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Center For Colorado Policy Studies

ABOUT THE CENTER FOR COLORADO POLICY STUDIES

The mission of the Center for Colorado Policy Studies is to apply economics and related disciplines to critical state and local policy questions. We encourage faculty, along with some of our best students, to engage in nonpartisan, fact-based research on issues facing the Pikes Peak Region and the state of Colorado. We also provide advice and information to state and local governments and nonprofit organizations. The Center operates under all laws governing the University of Colorado, including the Rules of the Regents. Statements and publications issued from researchers at the Center do not necessarily reflect the views of the University of Colorado or the members of our Advisory Board.

This conference represents the work of the Center, in collaboration with universities and nonprofit organizations across Colorado. We are committed to making our work accessible to interested citizens and policymakers and post much of it on our website at http://web.uccs.edu/ccps. We are also available to make community presentations about past and ongoing work. A listing of work on growth, tax policy, and education issues can be found on the website. We welcome your inquiries and feedback! Our work in the various programs, listed below, is funded by contracts and grants, in addition to tax-deductible private donations made through the University of Colorado Foundation.

Program on Education Policy
The Center's program on education policy explores the impacts of how Colorado funds its public schools on school and district financial viability as well as on student performance. We apply research from the economics of education to trade-offs facing Colorado's schools.

Program on Growth Issues
The Center's program on growth issues applies the latest research in land use and environmental economics, along with public finance and basic economic theory, to the growth issues facing Colorado today. We start with the assumption that market-based forces should be relied on wherever possible but recognize that certain economic, social, and environmental conditions cause markets to break down.

Program on Tax Policy
The Center's program on tax policy explores the impacts of Colorado's state and local tax structure on areas such as patterns of growth, economic development, income inequality, local government revenues, and resource use by Coloradans. We apply the basic principles of public finance to current and proposed tax policies, as well as comparing the costs and benefits of the current system and proposed changes to the citizens of Colorado.

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Special thanks to the Kraemer Family Library, Colorado Springs Chamber of Commerce, and Economic Development Corporation.

LETTER FROM THE DIRECTOR

September 2004

Dear Reader,

"Colorado's Future: The Challenge of Change" brought together researchers from Colorado universities with state and local policymakers for a second time on September 26, 2003.

The conference was sponsored by the **Center for Colorado Policy Studies** and the **University of Colorado - Colorado Springs**, with financial support from the Bain Family Foundation, the Gay and Lesbian Fund for Colorado, the El Pomar Foundation's Forum for Civic Advancement, the Bighorn Center, the Colorado Labor Council and La Plata Investments, along with the Colorado Springs Chamber of Commerce and Economic Development Council and the Kraemer Family Library at UCCS.

This year's volume is available only on the web due to the tight financial conditions of 2003-2004. But once again, you will find some very interesting papers by Colorado faculty from across the state on land use, sustainability, term limits, and right-to-work legislation -- just to name a few. We encourage you to contact them directly with questions or comments.

Whatever the subject, there is rarely a shortage of opinion in Colorado. There is usually at least one group to lobby for or against any policy. But timely, objective, and high-quality analysis is sometimes in short supply. It is more important than ever that it be available for elected officials, their staffs, and for interested citizens who serve on policymaking boards across the state. Conferences like this further the healthy exchange of ideas between scholars and policymakers.

The 2003 conference included a panel discussion of how research has been applied to tax reform, standardized testing in K-12 and drug and alcohol treatment in Colorado prisons. You will find a synopsis of this discussion on p. 42 of this volume and a subject-expert index on the last pages to help you locate faculty at Colorado universities doing work on other issues that concern you. We believe there are many fruitful partnerships waiting to happen among faculty and policymakers who both care about a better quality of life for Colorado.

We invite you to contact the authors directly and to visit other portions of the Center for Colorado Policy Studies website at http://web.uccs.edu/ccps, including the web version of the Colorado's Future 2002 conference. We are also very excited about our partnership with Colorado State University in their **October 15, 2004, Colorado's Future: Economic Development and Public Policy conference** and hope to see many of you there. You can learn more about the program and register online at http://www.cofuture2004.colostate.edu.

Sincerely,

Daphne T. Greenwood

Daphne T. Greenwood, Ph. D.
Director, Center for Colorado Policy Studies

University of Colorado at Colorado Springs

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Welcome to the University of Colorado at Colorado Springs and the Colorado's Future Symposium

Chancellor Dr. Pamela Shockley Zalabak:

Thank you, Daphne and thank all of you for being here today. This is one of the most exciting conferences that we hold on our campus! The title speaks to the issue important for all of us to be considering -- the challenge of change. In Colorado, change is all around us and the real issue is to what extent we make use of our resources to address that change.

The topics on today's program are absolutely vital not only for what is happening in Colorado but also beyond the borders of Colorado. The extent to which we can put public policy, university research, and private resources together will determine how well we meet the challenge of change. Contributing our research to important public policy questions is an important service that the university needs to provide. But we need the participation of the entire community as well. I am pleased that so many community members from all over Colorado as well as the Pikes Peak region are here. I looked over the program and know this is going to be a very stimulating day!

I hope that you know that you are on a campus of the University of Colorado that is committed to a strong partnership with its community. One of the things that I am most proud of for this campus is that in the American Association of Colleges and Universities survey we were ranked along with Arizona State University as the campus in America most engaged with its community. A conference like this exemplifies what they look for in that ranking -- being engaged in the issues that are critical to the community.

The Colorado Springs campus of the University of Colorado also remains the fastest growing four-year public institution in Colorado. We ask for your support in creating increased access to the programs that happen here at the university. We are proud of those programs and we are thankful of your support. I am more than ever aware that the challenge of change is a challenge of finding leaders -- in all sectors of our society -- who are willing to go beyond reacting to change and to think proactively about how we can manage change. It takes gutsy people to shape a positive future for Colorado.

I want to close with a favorite quote of mine. It is not about academia; it's about all of us. Eric Hoffer said it years ago: "The learned live in a world that no longer exists -- it is the learners who will survive." I hope today is about being learners. So thank you all for being here and thank you, Daphne, for your work in putting this together.

Dr. Pamela Shockley Zalabak
(Ph.D., University of Colorado) is Chancellor and Professor of Communication at the University of Colorado at Colorado Springs. The author of five books and over more than one hundred articles on organizational communication, Dr. Shockley's research interests include organizational cultures as they relate to individual employee values and overall organizational effectiveness. Prior to assuming Chancellor responsibilities, Dr. Shockley was Vice Chancellor for Student Success and the founding chair of the University of Colorado at Colorado Springs Communication Department. Dr. Shockley is the recipient of the University of Colorado Thomas Jefferson Award, the President's Award for Outstanding Service, the Chancellor's Award for Distinguished Faculty, and the Colorado Speech Communication Association Distinguished Member Award.

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Rosemary Bakes-Martin

Tracy L. McLaughlin

Kelli Klebe

Michael McLeod

KEYNOTE SPEECH

Rosemary Bakes-Martin

El Paso County Department of Health and Environment and CDC

(M.S., University of Colorado School of Medicine, M.P.H., Emory University,) is the public health administrator for the El Paso County Department of Health and Environment. She was formerly a Branch Chief at the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia. Before joining CDC, Ms. Bakes-Martin was Director of the Medical Technology Program at the University of Colorado Medical School and held numerous positions in clinical laboratories throughout the Denver Metropolitan area. Bakes-Martin was recognized in June 2002 with an "Exemplary Service Award" for the development of the National Public Health Performance Standards. In 1999 she represented CDC on the President's Y2K Council and in 2003 she was appointed to the MAPP Work Group by the National Association of County and City Health Officials.

I came to El Paso County from the Center for Disease Control (CDC) in Atlanta as deputy director for the health department. Within a year I found myself director of the El Paso County Health Department. I am still wearing those two hats and that influences the remarks I make today.

At the CDC we have monthly conference calls between people around the country who serve in dual roles as I do. We advise CDC on programs they are thinking of implementing on the local and state levels – giving our perspective on whether they will work. It's a good thing for both CDC and the County Health Departments.

But what I want to talk to you about today is an issue dear to my heart. I will use public health examples but much this applies to other subjects you will cover today. We have come to realize in public health that we have a gap between the science we do throughout the world and the science of public health practice. We do not have good science that helps us guide decisions on how to develop programs on a local or state level, on what determines an effective program, and whether or not the things that we are doing really make a difference.

Now I want to step back and emphasize that we do have good science on what works as far as childhood immunizations, epidemiology science, and some biomedical science. But we must go outside the health department and work with other entities in the community to define what improving quality of life means. We have very little science on how inputs such as public health expenditures or work force make a difference on the outputs of *quality* and performance.

There is a new term in public health called "practice-based research." The next two papers are examples of this. The challenge for us, not only in public health but in a lot of other areas in Colorado, is how to integrate practice-based research into what we do. The only way to make this research effective is to have it community-based. Often what I see in public health and other government agencies is a disconnect between practitioners and the research institutions. We have an opportunity to do something about that disconnect. We have good institutions of higher education in Colorado. We also have good research opportunities and if we can bring those practitioners together with the researchers we can be more effective.

Policy makers need the information we can give to them when we come together. They talk about accountability-accountability for tax money spent and accountability for our activities. But accountability that is not based on good data or

research is really of no value. I want to give you an example from the federal government. About ten years ago, there was a new concept that came into the federal government, officially known as GPRA – the Government Performance and Results Act. If a local or state entity was going to award government funds, they need to be able to show that what they did with those funds actually made a difference. Sounds logical, right? But it was a huge paradigm shift, a huge change, because previously in government agencies, it was just accepted that the things that we were doing were the right things to do.

When I first went to CDC in 1989, some of our officials had to go in front of Congress to defend their budget. This was a first for them and they came back in shock. Their budget proposal was not going to be accepted as is. They had to justify what they were doing and be able to show that it made a difference. But the problem with GPRA is that we are having trouble implementing it. It requires a different type of science. To evaluate what we are doing and show that it makes a difference nationally and locally -- not only for health departments but departments of justice and of defense -- can only be done through partnership. We need to be looking at the number of services and the adequacy of services we are delivering and how it all affects quality of life. Quite frankly, we need to assess whether the money is being spent the way it should be.

We found at CDC that science does not rule the day. Science by itself will not make a difference. When we deal with policy makers we need to face the fact that it's unreasonable to expect policy makers to utilize science alone to make all their decisions. An example from a public health perspective was the issue over fluoride in the water supply of Colorado Springs. We had scientists from CDC coming in front of the Colorado Springs city council and, unfortunately, in our egotistical minds felt "this is a no brainer." What we found was that science by itself has nothing to do with policy.

Using science to influence public policy is our job at the health department, the police department, and so on. We cannot just hand the policy makers the science and expect them to interpret it. That's where we come to practice and community-based research. What we need in Colorado is a stronger partnership with our educational and research institutions. We need to break down the barriers that are there.

We are no longer a public health department -- we are trying to build a public health system. We are trying to build a community that thinks about public health that is involved in public health and takes responsibility on issues like our high rate of teen suicide in Colorado. My challenge to you is to continue down the road of practice based research that involves the community and work together in partnership.

we do have good science on what works as far as childhood immunizations, epidemiology science, and some biomedical science. But we must go outside the health department and work with other entities in the community to define what improving quality of life means.

Science by itself will not make a difference. When we deal with policy makers we need to face the fact that it's unreasonable to expect policy makers to utilize science alone to make all their decisions.

Substance Abuse Treatment Programs for Offenders: How Effective Are They?

Kelli Klebe (Ph.D., University of Minnesota) is an Associate Professor of Psychology at the University of Colorado at Colorado Springs. She has published work in the areas of quantitative psychology and program evaluation. She also has worked as an evaluator with the substance abuse programs for the Colorado

The presented research was supported in part by the National Institute of Justice RSAT Evaluation Program and the Edward Byrne Memorial State and Local Law Enforcement Assistance Formula Grant Program administered through the Drug Control and System Improvement Program.

Since the escalation of drug use in the early 1960's ,researchers, policy makers, and health care workers have struggled to find effective ways to deal with the consequences of substance abuse and addiction. Research shows that substance abuse and addiction takes an enormous toll on individuals, families, society, and taxpayers and that these costs manifest themselves in a number of ways. For example, substance abuse has been associated with health problems such as fatal and nonfatal overdose, infection, and the transmission of AIDs and other sexually transmitted diseases (National Institute on Drug Abuse, 1995). The use and abuse of these substances has also been shown to increase the risk of accidents and injuries, maternal complications of pregnancy, low birth weight and birth defects, as well as suicide and other psychiatric problems. In addition, substance use and abuse has been shown to have negative effects on employment, school achievement, socioeconomic status, family stability, and crime and violence rates.

Of the many problems associated with substance abuse, those that are crime-related are some of the best documented. A report released by the National Center on Addiction and Substance Abuse at Columbia University ("Behind Bars," 1999) found that 1.4 million (80%) of the nation's 1.7 million inmates in federal, state or local facilities were either under the influence when they committed their crimes, engaged in illegal activity to buy drugs, have a history of drug or alcohol abuse, or have some combination of these characteristics. Further and perhaps even more compelling evidence of the impact of substance abuse can be found in statistics on recidivism rates (Belenko & Peugh, 1998). In a survey of inmates in state and federal correctional facilities (Bureau of Justice Statistics, 1999), drug offenders were reported *to have extensive criminal histories*. Among drug offenders in state prisons, 54% were on probation, parole, or escape at the time of their arrest; 83% had a prior sentence to incarceration or probation and 45% had three or more prior sentences; 24% had a prior violent offense ,and 32% reported that all sentences had been for drug offenses. There are similarly high rates among federal prison populations. In a survey of 35 cities in the U.S, 64% of male arrestees tested positive for drug use at the time of their arrest (National Institute of Justice, 2000). The Colorado Department of Corrections estimates that 82% of incarcerated persons have moderate or more severe substance abuse needs.

The Schneider Institute for Health Policy (2001) has put the various costs associated with substance abuse and addiction into an economic perspective. They estimate that, as of 1995, the overall yearly cost of substance abuse to taxpayers was $414 billion, with $166.5 billion going to pay for alcohol abuse, $138 billion for smoking, and $109.9 billion for drug abuse. Included in this estimate are costs associated with treatment and prevention, healthcare, reduced job productivity or lost earnings and other costs such as crime and social welfare. Figures such as these have gotten the attention of researchers, policy makers, and clinicians and have resulted in an increased interest in looking for ways to improve treatment outcomes among prison populations. However, in a correctional system where the predominant policy has been to use imprisonment for punishment, rather than rehabilitation, change has been slow (Califano, 1998). This reality was punctuated in a 1999 report released by the Bureau of Justice Statistics which estimated that, as of 1997, only 32% of state inmates and 36% of Federal inmates who had reported being regular drug users had received any type of substance abuse treatment while they were

The term "therapeutic community" describes a type of treatment that is "organized as a community in which all are expected to contribute to the shared goals of creating a social organization with healing properties."

incarcerated. Insufficient resources, inadequate facilities, and lack of trained staff are often cited as reasons for the lack of treatment (Blenko & Peugh, 1998; Martin, Butzin, Saum, & Inciardi, 1999).

Treatment Modalities

Substance abuse treatment programs for criminal populations generally provide programming to address both substance abuse issues and criminality. The goal is to help offenders develop skills to avoid relapse and lower recidivism. In order to meet these goals and ensure positive outcomes, it is essential that the treatment needs of each offender are matched appropriately to the available treatment services.

Assessing Treatment Need. Substance abuse treatment services vary across the United States according to the laws of individual states. Treatment provided within the state of Colorado follows guidelines designed to satisfy Colorado Revised Statute 16-11.5-102, a law passed in 1991 to require the establishment of a standardized process for assessment of substance abuse treatment needs and to set up a system of treatment (O'Keefe, Klebe, & Hormas, 1996). The system of treatment is based on seven treatment levels which include (1) no treatment, (2) drug education and increased urinalyses, (3) weekly outpatient therapy, (4) intensive outpatient therapy, (5) intensive residential treatment (IRT), (6) therapeutic community (TC), and (7) no treatment; assess for psychopathy. Individuals who enter the Colorado criminal justice system are first assessed to determine the extent of their treatment needs and then are recommended for treatment according to their level of need. Treatment levels 5 and 6 provide the most intensive treatment and will be the focus of this paper.

The Therapeutic Community. The term "therapeutic community" describes a type of treatment that is "organized as a community in which all are expected to contribute to the shared goals of creating a social organization with healing properties" (Rapaport, 1960, p. 10). As such, therapeutic communities (TC's) are designed to provide treatment and educational services within the context of the peer community (DeLeon, 2000). Residential TC's are particularly useful in treating criminal populations because they allow for separation of individuals who are under treatment from the rest of the inmate population who are often antagonistic towards rehabilitation efforts (Wexler & Williams, 1986). The TC treatment approach focuses on four main treatment areas: the drug use disorder, the person, recovery, and right living (DeLeon, 2000). Treatment of the drug use disorder involves the whole person and is based on the cognitive behavioral model. This model is designed to (1) create an awareness within the client of how the client's behavior affects others and how others' behavior affects the client; (2) address issues regarding faulty judgment that can lead to problems in terms of problem solving, decision making, and assessment of consequences; (3) help clients develop insight into the connections among their experiences and the reasons, influences, or determinants of their experience; and (4) help clients develop a better grasp of reality in terms of how they see themselves, others and their circumstances. The TC modality of treatment views the drug use disorder as a symptom, not the problem. The problem is believed to be rooted in the individual's self-defeating and destructive patterns of behaviors and thinking that result in instability in lifestyle and functioning (DeLeon, 2000). The person bears the responsibility not only for his or her disorder, but also for his or her recovery. Recovery involves either learning or relearning skills that enable a positive lifestyle and a drug-free life. TC programs are highly structured and consist of orderly routines that not only distract the client from the negative thinking and boredom that can lead to substance abuse, but also teach such skills as time management, planning, setting and meeting goals, and general accountability.

Therapeutic communities serve populations with the highest substance abuse needs. The programs are intensive and are usually long in duration (9-12 months). Therapeutic communities may be modified to meet the special needs of the population being served. Within the Colorado Department of Corrections, the therapeutic community model has been used both in prison and after prison as a transition to the community. Therapeutic communities have also been modified to meet the different needs of women offenders and offenders with serious mental illness as well as substance abuse problems. In this paper, two different evaluations of five different therapeutic communities are presented. The first evaluation compares different therapeutics communities with an appropriate control group in three different populations of inmates. The second study looks at the effects of continuity of care provided by offenders receiving different treatment plans involving therapeutic community programs.

Intensive Residential Treatment. In contrast, intensive residential treatment (IRT) programs are of relatively short duration but provide intensive treatment in this short period. IRT programs serve challenging, high-risk populations but do not have a strict model in how treatment is provided. There is a lack of research on IRT program services and outcomes.

Offenders in Colorado who participate in IRT programs are there primarily for a drug related violation; they are often referred to this modality in lieu of prison. They might also enter the program as a condition of their sentence, either as a diversionary program for less serious offenders or as a transition from prison. Offenders participating in these programs are at a high risk of re-offending and/or relapsing in their substance use.

Due to the varying nature of IRT programs, each has different treatment durations. An offender's length of stay in a Colorado IRT program could range from 14 days to approximately 45 days, with differing amounts of continuing care following the residential component. During this time, participants are housed in a correctional-type facility. Of the four programs studied in this paper, two provided treatment for male offenders only, whereas the other two programs had beds available for both males and females.

Variability can also be found between the programs in relation to their treatment perspective (O'Keefe, Doffing, & Nugent, 2001). Some Colorado IRT programs endorse a mental health model of treatment, while others use an addictions model. The use of these different models is most obvious when looking at how individual treatment needs are handled. The mental health model of treatment prefers individualized treatment sessions, while the addiction model relies more heavily on group dynamics as the primary means of treatment. This distinction translates into how groups are conducted; some follow a lecture style format, while others use a group processing format.

Staffing patterns provide further evidence of different treatment perspectives. Consistent with the mental health model, some staff members have educational degrees in disciplines related to therapy. Others have less formal training and clinical experience but are in recovery themselves and have deep personal knowledge of substance abuse treatment. Because of this staff diversity, the treatment team at each program utilizes different treatment approaches and paradigms.

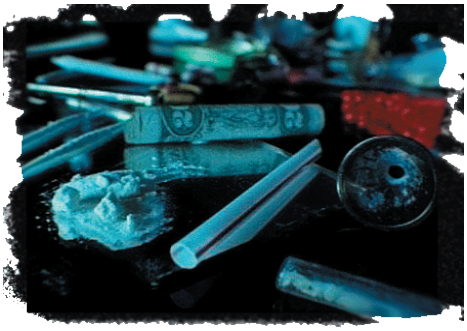
Overall, the IRT clients are exposed to treatment aimed at developing positive coping skills, relapse prevention education, and skills used to identify thinking errors associated with substance abuse and criminal conduct.

These program variations are not unique to Colorado; similar differences have been found in IRT programs nationwide. It is not at all uncommon for IRT programs to use different titles as well. For example, an IRT program might be called a modified TC, a short-term inpatient treatment program (Broome, Simpson, & Joe, 2002), or a community residential facility (Moos, King, Burnett, & Andrassy, 1997).

IRT programs are commonly confused with TCs in the research literature; however, the two programs are actually very distinct from one another. For example, the intensity and duration of the TC (9-12 months) exceeds that of the IRT program. The most noticeable difference between the programs is their overall philosophy and approach to treatment. TCs are structured around the social learning model. The objective is to treat the whole person, focusing on psychological, social, and behavioral aspects (Nielsen & Scarpitti, 1997). The goal of treatment is to restructure attitudes and provide offenders with relapse prevention and social skills (Wexler, 1995). The staff and clients in the TC are responsible for creating the context for change, whereby the community works together as the reinforcement for positive change (DeLeon, 1994).

An IRT may best be described by defining what it is not – a TC. Although both programs share similar treatment components, IRT programs are less homogeneous in their programming and treatment approach. Rather than focusing on a thorough restructuring of the entire person, the IRT programs were developed to rapidly address addiction issues and criminality through psycho-education and therapy (O'Keefe et al., 2001).

In the current paper, an evaluation of four IRT programs to reduce recidivism will be summarized.



Program Evaluations

In this paper, three different outcome evaluations that have been done on substance abuse programs for offenders are summarized. Outcome evaluations focus on whether or not a program is able to reduce recidivism. Often when completing outcome evaluations, the effectiveness of a program to reduce substance abuse is the primary concern; however, when working with offenders the most studied outcome of substance abuse programs is the reduction in recidivism. Recidivism can be measured in a variety of ways, including return to prison for a violation of parole, return to prison for a new crime, or re-arrest rates.

In each of the studies completed, treatment programs are compared to control groups to explore the ability of the treatment program to reduce recidivism. Treatment programs often vary with respect to one another in terms of the characteristics of the program clients. In each evaluation, a particular treatment group is compared with a control group that has been matched on similar characteristics (e.g., criminal risk, gender, substance abuse needs). The control group participants have not received the level of treatment that the treatment participants are receiving, however, they may have received a lower level of treatment, in particular, educational classes about substance abuse.

Evaluation of Intensive Residential Treatment Programs

Four IRT programs were studied (for a full report see O'Keefe, Klebe, Fisher & Roebken, 2003). Other Colorado IRTs are not included because they did not exist at the inception of this study. There were between 150 and 278 participants from each treatment program. The treatment participants were selected first and then the control participants were obtained after all treatment participants were selected, so as to identify individuals who were similar to the treatment group. Control participants were selected to represent the overall composition of the treatment sample. Control and treatment participants were compared on a variety of variables (e.g., age, criminal risk, substance abuse needs, etc) to assess the equivalency of the groups. The groups were similar in most ways. When there were differences, those variables were taken into account during the statistical analyses to see if they explained the differences in outcomes between the groups. The treatment and control groups were compared on five types of recidivism variables at six months after release from treatment: technical violation arrests, misdemeanor arrests, felony arrests,

incarceration, and supervision failure. Rearrest data for technical violations, misdemeanors, and felonies were obtained through the CCIC/NCIC database system. Colorado incarceration outcomes were gathered through the DOC information system. Supervision failure is a global measure of recidivism and a failure is counted if any one of the other types of recidivism occurs. The percentages of people who had a particular recidivism behavior occur are listed in Figures 1-4 showing each treatment group compared with their corresponding control group.

Overall, the treatment groups for three of the programs showed few statistically significant differences. Only treatment program D (see Figure 4) shows statistically significant positive outcomes as compared to the control group.

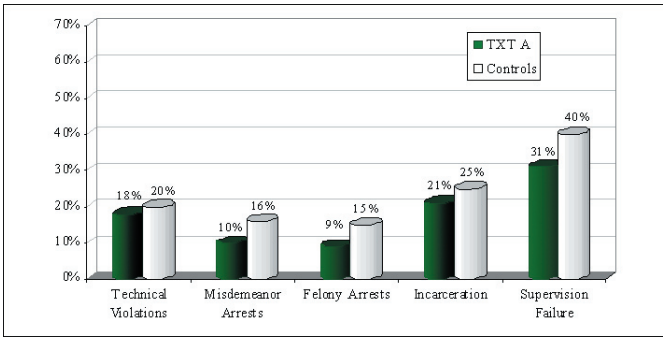


Figure 1: Comparisons between treatment and controls on six month outcomes for Program A.

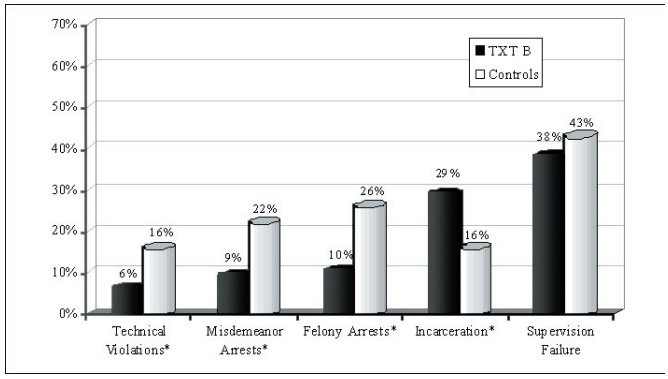


Figure 2: Comparisons between treatment and controls on six-month outcomes for Program B.

** indicates a statistically significant difference in the percentages for the two groups.*

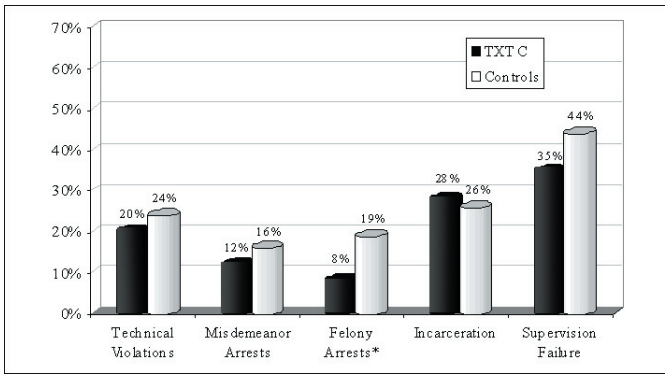


Figure 3: Comparisons between treatment and controls on six-month outcomes for Program C.

** indicates a statistically significant difference in the percentages for the two groups.*

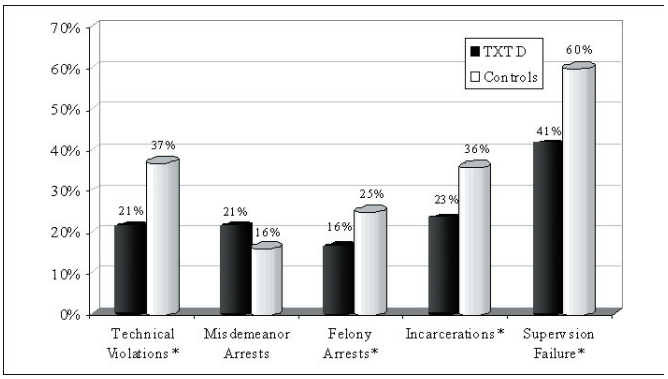


Figure 4: Comparisons between treatment and controls on six-month outcomes for Program D.

** indicates a statistically significant difference in the percentages for the two groups.*

In conclusion, although the treatment group had a trend for more positive outcomes than the control group, these differences were not significantly different from chance except for one progam. The study findings lead to the question of whether the IRT model is only partially successful or whether the programs do not have good fidelity to the model. There seems to be evidence to indicate it is a mixture of both.

The process evaluation of these four IRTs (O'Keefe et al., 2001) is seemingly predictive of the outcome findings, thereby suggesting issues exist regarding implementation of the model. The program that demonstrated the greatest fidelity to the model with the most intense and high-quality services is the same one that had the most successful program outcomes.

The significant body of literature emphasizing the relationship between treatment duration and outcomes (Condelli & DeLeon, 1993; Condelli & Hubbard, 1994; Wexler, DeLeon, Geroge, Kressel, & Peters, 1999) would suggest there is a flaw in the IRT model. The residential portion of an IRT is not nearly long enough to elicit change in this population. Colorado's criminal justice system has done very little, until recently, with its assessment and treatment system to promote the importance of continuing care for IRT completers. Without a continuing care component of six months or longer following residential stays, the IRT modality will have limited effectiveness.

