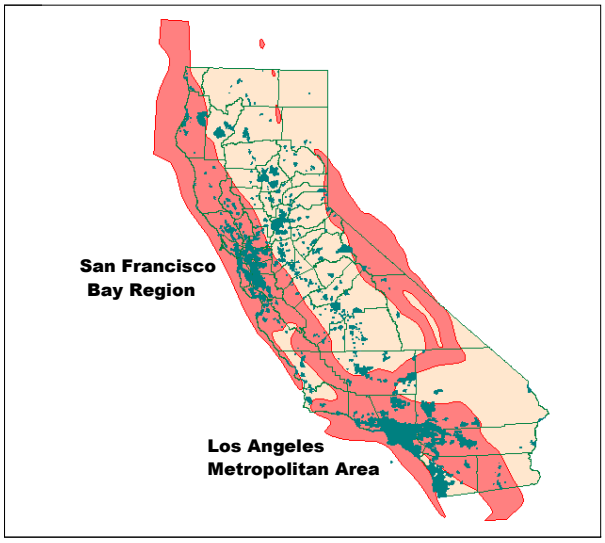
[208] Office of Governor Gray Davis, Office of Emergency Services. *State Emergency Plan*, 1998.
[209] California Resources Agency, Department of Water Resources, California Floodplain Management Task Force. *Final Recommendations Report*, 2002.
[210] Department of Water Resources
[211] California Resources Agency, California Department of Forestry and Fire Protection. Forest and Range Assessment 2003.
[212] Ibid.

will require strengthening California's infrastructure to resist the impact of earthquakes and making prudent land-use decisions.

Escalating Costs of natural disasters Following an alarming national trend, the cost of natural disasters has reached an all time high, and California is no exception. Figure 2 below, shows the increasing trend in the cost of natural disasters in the United States due to losses. A recent study by the Federal Emergency Management Agency indicates that nearly 75 percent of natural future expected losses from national earthquake disasters would be in California unless mitigating actions are taken[213]. Mirroring the startling exponential increase of losses from all natural hazards nationwide, California's vulnerability to earthquake disaster is increasing at a breath-taking pace. In less than 10 years, the record $6 billion loss from the 1989 Loma Prieta Earthquake was surpassed by over $40 billion in losses caused by the 1994 Northridge Earthquake.

Figure 28: California's Earthquake Area



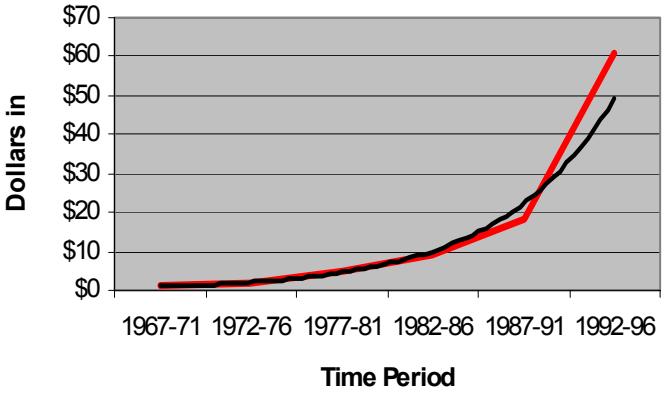
California's high earthquake risk areas are shown in red, cities are shown in blue (From California Geological Survey, 2003)

Terrorist Activities

Terrorism has become a leading concern with California public safety officials. The occurrence of terrorist events at the Alfred P. Murrah Federal Building in Oklahoma City and at the World Trade Center Building in New York City, highlighted the risk of terrorist attacks in California. It is now recognized that such events can result in massive casualties, environmental contamination, and cause severe disruptions to communities, infrastructure, and to the state and national economies. Areas with high concentrations of people, whether they be communities or special events (e.g. sporting events), are particularly at risk, as is the infrastructure that serves these populations.

Establishing an estimate of the costs associated with protecting the public from terrorist activities is difficult to measure. A conservative estimate of state costs since 9/11 is approximately $700 million. A general estimate for costs to the California Highway patrol alone during heightened alerts is $500,000 per week[214].

Figure 29: Losses From U.S. Natural Disasters (in Billions)



The red line shows the increasing trend in the cost of natural disasters in the United States. The black line shows an exponential trend for reference (Consumer federation of America, Washington D.C.

National Security

Public safety takes on national and global significance in California with the presence of 61 Department of Defense military installations. Aside from the sheer size of the military contribution to the California economy, the state is critical for the training of our military forces, and the research, development, test and evaluation of new technologies.

While the presence of the Armed Forces in the state is strong, the state's population explosion has put many bases at risk, interfering with their ability to carry out

[213] HAZUS 99 Estimated Annualized Earthquake Losses for the United States, Federal Emergency Management Agency Report 366, (2001) p.33.
[214] Governor's office of Homeland Security

their missions. During the 1990's, 29 bases alone were closed. Some of these closings occurred due to the growing incompatibility between the mission of the installations and the expansion of adjacent communities. Several additional installations are experiencing development encroachment pressures and are at risk for possible closure. The type of growth that occurs around military installations, will directly influence the future of military bases in the state.

Emergency Preparedness

Role of State government

The Governor's Office of Emergency Services (OES) is the lead state agency for all aspects of emergency management, including planning, response coordination, recovery coordination, mitigation efforts, and training. Responsibilities of OES also include the development of the State of California Emergency Plan. The State plan details the responsibilities and roles of each state entity as it relates to public safety and response to emergency situations. OES works closely with all levels of government during emergencies and oversees the development of state agency emergency plans. Due to their expertise, the state agencies most frequently asked to respond to emergencies include The California National Guard, The California Highway Patrol, the Department of Forestry and Fire Protection, the Conservation Corps, the Department of Social Services, the Department of Health Services, and the Department of Transportation.

Individual state departments have the responsibility of managing certain types of emergency information. For example, the California Geological Survey (CGS) within the Department of Conservation has the lead in geological hazard review and investigation. CGS also provides information and advisory services to the public and local governments relative to earthquakes. OES maintains an earthquake program that provides information to residents on how to prepare, respond, and recover from earthquakes.

Relative to wildland fires, the mission of the California Department of Forestry and Fire Protection (CDF) is to protect people from fires, respond to emergencies, and assist in managing and protecting the state's natural resources. CDF works closely with the Office of the State Fire Marshall and the California Conservation Corps in responding to fires. CDF takes a proactive approach in assessing the amount of forests and rangelands, analyzing their conditions and developing management and policy guidelines through the Fire and Resource Assessment Program (FRAP).

The Governor's Office on Service and Volunteerism (GO SERV), California's national service commission, is charged with administering the Citizen Corps and Community Emergency Response Team (CERT) programs across the state. These grants are designed to increase the capacity of local governments to prepare for and respond to disasters and other emergencies, including acts of terrorism. GO SERV provides these grants to local government emergency management and first responder agencies to utilize volunteers within the context of the Standardized Emergency Management System (SEMS). The goal is that volunteers will work directly and in coordination with first responders to help mitigate emergencies.

Emergency planning

California is perhaps one of the most emergency ready states due to its experience dealing with a broad spectrum of emergencies and disasters. In the 1990s, OES developed the mandatory Standardized Emergency Management System (SEMS). SEMS created a system where city, county, and state public emergency services work together to respond to any disaster in a coordinated fashion. SEMS is based on the concept of "neighbor helping neighbor." California has nearly 80,000 sworn peace officers, over 60,000 firefighters, 1,500 FBI agents and thousands of emergency management personnel. Each of these are trained in a multi-hazard approach to emergency preparedness.

The state has been actively involved in anti terrorism planning since the late 1970s. OES, through the California Specialized Special Training Institute (STI) has trained over 2,000 personnel in terrorism preparedness and response and over 12,000 persons in hazardous materials. California developed its Terrorism Response Plan immediately following the terrorist attacks on September 11. The state has also developed its medical readiness by developing a response plan for hospitals and public health and medical care professionals.

While the ability for the State to respond to public emergencies and natural disasters is excellent, the costs, both in human life and property, are quite high. Utilizing sustainable growth and development concepts can lead to minimized risks and costs, while helping foster a sustainable economy.

EFFECTS: Economic Impacts of Inefficient Development

Development patterns in California

California has seen tremendous economic expansion in the 1990's. This expansion, along with population growth, has resulted in high levels of land development. Land development can have many benefits, such as creating jobs, providing workforce housing, revitalizing communities, and creating valued amenities. However, these benefits are diminished by the way in which we have developed land in California.

Since the 1950's, California land development has been constructed around the automobile as the primary transportation mode. This has allowed for jobs, housing, and necessary services to be spread farther and farther apart from each other. This decentralized land use pattern has high infrastructure costs and high resource costs, straining the economic health of our state and the quality of our environment.

Many factors have worked together to create inefficient development patterns including fragmented local planning, the lack of state planning guidelines, government policies and infrastructure subsidies, and market demand.

More efficient development would reduce infrastructure costs; preserve land for agricultural, recreation, habitat, and commercial uses; improve our air and water quality; and reduce California residents' transportation and housing costs.

Inefficient development impacts private business

Businesses' operating costs in California are affected by inefficient development patterns. California's economy is heavily dependent on shipping and global commerce. Import and export goods are distributed through the state's air and sea ports, interstate rail, and road networks.[215] In 1997, California shipped $802 trillion worth of goods. Trucks using California's roadways carried 68 percent of these goods.[216] The shift from rail and shipping to trucking has in many ways made California businesses (and businesses nationwide) more efficient, but subsequent residential and commercial growth has been attracted to the highway system. Rapid growth and the lack of adequate planning along these transportation corridors has filled our roadways beyond capacity. Traffic congestion has led to delays in transporting freight, increased accidents, and ultimately, an increase in freight transportation costs.[217] These increased costs are passed on by business to consumers.

Inefficient development may provide some immediate economic gains, but the long term costs eventually outweigh the short term benefits for all businesses. To compete in an often global marketplace, businesses depend on their ability to locate where they will find an adequately trained workforce, sufficient infrastructure, and quality of life for their employees.[218] Inefficient development results in high housing and transportation costs that drive up wages. High living costs make it difficult to recruit employees because of the quality of life sacrifices they must make. As employees are forced to make longer commutes, their productivity decreases. Environmental pollution issues, such as poor air quality, also hinder business by imposing restrictions on their ability to operate and expand, and potentially encourages stricter regulations.

