

# California's Central Valley— Confluence of Change

Harold O. Carter & Carole Frank Nuckton, Editors

University of California, Agricultural Issues Center



The editors thank Julie Spezia and Ray Coppock for their contributions in producing these proceedings.

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Proceedings of symposia sponsored by the  
University of California Agricultural Issues Center  
May 3rd 1990, in Sacramento and  
June 5th 1990, in Fresno

# Confluence of Change

We don't presume to have "solved" the many problems facing the Valley. Our thesis is: The Central Valley is an irreplaceable resource; if we understand what is happening to it, then we have a chance to influence its future.

## Hal Carter:

These pages present highlights of the UC Agricultural Issues Center's two symposia on California's Central Valley—May 3rd, 1990, in Sacramento and June 5th in Fresno. Rather than present the material in the chronological order that it occurred at the symposia (as in a proceedings), we have rearranged the material topically so that the story of the Valley, its opportunities and challenges, can be told in a more meaningful, interesting way. The conferences were based on the Center's two-year study of the many forces of change in the Central Valley. We found that there were both positive and negative changes, and we attempted to draw attention to the inter-connections among these forces. We hope to show how all the issues "hang together." And how agriculture affects and is affected by the changes going on.

The study was divided into several teams by topic—(1) population growth, urbanization, and demographic change; (2) transportation; (3) water, air, land, and biological resources; and (4) institutional influences. The leaders of these topical groups were the speakers at the symposia.

The project received valuable input from over 60 university researchers on five UC campuses. Other experts from the state university system, various state agencies (the Air Resources Board, the Department of Water Resources, the Department of Conservation), the American Farmland Trust, the U.S. Soil Conservation Service, and the Water Education Foundation also contributed to the study.

An important role was played by the workshops conducted by the study teams out in the state and on the Davis campus. These are described and participants acknowledged on the following pages.

## Ken Farrell:

The Agricultural Issues Center's study, its two conferences, this book, subsequent study-group reports, and other follow up provide important steps in the direction of addressing the many issues confronting California's Central Valley—population growth, demographic change, economic expansion, transportation problems, water supply and quality, air pollution, land use conflicts, and effectiveness (or lack of effectiveness) of current institutional structure to meet the challenges. We want you to get from these materials a vision for the future of the Valley—having been made more aware of the threats to that future. There is still time to plan, but the planning must be now before all these pressures fall full force on the Valley and its unique agricultural system.

*Central Valley: Confluence of Change*

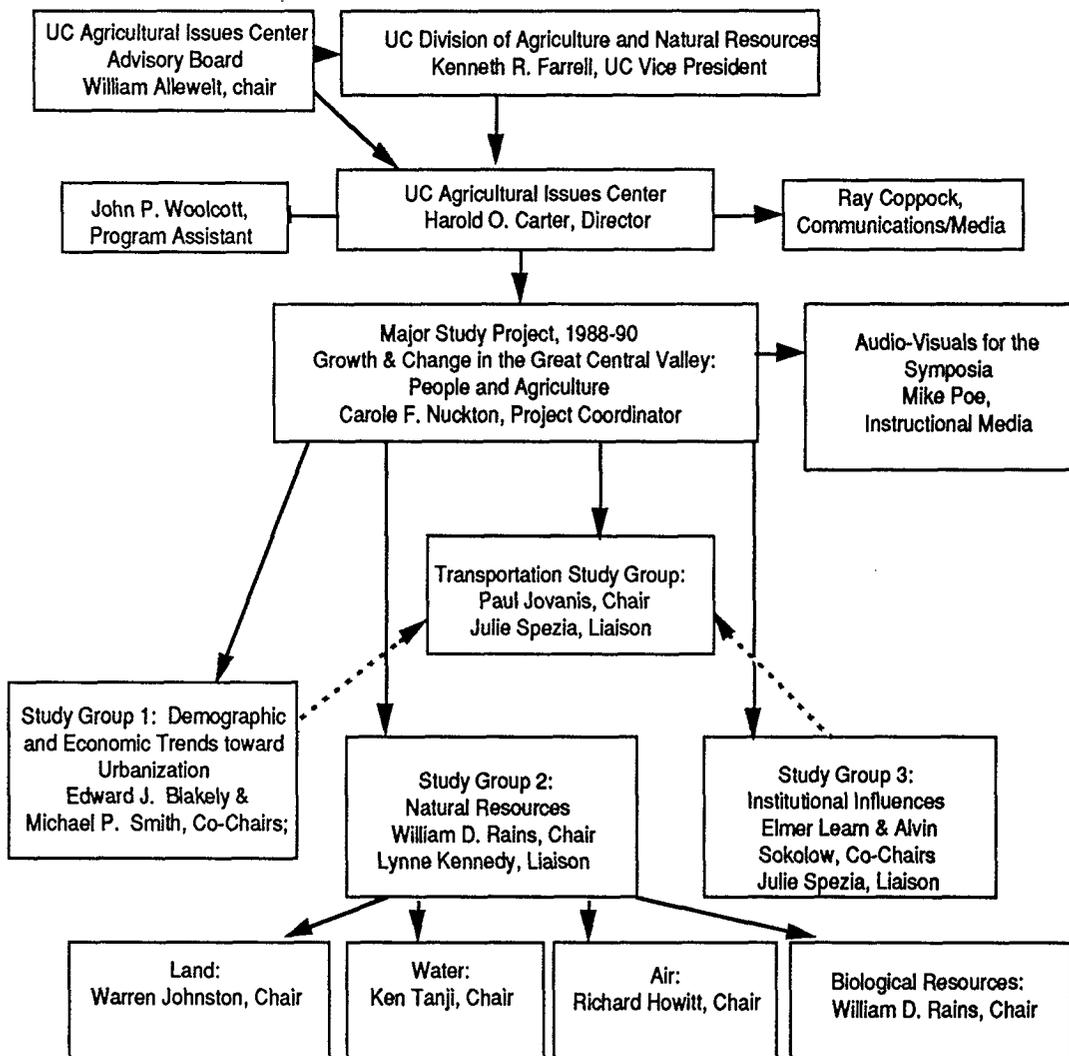
Finally, an important contribution to the study project was made by the excellent panelists at the two symposia who brought broad experience and offered expertise from diverse fields. Their comments are placed topically alongside the presentations, as appropriate. Also, the panelists' input will be incorporated into the final study-group reports.

The symposia and this book are intermediate in the Center's effort. During the study project the Center worked with the Cooperative Extension Regional Directors\* and with Cooperative Extension county contacts\*\* to lay the groundwork for extending the project to others in the state. The Division has now appointed a special committee to see that the work is extended at the community level.

\*William R. Hambleton, San Joaquin Valley; Nicelma J. King, North Central; Terry Salmon, North Counties.

\*\*Allison M. Beale, Sacramento County; J. Hodge Black, Kern County; Ernestine Ivans, Kings County; Tom Kearney, Yolo County; Ronald S. Knight, Tehama County; Curtis Lynn, Tulare County; Dick Bethell, El Dorado County; Lawrence Clement, Solano County; Roger Ingram, Nevada County; Gary Johnston, San Joaquin County; Laurel Kubin, Colusa County; Raymond Lyon, Glenn County; Maxwell Norton, Merced County; Jerry Smith, Butte County; Wallace E. Tyler, Shasta County; Charles Wilson, Sutter-Yuba Counties; Phil Osterli, Stanislaus County; Bob Sheesley, Fresno County; Rocky Teranishi, Madera County; Garth Veerkamp, Placer-Nevada Counties.

**Study Flow Chart**



# Symposia Participants:

(Brief biographical statements for all symposia participants are found at the end of this volume.)



Harold O. Carter, Director  
UC Agricultural Issues Center



Kenneth R. Farrell, UC Vice President  
Division of Agriculture and Natural Resources

## Keynoters:

Sacramento



Dan Walters  
Author and Political Columnist

Fresno



Charles Hess,  
Assistant Secretary for Science and Education  
US Department of Agriculture

People Pressures



Edward Blakely  
City and Regional Planning  
UC Berkeley



Paul Jovanis  
Civil Engineering  
UC Davis



Tom Hazlett  
Agricultural Economics  
UC Davis

Panelists, Sacramento



Steve Juarez  
Assembly Gov. Efficiency  
& Consumer Protection  
Committee



Grantland Johnson  
Sacramento County  
Board of Supervisors



Deena Sosson  
Econ. Dev. Adm.  
Sacramento



Donald E. Swartz  
Blakeley Swartz Co.  
Chico

Panelists, Fresno



Bill Briam  
Council of Governments  
Fresno



Bill Jirsa  
The Grupe Co.  
Fresno



Roberta MacGlashan  
LAFCo &  
Long-range Planning  
Tulare County



Hugo Morales  
Radio Bilingue  
Fresno

**Resources At Risk**



D. William Rains  
Agronomy & Range Sci.  
UC Davis



Kenneth K. Tanji  
Land, Air, Water Resources  
UC Davis



Richard Howitt  
Agricultural Economics  
UC Davis



Warren Johnston  
Agricultural Economics  
UC Davis

**Panelists, Sacramento**



Paula Carrell  
Sierra Club  
Sacramento



Grant Chappell  
Rice Farmer  
Sutter County



Robert Potter  
Dept. of Water Resources  
Sacramento



Jananne Sharpless  
Air Resources Board  
Sacramento

**Panelists, Fresno**



Judy Andreen  
Fresno County  
Board of Supervisors



Robert Braitman  
Gov. Org. & LAFCo  
Ventura County



Joe Fontaine  
Past National Pres.  
Sierra Club



Curtis D. Lynn  
Cooperative Extension  
Tulare County

Government Gridlock



Elmer Learn  
Agricultural Economics  
UC Davis



Alvin D. Sokolow  
Political Science  
UC Davis

Panelists, Sacramento



Peter Detwiler  
Senate Comm. on  
Local Government



Tom Graff  
Env. Defense Fund  
Oakland



Peggy Mensinger  
Former Mayor  
Modesto



Henry Schacht  
Agricultural Consultant  
Writer

Panelists, Fresno



Dan Dooley  
Env. Attorney/Farmer  
Visalia



Beverly Kees  
Editor  
The Fresno Bee



Dan Whitehurst  
Former Mayor  
Fresno

## Study Group Participants

Harold O. Carter, Director, UC Agricultural Issues Center (AIC)

Carole Nuckton, Project Coordinator, AIC  
Lynne Kennedy, Study Group Liaison, AIC  
Julie Spezia, Study Group Liaison, AIC  
Ray Coppock, Writer & Media Rep., AIC

### People Pressures

#### *Study Group Co-Leaders:*

Ed Blakely, City & Regional Planning, UC Berkeley  
Mike Smith, Applied Behavioral Sciences, UCD

#### *Members:*

Maeve Phelan, Ctr. for Real Estate and Urban Econ., UCB

Ted Bradshaw, Inst. of Gov. Studies, UCB  
George Goldman, Ag. & Res. Econ., UCB  
Cynthia Kroll, Ctr. for Real Estate and Urban Econ., UCB

John Mamer, Ag. and Res. Econ., UCB  
Paul Ong, Urban Planning, UC Los Angeles  
Joan Randall, Applied Behavioral Sci., UCD  
Will Rochin, Ag. Econ., UCD  
Lor Shepard, Ag. Econ., UCD

Helen Theodoropoulos, Applied Behavioral Sci., UCD

Kelvin Willoughby, Inst. of Urban and Reg. Dev., UCB

#### *External Member:*

Ken Entin, Dept. of Politics and Public Adm., Cal. State University, Stanislaus

### Resources at Risk

Study Group Leader: Bill Rains, Agronomy and Range Science, UCD

#### Land Subgroup

Warren Johnston, Chair of Subgroup 1989-90, Ag. Econ. UCD

Mike Singer, Chair of Subgroup 1988-89, Land, Air, Water Resources, UCD

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Curt Lynn, Director, Coop. Ext. Tulare Co.  
Bill Wood, Soils and Env. Sci., UC Riverside

#### *External Members:*

Darwyn Briggs, USDA, Soil Cons. Serv., Davis  
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Robert Yoha, Dept. of Conservation, Sacramento  
Will Shafroth, American Farmland Trust, San Francisco

#### Water Subgroup

Ken Tanji, Chair of Subgroup, Land, Air Water, Resources, UCD  
Blaine Hanson, Land, Air, Water Resources, UCD  
Chet McCorkle, Ag. Econ., UCD

Don Nielsen, Land, Air, Water Resources, UCD  
Henry Vaux, Water Resources Center, UCR  
Craig Woodring, Land, Air, Water Resources, UCD  
*External Members:*

Edward Craddock, Div. of Local Assistance, Dept. of Water Resources, Sacramento

Ed Imhoff, San Joaquin Valley Drainage Program

Glenn Sawyer, Carmichael

Rita Schmidt-Sudman, Water Ed. Foundation, Sacramento

#### Air Subgroup

Dick Howitt, Chair of Subgroup, Ag. Econ. UCD

Bob Brewer, Kearney Ag. Center, Parlier

Michael Kleinman, Dept. of Community and Env. Medicine, UC Irvine

Bob Sheesley, Director, Coop. Ext., Fresno Co.

Brian Mudd, Air Pollution Research Center, UCR

Arthur Winer, Env. Sci. and Eng. Program, School of Public Health, UCLA

#### *External Member:*

Bill Lockett, Air Resources Board, Sacramento

#### Biological Resources Subgroup

Bill Rains, Chair of Subgroup

Montague (Tag) Demment, Agronomy, UCD

Cal Qualset, Genetic Res. Cons. Prog, UCD

Pat McGuire, Genetic Res. Cons. Prog, UCD

Dennis Raveling, Wildlife & Fisheries Biology, UCD

Pete Richerson, Div. of Env. Studies, UCD

#### *External Member:*

Mickey Heitmeyer, Ducks Unlimited, Sacramento

### Government Gridlock

#### *Study Group Co-Leaders:*

Elmer Learn, Ag. Econ., UCD

Al Sokolow, Poli. Sci., UCD

#### *Members:*

Clair Christensen, Applied Behavioral Science, UCD

Claudia Reid, UC Governmental Relations, Sacramento

Will Rochin (also on Group 1)

### Transportation Study Group

Study Group Leader: Paul Jovanis, Civil Eng., UCD

Jill Auburn, UC Sustainable Agricultural Research and Ed. Program

Joe Ahrens, Veg. Crops, UCD

Elizabeth Deakin, City and Regional Planning, UCB

Roger Garrett, Ag. Engineering, UCD

Tom Hazlett, Ag. Econ., UCD

John Keller, Grad. Stud., Ag. Econ, UCD

Sam Logan, Ag. Econ., UCD

Gordon Mitchell, Pomology, UCD

## *Central Valley: Confluence of Change*

### **Government Gridlock Study Group Participants in County Workshops**

Butte County Meeting—Chico, California  
Bill Brouhard, Ingram-Shelton Realtors  
Fred Davis, City Manager, Chico  
Steve Dilg, President, Butte County Farm Bureau  
Pam Figge, Planning Director, Gilroy  
Kelly Meagher, Butte Environmental Council  
Irv Schiffman, Poli. Sci., Cal. State U., Chico  
Jerry Smith, Director, Coop. Ext., Butte Co.  
Karen Vercruse, Supervisor, Butte County

Fresno County Meeting—Fresno, California  
Ken Billings, Ranchers' Cotton Oil  
Steve Hall, Sandalwood Development  
Cindy Hoopes, Valley Action Network  
Jim Katen, Chief Deputy City Manager, Fresno  
Burt Mason, Ag. Econ., Cal. State U., Fresno  
Robert Sheesley, Director, Coop. Ext., Fresno Co.  
Richard Welton, Public Works and Planning  
Director, Fresno County

Kern County Meeting—Bakersfield, California  
Randy Abbot, Cty. Director of Planning and  
Development Services  
Tom Almberg, Kern County Farm Bureau  
Hodge Black, Director, Coop. Ext., Kern Co.  
Joe Fontaine, Past National President, Sierra Club  
Jack Hardisty, Planning Director, Bakersfield  
Joel Heinrichs, Director of Policy Analysis, City of  
Bakersfield  
Pauline Larwood, Supervisor, Kern County  
John Stinson, Asst. City Manager, Bakersfield  
Doug Warren, Bynum and Associates

San Joaquin County Meeting—Stockton, California  
John Eilers, Land Utilization Alliance  
Barbara Fass, Mayor, Stockton  
Alan Harvey, City Manager, Stockton  
Gary Johnston, Director, Coop. Ext., San Joaquin Co.  
Kalvin Platt, Developer, SWA Group  
Phil Sanguinetti, Planning Director, Manteca  
Randy Snider, Mayor, Lodi  
Mel Wingett, Asst. CAO, San Joaquin County

Stanislaus County Meeting—Modesto, California  
Lamar Bartholomew, CAO, Stanislaus County  
Ken Entin, Politics and Public Adm., Cal. State U.,  
Stanislaus  
Victor Holanda, Dir., Planning and Comm. Dev.,  
Stanislaus City  
Larry Hooker, Stanislaus County Farm Bureau  
Peggy Mensinger, Former Mayor, Modesto  
Steve Mothersell, Developer, SCM Corporate Group  
Bill Nichols, Planning and Comm. Dev., Modesto  
Phil Osterli, Director, Coop. Ext., Stanislaus Co.  
Rolland Starn, Supervisor, Stanislaus County  
Carol Whiteside, Mayor, Modesto

Yolo County Meeting—Davis, California  
Jerry Adler, Davis City Council  
Tim Bach, Senior Planner, Woodland  
Donna Landeros, CAO, Yolo County  
Malcolm Leiser, Farmer, Woodland  
Betsy Marchand, Supervisor, Yolo County  
Dan Ramos, Developer, Ramco Enterprises, Inc.  
Rich Rominger, Yolo County Land Trust

### **Transportation Study Group Workshop Participants**

Facilitator: Jennifer Franz, J.D. Franz and Associates

#### **Workshop 1**

Joel Anderson, V.P., California Trucking Association  
Andrew Chesley, Dep. Dir., San Joaquin County  
Council of Govt.

Hal Davis, Dole Oceanic  
Bill Geach, V.P., Blue Anchor  
Anne Geraghty, Air Resources Board  
Michael Hinshaw, Caltrans, District 10  
Doug Papka, Traffic Manager, Lucky Food Centers  
Mary-Ann Warmerdam Falconer, California Farm  
Bureau Federation

#### **Workshop 2**

Bob Barrett, Sutter County Public Works Director  
Scott Chad, Dir. of Transportation, El Dorado County  
Ed Gerber, Gerber and Associates

Bob O'Laughlin, Caltrans, District 3  
Doug Reed, Sacramento Area Council of  
Governments  
Pat Smith, Golden State Peterbilt  
Robert Weber, Traffic Director, Safeway Stores

#### **Workshop 3**

Joel Anderson, V.P., California Trucking Association  
Bill Briam, Exe. Dir., Fresno Council of Governments  
Elizabeth Deakin, City and Regional Planning, UCB  
Doyle Dodd, Executive Director, Stanislaus Area  
Association of Govt.  
Tom Hazlett, Ag. Econ., UCD  
Jody Lonergan, Caltrans, District 3  
Pilka Robinson, Sacramento Regional Transit District  
Steve Schnaidt, Senior Consultant, Senate  
Transportation Committee  
Dan Sperling, Civil Eng., UCD



# Setting the Scene

## A Portrait of the Valley

The great Central Valley of California is unique. No other spot on earth has its particular combination of size, climate, natural resources, institutions and people. The Valley is home to one of the world's great agricultural systems as well as millions of people. But it is not homogeneous. The traveller along its arterial routes—Interstate 5 or Highway 99—sees significant changes in climate, in the type of crops grown, and in patterns of urban development. Fifty miles wide and almost flat, the fertile Central Valley floor stretches two-thirds of the length of the entire state. Its character is shaped by the mountains that surround it. To the east and north are the snow-capped Sierra Nevada and the Cascades, vital sources of the Valley's surface water supply. To the west is the Coast Range, a barrier against the moister and milder climate of the Pacific Coast. One of the Central Valley's chief geographical features is a vast network of waterways. A dozen or more rivers flow into and along the Valley—among them, the Sacramento and San Joaquin rivers and their many tributaries. This network also includes the Delta, the central hub of the state's surface water supply; as well as several man-made rivers such as the California Aqueduct that carries water southward.

In agriculture the Central Valley plays a unique role not only in California, but in the nation and the world. California is responsible for over 11 percent of all the crop value produced by the United States—and almost two-thirds of that comes from this one Valley. And in technological development and overseas marketing, California's front-rank place in the global food system depends to a large extent on the Central Valley.

The Valley is composed of three regions:

- To the north is the upper part of the Sacramento Valley, not quite so intensively farmed and much less urbanized, with more water, more space and, so far, less development pressure.
- In the middle is the region surrounding Sacramento and the Delta. This area is feeling powerful pressure for development, both from San Francisco Bay Area population spillover and from its own commercial and industrial development.
- The southern region includes most of the San Joaquin Valley, California's historic focus of large-scale, intensive agriculture, now with its own expanding metropolitan areas. This region, too, is under intense development pressure from both internal and external forces.

**Ken Farrell:**

These are not normal times for the Valley nor for Valley agriculture. These are extraordinary times that require bold approaches. The Valley's population is growing rapidly in numbers as well as diversity. With increasing numbers of varied participants in life in the Valley come more issues. There are more problems to be decided than ever before—political, social, economic, legal, technical. And the tempo of change in the Valley is faster than ever before. We have much less time to address more and more problems of increasing severity—each of which must be addressed right now.

**Dan Walters:**

There are over 100 languages spoken in Los Angeles schools today, 40 of them at Hollywood High School alone. I am sure all of you at one time or another have eaten at that famous kosher burrito stand in downtown Los Angeles—the one operated by the gentleman from Korea. If you have been there, you get a good idea of what is happening in California in the 1980s and the 1990s.

The prime source of development pressure is people. By the year 1995, California's population is expected to increase almost 14 percent, to more than 32 million, and by the turn of the century, it looks like there will be 35 million Californians. The Central Valley will almost certainly take more than its share of this growth. In the central and southern regions of the Valley, the outlook is for an almost 20 percent increase in population during the next five years. Even in the northern valley the population is expected to grow slightly faster than in the state as a whole. Increases in population will be accompanied by demographic, social and economic changes. The Central Valley will mirror and possibly magnify California's demographic changes as the population grows older and becomes more ethnically diverse.

Statewide, the proportion of whites is projected to shrink from 60 percent in 1988 to just over 50 percent in the year 2000 and to minority status shortly after that. Meanwhile, other groups, especially Hispanics and Asians, will increase proportionally. Even at current levels, growth and change inevitably produce symptoms. There is visual evidence of what's happening to the Valley. One of the most obvious is homes and shopping centers sprouting from what used to be cropland. There are other obvious symptoms of growth and crowding in the Valley, some of them fairly unpleasant—crowded highways and air pollution, for example.

But population growth and societal change can lead to economic opportunity. Also, there is a perception of a better quality of life available in the Valley—less crime, better schools, more community spirit, lower cost homes, pleasant rural surroundings, and freedom from big-city bureaucracy. Of course, that perception may or may not be matched by reality. In any case, parts of the Central Valley are within com-

muting distance of jobs in the San Francisco Bay Area. Rapid growth of this commuter population is encouraged by lower costs for housing and other reduced living expenses in the Valley.

But even without all of the commuters, the Valley population would still continue to grow. The modern revolution in communication and transportation means that high technology industries can be located almost anywhere that land and labor costs dictate. One result is the appearance of thousands of new and different job opportunities in what were once sleepy Central Valley towns.

And yet, farm jobs are still important. Acreage of labor-intensive crops in the Valley has increased in recent years. To some extent, this has offset the effects of mechanization on the farm labor market. In many fruit and vegetable crops, farm jobs continue to attract migrant as well as resident workers—even though unemployment is still high during off peak periods. Meanwhile, recent immigrants who have already settled in the Valley tend to attract others, creating both a more diverse society and population pockets with common cultural backgrounds. Population growth and development, of course, bring more than economic opportunity. They also bring more intense competition for the very resources that make the Valley what it is—land and water.

And in that kind of competition, the winners have almost always been the development-oriented users. As one result, tens of thousands of acres of cropland in the Central Valley have been converted to residential subdivisions, or to industrial sites, or to ranchettes where rural living replaces commercial farming. Of course, the supply of Valley cropland is largely fixed; there's only so much acreage, and more intensive production practices have their limits. So the farmland conversion process continues—very often without much consideration of either long-range impacts or regional growth patterns.

Water, the lifeblood of the Valley's economy, is also a limited resource under competitive pressure. The San Joaquin Valley has a groundwater deficit, and the outlook of additional surface water is problematical. And competition for the existing supply continues among agriculture, urban and environmental users.

Economic development and competitive pressure are also shrinking the one resource that, more than any other, creates the character of the Central Valley—open space. The natural areas—the waterfowl habitats and the few

**Ken Farrell:**

Some of the best agricultural lands and natural areas are irrevocably being converted to urban and other uses. Salinity build-up, water shortages and quality deterioration, and air pollution vividly demonstrate the interdependence of the Valley's agriculture and its natural resources and environmental quality. Therefore, high priority must be placed on the need to move more quickly toward environmentally sensitive, sustainable cropping and animal culture systems, particularly with regard to reducing the use and adverse impacts of pesticides and other chemicals.

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remaining riparian strips—are being threatened by seemingly never-ending pressure to develop those areas.

Population growth in the Central Valley has direct effects on the human environment as well. Transportation links are becoming crowded. In the Valley, people and goods move mostly on highways—which are not always well maintained and are increasingly congested.

Alternative transportation systems are still largely undeveloped. Air quality is suffering under the impact of both more vehicles and more stationary sources, such as power cogeneration plants, which didn't even exist a few years ago. Water quality problems need to be addressed. These include selenium and excess salts in the parts of the Valley with drainage problems, and toxic contamination of groundwater, which continues in some locations.

These problems, of course, aren't the whole story. The Central Valley is still prosperous and enormously productive; it's still blessed with vast resources of land, water, and open space, as well as technology and people.

But, for these very reasons, the Valley's economy and its population are rapidly growing, changing and diversifying—and that process is creating stresses that will shape the future. Within Valley communities, there is often a lack of consensus, and a lack of funds for public financing. Interest groups supporting a wide range of issues inevitably compete for power and control of the money that might be available.

At least partly for its potential tax revenues, local governments under financial and political pressure, embrace a development of almost any kind. In other words, they are tempted to "zone for dollars." But once development takes place, they may find that demands for new services exceed the additional income. Agriculture is seen as both good and bad—as a supplier of open space and green landscapes—and as a source of pollution.

Communities are split over the payoffs and tradeoffs of economic development. Which will bring in more revenue? A prison or a processing plant? And then there's water. It is used for agriculture, industry, housing, recreation, and wildlife. They all need it, but the resource is limited so who gets how much?

These are just some of the elements of stress that pose serious problems for those communities not prepared to deal with the growth they are experiencing today and can expect in the future. Even if the local governments were prepared to handle these issues, there are some problems beyond their jurisdiction. Whether the threat is crowded highways or improper land use, pollution from industry and other sources, drainage problems or groundwater overdraft, the problems almost always cross over local agency boundaries.

These are some of the issues facing the great Central Valley of California. The question is, when the 21st Century arrives, what will be the condition of the Valley's agricultural open space? Of its water? Its industry and economy? Its people? How will the

Central Valley—with its enormous economic and social potential, its vast and varied resources—deal with the challenges of growth and change?

Although population growth and other forces will powerfully influence the future, we still have choices. The future depends in part on policy decisions that haven't yet been made. In the months and years ahead, private and public decisions can improve the outlook of this great Valley. If we are open to the opportunities, we will have time to make a difference.

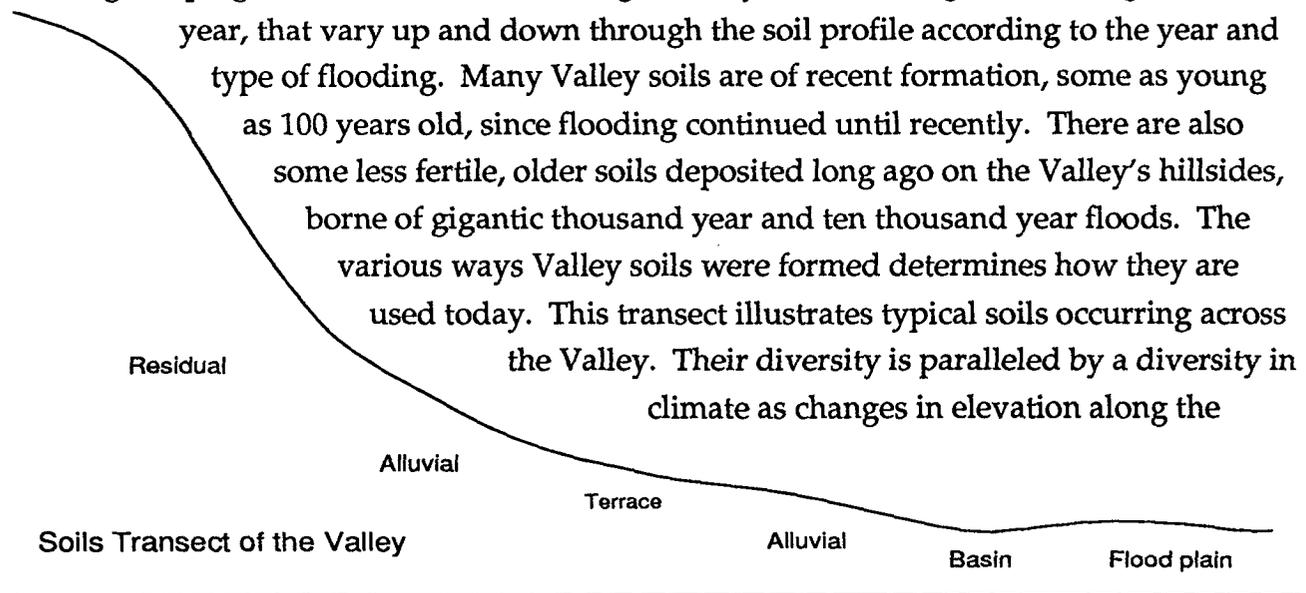
**Bill Rains:**

**History of the Valley**

The Central Valley appears far different today than it did to the first settlers as they crested the last Sierra foothill and saw the vast Valley spread before them. Instead of today's agricultural paradise, they saw a plain covered in oak and grassland savannah, which petered into scrub and bunchgrass at the southern end of the Valley. Covering around 4 million acres—nearly half of the total acreage under irrigation today in the Valley—was a huge, mosquito-infested swamp. Near the rivers stood enormous riparian forests with willows, cottonwoods, and the attendant biological diversity that characterizes such systems.

Early farmers, with the encouragement of the federal government, began to reclaim the swamplands. Through construction of private and public levees, tapping rivers for irrigation and other uses—first through individual efforts, then through the massive state and federal water projects—the Valley was claimed for civilization and agriculture.

Although over time humans have changed the Valley's vegetation, the soil resource has remained largely the same. Most Valley soils were formed from alluvial deposition as floodwaters coursed out of the mountains onto the Valley floor. This deposition resulted in large sloping fans of diverse materials, graded by size and weight within a given flood year, that vary up and down through the soil profile according to the year and type of flooding. Many Valley soils are of recent formation, some as young as 100 years old, since flooding continued until recently. There are also some less fertile, older soils deposited long ago on the Valley's hillsides, borne of gigantic thousand year and ten thousand year floods. The various ways Valley soils were formed determines how they are used today. This transect illustrates typical soils occurring across the Valley. Their diversity is paralleled by a diversity in climate as changes in elevation along the



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Valley's hillsides and presence or absence of cooling sea breezes create microclimate niches favorable for growth of particular crops. Together, the diverse soils and climate, and the availability of water from irrigation projects serve to make Valley agriculture among the most flexible and productive in the world.

#### **Pressures on Valley Resources**

The flexibility that characterizes Valley agriculture means that changes imposed on the system have traditionally been compensated for by the system itself, without major problems. For example, as fruits, nuts, and vegetables have become relatively more profitable to produce than field crops, cropping patterns changed accordingly.

Unfortunately, population growth is pressuring Valley agriculture to continue to adjust to an extent that threatens the agricultural base. Pollution of and competition for natural resources are creating constraints on production that decrease its flexibility. Natural ecosystems are under similar pressure. The record from regions around the world and in California itself is not encouraging: Population growth sooner or later adversely affects the resource base and existing biological systems. For over two centuries, the United States had a ready outlet for population expansion on its western frontier. In California large

#### **Warren Johnston:**

There are no more valleys over the hill to the east or the west . . .

blocks of land continued to be opened up for agricultural use until the 1930s. Since then conversion of dryland to irrigated agriculture has allowed greater production per unit of land. Today the total acreage of cropland remains relatively stable as losses to urbanization or degradation

about equal conversions from range and woodlands. The need to convert from one desirable land use into another suggests that in practical terms, land has become a finite resource. The frontier is gone, and changes in land use now involve difficult tradeoffs.

Pressures on the land are affecting resources other than croplands. As forest and range lands have been converted to urban and crop uses, the Valley's vital watershed, grazing, wildlife habitat, and other associated uses are threatened. We as a society are placing increasing demands on recreational facilities that require access to natural areas, a trend that will likely continue as population and affluence increase. The forest and range-land ringing the valley floor provide the space for many of these recreational activities. It is critical that we plan this land use to provide a quality of life that will last into the future.

Water and air, along with land, are pressured by increasing population in the Valley. Water is likely to be the most limiting factor for agriculture in the near future, and while there is not exactly competition for air, there is a shortage of "dump sites" for wastes in all media, whether gaseous, solid, or liquid.

When there were fewer people, there was less direct feedback on resource use from one sector of society to another. Now, sectors have begun not only to compete over re-

sources, but also to contaminate resources essential to each other, and to exert political force to develop policies to protect themselves from one another. For instance, two counties in the San Joaquin Valley Air Basin (Fresno and Kern) have been forbidden by EPA to permit development of any new, major stationary emissions sources. Several San Joaquin Valley counties are considering passage of a rule that would require any new pollution—even from indirect sources—to be offset by reductions from existing emissions sources. This would mean that industries or development wishing to move into those counties would have to create zero pollution or find a way to provide for diminished air pollution from an existing source equal to the newcomer's expected emissions.

Clearly, the Central Valley is facing choices, and these choices involve tradeoffs. Because the tradeoffs involve resource allocation, the ultimate decisions will be made through the political process. To help inform this process, voters and decision makers should be aware of the limits to which our natural resources can be pushed.

**Dan Walters:**

### **The Third Phase of the Third Wave**

California has one unalterable characteristic: It changes all the time. That is the only constant thing about California. The history of California is one of ceaseless social change brought on by succeeding waves of immigrants seeking better lives for themselves and their families. It was true of the early Spanish explorers. It was true of the farmers who came before the Gold Rush. It was true of immigrants from other states. It was true of the 49ers. It was true of the Dust Bowl refugees. It was true certainly of the great waves of migration that came to California during and after World War II.

One way to think of California is as a series of cycles. Each wave consists of three essential elements that have to occur in chronological order. First there is an economic change, followed by some sort of social change brought about by the economic change, and then those economic and social changes together produce some sort of change in the political climate.

By that line of reasoning California is in the third phase of the third wave. The first cycle in California's history lasted roughly one century—from about 1840 to about 1940 or shortly thereafter. That is what I would call California's rural phase when essentially rural matters dominated. In the 19th Century, agriculture developed, as did mining, timbering, the railroad system, and those sorts of things. The cities, with the possible exception of San Francisco, were fairly nondescript, relatively small, basically serving the surrounding rural population.