Evaluation of Therapeutic Community Treatment Programs for Different Populations

In this evaluation (for the full report see Neuhaus, in progress), four in-prison therapeutic community programs are each compared with a matched control group. The first two programs are for male substance abusing offenders; the third program is for substance abusing males who have a chronic mental illness; and the fourth program is for substance abusing female offenders. Participants received treatment in a therapeutic community during incarceration at a state prison. Participants are followed for one year following release from prison and recidivism is measured by whether or not they return to prison. Figure 5 shows the recidivism rates for each type of program and its comparison group.

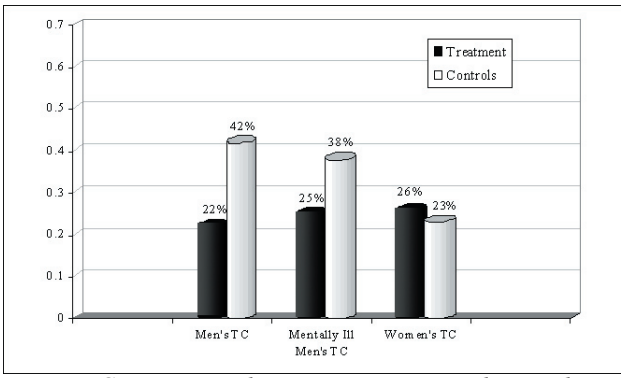


Figure 5: Comparisons between treatment and controls on 1 year re-incarcerations outcomes for three populations.

Overall, the three therapeutic communities for men are showing statistically significant positive outcomes compared to the control group. There are no significant differences between the women's treatment and control groups; however, the women tend to have more positive outcomes than the men. This study indicates a positive effect of treatment for men and shows that the therapeutic community modality can be effective for different offenders with different needs.

However, further investigation is needed to see why the women's treatment program is not having the same effect. This program has been undergoing a variety of programmatic changes, and this study does not allow the effect of those changes to be studied.

Evaluation of Therapeutic Communities with Aftercare Component

In this evaluation (for a full description of the study see Klebe & O'Keefe, 1999 and for preliminary findings see O'Keefe & Klebe, 2003), two therapeutic community programs are evaluated on one year recidivism rates. In this study, one of the programs is offered in prison and the second program is a community-based program. Five groups are compared: (1) offenders who participated in both programs (Both); (2) offenders who participated in the community-based program only (CB-TC); (3) offenders who successfully completed the prison program (P-TC); (4) offenders who failed the prison program (Dropouts); and (5) offenders who were eligible for TC treatment but who did not participate in any TC program (Neither).

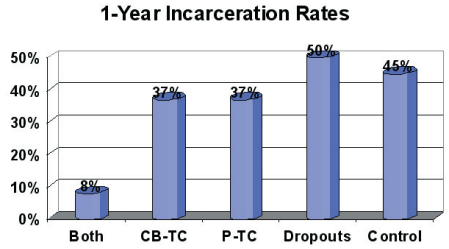


Figure 6: Comparisons across program groups on one year incarceration rates.

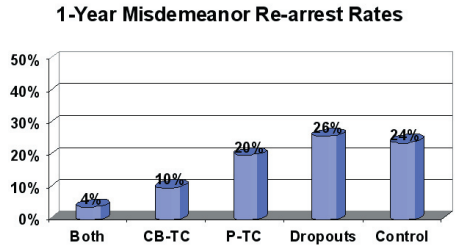


Figure 7: Comparisons across program groups on one year misdemeanor re-arrests rates.

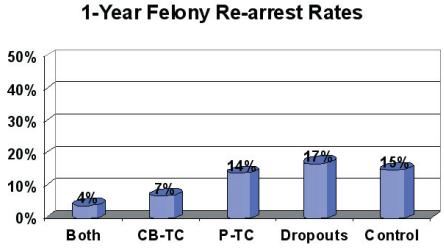


Figure 8: Comparisons across program groups on one year felony re-arrest rates.

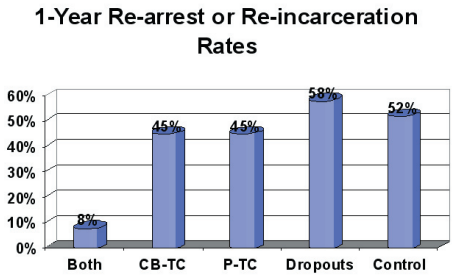


Figure 9: Comparisons across program groups on one year overall failure rates.

Overall, these programs are showing success in lower recidivism rates for offenders with the most severe substance abuse problems; however, the largest gains are show for offenders who participate in both treatment programs (for a potential of two or more years of treatment). This finding could be explained by a selection factor with only highly motivated participants choosing to be in both programs. Regardless, this 85% reduction in recidivism is quite impressive and holds promise for breaking the cycle of substance abuse and criminal behavior.

Conclusion

These three evaluations indicate that treatment for substance abusing offenders can have positive impact but that the impact is likely to be small and short-lived unless the programs are of the highest intensity, long in duration, and with a significant after-care component. These findings are similar to findings found by other researchers. An exhaustive meta-analysis of 443 programs (Lipsey, 1992) found that 284 programs (64%) reduced recidivism by an average of only 10%. However, therapeutic community treatment programs have shown impressive results in terms of reducing substance use and criminal behavior (Blenko & Peugh, 1998; Chanhatasilpa, MacKenzie, & Hickman, 2000; DeLeon, 1984; DeLeon, Graham & Wexler, 1997; Lipton, 1995; Wexler, 1995; Wexler, & Jainhill, 1982; Wexler & Williams, 1986).

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Can Forensic Odontology Take A "Bite" Out of Crime?

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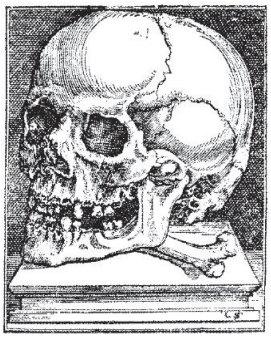
Forensic Odontology Takes A "Bite" Out of Crime

The field of odontology involves the identification of persons living or deceased, bite-mark identification analysis and comparison, lip print identification, and identification of dental specimens at crime scenes. Originally this policy recommendation article intended to suggest changes to a law or statute, but research determined that the recommendations should be made within the American Dental Association (ADA). This is because the ADA is the governing agency for dentists. The association members are the instruments of public policy for non-governmental agencies, the "unofficial actors," if you will. The reason to change the ADA policy is to help public officers (law enforcement agencies and county coroners) obtain their objectives of identifying the "whom" of human remains. Coroners work collaboratively with state and federal agencies, physicians, odontologists or dentists, law enforcement agencies, district and other attorneys and insurance companies. Making changes to the ADA code will enable them all to do their jobs more efficiently.



Did you know that your charming smile could get you convicted of a crime or could be used to identify your remains? This investigative side of dentistry is known as forensic dentistry or forensic odontology. Under the general field of forensic sciences, forensic odontology is its own discipline. With the cooperation of medical examiners or coroners, law enforcement agencies and odontologists, "dental knowledge is applied to the solution of legal issues in civil and in criminal matters" (Bowers 6).

Forensic odontology has been available for many years. With technological advances, forensic dentistry together with law enforcement agencies has been able to take a titanic "bite" out of crime. Forensic odontology is fast becoming a routine identification procedure in cases involving crime, mass disasters, missing persons and accidents, but with the technology available today, it could be a great deal better. This paper recommends that changes be made to the current regulations regarding public and private dental offices so that the objectives of law enforcement agencies and coroners can be further attained.

If individual dentists in private practices were to perform a comprehensive initial examination on each new patient, a thorough dental chart could be obtained when needed to better enhance and aid the field of odontology. When a new patient enters the dental office, a comprehensive examination should be completed that includes the full charting of pre-existing dental conditions (fillings, missing teeth, dentures, distinctive bite patterns) or at the very least, using current technology, intraoral cameras should be used to take a current picture of the new patient to have on file. In countless dental offices, this simple one-time task is not being done.

> With the high crime rates and threats of terrorist attacks in our society today, we need to develop a policy that requires dentists to capture better initial examinations. The enormous dental database that would be established could provide immediate identification of unidentified bodies or bite marks left on a victim or perpetrator. This would allow the field of odontology to reach its full potential.

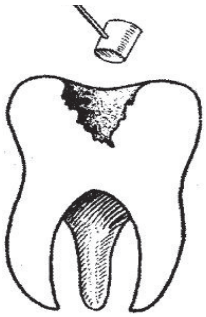
In showing the benefits of odontology, this article will look at the definition, the history, and some examples of cases solved by forensic odontology. It will also look at the governing agency for dentists (their interest group): the American Dental Association (ADA). This paper presents a brief history of the ADA and its specific codes identifying dental examinations and the actions that would be required to change its guidelines. After reviewing these areas, a policy recommendation will be made, and some future implications will be explored.

Forensic Odontology and Technological Advances

The field of odontology involves the identification of persons living or deceased in individual or mass disasters, bite mark identification analysis and comparison, lip print identification, and identification of dental specimens at crime scenes. Odontological identification is acquired from data collected both ante mortem and postmortem from dental records comprised of intraoral photographs, dental radiographs, impressions and study models of the teeth, as well as charting of existing dental work (fillings, missing teeth, bone loss, etc). Through technological advances, forensic dentistry and law enforcement have evolved in ways that only a few years ago did not exist. By looking at some of these technologically advanced areas such as computers, the Internet, digital imaging, scanners and compact disc recordable/rewritable drives and making a change to current policy, forensic dentistry together with law enforcement agencies will be able to further decrease crime and solve many "unsolved" cases.

The reader may need more knowledge about teeth and the field of forensic odontology. The importance of teeth in forensics is that they are hard and durable, which means that they will withstand most types of punishment: "Teeth are composed of enamel, the hardest substance within the body. Because of its resilience, the teeth will outlast tissues and organs as decomposition begins" (Saferstein 202); thus, a corpse could be missing for several years and could still be identified by previous dental records. For example, in Colorado Springs, Colorado, a girl (Heather Dawn Church) disappeared from her home and was eventually presumed dead. Almost exactly one year from her disappearance, a skull and some bone fragments were found in the vicinity of Rampart Range Road near the city of Colorado Springs. When investigators brought the remains to the local odontologist, it was determined that the skull was that of a teenager. The detectives went through files of unsolved cases and came upon the Church case. The odontologist was able to reach a positive identification by comparing her ante mortem dental records with the postmortem records.

The characteristics of teeth, their alignment, and the overall structure of the mouth provide individual evidence for identifying a specific person. Because human teeth, like fingerprints, are unique, they can be used to identify bodies that have been burned, mutilated beyond recognition or are in advanced stages of decomposition. From about six to 12 years of age, a person's baby teeth are replaced by permanent teeth and eventually total to thirty-two teeth, which vary in shape and position from person to person. There will also be racial variations. For instance, "crowding of teeth is common among Caucasians, but not among Negroes and Indians" (Tesar 103). With the use of the person's smile, a comparison can be made between a set of dental remains and a suspected victim or perpetrator.



Over time, changes occur in a person's teeth that contribute to their uniqueness: fillings are prepared because of decay, accidents knock out teeth, pipe smoking wears down the surfaces of front teeth, and tongue rings wear down the backs of the front teeth (Tesar 105). Some persons lose all their teeth because of periodontal disease or rampant decay; however, the victim's dentures or partial's can still permit identification of the remains. There was such a case in 1850 when a professor named John Webster murdered and burned his victim at a university (*Crimes and Punishment,* Vol. 8 875). Detectives were able to identify the victim because they found his charred dentures containing his initials in the incinerator. Another murder case solved by rigorous dentures was the John George Haigh case in 1949. The suspect believed that investigators had no case because there was no body, but forensic experts and the victim's dentist proved him wrong and identified his victim's new acrylic resin dentures, which had survived a bath in sulphuric acid that had destroyed the remainder of the body (*Crimes and Punishment*, Vol. 15 1827).

Did you know that your charming smile could get you convicted of a crime or could be used to identify your remains?

A person's occupation can also alter dental patterns. For example, a carpenter or seamstress can be identified by the wear on the teeth exhibited at the spot where nails or needles are constantly held in the mouth. All these changes produce millions of dental patterns that help to provide information to investigators to aid in the identification of a suspect or a victim. Of course, all of this information is dependent on the individual dental office recording exhaustive and accurate records of pre-existing and post-dental conditions.

Another use for odontology and teeth is to determine the age of a subject particularly if the person is young at the time of death. Age can be assessed by x-rays of teeth in the jaws and by dental eruptions into the mouth. However, other factors such as diet, race and environment affect these developments making them less useful after the subject reaches the early teens. Young people's ages can be estimated within approximately 20 days either side, because the dental tissue growth per day is registered by striations on the teeth (Evans 142).

Forensic Odontology can also be used to aid investigations in bite mark analysis. Bite identification has played a major role in solving many violent crimes. When a person bites something, the teeth leave a pattern. Sometimes the bite marks are on objects such as a piece of cheese or an apple and sometimes they are on the skin of the victim or perhaps on the skin of the attackers. A bite mark can appear as an imprint or a tearing of the skin such as a scratch. If the bite mark is found on a living victim, swift analysis is required because the color-reaction attributed to bleeding and inflammation can make the gathering of evidence more difficult (*Crime and Punishment*, Vol. 15 1830). A ruler is placed in the photograph to indicate size and a color scale may be included to indicate when the bite was made. After detectives take photographs, the marks are swabbed with saline solution and then analyzed to see if the saliva of the person who made the bite contains blood-type evidence (Evans 85). Once that is completed, a cast of the bite mark is made using a silicon impression material so that it can be compared with dental impressions taken from suspects or victims. Sometimes new models will be taken, but at other times, the suspect or the victim's dentist will have models on hand since models are often made in a dental office for the purpose of treatment planning. If necessary, local authorities can obtain a search warrant to retrieve the dental records and models from the dental office. Comparison relies on the similarities between the teeth of the alleged perpetrator with the marks on the body of the victim. With all the "evidence" obtained, odontologists and law enforcement can now make their case in court by using the new technology available to them such as computer software programs to demonstrate similarities between the study model of the suspect and the photographs of the bite mark.

First, computers have for sometime played a significant role in forensic odontology and criminal justice. Like computers, forensic odontology has been around for quite sometime (see Appendix 1). Computers have gone from large, room-filling mainframe models to laptops, and almost every agency, whether dental or law enforcement, private or public, has at least one available for its use. According to the ADA, "more than eighty percent of dentists have computers in their office and most practice management systems permit dentists to use electronic transactions". Amazing computer software programs have been developed to further enhance these two fields. For example, in dental offices there are programs such as Data Team, Easy Dental, or SoftDent that enable the person entering data into the computer to chart a patient's existing dentition. When a patient comes in for future dental work, those fillings or extractions are added to the charting section of the software program providing an up-to-date ante mortem dental record that could be uploaded to an inquiring law enforcement agency. If this software feature were to be used in dental offices, it would significantly cut down on the time needed for requesting and mailing dental records to the inquiring agency. Of course all of this is dependent upon the current dental office that is developing the extensive dental chart.

In a second example, in 1966, the National Crime Information Center (NCIC) became operational and went online in January of 1967. With the ever-growing crime rates, law enforcement officers needed quicker access to criminal data. Therefore, the bureau developed this nationwide electronic center. By 1971, all 50 states were linked to the Federal Bureau of Investigation's (FBI) central computer with its massive criminal databases. This database was, of course, momentous to the law enforcement agencies, but it was in 1975 that it became noteworthy to the field of odontology. In that year, the Missing Persons File was added to help agencies in locating individuals, and in 1983, the Unidentified Persons File was added as a way to cross-reference unidentified bodies against records in the Missing Persons File. An agency that has an unidentified body can enter the descriptors and do a search against reported missing

persons, or an agency can query whether or not its missing person has been discovered somewhere else as an unidentified victim of a crime. This program has been a tremendous success and with technological advances daily, it promises to be an even greater success in cutting crime rates.

Two other programs that have been successful in the advancement of odontology are the Computer Assisted Postmortem Identification program (CAPMI) and WinID2. The CAPMI program was developed by Colonel Lew Lorton of the U.S. Army Institute of Dental Research and offers a very large database for computer assisted victim identification (Johnson, 27 August 2002). WinID2 is a Windows9x based dental computer system, which is similar to the NCIC Missing Persons File that matches missing persons to the unidentified. WinID2 uses dental and anthropometrical characteristics to rank possible matches of the information entered into the WinID2 database about physical descriptors and pathological and anthropologic findings. WinID2 has proved useful in mass disaster situations and in the maintenance of missing persons' databases. Forensic odontologists, pathologists, coroners, medical examiners, forensic anthropologists and those in law enforcement agencies use WinID2 to identify the unknown.

The availability of both computers and the programs that are developed for them has allowed law enforcement officers to compare data and to provide odontologists with the "hints" needed to make the positive identifications that lead to arrests.

Second, the Internet has provided an enormous advantage in this area. Anyone can go online to find the information he/she is seeking. For example, one can locate information to purchase any lethal weapon and buy airline tickets to leave the country. The Internet cuts down on research and trips to the library and even on telephone bills. Almost every business or agency has a web site where an abundance of information may be placed. The American Board of Forensic Odontology (ABFO), which is the examining and certifying authority for odontologists, has a web site that law enforcement officials may contact for information on the approximately 114 specialists in the United States if they should need an odontologist for a case.

The Worldwide Forensic Odontology Contacts (WFOC) site is another gigantic step forward in aiding the identification process. This is a list of contacts to be used by Dental Disaster Victim Identification or other authorities requiring ante mortem dental information. The list was established in 1993, but now, with the use of computers and access to the Internet, it can be obtained in a matter of seconds for mass disaster situations like 9/11 where many odontologists are needed.

The third technological advancement to aid law enforcement and odontology is Digital Imaging. The rapid transmittal and retrieval of dental evidence, whether ante or postmortem, has been enabled through the use of digital and intraoral cameras and scanners. Digital cameras permit photographers and detectives at crime scenes to save the pictures to a disk or to use serial connectors to upload the "evidence" to computers for immediate comparisons and data analysis. There is no more waiting for pictures to be developed. Photographers can use software (like PowerPoint) to view the evidence in three-dimensional (3D) format or to view the

evidence from every possible angle and to create reenactments of the crime to prove a suspect's involvement. These "presentations" can be used to bring cases to trial or to convince jury members beyond a reasonable doubt of the suspect's involvement in a crime.

In addition to complete dental charting, intraoral cameras could be used in many dental offices and would provide an exact recording of a suspect's or a victim's dental record. These photographs would be kept as part of a patient's permanent record and could be uploaded with charts and x-rays to agencies for aid in positive identification.

Fourth, scanners can be used in both the criminal justice and dental field. Many criminal agencies have scanners available that can be used to upload "evidence" to the larger databases available or to the local computer for comparisons. Dental offices could use scanners to minimize the storage space required in the office (since they are required by law to keep all patients' records usually about seven years) by scanning x-rays, dental charts, and periodontal charting records into the computer. Doing this would allow for the immediate electronic transmission of dental records should the patient become a victim or a suspect in an unlawful case. If the chart being requested by authorities were that of a victim, a family member would most likely be available to sign a dental release form thus protecting the patient's rights. If the chart being requested is that of a suspect, the law enforcement agency could obtain a search warrant forcing the dentist to release the records thus protecting the dentist from any privacy-right issues involved in the release of such records. Scanning of this information by dental offices would enable the rapid retrieval of existing ante mortem conditions (such as pre-existing restorations and existing decay) for identification by law enforcement authorities. It would also help to establish a dental database to be used in the event of a disaster.

The rapid advancement of technology has permitted scanners to be available in local squad cars. Some vehicles have miniature cameras that can capture crime scene photos quickly to make them available for later evaluation. Other squad cars have a portable printer for their laptop, which has an optional scanner cartridge. One may simply remove the printer cartridge and replace it with a scanner cartridge and the printer becomes a scanner. An officer can scan "evidence" from the crime scene instantly and review it later.

Fifth, the invention of compact disc (CD) recordable/rewritable drives has allowed for the storage of vast amounts of data and digital imagery. Since the scanning of all the evidence at crime scenes or the scanning of dental records requires a large

amount of disk space, CD recordable/rewritable drives enable the process because they hold a large number of megabytes as compared to a floppy disk. Once the data is saved to compact disc, it can easily be transferred from one computer to another. If the data is on CD, the information is easily uploaded to authorities and it will not use up valuable space on the hard drive and slow the operation of a computer.

Technology's role has been extremely significant in many areas. The fields of forensic odontology and criminal justice have evolved to incorporate new fields and techniques such as software that enables the ability to maneuver pictures (evidence) to "recreate" crime scenes. The dental materials and equipment have evolved also and provide better evidence with the ability to obtain excellent impressions and models to be used as evidence. Odontologists are even consulted to take impressions of non-dental evidence, such as palm prints left at crime scenes. Computers and software for identification have made the identification process much more rapid. For instance, should a patient become involved in a criminal case, whether as victim or as suspect, the ante mortem dental information could be transmitted to the criminal agency working the case to be compared with the dental evidence (remains or bite marks on victim, suspect or objects) found at the crime scene. Investigators would no longer need to publicize a case in the print media in hopes that a dentist might recognize the work.

Policy Implications

Now that the reader knows the importance of odontology in aiding the work of law enforcement agencies and coroners and how important it is for dentists to do a thorough examination of each patient, it is appropriate to look at developing a policy that promotes the importance of odontology. Originally this article was intended to suggest changes to a law or statute, but research determined that the recommendations should be made within the American Dental Association (ADA). This is because the ADA is the governing agency for dentists. Its members are the instruments of public policy for non-governmental agencies, the "unofficial actors" if you will. Birkland defines unofficial actors as "unofficial" because "their participation in the policy process is not a function of their duties under the Constitution or the law" (77), and "Unofficial actors include those who play a role in the policy process without any explicit legal authority (or duty) to participate, aside from the usual rights of participants in a democracy" (50).

Interest groups have been a part of the American political scene for quite some time, and since the 1960s the number of interest groups has expanded rapidly. Some interest associations establish direct links to governments and administrations and hire lobbyists to influence legislative decision-making processes. In general, interest groups can influence government through campaign contributions, advisory committees and through lobbying. First, through campaign contributions and other methods, interest associations are able to gain access to public officials more often than the average citizen. This means that interest groups have a much better chance of having their cases heard. Second, since the government cannot have fact-gathering personnel in every field, it appoints committees to provide information and advice. The information they provide is used in making public policy. Now, obviously, if the information that government agencies are getting is from the industry involved, then the perspective from which they get the information is likely to be one-sided. For example, if the government needs information on proper fluoride levels, it most likely will call upon the American Dental Association for advice. However, these professionals (dentists) come from the industry involved. The government does not usually consider the opinion of the private citizen although concerns of high fluoridation, and its effect on pregnant women might well need to be taken into account. The advice the government receives is often "stacked" in favor of the advising corporation or interest group. Third, an interest group will influence government and policy making by lobbying. Usually an interest group will lobby to get a bill passed or amended or, if it fits the point of view of the people the interest group serves, to get a bill killed so that it does not become law. Anyone can lobby, but lobbying is most effective when done by large corporations or interest groups with resources to back them. In lobbying, it is important to be in contact with the legislators and executive branch members one wishes to lobby on a long-term basis. There is another type of lobbying that many have used, including the ADA. It is called indirect lobbying or grassroots lobbying. It involves trying to convince the public of the association's point of view and then having the public put pressure on their representatives and senators to vote the association's way. "Money, knowledge and information are related to the size of the group and the resources that it and its members can bring to policy conflicts" (Birkland 80). "A rough calculation of the political power of an interest group (and thus of one's political influence as a group member) is derived from the size of the group. A group with 500,000 members is likely to have more clout (or at least be "louder") than a group with only 500 members" (Birkland 81). Although not quite that large in membership enrollment, "the American Dental Association's ability to influence public policy is one of its core competencies" (ADA).

While it is difficult to categorize interest groups because nearly all claim to have the public's best interest in mind, the ADA is an economic interest group because it seeks to promote and protect the professional and economic interests of dentists. That is why, according to Kimberly Mann at the ADA, some of the definitions of dental procedures appear so vague: Interest groups are an effective way for many people to collectively express their desires for policy or policy change.

The American Dental Association exists for the benefit of the dentists, but it is also there to support the public. The ADA's mission statement is: "The ADA is the professional association of dentists committed to the public's oral health, ethics, science and professional advancement, leading a unified profession through initiatives in advocacy, education, research and the development of standards" (ADA website). Twenty-six dentists out of the state of New York founded the American Dental Association in 1859. It is the largest and oldest national dental association in the world with more than 141,000 members. The Association has more than 400 employees at its headquarters in Chicago and its office in Washington, D.C. The association has eleven councils that serve as policy-recommending agencies. Each council is assigned to study issues relating to its special area of interest and to make recommendations on those matters

to the Board of Trustees and to the House of Delegates.

The ADA is positioned to provide to the public and to the profession services that other organizations may not be able to offer. It researches dental hand piece and sterilization use, toothpaste, fluoride, and floss and lets the public know the best procedures to look for and products to use. The ADA is in a unique position because it has the resources (including large membership and extensive communications capabilities) necessary to respond to any desirable issue. The ADA also has the trust and respect of the public and the profession that enables the Association to continue its high level of ethical service while getting the job done. The ADA is the most credible and accessible information source on oral health issues for the dental community and governmental agencies as well as for the public and the media. The public listens when the ADA speaks and, after the horrifying events of September 11th, the public would undoubtedly want all dentists to provide comprehensive examinations so that it could reclaim its loved ones should another mass disaster occur. In mass disasters there is usually severe trauma or fire, which renders identification of victims difficult. Disasters can be natural in origin such as earthquakes or floods, or caused by explosions and fires and by transportation accidents of which air disasters form a high proportion (*Crimes and Punishment,* Vol. 15 1824). Identification is legally required for death certification and disposal of estates and some insurance claims.

With the events of September 11th, the public has become more aware of the importance of identification of remains through odontology, which makes this a perfect time to implement change and receive the support of the public and the profession. The reasons to change the ADA are to help public officers (law enforcement agencies and county coroners) obtain their objectives of absolute identification of human remains. Coroners work collaboratively with state and federal agencies, physicians, odontologists or dentists, law enforcement agencies, district and other attorneys, and insurance companies. Therefore, making changes to the ADA code would enable them to do their jobs more efficiently.

The ADA produced *The Dental Insurance Coding Handbook* in order to provide for the accurate recording and reporting of dental treatment. It is a set of codes that have a standard format, are at the appropriate level of specificity, and can be applied uniformly. These codes are used to report dental procedures provided under public and private dental insurance benefit plans, and "the code is periodically reviewed and revised to reflect the dynamic changes in dental procedures that are recognized by organized dentistry and the dental community as a whole" (ADA). The association is aware that changes may be needed as time and technology advances. Therefore, the association allows for requests to be submitted for review at any time and provides guidelines for such submissions.

The code that this article is recommending be changed is the diagnostic code 0150 and is entitled Comprehensive Oral Examination. The procedure code states that the comprehensive oral examination "includes visual exam, charting, periodontal probing, diagnosis, treatment recommendations and treatment conference for a new patient to the office, for a former patient who has not been to the office for three years, or for a present patient who is in need of a complete exam and has not had this procedure completed within the last three years" (Tekavac 23). In other words, current regulations require the dentist to chart for each patient the teeth present, the teeth missing, and those teeth the dentist proposes to treat. It is not necessarily a full mouth charting. When Dr. Thomas Johnson, a specialist in forensic odontology for more than twenty years, was asked in an interview if he was receiving adequate information on records requested from dentists for identification purposes, Dr. Johnson replied that only seven out of ten charts were complete enough to help in his cases. That is a mere 70% (7 September 2002). Dr. Johnson said that had more dentists done pre-existing charting, he would have been able to positively identify ten out of ten cases. He went on to say that the cases that he was able to positively identify from dental records were those of patients who had been seeing the same dentist for several years, and he was able to identify them from current procedures completed on those patients. His success was based on current dental work performed and not on any comprehensive examinations provided by dentists. In a study performed by two Regional Dental officers, charting was identified as inaccurate in 38% of examined records and charting was absent in 14%; less than half (48%) were considered satisfactory (*Forensic dentistry online*). All dental practitioners should carry out full dental charting for each of their patients not only for the purpose of identifying dead bodies or crime suspects, but also to keep proper records in case of possible future litigation resulting from claims of malpractice or neglect.

The problem with ADA code 0150 is that by stating only "charting," it is vague and is left open to individual interpretation. The guideline for submitting a change request with the ADA says, "a suggested revision to the code should address omissions or ambiguities within a current procedure code's nomenclature or descriptor" (ADA). The policy recommendation is to change the word "charting" to read complete or full dental charting that includes charting of both pre-existing dental conditions and current dental decay or conditions. With the code being better defined, there will be no room for misinterpretation, and all new patients will receive a complete comprehensive examination that will not only help the medical examiners and law enforcement agencies but also help the public in general. All dentists know that a careful examination occasionally discloses an asymptomatic important treatable condition. The initial check-up differs from mass screening in that the act of seeking dental assessment may be a "symptom" in itself. Many self-declared well patients in fact have symptoms, unhealthy habits (such as smoking which can lead to periodontal disease), or hidden fears. The comprehensive examination often leads to case findings, which, by virtue of its early discovery, can be successfully eradicated or controlled. Everyone, therefore, benefits from a more thorough dental examination by dentists.