Inefficient development strains local government resources

The passage of Proposition 13 in 1978 rolled back property taxes to 1975 levels and capped property tax increases on residential and commercial real estate at 2% per year. This initiative limited the ability of local government to

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[215] Shatz, H. J. (2003). Business Without Borders? The Globalization of the California Economy. San Francisco, California, Public Policy Institute of California.
[216] U.S. Department of Transportation, Bureau of Transportation Statistics. California Transportation Profile. Washington, DC, 2002
[217] California Business Transportation and Housing Agency, California Department of Transportation, California Transportation Plan 2025, DRAFT. Sacramento, California, September 25, 2002.
[218] Center for Continuing Study of the California Economy (1999). Land Use and the California Economy. San Francisco, California, Center for Continuing Study of the California Economy and Californians and the Land.

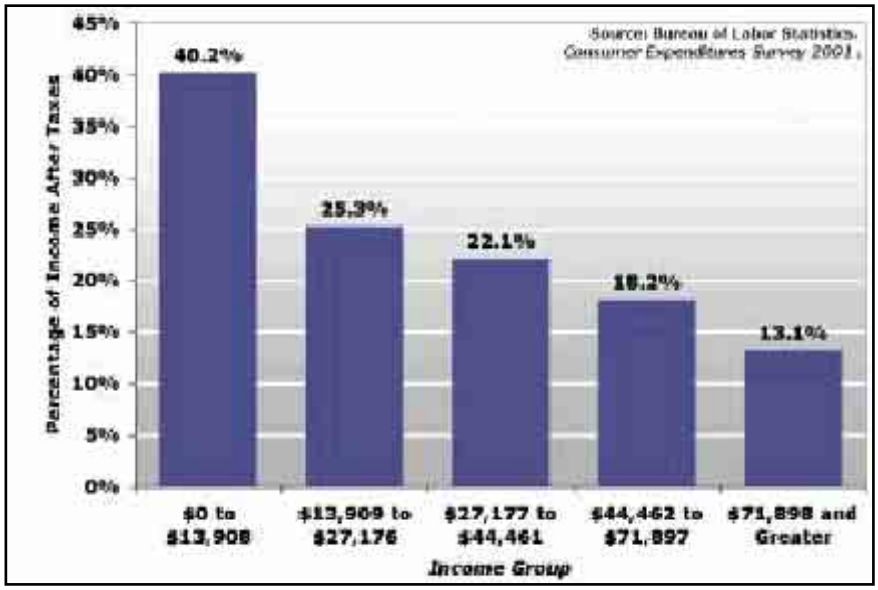
finance local services and infrastructure.[219] Statewide, property taxes account for only 7 percent of city funds.[220] Under Proposition 13, all but the most expensive new housing developments fail to generate enough property tax to cover local government's cost of providing services. This includes water treatment, waste collection, emergency services, schools, libraries, parks and road maintenance. To address revenue shortfalls, cities and counties increasingly compete against each other to attract retail businesses for the sales taxes they generate. This emphasis on the revenue generating potential of commercial development is commonly known as the fiscalization of land use.

Sprawl increases local governments' service provision cost. High density, well-planned developments can reduce cities' infrastructure investment and maintenance costs by up to 55 percent.[221] Inefficient development also drains investment away from already developed areas with existing infrastructure and prohibits the capitalization of existing resources. It risks creating neighborhoods and communities that do not have access to amenities such as transportation, quality schools, parks, and other needed services.

Inefficient development erodes quality of life and individual wealth creation

The desire for affordable housing is driving Californians to live increasingly further from their jobs. However, this move is often accompanied by higher transportation costs. Transportation is now the highest expense for households after housing, consuming some 19.3 percent of their income.[222]

Figure 30: Household Transportation Spending by Income Group



Sprawl drives transportation costs up because it cannot easily support public transportation. While the costs of automobile ownership are high, most Californians have no alternative. Owning an automobile is the single biggest factor for predicting a person's ability to find and retain a job. The necessity of automobile ownership forces low income families to spend scarce resources on automobiles and may be the single greatest barrier towards home ownership and wealth creation.[223] .

The current pattern of development has largely failed to provide Californians with affordable housing. Not only has overall housing production lagged behind demand, but much of the housing being constructed is of the profitable high-end type. Very little multifamily housing is being built to help house California's diverse population.[224] Taken together, the high costs of transportation and housing have an immediate impact on low-income workers who pay a much greater percent of their income for these necessities. Over time, this drives the cost

[219] Shires, M. A., J. Ellwood, et al. (1998). Has Proposition 13 Delivered? The Changing Tax Burden in California. San Francisco, California, Public Policy Institute of California.
[220] *Cities and Growth in California* (2002). San Francisco, California, Public Policy Institute of California.
[221] U.S. Council on Environmental Quality, U.S. Housing and Urban Development, et al. *The Co$ts of Sprawl (Executive Summary).* Washington, DC.
[222] Driven to Spend: The Impact of Sprawl on Household Transportation Expenses (2000). Washington, DC, Surface Transportation Policy Project.
[223] Transportation Costs and the American Dream: Why a Lack of Transportation Choices Strains the Family Budget and Hinders Home Ownership (2003). Washington, DC, Surface Transportation Policy Project.
[224] *Locked Out 2002*, Sacramento, California Budge Project.

of living up for all Californians. In addition, communities who do not provide affordable housing have difficulty attracting essential community members such as nurses, emergency responders, teachers, and maintenance workers because they cannot afford housing costs.

Decentralization, and the road construction that it demands, has not resulted in reduced traffic congestion. Instead, congestion, commute times, vehicle miles traveled (VMT), and automobile fatalities have increased.[225] (16).[226] Long commute hours eat into employees' personal time and increase our consumption of fuel making the state's economy more dependent on foreign oil. Increases in VMT and commute times result in higher air pollution levels leading to increases in respiratory ailments such as asthma.

Sprawl often does not provide opportunities for travel by walking and biking. Experts believe that this has increased the risk of obesity and the associated negative health consequences, including: diabetes, cancer, heart disease, arthritis, hypertension, and osteoporosis. (Ewing and Pendall et al) Twenty to 24 percent of California adults were obese in 2001. (Ewing and Pendall) The increase in these diseases raises public health costs and decreases employee productivity.

Long-term damage to the environment will cause future economic losses

Most new development has occurred on previously undeveloped land (also known as greenfields) including agricultural lands and open space. The loss of such lands directly impacts food production, species diversity, recreation, and tourism.[227] It also leads to fragmentation of theses areas, resulting in the decreasing effectiveness of food distribution and handling and creation of small "islands" of habitat that isolate animals from food and reproduction opportunities.

The poor air quality caused by high levels of automobile use damages crops, forests, rangeland, and habitat land not only by polluting the air but also by increasing soil acidification and contamination of water bodies.[228] Further degradation of these resources may result in the breakdown of the state's ability to sustain its economic and environmental needs for water and other natural resources.

If widespread inefficient development has delivered larger homes on larger lots for some Californians, this type of development has also resulted in decreased home ownership statewide; high business and consumer costs; high personal health and time costs; increases in air and water pollution; and greater resource consumption, in terms of energy and water. Inefficient development wastes our human and natural resources—the very things that have created the high quality of life that we value in California.

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[225] *Transportation Costs and the American Dream*
[226] Ewing, R., R. Pendall, et al. (2002). Measuring Sprawl and its Impact. Washington, DC, Smart Growth America.
[227] California Resources Agency, Department of Forestry and Fire Protection, Fire and Resource Assessment Program. *The Changing California: Forest and Range Assessment 2003*. Sacramento, California, April 2003.
[228] California Environmental Protection Agency. *Environmental Protection Indicators for California*. Sacramento, California, April 2002.

EFFECTS: Housing

Challenges to housing our growing population have never been so great. Although there is high demand for new housing due to the State's robust population growth and economy, there are many obstacles preventing the needed number and type of housing units from being built. Furthermore, the general trend in the patterns of new housing development is not sustainable. New housing development must be encouraged to locate in and adjacent to existing urbanized areas for continued vitality of our cities and towns. New development in nonurbanized areas must be more compact to preserve our natural resources and agricultural lands. Many communities are resisting additional housing development or placing limitations on overall growth. The pace of infill and multifamily housing development, in particular, is hindered by community opposition and high development costs. Land use planning regulations and tax structures create disincentives for new housing developments, especially affordable housing. Insufficient government financial assistance for housing development also deters construction of needed housing stock. Adequate, affordable housing, located in areas that enable access to jobs and services, is essential to creating livable communities for all Californians.

Not only does housing address the most fundamental need of people for shelter, it provides significant economic benefits. Housing construction has significant multiplier effects on the economy. The production of housing and the value of housing services produced by the housing stock account for about 14 percent of the nation's Gross National Product.[229] The construction of 1,000 single-family homes is projected to generate 2,448 jobs, approximately $33.5 million in wages, and more than $17.8 million in tax revenues and fees.[230] Housing construction also generates 821,000 jobs and contributes more than $257 billion to the California economy each year.[231] The lack of housing production and the high costs of housing detrimentally affect job retention and creation.

Housing Production

Housing production in California has not kept pace with the State's housing needs, particularly in the coastal metropolitan areas and for low-income and other rental households throughout the State. The disparity between housing production and housing need has resulted in double-digit year-to-year percentage increases in the median housing price. The statewide median single-family home price for the second quarter of 2003 was $369,640.[232] High housing costs have placed homeownership out of the reach of many Californians.

During the 1990s new housing construction fell dramatically in California, and has not yet rebounded to prior levels commensurate with growth.[233] During the decade of the 1980s, 2.07 million housing units were built as compared to only 1.11 million during the 1990s.[234] While one unit was built for every 2.95 additional California residents in the 1980s, just one unit for every 3.72 additional residents was built during the 1990s.[235] As a result, household growth during the 1990s was undersupplied by an estimated 33 percent.[236] Acute deficits occurred particularly in multifamily unit construction. Multifamily units built in the 1990s equaled barely one quarter of the total new units produced, a drop of nearly 70 percent from the previous decade. Existing privately owned affordable rental housing is also being converted to market-rate rents, as federal and State regulatory controls on affordability expire on thousands of units. The Center for the Continuing Study of the California Economy (CCSCE) noted that the rapid rise in already high home prices from 2000 to 2002, in the midst of an economic downturn, corroborated that most regions in California are experiencing a severe shortage of new housing construction.[237]

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[229] National Association of Homebuilders.
[230] *NAHB, Housing, the key to economic recovery*
[231] The economic benefits of housing in CA, Sacramento Regional Research Institute, pg 5
[232] *Trends in California Real* Estate, California Association of Realtors, August, 2003.
[233] California Business, Transportation and Housing Agency, Department of Housing & Community Development, Statewide Housing Plan, "*Raising the Roof: California Housing Development Projections and Constraints 1997-2020*, Sacramento, 2002.
[234] Dowell Myers & Julie Park, (2002) *The Great Housing Collapse in California,* University of So. California.
[235] Ibid.
[236] Ibid.
[237] Center for Continuing Study of the California Economy, *California County Projections*, 2002 Edition, pg. 4-6

Housing production has increased in the past few years, with 186,000 new homes and apartments projected to be built in 2003, representing the highest housing production since 1989.[238] However, this level of production is well below the projected annual average need of 220,000 units.