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The conflicts of the day, such as the farmers versus the railroads, were essentially rural in nature until well into the 20th Century. California had a kind of rural ambiance. It wasn't a very important place in the larger scheme of things. It was largely ignored by the rest of the United States which had an eastern orientation. Yes, California had some movie stars and a few other things, but it really wasn't a very important place to most of the nation.

That changed very abruptly when the second cycle began—on December 7, 1941. All that came to an abrupt change with the onset of war which is, among other things a traumatic economic event. It transformed California in ways that are still occurring. It forced this nation to think of California in other than non-serious terms because we became the staging point and the industrial supplier for the war in the Pacific. Suddenly, what we now call the Pacific Rim, then called the Pacific Theater of Operations, was a threat to this United States. The window through which we looked at that threat was California. Seemingly overnight, but really within the space of a very few years, California was transformed from an essentially rural society with an agrarian outlook into an industrial society, as plants were established to create the implements of modern war—shipyards, auto assembly lines, planes, factories, etc. That bell once rung was not unring, for the period of industrialization continued on well after the war.

With the transformation from an essentially agrarian or rural state into an urbanized and industrial state, came a vast social change. Hundreds of thousands and millions of people were drawn to California, either voluntarily or involuntarily, from the rest of the nation. California's population began to swell in dramatic terms.

A new industrial middle class was born in California where none existed before. A generation of immigrants came to California from other states with very upwardly mobile ambitions—young people with young families who wanted more of everything: They wanted schools, they wanted recreational opportunities, they wanted homes in the suburbs, they wanted highways, they wanted colleges. They gave their permission to a generation of politicians, governors, and state legislators to supply those things and to levy whatever taxes were necessary to pay for them. Thus, the economic and social change brought about by vast population growth and the creation of new economic activities and new economic classes, begat a political change as well. That political change was to create an era of permission—an era of expansionism in terms of public services and facilities, what we now call infrastructure.

This era of permission had a partisan impact. California began to transform itself from what had been a Republican state, albeit a moderate Republican state, or even a progressive one, to a Democratic one as those newcomers to California, those immigrants, those war-time and post-war immigrants, put down roots and became voters.

The Valley during the 1940s and 1950s was still an agricultural area, still a rural area, bypassed by much of what was going on in the rest of California—mainly in the San Francisco Bay Area and the Los Angeles-Southern California area.

In the latter stages of this period and on into the 1960s—the period that I call the industrial period—the Valley was experiencing the beginnings of spill-over impacts as the freeways punched through the mountains and up and down the Valley. As the economy began to produce and develop in such a way that it could not all be accommodated in the immediate San Francisco or Los Angeles areas, you began seeing the first twinges of that industrialization in the Valley as well.

This brings us to the third wave. As rapidly as California industrialized during that war time and post-war period, it began somewhat to deindustrialize in the 1960s. This was really a shift to a new kind of economy as basic industry, including tires, steel, auto manufacturing and those sorts of things which had prospered in California in the 1940s and 1950s, began to move overseas into those suddenly resurgent economies of Asia. California began to deindustrialize. One by one we started shutting down much of that industrial plant that had been built up during the period of industrialization. Some of this change was in the Valley and other agricultural areas. For example, the shutdown of a big tire factory near Salinas is kind of a monument to that period of deindustrialization.

California didn't dry up. It didn't experience the wrenching sorts of economic dislocations that other industrial states experienced during that same period. California's economy began to move into a third wave, beginning with an economic change, transforming itself into a post-industrial economy. This new economy would be rooted in trade, in services, in certain forms of high-tech manufacturing. This new kind of hybrid economy was no longer centered in one industry or one group of industries.

This transformation temporarily produced a social lull in California. With declining industrial job opportunities and with the beginning of a shift to a new kind of economy, California wasn't attracting immigrants from other states to the extent it had been. So, in the 1970s, we experienced a transition period or a lull. Population growth tapered off. We were still growing, even a little bit faster than the rest of the United States, but compared to previous booms, it was somewhat of a lull. An economic lull, a social lull, a kind of resting period in California's history.

By the late 1970s, boom times returned. That post-industrial economy kicked into high gear—Silicon Valley, new office parks, new construction, new development went on all over California—and that in turn had, of course, a social impact. This social impact was similar to and yet dissimilar from the previous cycle.

First, it began attracting immigrants again—the constant history of California. But these immigrants weren't coming from Iowa or Illinois or Massachusetts or Oklahoma. These immigrants were coming from overseas, from other nations—a new wave of immi-

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gration into California, enriching its cultural mix, enriching its economy. California became the destination of choice for the world's economic and political refugees.

The numbers of that expansion in the 1980s are nothing short of phenomenal. We created three million jobs in California in the 1980s—a job creation so intense that we could add six million to our population during that period. That six million represents a 25 percent population growth; it also represents 25 percent of all the population growth experienced in the entire United States during that period. One out of four new Americans either by birth or immigration in the 1980s was a Californian. With only about 11 or 12 percent of the nation's population, we added one-quarter of its new population. By the end of the decade our population was growing at the rate of 2,000 people a day—net. (Actually something more than that in gross, because we lose one-quarter of a million people to other states every year.) This population growth expanded during the decade, starting at one-half million a year at the beginning of the decade to three-quarters of a million a year by the end of the decade. We are still growing at about 750,000 people per year. We gain a million, lose one-quarter of a million and net out three-quarters of a million.

We add more children to our school system every year—160,000 or 170,000—than Massachusetts added to its entire population in the decade of the 1980s. In proportionate terms, we are adding cars faster to our roads than we are adding people. However, the Anglo population of California, the non-Hispanic white population, is stagnant. It has been stagnant for most of the 1980s. Yes, it is still growing a little bit as the Baby Boomers produce a few babies, the Echo as some people call it, but it is really not growing very much in numerical terms, and it is declining in proportionate terms, down to 60 percent and now a little bit below 60 percent of the total.

So of those 2,000 people per day, one-half are immigrants, one-half are babies, and of that half that are immigrants, the vast majority are foreign immigrants from other nations, primarily Asia and Latin America. Because this is an immigration-driven population growth, we are experiencing deep social change as well as growth. Because it's an immigration-driven population growth the cultural face of California is being transformed in ways that we can only begin to imagine.

The immigrants settle primarily in the central cities. But the central cities aren't growing very much, if at all. San Francisco has actually been losing population. So what is happening? It is a two-pronged population growth. Immigrants settle in the central cities, and there is a commensurate shift of population out into the suburbs, so the net increase is felt away from the central cities. Our tendency has been to think of California as being Northern California and Southern California. Now it is more accurate to think of California in metaphysical terms, if not physical terms, as a series of concentric belts. There are the central cities, San Francisco on the north, Los Angeles in the south—San Diego, Sacramento and other ones, but primarily those two. They are undergoing a tremendous popu-

lation change, a transference as immigrants settle in, as other people move out. Their ethnic mix is changing very dramatically, but in net terms their population isn't growing very much, if at all.

The second belt is what I would call the inner Sun Belt—those residential suburbs of 20 and 25 years ago, Contra Costa County, San Mateo County, Marin County in Northern California; the San Fernando Valley, Orange County in Southern California. These communities were actually former agricultural areas turned bedroom communities during the post-war boom. They aren't experiencing as much population growth these days. But what they are seeing is tremendous growth in jobs, in employment. Why? Because the new jobs of the 1980s, of this post-industrial economy, are portable. They can be picked up and moved rather easily or they can be located in areas that would be incompatible with that earlier industrial-type employment. You can locate insurance claims processing centers right next to housing in the suburbs where you could not locate a steel mill. As the economy transforms, jobs become portable and as they become portable they tend to flow outward from traditional employment areas, from the traditional industrial and commercial areas.

So these old bedroom towns are experiencing tremendous growth in job development. Along the I-680 corridor through Contra Costa County, along the highway in Concord and in Walnut Creek and in San Ramon, are tremendous office complexes that developed seemingly overnight. The situation in Orange County is very similar. This change symbolizes the shift of employment from the central cities and the traditional industrial and commercial areas out to this inner belt, this inner Sun Belt of California. As this occurred, home prices rose very strongly and population growth slowed there.

Then, development has been moving further out for two reasons: housing costs and transportation access. No one can commute from Modesto to downtown San Francisco very easily, but a commute from Modesto to Pleasanton or San Ramon becomes feasible in the minds of many. So out the transportation corridors has flowed a certain push-pull relationship in development. People go out looking for affordable housing within commuting distance.

As they moved to Orange County and Walnut Creek after World War II and in the 1950s, now they are moving to Modesto or Riverside. They go out looking for housing along the transportation corridors and commute in to the jobs. Eventually the jobs kind of seep out toward these population growth areas; then, of course, the commute envelope is extended further on out, and on out, and on out, and on out.

What is happening is in a very logical pattern. The Gilroy-Morgan Hill area is experiencing great job development these days. Home prices have gone up. The highway over the Pacheco Pass is being improved to four-lane standards. (For some reason, people don't like to commute on two-lane roads.) Within a very few years Los Banos will become

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a suburb of Gilroy. Gilroy is already a suburb of San Jose and, although the people of San Jose don't acknowledge it, metaphysically at least, they are still a suburb of San Francisco.

There is exactly the same pattern in Southern California as the people moved out to Riverside and then beyond Riverside. The Merino Valley, a little spot in the desert that wasn't even anything 10 years ago, is now a city of over 100,000 people.

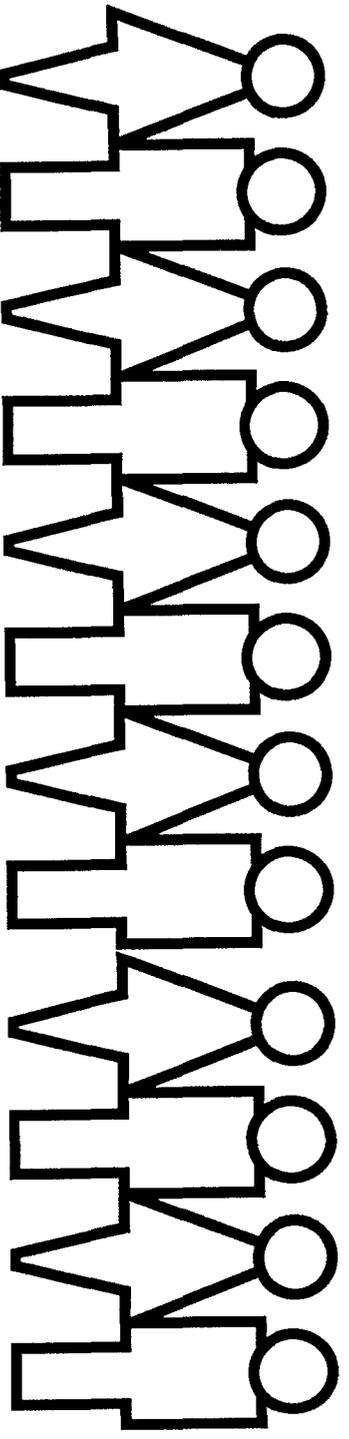
Inevitably, of course, development pushes beyond the great barrier—the Coast Range—on into the Central Valley. Not only Los Banos, but also Modesto, Stockton, Patterson, and Turlock are experiencing this kind of development. It is not going to stop.

If you liked what happened in the 1980s or you didn't like what happened in the 1980s, I have one word for you in the 1990s: more of everything. This economic engine shows no signs of slowdown.

**Grantland Johnson:**

There are three fundamental policy objectives that must be addressed if California is to maintain itself as a leader both nationally and internationally—the questions of economic growth and prosperity, of environmental policy and protection, and of social equity.

# People Pressures



# Room for Whom?

## Ed Blakely:

The great Central Valley has been no stranger to change. The Valley's first great change was the conversion of its natural habitats to agriculture. For most of California's history the Central Valley has been the world's premier irrigated garden, as its agriculture became the economic backbone for about one-sixth of the state's population.

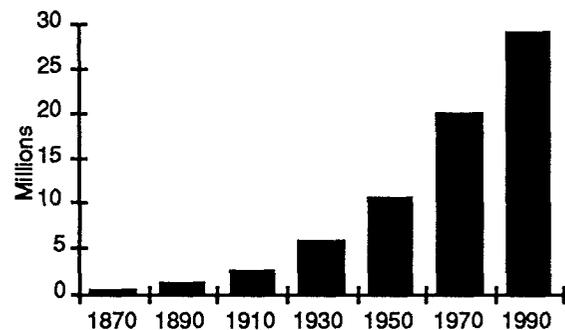
Today the Valley is undergoing a second great change—the transformation of an agricultural base to urban domination. The first change civilized it; the second change brings confusion with respect to how the peopescap will continue to developed. We don't want to destroy the Valley, we want to create it. And in creating a new Valley, there will be an essential interplay among agriculture, the people, the place, and the resources.

We begin by describing the current and expected population growth patterns of the Valley. We then discuss the valley's diversity. There are three groups of people living in and moving to the Valley—the traditional base, including Anglo and Hispanic populations; new immigrants, including many from South East Asia; and the commuters. Each of these groups experiences and contributes to the Valley's growth in different ways. We conclude by proposing some alternative scenarios for urban growth and development in the Valley. The goal is to choose a scenario that will help shape the Valley for the better for both its natural and human resources.

Population growth has been the dominant factor shaping the character of California since statehood. The population of this state doubled just about every 20 years until it slowed in the 1970s. This rate of population growth provided a continuing renewal of the economy and infrastructure.

The state has also had a history of increasing ethnic diversity. The early Chinese were key in developing the railroads and other infrastructure. Other minority groups, particularly the Hispanics, have played important roles. Minorities will soon become the majority. And that new forged majority will bring new life blood as well as change the character of the state. These new people are

Population Growth in California



Source: Dept. of Finance

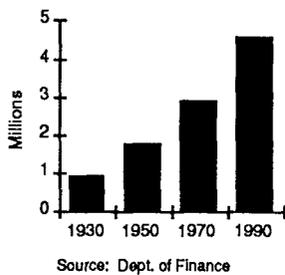
## Dan Walters:

More than any other region, the Valley's ethnic proportions and its voter registration and voting patterns most nearly represent those of the state as a whole. The Valley is a microcosm of the state in many respects, particularly political ones. So one might accurately say that in politics, as goes the Valley, so goes California.

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competing for that space and are competing to guide the development of California's future.

Population Growth in the Central Valley



The Valley's growth rate was slower than that of the state from the 1950s through the 1970s. Now the Valley rate is increasing—keeping up, keeping pace with the state. Today the Valley has about 4.5 million people. Forecasts are notoriously difficult to make, in part because the prediction of a population level sets in motion policies to try to change it. But, assuming that the current acceleration of growth will continue, a conservative estimate developed by the California Department of Finance suggests that by 2010 there will be nearly 7 million persons in the Valley, an increase of almost 3 million. It is just as possible that the Valley population will

### Dan Walters:

The state can continue to expect relative prosperity in economic terms. We'll probably add another three million new jobs in the 1990s and probably another six or seven million people. One estimate is that our population is now about 29 million and that it's going to be 32 and maybe 35 by the end of the century. More realistically we are probably 30 million already and will be 36 or 37 million by the end of the century. And we'll continue to add more cars to our roads because of those extended commuting patterns and because of the advent of two-income families, both workers requiring commuter vehicles. Our traffic will probably get worse before it gets better.

So all the tensions and all the changes we experienced in the 1980s will be continued to be experienced during the 1990s. The Central Valley will be the confluence of that change. The middle Valley, Sacramento, which has an urban syndrome all its own and its own set of satellite communities, will continue to expand. It is one of the fastest growing urban areas in the country right now, tetering on the edge of big-city status.

The lower Valley, the Bakersfield area and environs, will begin experiencing spill-over from the Los Angeles area. It is already starting to feel it just a little bit. In the 1990s it will probably feel it a lot because there is the same kind of pattern going on as population pushes northward into the upper San Fernando Valley area of Los Angeles—jobs flow out, and home prices go up. There is then a greater and greater economic incentive to move over the hill, over the Tehachapi, into the Valley. It has already happened in the Antelope Valley and the most southern regions of the San Joaquin Valley.

The Sacramento Valley will continue to experience pressure from San Francisco—squeezed in between San Francisco and Sacramento. Along the I-80 corridor from San Francisco, what is the last outpost of Bay Area development? It's a subdivision just a little this side of Vacaville. And what is the first indication of the Sacramento urban area? It is right around Dixon. And the space between those two is 7 miles. So there is going to be essentially one urbanized or one suburbanized highly developed area from San Francisco to Sacramento. It is inevitable; nothing is going to stop it, because driving this thing is continued economic growth and continued population growth. Two thousand people a day have to go some place!

double in the next 20 years as the state population has done for over 100 years, for a total of 9 million persons. Such an increase can mean inevitable disaster—or new opportunities. That’s the crux of the problem that we face today.

**Donald Swartz:**

We are faced with an onslaught of immigration. We can either take that energy and channel it into appropriate ways or be closed and defensive and try to thwart it.

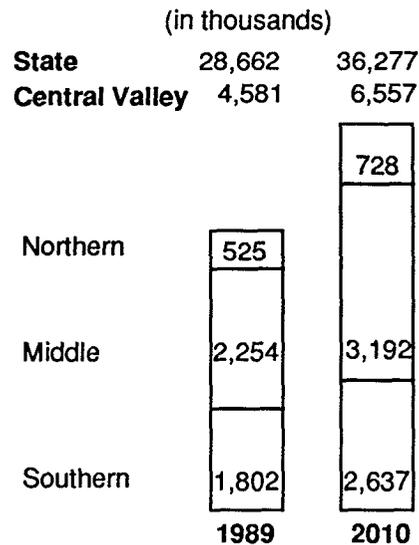
**Grantland Johnson:**

We cannot afford to allow ourselves to grow into a two-tier society. If 65-75 percent of our new workforce entrants by the year 1995 are going to be people of color and foreign born, that says something about our potential competitiveness. The changes in demographics require us to adopt a new attitude toward cultural diversity and linguistic diversity. We must appreciate the strong entrepreneurial impulse that many of our new immigrants bring to the United States. They also revitalize our economy and keep our population young.

**Hugo Morales:**

We are going through a rapid transition. Even within the minority communities, the recognized leadership often no longer represents the interest of large numbers of the community. And I venture to say that our institutions, including the University of California, no longer represent the interests of large segments of our population. For example, Fresno Unified, the third largest school district in the state, has an increasing problem with dropouts—about 25-30 percent across the board. Among the white population it is probably around 20 percent, and among blacks probably a little higher, but among the Mexicans it is about 50 percent. One of the solutions always suggested is more parent participation. Come to the school board meetings, go the P.T.A., get involved. However, how many of us feel comfortable letting these parents who have kids enrolled in Fresno Unified vote for school board members? Many of us do not feel very comfortable because these people are not U.S. citizens.

**Estimated Central Valley Population**



Source: Dept. of Finance

**Beverly Kees:**

We’re engaged here in a great experiment. We’re pulling people together from every continent to try to create what is culturally, economically and environmentally a model for the world. It’s a lot more fun being a creator than a caretaker. It’s also a lot harder because we’re taking risks.

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### **Dan Walters:**

All these demographic changes have an interesting political impact, particularly on the Central Valley. One might have expected that population growth with its diversity would be reflected in the political realm, as earlier social changes were. But so far that has not occurred, for the newcomers to California have not yet become politically active. The result is a growing tension between this dynamic, fast changing, fast growing population and political California—those who vote. This latter group is not changing very much; they are about the same number and have about the same characteristics. Voters are about 85 percent Anglo, relatively affluent, and relatively well-educated. They are a group of home owners and, most interestingly, a relatively aged group. The Anglo population is aging and the non-Anglo population is not because it is replenished by young immigrants and high birth rates.

Between the two groups—voters and nonvoters—there are not only ethnic and economic differences but also an age difference—a generation's difference. Half of California's voters are over 50 years old. The Anglo population already has a median age of 10 years over the non-Anglo population.

There is a continuing tension between the needs, the wants, the desires of one group and the tolerances and restrictions imposed by the other group—the voters of California.

### **Ed Blakely:**

#### **Valley City Structure**

Valley cities stand in contrast to the old city system that brought people together in high density around urban cores, where all transportation went into the city, where the jobs and opportunities were based in the city. These old cities were relatively self contained, described by concentric rings around the downtown commercial and business district. Residential districts were on the outside in gradually decreasing density. In between were manufacturing and warehouse districts.

Now, we see a new city system emerging—the sluburb. This new city system is wasteful in that sprawled suburban areas use up resources, create transportation and other overlapping problems. So we have to come up with yet another city system for the Valley—one that represents neither the old city system that is no longer viable nor the latest creation of sprawl that is wasteful. How we come up with something new is very important to the development of the Valley.

In this sense, the Central Valley is a laboratory—a crucible where over the next 20 years, California's new city will emerge. This will be a new city form designed to share both natural and physical resources within a new urbanized system.

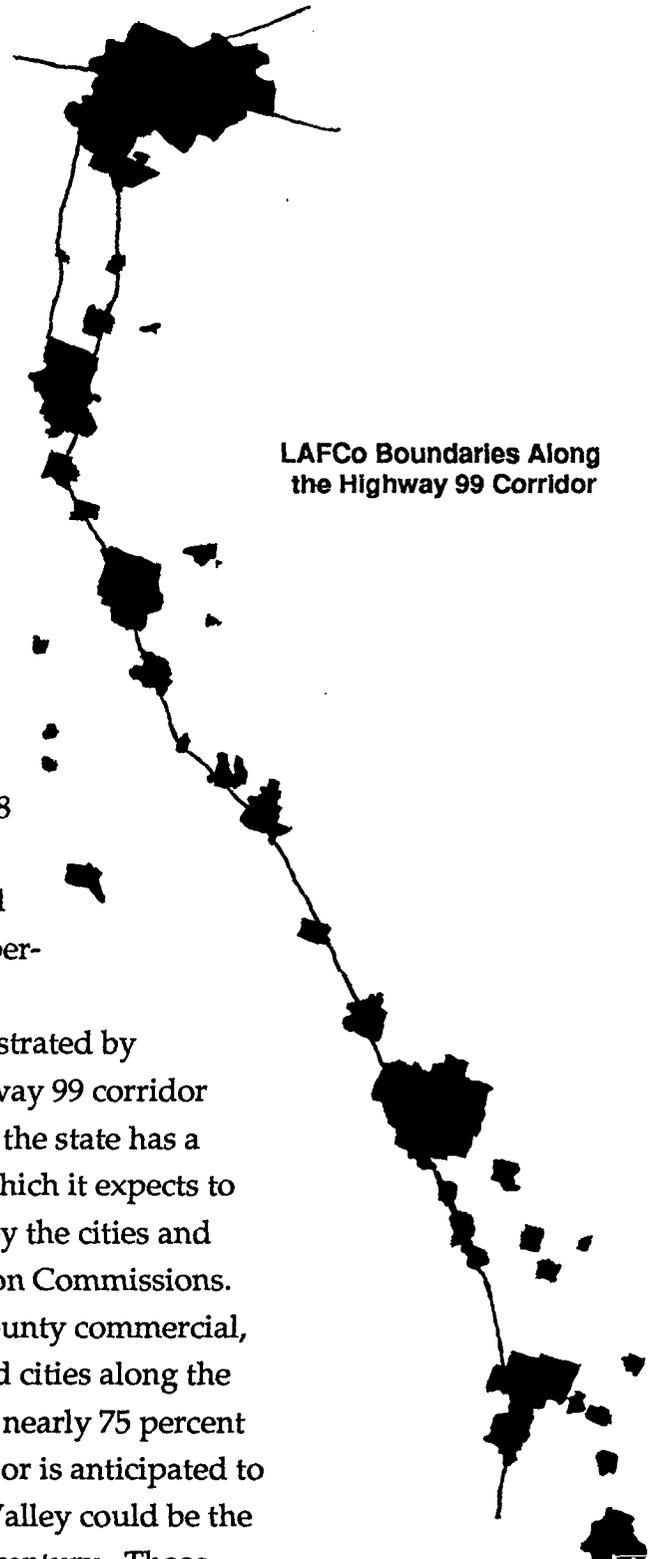
What is developing in the Valley so far is a long, continuous urban system made up of some 95 cities and several hundred more unincorporated, somewhat wastefully spread out. They're being formed out of communities once dominated almost solely by agriculture. They string along the valley. They string along because the best land drew the settlements and transportation linkages developed to serve those settlements. In contrast, Kentucky, a state about the same size and population as the Central Valley, has 425 cities

and a dense uncounted backdrop of small places. Kentucky represents a very different kind of development pattern.

The 95 cities are strung out mainly along the highway 99 corridor. Some 62 percent of highway 99 is already devoted to commercial, industrial and residential uses; 75 percent of this emerging linear city will be devoted to urban uses in the next 20 years. But the Valley cities are no longer a chain of small and medium places that are distinctive entities clearly separated from each other. Now, the urban area from Sacramento to Tulare is rapidly becoming one continuous 225 mile long urban belt.

So far this population base takes up a relatively small proportion of the Central Valley land. Data are hard to come by, but our best sources show that in the Central Valley as a whole, urban areas consumed 560,000 acres out of a total 20 million, or 2.8 percent of land. However if one assumes that urban development is largely on irrigable cropland, the total rises to 7 percent. And it may even occupy a higher percentage of the prime agricultural land in the Valley.

The urban dynamic that is evolving can be illustrated by mapping the urban limits of each city along the highway 99 corridor and its sphere of influence. Each incorporated city in the state has a "sphere of influence" the boundary of the area into which it expects to grow in 20 years. These areas have been negotiated by the cities and counties through LAFCo boards, Local Area Formation Commissions. Some 62 percent of highway 99 is in a LAFCo area; county commercial, industrial, and residential growth and unincorporated cities along the way account for another 10-20 percent. Thus already nearly 75 percent of this emerging linear city is in urban development or is anticipated to be urbanized within the next 20 years. The Central Valley could be the world's longest single urban system early in the 21st century. Those who would value this corridor for agriculture, wetland preservation, and open space may have as little as 25 percent remaining.



LAFCo Boundaries Along the Highway 99 Corridor

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Much of the growth that the Central Valley is experiencing is in this urban strip. A probable development pattern is for these cities to compete with one another and agriculture, and spread out using the suburban sprawl pattern. For without planning, cities compete with each other for resources and growth resulting in a fragmented sprawling urban form that is both dysfunctional and destructive.

Will the Valley follow the pattern of Santa Clara and Los Angeles where urbanization has absorbed virtually all the important farmland? Moreover, these and other counties grew so rapidly during the 1980s, they are finding it increasingly difficult to continue to grow, for growth requires undeveloped land, and that is increasingly rare in the south and along the coast. One of the few places left to grow is in the Central Valley. Thus we can conclude that *the issue is not whether the valley urbanizes but how.*

The way these people come together in this space will determine how the Valley can share its resources. Currently, Valley cities have low density and a dispersed population. Increasing dispersal of urban settlements generally creates cities with much lower densities, but that take up much more land for building and transportation—much of the land that once supported agriculture.

Is it possible to contain this growth pressure within a continuous development where agriculture and urban uses can coexist in the Valley? Any new urban form must place a premium on planning. Conflict and competition are not necessary. Complementary growth is possible—growth that preserves the most important values.

#### **Three Population Groups**

The emerging linear Central Valley city is likely to differ in another way too: Its population will be a much more diverse mix. Thus, we turn to look at the people shaping the Valley's development. Three distinct groups have sharply contrasting reasons for living in or coming to the Valley, differing opportunities within the Valley, and contrasting economic prospects:

- Traditional Valley base
- New immigrants
- Commuters

The traditional Valley population mainly consists of white and Hispanic people who settled there. The Hispanic population is increasing as more migrate from Mexico and other Latin American countries. This population has had agriculture as its focus. More recently we have an Asian population coming as immigrants and refugees from their countries. And, finally, another set of immigrants—new commuters who have come to the Valley for other reasons.

### Traditional Valley Base

The majority white population is still heavily involved in agriculture and related enterprises but that is changing. The importance of agricultural employment varies by region in the Valley. The northern Sacramento Valley has twice as much agricultural industry employment as the central portion of the Valley; the southern San Joaquin has twice as much as the Sacramento Valley. But the proportion of farm to total employment has declined in the Valley as a whole, as other sectors have increased faster. In just one decade, farm sector employment in the San Joaquin Valley declined 14 percent with respect to the overall employment base. And gross personal income (adjusted for inflation) from farming has fallen substantially. Especially in the urbanizing areas of the Valley, agriculture as a proportion of total personal income is dropping. For example in San Joaquin County in one decade the contribution from the farm sector fell from 14 to 5 percent.

#### Charles Hess:

California agriculture is an important component of the state and national economy, and it contributes to a positive balance of international trade in agricultural commodities. Agriculture is producing something of value which in turn has a great multiplier effect in the state's economy. In contrast, in the service industries which currently represent 75 percent of our economy, dollars are exchanged, but no new value is created. Agriculture is essential to a sound economy so that service industries can exist and prosper.

Agriculture is critical in terms of food security. USDA's Economic Research Service expects that the world's population will reach 7.2 billion by 2010. For a secure environment for future generations, we must preserve prime agricultural lands for the production of food and fiber in the Central Valley, in other parts of California and throughout the nation and the world.

Agriculture provides an economically viable way to maintain open space. Rather than convert the Valley to range-to-range urban sprawl, with all the pollution that would go with it, let's plan to keep agriculture as a major component of land use plans to keep California economically and environmentally green.

Agriculture may have a new role to play in enhancing the environment and the economy. There is growing concern about what we may be doing to our global environment, along with considerable controversy about whether or not we will experience global warming. Agriculture and forestry can play a very positive role in sequestering carbon dioxide through the process of photosynthesis. In addition, agriculture could become an important source of carbon-based chemicals for industry and help recycle carbon dioxide rather than using fossil fuels and adding to the carbon dioxide burden in the atmosphere. We already have a number of important oilseed crops in California which is a good start in the industrial use of agricultural commodities.

There is no question that agriculture has been, and will continue to be, an indispensable component of the future of the Central Valley. It is essential as both an economic and an environmental force. We have to continue to work to ensure agricultural sustainability and to reduce or eliminate adverse environmental impacts. And we must not overlook the *positive* environmental benefits agriculture provides.

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Between 1973 and 1986, primary sector employment (agriculture, forestry, mining) lost about 15,000 jobs, while services (including sectors such as trade, personal and professional services, government) gained 450,000 and manufacturing and construction gained 75,000. Service employment increased from 68 percent to 72 percent of employment in that period. These new jobs are bringing new population; some jobs service the existing population and others are brought by that population. Emerging new industries (high tech) account for some 12 percent of the state's new jobs and about 5 percent of the Valley's new jobs. People are the new resource; human resources will develop the new employment.

While its agricultural past still dominates the Central Valley, growth and its future clearly lie with an expanded economic base. This change apparently comes by direct spillover from other urban areas seeking lower prices and good labor availability more than from a new industrial nexus tied to world markets.

The Valley's economic growth is not painless, however. Like many developing bases, population increases outstrip the economy's ability to absorb all the people. At the same time that jobs are being created, unemployment is rising. This is a result of a bad fit between jobs and skills. People have a hard time making a transition between jobs. We've had double digit unemployment in most of the Central Valley in spite of the economic upturn.

The gap between Valley and state unemployment figures is widening. In 1975 unemployment in the Valley was almost the same as the state as a whole with the exception of northern Sacramento Valley counties. By the mid-1980s state unemployment was on a steep decline while in the northern and southern parts of the Valley it increased. Although unemployment has decreased in the Valley the last few years, the gap with the state remains wider than in the past. Disaggregating the Valley unemployment figures shows that Hispanics constitute about 60 percent; the white population, 30 percent; Asians, 6 percent of the unemployed.

#### **Hugo Morales:**

The history of agricultural labor in California demonstrates that farmers have always found a way to have cheap labor. The Immigration Reform and Control Act of 1986 passed only after effective legal means were added to guarantee a cheap supply of labor for farmers. The situation is economic: People from Mexico will come here, legally or illegally—otherwise they would be starving.

#### *Farm Workers*

The agricultural workforce is largely Hispanic with some 80 percent born abroad. An estimated three-quarters of these workers now have green cards. Many work only part of the year, thus unemployment compensation is an important supplement. Average annual earnings for a family of four in 1983 were just \$10,000, still below the poverty level.

Average agricultural employment in the Central Valley is about 175,000, with only about 125,000 employed at the low season, including about 40,000 farmers and 40,000 regular hired workers. At the peak,

because of shifting seasons and diverse crops, between 40,000 and 180,000 more workers supplement the regular work force. The peak employment during 1989 was 280,000 workers.

The agricultural work force has also provided an entry for Hispanics into other sectors of the California work force. A seemingly unlimited supply of willing workers lives south of the border and comes to California farms both legally and illegally. These workers come for several years, often returning to Mexico between seasons even if they entered legally. Attracted by the chance of employment as well as better wages than they can get in Mexico, they have made available a willing pool of workers, postponing the necessity of improving farm wages and working conditions.

In some areas, though, farmers have improved the duration and condition of work in order to stabilize their work force, using techniques such as granting workers year to year seasonal work security and seniority, arranging for some off farm employment during winter, increasing diversity of crops to utilize the work force more fully, selectively using technology, and taking advantage of the state unemployment insurance that now covers most farm work. Also, the type of work available and changing technologies in agriculture may accommodate new entrants to agriculture, such as more female workers, but they are also changing the structure of the labor market and influencing the lifestyles of the agricultural workforce.

The amnesty program under IRCA (the Immigration Reform and Control Act) has legalized the status of many workers—perhaps 150,000 or more of whom are in Central Valley agriculture. However, growers are uncertain if and how

**Hugo Morales:**

The power to change the situation does not lie with the workers; the power to change lies within our institutions. And this becomes a moral issue. Here is a population with no health insurance, inadequate housing, in many cases no housing. Here is a population that has no provision for pensions, not to mention low wages. So, the whole issue of farm labor is really a difficult moral one—one we have to answer as a society. Do we really want to support that kind of subclass or underclass within our midst and ignore it?

**Ed Blakely:**

As my colleague John Mamer said, these on-farm adjustments to stabilize the workforce cannot match the profound impacts of a series of court rulings and laws. These structured changes for agricultural labor create new market pressures on farm wages and working conditions. For example, since separate hiring facilities for agricultural labor are no longer permitted, potential on-farm workers now have access to the entire job market. And most recently, the Immigration Reform and Control Act of 1986 (IRCA) was designed to stem the tide of the “willing pool of workers” from Mexico. However, many of these advancements continue to be threatened by the rising use of farm labor contractors and the huge pool of illegal immigrants.

*Central Valley: Confluence of Change*  
**Hugo Morales:**

To eliminate the food subsidy on the back of farm workers, farmers would have to organize and charge more for their product. If they could set a price to maintain their profit and, at the same time, improve the housing conditions, wages, and working conditions of workers, that would be wonderful. But we live in a world of fiction when it comes to farm workers. When they get injured, they have no health insurance so they end up at a county hospital where they are not treated as dignified individuals who are supplying food for our tables; rather they are treated as some kind of public charge.