At present, dentists already perform the "inadequate" initial oral examination and file code 0150 on insurance claims when they are seeing a new patient. They need only spend approximately five more minutes with each patient to do the complete charting that would immensely help the field of odontology and the patient. The dentists should follow the model that the Air Force presents. The Air Force uses the same ADA codes, but they are very serious about completing a thorough examination on every active duty person on

the base. Within three months of being assigned, Air Force dental clinics see every new active-duty person at the base and perform a complete oral examination of all dental procedures whether past or present. Besides dental emergencies, it is only after that initial examination that the patients are seen for routine dental care such as cleanings and fillings. By performing the examination first, the dentist can complete a treatment plan for each patient and also learn any concerns of the patient. Perhaps the armed services care is due to the possibility of wartime or other events that could produce mass casualties, but it is a model that should be replicated especially in this day and age.

The cost to dental practices of adding approximately five minutes to each patient's allotted time would vary on each individual office's schedule setup. Some offices only see new patients for examination and x-rays first, while other offices try to do a cleaning at the same appointment time. However, since this one-time comprehensive examination applies only to new patients, and dental offices are paid more for this procedure code compared to the ADA code 0120 used for periodic examinations, there should not be any cost to the dental offices except that the dentist would actually have to spend a little more time with each patient. In the long run, this could actually help the dentist's office to build a closer and more caring practice.

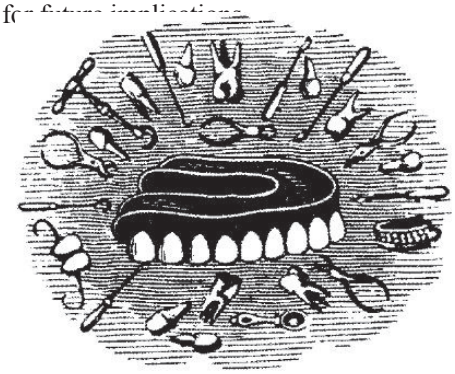
Policy Implementation

Implementation of this policy change would be easy to accomplish since every dental office has to abide by the ADA codes whether or not they belong to the American Dental Association. The ADA sends out regular newsletters to members and non-members notifying them of any changes to the handbook. The association also has media contacts to make the public aware of the changes so that they know what to expect when seeing a new dentist (Mann). While working at a private dental office in 1994, the ADA implemented a similar change to an ADA code because insurance companies were receiving numerous complaints from patients that they were not receiving proper teeth cleanings at the dental offices; the dentists were polishing the patients' teeth, but not scaling or using instruments on them. The dentists told the patients that scaling of their teeth was a different type of cleaning and would cost them more (Mann). The ADA code for adult cleanings also had some vague terminology that allowed for different interpretations, so with the complaints of patients and insurance companies, the code was changed to specifically say that a routine cleaning included "instrumentation to remove all supragingival un-calcified and calcified accretions" (Tekavac 23). Once the ADA accepts a policy change, it simply notifies its professionals and the change is implemented.

An implementation would be monitored or regulated essentially by the insurance companies and therefore would cost the association nothing more than the printing of newsletters, which they already do yearly. There may be a small cost associated if the media is used to make the public aware of the changes. Dental insurance companies do random checks of dental procedures routinely; they could easily check dental records for compliance with the new standards for comprehensive examinations when they are performing the random checks. Insurance companies are already performing these audits, so there would be no added cost to them. If the dental offices were found not in compliance, then they are fined, dropped from insurance plans or charged with insurance fraud. If found guilty, it could possibly mean the loss of the dentist's license and practice, so it is assumed that they would do their best to be in compliance. The change in policy would help the public by aiding in the early detection of possible health risks and by allowing for the early identification of loved ones. It would help dentists in case of any future litigation claims and it would greatly help the medical examiners, odontologists, and police departments to meet their job objectives. This policy recommendation is beneficial to all those concerned and should be adopted.

Future Implications

With the adaptation of this policy, in the future, through computers (laptops in squad cars and desktops in dental offices), there can be an immediate identification of unidentified bodies or bite marks left on victims or perpetrators because of the enormous dental database available for identification. Dental offices can be directly linked to main computer frames. Each time the office sent electronic claims to insurance, they would send an updated dental record of every patient seen that day (after proper dental releases are signed by the patient). The patient today signs a release form for dentists to send their dental information to insurance companies; the inquiries needed to obtain releases to send information to a government agency could be another issue for future implications.



Conclusion

This article has covered forensic odontology, technology's influence on the field, the American Dental Association and its guidelines for dentists, a policy recommendation, and what to expect in the future. With the policy recommendations mentioned in this paper, practicing dentists can play a vital role in the identification process via helping the nation recover from any terrible event, small or mass, by developing and maintaining standards of record keeping which would be valuable in restoring patients' identity. Dental evidence has assumed the role of main evidence in courtrooms and forensic odontology has become an accepted part of the forensic scene. Forensic odontology has expanded considerably due to technological advances, a greater intensity of international traffic with an ever-increasing number of transportation disasters, and increased international crime.

In conclusion, one of the most important aspects of a person's dental record may well prove to be its potential value should the forensic dental identification of their remains becomes necessary. The better the quality of the ante mortem dental records, the easier

and faster identification of the remains would be. It is often only the teeth and dental restorations that remain to confirm the identity of
each individual. In the future, with dentists keeping better records in collaboration with government agencies and law enforcement officials, bodies will not remain unidentified and be placed in unmarked graves, and criminals will not escape for long.

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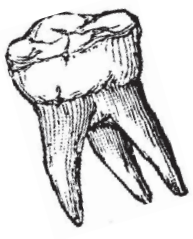

Appendix 1: Timeline of Odontology

Landmarks in Odontological Cases (USA)

Date	Case	
1776	Gen. Joseph Warren	Walrus tusk as canine
1850	John W. Webster	1st murder conviction by dentures
1925	Schwartz	Insurance fraud
1973	Dean Corll and Elmer W. Henry	Identity of 27 victims of mass murderers
1973	Milone	Convicted of rape and murder by bite mark evidence
1974	Members of Symbionese Liberation Army	Gunned down by LA police; identified by dental evidence
1976	Computers 1st used	Identification of 139 victims in mass flooding
1979	Theodore "Ted" Bundy	Bite mark evidence used in convicting serial killer
1979	Two teams of dentists	Identification of American Airlines Flt 191 with 274 victims
1981	Lee Harvey Oswald	Disinterred to make positive ID by comparison to military dental records
2001	Disaster Mortuary Operational Response Team (DMORT)	As yet, undetermined number of identifications of victims of September 11, 2001

Appendix 2: Interview With Kimberly Mann

1.What is your name?
2.How long have you worked for the American Dental Association (ADA)?
3.What is your position or job title?
4.What is the current definition of the ADA code #0150?
5.Do you interpret that to mean that dentists should do a complete exam, including full charting of pre-existing and needed work?
6.Why do you think the pre-existing charting is not being done?
7.Why is the code so vague?
8.Does your organization exist to protect the public's needs also?
9.Is it possible to recommend changes to the code/codes?
10.Have you seen any recommendations implemented?
11.How does the ADA monitor compliance of new regulations/ guidelines?

Appendix 3: Interview with Dr. Thomas Johnson

1.What is your name?
2.What is your profession?
3.How long have you been in that field?
4.When did you become a specialist in forensic odontology?
5.Over the years have you seen the field change much?
6.Can you think of any specific areas where it has grown?
7.When you request information from dentists, is the information you get helpful?
8.Does the information you receive contain complete charting of the patient's history, both pre-existing and needed treatment?
9.If you were to provide a number, what percentage of requested records that you receive have the needed documentation to use for identification purposes?
10.Do you think that there would be more remains identified if the dentists were required to do comprehensive examinations?
11.Would you support a recommendation made to the ADA to change its current guidelines regarding initial examinations, code 0150?

Appendix 4: MPA Competency

Since every course taken within the MPA program has writing requirements, all of my courses have been helpful in completing this final project. The three core courses that have aided me with this project are
1). PAD 5001: P AD 5001-3. Governance and Institutions.
This course introduced this writer to the roles of public service organizations and professionals in American society. It explained the history, nature, and scope of public service. As stated in the university's course catalog, "this course explores the creation of American public and nonprofit institutions, the ways organizations are structured and managed, and the role of the public service practitioner in the challenging contemporary setting." This course introduced this writer to terms like bureaucracy, federalism, formal bases of governmental agencies, formal and informal organizations, iron triangles and issue networks. Since the latter two concepts tend to involve interest groups, which this writer's paper is about, this course taught the writer how to tie the policy recommendations to the ADA to a public administration project.
2). PAD 5003: Information and Analytic Methods.
This course helped in my final project by showing basic research methods and techniques and how to make use of research and data. This course taught students to be informed consumers of obtained data. It showed how to get what one needs from a published study or article. The course taught how to do a research project including identification of questions/hypotheses, review of existing re-

search, selection of designs and sampling strategies, and methods to choose for data collection. Data collection includes surveys, interviews, and existing data. Even though this paper is not a statistically based project, this course was extremely helpful because it taught the benefits of doing personal interviews, how to conduct those interviews, and how to decide what questions to ask during an interview.

3). PAD 5005: Policy Procedures and Democracy.

This course was helpful because it demonstrated a theoretical approach to understanding the public policy process. It presented models of the policy process and applied them to current issues. This course supplied the student with knowledge of official and unofficial actors, public opinion, and the media and how they influence the policy process. These studied areas were crucial to my final project since the ADA is an unofficial actor that uses the media and public opinion to get agendas on the ballot. In this course, the student learned about Internet searches and availability, data research techniques, making policy recommendations, policy implementing procedures, and policy development. Also, through varied writing assignments, it aided this student's paper writing skills. This course was indeed very helpful for this writer's research project.

As far as future educational goals, this student is looking to get into the field of public administration in order to use the current knowledge and learn more about the policy processes involved in whatever organization of employment.

Discussant Session 1

Michael McLeod (A.B., College of William and Mary; J.D., University of Michigan) is an Instructor of Public Administration in the Graduate School of Public Affairs at the University of Colorado at Colorado Springs. A former practicing attorney, he is a Ph.D. candidate in public administration at Syracuse University. He is the principal investigator of a study of the potential for AIDS ministries in Colorado to be formal partners in public health with government agencies and nonprofit organizations.

Session 2
Politics, Choice, and Public Policy

Richard F. Celeste

John A. Straayer

Jennie Bowser

Raymond Hogler

Daniel E. Ponder

Session 2 - *Politics, Choice, and Public Policy*

Keynote Speech

Richard F. Celeste
President,Colorado College

Dick began his term as the twelfth president of Colorado College in July 2002. Prior to joining CC, he served as the United States Ambassador to India. His public service experience also includes two terms as Governor of Ohio, service as Director of the United States Peace Corps, and one term as Lieutenant Governor of Ohio. Equally at ease in the private sector, Dick was a Managing Partner of Celeste and Sabety Ltd., an economic development consultancy. Active in academia before arriving at CC, Dick was a Rhodes Scholar and Yale graduate who has taught urban economics at John Carroll University and has served as a visiting fellow in public policy at Case Western University. He currently is Chair of the Board of Trustees of the Health Effects Institute in Boston, an Advisory Board member of Stonebridge International and a member of the Council on Foreign Relations. He is married to Jacqueline Lundquist and they have a son Sam who is six. He has six grown children by a previous marriage.

I want to say how much I appreciate the invitation, Daphne, from you and the Center for Colorado Policy Studies to participate today with my fellow panelists.

You know, I just started my "sophomore year" at Colorado College and am very much a newcomer to Colorado. I have to explain to people that I am not here as a politician, or even one who had many political science courses in college. I am here as a practitioner, not as an academic, who is more familiar with my home state, Ohio, than Colorado. So I thought I would share with you some experiences from Ohio that I think you may find relevant as we think about where Colorado is today and where it's headed in the future.

In the spirit of full disclosure, let me say that my first run for governor of Ohio (in 1978) was unsuccessful, though a close race. In 1982 I ran again. I have the distinction of starting Jerry Springer on his television career. I defeated him in the Democratic primary, and he gave up politics -- at least until recently. I went on after that primary to become governor, winning with a very substantial margin.

Ohio was in the middle of the recession of the early 1980's. The day that I took my oath of office in January of 1983 the unemployment rate in Ohio was 14.3%! We ranked 50th among 50 states in job creation, a rank we held firmly for three full years. We were going to get no help from Washington. President Reagan had said to the steelworkers as they were losing jobs, "Look the future isn't there--just go on west to Texas or California. "

I was of a mind of Alice when she met the cat and said, "Could you tell me please which way to go from here?" And the cat (you'll remember) said, "It depends on where you want to get to." And Alice responded, "Well, I don't much care." So the cat said, "Well, it won't make much difference which road you take."

We had to choose a road in January of 1983. And the first thing I did was ask my director of development (who had come out of the state chamber of commerce) and my director of transportation (who had been secretary of the AFL-CIO) to work side by side. I asked them to go around the state and listen to business and labor and education and civic leaders and come back to me with a five--year plan for the state of Ohio--a notion of what our goals as a state should be five years out and beyond. I chose five years because that was longer than anyone's term in office in state government. They came back with a cardinal principle that served me well and continues to be very much on my mind in leading Colorado College. We should build on our strengths. We were a manufacturing state. We had to figure out what kind of changes were going to impact manufacturing. We were a mid-western state in the heart of the "rust belt." We had to understand what kind of strengths we had.

Two strengths stood out in that strategic plan. The first was location. We learned that Ohioans in huge numbers fled our state to go on vacations to Michigan, (shame on them) to Kentucky, to West Virginia. If we could keep 50% of these Ohioans home for a vacation in Ohio where they would spend their dollars versus going to one of our neighbors we could triple the state tourism dollars. So we identified some tourism attractions like the best roller coasters anywhere in the country (Cedar Point) along with Lake Erie and a variety of real assets that the state had never promoted before.

Another strength that we had to build on was education.

My challenge was to say to our public universities, "Don't try to be all things to all people, but pick areas where you can be a national and international leader." Even in the midst of the budget crisis, we appropriated money to challenge institutions to create centers of excellence related to their particular strengths. Polymer Science at Akron University and Case Western Reserve University became parts of such a center. Locations take on a distinction of their own. My example would be the manufacturing area, Akron, Ohio, which was the "rubber capital" of the nation and where the Goodyear blimps were built and housed. Well, obviously the rubber industry had undergone a great change with all the imported cars. The challenge was to migrate from skills in rubber to the application of those skills to new materials like polymers, and so what we did was to create a center focused on Akron and Cleveland, Ohio, where in a period of five years we probably generated a thousand firms who worked in aspects of polymer manufacturing and polymer development. Robotics at the University of Cincinnati was important because Cincinnati Millicron and other major manufacturers who worked in the old milling machines were moving into factory robotics in a big way. And science and our universities were vitally important to that transition.

I have the distinction of starting Jerry Springer on his television career. I defeated him in the Democratic primary, and he gave up politics -- at least until recently. I went on after that primary to become governor,

First came a strategic plan to build on our strengths. Second, we used modest investments to incentivize action. Today you are going to be talking about "right to work" and economic development. In Ohio, we didn't have a choice about this -- as you know, it is a very strong labor union state. Manufacturers would choose to leave because they didn't want to negotiate with the auto workers or the steel workers, the machinists, or the rubber workers. So we created a program that would give grants of up to a million dollars for community proposals around labor management cooperation. The first community to come in was Toledo, Ohio – its glass workers and teacher unions, and the city, and businesses had a history of cooperation. But pretty soon we had other urban and metropolitan areas coming in with other proposals for labor management cooperation. Sometimes these were based in universities, sometimes in local Chambers of Commerce; sometimes they were based in the headquarters of the local union. Within two years I had labor leaders going with me on trade missions to China to talk about why it was important to invest in Ohio.

Another challenge was how to promote innovation. How do you stimulate the movement of new ideas and new technologies out of universities labs and into the community? Remember this was 1983, not 1993 or 2003! You have to find a way to bring business and universities together in intimate ways so that business leaders know the skills embedded in the universities. And university faculty are encouraged to do something beyond producing an interesting paper or a new idea -- to think about how that may have a fit in the market place development of a particular product. So we accelerated the development of business-higher education collaborations back in the 1980's. We made sure that businessmen dominated those collaborations because our goal wasn't an academic exercise -- our goal was a market stimulating exercise.

Well, enough of what we did in Ohio! For Colorado, or any state to think about its future, you have to think strategically. This is not about where we want to be one or two years from now. You have to think five or ten years down the road. How does Colorado position itself vis-à-vis the rest of the country? It cannot be a "me too" plan. It has to be a plan that builds on the distinctive assets of this state – the natural assets, locational assets, human talent, and so on. And there have to be modest investments in areas where you believe you have an edge. Those modest investments can come from the state, they can come from local communities, they can come from the private sector, but you cannot do it without making some kind of investment.

I am going to give you two examples of concerns I have about the future of Colorado from my first year as a resident (you can dismiss these completely because I am such a neophyte!) The first has to do with higher education. This state needs to come to a much keener appreciation of the value of higher education for its future. (Applause). I believe that in the present economy, unless Colorado sustains and strengthens need-based financial aid for students, we are going to fall behind other parts of the country.

The challenge in this state is that there has not been a great tradition of going on to college. This was not a well-established tradition even in Ohio, or at least not as established as we wanted it to be. But by comparison Colorado lags. This is particularly a challenge for young people who come from families who have not had experience with college before, families with very limited income means. When they see a headline about a 13% increase in tuition or whatever, they don't know what the financial aid message is. There has to be a powerful message that starts early-- I think middle school is not too early -- to say to young people, "If you have the capability, you will be able to go to college." That commitment it seems to me is vital for the future of this state.

My second concern related to the fact that I believe the future of Colorado is going to be with small business. I can't imagine that there are large businesses that are going to dominate the future of this state. It's going to be a very entrepreneurial and diverse small business sector, including free agent businesses. This may be as small as one person who sets up in his/her house in Manitou Springs or wherever and with online capability can be a life coach or can be a consultant. I believe there has to be a way for small businesses to get together and buy health insurance competitively. I do not understand why in Colorado it is not possible to do this. The Chamber of Commerce in Cleveland is strong and viable because in the 1980's they developed a plan to provide access to health insurance for small businesses. You had to become a member of something called a Council of Small Enterprises to get that insurance. Well, the Council of Small Enterprises is the most viable part of the Cleveland Chamber! While big business withered, small business thrived. And there are 3,600 small businesses that get their health insurance cooperatively through C.O.S.E. at competitive rates. This is something that ought to be possible in any state, including Colorado.

I believe that in the present economy, unless Colorado sustains and strengthens need-based financial aid for students, we are going to fall behind other parts of the country. The challenge in this state is that there has not been a great tradition of going on to college.

Just two last thoughts about where public policy can make a difference for the future of this state. The political process only works if we are really involved in it -- not sitting up in the grandstands offering advice from time to time -- but really involved in it. In my successful race for governor my lieutenant governor candidate was a man named Merle Schumaker (30 years in the legislature – impossible today -- 18 years as chairman of the finance committee, he knew state finances better than anyone else in the state). We're on a little plane flying from Cleveland, my hometown, on our way to Chillicothe, Ohio, on a beautiful April day. It was like Colorado weather (laughter) cloudless sky, just gorgeous, and we are at about 5000 feet. I looked over to Merle who is just sitting there white knuckled. All of a sudden it occurred to me that he had never flown before.

I said, "Merle, this is safer than driving." And he said, "Well, people have told me that." But his knuckles didn't relax at all. I said "Why are you so uptight?" He said, "Dick, I have never been in a vehicle yet where sooner or later I didn't have to get out and push." And the point I want to make is this -- for Colorado to realize the kind of future any of us want for her, sooner or later we've got to get out and push.

COLORADO'S LEGISLATIVE TERM LIMITS BOON OR BOOMERANG?

John A. Straayer is Professor of Political Science, Colorado State University. He is the author of a dozen books including THE COLORADO GENERAL ASSEMBLY, University Press of Colorado, l990 and 2000. Professor Straayer is currently studying the impact of term limits on the Colorado legslature. The study is part of a larger national study of term limits and involving the National Assocation of State Legislatures, the Council of State Governments and the Legislative Leaders Foundation along with academic investigators at several universities. Straayer teaches state and local politics and legislative politics. He has supervised his deparments internship in the Colorado legislature for more than two decades.

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There's been no shortage of commentary on the likely consequences of term limits. Most fundamentally, term limit promoters wanted an end to careerist politics and what they alleged were its associated evils: non-competitive elections, invincible incumbencies which worked against the entry of women and minorities, non-responsive and non-responsible lawmakers, tight legislator-lobbyist ties, self-serving pork barrel politics. Term limits, some said, would open up the cozy closed systems and give us lawmaking by "citizens" rather than "politicians."

Critics worried that term limits would usher in a host of negative and unwanted consequences; the limits would make government worse, not better. Among the predicted negatives were a loss of institutional and policy memory and civility, enfeebled leadership, a shift of power from the legislative branch to the executive and to staffers and lobbyists, growth rather than shrinkage of the pool of political careerists, procedural chaos, and a flow of policy mistakes.

So, who was correct? Since the first cohort of Colorado's legislators was term limited in l998, we've cycled through three post-term limit elections and five legislative sessions. What has happened? What follows is what we have learned thus far; the inquiry continues.

The Research

This work was done in connection with The Joint Term Limits Project, a cooperative endeavor of the National Conference of State Legislatures, the Council of State Governments, the Legislative Leaders Foundation, and academic personnel from several universities.

The findings are based upon more than 75 personal interviews and scores of impromptu conversations with legislators, former legislators, lobbyists, staffers, members of the media and others. One mail questionnaire produced additional perspectives on the consequences of term limits from selected "knowledgebles" who have

observed the legislature for a minimum of ten years. The General Assembly has been observed directly for more than two decades, and we have examined and used such available public record materials as legislative calendars, journals, status sheets, and election records. We have followed closely media reporting on the legislature and its members.

Colorado's term limits have done precious little to advance the aims of their proponents, but have created some of the conditions feared by critics.

Colorado's Term Limits

Colorado adopted legislative term limits in l990. Lawmakers are limited to eight consecutive years in a single chamber, although they may then serve another eight in the second house or lay out for four years and start again. The limits are constitutional. They were placed on the ballot by way of the initiative process and passed with 71 percent of the vote.

As with term limits in almost two dozen other states, and like the revenue and expenditure limits which Colorado and other states have adopted, Colorado's limits swept in during the anti-incumbency and anti-government wave of the late l980's and early l990's. Popular irritation with national politics, national institutions and national politicians may have been the catalyst, but it was the states with the initiative process which caught the fury of institutional change.

Term Limits Consequences, So Far

Elections

What has occurred or, perhaps more pointedly, what has not occurred in the post-term limits electoral arena should be a major disappointment to devotees of the limits. The turnover rate is basically unchanged: incumbents lose at the same very low rate, as before many seats are uncontested, after an initial surge the number of open seats and primary races are about the same as before, and campaign spending appears to be as high as ever.

The turnover rate in 1195-96 was 34 percent in the House and 26 percent in the Senate. In 2003-04 it was 32 percent in the House and 29 percent in the Senate. The rates in both chambers jumped into the mid-thirties after the l998 and 2000 elections but seem now to have settled back closer to the old rates.

The number of general election incumbent losses has not changed in any significant fashion. In l994, the year when Republicans made major gains all across the nation, nine General Assembly incumbents lost. But in l996 the number was just two; there were none in l998 and then three in both 2000 and 2002. We can say that thus far term limits have done nothing to increase the vulnerability of incumbents.

Many seats were uncontested both before and after term limits, with the numbers virtually unchanged. Over the past four elections in the House, the numbers were l8 in l996, l7 in l998, 21 in 2000 and 20 in 2002. Senate numbers for l996 through 2002 were, respectively, six, three, two and, most recently, five.

Term limits did boost the number of open seats in both l998 and 2000. But the number in 2002 was very much like that in the pre-limit l996 election, namely, l5 in the House in both l996 and 2002. The Senate numbers were four in l996 and seven in 2002. Paralleling the l998 and 2000 increase in open seats, the primary numbers have gone up in the House from eight in l996 to l6 in l998 and l5 in both 2000 and 2002. Most are in open seats as one would expect. In the Senate the number of primaries dropped from six in l996, five in l998, six in 2000 to just one in 2002. Again, most were in open seats.

The conclusion? Of necessity, the number of open seats, and along with them the primaries, rose some in the two immediate post-limits elections. But the increase was not dramatic and the old patterns seem to have settled back in. And overall legislative turnover, too, remains close to its historic pattern.

We lack comparative data on campaign expenditures. But both the scattered evidence we've seen in the media, and the testimony of those interviewed suggests that costs are going up, not down, as candidates are coming to see campaign law contribution limits as the minimum lobbyists and the groups they represent should "voluntarily" cough up. Our mail questionnaire responses paint the same picture; 82 percent of the respondents see candidates as more aggressive in seeking campaign funds, and more than 90 percent see greater leadership emphasis on campaigns and elections.

Political Ambition

Term limit proponents wanted, most of all, to clip careerism and restore the world of the citizen legislature. Did they? Not in Colorado; indeed, following the pattern seen elsewhere in the country, the pool of the politically ambitious has grown, not shrunk.

Ninety-seven legislators departed the General Assembly ahead of the four election cycles leading up to the l998 impact of the limits. Of these, 29 percent sought further elective office and 43 percent retired from politics. In the three post-term limits election cycles, 58 legislators were term limited; 53 percent ran for another office; and just 25 percent retired. Thirty-six more left the legislature without being term limited since the l998 impact, and a whopping 64 percent of these ran for another office with just fourteen percent retiring from politics.

The world of political ambition seems to be growing, not shrinking as our lawmakers, tasting elective office, just don't want to go home.

Legislative Experience

For better or worse, term limits have depressed the experience level of members of the General Assembly, in the House especially. For term limit supporters, this is surely for the better. But critics say, as do most of the knowledgebles we've interviewed, that there are serious down sides to this shrinkage in legislative experience. Fewer members are familiar with the history of policy, fewer fully understand potential ramifications of new policy, members operate at an informational disadvantage vis-a-vis the governor and his staff, lobbyists and the legislatures own staffers, they are unfamiliar with unwritten legislative norms and customs which are essential to the smooth and civil functioning of the institution, and they're personally less familiar with, and thus often less tolerant of, each other. There is an absence of the long-term veteran, the "policy champion," who, over a decade or more, masters the substance of a policy area, educates colleagues, and builds support for well-crafted, problem-solving policy.

Responses to the mail questionnaire paint the same picture. Eighty-four percent of the respondents asserted that members now have less knowledge about both statewide issues and legislative operations, 70 percent say members now have less support for the institution, and 73 percent claim that the governor has more power than before.

A few numbers will serve to illustrate the loss of experience. In l993 the average years of experience of a House member was 4.20 years as the session began; in 2003 the number was 2.48. In the Senate, the number, including both House and Senate time, was 8.03 in l993 and 8.46 in 1997 and 6.86 in 2003. The disappearance of the long-time veterans is demonstrated by these figures: in l993, 23 House members had been in the chamber for six years or more and in 1997 it was 18; in 2003 just eight had. In the l993 Senate, 15 had combined House and Senate time of 10 years or more and in 1997 it was 18. In 2003 that number was just nine. The "old vets" who once served as role models and provided valuable behavioral cues are no more.

Demographics

Reformers said the forced exit of careerists would make room for a more diverse membership, more women and racial and ethnic minorities. That has not happened. In l996 the House had 26 women members; in 2003 it was 24. The l997 Senate had a female membership of 10; in 2003 it was nine.

The story with respect to ethnic minorities is a little better, but not by much. In l997 there were five Hispanic House members and that number grew by just one as of 2003. Both the l997 and the 2003 Senate had two Hispanic members. The African-American contingent in the House grew from one to three from l997 to 2003, and from one to two in the Senate over that same period. There are changes to be sure, but the changes are slight.

Our data on member age and occupation are limited to members who were forced out in l998 and their replacements. Overall the occupations changed little. Lawyers, persons engaged in small businesses and real estate, and administrative types were replaced a retired state trooper, an auto salesman, more businessmen, and a farmer. The titles changed, but the sector of the workforce from which they were drawn did not. Similarly, age changed very little. Those limited from the House averaged 57.83 years. Their replacements averaged 5l.6l; adding the eight allowable years and factoring in some earlier departures provides about the same number. And it was much the same in the Senate.

Does all of this matter? It matters only in the sense that, contrary to the expectations of the reformers, the General Assembly is no more and no less diverse after term limits than before.

Leadership

Here is where we see a major impact. Leadership is both much less experienced and much weaker. The two House Speakers before term limits were Chuck Berry who served in that position for eight years, and Carl "Bev" Bledsoe who was Speaker for ten years. Since l998, Speakers Russell George, Doug Dean and Lola Spradley have been two-year Speakers. In the Senate, long-term veteran Ray Powers served as President of his chamber for two years, as did Stan Matsunaka and, now, John Andrews. These Senate Presidents were preceded by Tom Norton (six years), Ted Strickland (10 years) and Fred Anderson (seven years).

Quite apart from their personal qualities and styles, two-year leaders are not possessed of the political clout and can't provide the continuity of leadership of their predecessors. Leadership contests are now continuous, the quest for positions beginning just as soon as incumbents are selected. As there are more leadership slots open more often, an enlarged slice of the membership sees itself as the next leaders. Further, as soon as leaders are picked, they become lame ducks; their power to exercise discipline and impose sanctions for misguided behavior is limited. They're soon gone and their colleagues know it. And, with term limits the leaders themselves are without the long-term experience which steeps one deeply into the norms of the institution.

Sixty-two percent of our mail questionnaire respondents saw a diminished willingness of members to follow leadership. Seventy-two percent assert that those seeking leadership posts are less willing to move through an established leadership ladder, and 77 percent see members planning leadership quests early in their careers.