Housing Trends

The conditions identified above have resulted in an increasing housing crisis for Californian. This in turn has given rise to several daunting trends described below.

Increasing Housing Cost Burdens: The high cost of housing in California has made housing affordability a rising concern for an increasingly broad spectrum of households. Individuals earning average wages, such as public service and health care employees, for example, cannot afford to live in the communities in which they work.

Housing affordability problems are rooted in a mismatch of what the private sector can provide and what residents can afford. The housing affordability gap has dramatically increased housing cost burdens that has significantly increased in recent years. The gap has continued to grow even during periods of economic expansion, demonstrating that recent periods of economic growth have not resulted in increased affordable housing for many. California is second only to Massachusetts in terms of the hourly wage needed to afford a two bedroom apartment at the fair market-rate. In 2002, the average hourly wage needed to afford a market-rate apartment was $19.69. California also had six of the ten least affordable metropolitan areas for housing in the country, and seven of the ten most expensive counties.[239]

According to the California Association of Realtors, the percentage of households in July 2003 that could afford to purchase a median-priced home in California was 27 percent.[240] As with any state, the affordability index varies significantly from region to region. California's most affordable region was the High Desert region with a median price of $146,988 and with an affordability index of 64 percent. Monterey, on the other hand, was among the least affordable regions with an affordable index of 17 percent.[241]

Affordability can range significantly between adjoining counties, resulting in many residents maintaining jobs in the higher cost area and living in a more affordable adjacent county. Riverside County jurisdictions, for example, experience a flow of new residents from San Diego and Orange counties that move to obtain more affordable housing, despite the long commute distances. San Diego County maintains a low affordability index of 21 percent as compared to 40 percent in Riverside County.[242]

Low Homeownership Rates: California lags far behind the rest of the nation in homeownership rates, with its rate among the three lowest in the nation. While the 2002 national homeownership rate was 67.9 percent, California's homeownership rate was only 58.0 percent.[243] Although California has benefited from more new homeowners in recent years, due in large part to low mortgage interest rates, improvement has been restrained by underproduction and high housing costs.

Overcrowding: More than 15 percent of California households were overcrowded according to the 2000 Census. The Census identified overcrowding most common among low-income households and most prevalent in renter housing. Roughly 24 percent of renter households statewide were overcrowded. In some counties, nearly a third of renter households were overcrowded.

Low Vacancy Rates: A very serious problem that resulted from the housing shortfall in the 1990s was a low vacancy rate for both homeowner and rental units. Between 1990 and 2000, the homeowner vacancy rate decreased from

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[238] California Building Industry Association, "Housing to Continue Strong in 2003, but Production Remains Short of Need", January 8, 2003.
[239] National Low Income Housing Coalition, Out of Reach 2002. September, 2002.
[240] *Trends in California Real* Estate, California Association of Realtors, July, 2003.
[241] Ibid.
[242] California Association of Realtors, news release on March 25, 200 7 CAR Trends, July 2003
[243] California Building Industry Association, Housing Information Center, information on both California and the United States.

2.03 percent to 1.4 percent, and the rental vacancy rate dropped from 5.94 percent to 3.7 percent.[244] Vacant units were used to absorb a significant amount of the housing demand during the later half of the 1990s, resulting in extremely tight housing markets which limited mobility in many populous metropolitan areas.

Housing Discrimination: Many Californians face housing discrimination and therefore lack equal access to available housing. Members of minority groups are most likely to experience discrimination in their efforts to obtain financing for home purchases. Discrimination ranges from predatory lending practices and racial disparities in loan denial rates to less generous home loan amounts and rates. Hispanics in the rental market are particularly affected. A nationwide study by the federal Department of Housing and Urban Development (HUD) found discrimination strong against Hispanic renters during the 1990s, with approximately 25 percent of Hispanic renters experiencing discrimination.[245]

On the basis of national discrimination rates cited in a 2003 Fair Housing Trends Report, Californians are estimated to experience approximately 300,000 incidents of housing discrimination.

Increasing Homelessness: A lack of shelter is one of the most basic equity issues. While reliable counts of homeless are illusive, as of 1997, 360,000 Californians were estimated to be homeless.[246] Of these, it is estimated there are 80,000 to 95,000 homeless children in California, making the percentage of children who are homeless greater today than at any time since the Great Depression.[247]

Exacerbating the homelessness situation is the fact that the gap between the minimum wage and the hourly wage a full time worker must earn to afford adequate housing has increased sharply. Many people that seek emergency or transitional shelter are employed, but the lack of affordable housing makes it difficult for people to move from shelters to permanent housing.

High Development Costs: Lot prices of more than $100,000 are increasingly common, even in typically more affordable areas. In addition, it is not uncommon for impact or mitigation fees and exactions charged by local governments to range between $20,000 to $50,000 per unit. Infill development, especially when involving remediation of contaminated soils and aging infrastructure, can be very costly.

Growing Commute Distances: Since residential development commonly constitutes the predominant land-use of newly urbanizing areas, new housing development impacts broader development and transportation patterns. While other states have experienced decreases in average commute times, California has not followed the same pattern. Between 1990 and 2000, the share of California workers that commuted 90 minutes or more increased by 57.1 percent, with Sacramento area commuters increasing by almost 96 percent.[248] Long commutes to bedroom communities allow little time for family and community activities.

Planning and Zoning Constraints: Many areas of California consume less land per acre than other areas in the U.S.[249]. However, the number of housing units per acre of developed land in California declined between 1987 and 1997.[250] Much of this has occurred due to constraints being placed by local government. These constraints are reflected in planning and zoning ordinances, building codes, and local government planning practices. In addition, local government often fails to effectively guide new housing development. A recent study found that significant deficiencies exist in the capacity of existing local planning systems to accommodate change and pursue rational planning goals. For example, in Ventura County, a study by William Fulton found that, "despite passing a

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[244] Dowell Myers and Julie Park. *The Great Housing Collapse*. University of Southern California, May 2002, pg. 4.
[245] *HUD releases report: Discrimination in Metropolitan Housing Markets 1989-2000*, News Release, April 17, 2003.
[246] California Business, Transportation and Housing Agency, Department of Housing & Community Development, State Housing Plan Update, *California Housing Markets 1990-1997.* 1998.
[247] California Housing Law Project. Facts and Issues; homeless children.
[248] California Budget Project. *Locked Out 2002: California Affordable Housing Crisis,* October 2002*,* page 23.
[249] Fulton, William, Rolf Pendall, Mai Nguyen, Alicia Harrison, "Who Sprawls Most? How Growth Patterns Differ Across the U.S.," Brookings Institution, Washington, D.C., 2001.
[250] Johnson, Hans P. and Joseph M. Hayes, "California's Newest Neighborhoods," California Counts, Population Trends and Profiles, Public Policy Institute of California, San Francisco, CA, August 2003.

countywide growth-management initiative in 1998, most cities in the County had not adjusted their planning documents to accommodate expected housing demand. This situation created conditions likely to lead to further housing-price escalation and increased political manipulation of the housing market."[251]

Resistance to New Housing Development: Resistance to additional housing development has steadily increased. The result has been a proliferation of growth control measures designed to restrict housing supply in communities throughout the State. A combination of locally adopted ordinances and initiatives has created restrictive urban limit lines, locked in low densities and land uses, or in some cases, effectively placed a moratorium on additional multifamily housing.

Constraints of Planning and Environmental Review Practices: The prevalence of project-level mitigation via the environmental review process of CEQA often fails to adequately consider spillover impacts beyond the project vicinity or jurisdiction. To mitigate the environmental effect of high density housing in one area, a preferred project alternative is often presented as, and the project conditioned on, a number of housing units below the maximum allowable density. The practice of building at low densities in one community may satisfy that jurisdiction's desire to limit growth impacts within its jurisdiction, yet will often have unintended consequences on neighboring communities. This detrimental effect on the entire region or area are not considered. When housing supply is limited in high demand areas, housing production is diverted to outlying areas, often with subsequent increases in traffic congestion, commute times and encroachment onto greenfields, including agricultural lands.

Constraints to Infill Development: While infill development has been successful in a scattering of localities, there is much progress to be made in creating significantly more opportunities for redevelopment or infill in existing communities. Barriers that must be overcome include high land assembly and infrastructure costs; the unwillingness of many cities to use condemnation powers in blighted areas; conflicting municipal social goals and regulatory policies; the difficulty of finding developers with infill experience; the complexities of public-private partnerships; excessive risks associated with building in untested markets; resistance from local residents; and, other stakeholder conflicts and political constraints.[252] State, local, and federal policies must do a better job of addressing these problems. Without changes to existing laws and practices housing, placing housing in infill locations will continue to be difficult.

Natural Resource Constraints: There are several natural resource constraints that serve to limit the construction of housing. The primary example of this is inadequate water supply because certain regions of the state are limited in water availability. Southern California for example, must rely on water transported into the region in order to service new housing development.

Unmet Special Housing Needs: Special needs populations, such as farmworkers, are overwhelmingly priced out of the housing market. This is true particularly in coastal communities. Several rural and urban coastal counties have significant populations of farmworkers that are frequently the poorest residents and in desperate need of affordable housing. The State's disabled and growing elderly populations are in similar situations relative to access to housing opportunities. With these two population groups, issues of housing accessibility, pedestrian access, safety, universal design, and access to services are key housing related concerns.

Growing Disparities: Despite some regional variations, residential developments built during the 1990s primarily consisted of homes that are larger than the statewide average, and contain residents who are less ethnically diverse and have relatively high incomes.[253] In many areas, more recent new single-family homes have increasingly become larger, resulting in communities of "mini-mansions." In contrast, lower income and ethnic populations have fewer opportunities to purchase housing in these new subdivisions and are also facing fewer housing opportunities within their neighborhoods. While the Hispanic population is the fastest growing population segment in California, this

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[251] Fulton, William, et. al., "Smart Growth in Action: Housing capacity and development in Ventura County," Los Angeles, CA: Reason Public Policy Institute (RPPI), 2001

[252] Farris, J. Terrence, "Barriers to Using Urban Infill Development to Achieve Smart Growth," Fannie Mae Foundation, Housing Policy Debate, V. 12, Issue 1 (2001), Washington, DC.