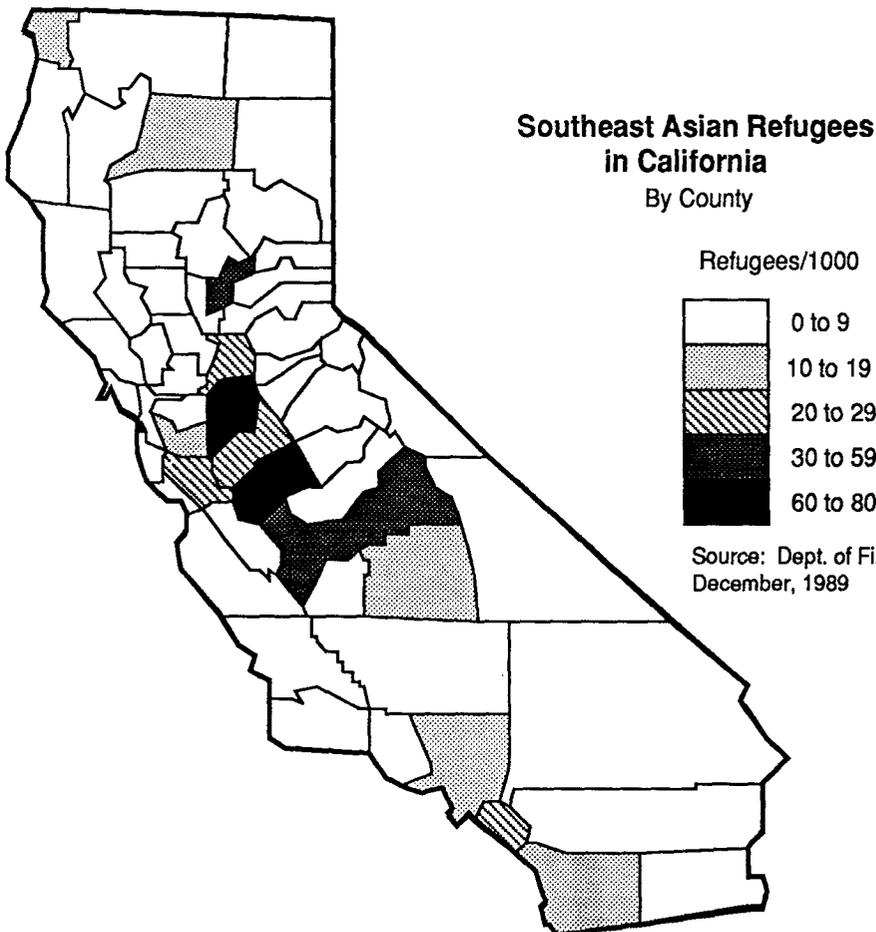
long these newly legalized workers will remain in agriculture. Many of these willing workers who are coming across the border are not just coming into farm work. They are going into the garment industry, they are going into our factories, they are becoming landscapers, and gardeners. They are the new service workers in America.

**Recent Immigrants,  
 Including Many From South East Asia**

California's location on the Pacific Rim and its historic ethnic diversity makes it a choice location for Asian immigration. Data are limited on the number of immigrants who are in the Central Valley, but about one-third of all South East Asian refugees who came to the United States settled initially in California. Today there is a massive resettlement in California; it is estimated that over

half of all South East Asian refugees are in this state.

Between 1980-88 one in every nine migrants to California (including those from other states) was a South East Asian refugee. Most are in Los Angeles and Orange counties, but many are coming to the middle part of the Valley. By 1988, the Central Valley had over one-fourth of all these refugees to California, over 110,000. The majority of these refugees are young, have growing families, and need time to adjust to the California economic and urban systems.



Merced County is one of the most dramatic, with its influx of some 11,000 Hmong, now constituting about 20 percent of the city's population. This rapid and extensive of an increase in the Hmong population has led to serious service delivery problems.

**Interview with Merced Officials on the Refugee Situation There**

**John B. Cullen, Director, Human Services Agency, Merced County:**

When you realize that 10 years ago we had no Southeast Asians in Merced County and today we have 11 or 12,000 people you can guess the tremendous impact that it has on all our systems. We have right now about 8,300 of these 11-12,000 Southeast Asians on some form of public assistance in Merced County.

**Lee Pevsner, Housing Program Manager, Merced City:**

Ever since the arrival of the Southeast Asians we have had double digit unemployment in Merced County. Look at where people are employed and the kinds of employment opportunities we have here—we just don't have the capacity to absorb people with low-language abilities. Our job market is flooded with unskilled and low-skilled workers.

**Ronald Dangaran, Superintendent, Merced City School District:**

Out of 1,000 school districts in the State of California, we are ranked 60th in terms of need and yet the Title VII monies we are receiving from the federal government are really very small—almost insignificant.

**John Cullen:**

Why should Merced County have to spend \$1,000,000 more per year than our neighboring counties because refugees have chosen to live here?

**Houa K. Vang, Branch Director, Lao Family Community, Inc.:**

You have a hard time to find someone so they can drive around San Francisco. Our people are scared of driving, even in Sacramento—there is more traffic and they're scared of driving. How can we live in San Francisco and drive there? There is *no way*. We cannot go shopping either, and we cannot afford the rent. If you could just have a small factory or something around here, around the county here, we could work better.

**Lee Pevsner:**

The city of Merced is like many communities in that we have an extreme problem with low-income housing. The problem expanded geometrically when the refugees started to increase here, going from zero in 1982 to maybe 10 or 12,000 now. In fact, Southeast Asians comprise 16 percent of Merced's population.

**Houa K. Vang:**

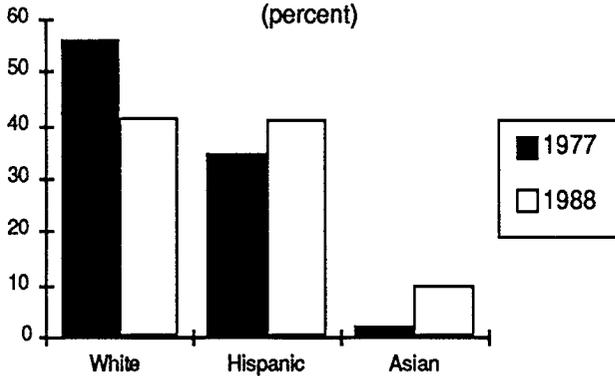
The refugee people come from large families, and bigger family cannot qualify for housing. There is *no way* you can break out because you cannot afford to rent a house or an apartment with your cash from AFDC—so you have to join more than one family together.

**John Cullen:**

The federal government picks up the full cost only for the first four months that a refugee is in our country on public assistance. The assumption is that a refugee only needs four months of public assistance in order to become self-sufficient. If you talk to anybody in the field right now, especially in California, you will find that our Southeast Asians demand a long-term connection with public assistance in order to acquire the educational skills, the survival skills, the job skills that took all of us at least 12 years of elementary school and possibly college to achieve. It is not realistic to think that a Southeast Asian coming from a 13th or 14th century culture can come up to speed in our country in four months. We need to have federal support on top of what we already get to deal with this new population—and an understanding that at least our refugee community, the Hmong primarily, are not like every other immigrant or refugee group that has come to this country. It is going to take new strategy, not the traditional approaches, to deal with their unique needs.

## Central Valley: Confluence of Change

Fresno County School Enrollment, 1977 and 1988  
(percent)



### Ed Blakely:

Together the increasing Hispanic and Asian populations statewide and in the Valley mean that in a number of counties, non-Hispanic whites are no longer a majority. School enrollment data give a glimpse of the changing ethnic mix. (Later we will have a more accurate picture from as the 1990 census becomes available.) Although the school population of Central Valley as a whole still has a non-Hispanic white majority, in the southern San

Joaquin Valley that group has dropped to 49 percent; 39 percent of the school population is Hispanic (compared to 31 percent for the state). The graph for Fresno County shows this change over time. A similar pattern is observed in Kings, Merced, Tulare and other counties.

### Commuters

Good data are lacking on who the commuters are and how many they are. They come to the area searching for lower cost housing, a better lifestyle, other opportunities, but they work elsewhere. One measure is to look at the traffic patterns on roads known to carry commuters from the Central Valley towns to the San Francisco Bay Area to work. Perhaps the highway with the heaviest impact is route 205 feeding into 580 near Tracy. During 1985-88, traffic increased 42 percent on Interstate 205, while Interstate 80 increased 25 percent and all other state highways increased 15 percent.

Unfortunately we do not know much about the employment patterns of these "over-the-hillers." By anecdote they have young families, and work as school teachers, fire fighters, factory foremen, technical draftsmen, personnel managers, executive secretaries and in sales. Skilled and semi-professional workers dominate. Dual income families are typical, and in new commuter housing developments few people are around during the day. Their choice to commute is motivated largely by differential housing prices between the San Francisco Bay Area and other coastal locations and the Central Valley.

Most would like to have jobs without the commute, but Valley wages are consistently below those of the Bay Area. The difference varies from a few percentage points to as much as 25 percent or more. The gap varies by sector. For example, coastal union construction jobs pay considerably more than in the less unionized Valley, while the difference is smaller in technical jobs because that labor market is statewide.

Commuters are thought to have a relatively weaker attachment to the communities in which they live. There are a number of signs of this weak attachment:

- Commuters tend to be *absentee residents*. They tend to not actively participate in civic affairs and may not even vote. Thus they don't develop close attachments to the place and cannot help build community. There is strain and stress as people have to go a long ways to work and home again.
- Many of their children are *latch key*, coming home from school with no one there. Without strong parental supervision other problems are created for the community, such as drug abuse.
- Many commuters don't develop strong *loyalty to the community*. Since they don't work there, they don't feel much allegiance to the place.
- Nor do they *shop* there. Many shop instead near where they work.
- There is an occupational segregation created in a community when only service jobs are available locally to serve those who work elsewhere. This creates a *growing inequality* in incomes and results in tension between the people who commute and those who remain behind.

The commuter problem originates in the urban context where jobs are created but not housing. Estimates of a housing shortfall in the Bay Area range up to one-half million. The Bay Area Economic Forum estimates a job growth of 1.1 million in next 15 years to 2005, but a shortfall of 165,000 housing units. The Association of Bay Area Governments estimates a shortfall of about 200,000 resident employees. These projected shortfalls in Bay Area housing will necessarily be filled by commuters. This means we'll have more growth pressure in the Valley, since the housing for these workers will have to be created in the Valley, if anywhere. This will mean increased competition for land. Growth management problems will arise; growth control becomes the next big issue.

### Managing Growth

In order to contain growth some suggest growth control measures, either by initiative or city ordinance. But these efforts don't control growth, they just rearrange it. They put people in other places; they politicize the issues, rather than dealing with them. They lead to increasing segregation of jobs, of housing, and of opportunities. They don't pull together the opportunities needed to plan the Valley intelligently. An intelligent urban plan is one which seeks to develop jobs, which offers opportunity and which creates its own economic momentum to ultimately contribute to the value and the development of the state. We have to make new room for new people and new opportunities. That room can be in the Valley—if we plan it intelligently.

**Bill Jirsa:**

Growth control for whatever reason—and there are legitimate reasons—will harm the people who need the housing the most.

## Housing Price Pressures

### Peggy Mensinger:



In the early or even late 1970s, none of us anticipated that Stanislaus County and particularly Modesto would be called upon to solve the Bay Area's housing failure. The Bay Area encouraged commercial and industrial use of land, and they had land for luxury housing projects, but they told their workers, sorry there is no room. The Valley is being called upon to provide land and air and water and services to people in search of affordable housing who are willing to drive incredible distances. It is quite overwhelming.

If we just leave it to short-range market forces, the tremendous demand from the Bay Area will convert farmland to houses, while the local citizenry will be priced out of the housing market. We need to balance those short-range market forces with some long-range vision by the government and its citizens.

### Bill Jirsa:

In Fresno we are seeing an in-migration of people from the Bay Area and Southern California, but these people are retirees, not commuters. These people have a couple of suitcases full of cash and can actually buy almost anything that the Fresno market has to offer.

If we're going to provide housing for all the people moving to the Valley, we'll experience Bay Area prices pretty soon. In Fresno County, land prices in the areas that can be developed have gone from about \$30,000 an acre two years ago to \$60,000 an acre this year. Higher land prices dictate development of high-end housing. Unless county governments allow development in a free market without constraints, the "affordability factor" in this Valley will disappear.

### Tom Hazlett:

The reason that housing is so expensive, relative to food and other commodities, is to some extent due to the power of the homeowners' cartels in these communities, exercising their veto authority over high density, low-priced housing. It's a great thing that Americans have to pay so little for food. Hopefully they'll be treated to some enlightened housing policies that make it possible to pay less for housing too.

### Grantland Johnson:

We have to not only construct *affordable* houses which really are for middle and moderate income families, but we have to provide for very low income families. We have 24,000 people in Sacramento County who are paying 50 percent or more of their income for housing. The reality is that if we dedicated 10 percent of the housing stock in each new subdivision to low and moderate income folks, we would make a tremendous advance toward housing those persons who don't have the ability right now to afford decent shelter. It is clear to me that here is a case where the state must step in and leadership, for there are very few cities and very few counties that have the courage to tackle this problem.

### Hugo Morales:

We need to change our values about housing. We really need to think about new ways of living, which do not involve a big house, with 12 bedrooms and a huge lawn, with one or two people living in it.

**Ed Blakely:**

**Alternative Development Patterns**

We are obliged to plan a city system that makes sense for the 21st Century rather than one which made sense in this last century. Current Valley city systems have created a sprawling set of *competing nodes* where cities and counties compete with each another in an uncontrolled way.

Another type of development is to create new communities. Planned new cities are being created to solve the housing crisis in the Bay Area. Sometimes hailed as a panacea, their value is yet unknown. They lack the stability of history; they are without a core; many are on prime land, even if built above the Valley floor.

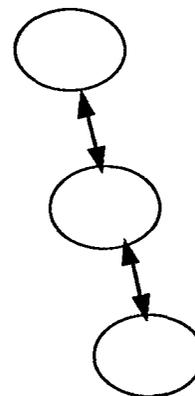
Another system we could have is strip development with growth occurring along the various roads. This is a type of sprawl, leading to an uneven and opportunistic patchwork of unattractive development.

A fourth kind of development might be pursued which incorporates known and desirable characteristics: A pattern that builds in an intelligent transportation system by controlling development along an already existing corridor. It could consolidate our already linear set of communities, pulling them together so as not to encroach upon the land. A linear development with designed integration offers potential of a better system for the Valley.

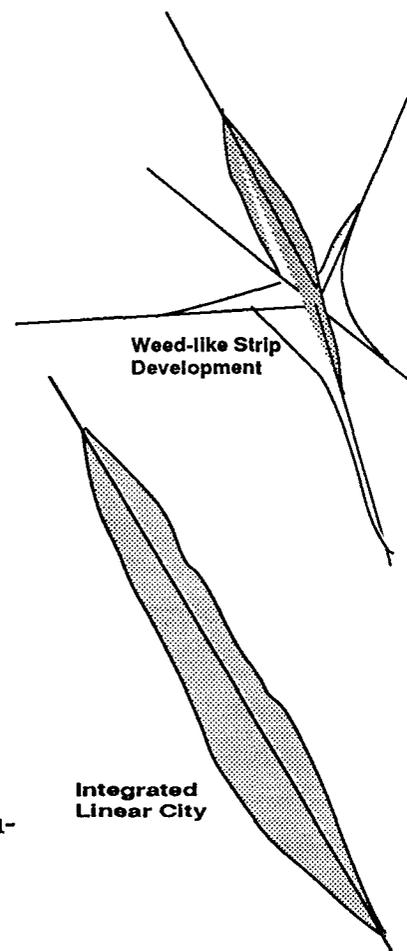
The goals of such a planned system are several:

- Attempt a better balance between housing and jobs and, using the existing transportation system, make the needed connections.
- Establish a more desirable infrastructure for the corridor; for example, plan within it greenbelts and wetlands.
- Provide an organized and stronger commercial/industrial system.
- Provide a rational transportation system, integrating highway, air and rail in a more logical way—buses and rail could link the Valley cities.

*People Pressures*



**Competing Nodes**



## *Central Valley: Confluence of Change*

These are the kind of plans that could make a better place, a place where we all might live. But we need to think about how we would plan such a system.

### **Deena Sosson:**

My main concern is the seemingly ready acceptance of the state's inactivity and passiveness in the whole issue of managing growth. There should be an overall state interest in defining and articulating growth management goals. The state's proper function is to provide incentives for regional planning and to provide disincentives for areas that do not participate in a regional cooperative network. The state needs to reorder its fiscal system to remove the fiscal imperative that seems to be driving so many land use decisions.

### **Hugo Morales:**

When we talk about collaboration and plans for the future, we must bring to the table the new population—including the underclass, whether they be white, yellow, brown or black.

### **Options**

In planning for development, there are a number of options. Some are very good; others are unsatisfactory. The first way is the *bureaucratic option* by which we use rules and regulations to try to control development. We've been doing this for over 40 years. This option is no longer viable simply because planners can no longer direct development toward desired goals. Rules and regulations won't get us where we want to be.

The second way is *collaborative options* whereby cities and counties work together. Collaboration and cooperation are very tough words, implying a willingness to work under set of agreed-upon rules without a higher power to enforce them.

The third option is the *ballot box*. This is also an option we're using now—voters determining how their community should be developed. Whether voters know anything about planning or not, they certainly know what they don't want. Thus, they are voting against things they don't want to have happen rather than voting for what they do want to have happen. The ballot box is no place to plan.

However, there are intelligent ways to plan and we need to start using more intelligent plans. Intelligence suggests that we need to have more *regional planning* solutions—solutions that bring together all the forces to design a better community across a larger space.

In the Central Valley, we have to design tomorrow today. But we can't design tomorrow merely by reaction to today. Rather, we must think about what tomorrow should be—what the critical elements for tomorrow are. This task will take careful planning with legislators, other policy makers, other professionals, and concerned citizens.

# Clogged Arteries in the Heartland: Transportation Surgery Needed

## Important Issues

The transportation study team believed that we needed to develop a comprehensive understanding of the role that transportation plays in the Valley. We identified several issues for in-depth analysis:

- Is urban traffic congestion a problem now and is it likely to be an increasing problem in the future?
- Are deteriorating roads increasing the cost of doing business in the Valley? Are they resulting in product loss and damage during shipment? Are carriers faced with the need to reduce their speeds in getting goods to the market because of poor and deteriorating road conditions?
- Why are firms relocating to the Valley? Are they relocating processing and production facilities to the Valley in order to reduce their transportation costs or are other factors driving these moves?
- Are transportation institutions, at all levels, adequately addressing the problems faced by Valley transportation? And if they are not, what can be done to improve planning and decision making?

### Paul Jovanis:

Congestion in the Valley is directly tied to population growth and economic activity both throughout the state and in the Valley itself. Estimates are that population will increase at least 3 percent per year. Whether it is more or less than that, it is clear that both population and economic activity will keep on increasing in the Valley and throughout the state. Importantly, no one seems to be advocating constraints on statewide economic expansion. So the increases in congestion, directly related to the increased economic activity and population growth, will continue as well.

Currently, Valley congestion isn't nearly as bad as congestion in other major urban areas of the state. Certainly it does not compare to the Bay Area or the South Coast region. In our view this represents an opportunity for taking actions and identifying potential solutions that may be effective in the Valley. Congestion in the Valley is generally limited to relatively short periods of time on relatively identified links in the highway system—unlike the four or five or even eight hours of congestion that you see on Bay Area and LA freeways throughout the day.

A second transportation problem is road deterioration in the Valley. System providers such as Caltrans and county public works directors recognize the problem; whereas, users of the highways system—shippers, carriers, and the general motoring public—are apparently not yet aware of it. There is

### Steve Juarez:

There is a hidden cost of not keeping up with maintenance. People don't see deteriorating infrastructure—in transportation, sewers, dams, etc. When we allow cities, counties, and to a lesser extent, Caltrans to defer maintenance, the eventual costs of coming back to reconstruct those facilities far outstrips what they would be if we paid for preventive maintenance. It costs five times as much to reconstruct a highway as it does to maintain it for 40 years.

## *Central Valley: Confluence of Change*

a danger here in being overconfident. Although users may not perceive underlying problems or damage with a road, waiting until damage is obvious can mean a major reconstruction project. It takes 10 years or more to move through a major highway project from the planning stages to the implementation stages. In some cases we just can't wait until the road fails and literally collapses. The consequences and costs are just too great.

Many believe that farm to market roads will revert from paving to a gravel condition. Even with an infusion of additional funds for transportation investments like those of the gas tax initiative, resources are simply not sufficient to repave a lot of low-volume roads. Meanwhile, some farm-to-market roads increasingly being used by commuters will likely require some substantial expansion in the future.

In firms' decisions to relocate to the Valley, transportation is only one of many factors. Other factors include availability of low-cost land and labor, affordable housing for employees and more favorable union relations.

### **Bill Briam:**

The State of California has managed to get itself in the position of being 50th in the nation in per capita expenditure on highways and mass transit. It has the 47th lowest fuel tax in the United States. Because of the state's lack of dollars for infrastructure and improvements, you have counties like Fresno passing a 1/2 cent sales tax override within its own jurisdiction. Then we end up with a highway system that's a patchwork quilt because only those counties with additional money make improvements.

Transportation decision making is currently extremely fragmented. We heard one example of a county that terminated a highway short of a county line so it would not provide any economic benefits to the rival adjacent county.

Counties such as Fresno and Sacramento are to be commended for having the foresight and initiative to pass one-half cent sales tax supplements to provide additional funding for transportation. But it is important to recognize that a local infusion of funds is not a substitute for inter-regional and statewide planning and coordination. Traffic congestion and related vehicle emissions do not recognize political boundaries. By their nature they are regional and inter-regional in character. We should not be satisfied simply with piecemeal funding and patchwork planning. We have to look to Sacramento for help on these inter-regional and statewide issues, particularly in the air quality and transportation planning areas.

Thus, we can only be successful in managing congestion and meeting air quality mandates if we have major changes in transportation institutions.

## Solutions?

While there is a fairly high consensus on the Valley's potential transportation problems, there is much less agreement on their solutions. There is strong support for flexible multimodal approach in transportation planning. But how people would set priorities when allocating scarce resources is unclear. Everybody agrees that changes are needed, that more money and fresh ideas are needed—but there isn't really a clear sense of how best to meet these needs. An example is the strong differences of opinion about light rail and rail transit in general.

### Comments on Rail—Pro, Con, and Otherwise

#### Paul Jovanis:

- Given current land-use policy, rail transit is not likely to have a significant effect on reducing Valley traffic congestion. In fact, it may be counter productive if it siphons off funds that can be used for potentially more effective transit investments.
- It is not at all clear that greater ridership can be achieved through expansion of rail. Sacramento's light rail system, after operating for some four years, has finally managed to achieve the same total ridership that was carried by the buses before light rail opened. Just think what our bus ridership might be had we used those tens of millions of dollars for improved regional bus service.
- An underlying problem with transit is its lack of relationship with land use policy. It is difficult to have a light rail vehicle rumbling around in a subdivision with quarter-acre lots. Until land use policy changes, I don't think that rail is going to be a very good way to spend our bucks. I do think we should spend more on transit—but less on rail.
- An additional concern is the demographic trend toward an increasing number of two-worker households and single parent households. These household structures have travel needs that are much more efficiently met with an auto and highway transportation and much more difficult to meet with conventional transit.
- Still another concern that we had with light rail is that it has very little potential to improve air quality due to the reliance on auto access. Many people using light rail drive their automobiles to the stations. Auto emissions during cold start are basically ten times those that occur during idling and free flow operation. So, if you start your car to get to and from a light rail station, you have substantially lost most of the air quality benefits that might be achieved with transit.

#### Grantland Johnson:

We have made a choice to become dependent upon the single passenger automobile, and we are paying dearly for it. Rail investment in this state is miniscule. We have underallocated resources to rail and public transit.

#### Steve Juarez:

There is a schism between highway development and other modes of travel—mass transit, light rail, bus, heavy rail, intercity rail. Even in the light of Proposition 111 and the other two rail propositions, there is a continuing unwillingness of people to provide all the money necessary for the type of transportation they would like to have. I believe that even with the passage of these propositions we will still be far short of what we need to provide efficient and effective transportation solutions.

#### Ed Blakely:

These light rail systems are really a tribute to the politician's need to be at ribbon cuttings, rather than a need for transportation.

**Beverly Kees:**

Land use and transportation plans should be interwoven.

**Bill Jirsa:**

There's a problem when you're trying to develop a rail system, but you do not have a compact population of riders. I believe that rail is not going to work given the low density patterns of a typical Valley development. Trying to increase that density is fraught with political landmines. We want apartments—but not here—not in my backyard.

**Ed Blakely:**

Transportation is the means. If we get the ends right, we can have transportation systems that will meet these ends. We don't have the ends, yet we keep talking about the means. There are places in the world that get the ends and means right. In Europe, you can go to the city center and get where you want to go. You can experience gentle living in an urban setting.

**Paul Jovanis:**

We found it rather paradoxical that California is an innovator in highway construction, highway design, highway operation, yet seems to be sadly lacking in transit innovation. We seem to be dredging up the same ideas that have been used over the years and that may not necessarily be applicable to California's problems. For example, in bus transportation, why can't we come up with vehicles appealing enough to draw ridership away from private automobiles?



**Blakely & Jovanis**

Highway expansion clearly carries environmental risks but is generally compatible with California's existing diffuse land-use patterns and emerging demographics. Keep in mind is that highways carry more than people. They carry freight. A safe and efficient highway system is essential to the economic movement of goods within the Valley and to and from markets. We heard testimony during our group meetings of shippers' attempts to use rail for the movement of nonperishable goods, but due to the lack of reliability and lack of timeliness of delivery, they wound up going back to truck.

Truck/rail coordination is likely to occur in increasing amounts but in long-haul markets, basically in excess of 500 miles in length. For inter-regional and intra-state freight movement, truck is likely to remain the dominant transportation mode.

We need to emphasize that any modal solutions carry with them an extremely high risk of failure, given the fragmented transportation decision making that currently exists in the Valley and within the state. Transportation issues quickly transcend political boundaries, and, unless new institutions emerge with broader agendas, planning and implementation are likely to remain piecemeal and of limited effectiveness. A new regional basis for transportation decision making and stronger transportation institutions are urgently needed.

Our study team believes there are technological, management, and economic solutions that can help alleviate and avert Valley transportation congestion. There are technologies currently being tested in a number of places around the world that could be of significant help to us in the Valley and elsewhere in California. One is equipping automobiles with computers to guide drivers around congestion. The driver tells the computer the current position and the desired destination; the computer tells the driver the quickest way to get there. Such systems are being tested in Berlin, London, and Japan. Tests are planned for Los Angeles and Orlando, Florida. Because of the characteristics of congestion in the Valley—for relatively short periods on certain links—we only need to advise a relatively small number of vehicles to take alternative routes, to achieve significant savings in traffic congestion, especially in the short to medium term.

Another option that links management and technology is telecommuting, providing employees with an electronic medium to work at home, perhaps two to three days per week. Telecommuting aims at reducing peak period travel, thereby reducing congestion for all the other travelers on the highway system. A recently completed pilot study by the State of California showed reduced amounts of peak period travel on telecommuting days, no significant amounts of vehicle use while the person was working at home, and no negative impacts on ride sharing, car pooling or transit use. So this is a tactic that offers us a significant opportunity to beat the traffic congestion problems.

**Steve Juarez:**

The backbone of any transportation solution is comprehensive and cooperative transportation planning within specified commute sheds or regions. That doesn't necessarily mandate a regional governance, but you have to have a system that allows for regional decisions. This calls for a give and take among cities and counties that we don't have today, except in a few isolated cases.

**Donald Swartz:**

I think the issue of transportation is solved, not by Sacramento or Washington, but by the people through conservation. This is the simplest, least expensive, most immediate way to get at some of these transportation issues. I am not opposed to new technology in transportation, I just believe the answer lies with the citizenry. Each of us could ask, "Is there a way I can drive 12,000 miles next year instead of 13,000?"

**Don Swartz:**

Low energy prices have encouraged us toward an automobile-oriented society. People have always talked about the market price as being the appropriate price for energy, yet the next generation doesn't get to bid on that market price. Our grandchildren are not here today to say how dear energy is going to be to them. I personally would favor a gas tax as an artificial way of raising prices to encourage conservation.

**Paul Jovanis:**

You have to look at other subsidies too—one being income tax writeoffs for home mortgage interest and property taxes. It is not just low gas prices, there are other subsidies that drive us into these suburban types of land use patterns that are far from being the best for transportation considerations.

**Tom Hazlett:**

Other innovative approaches are available to foresighted policy makers at the local and state levels. From the economists' laboratory, may I suggest just three:

- First—road pricing. While taxes tend to be bulky and incentive distorting, user fees for roads, parking space and air pollution can, if properly designed, actually get people to do the right thing: to use roads less, and/or at non-peak times, pollute less, and conserve valuable natural resources more. The available electronic identifiers and optical scanning technology now makes such futuristic solutions practical, if not politically feasible. Faced with many expensive failures elsewhere in the transportation planning process, we should not scoff at the proven success of financial incentives in altering individual behavior in the public interest.
- Second—enlightened land use policies that help with transportation solutions. To the extent that local authorities are progressive with their mixed-use zoning, consumers will be more free to exercise their natural inclination to live near to where they work, thus cutting commute distances and congestion. Zoning officials should also recognize that density is not the root of all evil; rather, density is the friend of all mass transit solutions. These approaches surely require stiff resistance to the not-in-my-backyard forces and other established interests. Another helpful commercial zoning approach is to end over-requirements for parking space in commercial buildings, for this turns out to subsidize single passenger auto use.
- Third—recognition that certain transportation alternatives could have flourished, but were explicitly removed by public policy. Certain policy decisions could offer particularly easy economic solutions. For example, liberal permitting policies for jitneys, other share-ride services, and commuter van lines, once very popular in many California cities, were outlawed during the World War I era. They should be revived on the long commute routes that are becoming more and more common to Central Valley residents.

None of these suggestions out of the economic test tube can be implemented scream-free in a rambunctious political world. But local governments are experimenting, and if local policymakers exercise foresight, innovative solutions will make for a better world. The great opportunity for the Central Valley is that time has not yet run out.

**Paul Jovanis:**

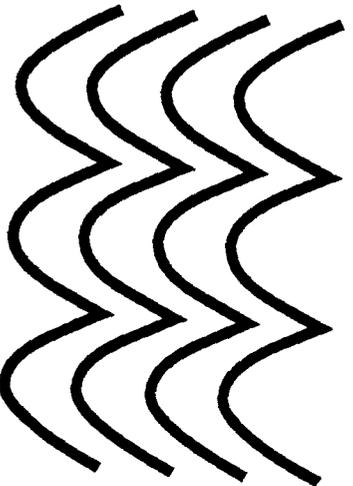
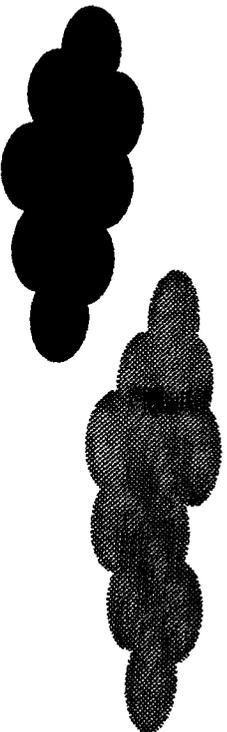
We need new institutions and major institutional reform to facilitate both regional and statewide transportation planning and coordination. We believe that, beyond the Valley, we need to broaden the mission of state transportation agencies to respond with a multimodal and interjurisdictional mandate. If we can't look to Sacramento for help, this is really bad news for transportation, for the state is where the help needs to come from. While the local counties have been very innovative in dealing with their transportation problems, transportation is just not something that can be dealt with very effectively strictly at the local level.

We need leadership and a sense of vision to move away from constrained conventional solutions, to more exciting, innovative and potentially more effective actions. This is particularly true in the area of transit innovations and in the application of advanced technology. What is important in the Valley is that we *can* make a difference. Things are not in as disastrous shape as they are in other major urban areas in California. Decisions that we make now in the next five years will shape the Valley for decades to come.

**Grantland Johnson:**

There is an absence of statewide leadership in dealing with our transportation infrastructure. Specifically, in Sacramento we are trying to get a beltway built, to transport intrastate and interstate traffic through Sacramento and around surrounding counties. We cannot get it built because of the "not in my backyard" syndrome. Where is the state? The state is nowhere to be found in terms of leadership. It is clear that kind of regional network cannot be built by the county or city of Sacramento or Yolo or Placer or El Dorado counties. It is not going to happen.

# Resources at Risk



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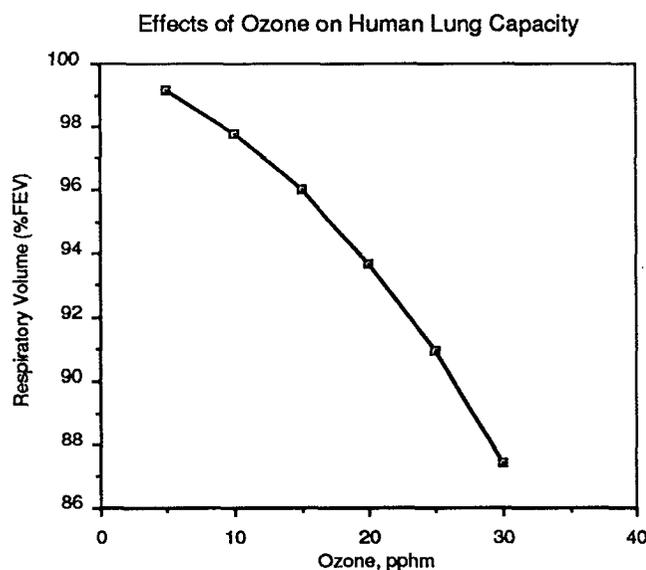
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# Resources at Risk

**Bill Rains:**

## Resource Thresholds

Is the Valley now on one or several thresholds of resource degradation? Are there limits to the pollution and density of human activities that can be supported by the resource system? The answers to these questions depend on how you define quality of life, and what level of health risk or economic loss you are willing to accept. However, in some areas thresholds are more distinct. For example, medical research supports the notion that ambient ozone levels even slightly above those under which we evolved are harmful. This diagram shows the increasing loss in lung capacity that results from rising ozone levels. State and federal air quality standards are based on the belief that there are levels it is dangerous to exceed. Within the Central Valley there are several air pollutants, including ozone, that exceed these standards—making it obvious that we have already crossed some thresholds with respect to the air resource.



The situation for water is less clear.

Availability of reasonably pure water currently determines the type and location of agriculture. Our whole system has been built around ample, inexpensive water supplies. Experts disagree on how much more water can be conserved without affecting long-term agricultural sustainability or yields. Some feel that agriculture could use as much as 20 percent less water than present levels without negative effects. Others believe that the margin for conservation has been virtually used up; they question whether there will be crops able to economically justify the capital expenditures needed to install water-saving technologies such as sprinkler and drip irrigation. The truth is, we don't know just how far our water supply can be stretched. However, even if a decision to increase available water by construction of dams and canals were justifiable economically, this would reduce the number of free-flowing rivers and change natural ecosystems that are currently valued by groups within society.

*Central Valley: Confluence of Change*

**Paula Carrell:**

We are up against a finite supply of several resources. We can't move on to the next unoccupied area of the country. Our water supplies are constrained; certainly our air supply is limited. We are at the point where we need to make choices, to effect tradeoffs, to recognize that a resource that is allocated in one place will not be available someplace else. It is nearly impossible to isolate particular problems. It is not possible to assume the position of "I am an environmentalist; my job is to protect ducks and forget the rest of it." Nor can one assume the position of "I am the farmer; my job is to protect my fields and forget the rest of it." The problems are interconnected, so the solutions are going to be interconnected.