Committees

In l993 House committee chairmen had spent a combined 74 years in the legislature; in 2003 the number was 48. The drop in the Senate was from an aggregate of 88 years to 73–clearly not as steep a decline. Colorado has long had a relatively high chairman turnover rate, but that turnover is a bit higher now. In the House it was five out of ten from l993 to l995 and four of 11 from 200l to 2003. In the Senate it was three of l0 from l993 to l995, and l0 of l0 from 2001 to 2003, but with change in party control.

Chairman turnover, thus, is not much changed from before term limits, but the chairs do have less legislative experience. Does it matter? According to interview respondents and direct observation, it does. Committee chairmen in the pre-term limit days were generally very familiar with the subject matter, the bills, and the interests which came before their committee and were adept at maintaining committee demeanor and controlling the pace of the work. Some still are, but some are not. There have been episodes of committees becoming chaotic and extremely contentious, and chairs losing control or violating procedural norms.

These views are reinforced by mail questionnaire "knowledgeble" responses; 84 percent see committee behavior as less collegial and courteous, and 70 percent say committee members are less knowledgeble about the issues before their committees.

The prime task of legislative committees is to study proposed bills closely, screen out bad bills and perfect others before they go to the floor. Some term limit critics have predicted that with less experienced committees more bad bills would make it to the floor and more would thus be picked apart and die there. That, however, seems not to have occurred. Basically, almost no bills were killed on the chamber floors before term limits and very few are now. For example, in l990, just l8 of the 547 bills were killed on the floors–nine in each house. In 2001, there were 652 bills. Twelve died on the floor of house of origin and just one in the second chamber. In 2002, with 714 bills, five died on the floor in each chamber.

When bills die in the Colorado legislature, and about half normally do, they most always die in committee. That was true before term limits, and it remains the case. So as a measure of the quality of committee work, a bill "death on the floor" count tells us nothing. Still, testimony by knowledgebles and direct observation indicate a post-term limit decline in the quality of committee process and product.

Budget Process

Arguably, budgeting is the central, most consequential, most important activity of a legislature. In Colorado, budgeting has historically been a prime base of legislative power within the separation of powers arrangement. Within the legislature itself, the six-member Joint Budget Committee (JBC) has been the center of the budget process. Term limits appear to have strengthened the influence of the JBC staff as well as the committee itself within the legislature but weakened the legislature's budget power vis-a-vis the executive branch.

The JBC has suffered a steep decline in experience. In l997 the six members' aggregate years of legislative experience was 57 years, with 28 years in total on the JBC. In 2003 these numbers fell to 27 total legislative years and just eight on the committee. Budgeting is always complex and difficult, and it was all the more so during the past couple of deficit years. In this context, the staff, sporting much more budgeting experience than the committee members it serves, has gained influence.

Similarly, the legislature itself is less experienced. The budget is made across the street from the capitol, and as several interviewees commented, most members "haven't a clue" about the budget. The full legislature seldom makes major alterations to the budget as it comes over from the JBC, but now, with the budgetary complexity, with TABOR, with amendment 23, with the deficit, and with a less experienced general membership, the budget is what the JBC says it is.

Except for the governor. Partly because of the term limit impact on the legislature and the JBC, because of term limits, and partly because of the political style of the current governor, the executive has gained influence on budget matters. The governor and his budget director are tight with information. Interactions among executive branch administrators and the JBC, its staff and the legislatures' standing committees, is watched and controlled by the governors office. The governor makes his budget preferences known and employs the veto threat and the veto itself to push budget decisions in his preferred direction. Governor Owens' vetoes of Long Bill "headnotes" (the budget line definitions) is a prime example. Further, with Republican majorities in the House and the Senate and on the JBC, the governor can and does employ the party tie to send his messages and his demands. Colorado budgeting is not what it was just a few years ago.

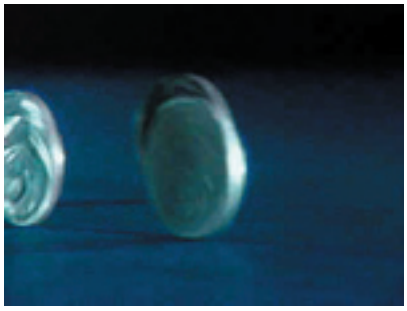
Legislative Power Relationships

Following from what is stated above, it is correct to surmise that the legislature has lost influence relative to the governor. Some of this is attributable to the style of the current governor, much of it is a product of the revenue authority stripped away by TABOR, and some of it tracks to Republican control of both legislative chambers and the governorship. Some also goes to the diminishment of leg-

islative experience generally, on the JBC, and in leadership. The depth of policy knowledge and the continuity in membership and leadership is significantly less now and thus, as an institution, the legislature is less stable and assertive. Additionally, the executive speaks with a single voice and commands the public square almost at will; not so for the legislature. In the mail survey, 73 percent of the respondents viewed the governor as stronger since term limits.

Also of significance is the need for legislators to be looking toward their post-limit political futures. One place to go upon leaving is into an executive branch position, and many have done so. And that means, of course, that you don't cross your governor while in the legislature. There appears, thus, to be some reluctance among members to assert the prominence of their institution in legislative-executive contests.

Critics of term limits worried that the legislature would lose power to the lobby corps and to its own staff. Interview testimony and observation suggest that this has, indeed, occurred, but not to the extent that some feared. Seventy-two percent of those surveyed by mail suggested that the lobby is now stronger. But mostly, the lobby corps has just changed. Some of the old-timers who relied for access on their close ties with veteran leaders are now at a disadvantage. Newer, younger, less experienced lobbyists enjoy a more "level playing field."



To some extent ethical standards seem to have taken a beating, as members may be prey to altered versions of past agreements, past events, past experiences with policies and programs. Some lobbyists complain that candidates and members apply excessive pressure for campaign contributions, and some members complain about excessive lobby pressure and even threats. Indeed, during the 2003 session, House and Senate leadership established a committee of lobbyists to study the perceived problems and make recommendations.

The influence of the legislative staff appears to have increased some, but mostly with respect to process. Post-term limit sessions have witnessed a greater need for staff help in explaining rules and procedure. More and more requests are made for staff help in responding to constituent queries. But true to the decades-old non-partisan tradition, Colorado's staffers have struggled to maintain political and policy neutrality and stick to information and process assistance.

The bottom line? Lobby influence has grown, but not greatly. Lobby corps dynamics have changed. The JBC staff is more influential with regard to the budget but otherwise, the staff is more engaged in process questions but not in matters of policy substance. The governor is stronger, the legislature weaker.

All of our information sources, our interviews, the responses to the mail survey and direct observation suggest heightened partisanship and diminished behavioral civility since term limits went into effect.

Partisanship and Civility

All of our information sources, our interviews, the responses to the mail survey and direct observation suggest heightened partisanship and diminished behavioral civility since term limits went into effect. Interview respondents commented often that with long legislative tenure members would come to know each other personably, work together, and over time sharp partisan differences would soften. Partisanship would decline and civility grow. Term limits clearly make this less likely.

In the mail questionnaire results, 78 percent said members were less courteous while not a single knowledgeble observer said courtesy had increased. Similarly, 84 percent saw increased partisanship while just one respondent perceived less.

While term limits may not be the sole source, there are other indications of heightened partisanship. The Republican Congressional redistricting blitz during the final three days of the 2003 session and its attendant harsh rhetoric and controverly provide, perhaps, the most visible example.

One of the most basic questions to ask about institutional change is whether public policy is any different as a result.

Public Policy

What little data we have suggests that policy content has not been impacted by term limits in a major way.

For the final pre-limits session and the first post-limits session, we looked at selected interest group support scores to see how the policy orientation of those who were limited, and then their replacements, fit with their respective party caucus policy preferences. The results showed that while the parties clearly differ, and differ greatly, neither the limited members nor their replacements were out of step with their party caucus colleagues. In short, at least with the l998 election, term limits did not usher in new members with discernibly different policy orientations. More time and more data may or may not confirm this initial observation.

The Legislative Process

It's been noted that leaders are weaker, the governor stronger, partisanship is up and civility down, both the lobby and staffers are a bit more influential and political ambition persists. Two additional points merit attention. There is broad consensus that post-limit lawmakers are less knowledgeble about statewide issues and problems. This is the view of many of those interviewed, a perception confirmed by the mail questionnaire. Indeed, a full 84 percent of the respondents saw post-limit legislators as less knowledgeble about both state issues and legislative operations. A majority, too, felt that the new ones were less apt to follow their party floor leaders and roughly half said members now are less likely to follow parliamentary procedure.

Some observers have speculated that the volume of legislation would increase as new term limited members would seek to make their mark quickly, knowing their time was short. Colorado's legislature imposes a five-bill limit on members, with some exceptions, so bill volume constraints will work against any explosive growth in volume. Data compiled by Legislative Legal Services staff members show some modest post-limits upward bill volume creep, but not much. Similarly, the bill pass/kill rate has been relatively stable. And our own tabulations of the resolution flow shows a similar pattern, namely, no significant change.

Summary observations.

Colorado's term limits have done precious little to advance the aims of their proponents but have created some of the conditions feared by critics. Careerist politics and political ambition remain. The institution is no more diverse. Elections remain costly, and lobbyists and staffers are a bit more influential. Members are less experienced, know less about statewide problems, are more partisan and less civil, the process is less orderly and the institution has lost power to the executive branch. Perhaps the only bright side of term limits is, as a number of interview respondents commented, "at least we got rid of a few bad ones."

One genuine bright spot has been the response of the institution, its staff especially, to the new conditions. Notebooks have been prepared for leaders and committee chairs on relevant constitutional and statutory provisions, internal rules, dates and deadlines and more. Special situations and useful responses to them have been written out. New member orientations have been greatly expanded and enriched, complete with practice floor and committee drills. In-session refresher sessions have been scheduled, although member attendance has been poor.

Our bias is toward a legislative institution with the will and capacity to act as a strong and independent policy body, addressing the state's major problems. For us, that requires effective leadership, a knowledgeble and experienced membership, effective committee bill-screening, fair and orderly procedures and civil, cooperative, behavior. We would like to assume that members of the Colorado public share this view, and, to the extent that they do, it is important that there is broad understanding of the consequences of term limits for our state's policy body.

RIGHT-TO-WORK LAWS AND BUSINESS ENVIRONMENTS: AN ANALYSIS OF STATE LABOR POLICY

Raymond Hogler is a Professor of Management at Colorado State University in Fort Collins. He teaches in the areas of employment relations and human resource management. He received Ph.D. and J.D. degrees from the University of Colorado and taught at Pennsylvania State University before coming to CSU. His articles on right to work have appeared in the University of Colorado Law Review and the Labor Law Journal. His book titled *Employment Relations* in the United States: Law, Policy, and Practice will be published by Sage in early 2004.

Under federal labor law, states can prohibit compulsory union membership clauses in collective bargaining agreements. The passage of "right-to-work" (RTW) laws may confer a perceived economic advantage on those states having such laws. Because the legislation negatively affects union density, it arguably creates a more favorable business climate and job growth. This article uses a cross-sectional model with data on states to analyze the effects of RTW on unions and business environments. We include the idea of "social capital" as an element of labor-management relations. Our findings indicate a negative correlation between a state's level of social capital and managerial opposition to unions. Variables representing social capital, managerial opposition to unions, political beliefs, and RTW laws account for between two-thirds and three-fourths of the variation in union density. Further, RTW laws have a substantial negative impact on union density net of the social and political controls. On the basis of these findings, we argue that RTW promotes a competitive environment based on lower labor costs. The laws may thus hinder the objectives of our national labor policy and state economic development strategies that could enhance employment conditions for employers and workers

Under our federal system, states can pursue competitive labor market strategies to attract economic development and raise levels of employment for their citizens. Differences in per capita income vary substantially across the continental United States, ranging from a high in Connecticut of $42,706 to a low in Mississippi of $22,372 (Bureau of Economic Analysis, 2003). Employment growth also shows marked disparities, increasing between May 2002 and May 2003 by over two percent in Hawaii and New Mexico but declining by more than one percent in Missouri, Massachusetts, Connecticut, and South Carolina (Bureau of Labor Statistics, 2003a).

While various factors can influence regional economic outcomes, one of the most controversial legal policies involves right-to-work (RTW) laws which prohibit compulsory union membership. A large body of economic literature examines the effect of RTW on labor markets, growth, and wages (see Moore, 1998, for a review). The analytical framework typically assumes that RTW states have lower union membership density and lower wages, and it follows on this model that lower wages will attract employment. Empirical studies find some support for the theory (Dinlersoz &

Hernández-Murillo, 2002). Conversely, other research disputes the argument that RTW produces beneficial economic results in general (Holmes, 2000). Despite the controversy surrounding RTW, 22 states have enacted such laws, and one state — Colorado — is a "modified" RTW jurisdiction (i.e., workers must approve union security in a special state election). Oklahoma is the most recent state to adopt RTW, which it did by referendum in 2001 (Hogler and LaJeunesse, 2002). Proposed legislation to enact a federal RTW law was introduced in the U.S. House of Representatives in January 2003 (U.S. Congress, 2003).

This article explores the RTW debate from a business policy perspective. We first propose a model of union membership density on the state level. Next, we empirically analyze the different factors associated with membership levels, focusing particularly on the effects of RTW laws. The analysis confirms previous research that RTW laws negatively impact union density. Our findings also suggest important correlations between managerial opposition to unions and a state's level of social capital. Thus, the presence of a RTW law may indicate a conflictual labor relations environment characterized by lack of trust, cooperation, and mutual agreement about work processes and outcomes. We conclude with a discussion of the implications of RTW for managerial practices and legal policies affecting employment relations.

Modeling State Union Density

The ongoing decline of American unions has prompted speculation about the labor movement's future viability (Bennett & Kaufman, 2002; Rose & Chaison, 2001; Troy, 1999, 2001). In 2002, total membership density was 13.2 percent of the nonagricultural workforce, with only nine percent in the private sector (Bureau of Labor Statistics, 2003b). Since the enactment of the National Labor Relations (Wagner) Act in 1935, federal policy has expressly promoted collective bargaining as a means of reducing industrial conflict and promoting equality of bargaining power between employers and employees throughout the country (Kaufman, 1996). Although those policy objectives remain unchanged, levels of union influence in both regional and sectoral labor markets vary considerably and impede standardization of wages and working conditions. Indeed, one of the defining characteristics of unionization in this country is the substantial difference in density rates among states.

Recent data, to illustrate, show that union membership in North Carolina stands at a low of 3.2 percent of the work force, while the rate peaks at 25.3 percent in New York (Bureau of Labor Statistics, 2003b). Such differences raise important questions about the nature of the U.S. labor relations system. One of the central issues in that debate is the role of right-to-work laws. The question is whether the legislative context for union organizing affects membership outcomes, or if both density and the legal environment reflect underlying tastes for and beliefs about unions. Our analysis shows that RTW legislation is linked to lower levels of union density across states even after controlling for social, economic, and ideological factors, with states having such legislation exhibiting lower union density by 6.6 percentage points, ceteris paribus. The fact that such laws indeed matter to labor organizations underscores the importance of evaluating the congruence of those statutes with basic employment policies.

The overall prospects for union organizing depend upon such variables as labor market and worker characteristics, the response of employers to union activity, government regulation, the prevailing political ideology, and the social context in which the organizing occurs. Previous studies have typically adopted a national or comparative approach (e.g., Lipset & Katchanovski, 2001; Rose & Chaison, 2001), and they provide valuable insights into the causes of long-term union decline. However, some of the factors which affect union density, including right-to-work laws, are better measured cross-sectionally. In order to simultaneously control for relevant factors and to discern their effects net of each other, we take a cross-sectional approach using states as the units of analysis. Taken together, employer opposition, RTW legislation, political ideology, and social capital components explain most of the state difference in union density.

Employer Opposition

An influential theory attributes union decline to the vigorous, and sometimes illegal, activity of employers to discourage unionization of their firms. Beginning with the work of Harvard law professor Paul Weiler (1983), the union opposition thesis has attracted considerable support in the industrial relations literature (Freeman, 1992; Freeman & Medoff, 1984; Kleiner, 2001; Rose & Chaison, 2001). Weiler(1983) argued in an influential article that "[p]erhaps the most remarkable phenomenon in the representation process in the past quarter-century has been an astronomical increase in unfair labor practices by employers" (1983: p.1778). Although surveys find there is a strong desire for some form of representation among nonunion workers (Freeman and Rogers, 1999), unorganized workers may perceive that any attempt to unionize will lead to managerial intimidation and retaliation. The economic incentives for employers to oppose a union include lower compensation costs and greater profits, even if unionization improves the firm's productivity (Lazear, 1998). Because sanctions under the National Labor Relations Act are insufficient to deter unlawful action, managers will engage in the "high-payoff strategy" of resistance, and the intensity of managerial opposition arguably accounts for about 40 percent of the decline in private sector union density (Kleiner, 2001).

For these reasons, the degree of employer hostility to unions is a key explanatory variable in union penetration. Following Freeman and Medoff (1984), we use unfair labor practice charges as an

indicator of employer opposition to unions. To measure union opposition within states, we compiled an index of opposition for 1980-1990 using National Labor Relations Board annual reports. The index assumes that employer opposition arises primarily in response to organizing threats. Accordingly, we calculate a ratio of employer hostility by comparing the number of election petitions filed in the state to the number of unfair labor practice charges filed. As Table 1 shows, the opposition index reveals substantial differences among states. In West Virginia, for example, employees and unions filed 7.65 unfair labor practice charges for every representation petition. In North Dakota, the ratio is 1.78 charges per petition. We expect that the opposition index will be negatively correlated with union density.

TABLE 1
State Ratio of Unfair Labor Practice Charges to Election Petitions, 1980-90

STATE	ULP	ELECTION PETITIONS	RATIO
West Virginia	4,400	575	7.65
Indiana	11,941	1,829	6.51
North Carolina*	3,817	593	6.44
Colorado†	4,587	748	6.13
Texas*	8,944	1,531	5.84
Nevada*	2,951	505	5.84
Tennessee*	6,396	1,148	5.57
Kentucky	5,132	956	5.42
Georgia*	5,784	1,094	5.29
Oklahoma*	2,306	442	5.22
South Carolina*	1,421	278	5.11
Mississippi*	1,850	364	5.08
Louisiana*	2,630	519	5.07
Connecticut	5,769	1,044	4.95
Ohio	17,830	3,843	4.64
Virginia*	4,123	893	4.62
Wyoming*	398	91	4.37
Arizona*	3,291	755	4.36
Nebraska*	1,151	268	4.29
Maryland	4,850	1,152	4.21
Massachusetts	8,454	2,013	4.20
Rhode Island	1,105	263	4.20
Missouri	9,461	2,276	4.16
Michigan	15,732	3,852	4.08
California	34,461	8,492	4.06
Florida*	6,970	1,722	4.05
Illinois	16,551	4,097	4.04
Pennsylvania	17,072	4,281	3.99
Wisconsin	6,375	1,599	3.99
Vermont	450	114	3.95
Arkansas*	1,600	409	3.91
New Mexico	1,099	288	3.82
Kansas*	1,809	476	3.80
Washington	6,789	1,801	3.77
Alabama*	3,176	867	3.66
New Hampshire	589	165	3.57
Maine	956	274	3.49
Alaska	1,152	342	3.37
New York	23,446	7,232	3.24
Delaware	603	186	3.24
New Jersey	9,910	3,218	3.08
Oregon	2,899	1,000	2.90
Iowa*	2,097	750	2.80
Hawaii	1,395	531	2.63
Idaho*	767	297	2.58
Montana	1,100	437	2.52
Utah*	766	308	2.49
South Dakota*	228	102	2.24
Minnesota	3,157	1,471	2.15
North Dakota*	271	152	1.78

Legal Environment

The presence of a "right-to-work" law indicates an unfavorable legal and political environment for unions and a favorable climate for capital investment (Abraham & Voos, 2000). In Section 14(b) of the 1947 Taft-Hartley amendments to the National Labor Relations (Wagner) Act, Congress explicitly conferred authority on states to outlaw contractual agreements requiring compulsory payment of union dues from individuals covered by the agreement. Right-to-work legislation tended to emerge in the south and the west, where unions have less political and economic influence (Gall, 1996). For this reason, unions have long insisted that RTW hampers their ability to organize workers. In response, proponents of RTW argue that the correlation between low union density and right-to-work law is spurious because both reflect the prevalence of an anti-union ideology (for discussions, see Hogler and Shulman, 1999; Moore and Newman, 1985). This argument has made it more difficult for unions to claim that politicians are favoring management over labor if they pass right-to-work legislation. Indeed, one of the more enduring issues debated in the empirical literature on right-to-work and union density concerns the problem of distin-

guishing between the effect on union density of right-to-work laws and differences in state preferences about unions (Moore, 1998). Our use of controls for both social attitudes and political ideology in a union density equation allows us to assess the impact of right-to-work laws net of the effects of regional differences in the ideologies and cultures which can affect unionization.

The Social Context of Union Organizing

An emerging body of literature addresses the prospects for revitalization of the American labor movement (e.g., Turner, et al., 2001; Wheeler, 2002). One proposed strategy for renewal is based on the idea of "social movement unionism," which focuses on higher levels of member involvement and political activism. Scholars advancing this position contend that the new strategy will be "aimed at organizing the unorganized and taking political action to strengthen union influence. The ultimate objective is to reform labor laws with new protections for workers and unions and to reform the institutions of industrial relations" (Turner & Hurd, 2001, p.23). The emphasis on social aspects of unionism offers insights into the issue of regional density. If civic activism affects union participation and support, there is presumably a relationship between "citizenship," broadly defined, and the success of a rejuvenated labor agenda (Johnston, 2002). We use the construct of social capital to examine correlations between state union membership density, right-to-work laws, and the social context of organizing.

The notion of social capital was first deployed by James Coleman (1988) to analyze individuals' participation in social networks. The theory is sufficiently general and elastic that it has been applied across the social sciences, but for that reason, its validity as a construct has been questioned (Arrow, 2000). Nonetheless, some dimensions of social interaction, such as union membership and political affiliation, have been used in a model of right-to-work voting behavior (Gall, 1996), and particular components of social capital are useful analytical factors. Adler and Kwon (2002) reviewed more than 20 studies of social capital, and they define the term as the "goodwill" to which individuals or groups have access: "Its source lies in the structure and content of the actor's social relations. Its effects flow from the information, influence, and solidarity it makes available to the actor" (p. 23). That definition fits closely with the general description of social movement unionism sketched above.

Unions are an institutional means of forming social capital since they enable workers to achieve common goals through collective action and overcome problems of "free-riding" (Olson, 1965; Bowles & Gintis, 2002). If unions and social capital are complements, as the foregoing arguments suggest, then the decline in unions over the past three decades would be expected to coincide with a decline in social capital. Conversely, social capital and union density also may be negatively correlated. For example, trust among workers would be expected to increase the appeal of union organizers to engage in collective action (Levi, 2000), but trust between workers and managers might lower workers' demand for unionization. Similarly, other avenues of civic activism may provide sufficient levels of social capital. Attending town meetings, volunteering in the local school, and related kinds of participation might reduce the demand for unions because they promote a social environment characterized by trust and cooperation (e.g., Putnam, 2000). Under those circumstances, high levels of social capital could dampen preferences for workplace organization.

To our knowledge, a social capital variable has not been included in previous studies of union density, although beliefs in the efficacy of group as opposed to individual action could be an important correlate of union density. In this study, we use Putnam's (2000) study of social capital in the U.S. Putnam constructs a measure of social capital across the contiguous states using fourteen indicators to determine a state's level of social capital. By combining these indicators into a social capital index, Putnam ranks the 48 states from a positive score of 1.71 (North Dakota) to -1.43 (Nevada) (data online at: www.bowlingalone.com/data.php3). We utilize both the social capital index and its components in order to gain insight into the ways in which social context can affect union density.

Political Ideology

Putnam's index of state social capital does not directly measure attitudes about unions or politics. Consequently, we include a separate variable to capture political ideology. Liberal and conservative political beliefs are often taken to, respectively, represent positive and negative beliefs about unions and compulsory financial support (Gall, 1988; 1996). Lipset and Katchanovski (2001) measured preferences for social democratic values and found that they are positively correlated with union density. Such research indicates that political ideas are an important dimension of workers' propensities for unionization and should be taken into account in assessing membership trends. Consistent with this line of research, we use the percent of voters in each state who favored the Democrats in the 2000 presidential election as a measure of political ideology (Federal Election Commission, 2000).

Labor Market and Worker Characteristics

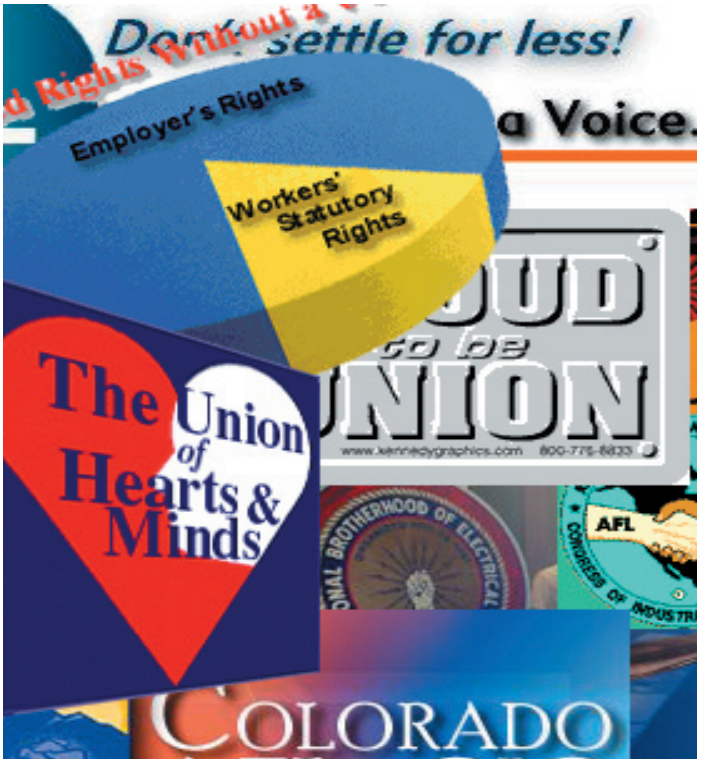
To construct a comprehensive model, we also included variables representing state per capita income, income inequality, income growth, industrial structure, and educational attainment. These variables control for the economic context facing unionization and right-to-work legislation, and they are often used to argue for or against unions and right-to-work laws. The method and results are discussed below.

EMPIRICAL ANALYSIS

Econometric Model

The dependent variable is UNION, the percent of the state's labor force which belonged to a union in 2000. The explanatory variables are ULP, the unfair labor practices index developed by Hogler and Shulman (1999); SOCK, the social capital measure constructed by Putnam (2000); RTW, a dummy variable valued at unity if the state has right-to-work laws and zero otherwise; and DEMO, the percent of voters who voted for the Democratic candidate in the last presidential election. A variety of controls for labor market and worker characteristics are also included, represented by the vector X. The units of analysis are the 48 contiguous states, i (SOCK is not available for Hawaii and Alaska). The initial model to be estimated is then given by the following equation:

Union symbols



Descriptive statistics for dependent and explanatory variables are presented in Table 2. The correlation coefficients listed in Table 3 show an interesting set of relationships among the explanatory variables. SOCK is negatively correlated with both RTW and ULP. The strength of these correlations indicates that the social capital index is successfully capturing social attitudes and actions which favor unions. The correlations further suggest that SOCK would be positively associated with union density but, as will be shown, this is not the case net of the effects of the other explanatory variables. DEMO shows no strong relationships to the other variables except for RTW. The negative correlation between DEMO and RTW indicates that the effects of RTW on the union are legislative rather than ideological. At the same time, it is noteworthy that ULP shows no correlation with DEMO or RTW. Unfair labor practices seem to cut across the ideological and legislative spectrum even if they are correlated with social attitudes and actions. The strength of these correlations and their correspondence with our assumptions increases our confidence that the variables we are using are capturing meaningful social, ideological, and political forces that can affect union density.

TABLE 2
Descriptive Statistics

SOCK	RTW	ULP	VOTE	DEMO	MTG	UNION	
Mean	0.020208	0.458333	4.216042	0.553677	45.377080	0.191327	11.893750
Median	-0.070000	0.000000	4.070000	0.557500	46.20000	0.187391	11.20000
Maximum	1.710000	1.000000	7.650000	0.685500	61.00000	0.327429	25.50000
Minimum	-1.430000	0.000000	1.780000	0.420000	26.30000	0.102683	3.600000
Std. Dev.	0.781026	0.503534	1.231810	0.065118	8.274756	0.054195	5.320391
Skewness	0.345482	0.167248	0.381648	0.047356	-0.333435	0.243353	0.350311
Kurtosis	2.501713	1.027972	3.138864	2.151390	2.899158	2.377215	2.177428
Jarque-Bera	1.451441	8.001565	1.203807	1.458219	0.909769	1.119332	2.334993
Probability	0.483976	0.018301	0.547768	0.482338	0.634521	0.571400	0.311145
Sum	0.970000	22.000000	202.37000	26.576500	2178.1000	8.227082	570.90000
Sum Sq. Dev.	28.670100	11.91667	71.31575	0.199294	3218.165	0.123358	1330.4080
Observations	48	48	48	48	48	43	48

TABLE 3
Correlation Coefficients

SOCK	RTW	ULP	DEMO	
SOCK	1.000	-0.428	-0.605	0.003
RTW	-0.428	1.000	0.139	-0.521
ULP	-0.605	0.139	1.000	-0.127
DEMO	0.003	-0.521	-0.127	1.000

The issue of simultaneity obviously arises in such regressions, where dependent and independent variables might be endogenously determined in a simultaneous system. However, Hausman Specification Tests rejected the simultaneity hypothesis for all core explanatory variables. Two Stage Least Squares (TSLS) estimates, using a variety of instruments, were implemented to check the robustness of Ordinary Least Squares (OLS) results; TSLS and OLS results converged consistently. The percentage of college graduates among the state's adult population, the percentage of the labor force in manufacturing, government and services, and several income and inequality measures were considered as both potential instruments as well as explanatory variables.