[253] Johnson, H. P. & J. M. Hayes, "California's Newest Neighborhoods," California Counts, Population Trends and Profiles, Public Policy Institute of California, San Francisco, CA, August 2003.

group is finding it difficult to move up the economic ladder due to a severe imbalance in housing supply and demand.[254]

How Has The State Responded?

While the federal government has long played a central regulatory and assistance role in housing finance and other areas since the l970s, California's state and local governments have also had an active role in regulating planning and zoning for housing through housing element law and in administering housing assistance programs for lower- and moderate-income households.

The California Department of Housing and Community Development (HCD) implements State housing laws and programs assisting lower-income households, with a focus on the needs of rural areas, the homeless, and special needs populations. The California Housing Finance Agency (Cal-HFA), the Tax Credit Allocation Committee and the California Debt Limit Advisory Committee of the State Treasurer's Office, along with the California Department of Veterans Affairs, are also involved in providing housing opportunities for California residents. Most of the resources of these agencies, many of which are subject to targeting restrictions of federal law, are allocated to address specific community development or need-based criteria (including support of transit-oriented development), and are made available to eligible entities on a competitive basis, and in consideration of capacity issues.

While State actions continue to result in additional housing opportunities, the pace of housing constructed during the 1990s must double over the next decade in order to meet this decade's household demand.[255] State government must play an even stronger role if this demand is to be met. Future state actions must focus on several broad themes:

- Facilitating and encouraging higher rates of housing construction,
- Increasing the amount of funding for affordable housing programs,
- Mitigating resource constraints in high demand areas in particular,
- Developing additional incentives for housing development in appropriate locations,
- Reducing conflicting policies that discourage housing construction,
- Creating more favorable fiscal and tax policies for multifamily development,
- Lobbying the federal government to expand existing housing programs and to create fiscal and tax policies that favor housing construction, and
- Securing greater regulatory certainty for housing construction in areas planned for development.

[254] Lopez-Aqueres, et. al., "Housing California's Latino Population in the 21st Century: The Challenge Ahead," The Thomas Rivera Policy Institute, December 2002.
[255] Myers, p.4

OPPORTUNITIES FOR INNOVATION

The following is a discussion of several means by which the State can promote sustainable development, by placing emphasis on efficient land use patterns, making use of innovative technology, preparing the State's workforce for coming challenges, promoting the use of hydrogen as an energy source, and encouraging the private sector to adopt sustainable business practices.

OPPORTUNITY: Sustainable Land Use Patterns

The preceding sections have identified some of the issues associated with our dominant development pattern. That pattern is characterized by decentralization, extreme separation of uses, and a concentration of investment on the developing urban fringe—in a word, sprawl. The issues associated with this form of development include:

- Traffic congestion and lack of viable alternatives to the automobile
- Air quality problems
- Water quality problems and uncertainty of future supplies
- Fragmented and disappearing habitat
- Conversion of our most productive agricultural lands
- Inadequate open space for recreation and ecological health
- Inequitable distribution of the benefits and burdens of development
- Human health effects related to environmental hazards and a lack of physical activity
- Disparities in infrastructure investment, including school facilities
- Reliance on non-renewable fuels and older centralized power technologies
- Encroaching development in areas at risk from natural hazards, including flooding and wildfire
- Lack of housing near jobs and services which serves all economic and demographic segments of California

Sprawl presents different problems for each group of stakeholders. For developers and investors, it is the uncertainty of entitlements, due to citizen opposition. For citizens and voters, sprawl-based project proposals usually mean a win-lose tradeoff, with the local residents losing their prized quality of life as more formulaic, traffic-inducing, one-size-fits-all development comes to town. For local governments, sprawl creates intractable long-term requirements for capital replacement and service spending against a rising tide of traffic, unaffordable housing, unbalanced jobs/housing, fiscalized land uses, and a never-ending appetite for undeveloped land at the edge of town.[256]

Society's response to these issues have typically focused on mitigating the effects—through the use of technology or regulatory controls to protect certain resources. This approach has met with success in many areas, but there is still more to be done. The sustainable development approach recognizes that success can be achieved by addressing the underlying patterns of land use and infrastructure. Sprawl has its roots in fragmented land use planning and a lack of regional and state guidance, government policies including infrastructure subsidies, and market forces. To successfully address the future population growth and economic prosperity of the state, California must make the choice to act sustainably.

<u>Sustainable development</u>

The alternative to sprawl is development that is compact and uses land efficiently, conserving agricultural and wild lands. It allows residences of all types – single-family houses, town houses, condos, apartments – to be intermixed in a single neighborhood in ways that increase, not decrease, their value. It allows small neighborhood-serving shops and restaurants to be located within the neighborhood or at its edge, so that customers have a choice of whether to walk, bike or drive to them. It incorporates schools and parks into the neighborhood fabric so that children can walk to them, giving the children a great sense of power and self-sufficiency while freeing the parents from permanent chauffeur duty. It locates large-scale employment investment in mature urban areas, and smaller scale employment opportunities for entrepreneurs in all areas. It encourages flexible and timeless mixed-use building types that can be

[256] Robert Alminana, Paul Crawford, Andres Duany, Laura Hall, Steve Lawton, & David Sargent, *White Paper on Smart Growth in California*, 2003.

adapted to new uses many times during their life-cycle, supporting changing business needs in a dynamic economy without demolishing and land-filling 10-year-old buildings each business cycle.

California's planning priorities

In 2002, the Legislature outlined three planning priorities for the State. These priorities are intended to promote equity, strengthen the economy, protect the environment, and promote public health and safety in the State, including in urban, suburban, and rural communities. The priorities are:

(a) To promote infill development and equity by rehabilitating, maintaining, and improving existing infrastructure that supports infill development and appropriate reuse and redevelopment of previously developed, underutilized land that is presently served by transit, streets, water, sewer, and other essential services, particularly in underserved areas, and to preserving cultural and historic resources.

(b) To protect environmental and agricultural resources by protecting, preserving, and enhancing the state's most valuable natural resources, including working landscapes such as farm, range, and forest lands, natural lands such as wetlands, watersheds, wildlife habitats, and other wildlands, recreation lands such as parks, trails, greenbelts, and other open space, and landscapes with locally unique features and areas identified by the state as deserving special protection.

(c) To encourage efficient development patterns by ensuring that any infrastructure associated with development that is not infill supports new development that uses land efficiently, is built adjacent to existing developed areas to the extent consistent with the priorities specified pursuant to subdivision (b), is in an area appropriately planned for growth, is served by adequate transportation and other essential utilities and services, and minimizes ongoing costs to taxpayers.

These planning priorities must be reflected in the State's five year infrastructure plan, in the Environmental Goals and Policy Report, and in each state agency or department's functional plan. In addition, the Environmental Goals and Policy Report is to serve as a guide for state expenditures and the preparation of state agency and departmental functional plans. It is through the expenditure of state funds and consistent agency and department planning objectives that the State can positively affect growth and development in California.

The State should also encourage and enable local governments to implement the three planning priorities. The State should work with local and regional governments to tackle the following barriers to implementing the state's planning priorities, and to implementing sustainable development in general:

- *Fragmented decision making*. Planning decisions are made by numerous local and regional entities. State agencies have not had a consistent framework within which to address local development issues.

- *Infrastructure funding*. In California, unlike many states, the State is often not the primary provider of infrastructure. Nevertheless, state funding is often a major influence in where and how infrastructure projects are built, including schools, roads, and water-related infrastructure. Aligning state and local infrastructure objectives, consistent with the state planning priorities, would be a powerful tool.

- *Fiscalization of land use.* The current system of local government finance often encourages the approval of sales tax generating retail development over needed housing or employment-generating development. The State's need for revenue stability which avoids past boom and bust cycles should be combined with the local need for revenue sources which do not bias the development process.

- *Public opposition to development.* When government fails to act, or is seen as being insensitive to growth issues, public opposition manifests itself both at public hearings opposing certain projects, and at the ballot box, where citizens overturn or amend local plans and development ordinances. The State can encourage local, regional and state dialogues about issues of growth and development. Through local and regional "visioning" processes, communities can come to common decisions which promote the needs of the economy, the environment, and society.

OPPORTUNITY: Technological Innovation

In the years to come, numerous technologies can be utilized to facilitate sustainable development in California, decelerate the pace of climate change, and supplement the California economy. Examples of these emerging and innovative technologies include broadband and wireless networks, nanotechnology, and Geographic Information Systems (GIS).

Nanotechnology

Nanotechnology refers to the range of new technologies that aim to manipulate particulars including individual atoms and molecules in order to create new products and processes. One nanometer is one billionth of a meter or 1/100,000 the width of a human hair. The California NanoSystems Institute (CNSI), located jointly at the University of California at Los Angeles and University of California at Santa Barbara enables the discovery and development of technological breakthroughs in nanometer scale structures and functions. Nanotechnology will provide future applications, such as the use of "smart paint", in which microscopic computer chips would be blended into the paint. This would enable energy saving color changes that better reflect or retain heat, and could be controlled remotely. Nanotechnology will also yield benefits in life sciences, space exploration, and fighting bio-terrorism.

Improving efficiencies through existing technologies will not be enough to reach our sustainable development goals. New technologies applied in innovative ways will be necessary.[257]

Some of these advanced technologies need further marketplace deployment to extend their accessibility and reliability, while others are still confined to the research and development stage and await commercialization.

Broadband and wireless networks hold limitless potential for advancing environmental protection, economic development, and social equity. The impacts of these technologies will range from facilitating telecommuting as an employment alternative, to enabling scores of other technologies; and from enhancing homeland security monitoring and communications to mitigating environmental justice problems and reducing the "Digital Divide."

High-Tech

The combination of broadband, wireless, and affordable Personal Data Assistants (PDAs) or flexible displays could enable buildings to be operated remotely. Each appliance and device could be linked to the Internet. Wireless technologies could be utilized to network each of those appliances or devices, and wireless broadband could enable their control from remote locations. The user could alter the building's temperature or exterior paint, turn on or off the washer, drier, and dishwasher, and even look for milk in the refrigerator. Benefits include reductions in energy consumption, travel, and pollution.

Environmentally Advanced Buildings

Advanced materials, conservation technologies, and pollution control technologies can be combined to construct environmentally friendly homes and facilities that are made with recovered materials (e.g., asphalt, concrete, plastics, wood, etc.), limit water consumption (e.g., low-flow faucets, waterless toilets), and use renewable energy (e.g., solar PV).