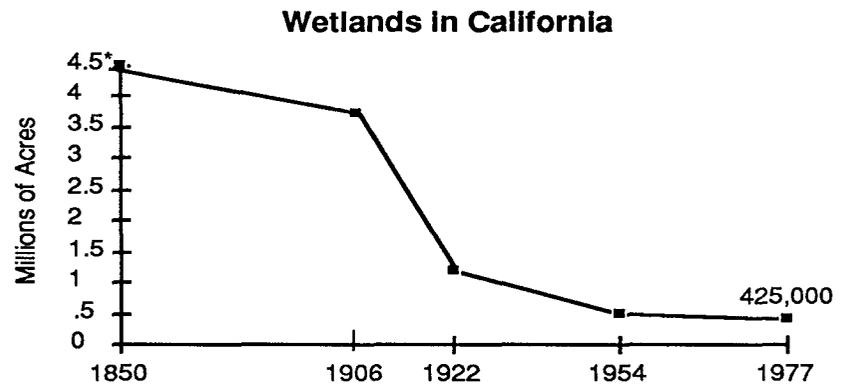
**Tom Graff:**

Environmentalists and their representatives have been around in an organized way for maybe 20 years. By now we are more used to collaboration and mediation and negotiation than has been the case in the past. We are looking for solutions that benefit not just the environmental sector but other sectors. I think that holds a lot of promise.

What about land? Does the fact that it has become finite in response to population growth mean that it will be degraded, or that we will lose certain soils, topographies, and microclimates from agricultural production? Will we lose natural habitats and the species that depend on them? The answer to both questions is "yes," unless we learn more about the land and wildlife resources existing within the Valley, and are able to choose wisely among competing uses. The formerly productive coastal regions illustrate the effects of urban growth on agriculture. Land use changes similar to those in the LA Basin or in Santa Clara County are beginning to occur in parts of the Central Valley, especially in the southern Sacramento and the northern San Joaquin valleys.

The tradeoffs for land are not just between urbanization and agriculture, but include wildland, scenic, recreational, and open space uses, to mention a few. The case of Valley agricultural land illustrates the tradeoff between agriculture and natural uses. The early settlers found a huge swamp ranging up and down the Valley. For them the swamp was a health hazard due to the malaria-transmitting mosquitos that infested it. The flooding of the rivers, which affected the total area covered by the swamp, also spelled danger to adjacent farms, so the settlers responded by draining the swamp and controlling the rivers. The eventual result was an agricultural system virtually unparalleled in the world. However, if the swamp is considered for its value as a wetland habitat and home to millions of birds along the Pacific Flyway, or for its surrounding riparian forests with their tremendous biological diversity, it is clear that Valley agricultural land came at a price. Although that price is difficult to assess, the magnitude of change from native ecosystems has been impressive. The introduction of agriculture, together with

increasing population densities, resulted in conversion of 85 percent of the 4 million acres of wetlands by the year 1939. By the mid-1980s another 240 thousand acres were converted, with only 380 thousand acres of wetlands remaining.



\*Approximately 4.5 million acres, estimates prior to 1900 range from 4.1 to 5 million acres.

Source: Bureau of Reclamation

### Charles Hess:

#### The Impact of the Environment on Agriculture

Nowhere is the impact of the environment upon agriculture clearer than in the Central Valley. For example, the Valley can act as a huge trap for pollution produced from within, as well as that which is blown in from the Bay Area communities. Studies at UC's Kearney Agricultural Center have shown such pollution can result in yield losses of 20 percent for grapes and melons, and 9 to 15 percent for cotton, alfalfa, and citrus.

Also, naturally occurring salts in irrigation water can concentrate in the soil through crop use and evaporation, reducing yields. Uncontrolled growth will lead to competition for land—a non-renewable resource—and for water, and will add to the pollution burden of the Valley air, further reducing crop yields and potentially having adverse effects on human health. Therefore, as we look at the future of the rapidly urbanizing Valley we must ask: What will be the future impact of the environment on agriculture? If the course of events is left unchecked, agriculture will be the Valley's most important endangered species!

By developing crops which are tolerant of air pollution or salt residues, research can probably prolong the time during which we can attempt to coexist. But is this really the best approach to the challenge? Is this the way we want to shape the future of the Valley—and other parts of the nation and the world which are faced with population pressure and pollution? I would hope that your answer would be no.

### Jananne Sharpless:

What has to be done is to look at these problems with a new perspective—how they impact one another. How land use, water, and air impact one another. Water clean up obviously is of great interest to the public; but it also involves some kind of impact on air quality. Likewise when we talk about land use planning, we must also consider transportation systems and other types of infrastructure that obviously have an impact on air quality and water needs.

*Central Valley: Confluence of Change*

**Tom Graff:**

There is a plea for recognition of the Valley's agricultural resource base as an important, special concern, but the Medfly situation attests that such recognition exists. People in urban areas are being asked to receive who knows what level of health risk and weirdness in terms of helicopters buzzing them on behalf of the state's agricultural resource base.

**Dan Walters:**

On a more localized basis, the Valley faces great political choices, including the conflict of agriculture with the growing population, not only in terms of the conversion of agricultural land to nonagricultural purposes, but also social and physical conflict between agricultural operations and nonagricultural lifestyles. The most dramatic and obvious example is people who live in suburban houses in the outskirts of Modesto who don't like planes spraying them with pesticides.

**Joe Fontaine:**

Protecting the environment is in our own self interest. If we don't, we are at the least endangering our health and our own standard of living. And at the worst, we might even endanger our existence on this planet.

**Bill Rains:**

**Sustainability of the Resource System**

Having said that scarce resources force society to make tradeoffs among uses, it is important to realize that there may be particular mixes of uses that are internally incompatible or environmentally unstable. For example, agriculture and houses may represent incompatible land uses since smells, chemicals, and noise from farms may prove objectionable to neighbors, while vandalism and loss of economic scale due to urbanization may drive agriculture away.

Examples of environmentally unstable resource uses abound. Irrigation without appropriate drainage in the San Joaquin Valley is now causing salinization of large areas, and has resulted in accumulation of toxic concentrations of selenium in the Kesterson Reservoir and other sites. Agricultural production in the Valley cannot survive for long without balancing the import and export of salts. Fortunately, this is a problem that can be solved if the political will exists to do so.

Unfortunately, other current practices involve unstable resource uses whose results are irreversibly harmful or that are undetectable but deleterious. An example of an irreversibly harmful situation might be the extinction of biological species due to loss of habitat, which leads to new, less-desirable ecosystems. The loss of the Valley's wetlands may constitute a deleterious, but unrecognized, threat to Valley water supplies, in that wetlands provided an important mechanism of groundwater recharge.

Because there are unknowns in our tradeoff decisions, it is imperative that society as a whole exercise caution. Agriculture must ensure that its practices are sustainable. This means gaining a better understanding of natural resources as well as the interactions among them. This knowledge must be gained quickly, not only to improve stewardship of the physical environment, but also to safeguard agriculture for future generations. The position of agriculture within California society is changing. In order to

assure that the agricultural sector retains some control over its own destiny, it must be *proactive* now in recognizing and acting upon the larger society's concerns for a healthful environment.

**Charles Hess:**

It is essential that we join together to take an assertive, proactive approach in dealing with environmental issues. To say that there are no problems or that public concern is completely the result of misinformation is not a productive approach—neither for our own future here in the Central Valley, nor for the restoration of public confidence.

The public is growing more and more concerned about the impact of agriculture on the environment, particularly its potential effect on water availability and water quality. And there are recent data to give some credence to that fear. A U.S. Geological Survey report published in November showed that in a sampling of surface water in 10 midwestern states, 90 percent of the samples showed the presence of some agricultural chemicals.

A growing concern about the impact of current agricultural technology upon the environment was reflected strongly in the 1985 Farm Bill. Programs such as the conservation reserve and the protection of wetlands were introduced. The current farm legislation debates are even more heavily weighted in this direction. In fact, a coalition of environmental groups even drafted its own version of farm legislation. The *Washington Post* was correct when several months ago it predicted that "the sharpest fight in the farm bill may not be about the traditional subjects of support programs or food stamps, but about the environment."

The environment is certainly one of our top priorities at the U.S. Department of Agriculture. Secretary Yeutter said, "We at USDA are reaffirming our commitment to a healthier environment and pledging our wholehearted support of efforts to preserve and protect our natural resources for future generations." I think it is important to recognize that the Secretary used the verb *re-affirming*. Agriculture has always tried to be a careful steward of our land and water resources. It is simply that now this effort is receiving renewed emphasis.

We are working to achieve a national agriculture that can operate in an environmentally responsible fashion, while at the same time continuing to produce abundant supplies of food and fiber both economically and profitably. More research and information are needed, but we are well on our way in many areas.

**Tom Graff:**

I see an increasing interest on the part of Valley politicians in environmental issues—politicians of all parties, at all levels of government. This is bipartisan, and it derives in part from changing values in the Valley as well as nationally.



## *Central Valley: Confluence of Change*

Amazing change has taken place in the past five years in the reception of the concept of sustainable agriculture. We see the Leopold Center at Iowa State, a long-term ecological research program at Michigan State, a statewide sustainable agriculture program here in California, and the LISA (Low Input Sustainable Agriculture) program in the Cooperative State Research Service at the Department of Agriculture. Michael Jacobson, executive director of the Center for Science in the Public Interest, recognized the program when he said, "Even USDA is uttering the 'o' word [organic] and not choking."

Actually, we are doing a lot more than that. We are increasingly interested in the development and adoption of sustainable land use systems for two very basic reasons: (1) the need to bring about fundamental improvements in our global environment and (2) an ever-expanding need to provide economically produced food and fiber for a growing world population.

Through technology, the United States has developed an efficient, highly productive food and fiber system which is the envy of the world. American consumers currently spend the lowest percentage of their income on food of any people in the world—an incredible 11.8 percent. Now, however, we recognize that this technology has had some costs

## **Cost of Food**

### **Audience Participant:**

Why is it that society is not willing to pay a realistic cost for food? When I travel around the world, I find households paying anywhere from 30-50 percent of their income for food, but in the United States, we want to pay less than 10-15 percent. We go so far as to boycott, such as happened in the 1970s against beef, when there's talk of raising food prices.

### **Ed Blakely:**

U.S. food prices are really subsidized food prices, partly on the backs of our farm workers and partly through farm supports. The system provides something that's very important to all of us, at a very low price. You start raising that price and you start running into deep political difficulties. Gasoline prices are also artificially low in this country—we don't pay the world price here, but we should. We should also pay the real cost of food. But that would lower the standard of living for many Americans.

### **Audience Participant:**

That 11.8 percent of income for food is an average for the entire United States. I work with low-income families and many of them are spending 30-45 percent of their income for food. They are already spending 45-75 percent for housing; if you raise the cost of food, these families will experience a lot of difficulty.

### **Charles Hess:**

If we convert our prime agricultural land to homes, factories, and roads, we will end up in a situation where the supply of food will not meet the demand and the prices will go up.

which were not fully anticipated at the time of its introduction. We are looking more closely at its possible social, environmental, and health impacts and its interactions with other demands on natural resources. Clearly, we must address the issues—both perceived and real—that are being raised.

The term sustainable agriculture means different things to different people. But the name may not matter all that much. What *does* matter is that farmers around the country are closing their conventional cookbooks and carefully crafting new recipes for what might be called “smart and considerate farming.”

Rather than providing yet another definition, let me share with you our approach at the USDA: We feel it is the department’s responsibility to provide farmers with a range of options to best fit their economic and environmental situation. The choices range from the optimal use of fertilizers, pesticides, and other off-farm purchases in conjunction with best management practices to operations which actively seek to minimize off-farm purchases and emphasize crop rotation, integration of livestock and crop production, and mechanical or biological weed control. The thing they have in common is Integrated Resource Management—a systems management approach which looks at the farm as a whole.

To some, this seems a return to the 30s and “low tech” production methods. But sustainable agriculture does *not* mean going back to hoes, hard labor, and low output. What it *does* mean is the use of the very best of technology in a balanced, well-managed, and environmentally responsible system. It relies on skilled management, scientific know-how, and on-farm resources.

Let me stress again that we are not seeking to eliminate the use of important chemicals and fertilizers. In many instances, such chemicals and fertilizers are absolutely necessary to the farmer. We are, however, seeking ways to reduce their usage and increase their effectiveness in order to improve and maintain environmental and economic sustainability.

Contributions will be needed from all the agricultural sciences to develop sustainability models with sound

**Grant Chappell:**

I am a production farmer—prices, profit and labor. Yet at a recent agricultural leadership conference I attended there were two things we talked about—food safety and the environment. I bring this up to let you know that agriculture is very aware of its responsibility in finding solutions to these problems.

As our scientific instruments better measure the contents of our water and what is in our soils, we are learning that there is some cleaning up to be done. But many in agriculture started this process long before the regulatory agencies set any standards.

Along with the ability we now have to identify problems, we also seem to be developing the capacity to sit down as a group and deal with them. From that perspective I am very optimistic that agriculture can meet the challenges it faces.

## Central Valley: Confluence of Change

### Ken Farrell:

Beyond the farm, it is the Valley as an ecosystem that we want to sustain. And beyond the Valley's natural environment, agriculture finds itself an integral part of complex, dynamic social and economic systems in the Valley. An increasingly urban society in the Valley will see agriculture as one of many uses for natural resources; it will no longer accept the primacy of agriculture in its use of those resources. Perceived effects of agriculture on the quality of life of a predominantly urban population will raise increasingly complex, controversial public policy issues with potentially profound impacts on the future of agriculture in the state.

Looking beyond the agricultural, resource, and human systems in the Valley, agriculture's profitability and competitiveness must be maintained in the face of increasing internationalization of markets and trade. To maintain competitiveness in global markets, agriculture will continue to be dependent on new or improved production technologies and marketing strategies. But these approaches will need to be balanced against natural resource, environmental, and food safety constraints and objectives.

management practices and techniques for food and fiber production systems. The appropriate measure of a system's productivity and efficiency is not how much it produces, but rather the relative value of what it produces compared to what went into producing it. We now must include environmental impacts in the cost/benefit equation—something that has not always been considered. This applies not just to agriculture but to transportation, government, demographics, resource use, etc.

However, I want to express a note of caution. While we want to avoid adverse effects on the environment and on beneficial organisms, we must also be alert so that in our enthusiasm to remove compounds, we don't create conditions in which naturally occurring toxic substances (such as aflatoxins) are able to increase.

Universities will play a vital role in the future of sustainable agriculture. As we endeavor to create management systems which combine our knowledge in a wide variety of areas, universities will want to set up internal mechanisms to facilitate multi-disciplinary approaches to research. It takes cooperative interactions among a number of disciplines to develop stable systems.

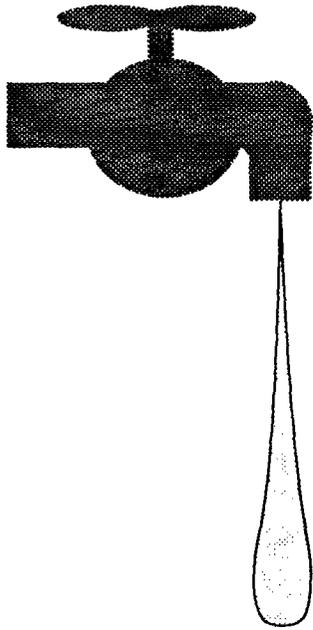
The widespread awareness of the need for economical and environmentally sound ways to farm has not always been matched by the availability of reliable and practical information on what, in fact, can be done. Innovative farmers and researchers have generated considerable new information, but it has not always been shared with and tested by others to the extent it should. Extension certainly has an historic *and* a very current role in meeting this need.

So far most efforts have been directed at farm-level research and education. As noted in the National Research Council's report, *Alternative Agriculture*, very little research is being done on what implications the adoption of environmentally sensitive agriculture systems might have for the structure of agriculture, environmental quality, and rural communities—as well as for national and global food

production. Again, we are seeing how necessary it is to look at the big picture and the interaction of all its components. We need every ounce of careful management and efficient technology we can muster to continue to maintain our competitiveness in a tough global marketplace and at the same time have an environmentally sensitive agriculture.

### Examples of Work at the Federal Level on Agriculture and the Environment

- Under the President's Initiative on Water Quality, research will help us to get a better sense of where we are in terms of the *real* vs. the *perceived* in the issue of water quality. We will determine what agricultural practices adversely affect water quality and then develop alternatives to them. Through the Cooperative Extension Service and the Soil Conservation Service, we will extend existing knowledge on best management practices.
- On February 9, 1990, the USDA announced the establishment of eight water quality demonstration projects to show new ways to minimize the effects of agricultural nutrients and pesticides on water quality. The Soil Conservation Service and Extension Service will provide joint leadership for the on-farm demonstration projects. In 1990, five USDA agencies have committed \$3.3 million to the projects located in California, Florida, Maryland, Minnesota, Nebraska, North Carolina, Texas, and Wisconsin.
- In the 1990 field season, the Agricultural Stabilization and Conservation Service will test a cost-share program for reducing chemical use. The trial program is designed to encourage adoption of integrated pest and fertilizer management practices. It will be limited to 20 farms in each of five counties per state. Participants must enroll at least 40 acres of small grains, forage, hay, or row crops and follow a written Integrated Crop Management plan (ICM) which seeks to reduce pesticide or fertilizer use by at least 20 percent.
- This past July, a new \$11.9 million Soil Tilth Laboratory on the Iowa State University campus was dedicated. This laboratory will study the effects of a variety of agricultural practices upon soil structure, organic matter, microorganisms, and movement of nutrients.
- The USDA also continues its research in Integrated Pest Management, looking at pest control in a systematic way in order to optimize all of the control strategies available: genetic resistance, biological control, cultural practices, and precision application of safe pesticides. There is a need to increase our efforts in moving the IPM systems from the drawing board to the field. Cooperative extension can play a big role here. There is a growing awareness on the part of farmers of the advantages of introducing IPM into their production systems as more and more pesticides are removed from the market and new regulations are developed on almost a daily basis.
- The Alternative Farming Systems Information Center at the National Agricultural Library is another way we are increasing the transfer of knowledge. As part of the team working with sustainable agriculture, this NAL information center focuses human expertise on the specialized subject area of sustainable agriculture. Inventorying and coordinating data from many sources, it plays an important role in meeting the information needs of researchers and producers.
- USDA's LISA research and education program was created to help develop and disseminate to farmers practical, reliable information on low-input sustainable farming practices. Now in its third year, the program has supported up to 90 projects ranging from experimental research to the development of educational materials. The benefits of this effort include more than information for farmers. The program is catalyst. It is helping to stimulate sustainable agriculture research and education in many universities and other research organizations. The Administration has requested \$4.45 million for LISA in 1991. Furthermore, if Congress funds our proposed \$100 million Initiative for Research on Agriculture, Food, and the Environment, we would expect to add another \$1 million to USDA's support for sustainable agriculture research.



# Water: Stretching the Limits

## Ken Tanji:

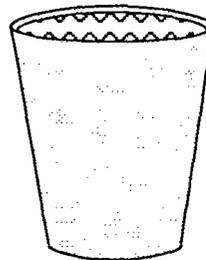
Water, after mercury, has the highest surface tension of the earth's commonly occurring liquids. But water can be stretched only so far. The water study group identified 30 water-related issues and problems in the Central Valley, and decided to address four of the most critical: (1) water use in the Central Valley, (2) the Sacramento/San Joaquin Delta's water issues, (3) drainage-related problems in the San Joaquin Valley's west side, and (4) the contamination of ground water by nitrates and pesticides.

## Central Valley Water Use

In a normal year, about 193 million acre-feet (MAF) of precipitation fall on California. About 121 million acre-feet are lost through evapotranspiration and about 72 MAF runs off into our rivers and streams. This 72 MAF of "normal" runoff, plus imports from Oregon and the Colorado River totalling about 6 MAF, represent the *average* annual surface supply that is beneficially used for in-stream or developed purposes. Normal, however, only occurs in concept, as California's weather varies. Actual runoff fluctuates between drought levels, such as the 15 MAF of runoff that occurred in 1976-77, and the wet-year flooding of 135 MAF in 1982-83.

According to the California Department of Water Resources (DWR), agricultural net water use accounts for about 30 percent of the 78 MAF total (normal runoff plus imports), and urban use—including domestic and industrial supplies, recreation, and energy production—accounts for 4 percent. Instream uses, such as salinity repulsion, interstate compacts, wild and scenic river outflow, recreation, and fisheries, account for 66 percent of the total available supply.

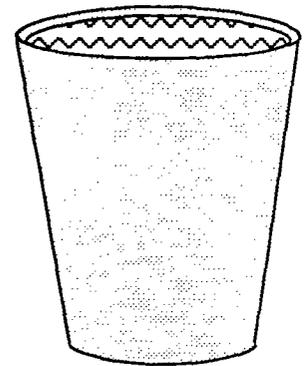
## Surface Water Runoff:



Normal year—72 MAF



Drought—16 MAF



Wet—135 MAF

Of the state's *developed* water supply, the common belief is that agriculture uses about 85%. Actually, the current figure is 80% or less and dropping.

## Central Valley: Confluence of Change

### Robert Potter:

I'm relatively optimistic about the California water situation. There is plenty to go around—but there are lots of conflicts.



### Central Valley Water Use:

Agriculture—93%  
Urban—6%  
Other—1%

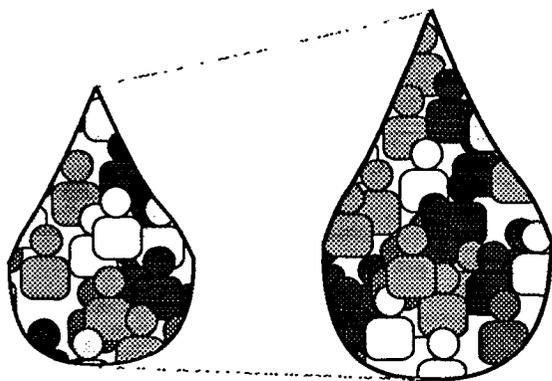
State planners in 1980 estimated that at most 5.5 MAF is available for further development. In light of increased environmental concerns for areas such as the Delta and projections that the state population will increase by a third by the year 2010, California's use of currently available water supplies will have to be closely scrutinized.

Central Valley's water users are important in the statewide outlook. According to the DWR, the Sacramento, San Joaquin, and Tulare hydrologic basins account for 64 percent, or 22 MAF, of California's urban and agricultural consumptive uses. Agriculture is responsible for 93 percent of this regional use, while urban accounts for 6 percent. Other uses, including public wildlife areas, nonurban parks, and energy production, are responsible for only 1 percent.

But in-valley urban use will increase relative to other uses over the next 20 years. Central Valley urban areas are growing rapidly, with in-valley population projected to increase to nearly 7 million by 2010, almost 3 million more than in 1990. Consequently, more and more water is likely to be required throughout the Valley to service these urban uses. If past patterns of growth-related water use recur, these new citizens will require about 450,000 acre-feet of water. Some of this water will be provided from the development of agricultural land with existing surface water entitlements. Generally,

the amount of water use on urban land about equals that of agricultural use on the same area of land. Hence, as agricultural land use changes, the water previously being used for crop production may meet the new suburban owner's needs on the same land. Problems arise when the land being developed does not have surface entitlements, thereby causing more demands on existing ground or surface water supplies. This can be exacerbated if the displaced farmers then develop new, previously unirrigated land elsewhere in the Central Valley.

### Urban Water Use:



26 million people  
in 1985, 5.6 MAF

40 million people  
in 2010, 7.2 MAF

Ground water makes up about 39 percent of the state's applied water. The use of ground water and surface water in unison to make up total supply is a systemwide practice. Therefore, ground water is a direct water source for some uses and an alternative source for others. As California has no general ground-water regulation, users pump to meet their needs when the surface supply is inadequate, often to the detriment of the entire system. This leads to a ground-water overdraft of about 2 MAF in normal years and more in dry years. Of this, 1.3 MAF occurs in the Central Valley.

The Central Valley water system also acts as a pipeline for much of the rest of the state. A significant portion of the water used in Los Angeles and San Francisco and their outlying metropolitan areas originates in the Central Valley and surrounding mountains. Yearly, over 7.3 MAF from northern and eastern watersheds are transferred through pipelines, canals, aqueducts, rivers, and the Sacramento/San Joaquin Delta to the west and south. Thus, almost any changes within the state's water system affect the management of the Central Valley water system.

Another factor to consider in Central Valley water use is the environment. Californians are increasingly concerned about maintaining, improving, and preserving the state's environment. Such concerns limit development and may cause water to be reallocated to maintaining estuaries, fisheries, and wildlife habitats. Environmental uses, which are not legally defined as appropriated water rights in most cases, involve a large proportion of the state's stream flow. Currently, over 48 MAF of river runoff is dedicated to salinity repulsion, North Coast wild and scenic river flows, or unregulated outflow that benefits fish, wildlife, and recreation.

Hence, water use in the Central Valley by an expanding population and economy will involve competition among urban uses, irrigated agriculture, out-of-valley users, and environmental concerns. Because few opportunities for additional water development exist, water conservation efforts must be increased, diversion and storage of surplus flows expanded, and voluntary transfers encouraged.

**Curt Lynn:**

The 1.3 million acre feet of groundwater overdraft each year in the San Joaquin Valley means some 500,000 acres of irrigated land will have to come out of production to offset that overdraft. You can't just keep pumping and pumping forever; sooner or later the system has to come into balance.

**Robert Potter:**

For the last four years a group has been working to see what could be done to restore salmon stocks in the upper Sacramento River; the group was successful in what seemed an impossible task. The plan is out, and federal legislation will help finance it. I bring this up here to suggest that you can work out conflicts if, in fact, everybody who has a legitimate stake in the problem has a place at the table.

## *Central Valley: Confluence of Change*

### **Richard Howitt:**

We could take care of all increased water demands from urban growth by a 6% increase in consumptive efficiency by agriculture over a 20 year period. Agriculture could achieve the needed savings in five years if given sufficient incentives.

### **Dan Dooley:**

It's important to note that we have a 1.3 million acre foot overdraft of our ground water basin in this Valley, and if we conserve 6% of the water used by agriculture, we would just about reach equilibrium—with nothing left over for additional development.

### **Curt Lynn:**

What people fail to realize is that the Valley—particularly on the east side—has a highly efficient water system. The only way water is lost is through evapotranspiration from agricultural crops, landscape trees, lawns, weeds, and so forth. We don't dump our waste water in the ocean as they do in the coastal cities. Our waste water either percolates back to ground water or goes into a river for further use downstream. In Sacramento, it goes into the river, then on to the Delta, and becomes drinking water in Contra Costa County or in Southern California. We don't just throw water away.

The conservation of water is a necessary component of any water-use program under finite supply conditions. A number of programs are underway. For instance, in 1986, the state legislature passed the Agricultural Water Management Planning Act, which requires most agencies in California concerned with supplying agricultural water to provide management plans to DWR. This legislative "solution" exemplifies how supportive state policies on demand management can enter into the state's water program.

Programs, however, do not develop extra water through conservation—people do. And conservation translates into more water for use systemwide only if the water conserved would be otherwise lost by evaporation or degraded water quality. Per-capita water use in both Fresno and Sacramento is 350 gallons per day, which is higher than other comparably sized cities in California located out of the valley. This is largely due to the higher landscape irrigation requirements necessitated by the warmer climate. The amount of conservable water is under debate. In recent history, urban users have had essentially no long-term constraints on their water use. Water was cheap and plentiful. This is changing, however, as supplies become more limited, population grows, and drought years have a greater impact. Active programs for urban water conservation are being embraced by most communities, but time is needed for values to change and existing uses to be modified. Drought years, though difficult to deal with, help people realize that they can change. Changes in vegetation, water-saving plumbing fixtures and low-water-use landscaping are instrumental to efficient urban use.

In irrigation, a sizable proportion of the water is consumptively used for biomass production. This water cannot be easily reduced without decreasing crop production. What can be limited, however, is the amount lost during application, either through surface runoff or deep percolation. Some deep percolation is necessary with any

irrigation, as a small amount is needed to maintain the salt balance of soils and sustain production.

Different irrigation systems lead to differing amounts of deep percolation and runoff. The more expensive, pressurized systems, e.g., drip, trickle, and sprinkler systems, can result in a more uniform application if they are well designed and managed. However, these systems may not be economically or physically feasible for many of California's crops. About 79 percent of California's crop acreage is irrigated by surface methods. Surface systems, such as furrow irrigation, are less costly, but also less efficient—unless highly managed. To allow enough time for water to infiltrate around the roots of all plants under furrow irrigation, some water inevitably percolates beyond the roots due to nonuniform rates of application and infiltration. Also, some water may run off at the lower end. Methods that minimize deep percolation, such as surge flow application, combined with pumping back and reusing of runoff, can improve furrow irrigation, though at a higher cost.

A 1986 study by the Central Valley Water Use Study Committee investigated agricultural water conservation. It found that the agricultural sector could save 290 to 390 thousand acre-feet depending on the assumptions. This would be realized principally by decreasing percolation losses to saline ground-water bodies and, to a lesser extent, by improving delivery and application systems.

The water supply can also be augmented by storing winter and spring flows that might be otherwise lost, i.e., saving extra runoff water from precipitation in very wet years. Using ground water aquifers for storage can be much less expensive than new surface water storage facilities. The Kern Water Bank is currently developing ground-water basins for holding high streamflow from wet years.

The re-use of drainage waters and reclaimed waste waters is another potential source of water for some uses, including crop and landscape irrigation. In some instances, it may be possible to trade water supplies, e.g., nitrate-contaminated urban well water for better-quality irrigation water when available.

Increasing demands for water supplies of suitable quality along with the high economic and environmental cost of developing additional supplies guarantees that water transfers will play an increasing role in California water management. These transfers, based on voluntary agreements among users, provide additional incentive for conservation and reuse.

Recent governmental actions to provide legal and institutional flexibility to facilitate voluntary transfers show that the benefits of transfers are taken seriously. There is no movement to diminish the role of the environmental review process, however. It is recognized that successful transfers will have to account for the interests of all affected parties, including those not directly negotiating the transfer. Any adverse affects on instream uses,

## Central Valley: Confluence of Change

### Robert Potter:

Those who view the water resource as a fixed pie consider water marketing—moving water from the ag to the urban sector. Urban water managers in conversations with ag leaders are considering strategies for sharing water that do not entail reduced agricultural productivity. If the urban sector is willing to invest capital in the ag sector so that the water systems can be more flexible and so that plumbing exists to move from one source to another, then there's room out there to manage most of the state's water problems.

### Curt Lynn:

Water and land use fit very much together in this Central Valley. The Valley itself, the Valley floor, from one end to the other, doesn't generate sufficient water to sustain much agriculture. It's only the water that flows from the surrounding hills that gives this Valley its great productivity.

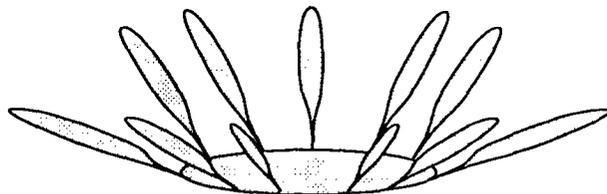
By the year 2010, DWR forecasts that urban development in the Valley will require an additional 450,000 acre feet of water annually and some 200,000 acres of agricultural land. It's often said, "Well, why don't we put these urban developments in the foothills? Why put them down on the fertile valley floor?" But it really doesn't make much difference where you put the urban areas—you're going to take that water from agriculture, because there isn't any other source. Whether you take it directly by building on agricultural land or put urbanization in the foothills, development will be upstream of agricultural use—that water is going to come from agriculture, no matter where the development occurs. Unless there is some additional water development—and that's a big if—for every acre of urban development, an acre of land will go out of agricultural production. The point is that to get anywhere in the discussion of California's and the Valley's water problems, we have to address land use and water use issues together.

I could show you some very productive ag land that you can get for \$300 per acre. Right across the road you're going to pay \$3,000 per acre if it doesn't have citrus trees or \$15,000 if it does. (Neither parcel has ground water.) The difference is that one side isn't in the water district and the other one is. That's why the water and land issues cannot be isolated.

local economies, and other water users must be taken into account with regard to mitigation or compensation.

Some state policy makers point to the marketing of water rights as a panacea. They believe that water is a limited resource, and those who can, should purchase water that is already in the system, thereby reallocating the water to the most economically beneficial uses. Opponents point out that water is basic to all social processes, and that water markets would create difficulties for, if not exclude, the economically disadvantaged sectors of society. Less profitable agricultural endeavors in California may have trouble in competing for water. This, in turn, would adversely affect those employed in these enterprises.

A final option, not desirable to many, would be to legislate reallocation. Currently there are no moves toward this. However, the burgeoning population's domestic water supply must be met in the coming decades.



## Delta Water Problems and Issues

### Ken Tanji:

The Sacramento-San Joaquin Delta is a complex hydraulic system is somewhat like a busy railway terminal, where water comes and goes in many directions and is used for many purposes. Its 700 miles of waterways, 1,100 miles of levees, and 500,000 acres of lowlands figure prominently in California's water picture. The 778,000-acre region receives 47 percent of the state's annual runoff. About 6 MAF per year is exported via the Contra Costa Canal, the Central Valley Project, and the State Water Project. The CVP and the SWP serve more than two-thirds of the state's population, including San Joaquin Valley farmers and residents of northern and southern California cities.

A diversity of wildlife populates the Delta, including salmon, trout, bass, and sturgeon; 200-plus species of birds, 30 species of mammals, and 17 species of reptiles and amphibians. Delta-grown crops include corn, small grains, sugar beets, asparagus, pears, tomatoes, and alfalfa. About 76 percent of the land is dedicated to agriculture, 19 percent to natural areas, and 5 percent to urban development.

The quality of water in the Delta depends on runoff from the Delta and its upstream sources, uses in the bay, and whether or not intrusion of sea water occurs. Broad year-to-year variations in flow are mitigated by releases from reservoirs during dry years. This dampens the effects of naturally occurring reduced flow and subsequent saline intrusion.

The following issues on use of the Delta's water have arisen:

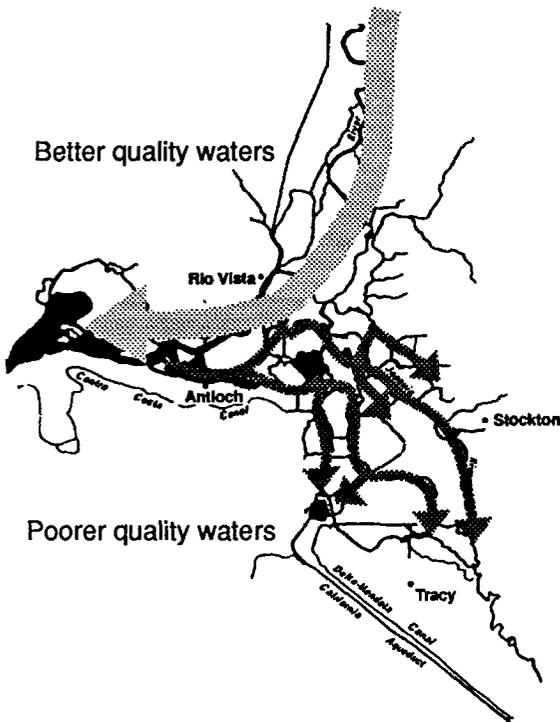
- (1) Should all the levees be kept and, if so, who should pay to maintain and improve them?
- (2) How should the Delta's water be allocated?
- (3) What constraints should be placed on the quality of Delta water?

The levees confine the Delta's water to channels, the depth of which maintain a high hydrostatic pressure that, in turn, prevents the San Francisco Bay's salt water from encroaching. This, in itself, may be reason enough to maintain the levees. Elevations of the islands are dropping about 3 inches per year due to cultivation practices that result in erosion by wind and the oxidation of peat soils. Also, if global warming occurs, ocean

### According to DWR, Delta waters:

- Receive 47% of total runoff,
- Provide 45% of drinking waters,
- Provide 40% of agricultural water.