Simultaneity did arise with the measures of income inequality and per capita income as explanatory variables, but the simultaneity control provided by TSLS showed these measures to be insignificantly related to state union density. The concentration of government, services, and manufacturing employment as well as concentration of college graduates were also explored as potential explanatory variables but were found to be insignificant. While superficially surprising, the finding is consistent with other recent empirical studies of union density (Moore, 1998) and reinforces the need to understand the underlying sources of varying union concentration across states.

Results

Initial OLS Regression results are shown in Table 4. Again, these findings were substantively identical to those from TSLS procedures using a range of instruments. The summary statistics show that the equation is robust. Using unconventional but surprisingly revealing explanatory variables, the focal regression with only four core regressors explains 62% of state-to-state variance in union density. RTW is significant within 1%, DEMO is significant within 5%, and ULP is significant within 10%. The signs on all three variables are as expected: RTW and ULP lower union density while DEMO raises it. The social capital variable is negative, but it is difficult to interpret this result since its significance level is so low. In results from an equation which excludes the DEMO variable (not shown), SOCK is negative and significant within 10%. Because the significance of SOCK drops drastically after DEMO is inserted into the equation, it is tempting to conclude that social capital does have an ideological component. However, Table 3 shows that the correlation coefficient between SOCK and DEMO is very low. Putnam's (2000) social capital index does not appear to be robust in a union density equation, perhaps because it is a composite of many different indicators of social attitudes and actions. We therefore ran additional equations using the components of SOCK. The final results of these iterations are presented in Table 5.

TABLE 4
Regression Results
Dependent Variable: UNION

Variable	Coefficient	Standard Error
C	11.92***	4.21
RTW	-6.60***	1.35
ULP	-0.98*	0.49
SOCK	-0.93	0.98
DEMO	0.16**	0.07
Adjusted R-squared	0.63	
Durbin-Watson	2.17	
F-statistic	20.61	
	***	Significant at the 1% level
	**	Significant at the 5% level
	*	Significant at the 10% level

TABLE 5
Regression Results
Dependent Variable: UNION

Variable	Coefficient	Standard Error
C	5.79	7.93
RTW	-6.63***	1.12
ULP	-1.02**	0.47
MTG	-36.93***	10.47
VOTE	24.16**	9.90
DEMO	0.16**	0.06
Adjusted R-squared	0.78	
Durbin-Watson	2.03	
F-statistic	31.16	
	***	Significant at the 1% level
	**	Significant at the 5% level
	*	Significant at the 10% level

Our method was to leave in RTW, ULP and DEMO, and to add in each component of SOCK one by one in separate equations. This showed that the only significant component was attendance at town or school board meetings (MEETING). We then ran equations with RTW, ULP, DEMO and MEETING, and again added in each of the other components of SOCK. This type of sequential testing is akin to that prescribed by Hendry, Pagan, and Sargan (1982).

The result of this approach showed that the percent of the electorate which voted in the 1988 and 1992 presidential elections (VOTE) was the only other component of SOCK which became significant alongside MEETING. Having "served on a committee for a local organization" was also provisionally significant, but inserting VOTE removed its impact. Unsurprisingly, these two civic involvement measures are strongly positively correlated, with VOTE providing the stronger explanatory power. The final equation thus includes the VOTE and MEETING components of SOCK as well as RTW, ULP, and DEMO. Each of the explanatory variables is significant within the 5% level. The equation explains 78% of the state-to-state variation in union density. This is very high for a cross-sectional equation, particularly one with a small number of explanatory variables. The coefficients for all of the primary explanatory variables, most notably RTW, remain virtually identical in the new equation, further underlining the robustness of the results.

The other core variables of interest offer insights into the factors influencing unionization. Higher levels of unfair labor practices are associated with significantly lower union density, while right-to-work states also feature lower rates of unionization. These results are important because each controls for the other. Even holding employer opposition, political ideology, and civic activism constant, right-to-work laws tend to lead to lower union density in themselves. States with such legislation have 6.6 percentage points lower union densities than their otherwise identical counterparts. Similarly, greater numbers of unfair labor practices tend also to reduce unionization, even when controlling for right-to-work status and the ideological and social variables. States with demonstrated hostility towards unions have significantly lower unionization rates. Overall, the statistical analysis reveals a complex set of relationships which influence regional union density. Our quantitative model has considerable explanatory power; it also suggests the subtle effects of social and environmental conditions on density.

DISCUSSION

Managerial and Policy Implications

Our results indicate that right-to-work laws negatively affect the ability of unions to organize workers and to develop workplace institutions conducive to collective bargaining, a finding supported by comparative studies of Canadian union density (Taras & Ponak, 2001). For that reason, employers competing on the basis of low wages may be attracted to a business environment featuring RTW laws (Dinlersoz and Hernández-Murillo, 2002). In addition, RTW states typically offer a "package" of developmental inducements that help to explain trends in job growth (Holmes, 2000). Those inducements, however, may be offset by other conditions. Our data suggest that a climate of aggressive antiunionism is correlated with less institutional support in the form of communal social capital, and such support may be an important determinant of overall economic success. As Bowles and Gintis (2002) commented, "In contrast with states and markets, communities more effectively foster and utilize the incentives that people have traditionally deployed to regulate their common activity: trust, solidarity, reciprocity, reputation, personal pride, respect, vengeance, and retribution, among others" (p. F424). That is, where productive activity involves cooperation and group effort, communal norms punish shirkers, free-riders, and non-cooperation.

Firms operate in social as well as economic environments, and policy makers ideally will consider the dynamics of institutional development when formulating conditions necessary for sustained growth. An assessment of current policy by leading labor market experts confirms that insight. According to a task force on the future of employment in the United States, "An institutional perspective understands the economy as embedded in the social structure and as depending on that structure for its capacity to operate effectively. It sees a need for the active cooperation of workers in the work process, and it emphasizes the difficulty of achieving that cooperation if the non-market values are not respected" (Osterman et al., 2001, p.3). Without such a perspective, the authors argue, we will fail to create viable avenues for the necessary reshaping of our employment system.

With specific respect to organizational practices, a recent study indicates that workers desire a greater representational voice in the firm's decision-making processes than they now experience (Freeman & Rogers, 1998). High levels of conflict associated with opposition to collective activities may have negative consequences for productivity and efficiency. As employment and economic activity change in response to changes in the global and technological environment, the "postindustrial" workplace will need stable, coherent institutions for competitive performance. At present, our employment rules "encourage widespread low-wage, low-skill competition and fail to encourage widespread improvement of service sector economic performance" (Herzenberg et al., 1998, p.19). Right-to-work laws tend to signal a business environment lacking the institutional features found in union security states.

Historically, federal labor policy in the U.S. has favored workers' rights of organization and collective negotiations toward the objective of macroeconomic stability, and union security is an important means of promoting that objective because it establishes workplace procedures for ensuring basic fairness. When conceived by Senator Wagner in 1935, the design of the National Labor Relations Act was to subordinate individual choice to considerations of class power and economic emancipation (Barenberg, 1993). The Taft-Hartley amendments of 1947 identified rights of individuals and state sovereignty as policy concerns, but such concerns are inconsistent with federal goals of uniform labor market regulation and union formation (Gross, 1995). To some extent, consequently, the legal policies regarding collective bargaining work at cross-purposes. Right-to-work laws add to the incoherence of labor policy.

Limitations and Research Implications

Our use of social capital as a factor in analyzing the effects of RTW laws offers a new approach to this important labor relations issue. One limitation of our study is that the construct of social capital is not easily defined, although the concept has gained widespread attention across academic disciplines. We attempted to isolate specific components of social capital and determine their influence on union density, but that effort failed to identify precisely which social actions count in union organization. Putnam (2000) suggests that the long-term decline in social capital is related to union decline over the same period. Longitudinal studies may confirm such insights, but our cross-sectional model did not do so. Given the academic interest in evolving industrial relations, future research on unions and society could elaborate the ways in which attitudes about civic matters influence attitudes and behaviors at work.

While social capital resists definitive description, Putnam's (2000) state-level data sketch some important dimensions of the institutional context of employment systems. Our econometric model demonstrates the correlation between legal environments and union density, particularly how unlawful anti-unionism is associated with lower success in organizing. Employer opposition is in turn negatively correlated with levels of social capital. Because a large body of research is devoted to such topics, those relationships provide new insights into the ways in which laws can affect business climates. Our study adds to existing research by incorporating data on union opposition at a state level into a model of RTW laws. A longitudinal approach using changes in density, union opposition, and political ideologies could provide historical confirmation of the importance of social conditions and unionism.

CONCLUSION

Right-to-work remains a controversial and debatable subject (e.g., Greer and Baird, 2003). Pending state and federal legislation addresses the issue. This study establishes significant linkages between right-to-work laws, unionization, and the social context of business. It thus contributes to a better understanding of the factors relevant to policymaking. An important result is the confirmation of previous research that membership density is reduced by the existence of right-to-work laws. A second contribution is to extend the debate about RTW legislation beyond the wage-job growth nexus and into the area of employment institutions. Put simply, right-to-work laws are inimical to the conception of national labor policy of the NLRA as conceived by Senator Robert Wagner in 1935. Whether Wagner's views remain relevant in today's environment warrants serious consideration.

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* Right-to-work states † Modified right-to-work state

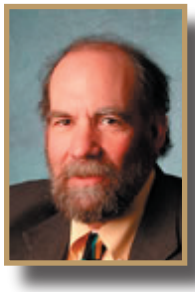
Discussant Session 2

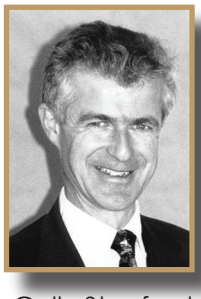
Daniel E. Ponder (Ph.D., Vanderbilt University) is Associate Professor of Political Science at the University of Colorado at Colorado Springs. He is the author of *Good Advice: Information and Policy Making in the White House* (College Station: Texas A&M University Press, 2000). He is the author of numerous articles, book chapters, papers, and essays on American national government, with specific reference to the presidency and Congress. He serves on the Board of Directors for the Presidency Research Group of the American Political Science Association. He has been a consultant for the state of Colorado and for Teller County and is currently at work on an textbook on the U.S. Presidency.

Making Better Policy Decisions for Colorado's Future: How Has University Research Helped Policy Makers with K-12, Substance Abuse, & Tax Reform?

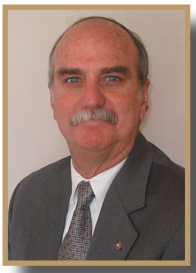

Dr. Kelli Klebe


Maureen L. O'Keefe


Dr. Ken Howe


Gully Stanford


Phyllis Resnick


Dr. Michael Williams

Panel Participants:

Dr. Kelli Klebe
UCCS

Maureen L. O'Keefe
Department of Corrections

Dr. Ken Howe
CU-Boulder

Gully Stanford
CCHE and State Board of Education

Phyllis Resnick
Colorado Public Expenditure Council

Dr. Michael Williams
University of Denver

Moderator

Daphne Greenwood
University of Colorado at Colorado Springs

(Ph.D., University of Oklahoma) is Professor of Economics and Director of the Center for Colorado Policy Studies, University of Colorado at Colorado Springs. She has published work in areas of health and education policy, measuring poverty and wealth and tax policy. Most recently, she has been working on how community indicators can be used to measure quality of life and sustainability and how to measure the full costs and benefits of different patterns of local growth. Dr. Greenwood was formerly elected representative to the Colorado legislature, Honors Professor at the U.S. Naval Academy, visiting scholor at the U.S. Treasury Department, and corporate economist with Esmark, Inc., a Fortune 100 company. She is on the Board of Directors of the Catamount Institute and is a member of the City of Colorado Springs Trails and Open Space Advisory Committee.

Daphne Greenwood:
Our panel discussion this year focuses collaboration between researchers in Colorado universities with the public sector. As you will hear today, there have been some successes and there have been pitfalls. We have three pairs of collaborators, made up of a researcher and a state government person. I have asked each group to start with some background about what they were working on but to focus on the processes of what happens. Regardless of our individual field of interest, that should help us get a sense of what needs to happen to work effectively, whether we are coming from the public sector side or the faculty side we know there is a gap to bridge.

Let's start with Dr. Kelli Klebe of our psychology department who has been working with Maureen O'Keefe of the Colorado Department of Corrections. And then we will go on to education policy and tax reform.

Kelli Klebe:
We are doing substance abuse evaluation for treatment programs offered to people in the criminal justice system, in prison or on parole. Our service contract with the department is to provide faculty consultation as well as students and professional research assistants to go help design programs and decide how to evaluate programs. There is often debate about who should do evaluation of programs – should it be internal to the programs or done externally by people who can be more objective? The advantage to using internal people is that they really know how their programs and their systems work. But external people bring different perspectives because they are not caught up in the institutional culture of the organization. However, you bring your own institutional culture with you and that sometimes throws a monkey wrench in it all! But external evaluation brings a kind of legitimacy to a program evaluation that there is just not somebody internally saying good things about what they do. When an external reviewer has negative things to say about programs, it's harder for the personnel to say "They have an axe out for me and my model".

It's been a good experience on both sides because our students also get opportunities to do applied research. I teach research methods and statistics and it's easy to tell students what to do in the classroom when you have perfect data and perfect research design but we all know that when you go and do research in the community, there are more problems that arise. This gives our students a good set of skills to take with them into the community. We have actually had quite a few students who started working in different branches of the criminal justice system doing research after being research assistants and then graduating. I will let Maureen talk about how the data that we've generated has been used or not used.

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It's been a good experience on both sides because our students also get opportunities to do applied research. I teach research methods and statistics and it's easy to tell them what to do in the classroom when you have perfect data and perfect research design but we all know that when you go and do research in the community, there are more problems that arise. This gives our students a good set of skills to take with them into the community. We have actually had quite a few of them students working in different branches of the criminal justice system doing research. I will let Maureen talk about how the data that we've generated has been used or not used.

Maureen O'Keefe:
Let me start off by saying it was never my dream to work in corrections, in fact as a student it never even occurred to me – so I can blame Dr. Klebe for that! One of the reasons that I have stayed so long -- 10 years now -- is because I really believe the research has an impact. In any governmental institution there are people that like and believe in research and use it to make better program improvements, and then there are people who do not believe in it will not use it to inform their decisions. Obviously,

I gravitate towards those who do use the information and the data – and the substance abuse field has been excellent about doing that. About 10% of the budget has been dedicated to research and you do not find that in most government agencies. That speaks to the quality of programs we offer offenders as well as the face we are able to present to the public. It influences what we can do to make the community safer because these people are coming back to your neighborhood!

What I have seen is that the original impetus for the research has a huge impact on how the research is used. If it was requested from inside by the administrators, you usually have an opportunity to make some positive changes. On the flip side, there are a lot of requests coming from the legislative branch that don't result in much of an impact.

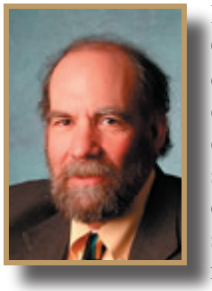
If the legislative process doesn't give us enough time to do it right – sometimes only weeks or a month or two – the result may not be much.

It takes a long time to complete a good study where you implement controls -- you can't anticipate everything that will be coming at you. What the university offers to the research is good solid design. Dr. Klebe's influence has been really important in the many studies we have done together and I have never had a challenge based on the quality of design. People trust the research and use the information to make better decisions. I encourage universities to take a bigger role in publicizing the research and getting the findings out. In the DOC we live and we die by the media, perhaps more so than any other government agency. When something goes wrong, people know about it. A lot of times people don't know about the good things that we are doing. So anything people at the university can do to educate the public about what is going on would be really helpful.

Daphne Greenwood:

Maureen is one of the many UCCS graduates doing a great job at Corrections and we are delighted to have her back here on the panel today. We are going to hear next from a group that has worked in education policy. They may feel as if they are at times under the greatest spotlight in the state. Dr. Kenneth Howe is from CU-Boulder where he heads the Education and the Public Interest Center. Gully Stanford, a member of the Colorado Commission on Higher Education, is also a former member of the state Board of Education -- that is actually the hat he is wearing here today. As you'll hear from Dr. Howe, his center did some work for the state board that turned into a fairly exciting story – but I'll let him tell you about that.

There is a certain point at which the author of the play has to let go of the play and say, "I have written my play, make of it what you will."

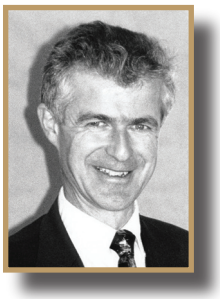


Kenneth Howe:

Okay, I'll begin by saying I've never been accused of being a Pollyanna or a cheerleader. But even taking that into account, I think, it's an especially difficult times for the university researcher working in an area of educational policy formation and evaluation. There is a marked suspicion of university researchers, evidenced recently by the appearance of David Horowitz on the scene, whose idea of an "academic bill of rights" is supported by both Governor Owens and Senator John Andrews. Going a bit further than this, several legislators attempted to eliminate funding for the Education and the Public Interest Center, because of its alleged "leftist" bias. What I want to suggest is that bias can exist on both sides. Policymakers sometimes have such a strong attachment --or aversion—to a given educational policy that research won't make much difference.

The study we did -- commissioned by the CDE as part of a competitive process – was to examine the ACT college entrance exam, now required of all 11th graders in Colorado. Our main objective was to determine whether or not the ACT accurately measured the Colorado model content standards. The was tied to the further question of whether the results of the ACT should be included in high school report cards as another measure of the Colorado model content standards along with the CSAP examinations. Now, the ACT is not designed to measure individual standards in given states; it is a test designed for college entrance that can be applied across the nation. Our study concluded – not surprisingly – that the test did not measure Colorado content standards.

My understanding is that on the basis of the study the State Board of Education was unanimous in its view that the ACT shouldn't be part of the high school report cards. But the board didn't have the power to change the policy. They could only advise the Governor as to what they thought the policy should be. My understanding is that through Commissioner Maloney it was suggested to the state board that the Governor wouldn't be pleased with a recommendation that the ACT not be on the high school report card. As it turns out there was a special meeting of the state school board, in which ACT was invited to defend why its test measured the state model content standards. But we were not invited to defend our study. Gully Stanford was there but I don't know if he remembers exactly what transpired.



Gully Stanford:

Thank you very much for inviting me. I am a Denver Public Schools parent. My day job is to direct public affairs at the Denver Center of Performing Arts, so I know a little about data based decision-making and management because we have to make payroll each week. Let me talk about the value of university-based research, which is what I believe this panel is about. Whether or not Ken is happy about the results of what happened to his research, those of you who do research need to know it is one piece of a whole lot of elements that

go into the mixture on which policy decisions are made.
In fact, the research that Ken provided was extremely helpful in informing us as we were required to make recommendations that had to do with a published report card. The report card is not an end in itself but a means to an end. I happen to endorse the end. The end is to make the Colorado citizens and the elected or appointed decision makers, whether they are in the executive branch or the legislature, or in elected wards, to give them some kind of reliable picture of what is going on in our schools. I am actually going to speak out for our ability to absorb, digest and put to good use university based research. The major flaw in the report cards is that the ratings of the schools -- from unsatisfactory to advanced -- are based not on value added progress from year to year, though thanks to some people, including Rep. Williams – who is in our audience -- and Rep. Keith King, there is a rating of progress over time. We now have a student identifier, which will lead us from 3rd grade where we start the CSAPs through 10th on the CSAPs and 11th grade on the ACT, but also on through the accuplacer and on into college.

Some legislators are calling it a perfect storm or a fiscal train wreck

Now, with my CCHE hat on I am very, very excited about what we are able to do with the data we've got. Are the ACT data useful? Yes, actually they are. And as a parent of a senior and a sophomore in the Denver public schools, I have to tell you that although I know and it was helpful to know and the Governor knows and the state board knows that the ACT is not a good test of content knowledge and therefore cannot be comfortably aligned with the sequence of the CSAP's. What we determined as a result of your (Ken's) findings and through further discussions is that it was better to have them in there for the political purposes that we have them in there. Yes, the state board of education sent a strong message across saying this is not academically sound. But to tell you the truth, as things have played out having the 11th grade ACT and including it in the report card has done, I believe, a great deal of good

I give a resounding endorsement to the commissioning and collecting of studies such as Ken's! But there is a certain point at which the author of the play has to let go of the play and say, "I have written my play, make of it what you will." I think we made something -- it may not be approaching a silk purse. But his research was valuable due to the warnings embedded therein. The more interesting conversation, if we have time at the end, is how these researches are delivered and discussed and defended or justified because Ken really didn't have a chance to be an ongoing part of the conversation with CDE and the state board of education.

Daphne Greenwood:
Thank you, Gully. This year TABOR, Amendment 23 (the K-12 education funding requirement) and Gallagher have come together in what some legislators are calling a perfect storm or fiscal train wreck. Several years ago the legislature created a Colorado Tax Commission made up of local government representatives and private citizens as well as former and sitting legislators. If they, or the Governor, had followed through with financial support we would have answers today to many of the questions now being posed in the press. But the Commission was told to go out and raise its own money to pay for research. That approach has become rather typical in Colorado.

But people who really believe in studying tax reform in Colorado and looking at the consequences for our economy have tried to keep the effort going even though the Commission was finally dissolved after accomplishing little of what it aspired to do. Phyllis Resnick, who has many years of experience working on fiscal issues in Colorado, is now director of the non-profit Colorado Public Expenditure Council. CPEC also has a long history of helping the legislature with tax and budget issues and has recently affiliated with the Daniels College of Business at the University of Denver. And Dr. Michael Williams has come recently from the University of Texas and a distinguished career as an economist in private industry with Texas Instruments and various banks to join the faculty at DU. They are trying to accomplish some constructive work together on limited funding. Many of us in Colorado are familiar with that challenge. But I am going to turn it over to Phyllis first and let her tell you about what they are trying to do now even though there is no longer a Colorado Tax Commission.

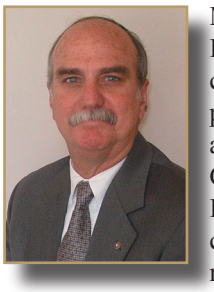
Phyllis Resnick:
As Daphne outlined for you we are a little different than the other two groups on this panel. We don't have a completed study that we can discuss but we are trying to create a group that can be an ongoing resource on tax questions for the state.
In addition, our partnership is between a non-profit and a university, although the non-profit (CPEC) is trying to carry on the unfinished work of the state commission.

When the tax commission was disbanded at the end of fiscal year 2002 we had some members of our board who were also on the tax commission board who requested that we continue part of their effort. They asked us to continue their effort to create a modeling and data resource for the state so that we could answer "what if " questions related to the various ones that are often on the ballot. For example, we have a ballot issue on changing the Gallagher amendment before us November 4, 2003. We at CPEC get many calls from the media wanting analysis of how the proposed change would impact individual households or the economy as a whole. Unfortunately, what we have to answer is that we don't have the data or the capability to an in-depth study.
The vision of the tax commission was that at the end of their work that there would be a resource in the state that could answer those questions. What are the economic impacts of repealing Gallagher in such a manner? In retrospect, what were the projected impacts of the TABOR Amendment or Amendment 23? As Daphne said, we are in a somewhat challenging position because we are being asked to do this and we don't really have the funding to do it. So we are currently out looking for interested parties to help us get

the center off the ground. Our vision, ultimately, is that the Center will be housed in the Daniels College of Business and will be a partnership between our group and the Daniels College and will ultimately be available as a resource to state government leaders, to local government leaders, to media, and to private industry with economic development type questions that relate to changes in the tax code or incentives.

Just recently we've complicated the issue a little more. We've been approached by a gentleman who owns a private consulting firm that has done some contract research for the state. Through that effort he has amassed quite a few years of time series of very in-depth property tax data. He has proposed to us that he would join our partnership and contribute his data to the effort to develop a state data repository. If this partnership happens, we will have a non-profit, private, university partnership trying to carry on an effort that the state was not able to complete! It would be valuable to the state if we could provide objective information about the type of policy decisions we often make at the ballot box, often with the 30-second sound bytes on TV serving as the voters' only form of "analysis".

But there are going to be plenty of pitfalls along the way and challenges that we are going to have to face in order to get this off the ground, not the least of which is funding. With that let me turn it over to Dr. Williams who can identify some of the challenges we've already seen.



Michael Williams:
I am certainly glad that Phyllis and I are covering some uncontroversial issues on tax policy as opposed to education or substance abuse! But, let me address why the Daniels College of Business got involved in the effort. It seems that people outside the academic community have a view of the academic community as people who pretty much sit around waiting for some research topic to come our way so we can write about it and have a publication. Of course, that is really not true. There has to be an intersection or common interest between the university and the public or private organization. Part of our vision statement at Daniels is community commitment, and we were impressed with the reputation that CPEC has as an unbiased source of information about tax policy.

We started off asking, "How can we work together? What is the intersection of common interest?" We took some baby steps at first -- we didn't immediately find the areas of common interest. We thought of an unpaid intern at CPEC, since they don't have a large resource staff, but trying to convince a business student that they need to take an unpaid internship in a public policy organization was a little bit difficult. Then we found out that there is a course for our graduate students called "Integrative Challenge" where students are always looking for topics for papers! Phyllis has been supervising studies such as "Teachers Salaries in Colorado: Reasons, Consequences, and Alternatives for Below Average Compensation", "The Impact of Tax Policy on Retail and Economic Development", and "Tax Exempt Land in Colorado, 1980 through 1999".

Out of our discussions came the modeling effort. I got very interested in the modeling project because it was an intersection of my personal interest with that of CPEC. My academic field happens to be econometrics and I haven't been able to do a whole lot of work in that area. At Texas Instruments some twenty-four years ago we estimated the effects of an R&D tax credit using the Data Resources, Inc. econometric model to find out the economic impacts from various changes. I'm also the chairman of the Institute for Policy Innovation, which looks at tax and spending policies of the federal government. Traditionally when we look at tax policies, we say here is going to be the amount of dollars that we are taxing, this is the value of property or whatever and if we raise the tax 5 percentage points we are going to get 5 percentage points more of that dollar amount collected in taxes. In other words, we use static analysis that assumes people don't change their habits. I am interested in using more dynamic analysis that says if you raise or lower taxes people are going to change the way they hold property or their purchases and so forth.

The oversight of CPEC really insured that the modeling effort would be unbiased. A lot of people want the university to do research to prove their point. They want the university to bless their preconceived idea. I really feel that an organization like CPEC will keep us from doing that. The ultimate vision we have is an econometric model that would show the economic impact of various tax changes in the state of Colorado. Of course saying that, I realize that econometric models can be made to produce the result the developer wanted, so we have to avoid biases in the development of such a model. The center right now is really a group of people working together as opposed to an office at Daniels College of Business. It is a collaboration between people trying to decide where the most appropriate modeling effort.

Daphne Greenwood:
Thank you and I hope you can see some commonalities across different topics. I want to give the panelists a chance to talk among themselves, but let's take a few questions from the audience first. If you want to direct them toward anyone in particular that's fine or if you just want to see who will take a crack at the question that is fine too.

Gully Stanford:
I've got a question for Ken. I am trying to remember the genesis of your particular study --was that mandated in the school finance act? Is that what triggered it?

Ken Howe:
No, if I recall it came from a whole separate bill that was sponsored by Sen. Pat Pascoe.

Gully Stanford:
Were any of you involved in the special education study that the University of Colorado in Boulder did for us? It pointed out that it is hopelessly under funded, you're probably familiar with that, in the state of Colorado and elsewhere the federal contribution and the

state contributions don't nearly match what the local districts have to put in. I think it was the school finance act that commissioned the study. And you could've said " OK, consider the source -- it's a couple of Democrats looking to embarrass the Republicans because we got a governor up there saying I'm fully funding education and they wanted to show that we're not." To me that's all part of the business.

Research doesn't happen in a vacuum and maybe now the academics can jump in and say, "Oh yes it must happen in a vacuum." I disagree -- it shouldn't happen in a vacuum! But I believe it should happen with some consideration as to market for which it is being prepared. When I commission a study on behalf of the Denver Center for the Performing Arts I am not looking for something that it says in some cultural cloud cuckoo land. I am looking for something that is said in the reality of metropolitan Denver. And so I challenge Ken: why remind us that there are political agendas here? Of course there are political agendas here. Both the special education study (which said that Colorado is something like $179 billion short of paying its bill each year) and the ACT study were actually very valuable in moving policy forward. (Looking at Ken) Do you want to respond to that?

Ken Howe:
Well, I don't want to go into the special ed issue cold, but let me respond in terms of the ACT study. The rationale for the study--the major rationale--was that the justification for including the ACT in the report cards was to measure the Colorado model content standards. But the our study shows that it doesn't measure them. So it doesn't strike me that the study moved policy. One reason to look at the existing literature when doing policy research or evaluation is that if you there is uncertainty on an issue it makes sense to do research to help eliminate that uncertainty. If I had known that the ACT study could have no impact I wouldn't have done it. ….. "Does the ACT measure the Colorado model content standards?" The governor's office said it did, the ACT group said it did. Our study shows that it doesn't!