As the computing, Internet, and media delivery networks converge, requiring greater capacity than dialup connections can offer, all geographical and user sectors of the State (e.g., homes, businesses, governments, schools) must have access. Ubiquitous broadband requires a combination of delivery mechanisms, including cable and fiber optics, Digital Subscriber Line (DSL), satellite, Multichannel Multipoint Distribution Service (MMDS, or "fixed wireless"), "WiFi"

[257] "Walking The Talk, The Business Case for Sustainable Development", Charles O. Holliday, Jr, Chairman and CEO, DuPont; Stephan Schmidheiny, Chairman, Anova Holding AG; Philip Watts, Chairman of the Committee of Managing Directors of the Royal Dutch/Shell Group of Companies, 2002

(Wireless Fidelity) and "WiMax" (with a broader reach), "3G" (third generation) and "4G" cellular networks, and "fiber to the home" by utilities.

New and expanded use of technology such as e-government and other Internet services support a variety of more efficient land uses including infill, mixed use and "integrated neighborhood" models. Establishment of these types of developments are beneficial as they create a better sense of community and minimize the need for personal transportation, thus reducing fuel consumption, pollution, unproductive travel time, and, ultimately, the impact on climate change. Many technologies can and will continue to be strategically utilized in the construction of sustainably developed buildings and communities.

Mobile, Local Technology

GIS, broadband, wireless, PDAs and flexible displays and the Internet could be combined to provide graphic depictions of location-based services within each community. The services that could be mapped, for the use of local residents, could include government services and the offices that provide them, bus and other transit services, child care services, schools, hospitals and health clinics, non-profit centers, etc. Information could be updated in realtime (e.g., progress of buses in transit), and could be available wirelessly, to maximize its utility for those who are already mobile. Note that this cluster could have a significant positive impact in bridging the Digital Divide, by providing useful, localized content.

While development of new technologies in the California economy can occur throughout the State, their co-location in technology corridors and science parks or, such as in infill areas, can facilitate economic development synergies, and mutually beneficial leveraging of resources and R&D efforts that accelerate and sustain each of them. High quality jobs and collateral economic benefits to the community at large can also result.

An ideal candidate for such a science or research park is the life sciences industry. California is already a world leader in life sciences with R&D efforts dispersed throughout the state. A focused environment could result in more rapid advances in genomics, bioinformatics, biomedical and other research areas.

When these centers are developed in partnership with major universities, venture capital sources, and key businesses, and accompanied by existing transit, utility, telecom, and other infrastructure, a "Regional Advantage"[258] is produced.

Another major contribution that supports advances in new technologies and innovations is the very advanced network developed for the Digital California Project (DCP). This initiative was designed to bring the same high-performance advanced services network capacity enjoyed by research universities to all of California's K-20 schools. As a result of the DCP, the network now extends into 56 of 58 counties in California, and provides services to 71 percent of the state's schools and 82 percent of the school districts. Connectivity to the remaining two counties is expected by the end of 2003.

Low-Tech

Low-tech, yet important, design techniques (e.g., building configurations, placement of windows, trees, and awnings, etc.) can be utilized to minimize the need for energy consuming heating and air conditioning. Similarly, community planning and design could locate essential services within the same neighborhood, to avoid lengthy travel for daily needs.

One of the key benefits of the network created by the DCP is telemedicine, by which the diagnosis and treatment of medical conditions is conducted remotely, between a doctor in one hospital and a patient in another, extending quality, affordable health care to rural and remote areas. Another candidate might be "e-disease management" which allows in-home monitoring and relaying of real-time health data to health providers, enabling early detection of health conditions and crises, while saving time and travel.

[258] AnnaLee Saxian (1996). *Regional Advantage: Comparing Route 128 to Silicon Valley.* Oxford Press.

OPPORTUNITY: Workforce Development

In California, "workforce development" is commonly thought of as activities by private and public sector entities that educate, employ, and train the state's workforce and that are linked to economic development. These components help prepare individuals to enter the workforce, as well as provide incumbent workers the skills for ongoing career development.

Workforce development is a sustainability issue, as California attempts to meet the economic, environmental, and equity challenges of the future. The workforce development system must evolve to meet the demands of California's changing economy and to provide workers with higher wages and learning opportunities that support a strong social fabric. The following discussion uses the term "workforce development", although the terms "workforce investment" and "workforce preparation" are synonymous.

Workforce Development: A Sustainability Issue

California's economy is dependent upon workforce development. A skilled workforce is critical to strengthen business development and expand economic growth in a highly competitive and changing global market. The state's ability to capitalize on its concentrated and diverse population of innovative people and to sustain a leading reputation in all of its industries is largely attributed to a workforce with the knowledge, skills, and abilities needed for implementing the cutting-edge ideas of California's abundant innovators. A properly developed workforce is also important to California's economy because the workforce reinvests its payroll, which in 2001 was $518.9 billion, into California's economy by purchasing goods and services within the State.

California continues to lead the nation in environmental protection efforts. A properly trained workforce is necessary to successfully implement the state's cutting-edge environmental policies, regulations and standards. It also enables the development of industries that serve to protect the state's environment. In other words, achieving environmental standards and requirements creates demand for properly trained workers and for new technology, which in turn stimulates new industries. Overall, more than 200,000 Californians are employed in environmental technology industries today.

As the protection and enhancement of California's environment is dependent on workforce development, so is workforce development dependent on the state's environment. California's tourism industry must have enough sufficiently developed workers to maintain its status as the state's third largest employer, which currently supports more than one million jobs. Because California is such a desirable place for people to live, the State benefits from the attraction of a diverse population which feeds its workforce. Successful workforce development and maintaining California's environmental quality are mutually dependent.

Ensuring equity for both workers and employers is of great importance to and strongly supported by the state's workforce development system. For workers, this means equity with regard to access to employment opportunities, promotional opportunities, job training and placement services, job retention-related efforts, wages, and benefits. It also includes worker protection programs that ensure safe, healthy work environments. For employers, this means equity with regard to access to a skilled workforce, employee training programs, and other business services. Workforce development can also minimize the number of people living in poverty by helping the unemployed obtain jobs and by preparing the current workforce to obtain higher wage jobs and jobs with better benefits. By promoting workforce development, the state promotes industries that invest in workers and value their contribution to business success.

California's Workforce Development System: Challenges and Recent Reform Efforts

California's current $4.6 billion workforce development system is a patchwork of 34 job-training programs administered by 14 different state entities. These entities, also called "partners," can be generally classified into one of the following categories: public educational entities, employment and training agencies, private post-secondary institutions, worker protection programs, social service programs, community-based and nonprofit organizations, and in-house business and industry training.

California's workforce development system is already a source of pride for the State even though it is still developing. However, the system is confronting three primary challenges: (1) the need for easier navigation, or greater accessibility, for both individuals and businesses; (2) the need to develop and offer training and lifelong learning opportunities that are aligned with the ever-changing demands of employers in both traditional and emerging industries; and (3) the need to eliminate duplication and resource inefficiency.

These challenges emanate from the system's fragmented organization, and obstacles complicate addressing these challenges. One challenge is that federal and state funding priorities and mandates emphasize individual partners and programs with distinct missions, expenditure requirements, administrative structures, accountability systems, and special populations or unique functions. In addition, federal funding, which is the primary source of funding in the state's workforce development system, has been consistently reduced in recent years and the State is unable to compensate for the reduction due to its own budget shortfall. Finally, while efficient when viewed in its entirety, the state's organizational structure is based on decentralized delegation of authority.

Recently, both the federal government and Governor Davis have taken measures to resolve the issues emanating from fragmentation:

- The federal Job Training Partnership Act of 1982 (JTPA) was designed to reduce the impacts of fragmentation by establishing stronger networks between workforce development partners.
- The federal Workforce Investment Act (WIA) of 1998, which replaced the JTPA, established the state's One-Stop system that relies primarily on partnership, coordination, resource sharing, and shared strategic planning.
- Governor Davis, not satisfied with progress made by federal efforts, created the California Workforce Investment Board (CalWIB) by Executive Order in 1999 to advise and assist in planning, coordinating, and implementing the provisions of California's workforce development programs and services as they relate to WIA.
- Governor Davis also launched a workforce development reform initiative in his 2001 Budget Summary that included significant reforms, including the establishment of a State Labor and Workforce Development Agency to oversee the critical worker protection, employment security, and workforce training programs; reshaping public policy through the establishment of broad, industry-based initiatives that benefit workers and employers; and building partnership among the state's workforce development partners at both the state and local levels.

A Foundation for Future Reform Efforts

Recent reform efforts targeting the negative consequences of fragmentation in the state's workforce development system are proving successful. Moreover, the efforts can be viewed as the beginning of a larger effort to assure California's workforce development system is sufficient to meet future demands. As California's global economy continues to grow and as its traditional and emerging industries become more coordinated, a cost effective and result-oriented workforce development system is needed. The following recommendations provide a framework for future state efforts to modify California's workforce development system to meet future demands of employers in a coordinated, cost-effective, and results-oriented manner as California's employment trends shift:

1. Improve awareness of, and access to, employment and training programs for unemployed workers, workers seeking skill upgrades, and employers.
2. Improve the workforce development system's focus on providing skill upgrade training for the already employed, especially on the "working poor". Most of the state's workforce is already employed, and more system focus should be placed on helping people maintain employable skill sets, achieving higher paying jobs, and increasing their standard of living.
3. Create more job training partnerships between the state's workforce development partners, the state's education system partners, and private sector entities. Many of the Governor's efforts to establish such programs are proving highly successful.
4. Improve the collection and application of employment data needed for developing comprehensive labor and workforce development policies and strategies.

5. Improve the workforce development system's coordination and collaboration with the state's education system, including K-12, Community Colleges, State Colleges, University of California System, vocational education programs, and apprenticeships, to establish new and stronger relationships for improving coordination, resource sharing, and common strategic planning.
6. Collaborate with the state's education system to improve the connection between educational curriculum and industrial demands.
7. Better link job training to labor market and industry demands and to growth opportunities.
8. Standardize terminology among the workforce development entities with an emphasis on private sector jargon to help facilitate coordination between the partners and to make the programs more user-friendly by workers and employers.
9. Increase coordination between State and federal job training programs that help new and incumbent workers.
10. Assist small businesses that do not have the time and/or resources to adequately access the state's workforce development system.
11. Develop programs that help guide youth from school to job training and career development programs and/or to gainful employment.
12. Fund what works. This involves increasing accountability indicators and emphasize funding on programs with proven success for: strengthening coordination between the state's workforce development partners, improving access to programs, creating employment opportunities, training people to acquire in-demand skill sets, and enabling workers to earn higher paying wages.
13. Provide funding preferences to workforce development programs that promote coordination and collaboration between partners.
14. Encourage workforce development programs to reflect the needs of larger regional marketed rather than the needs of a single small community.
15. Consider workforce development aspects when developing land use, transportation, and housing policies. The cost of land, commute times, and poor land use planning can discourage business operations in an area, especially with high-value added jobs that can usually locate anywhere in the world.
16. Block grant all existing job-training funds, to the extent permitted by federal law, to consolidate the focus of resources to the various workforce development needs.
17. Enhance the State’s Labor Law enforcement efforts that protect workers and employers who abide by the State’s labor laws. Enhanced enforcement efforts will benefit the State’s legitimate employers by eliminating unfair competition when illegal businesses operate in an underground economy.