**Reversal during Low Flow Periods:**



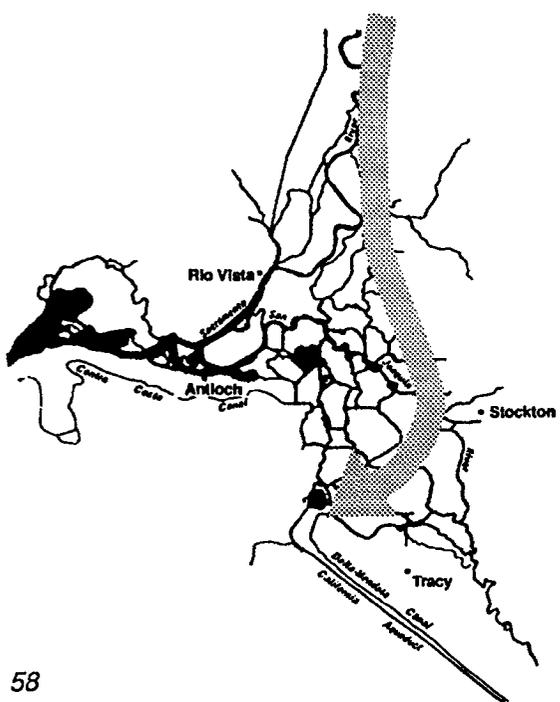
levels will rise and springtime runoff from the Sierra Nevada mountains will increase—a combination that would put severe pressure on the levees.

Loss of the levees and flooding of the islands may create a large inland sea, which would degrade Delta water quality with intrusion of seawater. The quality of the Delta's water affects people and agriculture throughout the state, so it remains unclear as to who should pay to maintain the levees. The costs of doing so will be enormous. A DWR study rated the condition of 20 islands as fair, 28 as poor, and four as very poor. The estimated costs of rehabilitating the levees range from about \$300 million to \$1 billion.

In allocating the Delta's water, the possible intrusion of sea water has to be considered. The export of water upstream reduces outflow in the Delta, which results in more saline water for downstream users. The Peripheral Canal, rejected by California's voters in 1982, would have delivered upstream water directly to the major water projects.

More recent plans to provide water of high quality to the major water projects have focused on improving channels in the Delta to facilitate the flow of relatively pure water through the Delta to the pumps. To date, such plans have been blocked.

**Proposed export around the Delta:**



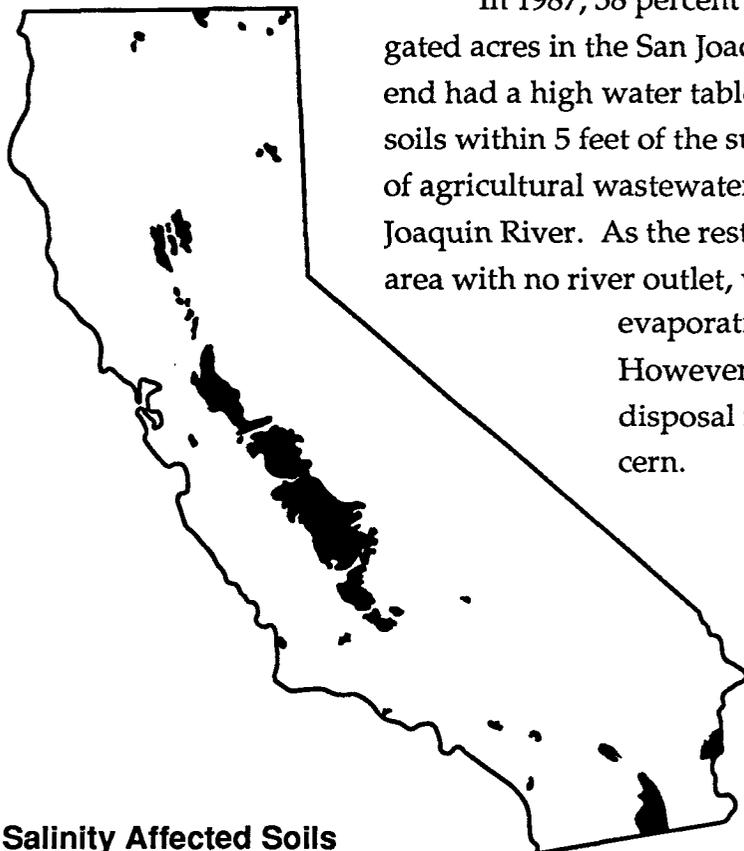
The third issue involves water pollution in the Delta. Currently, water diverted from the Delta during periods of low outflow contains concentrations of total dissolved solids that occasionally exceed secondary standards; concentrations of sodium that sometimes exceed the National Academy of Science limit of 100 mg/liter for persons on moderately restricted sodium diets; and concentrations of bromide and organic carbon that form brominated trihalomethanes (THMs), a suspected cause of cancer. At the State Water Project's pumps, levels of THMs have averaged about 500 micrograms per liter. Maximum values are about 900 micrograms per liter. The drinking-water standard is 100 micrograms per liter.

All of these issues need to be resolved. By 2020, an estimated 7.5 MAF will be exported annually from the Delta—up 25 percent from current levels. The State Water Resources Control Board has been conducting hearings on the Delta and the San Francisco Bay for two years. They are expected to adopt revised basin management plans, an environmental impact report, and water rights decisions later this year.

**Ken Tanji:**

**Drainage-Related Problems in San Joaquin Valley's West Side**

Salinity and trace elements found in runoff and drainage water have been an irrigation-related problem in many areas of California since the 1870s. The Central Valley, with 7.7 million acres of irrigated area, has about 2.4 million acres of salinity-affected soils. When such soils are irrigated, the salts are mobilized and are later concentrated as the plants take up the water. Drain waters contain not only salts concentrated by the evapotranspiration of plants, but also naturally-occurring trace elements that have been mobilized out of the soils. Selenium toxicosis of waterfowl discovered at Kesterson Reservoir in 1983 is but one example. Still another problem is when the ground-water table encroaches on the crops' root zone; resultant water logging robs the roots of oxygen, stunting growth. This problem has been solved by using buried pipes or deep trenches to drain the excess water, but now disposal of the water containing trace elements and/or high levels of salts poses an additional problem.



**Salinity Affected Soils**

In 1987, 38 percent (837,000 acres) of the 2,234,000 irrigated acres in the San Joaquin Valley's west side and southern end had a high water table problem of permanently saturated soils within 5 feet of the surface. Of this, 468,000 acres disposed of agricultural wastewater by returning flows to the San Joaquin River. As the rest of the area is a hydrologically-closed area with no river outlet, water districts and farmers built evaporation ponds to dispose of excess waters. However, the environmental soundness of this disposal method is currently of increasing concern.

According to specialists in the San Joaquin Valley Drainage Program, mass balances on the salts of the west side's semiconfined aquifer indicate a regional buildup. Salt inflows to this ground-water body were shown to be 8.4 million tons per year, while outflows were only

## Central Valley: Confluence of Change

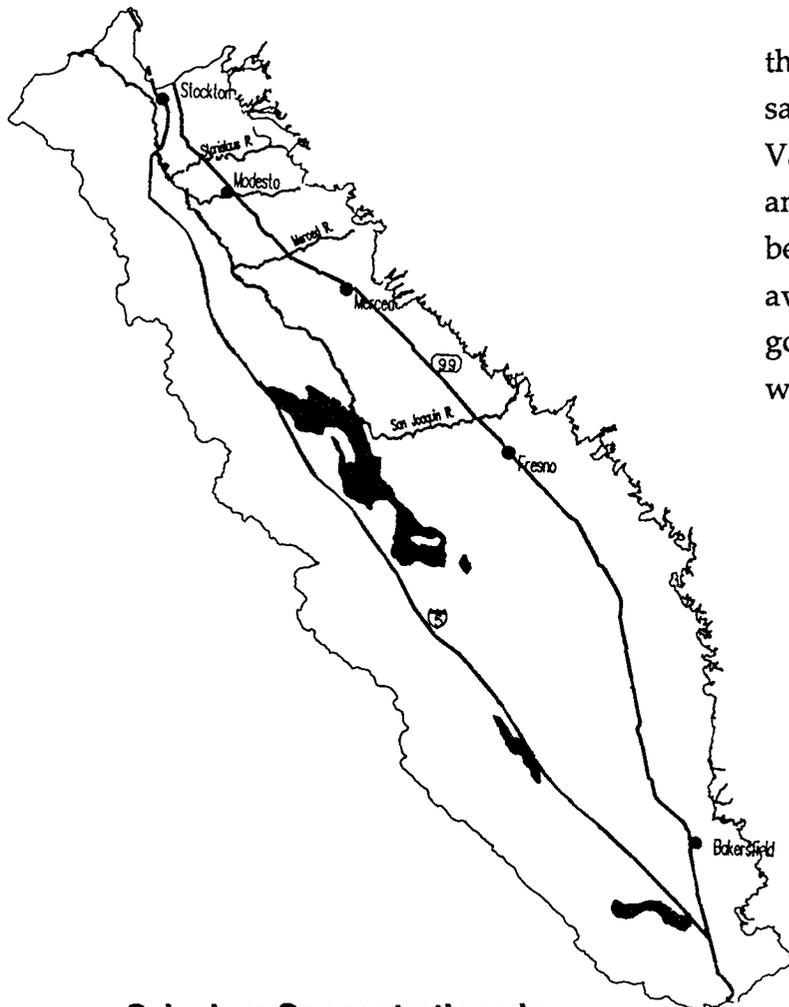
5.1 million tons per year, for a net build-up of 3.3 million tons. In the long run, these salts must be removed from the system or they will accumulate and detrimentally affect production.

Currently, 22 evaporation ponds, with a total surface area of nearly 7000 acres, exist in the Central Valley. These ponds are used to dispose of about 32,000 acre feet per year of drainage waters, leaving behind 810,000 tons of evaporated salts per year, or 25 percent of the San Joaquin Valley's annual salt accumulation. The long-term consequences are speculative at present, but environmental effects of the ponds are a major consideration.

Besides salt build-up, the occurrence and concentration of potentially toxic trace elements in evaporation ponds also pose a serious problem. Trace elements of concern include selenium, arsenic, boron, molybdenum, and uranium. These elements occur naturally at low levels in soils throughout the San Joaquin Valley. Irrigation leaches them from the soil and into drain waters, where they are collected and deposited into evaporation ponds. In the evaporation process, they are concentrated to levels that are or may be toxic.

Looking towards the next century, there are several potential options to manage salinity and toxic elements in the Central Valley. One approach may be to decrease the amount of unusable drainage water through better irrigation management—for example, avoiding mixing poor-quality water with good and reusing surface runoff and drainage waters on the farm and regionally.

Another lies with technologies which are now being developed to treat drainage waters and remove selected constituents. The San Joaquin Valley Drainage Program has investigated a number of such methods, including biological, physical-chemical, and adsorption. Among the most promising are anaerobic bacteria or microalgal-bacteria, microbial volatilization, adsorption by iron filings, chemical reduction, and reverse osmosis. However, these treatments are costly and unreliable, and as of yet, unproven at the scale needed to solve the Valley's drainage problems.



**Selenium Concentrations in Shallow Ground Water Greater than 50 ppb**  
San Joaquin Valley Drainage Program

A number of studies are underway on drainage water disposal in natural bodies of waters and evaporation ponds, managing the salts and trace elements to minimize degradation of the biological environment, including humans and wildlife, and the physical environment, including soil and water.

Still another approach involves institutional and jurisdictional measures aimed at decreasing the use of water in problematic areas. These include implementing increased or tiered water prices, regulating the on-farm delivery of crop-specific amounts of water, water marketing, imposing fees for treatment and disposal of agricultural wastewater, retiring certain lands, and increasing constraints on surface discharges.

Agricultural drainage in the San Joaquin Valley's west side will continue to be a significant issue for the next few decades. The problems of high water tables and drainage, maintenance of salt balance, and toxic element confinement and disposal are interrelated—and their solutions must be comprehensive.

**Ken Tanji:**

**Ground-Water Contamination from Nitrates and Pesticides**

The prosperity of California's cities and farms, including those in the Central Valley, hinges on a dependable supply of water. Much of that supply comes from ground water. Only about a fourth of the ground water from the over 850 MAF in ground-water basins in California can be economically reached and used, but this is still more than six times the amount provided by the state's surface water reservoirs.

For centuries, ground water was considered to be relatively free of contamination. The layer of soil above ground water was thought to filter out contaminants before they could reach the aquifer. In the late 1970s, technology advanced to the point where trace substances could be detected in minute concentrations, such as parts per trillion. Mounting evidence indicates that California's ground water is significantly contaminated in certain locales by nitrates and pesticides. And the Central Valley's ground water is no exception.

Between 1959 and 1969, 1 to 3 percent of the samples of ground water from the San Joaquin Basin and up to 17 percent of the samples from some Tulare Basin counties had levels of nitrate above the California Public Health Service's drinking-water standard of 45 parts per million. In more recent years, ground water at locations throughout the Central Valley has been found to have levels of nitrate equaling two to three times the drinking-water standard.

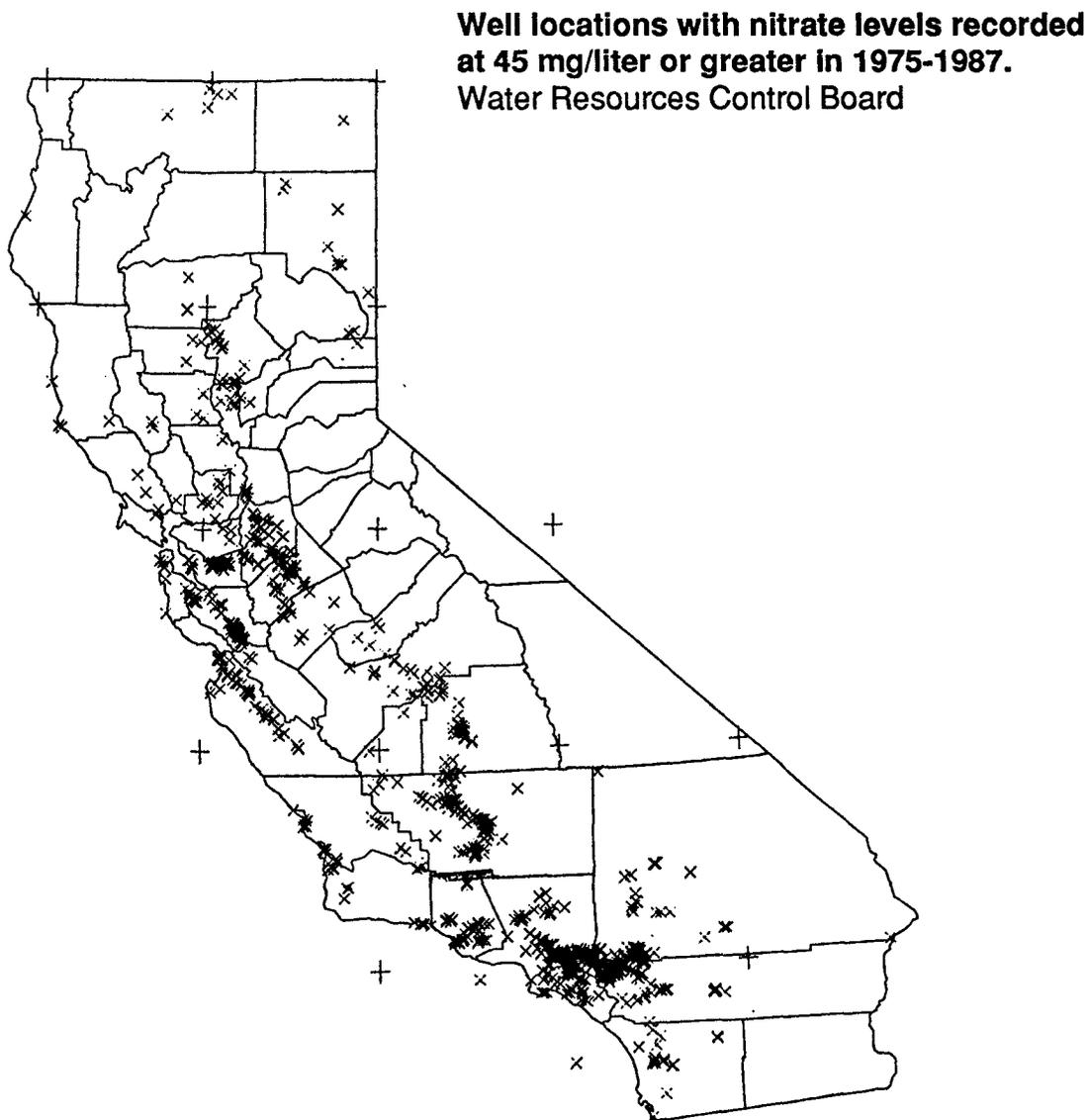
In the Sacramento Valley, the principal sources of this nitrogen are agricultural drainage and septic tanks. In the San Joaquin Basin, the primary sources are fertilizer used on croplands, livestock wastes, and municipal and industrial effluents.

Nitrate itself doesn't jeopardize health, but it converts to nitrite when ingested. It can then react with other substances to produce cancer-causing compounds—nitrosamines.

**Central Valley: Confluence of Change**

Several studies have correlated (but not proved) the incidence of cancer with exposure to nitrite via food.

Nitrates in drinking water have, however, been implicated in infant methemoglobinemia, otherwise known as "the blue baby syndrome." This occurs in infants aged six months or less, when nitrite, formed from nitrate in the stomach, combines with hemoglobin, reducing the blood's oxygen-carrying capacity.



According to a 1984 California State Water Resources Control Board report, 54 different pesticides have been detected in wells throughout the state. However, DBCP (1,2-Dibromo-3-Chloropropane) is by far the most ubiquitous, accounting for 85 percent of the contamination detected statewide.

DBCP, a pesticide for killing nematodes, has been identified as a cancer-causing substance for animals and thus is a suspected cause of cancer for humans. Studies indicate that it may cause sterility in human males and birth defects. In 1977, California banned the use of DBCP, but contaminated wells are still being discovered. Because DBCP continues to move through the soil profile after the ban, levels in 1989 in some wells exceeded their 1979 levels.

Nowhere nationwide is the contamination of ground water by DBCP more apparent than in the San Joaquin Valley. In 1979, the Central Valley Regional Water Quality Control Board discovered the ground water in wells near Lathrop in the San Joaquin Basin to be contaminated by DBCP. This resulted from improper storage and handling at a pesticide factory, but the California Department of Food and Agriculture and the California Department of Health Services have since found contamination of ground water by DBCP resulting from agricultural use of the pesticide.

DBCP has been found in 24 percent of the wells tested in Tulare County, 16 percent of those in Kern County, and 43 percent of these in Fresno County. The total amount of ground water contaminated by DBCP has been estimated at 30 MAF, about 25 percent of the San Joaquin Valley's usable ground water. Concentrations of DBCP in some wells in Fresno and Kern Counties regularly exceed the California Department of Health Services action level of one part per billion. In a 1982 sampling, contaminations of DBCP ranged from 0.1 to 10.5 parts per billion.

It takes years for a ground-water basin to purify itself. This is because ground water moves so slowly in most cases (in feet per year). In light of this, the problem of the contamination of the Central Valley's ground water by nitrates and pesticides may last for decades.



Water is truly the lifeblood of California and especially its great Central Valley. This precious resource is highly mobile and quickly picks up contaminants. Although the Central Valley is blessed with an abundant supply of water in most years, the developed surface water supply is unpredictable, and as evidenced by ground-water overdraft, insufficient to meet current demands. The increasing contamination of ground water is beginning to constrain its use for some purposes, especially for drinking. Agriculture is the largest water user in the state and in the Central Valley, and competition for water from the urban and environmental sectors will escalate. Since water can be stretched only so far, conservation will have to be practiced, water policies reviewed, and, where deemed necessary, new policies promulgated.

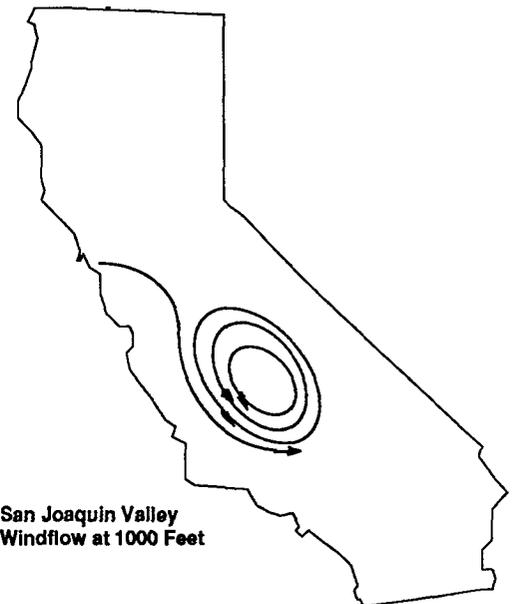
# Air: Tradeoffs Between Economic Activity and Air Quality

## Richard Howitt:

Just as growth in California is stretching the limits of available water supplies, so human activities are driving air pollution to levels that threaten agriculture and human health. The Valley is particularly susceptible to air-quality degradation because of its unique geography and meteorology. Located between two mountain ranges and downwind from the coastal urban centers, the Valley has an inlet for smog, but no equivalent outlet. Besides this imported pollution, the Valley generates increasing quantities of its own. The ratio between externally and locally generated pollutants is unknown. What *is* known is that the Valley is subject to the same inversion problems that plague the Los Angeles area. In fact, based on wind and temperature patterns, San Joaquin Valley air quality has potential to become worse than that in the South Coast Air Basin.

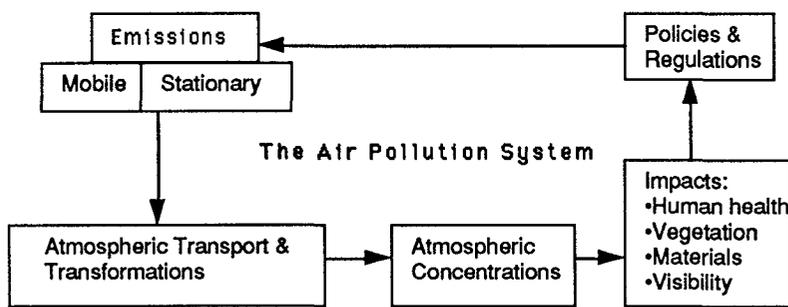
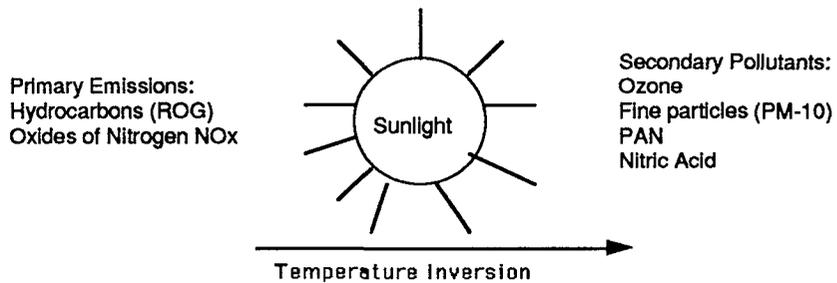
Although it is unlikely that emission densities in the Central Valley will reach those in Southern California in the near future, the outlook for Valley air quality is discouraging—given the predicted growth in population—unless significant measures are taken beyond currently mandated controls. Unlike the South Coast and Bay Area regions, which experienced improvement in air quality following introduction of three-way catalytic convertors and other controls over the past decade, Central Valley air quality (with the possible exception of carbon monoxide levels) has largely failed to participate in these improvements. Specifically, over the past 10 years ozone levels in the San Joaquin Valley Air Basin have remained nearly constant despite significant reductions in hydrocarbon emissions. If the number of days above the federal ozone standard is considered a proxy for air quality, portions of this valley such as Fresno and Kings counties already experience worse air quality than the cities of New York, Houston, Philadelphia, and Chicago.

Air quality in the Sacramento Valley Air Basin is generally somewhat better than that in the San Joaquin Valley Air Basin. Even so, the Sacramento Valley exceeded state ozone standards, which are more strict than federal standards, on 98 days during 1988. Compare this with 154 days of non-compliance experienced in the San Joaquin Valley during the same year, or 216 days in the South Coast. The entire Central Valley was also



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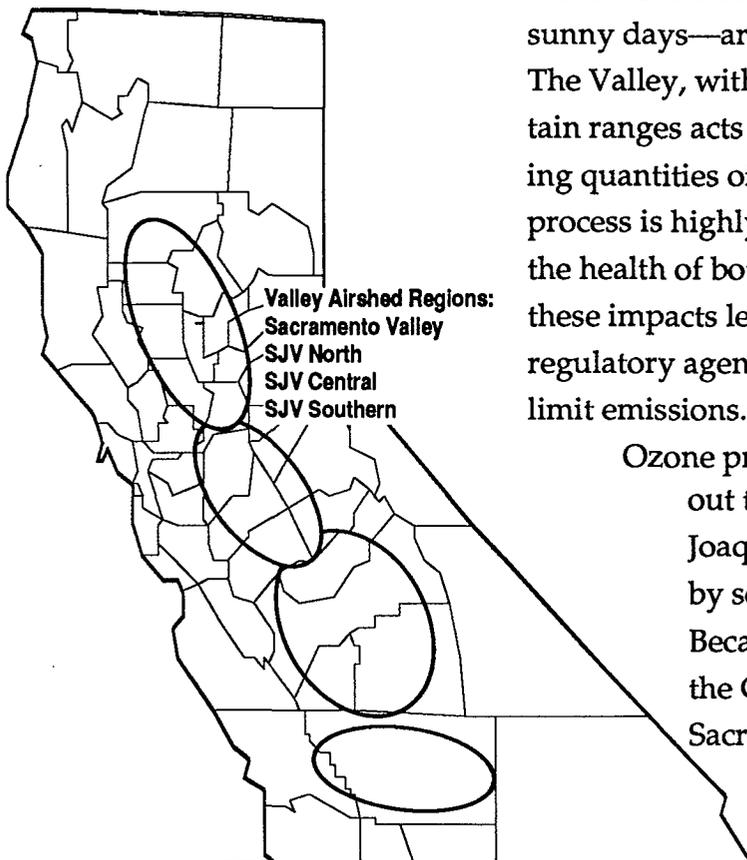
out of compliance for particulate matter of 10 microns or less, and standards for carbon monoxide were exceeded by several metropolitan areas. Unfortunately, time constraints dictate that we limit our discussion today to the topic of ozone.



What creates the Valley's ozone problem? A look at the air pollution cycle helps understand the relevant factors. First, ozone is not emitted directly. Rather, it is a secondary compound formed by the reaction of nitrogen oxides with hydrocarbons under the energy of the sun. Nitrogen oxides come primarily from human activities, whereas hydrocarbons are generated by both human and natural sources. Sunlight and heat speed the rate of transformation of these compounds into ozone, which means that the same conditions that

are favorable to the growth of plants—i.e. warm, sunny days—are also favorable to ozone formation. The Valley, with its smog load trapped between mountain ranges acts as a huge crockpot, generating increasing quantities of ozone. The ozone formed in this process is highly active in the environment, damaging the health of both humans and crops. Recognition of these impacts leads to action by the legislature and regulatory agencies, which devise rules designed to limit emissions.

Ozone production is not homogeneous throughout the Central Valley. Even within the San Joaquin Valley, indigenous emissions differ by source and type of pollution generated. Because of these differences, we will divide the Central Valley into four air basins—the Sacramento Valley and the northern, central and southern San Joaquin Valley.



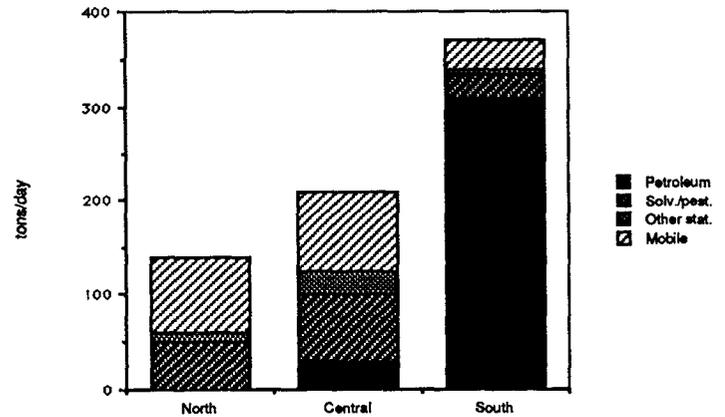
We recognize, however, that the air within the entire Central Valley is subject to similar geographic and meteorological factors.

Air Resources Board data give emissions of reactive organic gases (ROGs), a class of hydrocarbons involved in ozone formation from petroleum products and refining, solvents and pesticides, other stationary sources, and mobile sources. ROGs are produced mostly by traffic, solvents, and pesticides in the northern and central portions of the San Joaquin Valley, whereas production and refining of petroleum contribute a major share in the southern part.

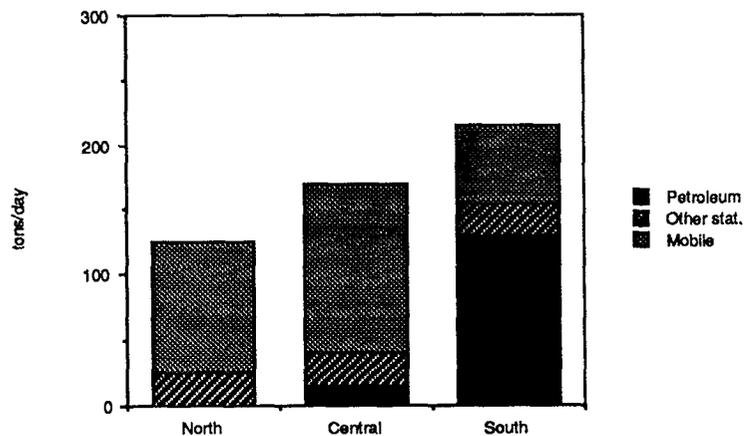
Nitrogen oxides, whose concentrations are believed to be the limiting factor in determining the maximum amount of ozone formed in the Valley, are attributable mainly to vehicles in the north and petroleum industries in the south.

Unfortunately, nitrogen oxides are projected to grow over the long term in response to increased population and road travel in the Valley. NOx emissions will decrease until about 1995 due to the decreasing number of old cars on the road that don't meet state standards. However, by the time these "dirty" cars are off the roads, emissions will trend up along with vehicle miles travelled, since the gains from adoption of catalytic converters will have been exhausted and no other major technological fixes are in the offing. Note that the rate of growth

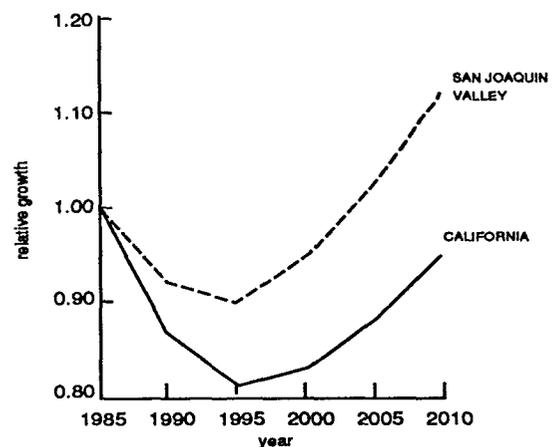
San Joaquin Valley ROG Emissions, 1985



San Joaquin Valley NOx Emissions, 1985



Projected San Joaquin Valley and California Motor Vehicle NOx Emissions Normalized to 1985



## Central Valley: Confluence of Change

in NOx emissions in the San Joaquin Valley is projected to become considerably worse than the state as a whole.

Air pollutants, especially photochemical oxidants, have been adversely affecting California crops for decades, on a regional and statewide basis. Ozone and other pollutants are reducing yields of many of the state's important crops. Economic losses resulting from these reduced yields in California are estimated to range up to several hundred million dollars. Here we focus on the effects of ozone on agricultural crops, but we cannot ignore the very important impacts on human health. Parallels can be drawn between effects on humans and plants.

### Primary Effects of Ozone on Plants:

- Interferes with photosynthesis
- Changes biochemistry
- Retards growth
- Increases susceptibility to disease

### People:

- Injures lungs
- Retards lung development
- Speeds lung aging

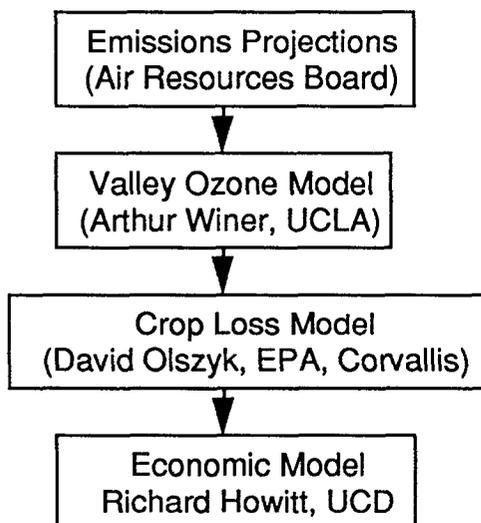
On people, ozone's effects range from relatively minor impacts, such as increased respiratory symptoms (cough, sore throat, chest tightness), to the more serious, such as increased susceptibility to respiratory infections, aggravation of asthma and bronchitis. Exposure may also retard lung development in children and accelerate decline of respiratory function in susceptible people. In the extreme, severe air pollution episodes have resulted in premature death of exposed individuals (usually those with already compromised heart and lung function).

### Analysis

As a study team, Arthur Winer, David Olszyk, and I linked several models together. (Michael Kleinman paralleled our results showing effects on human health.) Air Resources Board emissions data fed into Winer's Valley ozone model which fed into Olszyk's crop loss model which was then used in the California Agricultural Resources (CAR) economic model. I report the results of the economic analysis.

We began by using forecasted emission inventories, current knowledge of atmospheric chemistry and crop loss, and economic modeling to estimate the present impact of ozone on crops in the Central Valley, as well as future impacts in 2010. Two scenarios representing dirtier and cleaner air conditions for the future are evaluated for 2010. The worse case projects increases in ozone concentrations based on ARB calculations which assumed no further emission controls on ozone precursors beyond those presently mandated by law. The cleaner case

### Linked Models:



illustrates meeting the state air quality standards for ozone.

### Two Scenarios

Dirty—Current controls continue

Cleaner—Meets state standards

Crop yield losses were estimated based on the ambient ozone air quality data for 1986 and projected data for 2010. The general procedure for calculating yield losses involved use of crop productivity data, ozone concentration-yield loss models, and the projected ozone levels. Predicted percentage yield losses were obtained in comparison to potential yields if ambient ozone levels corresponded to "clean air." Losses were determined first for each major crop in each county in the Central Valley, and then for the entire valley, weighted by the production in each county.

Computer model results indicated that substantial yield losses from current (i.e., 1986) ambient ozone levels are probably already occurring for 31 important crops growing in the Central Valley. Current losses of over 20 percent are estimated for beans, melons, and grapes, and of 9-15 percent for alfalfa, alfalfa seed, cotton, lemons, oranges, and potatoes.

If state standards for air quality are met, two examples of estimated yield improvement are that by 2010, southern San Joaquin Valley cotton and table grapes would be 12.5 and 15.4 percent higher than their projected levels.

### Economic Assessment

The basis for the *economic* assessment of air pollution is the CAR economic model with agronomic regions aggregated from county level data. Only data from the four Central Valley regions are discussed here—the Sacramento Valley and the northern, central, and southern San Joaquin Valley.

The general structure of the CAR model is a constrained quadratic programming model, presently including 38 annual and perennial crop activities, with some crops having multiple activities (e.g., dryland vs. irrigated). For each crop, a linear demand function, estimated over the period 1969-1984, relates the price received by California producers to the quantity produced in California and marketed. For each production activity, there is a variable cost coefficient based on farm survey data and input prices and an explicit cost coefficient for the fixed resources of land and water. The quadratic objective function of the model reflects profit maximizing by producers and market preferences of consumers, represented by the demand functions. The model is currently calibrated to predict expected conditions in 1987. The base run uses 1987 prices and quantities demanded and 1987 yields. (Percentage yield changes are based on 1986 emissions, but there was little change in emissions between 1986 and 1987.)