Gully Stanford:
Actually, you can't say it doesn't measure them, you just said it mostly doesn't. I mean you covered yourself a little in there if I didn't actually read the study.

Daphne Greenwood:
Guys, guys, you inspired an audience question.

Gully Stanford:
Good, good.

Prof. Neil Grigg from audience:
Just a general question for anybody on the panel. We tend to think about policy research and the idea of researchers as a means to improve policy. But it always seems to me that one of the major benefits of policy research that takes place in educational institutions would be to take that knowledge back into the educational systems and see if we can get better citizenship and better awareness among all the people (including those in K-12) about these issues. I just wonder if any of the policy research that we've heard about here is being reflected back into the school system.

Daphne Greenwood:
Do any of you want to take that? Probably the tax policy issue is a little too esoteric for K-12, but there I think the challenge is – is it reflected by the media so the voters understand better?

Phyllis Resnick:
Right now, we are in the genesis of this project and are trying to get awareness about the center we are trying to build. The idea is that then it will become a resource and we could answer questions and contribute to the dialogue about good tax policy and do presentations on education related to these issues. But right now without the tools at our disposal we haven't been able to be disciplined in those conversations. I recently was called by a reporter from the Rocky Mountain News who was writing an article on some sort of analysis at the very micro-household level related to property taxes and what would happen if we changed Gallagher. That is a perfect example of something that had we had the center up and operational we could have answered. I don't think that anyone else has the answers for those questions, either.

Gully Stanford:
I think you've sold yourself short. I think the fact that the headline is "John Andrews agrees TABOR can do with some pruning" is a tectonic shift in the right direction. It comes very much as a result of the input from the institutes and the universities. My answer to your question is, yes absolutely! And what Ken said may not have resulted in eliminating the ACT from the report card, but quite honestly if he thought that was his goal, he was coming from an ideologically isolated place, because the study of the ACT was part of a tapestry that went into the decision of what should be in the report card. Let me tell you that regardless of how well ACT reflects the Colorado model contents standards which we test through 10th grade with the CSAPs, it is bringing the desired focus and conversation into the rooms of counselors. God knows I just met with them, counselors and principals, college preparation, you know the data, again university-based research which is telling us what a dreadful job we are doing in Colorado of getting our own students, particularly our students of color and our students of poverty into our universities. So the work that Ken did has unintended consequences that he might not have considered -- one being that the Commission on Higher Education will adopt a pre-collegiate core as a requirement into the 4 year colleges. His research has indeed fed into that.

Ken Howe:
I actually have done some earlier research that was influential. I studied the open-enrollment system in Boulder, for example. And our results actually made a difference with respect to policy. It was exactly as Gully Stanford says, that the complex set of circumstances, combined with various things about the system, results in our findings and recommendations being tweaked, modified, etc.,

by the policymakers. But this is different from the example of the ACT study, in which the major findings were just ignored or denied. I do agree--and actually said--there are other reasons for administering the ACT to all Colorado 11th graders, other than to measure the Colorado model contents standards. I wasn't privy to the conversations, Gully Stanford was, and so the ACT study may have figured into deliberations in a way that I don't appreciate.

Gully Stanford:
Let me just close that thought. As you set these things, up make sure that the thread in the tapestry has a beginning and an end. When I was on the state board of education I was notorious for demanding to know where stuff came from and wanting an explanation of the reasoning, the background, etc. As you get into these working relationships, whether it is with corrections, or transportation, or fiscal policy, there should be a clearer delineation of the role for someone like Ken. He's been sitting here waiting to tell us this for two years now and he is finally getting a forum in which to share, there should have been a point in the process where the researcher was heard from directly.

In fact, on the special ed piece we stayed in touch with the researchers after the report was delivered. That is something that should definitely be considered -- because we are having a more thorough conversation about this now when I can do nothing about it than we had then when I was on the state board.

We are researchers and we are teachers -- so our research feeds into what we do as teachers as well

Daphne Greenwood:
Thank you. Kelli, maybe you can tell us how you see things differently in your area and why you're being able to accomplish things more easily in your field.

Kelli Klebe:
You know, I'm lucky where I'm at in this! I just want to direct one thing to the earlier question about whether research goes back into the educational system. From my perspective and my colleagues, we're researchers and we are teachers -- so our research feeds into what we do as teachers as well. I teach statistics and research methods within the psychology department and that is nobody's favorite topic. They all dread that they are in my class, but if I use the research that I am doing that is applied in the community, they get much more excited. When former students come back and tell me what they are doing, what material from class feeds into what they use now and what they wish they would have had in class, I use that information to help think about what I teach.. So now program evaluation is part of my undergraduate research methods class. Because that is how my students actually go out and do research. Few will be university professors -- they are going to be applied researchers.

I did teach a class where I was everybody's favorite topic -- that was crime and drugs. It was an experiential class (laughter). But mostly it was all about this research and the students wanted to know what research psychologists do that can help us think about policies that are made in the criminal justice system. Now back to Daphne's question, "Why do I think that we've been successful?" I would have to say that I've done evaluation research in other arenas and some in education as well and often what you give to people they don't want to use. But the drug and alcohol unit within the DOC has wanted that data. They even set aside part of their budget to gather that data. Some of this has to do with whether they get funding for programs -- the federal agencies require that they do evaluation research so ensure their money is being well spent. But I think it's more that they have somebody in that unit who values what research is and asks for it and tries to find ways to use it. We have had a pretty positive experience. However, it has been my attitude that once I write "the play", it's DOC's to do with what they will.

Daphne Greenwood:
My closing comments probably come from having been close to the political process and also being an academic. People in academia need to have a lot of patience and recognize that often an idea has to be kicked around for a long time and perhaps to be repackaged and re-evaluated many times over before the weight of the evidence is enough. We have all learned to have that patience with our students. Even with the power of the test over them they can still be quite resistant to new concepts. Policymakers in many cases have fully developed opinions, along with pretty strong egos. They are not going to accept something new right off the bat. But we can be part of a process in which the evidence builds up and people make changes. In the end the public are the real policy makers – at least on issues they care about. That is why it is so great to have Rep. Williams and Merrifield, Commissioner Stanford and Regent Carlisle here along with many interested citizens. If there are policy makers who are ignoring the research in education or tax policy and enough members of the public say "Hey, wait a minute, this is what makes sense" then elected officials will change and pay attention. If not, new people can be elected. So in the end what we do as educators and researchers is important if it reaches the public. It's been an honor to have all of you here today.


Fred Van Antwerp

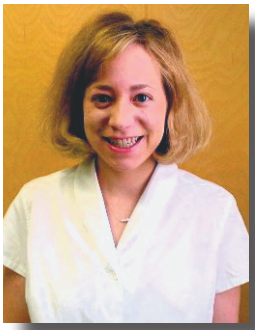

Walter E. Hecox


Andrew Seidl


Donald M. McLeod


Roger Coupal


Karen Hyllegard


Jennifer Paff Ogle


Brian Dunbar


Byron Koste

Session 3 - *Smart Growth and Sustainable Development*

Session 3
Smart Growth and Sustainable Development

Keynote Speech

Fred Van Antwerp (M.A., Pennsylvania State University), Executive Director of the Pikes Peak Area Council of Governments. Earlier, Mr. Van Antwerp worked in urban planning and development for nearly 25 years, both in the United States and abroad. In the United States, he has held positions as Head of Comprehensive Planning for both the City of Albuquerque and the City of Colorado Springs. In Colorado Springs, he was formerly Director of the Downtown Action Plan. Overseas, he has worked both in the Middle East as a Transportation Project Manager for five years and in Eastern Europe for the U.S. State Department on a Large Local Governance and Democracy Building Program for six years. He is currently Involved in redevelopment efforts in Armenia.

Good afternoon, ladies and gentlemen. I'm Fred Van Antwerp, the Executive Director of the Pikes Peak Area Council of Governments. For the next hour and 15 minutes, we're here to talk to you about smart growth and sustainable development.

So let's get started by defining some terms and providing some information. A lot of terms are used interchangeably these days and serve to confuse the issue. Terms such as "growth control," "growth management," and "smart growth" have important distinctions.

In the late 70's and early 80's, a number of community groups entertained the idea of stopping growth altogether in their communities. These growth control advocates were countered by "growth management" proponents who advocated specific government policies to try to influence the rate, amount, and location of growth within a locality. "Growth management" proponents sought to accommodate growth rationally and in an orderly way, but not to prevent it.

"Smart growth" refers to policies that are specifically designed to work against urban sprawl.

"Smart growth" is a newer term that refers to policies that are specifically designed to work against urban sprawl. Proponents of smart growth envision communities that grow to be more compact, in which we spend less time driving and thus have more time for leisure pursuits; communities that make better use of portions of the city that we've already developed; and communities that live in denser, mixed-use developments which enable us to walk more and thus live healthier lives. Smart growth is a hot topic these days, and the national planning literature is full of articles taking sides in this debate. The debate is being waged among these four groups:

1) Anti-growth advocates who are upset by the impacts of suburban sprawl. They want to slow down outward expansion and cut dependence on private automobiles.
2) Pro-growth advocates who aren't much upset by sprawl but want to expedite outward expansion to accommodate future growth fully.
3) Central-city advocates who are concerned about resources being drained from the central city by our outward growth process. They want more reinvestment and redevelopment in core areas.
4) Slow-growth advocates--those who want to accommodate reasonable growth but want to reduce some of its negative impacts. Major employers often fall into this category.

In its broadest sense, smart growth refers to a set of 6 goals designed to counteract sprawl .

The first goal is to place limits on the outward expansion of further growth. This includes supporting urban growth boundaries and utility service districts. There is the belief that such limits will reduce infrastructure costs, shorten commuting times, and preserve vacant land and open space. There are good examples of this right in Boulder; also the state of Oregon has required this in each of its 241 cities. This strategy is controversial and has met with mixed results.

The second goal is to encourage higher-than-normal residential densities. Compact development seems good because it reduces infrastructure costs, shortens trip lengths, encourages walking and bicycling, and may make more use of public transit feasible. A good example of this is the co-housing development area called Casa Verde in Colorado Springs.

The third goal is to encourage mixed-use zoning by adopting urban design innovations in both cities and new suburban areas. These would encourage pedestrian-friendly communities, mixed land uses, town centers, and other design elements that make com-

munities more interesting. If you consider many parts of Old Colorado City and Manitou Springs, where retail, office and residential are in close proximity, you get the idea. An excellent example of a new development is the Bell Creek Development in Commerce City.

The fourth goal is to reduce dependency on private automotives and the use of one-person auto trips. The usual tactics advocated are building high occupancy vehicle (HOV) lanes, shifting money from road building to more transit, creating pedestrian-friendly communities, and building light-rail systems.

The fifth goal is to revitalize older areas and develop infill sites with new and renovated structures to make them more attractive to middle- and upper-income households, and to improve the quality of life for existing low-income residents. This includes shifting new development from fringe areas to infill sites, and cleaning up and redeveloping polluted brownfield sites. We have some great examples of this in the new Lowell Neighborhood area and the future Palmer Village development.

Finally, the last goal is to preserve large amounts of open space and protecting the quality of the environment. We have done very well with this idea, with the purchase of Greenland Ranch, north of El Paso County and the recent purchase of Red Rock Canyon.

You might ask yourself why should we care about the issues of growth? Well, when communities like ours grow so fast, we are overwhelmed by issues that weren't present just a few decades ago. Issues such as traffic congestion, air pollution, water shortages, rising housing costs, and disappearing open space. These issues are real and have tangible effects on each of our lives.

Without trying to alarm you, it is a good time to tell you that PPACG just completed its new growth forecasts for the next 25 years. Our region currently has about 540,000 residents; we are forecasting 801,000 people living here by 2030. Now that may seem a lot of people to you, but actually it's on the low side. Since 1970, our population has grown by about 23 percent each decade. If we continued growing that way, we would be forecasting 960,000 instead of the 800,000 that we're estimating. None the less, by 2010, El Paso will be the largest county in Colorado and will stay that way for the foreseeable future.

The difference between the big growth scenario and the more moderate one is that we are forecasting a lower-employment growth rate and less net migration in the next few decades. Our own natural increases – births over deaths – will account for a greater portion of our population growth than in the past. Of the total increase of 260,000 people, 68%, or 175,000 is due to natural increase, and 32%, or 83,000 is due to net migration.

But still, we are talking about adding 260,000 more people – that is two communities the size of Pueblo - to our community over the next 25 years. This is an excellent time to ask ourselves what kind of community do we want to grow to be by 2030? Where these people will locate and how services will be provided to them and at what cost are issues that will affect their quality of life as well as our own.

Let me draw attention to two aspects of our future community.

First, we're going to have a much larger number of seniors living here. The number of seniors, those 60 and older, is going to triple by 2030. As a portion of our population, seniors are now 11 percent of our community and will rise to 20 percent by 2030. Adding on to my previous question, what kind of community do we need to start planning for now so that our seniors 20 years from now will be able to live independently, in good health and with dignity? Let's see…that would include me and many of you as well!

The other topic is automobiles and traffic congestion. With another 260,000 people on their way, let me give you some figures about autos and traffic as well. For some reason, we have more registered vehicles in El Paso County than people. In fact, we have five registered vehicles for every four people. If this trend continues, we'll have another 325,000 registered vehicles in El Paso County than we have today, or a little over one million in total.

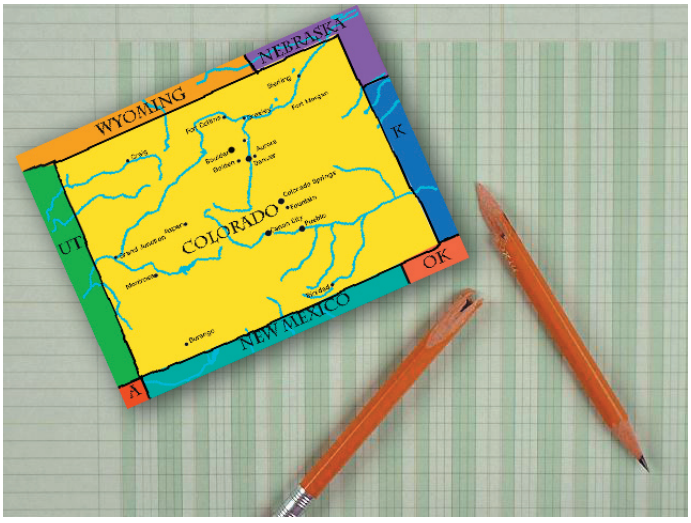
And as the future urban area spreads out, the amount of vehicle miles traveled will also increase significantly. While our population is predicted to grow by 48 percent, the growth of vehicle miles traveled is expected to increase by 104 percent. More people will be driving greater distances and will be taking more time on those trips--in fact, 23% more time per average trip.

Attempting to manage urban growth by managing the rate of growth or amount of growth is considered by many as extremely difficult or impossible. The two principal components of growth, natural increase and net migration are outside the control of local, state and federal governments. It has to do more with climate and attractiveness of our community. Subsidies can play a role, but their effects are unpredictable.

What kind of community do we need to start planning for now so that our seniors 20 years from now will be able to live independently, in good health and with dignity?

As an example, Colorado Springs has grown enormously without many subsidies, and the opposite can be said about other communities. On the other hand, attempting to shape growth is also difficult but is being attempted in our community. This is illustrated by the examples identified earlier dealing with higher density residential, attempts at new urbanism, redeveloping older areas and open space acquisition.

However, several of the growth related problems that we talked about are regional, such as traffic congestion, air pollution, water shortages, and the cost of infrastructure. Individual local governments cannot solve these large problems by themselves because the problems extend beyond their boundaries and their control. Consider this: While we anticipate about 260,000 more people living here by 2030, there is plenty of land available to develop in our region, whether in the city of Colorado Springs, El Paso County, Fountain, Woodland Park or in Teller County. Banning Lewis Ranch, by itself, could absorb 250,000 people if it were to build out to its full potential. I believe that there is some potential for shap-



ing, managing, and phasing growth if local governments can get together and agree on such things as urban boundaries, transportation infrastructure, open space, water and air quality, and the location of regional employment centers that are supported by multimodal transportation. Despite the decentralized nature of local government control, there have been some successes when local governments get together to form a regional approach.

I'd like to stop with that thought and now turn this over to our panelists who will give you their perspective on smart growth and sustainability.

Smart Growth: What Measures Can Local Governments Use?

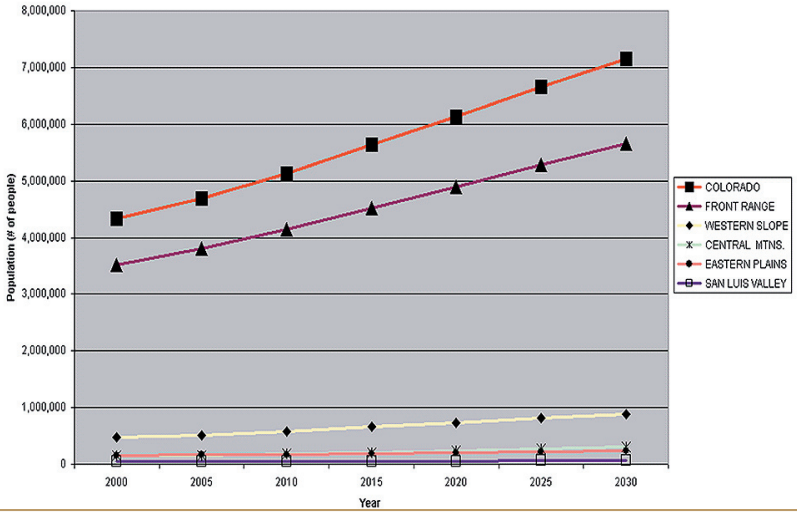
Walter E. Hecox is Professor of Economics at Colorado College in Colorado Springs. He has conducted research and published in areas of international economic development and regional environmental and socio-economic conditions, including *Charting the Colorado Plateau: An Economic and Demographic Exploration* (Flagstaff: Grand Canyon Trust, 1996). His Sustainable Development Workshop brings students and faculty together around regional environmental and resource management issues in the Rocky Mountain West.

Written in association with F. Patrick Holmes (B.A., Colorado College) who is Research Associate for the Colorado College Slade-Strand Sustainable Development Workshop. He has researched the causes and consequences of spatial disparities in socio-economic prosperity throughout the American West, including analysis of wilderness impacts on surrounding communities' economies and work for the Sonoran Institute in Bozeman, Montana.

Research Question:

Colorado struggles with rapid demographic and economic growth. Despite the 2002 nationwide downturn, projections by the Colorado State Demographer, shown in Figure A, are for another 2.8 million people over the next 30 years, resulting in 7.156 million people spread around the state by 2030. But regional disparities in levels of population and economic activity, as well as prior and projected growth rates, create severe problems of equity and efficiency in access to public services and impacts on social, cultural, and natural resources.

Projected Population Growth in Colorado, 2000-2030



"Smart Growth" as a descriptor survived the change of state administrations in 1998. Gov. Roy Romer first established an office and web site concerning this idea that growth can be "smart." Gov. Bill Owens kept the words and web site but infused major changes into the concept.

Can we currently look to such an amorphous concept to guide both growth and the state government's policy responses? Do we have devolution of powers and sources of finance to state regions, so that they can grapple with disparate growth pressures accordingly? Or do we have "federalism" at the state level, with Denver dictating the how's and why's of "growth" management?

• A sound understanding of the "shifting" Colorado economy is an essential first step to answering these questions and redressing policy inadequacies. How has the state's economy changed over the past 30 years? Where are the pockets of growth and decline? What kind of economic base does Colorado have as it faces another 30 years of population growth?

• Access to a three-decade profile of Colorado economic growth dynamics is essential if Colorado is to ground policy upon facts and move on to a set of policy responses to match the growth boom forecast by the Colorado State Demographer.

• Tools of regional economic analysis are used to establish an understanding of the changing "fortunes" of regions within Colorado. Location quotient as well as mix-and-share analysis provide powerful tools for conveying an intuitive understanding of growth among regions within Colorado when compared to State, Rocky Mountain Region, and national baselines. The result is a 30-year profile of the path economic growth has taken among regions within Colorado, the same regions that now face even more growth and change over the next 30 years.

• Preliminary findings support the hypothesis that regions within Colorado are experiencing substantial differences in overall growth of employment and the composition of jobs. This disparity should be reflected in variations among state regions in the types of policies to deal with growth and the levels of public resources made available to accommodate economic change.

Methodology/Data:

Data from U.S. Department of Commerce Regional Economic Information System CD-Rom (REIS) was used to collect employment data from 1969-2000, the longest possible time series given data availability, for all counties in Colorado. This county level data was then aggregated into the special planning regions developed by the Colorado Department of Local Affairs. These special planning regions are the following:

The Front Range: Adams, Arapahoe, Boulder, Denver, Douglas, Jefferson, Larimer, El Paso, Pueblo, and Weld
The San Luis Valley: Alamosa, Conejos, Costilla, Mineral, Rio Grande, and Saguache
The Western Slope: Archuleta, Delta, Dolores, Eagle, Gunnison, Garfield, Grand, Jackson, Routt, Moffat, Rio Blanco, Summit, Pitkin, Mesa, Montrose, Ouray, San Miguel, San Juan, Hinsdale, Montezuma, and La Plata
The Eastern Plains: Baca, Crowley, Bent, Prowers, Otero, Kiowa, Cheyenne, Kit Carson, Lincoln, Elbert, Washington, Yuma, Morgan, Logan, Phillips, and Sedgwick
The Central Mountains: Las Animas, Huerfano, Custer, Fremont, Chaffee, Park, Teller, Lake, Clear Creek, and Gilpin

This data was then used to perform two forms of regional employment composition analysis, location quotient analysis and mix-share analysis. Location quotient analysis measures the specialization of a region in selected industry categories or sectors relative to a benchmark region for a given year. Location quotients have been calculated for all special planning regions for the entire thirty-year study period so as to compare changing regional employment specialization to the state of Colorado, the Rocky Mountain West, and the United States as a whole. Deviations from the expected results of these calculations suggest areas and industries where employment composition warrants further analysis.

Total regional employment growth by job sector is impacted by growth in overall employment at the greater-regional level, but also by growth or decline in that particular employment sector or industry. The second type of analysis, mix and share analysis, is used to analyze this growth by disaggregating gross employment growth by job sector into its component parts. The growth component is how much employment would have changed had growth in employment mirrored total employment growth in a benchmark region. The industry mix component is how much employment would have changed had growth mirrored growth in that particular industry in the benchmark region. Finally, the difference between the actual growth observed and that predicted by combining the growth and industry mix components is equal to the regional shares component. The regional shares effect can be interpreted as a competitive advantage/disadvantage in a given industry or sector in a given region. This data enables researchers to pinpoint regions that are leading and regions that are lagging in attracting and retaining certain types of employment relative to a common, greater region. Mix and share analysis was performed for all planning regions in relation to the benchmark regions of Colorado, the Rocky Mountain West, and the United States for the time period from 1970-2000. The results were then used to discuss industry level employment change in different parts of Colorado relative to each other, the State, the Mountain States, and the nation as a whole.

How has the state's economy changed over the past 30 years? Where are the pockets of growth and decline? What kind of economic base does Colorado have as it faces another 30 years of population growth?

Population Growth: A Future with Millions More Coloradans

Population in Colorado is predicted to increase by 2.8 million people from the year 2000 to the year 2030, making it the second most populated state in the Rocky Mountain West behind Arizona. For perspective, this increase is the near equivalent of the entire state of Connecticut moving to Colorado. By 2030, the number of people calling Colorado "home" will be more than the current population of the state of Massachusetts and slightly less than the current population of New Jersey, at 7.2 million people. While most of this population influx will continue to be located along the Front Range, the rates of growth across the state will be most pronounced in the Central Mountains and Western Slope regions. Figures B and C depict the average annual growth and the share of total population in five-year increments by region for Colorado for the period from 2000-2030. It is no surprise that the high amenity regions of the Central Mountains and the Western Slope will continue to increase their share of statewide population by growing faster than other regions and the overall state growth rate. A major reason is that these regions will become more accessible to larger markets through improved transportation opportunities and a more competitive mix of services. Likewise, the Front Range will begin to decrease its growth rate and share of state population as overcrowding pressures take shape, influencing firms' and individuals' decisions to relocate elsewhere.

Figure B: Percent of Forecasted Population for Colorado Planning Regions as a percent of total Colorado Population, 2000-2030

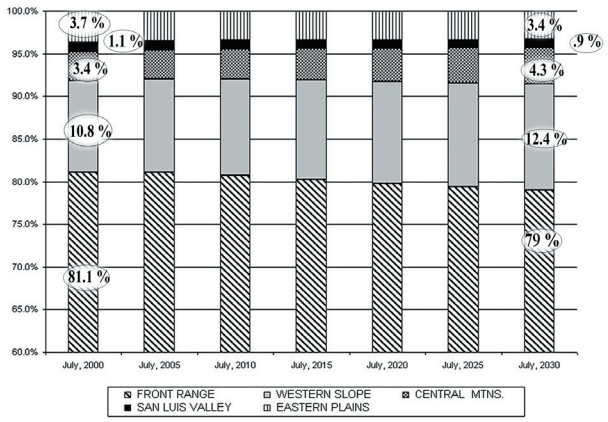
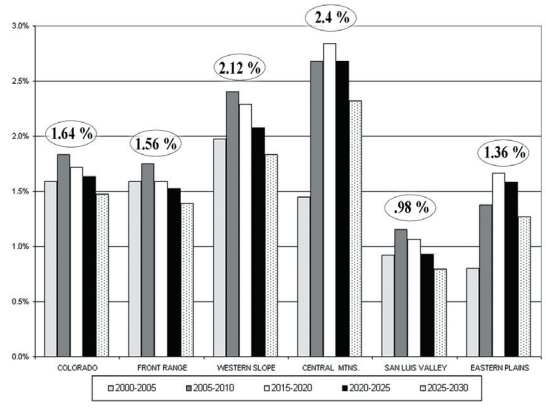


Figure C: Forecasted Average Annual Population Change for Planning Regions in Colorado, 2000-2030



Economic Growth and Change

A look back at Colorado's recent economic history tells a tale of a state that began to position itself well to prosper during a move away from heavy dependence upon resource extraction, in a time when prosperity was fleeting. Wilson Kendall, in his "Brief Economic History of Colorado," identifies an era of federal spending from 1940 to 1966 that encompasses the later portion of the Great Depression through to the period after the Second World War as key to Colorado's future (Kendall, 2002). Improved transportation infrastructure and high levels of defense spending brought new income and opportunity to Colorado, and in particular to the Front Range region. The population in the Front Range nearly doubled during this period going from 700,000 people to nearly 1.3 million. While defense spending was playing an important role in generating income in the state, mining, and agriculture both realized relatively high commodity prices during and after the war, thus generating growth in other regions of Colorado.

By the early to mid 1960s, however, a major defense spending cut and diminishing coal-mining activities began the initial stages of a shift in the drivers of the Colorado Economy. Following this slump, Kendall notes the period from 1966 to 1984 to be a period of "unprecedented growth." The Workforce nearly doubled during this period from the mid 1960s to the mid 1980s, and per capita income rose to be a full 8 percent above national levels. This new growth was bolstered largely by an influx of highly skilled, technological professions. Firms like Hewlett Packard, Storage Technology and Texas Instruments built or expanded in the Front Range region. Kendall points to attractive lifestyle amenities including a "golden age" for Colorado skiing, a highly educated workforce and to a favorable transportation infrastructure, as the salient reasons for this boom.