OPPORTUNITY: A Hydrogen Fueled Economy

One of the most promising responses to the multiple challenges of global climate change, finite fossil fuel supplies, as well as air, water and land pollution is the development of new and more efficient hydrogen technologies to meet the world's energy need.

The transition from a fossil fuel-based economy to a hydrogen fueled economy will require a significant worldwide paradigm shift that both challenges and enhances the basis upon which global economies operate. In 2002, California imported 53% of petroleum, 23% of electricity, and 83% of the natural gas it used.[259] An economy and lifestyle supported through hydrogen-generated electricity and hydrogen-fueled vehicles would allow California virtual independence from existing fossil fuel limitations.

California has consistently been a leader in economic and technological change, with a long history of environmental consciousness, support for technological innovation, and economic prowess, that will assist California in continuing to lead the world's transition to a hydrogen-fueled economy.

Hydrogen Technologies

Hydrogen can be used in almost any application in which fossil fuels are being used today but also has specific advantages for more efficient advanced and emerging technologies such as fuel cells. Hydrogen can be used as a fuel in furnaces, internal combustion engines, turbines and jet engines, in the same way and in some cases even more efficiently than fossil fuels, i.e., coal, petroleum and natural gas. Automobiles, buses, trains, ships, submarines, airplanes and rockets can run on hydrogen. Hydrogen can also be converted directly to electricity through fuel cells, with a variety of applications in transportation and stationary power generation. [260] Hydrogen is also a valuable feedstock for a variety of manufacturing processes, and its renewable production will further reduce use of natural gas.

Today, most hydrogen in the United States, and about half of the world's hydrogen supply, is produced from natural gas. Although natural gas will likely provide the earliest affordable transitional conversion energy source for the production of hydrogen, electrolysis of water is another currently available option. An emphasis on the use of renewable energy sources is essential.

The Changing California: Homes, Businesses, and Neighborhoods

Future applications of hydrogen technologies will impact our everyday lives in profound ways. As an example, homes could be equipped with compact independent hydrogen energy appliances that create and store hydrogen, and make electricity to run our lights, computers, refrigerators, washers, dryers, air conditioners, and other appliances. California's hydrogen fueled future is one in which communities and households will be able to control their own basic needs such as the availability and cost of energy, water and waste disposal.

The distribution of the raw material feedstock (water) for hydrogen production by electrolysis, can be accomplished using the same infrastructure we use for water distribution today. The electricity needed for hydrogen production could come from local distributed generation equipment, such as roof-top photovoltaics although the area required might be rather large. Integrating hydrogen conversion in fuel cells with photovoltaics and other direct-current generating devices could also lead to major changes in the way electricity is distributed with greater reliance on direct current mini- or microgrids and less reliance on overburdened central grid systems.

Transitioning to a Hydrogen Fueled Economy

The transition from a fossil fueled economy to a hydrogen fueled economy will require substantial public and private investments including the production and distribution of hydrogen fuel, development of clean technologies to utilize hydrogen fuel, development of standardized codes for the conversion, construction and development of

[259] California Energy Commission, Chart – California's Major Sources of Energy, 8/11/03.
[260] International Association for Hydrogen Energy, Coral Gables, Florida.

hydrogen-fueled vehicles and facilities, and development of the infrastructure to support them. Continued research and development is necessary in storage, materials sciences, and technologies related to hydrogen.

Making these investments will be cost-effective in the mid-to long-term as hydrogen provides the best opportunity for reducing or eliminating air pollutants and greenhouse gas emissions and providing energy diversity, security, and independence.

The State can play an integral role in advancing the development of this infrastructure through the implementation of a focused integrated strategy which includes partnering with the private sector for: construction of the initial refueling stations; purchasing of hydrogen fueled vehicle fleet; support for general and applied research through state agencies and at public universities; and development and conversion of state buildings to hydrogen fueled appliances.

One way to enhance the transition to the hydrogen fueled economy is through the "energy station" concept. As an added benefit, hydrogen refueling stations can also produce hydrogen for stationary power users, thereby reducing peak demand for electricity, acting as a the core generator for a distributed generation system, and/or providing emergency back-up power for essential services such as hospitals and clinics.

Establishment of more hydrogen refueling stations is an initial and critical step in the transition away from our almost total dependence on fossil fuels for energy. Currently, there is a small but growing number of hydrogen refueling stations operating in California. Increasing the availability of hydrogen refueling stations will stimulate the production and sale of more hydrogen-consuming cars as well as other appliances in California. Effective policies will need to be initiated to leverage more private sector development of this type of infrastructure to support hydrogen-fueled vehicles and facilities.

California's aggressive implementation of its Renewable Portfolio Standard will produce more renewable power which will in turn produce more hydrogen through electrolysis. This is also placing a greater emphasis on the need to adopt standards and support innovations in technologies to make the conversion and use processes more cost effective and efficient.

Various government agencies and international associations are making great progress toward implementation of the hydrogen economy. The federal government, particularly through the DOE, DOD, and EPA, and the South Coast Air Quality Management District have been especially effective in promoting fuel cell development and hydrogen infrastructure. There are also Associations all over the world, including the National Hydrogen Association, the American Hydrogen Association, the Canadian Hydrogen Association, the European Hydrogen Association, the French Hydrogen Association, the German Hydrogen Association, the National Hydrogen Association of Australia, to name a few, who are pursuing standardization, safety, and other issues in pursuit of a common vision for achieving the hydrogen fueled economy.

Industry and Government Partnerships in Hydrogen Technologies

The California Fuel Cell Partnership, established in 1999, has delivered great value to the member companies, including automakers, fuel suppliers, government agencies, and technology companies, by providing a public venue to demonstrate their prototype vehicles, put miles on the cars, educate the public, and gain valuable real-world experience.

The California Stationary Fuel Cell Collaborative was created in 2001 to support the use of hydrogen fuel cells by state, local and public agencies as well as private business. The Collaborative has set a minimum goal of 50 to 250 MW of installed fuel cell electricity capacity in California by the year 2006.

Collectively, these types of partnerships and collaborations are essential in ensuring coordination of hydrogen efforts and in increasing the public's awareness of the opportunities and advantages of hydrogen-fueled vehicles and stationary uses.

OPPORTUNITY: Corporate Social Responsibility

State government cannot achieve its vision of a more sustainable society where everyone benefits from a vibrant economy and a constantly improving environment without the participation of key stakeholders including local government, the nonprofit community, civic leaders, the business community and engaged individuals.

This section discusses the growing Corporate Social Responsibility (CSR) movement and how the business sector has increasingly become aligned with sustainable development principles as both a market approach and a strategy for ensuring the long-term viability of business.

What CSR?

Business approaches to CSR vary among regions as well as industries. Historically, U.S. companies have equated CSR with corporate philanthropy, i.e. contributions to the social good (outside of its primary work) such as the Ronald McDonald House and youth baseball team sponsorship. Other regions in the world, the EU in particular, demonstrate CSR through the pursuit of sustainable business practices including the use of recycled products, purchase of renewable energy, and humane labor practices.

Supporters of CSR, such as the World Business Council on Sustainable Development, encourage companies to embrace CSR as a strategy for enhancing shareholder value through improved corporate image. CSR is also a way to reduce risks associated with externalities like increased taxes and regulation on GHG emissions, disruptions in supply chain due to labor disputes and conservation of natural resources which may be needed for the long term by business and industry.

Government Policies Driving Business Practices

Although the United States has chosen not to ratify the Kyoto Protocol, a majority of industrialized counties in the world have, including Canada, Australia, Japan and all of Western Europe. Signatories to the Kyoto Protocol have agreed to meet certain specific reduction targets for GHG emissions during the first compliance period of 2008 to 2012.

As these countries move toward implementation of the Kyoto Protocol, they will be adopting policies to ensure that the GHG reductions targets are met. Approaches to emission reduction may include voluntary and/or mandatory reduction targets as well as financial incentives and disincentives through tax structures and offsets.

Access to Markets

Companies like Coca-Cola are looking for carbon credits, recycled materials for operation and reducing its consumption of natural resources because they want to be identified as a good corporate citizen and retain their ability to sell in western industrialized counties which have signed on to Kyoto.

Multi-national corporations that wish to sell products or services in these global markets may have to demonstrate that they are operating in a manner that not only reduces GHG emissions, but also that they meet a variety of other social and environmental requirements that have come to be understood as sustainable business practices.

Changing Investment Practices

Financial and insurance institutions are major investors in global financial markets with assets over $25 and $10 trillion, respectively. Environmental risks to these entities include direct risks, where the institution itself creates the environmental problem, and indirect risks, where the institution is affected by actions of another party such as a borrower or an investor.

The concept of risk management was introduced to business by the insurance industry over 50 years ago. In the late 1980's institutions applied these systemic risk management methods in response to the new U.S. "Superfund" laws. This new liability caused lenders to initiate environmental risk programs and adopt due diligence policies to avoid direct liability as well as the indirect financial losses associated with borrowers' liability.

Today, these same risk management concepts are being used by insurance and financial institutions to reduce their potential liability on GHG emissions and other social and environmental challenges to sustainable development.

Global CEO Study

In a study of nearly 1 million CEOs from 43 countries, the main reason for an interest in sustainable business practices is concern about reputation and brand.

79 % agreed that sustainability is vital to the profitability of any company. This is a 10% increase over the previous year's response.

71% said they would sacrifice short-term profitability in exchange for long-term shareholder value when implementing a sustainability program.
Price Waterhouse Coopers 2002

Large institutional investors are also increasingly scrutinizing corporate social and environmental business practices as a means of analyzing the business'ability to succeed in the marketplace. International institutional investors like CalPERS, the nation's largest public pension fund with assets totaling over $137.8 billion[261], have begun to insist on greater disclosure and improved business practices.