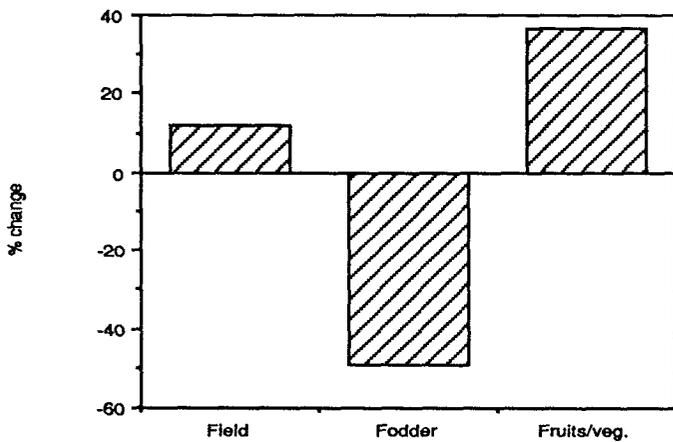
Changes in crop yields have *both* productivity and price effects. If the crop is rather price responsive, as are wine grapes, the positive price effect could eliminate the negative

**Central Valley: Confluence of Change**

productivity effect. In this situation, a yield depression over all the major producing regions could theoretically increase producers' returns to land and management, but increase prices to consumers.

In addition to price effects, growers will substitute increased acreage of more profitable crops to offset ozone-induced yield decreases for all crops. This substitution response could lead to a reduction in the acreage of lower-valued crops. Also, income growth, demographic and lifestyle changes are shifting U.S. consumer demand toward an increased emphasis on fruits and vegetables in the diet. In response, the Central Valley's crop mix will include a greater proportion of these high-value crops. But this will tend to increase the economic cost of ozone losses over time if the crops have a similar sensitivity to ozone. In fact, high-value crops are often more sensitive.

Acreage Changes by 2010 with Cleaner Air

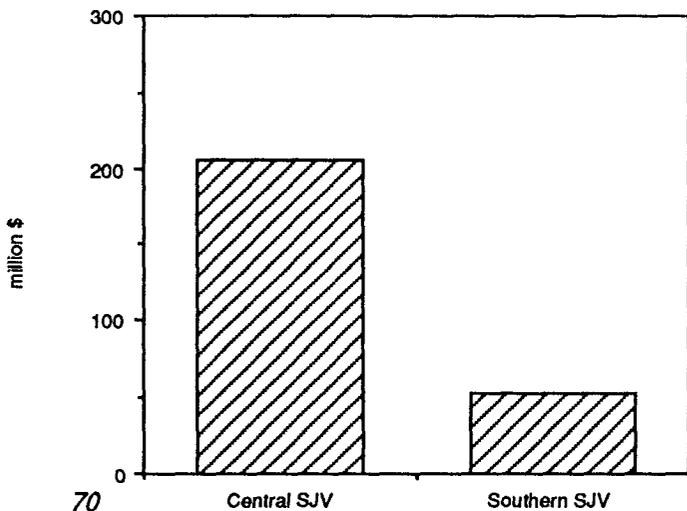


The figure shows the effects of *two* variables—reduced ozone *and* demand changes. Air quality-induced changes accentuate the effects of the increased demand for fruits and vegetables in 2010 under the improved air quality scenario. Field crops would have a modest increase, while fodder crops are substantially decreased.

Changes in returns to farmers' land and management from air quality improvement vary by region. In fact, in the Sacra-

mento Valley where ozone concentrations are relatively better than in the San Joaquin Valley, producers would suffer some monetary loss from air quality improvement, because yields would increase there and in other Central Valley regions, lowering prices. For the

Producer Benefits from Cleaner Air in 2010



same reasons, gains are only slight in the northern San Joaquin Valley. In the central and southern San Joaquin Valley (Kern County), however, by 2010, producer returns would increase by \$206 million over what they would be if state standards are not met; in Kern County, by \$52.4 million.

The effect of meeting state ozone standards has noticeably different impacts by crop and region. The net result is influenced *first* by the crops' relative susceptibility to ozone in terms of yield reduction,

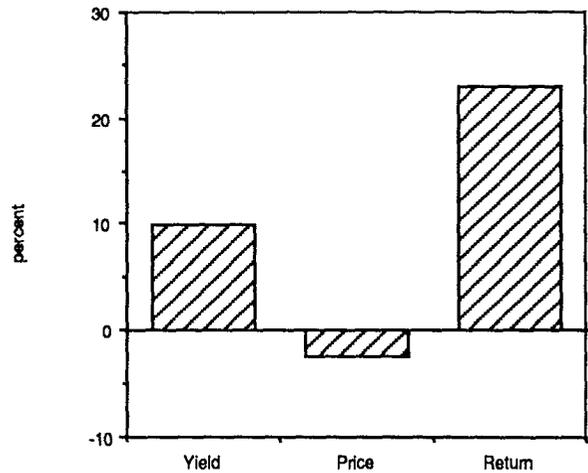
second by the crop elasticity of demand and changes in consumption patterns, and third by ozone changes in the principal growing regions. These three factors will influence cropping patterns in the Central Valley. Using cotton and table grapes (which are especially susceptible to air pollution), we illustrate this important relationship.

The figure shows the model's predictions of changes in the central San Joaquin Valley yield, price, and grower returns for cotton by 2010 if state ozone standards are met. In 2010, producers' return to land and management increase nearly 23 percent from a 10 percent yield increase.

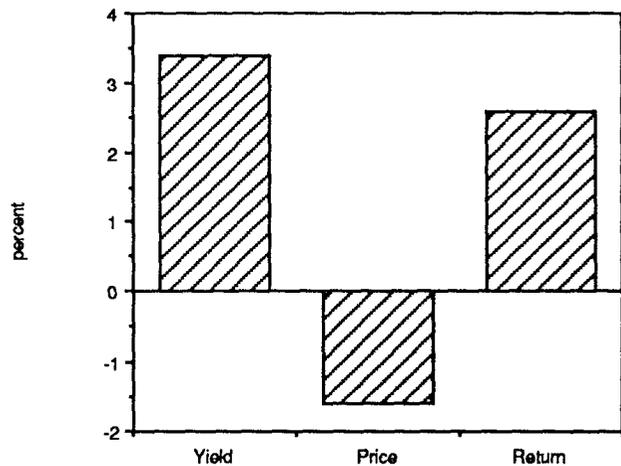
In 2010, if state standards are met, grapes also show a yield increase of 3.5 percent with a corresponding price decline. Producer returns also increase, but not by the same proportion as cotton, because of a demand elasticity difference between the two crops.

In response to these yield, price, and returns changes stemming from changes in pollution levels and in commodity demand, growers will change their cropping mix. The striking thing is that air quality considerations alone result in a large swing in acreage planted. Under projected ambient ozone levels in 2010, Central San Joaquin Valley cotton acreage would decline almost 18,000 acres; but if state ozone standards were met, acreage would increase nearly 20,000 acres. The change represents 4.5 percent of the total cotton acreage there. In the southern San Joaquin Valley, the swing amounts to 7.8 percent of the acreage.

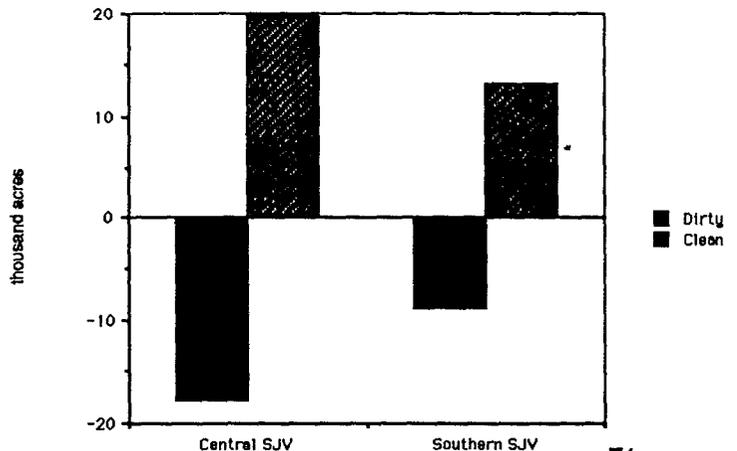
Changes in Cotton Yield, Price, and Return, Central San Joaquin Valley, 2010



Changes in Grape Yield, Price, and Returns, Northern San Joaquin Valley, 2010

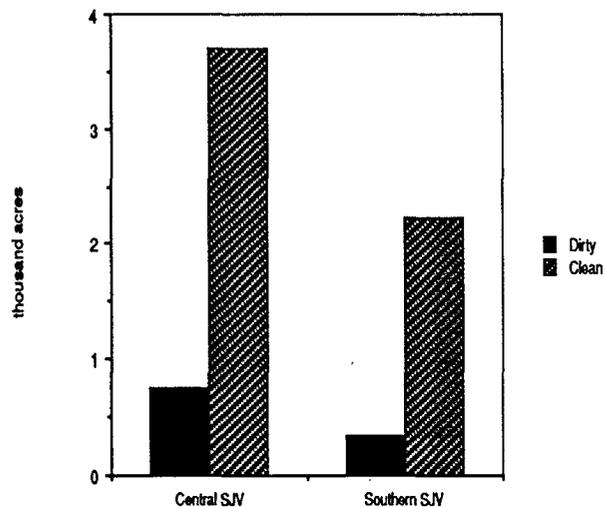


Changes in Cotton Acreage, 2010



## Central Valley: Confluence of Change

Changes in Grape Acreage, 2010



Similarly, table grape acreage exhibits very different responses depending on air quality. Grape acreage expands in both the central and southern San Joaquin Valley by 2010, even under the projected ambient ozone levels. But the acreage expansion were state standards met would be nearly five times greater in the central and nearly seven times greater in the southern San Joaquin Valley. In summary, Central Valley growers are shifting to higher-valued crops such as table grapes. But this trend would be accentuated if state air quality standards are met by 2010.

### Conclusions and Recommendations

At the start of the final decade of the 20th Century, California is at a turning point in its efforts to control air pollution. Many of the readily-implemented and cost-effective emission control strategies have been adopted. Here we consider three additional possibilities—improved crop resistance, ozone standards for crop protection, and a regional approach to air quality improvement.

#### Improved Crop Resistance

Crop improvement to increase ozone resistance and crop management to reduce ozone susceptibility are necessary to insure high agricultural productivity—until improved air quality objectives are met. Past research efforts have focused on documenting and quantifying ozone effects on crops; little attention has been given to reducing crops' susceptibility to ozone. In particular, the ozone susceptibility of certain high-value crops could be altered through genetic improvement. The policy question here is to determine the extent to which university research should focus on adapting crops to ozone and other pollutants rather than on mitigating the occurrence of serious air pollution problems in California.

At present, air pollutant susceptibility considerations play little or no role in crop management considerations. Other more visible problems such as irrigation, pest control, and fertilization are of primary concern and are successfully being addressed in part through integrated pest management programs for major crops. But ozone susceptibility is related to these other considerations.

New initiatives in sustainable or low-input agriculture will further a holistic ap-

proach towards crop management. Specifically, future management programs should integrate ozone susceptibility with all other aspects.

### **Ozone Standards for Crop Protection**

The exposure period and pollutant concentrations for which present ozone air quality standards are set are based primarily on human health considerations. A relevant policy consideration is whether to establish a secondary ozone standard to protect against adverse effects of ozone on crops and other vegetation. Secondary standards could be designed to provide more stringent ozone control in specific air basins. While this may be an effective way to protect the most susceptible agricultural crops, such as cotton, grapes, alfalfa, and citrus in the San Joaquin Valley, setting regional standards raises other issues related to the economic development and competitiveness of a region.

### **A Regional Approach to Air Quality Standards**

Analysis of air quality trends in the Central Valley for the past decade show little or no improvement despite significant reduction in ROG emissions, suggesting that future control programs emphasize reducing emissions of oxides of nitrogen. Present high population growth rates in the Central Valley and elsewhere in California are expected to continue over the next two decades, leading to many additional mobile and stationary emission sources. Although the Air Resources Board and the Central Valley Air Quality Management districts have proposed additional control measures, it is not clear that all of these will be enacted, nor that, even if implemented, they will be adequate to offset the impacts of growth.

A regulatory problem of special concern in the Central Valley is that multiple districts are responsible for the regulation of stationary source

### **Jan Sharpless:**

It is true that crops have greater sensitivity to air pollution than people. However, when the Air Resources Board sets the standards, we consider the magnitude of crop loss. Thus, it is not just a health standard; it does take into considerations other impacts. Whenever you try to make the standards more stringent than is required for public health, you will face tradeoffs. That is, you may be very protective of the crops, but then the controls that would be placed on agriculture could be more costly than the benefits from increased production.

### **Judy Andreen:**

It seems to be environmentalists vs. the government agencies and agriculture vs. the urban interests—everyone is fighting each other. No one will win a war of “us vs. them.” The air quality problem is not going to be resolved until we all see it as *our* problem, and we make an investment in solving it. People don't yet see it as *their* problem. People in urban areas see it as agriculture's problem—or somebody else's problem. They do not see that the car they are driving contributes to air pollution. They do not see that every stop sign generates 25 tons of pollutants every year—still everybody wants a stop sign in their neighborhood.

### **Jan Sharpless:**

The possibility of a consolidated district is a political hot potato.

## *Central Valley: Confluence of Change*

### **Jan Sharpless:**

There is a bill in the legislature that would combine the current eight air districts into a single district. All eight are within a single air basin, so there is a need to recognize impacts one district has on another. A lot of people are for consolidation, but many others are opposed to it for various reasons.

We are in the process of implementing the California Clean Air Act that was passed a year ago. Under that Act, each air basin has to have an air quality plan that achieves the state's standards in the fastest most practical way. So this will force districts in the same air basins to talk to one another and put together their plans.

### **Judy Andreen:**

There is now a very active eight-county effort to consolidate work on the air pollution issue. We have formed an air-basin authority, a regional approach, for dealing with standardized rules for air pollution control. Interestingly, we have come up against the cities who are very concerned that this will adversely affect economic development.

### **Jan Sharpless:**

With a better basic understanding of the Valley's air, we will have a better handle on what needs to be done. But I believe controls are not the only thing. We will also need better transportation plans and sensible management of growth. There is a great deal of momentum in the Valley now on all of these issues; the forces are there to produce some kind of consensus for the future.

emissions. Yet the formation and transport of ozone and other secondary pollutants cross local jurisdictions. It seems axiomatic, therefore, that air pollution effects on crops in the Central Valley must be addressed on a regional basis, considering the locations of both sources and receptors of pollutants. This requires forming a regional district similar to that created for the South Coast Air Basin in 1976.

A primary concern will continue to be determination of the relative contributions of distant and local sources to the ozone problem in the Central Valley. If, as is almost certainly the case, local pollutant emissions are a dominant and growing component of the air quality problems in the Valley, the tradeoffs between pollutant impacts resulting from urbanization and economic development versus continued high crop yields in the Valley must be faced. Legislators, regulatory agencies, residents of the Central Valley and members of the agricultural community must consider the possibility that maintaining agricultural productivity may ultimately require measures nearly as stringent, and with as great a societal impact, as those presently proposed for the South Coast Air Basin.

# Land: Competition for a Finite Resource—Flexibility or Irreversibility?

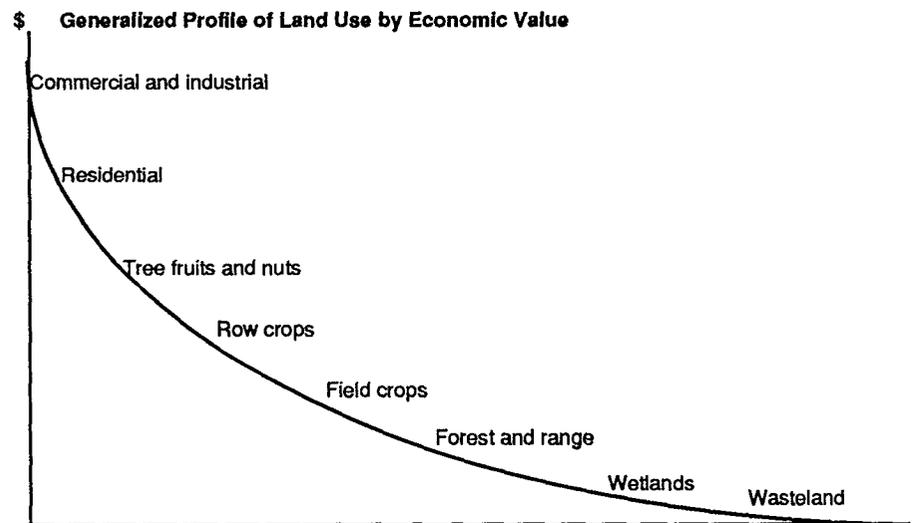
Warren Johnston:

Land use issues have quantity and quality dimensions. Contentious issues relate to both the physical extent to which land is available for a particular use (the *quantity* issue) and its relative superiority or inferiority among uses (the *quality* issue).

The Valley's total land area is fixed in quantity. Increasing competition for the services of this finite resource leads to land use issues, which revolve around changes in intensity of use.

Most parcels of land are suitable for various alternative uses. Highly valued land found in most central business districts could have been used for residential purposes, for crop production, for grazing and forestry uses, or left undeveloped as natural range-, wood- or wet lands. It is used as it is because owners of private property have economic incentives to use land for purposes that promise them the highest return. They allocate their land resources in accordance with the concept of *highest and best use*, as they judge it and as is locally acceptable.

Within the evolving process of increasing intensities of use in the Central Valley, land use issues become more contentious when *highest and best use* decisions for private property confer external costs on other property owners or conflict with societal interests. The criterion of highest and best use then shifts from one of simply maximizing economic returns to landowners and property developers, to a more complex process involving monetary values, adjusted for external costs, and intangible social values. As population grows in number and diversity, changes in land uses are competitive with those of traditional resource users and beneficiaries, creating tension between residents and immigrants. Differing perspectives and values make it difficult to reach consensus about land use decisions.



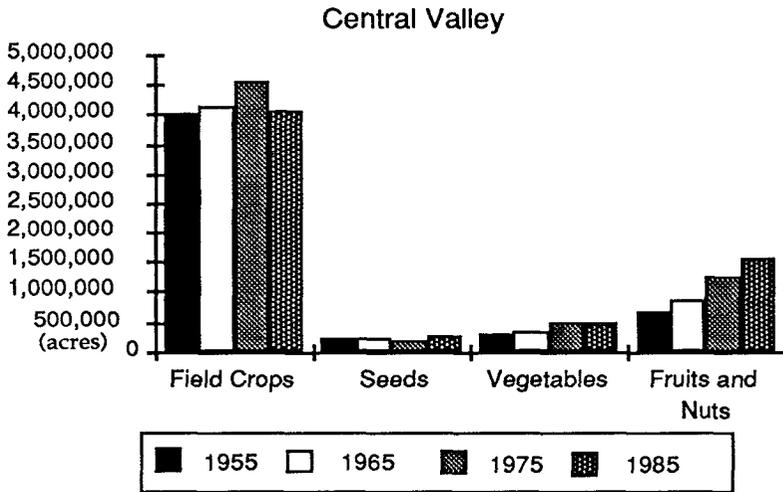
Adopted from Raleigh Barlowe, *Land Resource Economics*, Prentice-Hall, 1958

**The Agricultural Importance of the Central Valley to the State of California**

	Valley/State
•Total land area	25%
•Number of farms	50%
•Cropland	68%
•Irrigated land	74%
•Value of farm products sold	58%

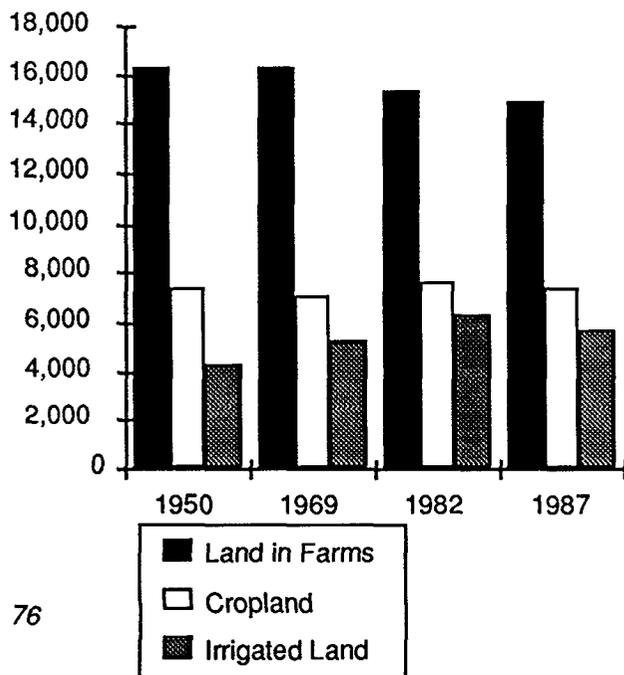
**Agriculture in the Central Valley**

California is the premier agricultural state in the United States, and the Central Valley is its heartland.



The Central Valley is evolving from an agricultural region which once produced field crops almost exclusively to one of increasing acreage in vegetable and fruit and nut crops. The continued production of basic commodities offers stability to agricultural incomes, permitting resources to be held in agriculture, while progressively meeting the demands for highly valued products. Shifts in acreage represent an intensification of production in response to growing domestic and international markets and displacement of production from largely urbanized coastal valley regions.

If the underlying agricultural land base were maintained in quantity and in quality, the Central Valley would surely expand its share of California's total value of farm products beyond the 58 percent reported in the 1987 Census of Agriculture. But real world observation tells us that maintenance of that agricultural land base and its productivity is being challenged.



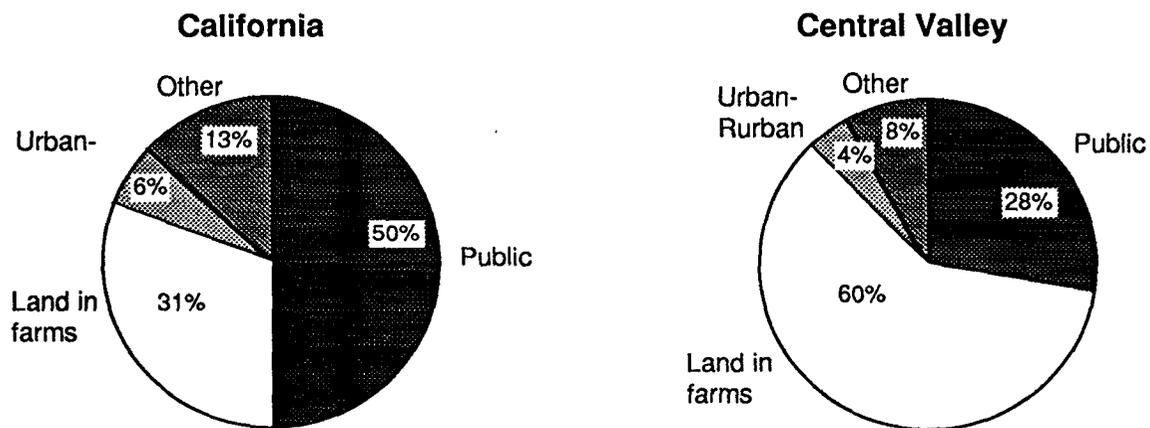
The agricultural land base for Central Valley farms, ranches, orchards and vineyards has declined over the past 40 years, from 16.3 million acres in 1950 to 14.8 million in 1987. The cropland base has, however, been rather stable at 7.4 million acres, although the 1987 acreage is about 200,000 acres less than the 1982 estimate.

Irrigated acreage increased from about 4.3 million acres in 1950 to nearly 6.4 million in 1982. It has since dropped to 5.6 million acres.

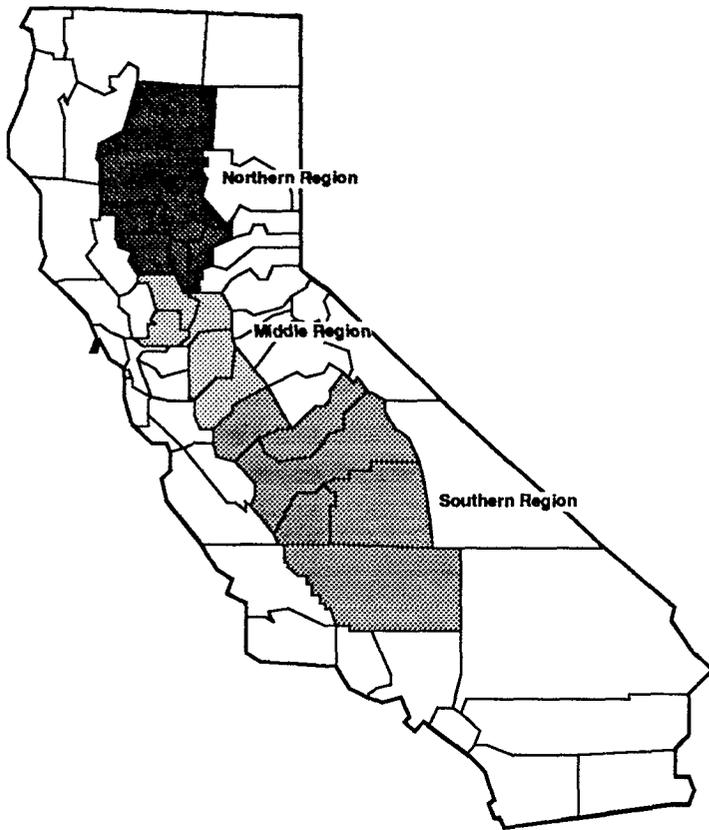
The postwar trend of rather constant acreage of all cropland and an increase in irrigated acreage differs sharply from changes taking place elsewhere in the state. Other areas experiencing urban growth have sharply reduced their farmland bases. California's population has increased from 10 to nearly 30 million since 1950, with much of the population growth occurring in those southern and central coastal valleys which were once California's most productive agricultural regions. Harvested acreage reported for coastal valley counties from the San Francisco Bay to the Mexican border decreased from nearly 2 million acres in 1949 to less than 1 million acres in 1987, a decrease of 53 percent over the four decade period.

What will be the impact of Central Valley population growth, given its finite land base? The answer is direct conversion of much of the land and concomitant resources of the agricultural sector.

The majority (72 percent) of the land area of the Central Valley is privately owned, in comparison to a 50-50 split for the state. Currently, 60 percent of Central Valley land is in farms; 4 percent is in urban and "rurban" uses; and other uses make up 8 percent of the total land area. (By rurban, I mean the parcelization of agricultural areas into rural homesites, ranchettes, and small farms.) Thus, a major proportion of Central Valley private lands are in farms. As the region's population grows, there will be increased pressures to convert private agricultural lands to higher intensity nonagricultural uses.



*Central Valley: Confluence of Change*



The 1987 Census of Agriculture gives additional insights about farming characteristics of the three subregions of the Central Valley. In particular, analysis suggests the potential for heightened conflict in the middle subregion, the mid-region from Yolo County on the north to Stanislaus on the south. This middle region is of particular significance to the overall Central Valley agricultural economy, but also the area of most rapid population growth. It contains the highest proportions of land in farms, of cropland, and of irrigated lands. It is the subregion with smallest average size of farms, reflecting both more mature development and ongoing parcelization. Finally, it has the highest per acre value of farm products sold, yet nearly 10 percent of the area is already in urban-rurban use.

	% land in farms	% land irrigated	# of farms	Size, acres	Value (\$) sales/acre
Northern	58	44	7,476	418	258
<b>Middle</b>	<b>76</b>	<b>59</b>	<b>12,488</b>	<b>223</b>	<b>679</b>
Southern	57	49	21,754	411	609

**Joe Fontaine:**

I believe, and I think that the Sierra Club would support this, that the major economic base for the Central Valley should remain with agriculture. Changing this base would be a tragedy and a crime, considering the productivity of this land. We should support full funding for the Williamson Act, so that we can encourage counties to keep the land under contract. I don't think any of us wants to see the Central Valley converted into a Los Angeles. One Los Angeles is enough for anybody.

Thus, a policy of maintaining the Valley's most productive agricultural resources would likely deflect irreversible conversions to nonagricultural uses from the mid-Central Valley. The combination of productive land and low cost reliable water supplies for agriculture there, as in established areas of the east side of the San Joaquin Valley, gives flexibility to the sector's productive capacity. The same combination of premium land and reliable, economic water supply also suggests that careful thought need be given to forestall the progressive displacement of agriculture from the east side of the San Joaquin Valley.

**Warren Johnston:**

Forces that take land out of agriculture are the same up and down the Valley, but the relative importance of each force in various subregions differs.

**Agricultural Land Conversion**

The current wave of population growth in the Valley differs from earlier development in that it no longer evolves from regional agricultural economies. Conversion to nonagricultural uses not only directly removes acreage but also may indirectly reduce per-acre productivity on adjacent or nearby lands.

A study by the American Farmland Trust documents an average annual loss of 12,000 acres of San Joaquin Valley farmlands to urbanization-type conversions over a recent 12-year period—that is a direct loss to agriculture of nearly 20 square miles a year. Evidence suggests that the rate of agricultural land conversion is not slackening, and will, in fact, accelerate in the next decade. LAFCO "Spheres of Influence" in the four southernmost San Joaquin Valley counties encompass nearly 345 thousand acres. Of those acres, 60 percent is undeveloped farmland within Spheres of Influence, portending the exposure of another 323 square miles of farmland to development consequences.

Urbanization and rurbanization present differing degrees of acreage removal from agricultural production. High density development directly removes land and hence, 100 percent of its agricultural productivity potential. Not only that, conversion in agricultural areas tends to remove the most productive soils, development being attracted by the resources and infrastructures supporting its pre-existing agricultural use.

Agriculture is inefficient at the rural-urban fringe for several reasons. The extreme amount of uncertainty associated with the high probability of land shifts gives farmers less incentive to invest optimally, especially in long-lived capital, when the probability is high that they cannot capture the returns from agricultural production. Near-term conversion possibilities detract from efficient agricultural production. The result is that productivity is reduced, essentially wasting land. It is a self-fulfilling prophecy when those in the fringe point to lack of economic competitiveness with other production regions. Less than optimal management and the externality of adjacent nonfarm norms about appropriate land use reduce the efficiency of farming operations and ultimately hasten conversions from agriculture. The fears and resentment expressed by nonfarm rural residents regarding odors, noise, and other aspects of agricultural practices can reduce efficiency as farmers adjust their schedules to accommodate their neighbors' sensitivities.

In agricultural areas, rurbanization, in creating rural homesites, ranchettes and small farms, fragments the land. Rurbanization obviously converts more acreage per unit than do high density urban developments. Agricultural census comparisons between 1978 and 1987 not only reveal the loss of 160,000 acres of cropland in the Central Valley, but also an

### *Central Valley: Confluence of Change*

apparent increase of about 4,000 farms, suggesting considerable rurbanization activity. While rurbanized lands may produce some agricultural product, their primary goal often includes nonpecuniary aspects of rural living. The most distinctive characteristics of rurban development are the intermixture of farm and rural-residence land uses with no sharply defined boundaries for either; a demand by dispersed, residential users for urban-type services not needed by farmers; and the imposition of additional costs of mixed development on farmers.

Urbanization and rurbanization have increased at the expense of agricultural systems. They directly compete with agriculture for space (land) and other resources traditionally associated with agricultural activity (water, air, labor, infrastructure investments). All of urban development and much of rurban development is irreversible, leading to permanent loss of agricultural land.

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### **Valuing Land**

#### **Joe Fontaine:**

Maybe we can do something about air quality and water quality with technological fixes. Maybe we can find more efficient ways to use water. But the really basic resource that we are making irreversible decisions about is land. We can't unpave parking lots and tear up streets and put land back into agricultural use. For generations into the future, these decisions are permanent, so we ought to be taking them much more seriously than we do today. There ought to be more than economic reasons to make those conversions from agricultural land to urbanization.

#### **Henry Schacht:**

Agriculture in California, and that means primarily in the Central Valley, is an asset of national and international proportions. Society is going to have to make some very hard choices in meeting threats to convert some of the finest farmland in all of the world. Last summer I was on a ranch, talking to an elderly friend of mine whose family has been in agriculture for many, many years who has been very successful, well established, profitable. I had noticed that the land just to the north of him had been going for some very high prices, so I asked, "How about the developers, are you waiting for them?" He said, "I'm waiting for them." When big bucks come into play, some of the farmers down in the Valley are, like my friend, waiting for the developers and don't want any curbs placed upon what they can do with their own property. I can understand that.

My personal urge is to see California agriculture preserved, as nearly as possible, in its present state of contributing importantly to the economic base of this state and to the food and fiber supply of the county and of the world. On the other hand, I can see how farmers faced with the prospect of selling their land for enough money to insure full economic security for themselves and their families would be influenced by the opportunity.

#### **Tom Hazlett:**

Land prices tend to reflect the fact that consumers are willing to pay a lot of money to live

on land that's a good place to live. If people want to be there, then they will bid up the price of that land. I see a real problem in saying that land is productive when it is in agricultural use, but is no longer productive with a few thousand houses on it. The fact is people want to live somewhere. I believe that's a productive use for a natural asset like land. People want to cluster together to some degree and land values reflect that. The land market is a very reliable mechanism and we ought to recognize that.

However, we ought to make sure that there are not implicit subsidies to over-developing for residential, commercial, or any other use. We don't want people to move in and spoil a lot of assets or resources that become costs to other people. Good planning is making sure that people pay the correct price.

**Bill Jirsa:**

The rational alternative is to make sure that residential development pays its way and that the land is in fact appropriately priced in terms of environmental and infra-structure demands that are placed upon the development.

**Robert Braitman:**

We need to develop a land use ethic in California that values agriculture land more highly than we do. Large parts of our community in Ventura County look at agriculture as an interim land use—farm it until something better comes along. We perhaps need to evaluate agricultural land differently than that. We need to develop an ethic for its use the way Japan and Europe have done.



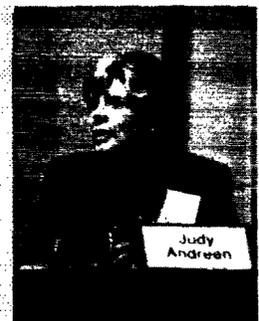
As Nancy Reagan said about drugs—"Just say NO." Just say NO. Just don't expand the urban area. The result of doing that over time is to force the market to recognize the viability of internal development. Hand wringing about low density will not help. But refusal to expand the urban area onto farmland will eventually cause the market to develop internally.

In Ventura County, we recently detached about 2,200 acres of prime agricultural land from one of our cities. The appraiser for one landowner said: "Land has two values—the intrinsic, doing what it's doing (in this case, producing strawberries); and its speculative value for some other, economically higher purpose. Commissioners, if you detach my client's land from the City of Oxnard, you are going to decrease the property value by 30 to 40 percent." One commissioner responded, "Let me get this straight. You're saying that if we detach this parcel from the city, the developer would be less inclined to buy it for development purposes?" Appraiser: "That's right." Commissioner: "That's why we're doing it!"

**Why Not Divert Development to the Foothills?**

**Judy Andreen:**

In many of the Valley counties our best agricultural land is where we have located our cities. And very often our least productive land is sitting vacant. If there were sufficient water, we ought to be putting those urbanized areas on underutilized range land to minimize the impact on our best agricultural areas.