The thirty years from 1970 to 2000 were a period of immense growth and change throughout the United States. The nation gained 76.2 million jobs for a growth rate of 83.5%; over the same period Colorado gained slightly more than 1 million jobs for a growth rate of 187%! The foundation for this growth, throughout the nation, has been technological change that boosted some types of employment while drastically diminishing others. Growing globalization has also opened borders, both boosting exports and flood-

Decline in Military Spending

Figure D: Economic Structure and Transformation

Region	United States	Mountain	Colorado	Eastern Mountains	Western Slope	Eastern Plains	Front Range	San Luis Valley
Year	1970	1970	1970	1970	1970	1970	1970	1970
A. Resource-Based Employ.								
Total Farm Empl	4.3%	5.8%	4.5%	7.1%	11.4%	28.1%	1.9%	25.1%
Ag Serv Empl	0.6%	0.7%	0.6%	0.2%	1.4%	2.2%	0.4%	1.8%
Mining Empl	0.8%	2.8%	1.7%	13.4%	5.3%	1.4%	1.0%	0.5%
Total Resource-Based Employ.	5.7%	9.3%	6.8%	20.6%	18.1%	31.7%	3.2%	27.3%
B. Manufacturing								
Manuf Empl	21.6%	10.2%	11.7%	4.2%	5.8%	5.7%	13.1%	4.2%
Total Manufacturing Employ.	21.6%	10.2%	11.7%	4.2%	5.8%	5.7%	13.1%	4.2%
C. Service-Based Employ.								
Construct Empl	4.8%	5.4%	5.4%	6.1%	5.9%	3.2%	5.5%	3.0%
Trans/Util Empl	5.3%	5.3%	5.4%	4.0%	4.8%	5.1%	5.5%	4.6%
Whlsl Trade Empl	4.6%	4.0%	4.7%	1.0%	1.7%	1.8%	5.3%	2.3%
Rtl Trade Empl	15.0%	16.2%	15.9%	19.1%	18.3%	16.6%	15.6%	15.9%
Fin Sector Empl	6.7%	7.1%	8.7%	5.7%	7.7%	5.8%	9.1%	4.6%
Services Empl	18.7%	20.1%	18.8%	16.2%	19.3%	13.7%	19.2%	17.5%
Total Gov Empl	17.6%	22.5%	22.6%	23.0%	18.4%	16.4%	23.5%	20.6%
Total Service-Based Employ.	72.7%	80.5%	81.5%	75.1%	76.1%	62.6%	83.7%	68.5%
D. Other Employment NES								
Other Employment NES	6.7%	7.1%	8.7%	5.7%	7.7%	5.8%	9.1%	4.6%
Total Other Employment NES	6.7%	7.1%	8.7%	5.7%	7.7%	5.8%	9.1%	4.6%
E. Total Employment								
Total Employment	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Region	United States	Mountain	Colorado	Eastern Mountains	Western Slope	Eastern Plains	Front Range	San Luis Valley
Year	2000	2000	2000	2000	2000	2000	2000	2000
A. Resource-Based Employ.								
Total Farm Empl	1.9%	1.8%	1.5%	3.3%	3.1%	16.2%	0.6%	12.5%
Ag Serv Empl	1.3%	1.4%	1.3%	0.6%	1.4%	2.4%	1.1%	4.5%
Mining Empl	0.5%	1.0%	0.8%	0.6%	1.1%	0.7%	0.6%	0.1%
Total Resource-Based Employ.	3.6%	4.2%	3.6%	4.4%	5.7%	19.3%	2.4%	17.1%
B. Manufacturing								
Manuf Empl	11.4%	7.2%	7.3%	3.6%	3.5%	7.1%	8.0%	2.4%
Total Manufacturing Employ.	11.4%	7.2%	7.3%	3.6%	3.5%	7.1%	8.0%	2.4%
C. Service-Based Employ.								
Construct Empl	5.7%	7.3%	7.6%	10.1%	11.9%	4.8%	7.1%	6.7%
Trans/Util Empl	4.9%	4.9%	5.5%	2.5%	3.4%	4.1%	5.9%	3.0%
Whlsl Trade Empl	4.5%	4.0%	4.1%	1.8%	2.1%	3.8%	4.4%	3.9%
Rtl Trade Empl	16.3%	17.0%	16.7%	16.5%	19.6%	14.4%	16.4%	15.2%
Fin Sector Empl	8.1%	9.2%	10.3%	8.6%	11.0%	6.5%	10.4%	6.3%
Services Empl	31.8%	32.5%	32.0%	34.0%	31.5%	20.3%	32.6%	25.0%
Total Gov Empl	13.6%	13.8%	12.9%	18.5%	11.4%	19.7%	12.7%	20.3%
Total Service-Based Employ.	85.0%	88.6%	89.1%	92.0%	90.8%	73.5%	89.6%	80.5%
D. Other Employment NES								
Other Employment NES	8.1%	9.2%	10.3%	8.6%	11.0%	6.5%	10.4%	6.3%
Total Other Employment NES	8.1%	9.2%	10.3%	8.6%	11.0%	6.5%	10.4%	6.3%
E. Total Employment								
Total Employment	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

ing the nation with imports. The resulting dynamic change in our economy can best be intuitively viewed by looking at levels and changes in employment.

Economic Structure and Transformation

An initial view of the "structure" of Colorado's economy and how it has changed over 30 years is available by looking at the percent shares of employment sectors in each region for 1970 and 2000. Figure D allows a comparison of these shares to the Colorado statewide total, the Census Bureau's Mountain Division (8 western states) and the US national total, providing perspective on how "representative" regions are of larger areas.

In every region the share of employment in resource-based sectors dropped substantially from 1970-2000. This suggests that global market forces including, increased competition from abroad and im-

proved technology requiring less labor and more capital, are having profound impacts on traditional western mainstays like forestry, agriculture, mining, and oil and gas extraction. Some have suggested that there is a need to realize that competing as a low cost producer of food, minerals, and timber is no longer a comparative advantage for these regions and communities. (Rasker and Alexander, 2003) Relative to other regions, some areas like the Eastern Plains and the San Luis Valley in Colorado, still specialize almost exclusively in these resource-based forms of economic activity. The inability of these regions to attract and retain other types of income and employment in light of these global market dynamics creates a frequently overlooked growth problem: one in which a lack of growth or a lag, results in relative decreases in prosperity.

On the other hand, every region increased its share of employment in the service-sector industries. The "service" category covers a wide variety of industries including higher paying producer services like those offering business, engineering, and management services. It also includes lower paying consumer services like gas station attendants, hotel workers, and restaurant employees as well as social service industries like health care workers and police officers. Buried within this antiquated industry classification lies explanations for the mixed blessing we commonly associate with growth: one in which prosperity is highly linked with the need to provide increases in community infrastructure, social services, and housing opportunity, but these new "
service" sector jobs often pay less than more traditional manufacturing and resource extraction types of employment.

Location Quotients

One relatively simple measure of the "proportionality" of employment by region is the Location Quotient (LQ). This statistic gauges the relative specialization of a region or state and its employment categories or sectors against a larger regional or national area for a given year:

- LQ = 1 signifies a region's sectoral employment share is equivalent to the larger comparison region's sectoral employment share
- LQ < 1 signifies a region's sectoral employment share is below the comparison region's sectoral employment share
- LQ > 1 signifies a region's sectoral employment share is above the comparison region's sectoral employment share

When LQs are compared over time, a rough measure of changes in a region's specialization and competitiveness can be highlighted.

Here, in Figure E, we look first at LQs for Colorado relative to national sectoral employment shares, both by decade and over time. This provides a statewide understanding of the employment sectors that are growing faster than national norms and those shrinking relative to the nation.

Figure E: Colorado Location Quotients Against the U.S. & Mountain Division

	LQ - Against U.S. 1970	LQ - Against U.S. 1980	LQ - Against U.S. 1990	LQ - Against U.S. 2000	LQ - Against Mt. Division 1970	LQ - Against Mt. Division 1980	LQ - Against Mt. Division 1990	LQ - Against Mt. Division 2000
A. Resource-Based Employ.								
Total Farm Empl	1.05	0.83	0.94	0.81	0.79	0.79	0.88	0.84
Ag Serv Empl	1.00	0.98	0.94	1.03	0.78	0.87	0.83	0.92
Mining Empl	2.11	2.35	2.04	1.61	0.63	0.87	0.93	0.80
Total Resource-Based Employ.	1.19	1.18	1.14	0.99	0.74	0.83	0.88	0.86
B. Manufacturing								
Manuf Empl	0.54	0.62	0.68	0.64	1.14	1.12	1.08	1.02
Total Manufacturing Employ.	0.54	0.62	0.68	0.64	1.14	1.12	1.08	1.02
C. Service-Based Employ.								
Construct Empl	1.12	1.25	0.91	1.33	1.01	0.96	0.88	1.05
Trans/Util Empl	1.01	1.03	1.11	1.11	1.01	1.00	1.08	1.13
Whlsl Trade Empl	1.02	0.96	0.93	0.90	1.18	1.10	1.07	1.03
Rtl Trade Empl	1.06	1.06	1.02	1.02	0.98	1.00	0.98	0.98
Fin Sector Empl	1.29	1.26	1.14	1.28	1.22	1.18	1.13	1.12
Services Empl	1.01	1.02	1.07	1.01	0.94	0.96	1.00	0.99
Total Gov Empl	1.28	1.08	1.06	0.95	1.01	0.96	0.96	0.94
Total Service-Based Employ.	1.12	1.08	1.05	1.05	1.01	1.00	1.00	1.01
D. Other Employment NES								
Other Employment NES	1.29	1.26	1.14	1.28	1.22	1.18	1.13	1.12
Total Other Employment NES	1.29	1.26	1.14	1.28	1.22	1.18	1.13	1.12
E. Total Employment								
Total Employment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

LQ of 1 signifies regional employment share is equivalent to national employment averages

LQ of <1 signifies it is below national employment share averages

LQ of >1 signifies it is above national employment share averages

It is clear from this data that resource-based employment in Colorado has shrunk in proportionate terms from 1970 to 2000. Total state resource-based employment's LQ fell from 1.19 in 1970 to 0.99 in 2000, while total farm employment's LQ over the same period fell from 1.05 to 0.81. Manufacturing, while well below the national proportion in Colorado, rose from an LQ of 0.54 to 0.64 over the 30-year period, while comparable data for total service-based employment fell from an LQ of 1.12 to 1.05. Interestingly for a region infatuated by the image that the "government" is intrusive and growing, the LQ for total government employment fell from 1.28 in 1970 to 0.95 in 2000!

Thus, even this initial data suggests that Colorado, over the last three decades, has "matured" away from relatively heavy dependence on resource-based production and employment and moved toward a state with a growing LQ share in manufacturing and varied growth and decline in various service sectors.

But how has this growth and changing sectoral shares in employment been distributed throughout Colorado? Have all regions benefited from the buoyancy of rapid employment growth at rates faster than nationwide or even in the Census Bureau's Mountain Division?

Continued use of Location Quotients sheds some light on these regional growth and change questions within Colorado. Using the same 30-year period, we now look at how the five regional clusters of counties within Colorado have seen employment totals and shares change relative to State totals.

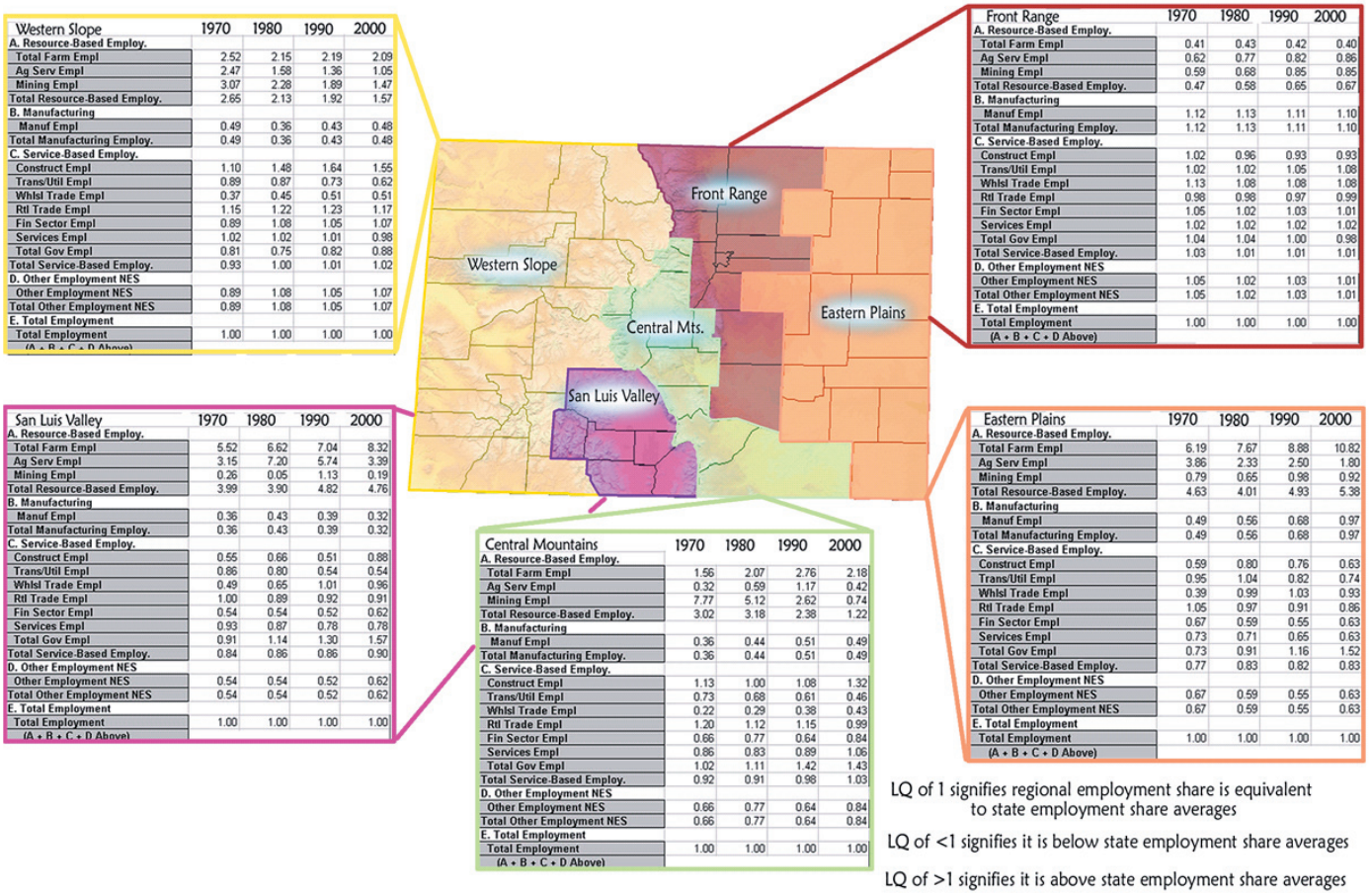
Recall that Colorado's total employment from 1970 to 2000 grew 187%. What about a similar measure for regions within Colorado? (See Figure F.)

Figure F: New Job Growth in Colorado

	1970 Employment	2000 Employment	# of New Jobs	% Growth
Colorado	1,031,728	2,960,920	1,929,192	187.0%
Eastern Mountains	25,212	70,683	45,471	180.4%
Western Slope	81,334	333,928	252,594	310.6%
Eastern Plains	59,739	85,233	25,494	42.7%
Front Range	850,163	2,439,458	1,589,295	186.9%
San Luis Valley	12,634	23,889	11,255	89.1%

Thus, regional shares of total employment in Colorado have significantly changed over three decades. Disparities in the amount of total job growth within regions of Colorado are obvious. Buried within these shifting regional shares are changes in each region's sectoral growth of jobs relative to Colorado. Using LQs for these regions, measured against total state employment by job sector, the changing specialization of regions can easily be highlighted in Figure G.

Figure G: Employment Location Quotients For Colorado 1970-2000



Western Slope	1970	1980	1990	2000
A. Resource-Based Employ.				
Total Farm Empl	2.52	2.15	2.19	2.09
Ag Serv Empl	2.47	1.58	1.36	1.05
Mining Empl	3.07	2.28	1.89	1.47
Total Resource-Based Employ.	2.65	2.13	1.92	1.57
B. Manufacturing				
Manuf Empl	0.49	0.36	0.43	0.48
Total Manufacturing Employ.	0.49	0.36	0.43	0.48
C. Service-Based Employ.				
Construct Empl	1.10	1.48	1.64	1.55
Trans/Util Empl	0.89	0.87	0.73	0.62
Whlsl Trade Empl	0.37	0.45	0.51	0.51
Rtl Trade Empl	1.15	1.22	1.23	1.17
Fin Sector Empl	0.89	1.08	1.05	1.07
Services Empl	1.02	1.02	1.01	0.98
Total Gov Empl	0.81	0.75	0.82	0.88
Total Service-Based Employ.	0.93	1.00	1.01	1.02
D. Other Employment NES				
Other Employment NES	0.89	1.08	1.05	1.07
Total Other Employment NES	0.89	1.08	1.05	1.07
E. Total Employment				
Total Employment (A + B + C + D Above)	1.00	1.00	1.00	1.00

Front Range	1970	1980	1990	2000
A. Resource-Based Employ.				
Total Farm Empl	0.41	0.43	0.42	0.40
Ag Serv Empl	0.62	0.77	0.82	0.86
Mining Empl	0.59	0.68	0.85	0.85
Total Resource-Based Employ.	0.47	0.58	0.65	0.67
B. Manufacturing				
Manuf Empl	1.12	1.13	1.11	1.10
Total Manufacturing Employ.	1.12	1.13	1.11	1.10
C. Service-Based Employ.				
Construct Empl	1.02	0.96	0.93	0.93
Trans/Util Empl	1.02	1.02	1.05	1.08
Whlsl Trade Empl	1.13	1.08	1.08	1.08
Rtl Trade Empl	0.98	0.98	0.97	0.99
Fin Sector Empl	1.05	1.02	1.03	1.01
Services Empl	1.02	1.02	1.02	1.02
Total Gov Empl	1.04	1.04	1.00	0.98
Total Service-Based Employ.	1.03	1.01	1.01	1.01
D. Other Employment NES				
Other Employment NES	1.05	1.02	1.03	1.01
Total Other Employment NES	1.05	1.02	1.03	1.01
E. Total Employment				
Total Employment (A + B + C + D Above)	1.00	1.00	1.00	1.00

San Luis Valley	1970	1980	1990	2000
A. Resource-Based Employ.				
Total Farm Empl	5.52	6.62	7.04	8.32
Ag Serv Empl	3.15	7.20	5.74	3.39
Mining Empl	0.26	0.05	1.13	0.19
Total Resource-Based Employ.	3.99	3.90	4.82	4.76
B. Manufacturing				
Manuf Empl	0.36	0.43	0.39	0.32
Total Manufacturing Employ.	0.36	0.43	0.39	0.32
C. Service-Based Employ.				
Construct Empl	0.55	0.66	0.51	0.88
Trans/Util Empl	0.86	0.80	0.54	0.54
Whlsl Trade Empl	0.49	0.65	1.01	0.96
Rtl Trade Empl	1.00	0.89	0.92	0.91
Fin Sector Empl	0.54	0.54	0.52	0.62
Services Empl	0.93	0.87	0.78	0.78
Total Gov Empl	0.91	1.14	1.30	1.57
Total Service-Based Employ.	0.84	0.86	0.86	0.90
D. Other Employment NES				
Other Employment NES	0.54	0.54	0.52	0.62
Total Other Employment NES	0.54	0.54	0.52	0.62
E. Total Employment				
Total Employment (A + B + C + D Above)	1.00	1.00	1.00	1.00

Central Mountains	1970	1980	1990	2000
A. Resource-Based Employ.				
Total Farm Empl	1.56	2.07	2.76	2.18
Ag Serv Empl	0.32	0.59	1.17	0.42
Mining Empl	7.77	5.12	2.62	0.74
Total Resource-Based Employ.	3.02	3.18	2.38	1.22
B. Manufacturing				
Manuf Empl	0.36	0.44	0.51	0.49
Total Manufacturing Employ.	0.36	0.44	0.51	0.49
C. Service-Based Employ.				
Construct Empl	1.13	1.00	1.08	1.32
Trans/Util Empl	0.73	0.68	0.61	0.46
Whlsl Trade Empl	0.22	0.29	0.38	0.43
Rtl Trade Empl	1.20	1.12	1.15	0.99
Fin Sector Empl	0.66	0.77	0.64	0.84
Services Empl	0.86	0.83	0.89	1.06
Total Gov Empl	1.02	1.11	1.42	1.43
Total Service-Based Employ.	0.92	0.91	0.98	1.03
D. Other Employment NES				
Other Employment NES	0.66	0.77	0.64	0.84
Total Other Employment NES	0.66	0.77	0.64	0.84
E. Total Employment				
Total Employment (A + B + C + D Above)	1.00	1.00	1.00	1.00

Eastern Plains	1970	1980	1990	2000
A. Resource-Based Employ.				
Total Farm Empl	6.19	7.67	8.88	10.82
Ag Serv Empl	3.86	2.33	2.50	1.80
Mining Empl	0.79	0.65	0.98	0.92
Total Resource-Based Employ.	4.63	4.01	4.93	5.38
B. Manufacturing				
Manuf Empl	0.49	0.56	0.68	0.97
Total Manufacturing Employ.	0.49	0.56	0.68	0.97
C. Service-Based Employ.				
Construct Empl	0.59	0.80	0.76	0.63
Trans/Util Empl	0.95	1.04	0.82	0.74
Whlsl Trade Empl	0.39	0.99	1.03	0.93
Rtl Trade Empl	1.05	0.97	0.91	0.86
Fin Sector Empl	0.67	0.59	0.55	0.63
Services Empl	0.73	0.71	0.65	0.63
Total Gov Empl	0.73	0.91	1.16	1.52
Total Service-Based Employ.	0.77	0.83	0.82	0.83
D. Other Employment NES				
Other Employment NES	0.67	0.59	0.55	0.63
Total Other Employment NES	0.67	0.59	0.55	0.63
E. Total Employment				
Total Employment (A + B + C + D Above)	1.00	1.00	1.00	1.00

LQ of 1 signifies regional employment share is equivalent to state employment share averages

LQ of <1 signifies it is below state employment share averages

LQ of >1 signifies it is above state employment share averages

All regions of Colorado outside of the Front Range started in 1970 with proportionately larger natural resource based employment than the state level and maintained that specialization for 30 years. The San Luis Valley and the Eastern Plains regions actually achieved higher LQs measured against the Colorado state total, signaling an even greater dependence on ranching, farming, and natural resource production. Manufacturing remains heavily grounded along the Front Range, with the Eastern Plains and Central Mountains showing slight growth in proportions of manufacturing employment. Employment in service sectors around Colorado shows varying trends, with LQs growing in the Western Slope, San Luis Valley, Central Mountains, and Eastern Plains.

LQ Summary of Findings:

Location Quotient analysis over 30 years shows that relative to the Nation, Colorado as a state became decreasingly specialized in resource-based employment, so that by 2000 it mirrored the Nation in resource-based employment--an astounding turn-around for a "Western" resource-rich state! Manufacturing and service employment have remained steady in proportion over 30 years but, compared to the Mountain Division Colorado, have a greater degree of focus on these two sectors. The Central Mountain region experienced a sharp drop in degree of resource-based employment compared with the U.S., Mountain Division, and Colorado but saw a rise in importance of service and manufacturing employment. On the Western Slope, resource-based employment specialization declined but remains higher than either the state or national levels. The Eastern Plains witnessed the highest proportion of growth in resource-based employment and saw manufacturing rise in importance by 2000 due to proximity to the Front Range. The San Luis Valley continues to specialize in resource-based employment for all years against all comparison regions, with manufacturing and services proportionately below benchmark regions. The Front Range, as expected, witnessed growth in manufacturing employment spe-

cialization, but by 2000 remained below the National proportion but above that of the Mountain Division and State of Colorado

Mix and Share Analysis

Intuitive Discussion:

This measure is designed to help regions describe and analyze labor market conditions and changes over a period of time. Generally regions or localities experience changes in their employment mix that are more or less concentrated in certain employment sectors than the larger comparison region, such as the US national totals or a multi-state region such as the Census Bureau's Mountain Division. These differences are frequently attributed to the employment structure of the region. Thus, a region might have some rapidly growing employment sectors while other sectors are experiencing slow growth or even absolute decline. In examining the region's labor market it is not sufficient merely to show that employment changes have occurred over the time period. More information can be obtained by "disaggregating" these employment changes into various structural effects that shine light on the reasons employment by sector is changing. Shift and Share Analysis decomposes employment changes into mutually exclusive factors or "effects" on employment. It paints a picture of how well the region's current employment sectors are performing by systematically examining the national, local, and industrial components of employment change. It will provide a dynamic account of total regional employment growth that is attributable to growth of the national economy (national growth effect), a mix of faster or slower than average growing industries (industry mix effect), and the competitive nature of the local industrial sectors employing workers (regional shares effect).

Explanation of statistic:

The change in a region's employment over time within sectors and in total can be disaggregated into the net result of three different effects:

National growth effect:

By how much would regional employment have grown in each of its industries and in total IF they had grown at the same rate as total employment grew nationally?

Industry mix effect:

By how much would regional employment have changed in each of its industries and in total IF each regional sector had grown or declined to reflect changes in each sector's share of national employment over time?

Regional shares effect:

By how much would regional employment have changed in each of its industries and in total AFTER removing the national growth and industry mix effects? This amount of employment represents CHANGING regional shares in each sector beyond that explained by the first two effects. This can also be viewed as a proxy for increases and decreases in a region's competitiveness by employment sector.

Mix-Share Analysis can also be stated as

$R = N + M + S$

Where
R = total change in regional employment
N = national growth effect
M = industry mix effect
S = regional shares effect

An example helps to clarify mix-share analysis. If a region's employment in agriculture declines from 150,000 to 120,000 between 1970 and 1990, national employment grows by 50% and national employment in agriculture remains constant, THEN the region's loss of 30,000 jobs in agriculture is explained as the sum of:
N = +75,000 jobs in ag if it grew at the rate of national employment
M = -75,000 jobs in ag to reflect declining national shares of ag employment
S = -30,000 jobs to reflect a regional decline in ag higher than experienced nationally

SO:

R	=	N	+	M	+	S
(150,000 – 120,000)	=	+75,000	+	(-75,000)	+	(-30,000)

Overview of findings:

Mix and Share analysis for the State of Colorado in Figure H shows that while the state added a total of 1.9 million jobs from 1970 to 2000, 861,081 of these jobs (45%) were due to overall growth of national employment, 141,051 of these jobs (7.5%) were due to an improved industry mix, and 927,060 of these jobs (48.5%) were caused by improved Colorado competitiveness. Buried within total employment change in Colorado are sectors that gained in competitiveness and those that shrank. For instance, total resource-based employment gained 36,860 jobs. When compared to the US total employment in each sector, Colorado gained 11,262 of these jobs due to growth of national employment, lost 47,614 jobs due to a declining national industry mix of resource employment, and gained 72,211 jobs due to an improved Colorado competitiveness in resource-based employment. Similar comparisons can be made between a region such as Colorado and the Census Bureau's Mountain Division.

Particular attention should be focused on the Regional Shares Effect in Figure H. This component of regional employment signals sectors whose "competitiveness" has grown over time, often enough to overcome a "loss" of employment due to the National Growth Effect and due to the Industry Mix Effect. When Colorado is compared to the US from 1970 to 2000, all types of employment had

positive Regional Shares Effects. But when Colorado is compared to the Mountain Division, Total Farm Employment shrank in competitiveness relative to the surrounding Rocky Mountain States. This is logical given Colorado's buoyant growth in population and employment along the Front Range.