In March 1999, CalPERS adopted the global Sullivan Principles, which pledge that the funds will be used to "support human rights, protect human health and the environment, and promote sustainable development." The global Sullivan Principals also commit CalPERS to "promote the application of these principles by those with whom they do business."[262]

CSR and Sustainable Stock Indexes

The Domini 400, the first stock index to specifically track companies based on sustainable development practices, was launched in May of 1990. It is primarily comprised of large U.S. companies, 250 of which also appear on the Standard and Poors 500. In August of 1999, Dow Jones & Company established the **Dow Jones Sustainability World Index (DJSI World)** – the first major tracking of the financial performance of companies following sustainable business practices on a global basis.

DJSI is comprised of the top 2,500 companies in the Dow Jones Global Index including 307 companies from 62 industries in 26 countries with a combined market capitalization of $5.5 trillion.[263] Two years after the DJSI World was established, the leading European index provider, STOXX LTD, started the Dow **Jones Sustainability STOXX** Indexes as a benchmark for European investments.

Return on Investments

The Domini Social Equity Fund was established to provide investors with a mutual fund that tracks the index. Return over the last ten year period was 9.74 % as compared to 8.22% as tracked on the Dow Jones Global Index (nonsustainable index).
August 2003

It is noteworthy that these sustainability indexes are not exclusively about renewable energy and natural food companies. They track business behaviors of a broad and generally diversified range of companies such as Avon, Coca-Cola, Dell Computer, Gillette, Green Mountain Coffee, and Safeway.

Increasingly, major companies are competing for favorable positions on these indexes to demonstrate good corporate behavior for the purpose of attracting and maintaining shareholders. Some indices like the Domini 400 have also established related mutual funds. While a decade ago there were a limited number of green funds, today investors have a broad array of mutual green funds to choose from.

[261] CalPERS website, source site April 2003
[262] page xxiv, Beyond Good Deals, July 2002
[263] Walking the Talk: The Business Case for Sustainable Development, Greenleaf publishing, page 37,

Voluntary CSR Commitments

Responding to market influences, a growing number of businesses and financial institutions have also signed onto voluntary CSR commitments including the United Nations Environmental Program (UNEP) Financial Initiative and the Coalition for Environmentally Responsible Economies (CERES). By making an environmental commitment, companies pledge to work towards achieving a balance between short-term gains, economic development, the welfare of people and a long-term enhancement of the environment. Generally these commitments acknowledge the principle of sustainable development and the precautionary principle, and that these principles will be addressed in their internal and external business opportunities.

As of June 2003, 195 companies from 50 countries have signed UNEP Financial Initiative banking statements and 90 companies from 27 countries have signed the insurance industry commitment. Key companies include Barclays' Group, Citigroup, Credit Suisse Group, FleetBoston Financial and Lloyds TSB Bank.

CERES is primarily a U.S. based sustainable development organization representing a coalition of investor, environmental, labor and public interest groups with over $300 billion in assets that are working together to increase corporate environmental responsibility worldwide. The 70+ companies that have signed on to the CERES sustainability principles include: American Airlines, Bank of America, Catholic HealthCare West, FleetBoston, Ford Motor Company, General Motors Corporation and Sunoco.

CSR and Environmental Goals

The carbon registries being established around the world, including California, are providing a market for carbon credits for companies which need to demonstrate GHG emission reductions. Another movement toward creating a market for environmental assets to help finance sustainable development is the Renewable Energy Certificate (REC). These certificates provide a unique mechanism for selling the environmental attributes separate from the underlying electricity.

Who will purchase the RECs? In September 2003, the World Resources Group and the Green Power Market Development Group announced new green power contracts entered into during the past year totaling 97 MW (enough energy to power 73,000 homes) through 250 facilities in 22 states. Companies participating in the Green Power group include: Alcoa Inc, Cargill Dow LLC, Delphi Corporation, The Dow Chemical Company, DuPont, General Motors, IBM, Interface, Johnson & Johnson, Kinko's, Pitney Bowes, and Staples. These purchases represent the largest corporate fuel cell and renewable energy certificate agreements in the United States.

If there is meaningful value assigned to RECs, it could become a new source of funding for the development of renewable energy generation facilities, and could be used by companies to demonstrate good corporate citizenship.

CSR and Community Development Goals

Beyond environmental mitigation efforts, CSR is also being effectively used to meet the needs of poor and underserved communities. As an example, the Community Capital Investment Initiative (CCII) was established in 2001 by the San Francisco Bay Area Council to leverage the CSR needs of businesses and promote smart growth in priority low-income neighborhoods.

The Bay Area Family of Funds was established to provide investment tools for CCII. They include real estate, business equity, and brownfield clean-up funds. The brownfield cleanup fund has raised over $35 million and extended credit totaling over $7 million since 2001. These professionally managed funds assure a market rate of return as well as achievement of social equity and environmental criteria. Investors in the brownfields fund include Bank of America, Bank of the West, Cedars Bank, Citibank, Greater Bay Bancorp and Washington Mutual.

Sustainable Development Practices and Managing Financial Risk

In general, banks and insurance companies operating in California are changing how they assess environmental risks, demonstrating the openness and transparency of their operations, managing more closely the origin of natural resources and materials, and allowing more time to evaluate projects and activities.

Swiss Reinsurance Company, a major insurer providing coverage worldwide, has begun to directly ask clients to explain what steps they are taking to prepare for the potential government regulation of GHG emissions, and assigning premiums accordingly.

Citigroup has established an Environmental Affairs Unit to coordinate an overall corporate approach to environmental sustainability issues and communication with stakeholders. They have also established a senior level Environmental and Social Policy Review Committee, adopted an Environmental Policy Statement and a Statement on the Financing of Investments; signed on to the UNEP Financial Initiative and participated in other industry environmental groups, i.e. Environmental Bankers Association.

What drives companies like Citigroup to move forward on these issues, according to WBCSD in its book *Walking the Talk: The Business Case for Sustainable Development*, is competition. "Being better at CSR than one's competitors is going to become more and more advantageous as the century advances and as the society's expectations of business continue to change."[264]

[264] WBCSD, Walking the Talk: The Business Case for Sustainable Development, page 105

CHAPTER 4: GOALS AND POLICIES

The following goals and policies are intended to encourage sustainable development through state government actions. Goals and policies must attack the underlying causes of the problems or impacts that manifest themselves in our economic, natural and social environments, as well as the problems themselves. Achieving these goals will require collaborative planning at and among all levels of government, with the State taking the lead.

These goals and policies are:

- State-oriented, able to be implemented by the State.
- Consistent with the three state planning priorities.
- Grounded in the facts presented in this report.
- Translatable into an implementation plan.
- Clear in identifying desired outcomes.
- Cross-cutting, achieving broad objectives that transcend issue or agency boundaries.

Each of the following broad goals, and the related policy recommendations to achieve them, will streamline and unify the work of state government in its efforts to achieve sustainable development.

Local governments are encouraged to use these goals and policies, as appropriate, in developing mission statements, general plan policies, and other expressions of the community's vision for their future.

Goal 1. Communities that provide affordable housing, economic opportunity, quality schools, parks and civic facilities that enhance the quality of life; and that use land in an equitable and environmentally responsible manner.

Policies:

A. Promote infill development and equity by maintaining, rehabilitating, and improving existing infrastructure that supports infill development, including the appropriate reuse and redevelopment of previously developed, underutilized land that is served by transit, streets, water, sewer, and other essential infrastructure, particularly in underserved areas.

B. Protect environmental and agricultural resources by protecting, preserving, and enhancing the state's most valuable natural resources, including working landscapes such as farm, range, and forest lands; natural lands such as wetlands, watersheds, wildlife habitats, and other wildlands; recreational lands such as parks, trails, greenbelts, and other open space; and landscapes with locally unique feature and areas identified by the state as deserving special attention.

C. When the state provides infrastructure for development other than infill development, such new development shall be all of the following: uses land efficiently; is built adjacent to existing developed areas when feasible pursuant to policy B; is located in an area appropriately planned for growth; is served by adequate transportation and other essential utilities and services; and minimizes ongoing costs to taxpayers.

D. Address the fiscalization of land use by providing stable local and state revenue streams which do not negatively influence the land development process. This realignment the state and local fiscal relationship shall more accurately reflect the programs, services and mandates provided by each level of government.

E. Provide technical assistance and incentives to local governments to promote efficient and sustainable development practices. This includes promoting consistency between the EGPR's goals and policies and local and regional plans.

F. Encourage a balance between job and housing development, at the regional, sub-regional, and community level to reduce the negative impacts of long commutes and automobile dependency.

G. Encourage safe and fiscally sound community planning policies and land use decisions, including discouragement of urban development in or near lands at risk of flooding, fire, or other natural hazards.

H. Promote the construction of sufficient housing for all income levels.

I. Provide for accessible, equitable educational, cultural, and recreational opportunities for all Californians, including multi-use neighborhood schools that support life long learning; libraries, museums, historically significant buildings and sites, and other cultural amenities; and parks, playing fields, trails, and other open space.

J. Provide the public with a transportation network that that increases mobility choices—including public transportation, walking, and biking—and allows equitable access to jobs, community services and amenities.

K. Plan and invest in the efficient expansion of our linear infrastructure, including but not limited to highways, rail, water systems, and transmission lines, to serve development consistent with policies A, B and C.

L. Encourage a robust technology infrastructure to support our society and economy, including wired, wireless, and satellite communications.

Goal 2. A state government that is responsive to regional and local needs.

Policies:

A. Create incentives for efficient and sustainable local government land use planning practices.

B. Seek the meaningful input and participation of all stakeholders, including local government, in the development of medium- and long-range state plans and policies.

C. Consider local and regional plans and seek local input when approving the acquisition or disposal of real property, and in the planning and construction of facilities and infrastructure.

D. Encourage collaboration, integration and transparency of state agency planning activities.

E. Develop networks of local land use planning professionals to share information and to help integrate state and local planning efforts.

F. Encourage regional approaches to problem-solving and encourage cooperation through the establishment and support of, and participation in, regional collaborative planning and resource management efforts.

G. Collect and share information and data with other state agencies, local governments, and regional planning organizations.

H. Support and coordinate the ongoing development and use of Geographic Information Systems (GIS) as a tool to plan for sustainable development at the state, regional and local level.

I. Deliver program and services to communities in an integrated and coordinated manner, reflective of local conditions, for the purpose of improved program and service delivery and reduction in the cost and time burdens to local government, community organizations, businesses and the public.

J. Create a state inter-agency permitting process that provides consistency and minimizes conflicting mandates.

K. Design open and effective means for achieving the participation of nongovernmental organizations in the development, review and implementation of programs and services to help ensure that sustainable development principles are fully embedded in State activities.