**Bill Jirsa:**

I have always felt that the proper place to be developing communities would be in the foothills, both on the east and west sides of the Valley. Unfortunately, it is more difficult to start new developments in those areas than it is on the fringe of an existing urban area. And the primary reason for the difficulty is not, as a lot of people think, infrastructure needs, but environmental problems. In the foothills out of Tracy, the kit fox has stopped three brand new town proposals.

**Roberta MacGlashan:**

Although we have plans which allow for some development along corridors in our foothill areas, there has been very little development there for environmental reasons, as Bill just mentioned.

**Curt Lynn:**

It doesn't matter that much whether you put the development on the Valley floor or in the hills, because it will take water from agriculture in either case.

**Warren Johnston:**

**Agricultural Product Markets**

Aggregate demands by the growing California market, and by changes in U.S. and export markets, also affect land availability. When crops are profitable, new lands may be brought into production, expanding acreage beyond the normal areas of production. But care must be exercised since added acres tend to be more fragile with lower levels of irreversibility thresholds, demanding greater management capabilities. Enhanced profitability also forestalls premature conversion of lands. However, reduced profitability makes conversion more attractive. Besides these normal commercial market outcomes, profitability and associated acreage response are often affected by government commodity policies and by federal, state and local resource policies.

**Technological Change**

Technology through public and private research and development offers the possibility of increasing yields per acre or expanding production to lands currently incapable of engendering economic productivity. Thus, technology may effectively stretch the available supply of lands among alternative uses. On the other hand, strategies to reduce levels of purchased inputs may be associated with lower levels of productivity per acre, increasing the demand for land and reducing overall supply available to competing uses. Institutionally-imposed views of sustainability may require more agricultural land to offset potential increases in the cost of food and fiber products, if yields per acre are reduced.

## Other Forces

Other forces that affect the overall availability and productivity of agricultural lands, include:

- salinization,
- reduced water supply,
- air pollution,
- erosion,
- soil compaction, and
- soil pollution.

All of these reduce per-acre productivity and, at the extreme, eliminate land from economic usage. Their effect on the land base is apparent.

For a more thorough discussion of the factors expanding and contracting the agricultural land base, see "Farmland in California: A Changing Resource," by Michael J. Singer, William W. Wood, Jr., and Curtis D. Lynn in *Agriculture in California on the Brink of a New Millennium*, University of California, Agricultural Issues Center, 1990.

### Curt Lynn:

The additional water being called for to export through the Delta and to the San Francisco Bay for environmental purposes, will mean more production loss, perhaps one-half to one million acres. And the major effort to restore flows in the San Joaquin River lost when Friant Dam water was diverted by the Central Valley Project will require putting back some 500,000 or 600,000 acre feet—another 200,000 acres of farmland could go out.

### Warren Johnston:

#### "Primeness" in Land Classifications

The quality dimension of the land resource must relate to its use. All lands are not equally "prime" for all purposes. Some lands are better suited than others for septic tank fields, for rice production, for wildlife habitat, for row crops, for residences, for parking lot structures, for wintering livestock. Suitability depends not only on the physical characteristics of the site, but also on environments and infrastructures within which it is found.

The expressed concern about the conservation of agricultural lands could be greatly clarified with a classification system that ranked lands hierarchically from the superior to the inferior—or from the best to worst. How to develop such a system is the subject of much conjecture. Superior for what use? Based on what criteria? Economic and scientific arguments in a classification scheme would be useful. Political arguments perhaps less so. Retaining flexibility for future alternative uses and forestalling irreversibilities should ideally be considered.

Currently there are four systems of state and federal land classification which provide concerned individual and agencies with relative ratings of agricultural lands. Three of the four measure only physical properties of soils. The fourth includes weak economic criteria, unchanged to reflect any inflationary effects for two decades. There are, additionally, several local government efforts to prioritize agricultural lands for development. This process reflects relative desirabilities for conserving lands in agricultural uses.

The lack of a commonly acceptable system of classification inhibits and confuses

## Central Valley: Confluence of Change

communication among participants in land use decisions. Most of the current systems refer to "Prime Farmland" with discussions complicated by the differing meanings of this common reference.

- California soils are evaluated by the *Storie Index Rating System* to classify general productivity based on profile, texture, slope and other productivity modifiers (erosion, salinity, drainage, topography, etc.). Soils with a rating of 80 to 100 (Storie Grade 1) are considered prime farmland by the Williamson Act, but some would prefer to use a wider 60 to 100 range (Storie Grades 1 and 2).
- The USDA *Land Capability Classification System*, the best known and most widely used national land classification system, uses soil and climatic criteria. It contains eight land classes, four of which are identified as appropriate for cultivated crops and three for grazing. From this system of classification, Class I and II lands are often referred to as "prime" lands.
- Prime farmlands in the *Farmland Mapping and Monitoring Program (FMMP)* of the California Department of Conservation use a less restrictive set of soil and climatic criteria. This is the growing favorite of those who wish a quick, institutionally supported encompassing definition for their prime farmlands activity.
- The *Williamson Act* uses multiple criteria to identify prime land for preferential property taxation. Land must (1) be USDA Class I or II, (2) be Storie Index 80 to 100, (3) have a gross annual return of not less than \$200 per acre for three of at least five years, (4) be currently planted in nonbearing perennials less than five years old which would normally yield \$200 per acre when commercial bearing, or (5) for rangelands, have a carrying capacity of at least one animal unit per acre. Thus, this definition for prime land comes considers a set of both physical and economic criteria.

Unfortunately, the several criteria permit varied identification of "primeness." The most restrictive is the Storie Grade 1 definition. It corresponds to a major portion of USDA Land Use Classification System Class I lands. The second most confining definition of prime is USDA's Class I and II lands. They roughly correspond to Storie Index rated lands of 50 to 100. The Williamson Act adopts both of these standards among its multiple set of criteria. The least restrictive cropland definition is the *Farmland Mapping and Monitoring Program* which includes additional lower rated lands—USDA Class I and II, plus some Class III lands. There are obvious degrees of "primeness."

The Williamson Act contains the only set with potential for incorporating high valued crop production on lesser quality soils and high productivity rangelands. All but the Williamson Act exclude recognition of the value of extensive agricultural lands, and it is restricted to only one such dimension of value—livestock production. Nowhere is there possibility to recognize upland values for watershed and other nonconsumptive uses by valley residents.

Each system may be useful in a *global* sense to verify if the proportion of soils in one county, or locale, are in a relative sense superior to those somewhere else by that same system's criteria. But what about the usefulness of these various definitions in local situations where the question is not whether conversion will occur, but rather where should development be located in order to conserve superior agricultural lands?

Development in many Central Valley locales is in areas surrounded by prime lands, defined globally. It is of little comfort to take a strong stance to conserve all prime lands unless, of course, no-growth is the objective. But what are the locally superior lands? Here the decision begs for specific clarity about local land quality. Similar problems occur in efforts to conserve superior rangelands, wildlands, or wildlife habitat.

There is, however, also need for strategies wherein global criteria prove useful. If a goal is to maintain maximum flexibility in the agricultural productive capacity of the Central Valley then supra-local priorities need better articulation. Local decisions that endanger the state's specialized production potential may need to be questioned. (Similar problems of locally superior and globally threatened lands also occur in efforts to conserve rangelands, wildlands, or wildlife habitat.)

Thus, there are degrees of "primeness." Where not all prime lands can be safeguarded, then we need to be able to identify the "best" of the prime. By doing so, concerned individuals and agencies could better guide public policy decisions aimed at conserving the *most prime* of our agricultural land base.

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### Planning is Essential

**Paula Carrell:**

Growth is inevitable. It is a moving freight train; there is no point standing in front of it. But the form that it takes, the way in which it progresses in the Valley, is not inevitable. I think it is possible for us to consider whether we can increase levels of compactness and density within the urban areas that are already developed and in that way protect significant amounts, if not all, of what we can identify as prime farm land.

**Charles Hess:**

To ensure agriculture's continued presence will require a proactive program of planning and communications. You must first identify the issues, the challenges, and the constraints. What will have to evolve is a major land use plan for the Valley in order to design the location and growth of urban areas, to provide transportation, and, critically important,

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to preserve prime agricultural lands. Coupled with the plan, there will have to be a strategy to implement it. Perhaps we need to introduce the transfer of development rights to separate the multiple values of land into agricultural purposes and the development potential. Such plans are being tried in a number of states. Advance preparation and the development of a strategic plan for action must be done at the state level. It is, after all, the state's economy and the well-being of all the people of California that are involved. The lessons that are learned in the process will be of value to the nation and to the world.

#### **Roberta MacGlashan:**

Tulare County has an impressive track record for preserving agricultural land. We started by adopting urban limits almost 20 years ago, before these were "trendy." With the involvement of our local agricultural community and the support of our elected officials, we adopted policies to encourage growth and development upon annexation to existing cities or in existing unincorporated communities within these urban boundaries and to restrict most of the area outside of those boundaries on the Valley floor to agricultural use in parcels ranging from 20 to 80 acres. This has worked very well in our county. However, until recently, we've probably been more insulated than Fresno from both people pressures and dollar pressures. So I don't know how long the success we've had can continue.

#### **Ed Blakely:**

One thing that some people have proposed is to deal with the Valley in the same way that we dealt with the coast. As we created a "coastal zone" we should create an "agricultural zone" in the Valley and thereby preserve prime agricultural lands through legislation. This, of course, would make land values elsewhere, like in the foothills, that much higher.

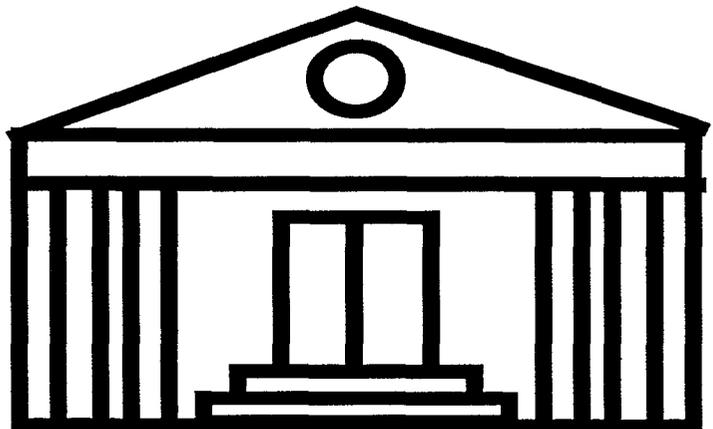
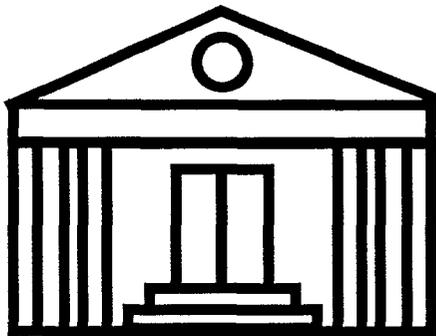
#### **Deena Sosson:**

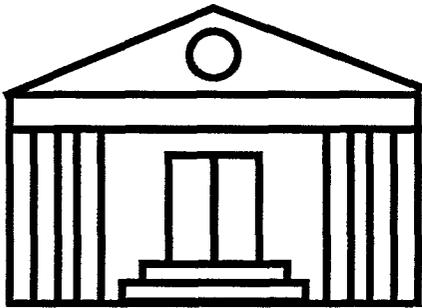
There are states who have taken the initiative to develop a goal statement and to require of regional entities that their plans be in conformance with the state plan. We had something similar with the Coastal Zone Management Plan. The state policy was that the coast represents a unique resource that requires localities to develop plans. Development is controlled by being in concert with the coastal zone plan. Similarly, there could be an agricultural zone management plan that would offer an overall guide to substate planning.

#### **Warren Johnston:**

There are no more valleys over the hill, either to the west or to the east, to absorb losses in agricultural productivity if Central Valley lands are not conserved. Conservation is wise use for the present and the future. It does not mean a lock up of resources in historic or current use. The challenge is to maximize benefits to all sectors. At the same time we must shelter the remainder of the agricultural sector from external forces that negate inherent productivity. The confrontation will only become greater as growth pressures test the finiteness of our resource base. In response, citizens of the Central Valley and this state must work diligently to maintain the flexibility and to forestall irreversibilities not only of its land base, but also of all resources associated with agriculture. There are no more valleys.

# Government Gridlock





# Governing the Valley: County/City Interactions

## Three Major Themes

1. Many of the problems faced by local governments in the Valley arise from actions or decisions taken outside the jurisdiction of the affected government.
2. Valley citizens have a strong commitment to local control, especially on such critical matters as land use.
3. Irrespective of local government organization the major problem faced by Valley governments is that, within the state of California, the authority to collect and expend public revenues is not distributed consistently with the assignment of responsibility to perform governmental functions.

### Elmer Learn:

The American system leaves to individuals and private firms primary responsibility for decisions relating to the timing, nature and location of economic activity. Decisions to construct new homes, create a shopping center or develop a manufacturing or a food processing plant are all, in the final analysis, private decisions. But, these and similar types of decisions are influenced by past, current or anticipated action of governments. Thus, governments at the local, state and national levels influence the magnitude and components of growth. By the same token, government actions become major determinants of the effects that growth has on quality of life in the Central Valley. The assignment to our study group was to describe and analyze governmental performance relating to these matters.

We concentrated on the cities and counties. We were also interested in the interrelationships between these local governments and the state. Emphasis was given to land-use issues because so many growth-related opportunities and problems revolve around public decisions about land use. Furthermore, it is in the land-use arena where some of the most contentious agriculture/urban conflicts arise.

Our study by no means covered the totality of governmental influence on growth. On matters pertaining to air and water, for example, governmental influence ranges from actions of the *local* air pollution control agencies and water districts; to the *state* Air Resources Control Board and Department of Water Resources; to the *federal* Environmental Protection Agency and Bureau of Reclamation. Indeed, our efforts to simply catalog the governmental agencies with influence in the Valley, without attempting to list their

**Dan Dooley:**

We have major contradictions in policies that relate to growth and development and quality of life in the San Joaquin Valley and, indeed, California, generally. For example, there are frequent conflicts between implementation of the Endangered Species Act and the planning codes that direct local governments to try to steer growth away from prime agricultural land. In Tulare County, areas that may be most appropriate for certain types of development also happen to be the preferred habitat for the kit fox or the blunt-nosed leopard lizard or the Tipton kangaroo rat. Conflicts also arise between implementation of underground tank clean up laws and the Clean Air Act.

Sometimes the agencies of government have conflicting responsibilities. For example, planning departments often also have economic development responsibilities. Boards of supervisors may sit as economic development boards or re-development agency boards and also as the air pollution control district boards of directors.

Before we can get a rational approach to growth and development and preservation of our quality of life, we've got to reconcile conflicting responsibilities and policies that exist within our laws.

constitutional source of authority or the laws and regulations that influence their activities, encompassed 18 pages.

Even casual observation would quickly reveal that we have a hodge-podge of interlocking and overlapping governmental authority. One person called this complex of government the "ad-hocracy" to connote our tendency to create new laws or agencies to cope with each newly identified problem perceived to be amenable to solution by public action. All too often these simple solutions intended to resolve a single issue have secondary and tertiary consequences that result in still more laws, regulations and overlapping jurisdictions.

This tendency to act without thorough consideration of primary and secondary effects is especially evident in the initiative process. Consider, for example, the vast increase in laws and regulations enacted by state and local governments as a result of passage of the 1978 tax reduction initiative known as Proposition 13.

**Local Problems Result from Remote Decisions**

There can be no doubt that increased complexity of government results from the added complexity of the problems with which we expect government to deal. But complexity also results from the fact that many of the problems faced by Central Valley communities do not easily lend themselves to local solution. Frequently, this is because the problem's source lies beyond the jurisdiction of local agencies. Such is the case, for example, with air pollution in many parts of the Valley. Similarly, the source of much of the population pressure challenging Valley cities and counties lies beyond the Valley itself—in national immigration policies or in economic and political conditions in California's heavily populated coastal areas. As many local government leaders can testify, however, recognizing the source of one's problems is only a first step toward finding a solution.

### Regional Authority Incompatible with Local Autonomy

Some believe the solution must come from a refinement of governmental structure. We might, for example, reassign many of the duties currently held by county or other local governments to multi-county regional governments. Such solutions could bring about a better convergence of jurisdictional responsibility for causes and cures of growth-related problems. However, regional governments with authority to do more than *discuss* mutual problems are unpopular. They are unpopular because they are in direct conflict with the long-standing commitment to local control—a commitment that appears to be holding its own as the level of mistrust in governments at all levels grows.

Multi-county or regional governments *are* one alternative for more effective management of growth related problems. But it would be a mistake to see them as the only alternative, because of uncertainties about the workability of such large organizations, their distance from citizens, and their political unpopularity. Efforts to make the existing hodgepodge of governments work more effectively with one another may be more productive in the long run than any revolutionary reordering or modification of the existing structure.

Still, some regional or even statewide considerations are in order. The reason is the geographic divergence between sources and consequences of growth-related problems. Planning goals to achieve quality of life objectives must be established in part on a regional or statewide basis. To illustrate, a state planning goal might be the preservation of prime agricultural land in the Valley.

#### Defining the Region

##### Grantland Johnson:

I'm not convinced the Valley can have a separate identity. There are some real distinctions, for example, just in the greater Sacramento area. There is the major city of Sacramento, Yolo County, parts of Placer and El Dorado counties, and I would add Sutter County. The question is—even in this area—how can you talk about a common identity? You have dramatic differences, both economic and demographic. Look at Stockton or Modesto or Fresno. What commonality exists there? Other than the fact that we are in the same general geographic region and have some economic ties, it is very difficult to talk about a common regional identity. There is a need to talk about inter-relationships—for example, between transportation and economics. But I would caution against the notion that somehow we can mechanically develop a sort of regional identity.

##### Deena Sosson:

Many communities in the Central Valley don't feel that their identity is with their neighbor to the north or south, but with the East Bay and San Jose. So to them the region is not the Central Valley. The issue of identifying the region really calls into question the rather easy articulation of the desirability of regional planning. Because if you can't define what your entities are, you don't know what you are going to plan for, or what your goals will be. That is a really critical question for this whole session—identification of growth management goals.

**Steve Juarez:**

Until we define ourselves as a region, attempts to solve problems in individual communities are going to be miniscule. We are going to have isolated impacts in enclaves—we are merely shifting the problem. The Bay Area, to a great extent, has seen itself as one financial and economic entity. The Central Valley has to do the same, and I would assert that until they do little positive change is going to happen.

**Bill Briam:**

We can learn from the errors that the major metropolitan areas have made. But in order to do it we need a collaborative effort. We need cooperation among state and local governments, the private sector, and citizens. We need to identify the Valley as a region. We need to develop a strong direction and plan—and transmit that plan to Sacramento to let them know who we are, what we are, and where we want to go. If we as a Valley do not do that, the state will step in and develop the long-range plan for the Valley.

**Elmer Learn:**

**Mismatch of Responsibility and Resources**

Proposition 13 and the related Gann Initiative (Proposition 4) have had immense effects on the power of local governments to deal with the problems of growth. Altering the power to collect and the authority to spend public revenues without substantially modifying the responsibilities of most government institutions has created chaotic conditions among local governments. Subsequent attempts to make piecemeal adjustments, e.g., by altering state funding or by mandating divisions of property tax revenues, have been incomplete at best. As one individual told us, heavy reliance on sales taxes as the only reliable source of additional revenue has caused many local governments to engage in a game of “zoning for dollars.”

In addition, the changes required by Propositions 13 and 4 have had the effect of highlighting the degree to which growth-related decisions by one unit of government can create serious problems for another. For example, virtually all local politicians are now aware that *city-approved* population growth generates increased demands for *county-provided* public services. Rarely, however, does growth produce additional county revenues sufficient to meet the added cost. Local governments are struggling to find solutions to this and other growth related problems. But, even individuals most committed to local control are having doubts about the ability of local governments to handle the pressures that growth places upon them. There appears to be convincing evidence that they cannot do so within the constraints currently imposed on their fiscal actions.

### **The Valley—Similar but Different**

Even if the fiscal shackles were removed, however, is it reasonable to talk of Valley planning goals? After all, the Central Valley of California is not homogeneous. The problems faced by and solutions required in Butte County differ significantly from those in Kern County. But, in spite of the differences in the Valley, there are similarities that distinguish these and other Valley counties from those on the coast or in the Sierra. Certainly this is true for the broad class of issues that is the prime objective of this study—those associated with growth and agriculture.

We attempted to gain a better appreciation of the similarities and differences of growth-related problems faced by local governments in the Valley by a series of six case studies of individual counties. In selecting the cases we attempted to get representation from north and south, and from counties where the agriculture/urban conflicts were likely to be greatest. In each county we held a meeting with elected and appointed representatives of county and city governments and with individuals representing private business and agricultural interests. The focus was on land use and fiscal relationships between the county government and the county's largest city. The selected counties and their cities ranged from Butte and Chico in the north to Kern and Bakersfield in the south.

Each of the themes mentioned at the beginning (see box) was raised by one or more of the local representatives in every county. They relate to problems that must be resolved if the Valley is to make an optimal contribution to the welfare of the state and nation while preserving the quality of life desired by its citizens.

#### **Al Sokolow:**

The Central Valley certainly has its share of local governments. We count about 500 independent local governments in the 18-county region—counties, cities, school districts, special districts. Most of these separate local governments have some relationship to growth patterns in the Valley, either in stimulating or responding to the influx of new residents.

The county and city governments, however, draw most of our attention. They are the local governments with the most comprehensive powers, including the ability to regulate and direct growth. Their planning and land use practices especially interest us. In this area the state of California gives counties and cities considerable authority and discretion—requiring certain basic actions, but generally permitting much local leeway as to the degree and location of growth. And as far as the state is concerned, counties and cities are largely identical in regulatory power. Both types of government adopt general plans with the same mandated elements, implement their plans and growth policies through zoning and other ordinances, and apply these tools on a daily basis to specific development proposals.

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Yet city and county approaches to the growth management task in California often differ. Counties in the Valley tend to be relatively cautious about the merits of population growth within their unincorporated jurisdictions. Somewhat protective of their rural areas, they are committed in varying degree to preventing or limiting the conversion of agricultural land to urban uses. (All Valley counties at least give lip service in general plan language to the farmland conservation ideal. And all of our six sample counties, with the exception of Butte, are major users of the Williamson Act, enrolling more than half of their agricultural acreage in this farmland protection program.)

County governments in this way reflect the interests of the unincorporated and more politically potent parts of their constituencies. At times, however, counties also promote some development in unincorporated areas—producing some ambiguous results in relation to the land protection objective.

### **Judy Andreen:**

Cities very often are interested in economic development. They want their boundaries moving out as quickly as possible because development within those boundaries not only generates property taxes but sales tax values. In Fresno County it is very difficult to find a commercial center in the rural area because the cities get those lands as quickly as possible. The sales tax is far more significant these days than the property tax.

On the other hand, cities are much less ambiguous as to purpose and policy. In the Valley as elsewhere, they are “growth machines.” They tend to be expansionist, seeking to extend their boundaries to take in larger populations and commercial areas. The imperative to grow comes out of the belief of city leaders that their communities need to grow to fund and justify expanded public infrastructure—and that expanded infrastructure is needed to accommodate added growth.

Population increase patterns in the six counties during the 1980s show the fruits of this difference. Estimated increases during 1980-89 were greater in the cities of each of the counties than in the unincorporated areas controlled by county government—substantially greater in four counties. Unincorporated areas in two counties (Yolo and Fresno) actually lost residents during this period, while their city areas grew by more than 25 percent, largely because of incorporations and annexation activity.

On the development front, then, county and city governments engage in a certain amount of pushing and shoving. Cities spread into adjacent rural areas while counties attempt to hold their ground.

By no means, however, is serious county-city conflict an inevitable outcome of this basic difference in jurisdictional purpose. California law and practice supplies incentives and tools for cooperation in the planning and approval of urban growth and on related finance matters. For example, the designation of city spheres of influence allows for

intergovernmental agreement in the phasing of municipal expansion. Along with annexations and other boundary changes, the spheres are approved by local agency formation commissions (LAFCos), composed of both county and city representatives. Other forms of county-city cooperation on land use-related matters include urban limit lines, agreements to concentrate urban development within city boundaries, joint study groups, and revenue sharing agreements.

### **Valley Variations**

It is the interaction of city and county decisions, then, that determines to a large extent the rate and direction of urban growth in particular areas. What do we find throughout California's great Central Valley?

Our conversations with county and city leaders and others in the six workshops point to differences in the interactive pattern from one county to another. As the chart on the next page indicates, the nature of county-city interaction on land use matters varies in the relative mix of elements of conflict and cooperation—from Butte-Chico as the most conflictual to Kern-Bakersfield as the most cooperative relationship.

This is a cumulative scale based on a number of indicators of conflict and cooperation—on the presence of such conditions as planning and revenue agreements, formal communication channels, annexation disputes, development disagreements, and litigation. We weighed the importance of particular conditions according to what people told us and according to the intensity of their views. This is an impressionistic summary, based on our interpretation of the perceptions of local leaders (supported by more objective information in some cases). But it does pinpoint key intergovernmental factors in particular areas as a basis for comparing county-city situations throughout the region.

#### *Butte County*

The Butte-Chico relationship, at one end of the scale, is marked by considerable contentiousness. To be sure, there is one sign of major cooperation—the Municipal Affairs Agreement signed by the county and the city in late 1987. It deals with the heavily urbanized but unincorporated area on the fringes of the city, with the purpose of assigning basic service responsibilities in the fringe area to Chico. In return for revenue concessions from the city, the county agreed to drop further opposition to city annexations in the fringe. Given the long history of jurisdictional conflict between Butte and its biggest municipality, this was a remarkable achievement. It also may be the most comprehensive formal county-city agreement, focused on a particular area, in the Valley. This was made possible by change in composition of the Board of Supervisors in the early 1980s, after considerable litigation—eight lawsuits in the early part of the decade.

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Still, the long standing political animosities and land use and revenue problems which led to the 1987 agreement have not disappeared. They linger. They include fierce opposition to city annexation in the unincorporated fringes of Chico, as well as major public service problems in this area complicated by irregular city-county boundaries, unincorporated islands, and Butte County's fiscal crisis. Development standards differ between city and county—the urbanized fringe is unsewered. About 75,000 live in the Chico urban area, half in the county part.

**Comparing County-City Relations in Six Valley Counties:  
Elements of Conflict and Cooperation**

Ranking	Indictors of Cooperation	Indicators of Conflict	Current Issues
<b>Most Conflictual</b>			
1. Butte-Chico	municipal affairs agreement	development standards annexation disputes litigation long-time contention	county finances annexation transportation
2. San Joaquin-Stockton	joint growth study	competition for development lack of communication	school district boundaries county finances jobs-housing balance
3. Fresno-Fresno	urban referral policy joint resolution on metro planning	annexations blocked referral policy threatened	annexation local tax for state highways revenue sharing air pollution
4. Yolo-Davis and Woodland	redevelopment agreement coordination committee urban referral policy	coordination committee stymied co-city information gaps	county finances agricultural land protection county economic development
5. Stanislaus-Modesto	sales tax sharing joint study	county development plans	jobs-housing balance agricultural land protection
6. Kern-Bakersfield	good communication joint metropolitan plan strong county finances		water, air pollution jobs-housing balance random development
<b>Most Cooperative</b>			

Source: Interpretative summary of comments by participants at county workshops conducted in December, 1989.

*San Joaquin County*

Political rivalries across jurisdictions are also present in the San Joaquin County picture, although with less acrimony than those which characterize the Butte-Chico relationship. "We have a lot of territorial conflicts which prevent us from making wise decisions," said one participant in our Stockton workshop. People have referred to a lack of "communication" and an excessive fragmentation of authority among different governments. As well as San Joaquin-Stockton relationships, interjurisdictional tensions extend to the smaller cities of the county. They also involve the overlap of school district and municipal boundaries (the city of Stockton is in three different elementary districts), a condition which affects the relative attractiveness of various cities for young families migrating to the area.

With the exception of a recent study of growth scenarios, jointly funded by the county and Stockton, there is not much evidence of formal county-city cooperation on land use and revenue matters. On the other hand, at least three cities (Stockton, Tracy, Manteca) and the county government appear to be competing for the most desirable slices of the growth moving from the nearby Bay Area. The competition is more city-city than city-county, as suggested by the county's recent support of Stockton's annexation plans to the extent of approving cancellations of two major Williamson Act contracts on the outskirts of the city. Lathrop was incorporated as a city in early 1989, largely to defend the community from the aggressive growth actions of Manteca, its immediate neighbor to the east.

*Fresno, Yolo, Stanislaus Counties*

The three "middle" counties on our scale exhibit a common pattern. County-city relations concerning land use matters follow a relatively harmonious course. All three county governments have fairly strong farmland protection policies, dating from pre-Proposition 13 times, which emphasize the diversion of urban growth to city areas. County-city agreements and general plan provisions support these policies. But increased fiscal strains just recently have caused all three counties to question past arrangements and to consider the merits of encouraging development in unincorporated areas.

Fresno's situation represents the most vigorous break with the past. In 1987, the county government withdrew from its master property tax sharing agreement with the city of Fresno, under which annexations to the city had produced a standard split of the affected property tax revenues. Comparable agreements with the 14 other cities in the area were abandoned by the county in 1989. The effective result has been to place a moratorium on all municipal annexation activity. And in a small way, the county began to promote some commercial development in its jurisdiction. The national press picked up the story of the automobile dealership approved in 1989, just across the street from the Fresno city border.

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At the root of the dispute is the belief of county leaders that annexations have seriously eroded their revenue base, adding to their fiscal problems. County officials complain that city annexations have been selective—taking in commercial and industrial properties, while leaving behind less revenue productive residential areas. Clearly the county's share of local sales taxes in the area has steadily dropped over the years.

But now, city-county negotiations are in progress. Agreements were recently signed with Coalinga, Mendota, and Selma, covering annexations along with sales and property tax sharing, redevelopment, and procedures for resolving further conflicts. Agreements are pending with the city of Fresno and other municipalities.

Similar county fiscal concerns underlie land use actions in Yolo and Stanislaus counties, but recent actions in both counties have been less disruptive of interjurisdictional relations than in Fresno. Strong cooperative mechanisms exist in Yolo, including a city-county coordinating committee and redevelopment revenue agreements. The committee has been a useful forum for informing city officials about the true state of county finances, but it has not been able to agree on an appropriate set of solutions. Without abandoning their strong support for farmland protection, county officials now are considering economic development possibilities in several unincorporated areas—primarily at interstate highway interchanges—as a means of producing sales tax income. The county lost its only significant sales tax generating area when the city of West Sacramento incorporated in 1987. County-city relations are aided by municipal slow growth policies (especially in Davis), city support for the county's farmland policies, and past cooperation in tackling fringe area problems. But county-Davis relations have soured in the last few years, revolving primarily around the city's desire to establish a buffer around its borders.

The underlying sense of cooperation seems to be more pervasive in Stanislaus than in either Fresno or Yolo counties. Here county government has sales tax sharing agreements with Modesto and two other cities, and the counties and cities have long worked together in planning for growth. Fast-growing Modesto has not pushed out its borders as aggressively as many other municipalities. Instead, because of Measure A of 1979 limiting sewer trunk expansion, the city has turned to infill projects. This results in relatively dense development and an efficient use of land, coinciding with the county's farmland protection policy. But, as in Fresno and Yolo counties, the fiscal squeeze has pushed Stanislaus County government into the development business. In 1987, the county amended its recently-revised general plan to allow industrial development in unincorporated areas.

**Kern County**

Finally, we come to Kern-Bakersfield—at the most cooperative end of the six-county scale. A moderate amount of cooperation and the absence of overt conflict between county and city governments mark this situation. Planning commissions of the two jurisdictions in late 1989 approved, and recommended to their political bodies, the jointly-developed Metropolitan Bakersfield 2010 General Plan. This covers the physical development and economic and environmental goals for a 405-square mile area including Bakersfield and its unincorporated fringes.

Kern County certainly has its share of growth-related issues, including air pollution concerns, water limitations, and federal requirements for the protection of endangered species. But they seem not to be embedded in county-city conflicts. One reason is that the Bakersfield area up until very recently has not experienced severe growth pressures, although other parts of the county have been affected by LA spillover. More important to the relative absence of county-city tensions, however, is the relative affluence of Kern County government.

**Fiscal and Other Explanations**

Obviously then, the land use interactions up and down the Valley are largely driven by county and fiscal concerns. We all know how Proposition 13 twelve years ago fundamentally changed the character of public finance in California. One impact was to force local governments to compete more aggressively for revenues. In the Valley as elsewhere, cities and counties increasingly base land use decisions on their revenue consequences. You can call it “the fiscalization of land use” or better yet “zoning for dollars.”

In this competitive scenario, cities clearly have the advantage, with revenue sources not available to counties, most of the sales tax base in the state, redevelopment powers, and the ability to extend their boundaries and infrastructure to take in new and profitable development. Counties have the burden of carrying out the welfare, social service, health, and judicial programs of the state. It is a well-known story by now of how the finances of California counties in the

**Dan Dooley:**

Conversion of agricultural land in the Santa Clara Valley and in the Los Angeles Basin predated Proposition 13. While I acknowledge the impact of the fiscal dilemmas generated by Proposition 13, growth pressures are generally unrelated to its fiscal consequences on local government.



**Robert Braitman:**

There should not be urban uses within unincorporated areas. Development should be annexed to cities. I'm not saying that the area to be annexed should be larger, but urban development ought to be within city boundaries. The way we fund local government is partly preventing this, because sales tax is not distributed on a per capita basis, but on the point of origin. So we end up with every city in a region and the county all having plans for shopping centers. How we reward local government is driving the land use machine in California.

We need to give attention to how we are going to finance counties, so they can keep the doors open in the health care system and the court system, while at the same time cities can annex land, and provide police and fire services. It's all tied up with the state laws on how we finance local government. The key seems to be this fiscalization of land use. We need to get local governments to adopt land use plans which are sort of revving in neutral—if you have a certain population you get a certain revenue to provide basic services, you don't have to go out and compete for commercial sales tax.

decade since Proposition 13 have been squeezed between decreased revenue powers and increased state mandates.

Central Valley county governments are among the most hardpressed of all counties in the state. County fiscal problems are more serious here than in any other region of California, a reflection of relatively low property tax and sales tax revenues in unincorporated areas and high caseload burdens for welfare and other programs. As illustration:

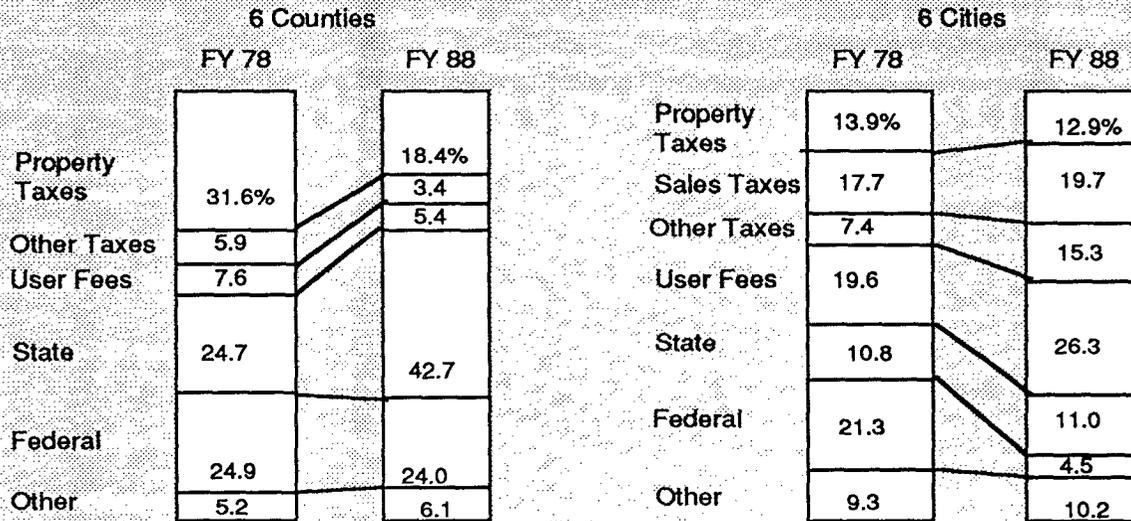
- The sales tax base in the 18-county valley region averages about 2 1/2 times more for a city resident than a resident of an unincorporated or county governed area.
- While the region has 15 percent of the state's population, its counties have 22 percent of welfare caseload.

No wonder then that Valley counties are forced to reconsider established land use policies, and all local governments are more inclined these days to view each other as competitors for land and money. The relationship between county fiscal stress and city-county cooperation is not always that simple, however. Other factors intervene in the relationship, and affect how counties and cities respond to fiscal problems in their land use actions. Longstanding formal agreements concerning revenue sharing, for example, may soften or delay efforts to take unilateral action on land use matters. On the other hand, traditional rivalries and the absence of regular communications among governments can exacerbate fiscal relations.

We see this interplay of finances and political relations in our six county-city situations. To be sure, the two situations at the ends of our conflict/cooperation scale also represent the extremes of county fiscal health—Butte is the most hardpressed of all counties, while Kern has an enviable revenue base tied to both

### Fiscal Patterns: Averages for Sample Counties and Cities

#### Revenues



#### Property and Sales Tax Trends

	6 Counties	6 Cities
Average Per Capita Total, FY 88	\$145.54	\$178.37
Average % Change in Per Capita Total, FY 78-88	-32.3%	+55.5%

11-Year California CPI: 57.5%

#### Al Sokolow:

Our basic point remains—relative fiscal health is the critical element in county-city land use cooperation in the Valley. Certainly counties in the region are much more budgetarily constrained than their cities. A look at aggregate revenue trends since before Prop. 13, comparing the six counties and their principal cities, makes this clear. Changes over an 11 year period, FY 1978-88:

- Revenue shifts for counties: Much reduced use of property tax, much greater dependence on state funds.
- Revenue shifts for cities: Less dramatic changes—stable property tax, slight increase in sales tax, bigger increase in proportion of user fees, drop in federal aid.
- Most striking change: Precipitous drop in property and sales tax revenues for counties—major local/discretionary funds—while such revenues for cities increased. Larger county decrease when the consumer price index is considered; cities held their own.

This aggregate comparison would paint an even more disastrous picture of county finances in the Valley, if not for the inclusion of Kern. Alone among our sample counties, Kern experienced an increase in property and sales tax revenues—18 percent over the 11-year period.

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oil and agriculture. In other cases, however, tradition and politics as well as finances affect the spirit of cooperation. Thus, a low level of intergovernmental communication helps to account for the high degree of tension between San Joaquin County and its cities. On the other hand, a longstanding pattern of county-city cooperation helps to blunt the interjurisdictional impacts of county fiscal stress in Stanislaus.

### **Institutional Issues and Solutions**

At the heart of the growth issue in the Valley, then, are enduring institutional patterns—revenues, land use powers, political conditions, regional arrangements, and state-local relationships. What are the prospects for improving growth management by reforming institutions? We explored this topic in the six meetings. How do our participants assess current institutional arrangements as they bear on the growth management task? And what reforms do they prefer?

We summarize here the perceptions and preferences of these Valley community leaders in the following three areas.

First, they associate the growth problem with the Valley's vulnerability to outside forces—the Bay Area, Los Angeles, and state government. In this connection, the following views are expressed:

- A resentment that other parts of California tend to see the Valley as an outlet for low-cost housing—as a kind of safety valve for relieving pressure elsewhere.
- Especially strong views in San Joaquin and Stanislaus about the impacts of Bay Area spillover. Leaders here are critical of the failure of Bay Area to provide affordable housing for its workers, thus pushing the jobs-housing problem “over the hill.” A comparable view at the southern end of the San Joaquin Valley is that the Bay Area is a major source of air pollutants.
- Overall, a belief that the Valley has limited influence in state affairs, that there is

#### **Dan Walters:**

The Valley is the last bastion of centrism in politics in California. This creates another interesting phenomenon: The Valley is not taken seriously in a political context when it should be. The party caucus within the legislature tends to be driven by ideological extremes—by the most liberal Democrats and the most conservative Republicans. It is no accident that the more moderate Republicans from the Central Valley and the more conservative Democrats from the Central Valley tend to be pariahs within their own party, at least as represented in the legislature.

Because of this moderation, the Valley does not have the political power that it should have in Sacramento. But things there are changing, for the state is becoming more like the Valley. There is a moderation trend in politics in the Valley and in California.

considerable legislative and gubernatorial indifference to the importance of the Valley's agricultural base.

Second, the participants in our six workshops are generally critical of the ability of public institutions to deal with growth issues. Although they admit the inadequacy of county and city performance, most of the critical comments are directed to other institutions, such as the following:

- Weak state leadership on growth issues.
- Ineffective regional mechanisms, especially COGs (Councils of Government), but also including LAFCos (Local Agency Formation Commissions). A major exception noted is the emerging regional cooperation on air pollution and the transportation work of some COGs.
- State revenue rules and constraints which impede county-city cooperation on growth matters by forcing intergovernmental competition for land and money.

Third, certain changes in policy and institutions are supported while others are generally opposed. Major reform preferences include the following:

- Strong support for granting local governments more revenue authority, although county and city officials differ somewhat on such specifics as a reallocation of the sales tax and tax base sharing for property tax increments.
- Support for a more aggressive state role in providing direction and standards for urban development on such matters as agricultural land protection, the appropriate jobs-housing balance in individual areas, and enforcement of existing housing requirements.
- Some ambiguity, however, in how much local control can be given up in favor of

**Beverly Kees:**

When I first came to Fresno two years ago, I was getting a tour of the area, and the tour guide pointed to our convention center and said that the city hadn't really wanted it, but people on the council at that point knew the city needed something like that and put it through. He also said that everybody on the council who had voted for it was thrown out of office in the next election. I think those folks were gutsy, and we need others who say, "It's right. Whether I get voted in again next time or not, it's right!" But that also means when some mistakes are made along the way, we don't throw them out of office. It's not just the politicians who have to do this, but society.

**Ed Blakely:**

This state needs to do three things: 1) We need a sales tax that's reapportioned on the basis of population, not where it comes from. 2) We need to abolish Proposition 13 so that people pay for what they get, putting in circuit breakers for age and other kinds of issues. 3) We need to have some form of taxing system with respect to the use of vehicles and other things that are related to the creation of an overall transportation system which is not just cars and freeways.

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stronger state action. Some leaders are willing to compromise this principle in exchange for more state government attention to local problems and more local discretion over revenues.

- Strong opposition to comprehensive regional government for the Valley, especially if this includes land use and other regulatory powers now exercised by counties and cities. While such "super" regional agencies are opposed, support exists for regional cooperation for particular purposes.

### **Some Modest Thoughts about Institutional Change**

The institutional mechanisms for coping with growth in the Central Valley are even more complex than we have suggested. Levels of county-city cooperation are a key factor, but not the only one. This is a limited picture of what goes into land use decisions; with more time and effort, we could dig deeper into the issue.

Still, we are able to comment on the urgency of growth management in this region. The Valley is simply not in control of its land use dynamics. If we are to look at institutional reforms which have the promise of protecting the region's agricultural base, and which prevent further deterioration of the quality of life, we must focus on those reforms which affect the Valley's relationships to the rest of California. It is not enough to require the communities and governments of the Valley to join in regional arrangements and cooperate more closely. Added to that, the Valley needs to develop some leverage over external policies and actions.

That influence has to occur in state policy and practices—especially in two major areas:

- (1) A stronger recognition on part of the state of the Valley's unique agricultural base.
- (2) A reorganization of California's local revenue rules, so that local governments (especially counties) have restored to them some of their pre-Proposition 13 revenue discretion. Only in this way can the incentive to compete for land and money be reduced.

The politically sensitive matter, of course, is how this affects local control. We want the people and the institutions of the Valley to control their destiny. But to do that, they need an expansion of power and resources that only the state can provide. Some leeway in the devotion to local control is necessary. It need not be a zero-sum situation; trade-offs are possible, for example, in which local governments accept some constraints in certain areas for increased resources in others.

As to the regional government option—our small study group does not believe this is the institutional panacea for the growth problem. Not if we are considering super regional governments which have multiple and comprehensive powers, including some now possessed by county and city governments. This is a limited and unwieldy solution which

does little to enhance the Valley's political position vis-a-vis other parts of California.

This is not to say that increased cooperation is not desirable. It is. Indeed it's necessary in specific areas such as air pollution and transportation. Regional cooperation among governments and other community institutions also is important politically—to develop a

### **Leadership: Local, Regional or State?**

#### **Dan Walters:**

All of these forces cry out for some very, very creative political decision making. But this decision making, if it is to have any chance to succeed, must happen on a regional rather than a purely localized basis. Nor should you look to Sacramento to solve the many problems, for tensions in the larger body politic between the changing population and the restrictions imposed by the electorate have created a paralysis in statewide policy making. It is extremely difficult, nigh on to impossible, to create policy, given these tensions. So there is an institutional gridlock in California's policymaking apparatus. It manifests itself in many ways, not the least of which is the absolute explosion of initiatives on the ballot as people try to fill a policy vacuum and break that gridlock.

So don't look to Sacramento to solve the problems of the Valley. If the problems of the Valley and the issues of the Valley are to be resolved, they will be resolved by the people themselves who live there, by business interests, by agricultural interests, by suburban interests, and by local governments working on solutions that make sense. Then, perhaps these solutions are taken to the legislature for ratification. Regional approaches are needed, but from the bottom up, not from the top down.

#### **Beverly Kees:**

I am appalled at the decisions the state sends down for voters to decide on. If they are waiting to see which way the winds are blowing, then we'll just have to march on them in a body and say we want good planning, and let them feel the pressure from below. We want leadership, but my gut feeling is that the best plans will come from the grass roots up. We need the state to get involved, but we aren't going to wait for the state to put them together first, because it won't happen.

#### **Paula Carrell:**

It's been said that we can't go to Sacramento for the answers, we can't go to Washington, DC for the answers. As a lobbyist in the Capital, I would say in a way that is true; but in a way it is not true. If the environmentalists, the farmers, and the urban developers arrive in Sacramento and they have not first tried to arrive at some consensus among their various competing but connected interests, it is true. On the other hand, if the people in the communities of the Valley sit down and grapple with these complex issues directly and then come to Sacramento with some consensus and say to the legislature: "We have resolved some of these issues, but there are some that we haven't resolved," then you will get action out of the legislature.

#### **Grantland Johnson:**

We have to deal with the question of regional government. There is no way we can deal with the tax base, with the problems of urban sprawl, with irrational land-use patterns, if we don't have some regional intervention—a structure that in part dilutes the absolute notion of home rule which simply does not make sense in 1990. If you want another Los Angeles in the Central Valley then let's maintain parochial decision making.

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### **Steve Juarez:**

It's healthy that we are seeing more and more counties seeking out their own solutions—the one-half cent sales taxes, drawing up their own county or city transportation, plans, etc. More of that type of planning on a regional basis could prove to be a boon for the Valley as a whole. Of course, that is going to require that the Valley define itself in such a manner—I'm not sure that is the case today.

Most of the money, even in Proposition 111, the gas-tax initiative, tends to be directed toward areas that have existing congestion problems. So, we see places like the Central Valley getting shortchanged in terms of planning for the future. That is why it is going to be incumbent on people here in the Valley to come up with their own solutions—maybe in a regional framework and maybe not.

### **Peter Detwiler:**

I am convinced that the state and the voters of the state will take back land use control from local officials when the conditions are right. We have three examples of that—the San Francisco Bay Conservation Development Commission, the Tahoe Regional Planning Agency and the Coastal Commission. In each of those cases the legislature or the voters was perfectly willing to trade off California's fear of big government in favor of a commitment to preserve an important natural resource.

My question is, what comes next? Is it air quality? Transportation? Open space? Maybe affordable housing will be the next issue that will cause the state to take control of its own destiny without a coercive state mandate. My fear is that local officials—particularly in the Valley—are not prepared to get their political acts together in time to forestall that kind of coercive activity...

Our constituents care little about the squabbles among regional and state agencies. They don't care whether it is a state agency or a regional agency or a local agency. What they care about are the results—affordable housing programs, increased mobility in transportation, sufficient water supplies, clean air.

### **Dan Dooley:**

There are a lot of changes going on in the Valley with respect to how we perceive what we have and what we want to have. Historically, we had a very few environmental organizations who selectively litigated and were careful in choosing the proper cases. And that often didn't affect the San Joaquin Valley primarily because we didn't have the intensity of growth here. I don't see that happening now. Many of you are familiar with the battle that's gone on in the city of Hanford over the location of a coal-fired co-generation facility. The coalition that has battled that facility by no stretch of the imagination could be characterized as a traditional environmental organization. It is a coalition of farmers, business people and interested citizens from the community. And with the recall of the mayor and the defeat of the two council members who supported the facility, they've effected change.

I believe that we cannot effectively deal with the growth and development in this Valley unless the impetus comes from the grass roots, from the people of the Valley. That is happening now and I'm confident that, in spite of the institutional gridlock we've just heard about, when people are upset and concerned enough—as they appear to be becoming—we will enact policies and institutions to address those questions.

### **Henry Schacht:**

The Valley needs regional planning and certainly along with that will come some form of regional control. It is hard to give up local perogatives but it is evident that it will have to be done—at least to some extent.

# The Next Step

## **Ken Farrell:**

These current and emerging issues facing the Valley's agriculture and its people open new, exciting opportunities for the University. The challenges to the Valley and the State mean that the University and the Division will need to (1) strengthen research and education capabilities, (2) augment the considerable talents and resources by tapping into needed expertise both from within the University and from educational, scientific and technological communities outside the University, and (3) provide the incentives to faculty and staff to carry out programs and projects of highest priority. Expertise will be needed from disciplines in the natural and social sciences as well as the professions. Innovation is called for to grasp the opportunities and to gain the public support needed to get the job done.

## **Hal Carter:**

What this project was intended to do is help identify decision-making opportunities. And, make no mistake, there are such opportunities. Certainly, population growth and other forces—political, social and economic forces—will powerfully influence the Valley's future. But that future still depends at least partly on policy decisions that haven't yet been made. To the extent that we understand what is happening in the Valley and are aware of the opportunities, there is still time to make a difference.

## **Dan Walters:**

I think of the future of California as having two extremes. One extreme is Disneyland. Everybody is happy, music comes from all the streets, the streets are all clean, as in Disneyland. (It's kind of boring actually.) The other extreme is Beirut on a big scale where no one is happy. Social conflict, stratification and a kind of tribalization process result in an extremely hostile society. The reality will be somewhere in between.

The quality of decisions that are made, primarily at the local level rather than at the state level, will determine which of those futures is more likely. As we approach the 21st Century, we confront those issues that determine whether we are going to be Beirut or Disneyland or something in between. The Valley will be the confluence of change in California.

## **Beverly Kees:**

Frankly, I find what I've heard at this conference very encouraging. Because I didn't hear a single problem that can't be solved. It's a matter of "Will we solve it?" First we need to identify everything we need to preserve—the natural resources such as the San Joaquin River, agricultural land, historical districts, neighborhoods—because once those are gone, they are gone forever.

**Ed Blakely:**

In the Central Valley, we have to design tomorrow today. But we can't design tomorrow merely by reaction to today. Rather, we must think about what tomorrow should be—what critical elements for tomorrow are. This task will take careful planning with legislators, other policy makers, other professionals, and concerned citizens.

**Paul Jovanis:**

We need effective leadership and a sense of vision to move transportation planning away from constrained conventional solutions, to more exciting, innovative and potentially more effective actions. This is particularly true in the area of transit innovations and in the application of advanced technology. What is important in the Valley is that the transportation system is not in as disastrous shape as in other major urban areas in California. Decisions that we make in the next five years will shape the Valley for decades to come.

**Good News, Bad News**

**Dan Whitehurst:**

The good news is that the San Joaquin Valley is blessed with tremendous resources—natural resources, human resources. That all kinds of people moving in reflects the things that the Valley has to offer.

The bad news is that so many people are coming here that we are now experiencing problems with air pollution and development is gobbling up agricultural land. There are other resource issues: contamination of soil, water supply problems. And there are social problems: unemployment, crime, school dropouts, teen pregnancy, drug use, and so on. Our problems, in fact, are greater in some respects than in other parts of the state—unemployment, for example.

But the good news is that despite the problems we're facing, we still have plenty of time to address these problems because we are not yet over built. We can learn from the mistakes of the Bay Area and Southern California. We still have plenty of open space that we can preserve.

The bad news is that even though we have time to solve the problems, our government agencies are not properly structured to allow us to address them. We have regional problems, but we don't have regional institutions that fit the problems. We have conflicts between cities and counties. We have municipal finance structured in such a way that it is impossible to muster the resources to solve problems, and cities encourage development to get revenue. But that leads to more problems.

The good news is that despite government gridlock, people are becoming aware. They are pressing for innovative and regional solutions to the problems. There are movements springing up at the grass roots level. So, even though government is currently not postured to solve the problems, soon the people will demand that they be solved.

Despite this renewed public awareness, the bad news is that voter apathy is at its worst in years. Voter turnouts in some municipal elections were only 30-25 percent of those who are registered—and they comprise maybe half of those old enough to vote.

Maybe we're not too much different from other places, but the stakes could be greater because of the Valley's tremendous potential.

**Charles Hess:**

It is essential that we join together to take an assertive, proactive approach in dealing with environmental issues. To say that there are no problems or that public concern is completely the result of misinformation is not a productive approach—neither for the future of agriculture in the Central Valley, nor for the restoration of public confidence.

**Ken Tanji:**

Water use in the Central Valley by an expanding population and economy will involve competition among urban uses, irrigated agriculture, out-of-valley users, and environmental concerns. Because few opportunities for additional water development exist, water conservation efforts must be increased, diversion and storage of surplus flows expanded, and voluntary transfers encouraged.

**Richard Howitt:**

It seems axiomatic that air pollution effects on crops in the Central Valley must be addressed on a regional basis, considering the locations of both sources and receptors of pollutants. This requires forming a regional district. Legislators, regulatory agencies, residents of the Central Valley and members of the agricultural community must consider the possibility that maintaining agricultural productivity may ultimately require measures nearly as stringent, and with as great a societal impact, as those presently proposed for the South Coast Air Basin.

**Warren Johnston:**

There are degrees of “primeness” in land classification. Where not all prime lands can be safeguarded, then we need to be able to identify the “best” of the prime. By doing so, concerned individuals and agencies could better guide public policy decisions aimed at conserving the *most prime* of our agricultural land base.

**Al Sokolow:**

Finally, we must stress the urgency of tackling the growth issue in the Central Valley. It is an urgency which goes beyond the borders of the 18-county region to take in the interests and welfare of all of California. When citrus, dairying, and other farm activities were forced out of Southern California and the other Santa Clara Valley by urbanization—they were relocated in the San Joaquin Valley. When further urbanization pushes them out of the San Joaquin Valley—where will they go? For the state’s agriculture and for urban development, the Valley is the last frontier. Once that frontier is closed, there is precious little room left. Is this the legacy we wish to leave to future California generations?

# Biographies of Symposium Participants

**Judy Andreen** represents the 5th District on the Fresno County Board of Supervisors, serving as chair in 1988. She represented the Fresno County supervisors on the Board of Directors of the County Supervisors Association of California (CSAC) for five years. With a strong commitment to improving air quality in the San Joaquin Valley, she serves on the San Joaquin Air Basin Control Council, the Valleywide Study Agency, and the statewide Policy Committee and has lobbied in both Sacramento and Washington, DC, for improving air quality. She graduated from California State University, Fresno.

**Edward J. Blakely** is professor of economic development in the Department of City and Regional Planning at UC Berkeley, where he serves as department chair. He has also served as advisor and consultant to several California counties and cities in economic development planning. From 1977 to 1984, he was assistant vice president of systemwide administration for the University of California. He is currently an advisor to the Australian states of New South Wales (Sydney) and Victoria (Melbourne). His B.A. is in history and economics from UC Riverside; his M.A., in Latin American affairs from UC Berkeley; and he holds a joint doctorate in management and education from UC Los Angeles.

**Bob Braitman** has been employed in Ventura County's Chief Administrative Office since 1971. Since 1974, he has also been the executive officer of the Ventura LAFCo, an independent agency charged by the state with encouraging orderly boundaries and discouraging urban sprawl. He graduated in political science from California State University, Fresno, and is currently progressing toward a degree in public administration from California State University, Northridge, Ventura Campus.

**Bill Briam** currently serves as executive director, Council of Governments, Fresno County. His special interest is in transportation. Previously, he served for five years as county administrative office, San Luis Obispo County, and before that as deputy and then assistant county administrative officer, Fresno County. He is a graduate of California State University, Fresno.

**Paula Carrell** is a graduate of UC Berkeley and served as a naturalist for the East Bay Regional Park District. For the last 15 years she has been a lobbyist in Sacramento for the Sierra Club.

**Harold O. Carter** is director of the UC Agricultural Issues Center and professor in the Agricultural Economics Department, UC Davis. He has served as chair of the department from 1970 to 1976 and 1987 to 1989. He was elected fellow of the American Agricultural Economics Association, has served as chair of the UC World Food Taskforce, as senior staff economist of the U.S. Council of Economic Advisers, and as co-director of the Economics Project of the UC-Egypt program. His B.S. and M.S. are from Michigan State University; his Ph.D. is from Iowa State University.

**Grant Chappell, Sr.**, farms the rice portion of the C. Bruce Mace Ranch near Davis and is currently president of California Pacific Rice Milling and a member of the Rice Industrial Commission. He has served on the board of directors of the local reclamation board and is a graduate of California's Agricultural Leadership program. His B.A. is from Stanford University.

**Peter Detwiler** is principal consultant to the California Senate's Committee on Local Government which reviews bills affecting local government finance, land use planning and development, and the powers of cities, counties, and special districts. Detwiler helped the legislature draft major reform bills on land use planning, redevelopment agencies, and long-term local finance after Proposition 13. He is assisting in Senator Bergeson's current project to explore legislative responses to the challenge of growth management. Detwiler's B.A. is in government from Saint Mary's College of California and his M.A. is from the University of Wisconsin, Madison, Center for the Study of Public Policy and Administration.

**Daniel M. Dooley** is a member of the law firm of Kahn, Soares and Conway where he is specifically responsible for matters related to water and water quality issues, environmental permitting, environmental law, and land use and toxics issues. From 1977 through 1980, he was chief deputy director of

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the California Department of Food and Agriculture where he was responsible for the major reform of the Pesticide Regulatory Program. Later he became a member of the California Water Commission. Dooley's B.S. degree in agricultural economics is from UC Davis. His J.D. degree is from the McGeorge School of Law.

**Kenneth R. Farrell** has served as vice president, Division of Agriculture and Natural Resources at the University of California since January 1, 1987. In this role, he is responsible for administration of systemwide research in the agricultural, environmental, and natural resource sciences conducted by the Agricultural Experiment Station on the campuses at Berkeley, Davis, and Riverside, and at nine field locations; and for Cooperative Extension programs at the Berkeley, Davis, and Riverside campuses and in each of California's 58 counties. He is past president and director of the American Agricultural Economics Association and was elected fellow of that association. Farrell holds degrees in agricultural economics from the University of Toronto and Iowa State University.

**Joe Fontaine** has been on the board of directors of the Sierra Club for eight years; he was national president in 1980-82. His special interest is land-use issues, particularly in national parks and forests. He is working on a citizens committee, the Kern County Clean Air Project. He teaches science at Foothill High School in Bakersfield. His B.S. is in geology from UC Los Angeles; his M.S. is in earth science from Cornell.

**Thomas J. Graff** is senior attorney, Environmental Defense Fund, Oakland. His present and past board and committee memberships include the National Academy of Science, Committee on Western Water Change; the San Joaquin Valley Drainage Program Citizen's Committee; the San Francisco Bay-Delta Preservation Association; and the Colorado River Board of California. His A.B. is from Harvard in history, his LL.B. from Harvard Law School, and his LL.M. from London University.

**Thomas W. Hazlett** is associate professor of agricultural economics at UC Davis. His fields of specialization include applied price theory, public choice and telecommunications policy. He has been an analyst for "Perspectives on the Economy" on nationwide radio, senior editor for the *Manhattan Report on Economic Policy*, and contributing editor for *Harper's* and *Reason* magazines. He is presently a commentator on "Byline," nationally syndicated to 200 radio stations, a contributing correspondent to the *Economist*, a monthly columnist in "Selected Skirmishes"

for *Reason* magazine, and an economic commentator on "Marketplace" for National Public Radio. His M.A. and Ph.D. degrees are in economics from UC Los Angeles.

**Charles E. Hess** is assistant secretary for science and education at the U.S. Department of Agriculture where he is responsible for the research and education programs in the food and agricultural sciences, including planning, evaluation, and coordination of state-federal activities through various committee structures. The Agricultural Research Service, the Cooperative State Research Service, the Extension Service, and the National Agricultural Library are under his general supervision. From 1975 to 1989, Hess was dean of the College of Agricultural and Environmental Sciences at UC Davis and associate director of the California Agricultural Experiment Station. Hess earned his B.S. degree in plant science from Rutgers University and his M.S. and Ph.D. degrees in horticulture, plant physiology, and plant pathology from Cornell University.

**Richard E. Howitt** is professor of agricultural economics at UC Davis. His fields of interest are resources economics, environmental economics, quantitative methods, and econometrics. He teaches Ph.D. level courses in economic theory of natural resources, dynamic optimization and control, economic optimization models, programming, and econometrics. His degrees include an N.D.A. in agriculture and farm management from Seale-Hayne College, Devon, England; a B.S. from Oregon State University, and an M.S. and Ph.D. from UC Davis.

**William C. Jirsa** is vice president of the Grupe Development Company, Northern California. He joined the Grupe Company in 1979 in Stockton, and moved to Fresno in 1985 to develop the Woodward Lake Community. In 1988 he received the Builder of the Year award for involvement and service to the Building Industry Association of the San Joaquin Valley. His B.S. and M.B.A. are from California State University, Fresno.

**Grantland Johnson** was elected to the Sacramento County Board of Supervisors in 1986 and represents District 1 which includes the communities of North Highlands, Antelope, Rio Linda-Elverta, north and south Natomas, downtown and the Tahoe Park area. Before being elected supervisor, he served four years on the Sacramento City Council, representing District 2. Johnson developed a public policy approach keyed toward the working-class targeting economic development, affordable housing, and environmental quality. Johnson is a graduate of California State

University, Sacramento, majoring in government. He recently completed the John F. Kennedy School of Government's program for senior executives in state and local government at Harvard.

**Warren E. Johnston** is professor of agricultural economics at UC Davis. His research interests focus on issues in commercial agriculture, natural resources, and related policy. He has studied agricultural land markets and the changing structure of U.S. and international agriculture. He served as acting associate dean, College of Agricultural and Environmental Sciences, 1980-81, and as chair of the Department of Agricultural Economics from 1981 to 1987. He was on the board of directors and is now serving as president-elect of the American Agricultural Economics Association. His B.S. is from UC Davis, and his M.S. and Ph.D. are from North Carolina State University.

**Paul P. Jovanis** is associate professor, Department of Civil Engineering, UC Davis. Before coming to Davis in 1988, he had a joint appointment with Civil Engineering and the Transportation Center at Northwestern University, Evanston, Illinois. His areas of specialization include transportation system operations, transportation system safety, and telecommunications/transportation interactions. His Ph.D. is in civil engineering, specializing in transportation engineering, at UC Berkeley.

**Steve Juarez** is principal consultant to the Assembly Governmental Efficiency and Consumer Protection Committee, California State Legislature. This committee is responsible for legislative issues concerning consumer protection and management of state agencies, with primary responsibility for the oversight of the Department of General Services and of the boards and bureaus with the Department of General Services and the Department of Consumer Affairs. Before taking this post, Juarez was with the Assembly Office of Research where he was responsible for all transportation-related matters assigned to AOR. Primary duties included the preparation of reports to the legislature on major transportation issues affecting California, including *California 2000: Gridlock in the Making*. His B.S. degree is from UCLA in political science and he holds a Masters of Public Administration from USC.

**Beverly Kees** is executive editor of the *Fresno Bee*. Before coming to California she held various editorial positions in Gary, Indiana, Grand Forks, North Dakota, and Minneapolis, Minnesota. Her B.A. is in journalism from the University of Minnesota where she served as editor-in-chief of the *Minnesota Daily*.

**Elmer W. Learn** is professor in the Department of Agricultural Economics at UC Davis. From 1969 until 1984 he served as executive vice chancellor, at UC Davis. Before coming to Davis he was on the faculty at the University of Minnesota; later he served in the central administrative offices of the university as assistant to the president and was later named director of planning and executive assistant to the president. His BS, MS and Ph.D. degrees are from Pennsylvania State University.

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**Peggy Mensinger** is a native of Stanislaus County where her family had a raisin dehydrating and packing plant in Modesto. She was a member of the Modesto City Council for 14 years, including two terms as elected mayor, retiring in 1987. She served on environmental policy steering committees for the U.S. Conference of Mayors and National League of Cities and on the League of California Cities board of directors. She participated on the advisory committee for preparation of the State Soil Conservation Plan. She currently serves on the Advisory Board of the UC Agricultural Issues Center and on the state board of the California Planning and Conservation League. Her B.A. is from Stanford University in political science.

**Hugo Morales** is a Mixtec Indian from Oaxaca Mexico. At age nine he joined his father in the farm fields of California. He attended public schools, become president of his class at Healdsburg High, and earned a fellowship to Harvard. After graduating from Harvard Law School, Morales returned to California where in 1980 he founded Radio Bilingue, a non-profit bilingual radio station that, among other

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things, gives farm workers information about immigration and legal matters, working conditions, and cultural opportunities. He also helped organize Fresno Tomorrow, a coalition of citizens' groups to aid troubled teenagers and reduce school drop out rates.

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**Jananne Sharpless** is secretary of environmental affairs and chair, Air Resources Board. She advises the governor on air and water clean up and toxic waste disposal policies and is the administration's policy coordinator for offshore oil issues. She also advises the governor on appointments to the Air Resources, Water Resources and Waste Management boards, and is responsible for preparation of the agency's budget. Before being appointed secretary, Sharpless served as chief deputy secretary, and from 1973-1983 she was principal consultant for the Assembly Ways and Means Committee. Jananne Sharpless is a graduate of UC Davis in political science.

**Henry Schacht** is an agriculture consultant and writer and a member of the Agricultural Issues Center Advisory Board. After graduation from UC Berkeley, he began his career with the news media. He was director of agriculture for NBC and ABC in San Francisco where his morning broadcast was recognized as among the nation's leading farm programs. He is probably best known for this twice-weekly Farm Reporter column in the *San Francisco Chronicle*. He has had broad international experience in agriculture, including special assignments on behalf of the U.N. Food and Agricultural Organization and service as a member of the Agricultural Policy Advisory Committee during the Tokyo Round of international trade negotiations.

**Alvin D. Sokolow** is professor of political science at UC Davis. Sokolow specializes in the study of politics and government in rural and other small communities. Sokolow organized a university extension forum on the California initiative process in Sacramento on March 23, 1990. He has been a faculty member at UC Davis since 1965 and has also taught at Michigan State University, the University of Illinois, and Western Michigan University. Sokolow has a Ph.D. and other degrees from the University of Illinois.

**Deena Sosson** has been with the Economic Development Administration, U.S. Department of Commerce, since 1978. In Washington, she served as the deputy director of the EDA Policy Division and the Economic Adjustment Division. Since 1983, Sosson has been the agency's sole representative for northern and central California. Before joining EDA, she worked for the National Association of Housing and Redevelopment Officials. In the early 1970s, Sosson was a legislative aid to Senator Alan Cranston for housing and community development. Her M.A. degree is in history from UCLA.

**Donald E. Swartz** is the West Coast partner of Blakeley Swartz. Swartz entered the development business in 1970 when he joined Cabot, Cabot and Forbes as general manager and later senior vice president of the San Francisco office. In 1977 he formed his own real estate brokerage and consulting firm. Then, in 1981, he joined Hillman Properties as vice president of operations where he directed the design, construction, development and marketing for major office buildings and business parks throughout California. His professional, civic and philanthropic interests include the Urban Land Institute and Beyond War. A California native, he is a graduate of Stanford University. His M.B.A. is from Stanford Graduate School of Business.

**Kenneth K. Tanji** is professor of water science, director of the Kearney Foundation of Soil Science, and water quality coordinator, Division of Agriculture and Natural Resources. His research interests are in chemistry of salt-affected soils and waters, reactivity and mobility of toxic trace elements, and computer simulation models. He is a fellow of four societies—the Soil Science Society of America, the American Institute of Chemists, the American Society of Agronomy, and the Japan Society for Promotion of Science. His undergraduate degree is in chemistry at the University of Hawaii and his graduate degree is in soil science at UC Davis.

**Dan Walters** has been a journalist for three decades, mostly with California newspapers. He has written extensively about California and its politics. In 1984, he and his column devoted to California politics and public policy moved to the *Sacramento Bee*. His column now appears in more than 45 California newspapers with a combined readership of some 10 million, ranging from tiny community newspapers to the *Los Angeles Times*. He has also written extensively about California and its politics for many other publications. His book, *The New California: Facing the 21st Century*, in its third printing, has become a standard reference work on social, political, and economic trends in the state.

**Daniel K. Whitehurst** is the president and chief executive officer of Whitehurst California, Inc., a company which owns and operates funeral homes and one cemetery in central California. An attorney by profession, Whitehurst served in local government for ten years, eight of them as mayor of Fresno. In 1985, Whitehurst accepted a visiting fellowship at the Institute of Politics at Harvard University and later served as president of the Fresno County Economic Development Corporation. In addition to his business, Whitehurst does political commentary on the ABC station in Fresno, and his articles appear in major newspapers in the West. His A.B. in government is from Saint Mary's College, his M.A. in urban studies is from Occidental College, and his J.D.

## The UC Agricultural Issues Center

In 1985, the UC Regents established a universitywide center located on the UC Davis campus. An external advisory board was appointed and Harold O. Carter was named director. The Center is seen as a forum where policy issues affecting California and the West can be analyzed and where the results of the analyses can be made available to those making and to those affected by the decisions. The Center was envisioned to address the new conditions agriculture faces in a changing world.

With the guidance of its board, the Center chooses "umbrella" type issues that encompass a broad spectrum of topics. They are large multidisciplinary study efforts, bringing specialists together from diverse fields. There a synergism takes place so that the output is truly greater than the sum of its parts.

The output takes on a number of forms. Symposia present highlights of the studies to representatives of agricultural organizations, state and federal agencies, interest groups active in the policy-making process, and the public. Proceedings and study-group reports are published and distributed. Video tapes based on the studies and its symposia are professionally produced for classroom and extension use. Workshops bring together university researchers and outside experts. And further research grows out of the projects as new ideas are stimulated from the synthesis of what is known about a particular topic.

The project on California's Central Valley is the third major effort. *Marketing California Specialty Crops: Worldwide Competition and Constraints*, and *Chemicals in the Human Food Chain: Sources, Options, and Public Policy* concluded in 1987 and 1988, respectively. In addition to the Central Valley study, the Center undertook two ambitious projects in 1989: (1) a study of the Williamson Act and (2) a series of "white papers" on crucial issues facing California agriculture. The result of the second is a new book, *Agriculture in California on the Brink of a New Millennium*.

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