Goal 3. An inclusive state whose actions and institutions reflect the diversity of California's population.

Policies:

A. Preserve local, regional and statewide cultural and historic resources.

B. Provide for equitable educational and recreational opportunities for all Californians.

C. Coordinate with local, regional, and tribal governments, and with other public agencies when they are affected by the development and adoption of state plans and policies.

D. Protect traditional tribal cultural sites.

E. Provide opportunities for California's diverse populations to meaningfully participate in the development of medium- and long-range state plans and policies.

F. Encourage the inclusion of youth on advisory boards and the implementation of strategies to assist youth in providing consultation on the future of California.

G. Encourage increased civic engagement by encouraging and supporting the capacity of communities to participate in state and local policy making. Community capacity is developed through, well-designed communities that provide the resources and the environment for civic interaction; access to information that allows for informed participation; an open dialogue between decision makers and community members; and opportunities for residents to participate in meaningful, collaborative policy discussions and decisions.

H. Encourage the development of communities that are accessible to all Californians, including the provision of accessible state facilities.

Goal 4. An economically vital state whose business environment supports innovation and entrepreneurship.

Policies:

A. Promote the establishment and vitality of small- and medium-sized businesses, as well as large business.

B. Encourage and support the implementation of sustainable business practices by all California businesses regardless of size.

C. Encourage trade and cooperation with other states and regions in the world as a means for furthering sustainable economic development within California and around the world.

D. Encourage innovative technologies that address state goals, such as environmental protection; resource conservation; employee safety; and clean, reliable energy sources.

E. Develop and support a workforce development system that will strengthen California's ability to compete effectively in a rapidly changing state and global economy.

F. Maintain California's status as a technological leader through the support of commercial space and satellite systems, information and communication technology, life sciences, digital media and entertainment, nanoscience, agricultural science and technology, and other emergent technologies.

G. Encourage a balanced distribution of jobs and housing within a region so that employees have the opportunity to live within reasonable distances of their jobs, and so that business expansion and worker productivity are not hampered by long commute times.

H. Ensure the continued viability of agriculture as an economic sector in California, while promoting the development of more sustainable industry-wide practices that reduce the impact on the environment and natural resources, and promoting an increased quality of life for agricultural workers.

I. Promote the active participation of workers in the decision making process for how to more fully implement sustainable development practices into the workplace.

Goal 5. A healthy and sustainable environment for all Californians.

Policies:

A. Promote policies and investments that conserve our natural resources and protect biodiversity for the enjoyment, economic prosperity, and quality of life of future generations.

B. Improve air quality for all Californians by promoting and investing in technology such as renewable energy sources for mobile and stationary purposes, promoting the use of hydrogen and other alternative fuels and low polluting vehicles, and encouraging development that supports transportation choice.

C. Promote development practices that improve water quality by protecting the natural functions of watersheds and aquifer recharge areas.

D. Support new technology and conservation efforts to reduce water usage in the business, agriculture, institutional and residential sectors.

E. Incorporate green building principles and materials in state facility planning and investment, construction and operations, and provide outreach and technical assistance to other government entities, such as school boards, cities, counties, and private developers to encourage their adoption of these practices.

F. Encourage the participation of state agencies in the creation and adoption of regional habitat conservation plans such as Natural Communities Conservation Plans (NCCPs) and Habitat Conservation Plans (HCPs).

G. Promote sustainable use and conservation of coastal and marine resources.

H. Improve coordination of regional efforts to conserve fragile mountain ecosystems while supporting compatible and appropriate economic development to maintain viable and sustainable rural communities.

I. Evaluate all policy and project decisions to ensure that they do not result in an inequitable environmental burden being placed on low income or minority communities. Distribute the benefits and burdens of state infrastructure, facilities, and investments equitably throughout the state.

J. Promote a widely held ethic of stewardship that encourages responsibility by individuals, institutions, corporations, and governments for the economic, environmental, and social consequences of their actions and for clean up and/or mitigation.

K. Promote compact, higher density residential development patterns to maintain and enhance agricultural and natural resources.

Goal 6. Safe, reliable energy to meet California's needs.

Policies:

A. Promote energy conservation and efficiency.

B. Encourage research and development of renewable energy sources to meet an ever-increasing percentage of California's energy needs, including wind, solar, geothermal, biomass and small hydroelectric.

C. Encourage significant reductions in, or elimination of, the use of fossil carbon as a fuel/energy source.

D. Establish achievable targets for greenhouse gas emissions that are incorporated into regulatory programs and reflected in subsequent investments in greenhouse gas reduction.

E. Analyze cumulative effects of proposed government actions on total greenhouse gas emissions and require feasible mitigation measures that would achieve greenhouse gas emission and fossil fuel use reduction targets. Provide technical assistance to state and local agencies to perform these analyses.

F. Invest in, and encourage private investment in, the infrastructure for production and delivery of hydrogen.

G. Ensure California's energy security through all of the policies A-F above.

CHAPTER 5: IMPLEMENTATION

The purpose of this implementation chapter is to provide guidance to the Governor's Office and state agencies on implementing the goals and policies articulated in this EGPR. This chapter will bridge the gap that too often exists in state policy documents between goals and policies, and clear strategies for implementation. The discussion below focuses primarily on process, identifying a general roadmap of strategies to approach implementation of the goals and policies of this report. Key details and specifics on a final implementation program (who, what, when) will be developed through the process outlined below.

The implementation process that follows will encourage state agencies to work outside of their "silos" and collectively focus on achieving sustainable development, which is the principle that ultimately guides this EGPR.

Criteria for Success

In order for this implementation process to achieve a successful final implementation program, the following concepts must be embraced at the outset:

- State actions must conform to the mandates set out in the EGPR statutes, including the provisions of Assembly Bill 857 (Chapter 1016, Statutes of 2002).
- All state agencies must be allowed to participate and be permitted to measure and monitor their success.
- Changes in state agency and department activities must be phased rather than attempt sudden and simultaneous changes across the board. The initial focus should be on those state agency actions that have the largest influence on the human, natural, and economic environments.
- There must be some flexibility to allow state agencies to get the job done. There must be sensitivity to the unique differences in the ways that each agency operates and funds projects.
- Consideration must be given to the fiscal constraints placed upon state agency budgets.
- Clear and consistent results must be produced for the public, state agency staff, and other interested parties.
- Conflicts among state agencies must be honestly and openly dealt with as they arise.

Mandates of EGPR Statutes

The EGPR statutes contain specific language related to its implementation and the implementation of the goals and policies set out in this report. Specifically, Government Code Section 65042(b) requires:

By January 1, 2005, every officer, agency, department, and instrumentality of state government shall:

- Ensure that their functional plan is consistent with the state planning priorities, and
- Annually demonstrate to the Governor's Office of Planning and Research (OPR), and to the Department of Finance when requesting infrastructure pursuant to subdivision (a) of Section 13102 of the Government Code, how the plans are consistent with those priorities.

In addition to the above, Government Code Section 65049 requires that:

- Following the approval of the Environmental Goals and Policy Report, the report shall serve as a guide for state expenditures, and
- When transmitting the annual budget to the Legislature, the Governor must include information relating proposed expenditures to the achievement of statewide goals and objectives set forth in the EGPR.

The authors of AB 857 recognized the sensitive and complex nature of implementing the goals and policies of the Environmental Goals and Policy Report. As a further requirement, Government Code Section 65404(a) directs the Governor to develop a conflict resolution process by January 1, 2005 that shall:

- Resolve conflicting requirements of two or more state agencies for a local plan, permit, or development project,
- Resolve conflicts between state functional plans, and
- Resolve conflicts between state infrastructure projects.

Components of the Implementation Process

The following outline establishes the process to be followed in developing a final implementation program.

1) Governor's Executive Order

   The Governor shall rescind Executive Order B-41-78 which implemented the 1978 EGPR, and issue an Executive Order adopting the current Environmental Goals and Policy Report. The Executive Order shall direct all state entities (state agencies, departments, offices, commissions, boards, and officers) to standardize their operations to conform to the goals, policies, and implementation process contained in the report. The Executive Order shall be transmitted to every state entity and the State Legislature.

2) Interagency Working Group

   OPR shall convene and chair an interagency working group to further define, establish, and guide the implementation program. The working group shall be formed immediately following adoption of the EGPR and issuance of the new Executive Order.

   a) The initial working group shall consist of representatives from all appropriate state entities. The composition of the working group shall be determined by OPR. OPR staff, with assistance and cooperation from all state entity staff, shall serve as staff to the working group.

   b) The duties and responsibilities of the working group will include, but not be limited to:

      (1) Develop criteria to determine conformance of state plans, programs, funding proposals, and other related actions with the goals and policies of the EGPR and the planning priorities of AB 857.

      (2) Conduct a survey of state entities to identify their plans, programs, actions, investments, statutory mandates, and other relevant items.

         (a) Identify whether state entities' plans, programs, actions, investments, statutory mandates, and other relevant items conform to the EGPR and planning priorities of AB 857 and if not, why they do not.

         (b) Assess whether state entities' plans, programs, actions, investments, statutory mandates, and other relevant items may have succeeded or failed in achieving the intended outcomes of the EGPR and the planning priorities of AB 857.

            (i) Identify all barriers or conflicts.

            (ii) Identify any successful methods that may serve as examples or best practices.

      (3) Identify methods and practices that will assist state entities to work together in a cooperative and efficient manner.

      (4) In coordination with the Department of Finance, develop a standardized format for annually demonstrating whether state entity infrastructure funding requests, as identified in state plans, programs, and budget documents, are consistent with the EGPR and the planning priorities of AB 857.

(5) Create a process for state entities to report to OPR and DOF as required by Government Code Section 65042(b).

(6) Develop a mechanism or incentives to reward performance by state entities.

(7) Develop a monitoring process to track performance of state entities.

(8) Develop strategies for encouraging and incenting sustainable development practices at the local government level.

(9) Develop a participation process to allow public and non-state entity comments and suggestions on the development of the implementation program.

3) Conflict Resolution

OPR shall develop a conflict resolution process by January 1, 2005 for interagency conflict resolution as specified in Government Code Section 65404(a).

4) Timeline

In order to meet the deadlines established in Government Code Sections 65042(b) and 13102 (c)(1), execution of this implementation process shall commence immediately following adoption of this EGPR.

5) Periodic Review of EGPR

Pursuant to Government Code Sections 65048 (a) and (b), OPR shall:

a) Establish a process to assure that the EGPR will be revised, updated, and transmitted to the Governor and the Legislature every four years, and

b) Establish a process to annually report to the Governor and to the Legislature regarding the status of implementing the EGPR.

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