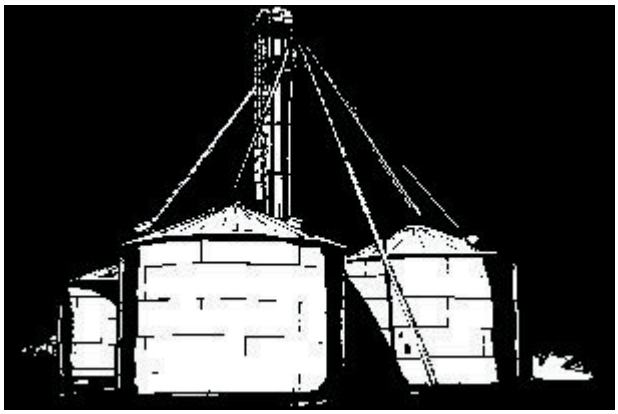


Figure H: Colorado Mix-Share Analysis against the U.S. and the Mountain Division

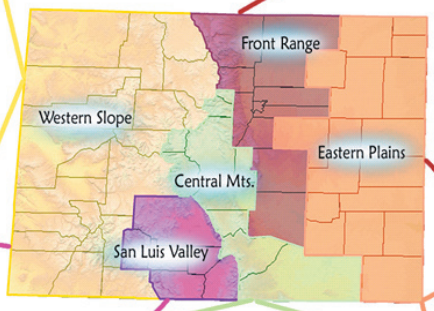
	National Growth Effect	Industry Mix Effect - US	Regional Shares Effect - US	Mt. Division Growth Effect	Industry Mix Effect - Mt. Div.	Regional Shares Effect - Mt. Div.	Total New Jobs in Colorado
A. Resource-Based Employ.							
Total Farm Empl	-10,149	-49,251	56,954	-3,089	-97,870	98,513	-2,446
Ag Serv Empl	18,543	13,591	1,296	29,092	17,088	-12,750	33,430
Mining Empl	1,229	-13,591	17,238	895	-35,029	39,010	4,876
Total Resource-Based Employ.	11,262	-47,614	72,211	25,778	-116,932	127,013	35,860
B. Manufacturing							
Manuf Empl	-3,562	-104,389	204,616	136,815	-107,580	67,429	96,664
Total Manufacturing Employ.	-3,562	-104,389	204,616	136,815	-107,580	67,429	96,664
C. Service-Based Employ.							
Construct Empl	66,070	19,473	85,101	172,936	59,990	-62,282	170,644
Trans/Util Empl	38,604	-7,753	75,846	97,188	-15,177	24,687	106,697
Whlsl Trade Empl	39,468	-814	34,388	98,216	579	-25,753	73,042
Rtl Trade Empl	163,285	26,473	139,485	357,637	26,018	-54,412	329,243
Fin Sector Empl	107,509	32,931	74,863	261,207	80,438	-126,342	215,303
Services Empl	413,488	251,351	87,740	755,570	362,567	-365,558	752,579
Total Gov Empl	96,739	-97,878	150,299	199,371	-272,362	222,151	149,160
Total Service-Based Employ.	961,500	260,123	575,045	1,955,790	255,719	-414,840	1,796,668
D. Other Employment NES							
Other Employment NES	107,509	32,931	74,863	261,207	80,438	-126,342	215,303
Total Other Employment NES	107,509	32,931	74,863	261,207	80,438	-126,342	215,303
E. Total Employment							
Total Employment	861,081	141,051	927,060	2,087,177	111,645	-269,630	1,929,192

Figure I: Mix-Share Analysis For Colorado Regions

Western Slope	N = Colorado Growth Effect	M = Industry-Mix Effect	S = Colorado Regional Shares Effect	Total New Jobs
A. Resource-Based Employ.				
Total Farm Empl	2,774	-17,877	16,293	1,189
Ag Serv Empl	8,517	4,355	-9,385	3,487
Mining Empl	-3,792	-6,866	10,097	-561
Total Resource-Based Employ.	-5,938	-20,099	30,152	4,115
B. Manufacturing				
Manuf Empl	6,381	-5,028	5,694	7,047
Total Manufacturing Employ.	6,381	-5,028	5,694	7,047
C. Service-Based Employ.				
Construct Empl	17,622	5,723	11,537	34,881
Trans/Util Empl	3,038	199	4,250	7,487
Whlsl Trade Empl	5,372	-497	741	5,617
Rtl Trade Empl	21,140	2,060	27,249	50,449
Fin Sector Empl	20,352	3,391	6,817	30,560
Services Empl	76,598	31,420	-18,550	89,467
Total Gov Empl	18,659	-18,382	22,693	22,971
Total Service-Based Employ.	150,634	16,586	74,212	241,432
D. Other Employment NES				
Other Employment NES	20,352	3,391	6,817	30,560
Total Other Employment NES	20,352	3,391	6,817	30,560
E. Total Employment				
Total Employment	146,690	-5,149	111,053	252,594

Front Range	N = Colorado Growth Effect	M = Industry-Mix Effect	S = Colorado Regional Shares Effect	Total New Jobs
A. Resource-Based Employ.				
Total Farm Empl	-2,786	-30,384	32,146	-1,023
Ag Serv Empl	1,636	11,416	11,910	24,962
Mining Empl	-2,224	-13,667	23,092	7,201
Total Resource-Based Employ.	-3,552	-37,317	72,008	31,140
B. Manufacturing				
Manuf Empl	87,585	-118,811	116,495	85,268
Total Manufacturing Employ.	87,585	-118,811	116,495	85,268
C. Service-Based Employ.				
Construct Empl	55,036	55,933	15,318	126,286
Trans/Util Empl	6,388	2,380	88,788	97,557
Whlsl Trade Empl	90,000	-16,034	-10,675	63,291
Rtl Trade Empl	30,837	18,338	218,819	267,994
Fin Sector Empl	47,253	41,791	87,779	176,824
Services Empl	181,818	327,092	122,270	631,180
Total Gov Empl	141,530	-246,081	214,307	109,755
Total Service-Based Employ.	480,679	190,783	801,425	1,472,887
D. Other Employment NES				
Other Employment NES	47,253	41,791	87,779	176,824
Total Other Employment NES	47,253	41,791	87,779	176,824
E. Total Employment				
Total Employment	362,812	76,446	1,150,036	1,589,295

San Luis Valley	N = Colorado Growth Effect	M = Industry-Mix Effect	S = Colorado Regional Shares Effect	Total New Jobs
A. Resource-Based Employ.				
Total Farm Empl	-205	-6,083	6,103	-185
Ag Serv Empl	1,885	862	-1,900	847
Mining Empl	48	-91	20	-23
Total Resource-Based Employ.	3,921	-4,699	1,417	639
B. Manufacturing				
Manuf Empl	410	-571	190	29
Total Manufacturing Employ.	410	-571	190	29
C. Service-Based Employ.				
Construct Empl	1,002	444	-212	1,234
Trans/Util Empl	1,218	30	-1,118	130
Whlsl Trade Empl	404	-102	351	653
Rtl Trade Empl	4,080	279	-2,734	1,626
Fin Sector Empl	1,338	316	-728	926
Services Empl	8,539	4,425	-9,194	3,770
Total Gov Empl	1,425	-3,196	4,019	2,248
Total Service-Based Employ.	17,900	2,319	-9,631	10,587
D. Other Employment NES				
Other Employment NES	1,338	316	-728	926
Total Other Employment NES	1,338	316	-728	926
E. Total Employment				
Total Employment	23,618	-2,635	-9,728	11,255



Eastern Mountains	N = Colorado Growth Effect	M = Industry-Mix Effect	S = Colorado Regional Shares Effect	Total New Jobs
A. Resource-Based Employ.				
Total Farm Empl	-93	-3,429	4,054	532
Ag Serv Empl	266	177	-96	346
Mining Empl	926	-5,379	1,482	-2,971
Total Resource-Based Employ.	2,645	-7,084	2,346	-2,093
B. Manufacturing				
Manuf Empl	855	-1,142	1,738	1,450
Total Manufacturing Employ.	855	-1,142	1,738	1,450
C. Service-Based Employ.				
Construct Empl	4,695	1,823	-905	5,612
Trans/Util Empl	1,915	51	-1,188	778
Whlsl Trade Empl	390	-92	697	995
Rtl Trade Empl	9,691	669	-3,495	6,865
Fin Sector Empl	3,470	777	416	4,663
Services Empl	15,825	8,187	-4,054	19,958
Total Gov Empl	3,710	-7,135	10,668	7,243
Total Service-Based Employ.	40,495	5,078	542	46,114
D. Other Employment NES				
Other Employment NES	3,470	777	416	4,663
Total Other Employment NES	3,470	777	416	4,663
E. Total Employment				
Total Employment	47,143	-2,372	700	45,471

Eastern Plains	N = Colorado Growth Effect	M = Industry-Mix Effect	S = Colorado Regional Shares Effect	Total New Jobs
A. Resource-Based Employ.				
Total Farm Empl	2,147	-32,279	27,173	-2,959
Ag Serv Empl	3,999	4,995	-8,278	716
Mining Empl	-105	-1,291	1,186	-210
Total Resource-Based Employ.	5,277	-25,774	18,044	-2,453
B. Manufacturing				
Manuf Empl	5,092	-3,633	1,219	2,678
Total Manufacturing Employ.	5,092	-3,633	1,219	2,678
C. Service-Based Employ.				
Construct Empl	13,727	2,252	-13,763	2,216
Trans/Util Empl	5,864	156	-5,602	418
Whlsl Trade Empl	4,347	-384	-1,806	2,157
Rtl Trade Empl	33,761	1,378	-32,821	2,318
Fin Sector Empl	16,799	1,864	-16,556	2,108
Services Empl	46,662	16,387	-53,940	9,109
Total Gov Empl	15,086	-12,072	3,929	6,943
Total Service-Based Employ.	145,990	10,029	-130,750	25,269
D. Other Employment NES				
Other Employment NES	16,799	1,864	-16,556	2,108
Total Other Employment NES	16,799	1,864	-16,556	2,108
E. Total Employment				
Total Employment	185,528	-17,513	-142,521	25,494

N= how much employment would have grown had it grown at the rate of total employment statewide

M= how much employment would have grown had it grown to reflect changes in the share of employment statewide of an industry or sector

S = growth with the other two effects removed, a proxy for the competitiveness of a region in a particular industry or sector relative to the state

Mix and Share analysis of individual regions within Colorado over this 30-year period illustrates disparate growth rates in employment and the causes for growth relative to the experience for Colorado, the Mountain Division, and the Nation. In short, employment growth was most rapid in the Front Range, followed by the Western Slope, with much slower growth in the San Luis Valley, Eastern Plains, and Eastern Mountains. A closer look at these regions' relative competitiveness in various industry sectors reveals more of the disparities in economic growth occurring in Colorado. The data is depicted in Figure I.

Front Range

The bulk of new jobs in the Front Range, roughly 92 % or 1,472,887 new jobs, occurred in services employment. This figure can be disaggregated into about a 60% contribution from overall employment growth in the state, and a 13% contribution from service sector growth at the state level. This means that particularly robust growth in the Front Range services sector created about 801,425 more jobs than it would have had growth mirrored overall and sector level growth at the state level. This relatively high share of new employment growth in the services sector is the region's most noteworthy employment characteristic.

San Luis Valley

There were 11,255 new jobs in the San Luis Valley, the smallest share of total new jobs in the state (roughly 0.6%). The bulk of these new jobs, roughly 95 %, were in the services sector. However, actual growth in the service sector (10,587 new jobs) lagged far behind expected growth from the regional reflection of growth in statewide employment (17,900 new jobs). The difference of 7,313 jobs by which the San Luis Valley grew more slowly than the state can be accounted for by the industry mix and the regional shares effects. The industry mix effect would have added 2,319 more jobs in the services, but this was offset by a regional shares effect of –9,361 jobs indicating that even the fastest growing employment sector in the San Luis Valley lags well behind other regions and Colorado as a whole.

The Eastern Plains

There were 25,494 new jobs in the Eastern Plains of Colorado during the study period, the next smallest share of new employment. Again, nearly all new jobs were in the services sector (~ 99 %), with some new jobs occurring in manufacturing as well. Job losses occurred in the resource-based employment sector, with losses in total agricultural employment being the most substantial. This loss of only 2,959 jobs in agricultural employment was miniscule when compared with what job loss would have been like had the region declined in this sector comparatively with the state (a would be loss of 32,729 jobs). When compared with the rest of the state of Colorado, the plains have a strong advantage in retaining agricultural employment. Service sector growth lags substantially far behind the rest of Colorado in the Eastern Plains. One would expect growth in the plains to respond to service industry and statewide growth effects; however, this is not the case. The Eastern Plains' share of service sector employment declined over the thirty-year period relative to the statewide total service employment. This was expressed as a relative loss of 130,750 jobs in services, the largest regional shares effect loss of any region in Colorado.

The Western Slope

New jobs in Colorado's Western Slope region amounted to 252,594 jobs, the second largest contributing region to state wide employment gains at 13 % of all new jobs. The region increased its share of employment in every major sector relative to statewide employment composition. While the region has a distribution of leading and lagging employment attributes within its communities, as a whole, it is the fastest growing region in Colorado.

The Central Mountains

Employment in the Central Mountains increased by 45,471 new jobs during the study period. Losses in mining employment mark the most significant changes in regional employment, although losses were not what they might have been had the region declined at the rate of the mining sector at the state level. Like trends occurring in the Western Slope, the Central Mountains increased drastically their share of government employment, expressed as a relative increase in 10,668 jobs when compared to the state as a whole. The region declined in its relative shares of jobs in statewide services and retail trade though. Manufacturing was another strong point for the region, contributing 1,450 new jobs.

Growth Policies: One Size Fits All?

Growth is a peculiar phenomenon: people and especially their political representatives often respond that it is healthy and desirable, inevitable, even essential. Freedom of migration within the United States (and increasingly across its national boundaries) creates a quasi-market environment where some local and regional "lifestyles" ascend while others dwindle as individuals and families "vote with their feet." Communities grow, remain steady, or shrink according to a complex set of demographic, social and economic factors. Chambers of Commerce and regional as well as state economic development agencies strive to "improve" the conditions leading to rapid, sustained growth of jobs, people, and associated community infrastructure.

Smart Growth is a commonly used term with rampant ambiguity. Some see it as a way political entities can define those conditions leading to sustained growth. Others see it as a way to "tame" rampant growth so that its impacts on communities and existing residents is more benign, less damaging to community assets and lifestyles. Yet others see the term as an oxymoron, a contradiction in terms, believing that growth itself inevitably must detract from a desirable status quo.

In Colorado smart growth has had a life of its own, transcending political administrations. Instituted first by Governor Romer in the 1990s, it now has a new shape under the Owens administration. We must therefore look at its current meaning in Colorado, how it compares to "smart growth" concepts around the nation, and whether this policy amalgamation is sophisticated enough to deal with the disparate needs of sub-regions within Colorado, or whether "one size fits all" take care of state policies towards growth.

Session 3
Smart Growth and Sustainable Development

Governor Owens in 1999 put his own administration's "brand" on the concept of smart growth, saying, "But as we all know, this growth brings with it side effects. Prosperity attracts people. They bring with them not only new ideas and new energy, but also, sometimes, more traffic, more housing, and more retail space. The challenges we face as a state is obvious: How do we maintain that special Colorado way of life while growing and prospering?" The result: his program: Smart Growth: Colorado's Future, "…a specialized package of incentives geared toward saving our natural landscapes, promoting strong neighborhoods, creating our transportation future, and providing opportunities for a better life for people living throughout the entire state" (Owens, 1999).

Smart Growth: Colorado's Future program components:

1). Natural Landscapes: saving open spaces, ranches and farms
- Hinges on the appropriation of state monies earned from the Great Outdoors Colorado Fund, which comes from state lottery revenues.

2). Strong Neighborhoods: protecting our way of life
- Establishes the initiative called Colorado Heritage Com munities which awards money to local comprehensive planning initiatives

3). Moving Forward: creating a transportation future
- Attempts to establish funds for improved transportation infrastructure and new mass transit system.

4). Opportunity Colorado: bringing prosperity to the whole state
- Provides tax credits in economically depressed areas for small business entrepreneurship that employs local work ers.
- Provides support funds for information technology infra structure

At the national level smart growth takes on a somewhat different focus and flavor. The Smart Growth Network, supported by the US EPA, highlights this perspective on growth:
"In communities across the nation, there is growing concern that current development patterns--dominated by what some call 'sprawl' – are no longer in the long-term interest of our cities, existing suburbs, small towns, rural communities, or wilderness areas. Though supportive of growth, communities are questioning the economic costs of abandoning infrastructure in the city, only to rebuild it further out. Spurring the smart growth movement are demographic shifts, a strong environmental ethic, increased fiscal concerns, and more nuanced views of growth. The result is both a new demand and a new opportunity for smart growth."

Smart Growth Network identifies the following principles to achieve success:
- Create range of housing opportunities and choices
- Create walkable neighborhoods
- Encourage community and stakeholder collaboration
- Foster distinctive, attractive places with a strong sense of place
- Make development decisions predictable, fair and cost effective
- Mix land uses
- Preserve open space, farmland, natural beauty & critical environmental areas
- Provide a variety of transportation choices
- Strengthen and direct development towards existing com munities
- Take advantage of compact building design

So we have both a current Colorado version and a broader, nationwide version of what "smart growth" means and the tools or techniques by which it can be achieved. But an important question is not definitions alone, but what the residents of Colorado think about growth, smart, or otherwise.

Coloradans' Opinions on Growth

While Coloradans have always perceived their quality of life as high, disparities exist as to whether that quality of life is improving or getting worse. Those who feel things are getting better, in the past, have pointed towards a healthy economy bolstered by new growth as the principal reason for this outlook. Those who are more pessimistic about the future cite transportation gridlock, seemingly faltering air quality and environmental degradations, as the foremost reasons why things are getting worse rather than better. (The Norwest Public Opinion Program, 2000). It appears that on the whole, Coloradan voters understand the many-faceted nature of growth as well as their elected politicians.

Even in this time of burdensome economic downturn, concerns about the pace of Colorado's growth persist as the top concerns that voters would like their elected officials to address (Cirulli and Associates, 2002). However, failure to address growth concerns through legislative action has been more common than not. The predominantly republican house and predominantly democratic senate have long agreed "in theory" on the necessity to adequately address growth management, but have failed to agree on a vision for enacting it. Exhibit A: a newly elected republican Governor touting Smart Growth as an issue and set of tools.

In January of 2000 an anti-sprawl citizen initiative was introduced for the November ballot by the activist coalition Coloradans for Responsible Growth as a constitutional alternative to legislative stagnation. The initiative would have required counties with populations of 25,000 or more and municipalities of 1,000 or more to submit growth maps for voter approval each year. Counties of populations between 10,000 and 25,000 could vote to become exempt from the legislation. In addition, the referendum required the affected areas to map growth for all portions of the area that could affordably be serviced with the proper infrastructure for the next ten years.

Initially, the proposal gained in popularity, reaching a 78 percent approval rating in June. By September that rating had slipped to 65 percent, and the referendum was ultimately defeated by a 70 to 30 percent margin. The initiative was opposed by a wealthy and powerful constituency of real estate and development

officials and by Governor Owens for being too costly. The initiative would have required an increase in local planning funding both for designing the maps and for dealing with inevitable litigation. There was some opposition expressing concerns that the proposal would also cause housing prices to soar and would encourage sprawl in outlying areas unaffected by the amendment. In the end, business and real estate interests prevailed, without funding proponents of the bill by a 4-to-1 margin through the support of a near $4 million dollar outreach purse. Governor Owens also opposed the issue on grounds that it was too overarching: a too broad-based application of state regulatory controls in matters that require local incentive structures.

Growth remains an important, if not the most important, issue for Colorado voters. In the aftermath of the initiative by the Coloradans for Responsible Growth, opinions concerning the proper role of a state level initiative are increasingly disparate. Popular opinion amongst Colorado voters suggests that the state should still play an important role in providing significant financial support for local planning efforts.

Do Colorado Growth Policies Fit Regional Needs?

We have seen the disparate nature of actual economic growth and change, as well as projected future population over the next 30 years. It is clear sub-regions of Colorado are experiencing quite different "growth" levels and impacts. Some are booming while others are struggling to maintain jobs, incomes, and community infrastructure. We have also seen definitions of "smart growth" policies in Colorado, and compared them to a national version. Also, we have looked at measures of public opinion Coloradans have about growth.

What remains is a fundamental question: are regions within Colorado each supported by a strong, logical, and comprehensive "growth" policy that assist in managing their region's growth and in some cases relative decay? A corollary question: do these regions each receive proportionate or "fair" shares of state expenditures for public services to match their "growth management" requirements? The answer requires a disaggregation of state expenditures over the past decade or more. Answers would shed light on the validity and usefulness of "smart growth" policies, pronouncements, and even rhetoric. An initial glance at the answer to this question is provided in Figure J.

Figure J: State Expenditures to Regions within Colorado

	Population Growth	Growth in State Expenditures to Counties
Colorado	34.7%	15.4%
Central Mountains	43.0%	14.8%
Eastern Plains	14.0%	4.3%
Front Range	34.7%	16.4%
San Luis Valley	16.2%	-0.7%
Western Slope	44.0%	21.3%

As Governor Owens remarked " Let me conclude by saying that I believe we can grow while protecting our natural landscapes, strengthening our neighborhoods, providing a modern transportation system and increasing opportunities for Coloradans

The way to accomplish this is by recognizing the tremendous diversity across the state and providing the tools that families and communities will need to chart a course for the future." In echoing the governor's assertion, we further pose the question to you the reader: Are the current tools and opportunities adequate for both regions that are swamped with growth and regions that are left behind? Concern by Colorado residents over growth provides a rationale for delving further into the "growth" mechanics that shape our communities, lives, and beautiful state.

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The Fiscal Impact of Rural to Residential Redevelopment

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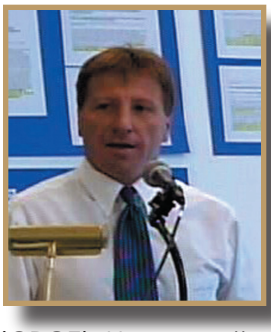

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I. Introduction

Homes, businesses, crops, and pasture are all common uses of private lands in Colorado. County and municipal leaders must make decisions that guide the use of the lands within their jurisdictions. One of the factors that guides community land use decisions is its relative contribution to the tax base. Different land uses command different tax rates and generate different amounts of tax revenues. However, different land uses also demand different amounts of community services. As a result, the net effect of land use alternatives on the tax base is of interest to community leaders.

In many rural areas of the United States, including Colorado, agricultural lands are under pressure to convert to rural residential uses. In Colorado, residential tax rates are higher than agricultural rates. Rural residential land use implies greater population density than agriculture, but less density than urban residential land use. Relative to agriculture, residential land use typically implies greater demand for community services, including police, emergency services, and schools and transportation infrastructure. Cows and corn don't go to school, as they say.

In this report, we analyze the relative cost of providing community services to agricultural lands versus rural residential development across the state of Colorado. The study focuses on measuring the net impacts of rural residential development on the fiscal structure of Colorado county governments and school districts. The analysis presents estimates of the fiscal impacts of rural residential development using an econometric model of county revenues,

county expenditures, school district revenues, and school district expenditures. This approach reveals incremental as well as average costs and can make possible projections about cost and revenues of future development. The scale of analysis is at the county level, where many of the impacts of rural residential development are felt and where many land use decisions are made. As among the most significant public service demands of residential development, this report summarizes the statistical analysis of school revenues and school expenditures, in addition to total county revenues and expenditures for Colorado counties.

II. Relevant Literature: Approaches and Results

The conversion of crop, pasture, and forest land into rural residential development is a widespread phenomenon in many Colorado counties and throughout the United States. Counties located in isolated, but amenity-rich areas are confronted with issues similar to those experienced by counties near growing urban areas (Heimlich and Anderson, 2001). A recent study by the American Farmland Trust (2002) estimated that 11 percent of all prime ranchlands (those with rural development densities, located near to public lands, year-round water availability, mixed grass and tree cover, and high variety of vegetation classes) are susceptible to conversion to residential development. Current and presumed future community preferences help guide local elected officials to make informed decisions about the use of these lands.

Farmland preservation advocates have taken a variety of approaches to make their case. They have argued for the importance of national, regional, and/or local food security and of rural communities, against the irreversible loss of high quality soils and wildlife habitat, and for the importance of fiscal stability and responsibility (American Farmland Trust, 1995). Farmland preservation advocates have essentially argued that land markets fail to reflect society's values for these productive and nonproductive attributes of agricultural lands. Market failure in local, regional, state or national land markets provides a justification for governmental policies of various types (e.g., zoning, density regulations, incentives, taxes, land purchases) and scales of intervention to redress this disparity.

The American Farmland Trust (AFT) has been a leader in investigating the fiscal impacts of agricultural land conversion..

As is common in public policy debates, critics of formal government programs for farmland preservation are also in evidence. Most often, critics of farmland preservation programs question the notion of loss of value (Gordon and Richardson, 1998). They argue that the benefits of farmland preservation are overstated in part because preserving farmland has the potential for restricting the supply of developable land, thereby increasing land prices, reducing the stock of affordable housing, and potentially depressing economic development. They also have maintained that the allocation of scarce public funds to open space preservation amounts to a subsidy to the rich and potentially takes away from programs targeted to the poor. Daniels (1999) contends that fears surrounding threats to U.S. food supply are unwarranted. However, he also makes the case that there are areas where dispersed development can cause fiscal and environmental problems. He argues that planners and policy makers need to be "strategic" and "aim for balanced growth." The ultimate "solution" for any single community, as always, depends. It depends on community human and natural resources, on its economic base, its social and cultural traditions, and its plans for the future.

Farmland preservation advocates and critics largely agree that transitions to higher intensity land uses from lower intensity land uses should "pay for themselves" from a public policy perspective. That is, new land development that creates an additional tax burden on current residents on a per capita basis should be viewed skeptically. Rural residential development may be clustered or dispersed. Dispersed rural residential development tends to have a more pronounced negative effect on the desirable attributes of open landscapes valued by both owners and non-owners of these lands including viewscapes, wildlife habitat, open space, rural lifestyle, flood control, community buffers. It is logical that if these desirable features of the landscape are lost, tax revenues may be reduced due to a decrease in the value of the total housing stock relative to what it might have been under a development design that would maintain or enhance these desirable attributes.

The American Farmland Trust (AFT) has been a leader in investigating the fiscal impacts of agricultural land conversion through the publication of dozens of "cost of community services" (COCS) studies across the United States (AFT, 2000). In a review of 70 COCS studies the AFT reports that, on average, residential development requires $1.15 in community services for every $1 of tax revenues it contributes. They report that farm and forest land uses require only $0.35 in services for every $1 of tax revenue generated, while commercial or industrial uses demand even less ($0.27: $1) relative to their contribution. Studies reviewed from the Western United States include Haggerty (1996, Montana), Hartmans and Meyer (1997, Idaho), Snyder and Ferguson (1994, Utah), and the AFT (1999, Washington). All were supportive of the general national results, although in Idaho agricultural and forest land uses were greater net contributors per acre to county revenues than commercial and industrial uses (1:0.48 versus 1:0.83 on average, respectively). The USDA (2001) reviewed 88 COCS studies and reported that, on average, residential development required $1.24 in community services for every $1 of tax revenue generated, while agriculture demanded only $0.38 in services per $1 of tax revenue contributed. In sum, commercial, industrial, agricultural, and forest uses of lands pay for themselves from a public policy perspective and residential development, on average, is a net drain on county coffers.

There are a number of reasons why these results might be observed. First, residential development and commercial development tend to demand a high level of services while agricultural and forestlands tend to demand fewer services on a per acre basis. Commercial and industrial land uses counter these high per acre service demands by paying a high tax rate generating high tax revenues. However,

Colorado Agriculture

residential tax rates are lower and agricultural tax rates lower still, diminishing the tax revenue generated per acre. The "bottom line" accounting is positive for commercial, industrial, agricultural, and forestland use, but not for residential uses. The traditional logic has been that taxing both the place of business and the places where the employees of the business reside amounts to a sort of double taxation. This logic is supportable so long as the business and the residences lie within the same tax district. However, conflicts can arise when net revenue generating commercial properties and net service consuming residential properties lie in different tax districts. Anecdotal evidence of this calculus abounds in Colorado as many municipalities are annexing commercial property as fast as they can get it, paying little attention to residential needs. Debates across county lines surround who has to house the commuters to whose commercial and industrial sectors.

As intuitively appealing as these results may be, the AFT approach has been criticized as methodologically inadequate and as advocacy research rather than objective science (e.g., Deller, 2002; Kelsey, 1996; Ladd, 1998; Heikkila, 2000). The principal criticisms of the typical COCS techniques are as follows: 1) The AFT approach is largely a non-statistical accounting categorization of rural and urban fiscal flows (AFT, 1999). Such case study approaches can be unsystematic and party to subjective assignment of service demands of the various land uses. 2) Case studies tend to be resource intensive (expensive) and their results are often non-transferable to other communities. 3) Moreover, these reports are taken at a particular point in time rather than over an appropriate period of years to account for public investment and variation in service demands over time. 4) They ignore potential economies of scale and the public good aspects of public services. That is, once the school building is built, each additional student doesn't cost nearly as much as the first students to occupy the building, at least until capacity is reached. Or, the cost of public transportation and emergency services for a community of 100,000 is quite likely less than 10 times the cost of these services for a community of 10,000. Each additional person/family does not imply a greater need for police services. Such services are affected after response times decrease and services suffer due to many more people. 5) Finally, and related to the last criticism, typical COCS studies report average rather than incremental (marginal) fiscal impacts. That is, there may be infrastructural capacity sufficient to accommodate the first 100 residences at little additional cost, but not for the 101st, which throws the accounting to negative as new large fixed infrastructure costs are encountered (Deller 2002).

In this report we endeavor to address these principal criticisms of the COCS literature in the following ways: 1) An econometric analysis is used. 2) Secondary data are employed. 3) The analysis extends across all Colorado counties. 4) The data and analysis incorporate six years of annual revenue and expenditure data. 5) The approach allows for both average and incremental effects to be evaluated.

III. Methodological Approach and Data

The econometric model employed here is derived from Coupal, McLeod, and Taylor (2002) and Heikkila (2000). The analysis addresses changes in the distribution of county revenues and expenditures due to a change in land use. Four equations are specified to understand two important fiscal relationships: county revenues (CREV), county expenditures (CEXP), school district revenues (SCHREV), and school district expenditures (SCHEXP). All monetary variables were represented in real 1998 dollars. The hypothesis to test is whether rural residential development exacts a higher cost to the taxpayer as land is moved from agriculture or forest to residential uses.

The expectation is that county revenues should balance county expenditures over time and that school district revenues should balance school district expenditures over time. Municipal government is not considered in this modeling framework since the issue relates to policies in unincorporated areas of counties. Urban school districts are included because it was impossible to separate out urban versus rural attendance. School districts and county governments have jurisdictional control in rural areas.

The arguments in each function are proxies that represent the user groups who contribute to revenues and exact a demand for services. The county revenue equation is estimated as a function of rural personal income (RUPINC), urban personal income (URPINC), acres of private rangeland (RANAC), acres of cropland (CROPAC), and county total assessed valuation of private property (TOTVAL). The county expenditures equation substitutes government employment (EMPL), a proxy for the provision of government services, for TOTVAL, a proxy for the basis upon which county revenue is generated. School district revenue and expenditure equations are estimated as a function of rural population (RURPOP), urban population (URPOP), acres of private agricultural land (AGLAND) and total assessed valuation (TOTVAL). School employment data were not available to proxy school service provision in a direct analogy to the county revenue and expenditures estimates.

Total assessed valuation is included to account for overall wealth effects. Rural and urban personal income is used instead of rural and urban population, where possible, in order to capture both income and population effects without incurring statistical problems; urban population and personal income are strongly correlated when they are used as separate arguments in the equations. Rural and urban personal income is calculated by multiplying average county per capita income by the respective populations. Comparing household incomes in urban census districts and primarily rural census districts within counties tested the differences between rural and urban income. The average difference between districts within counties was less than five percent.

County revenues come from property taxes, sales tax recapture and intergovernmental transfers.

County revenues come from property taxes, sales tax recapture, and intergovernmental transfers. Intergovernmental transfers and sales tax recapture are largely a function of population. Tax revenues (severance and federal mineral royalties) from mineral activities (coal, oil, gas, trona, and other minerals) are distributed based upon changes in population. So the model takes into account increases in these revenue categories through population change.

The model was transformed from a linear function to a log-log structure in order to account substantial size differences in Colorado's 63 (now 64) county governments. The log-log performs best, statistically speaking, when compared to the linear and log-linear specifications, as revealed through an F-test. The parameter estimates in a log-log specification are interpreted as percent changes in both the dependent and independent variables. That is, a one percent change in an independent variable is correlated with the parameter value percent change in the dependent variable.

The modeling effort also had to contend with substantial variation in county size, developable area (private land), amount of agricultural acreage, size of urban population, and imprecise data of various sorts. Early estimation attempts incorporated the potential effect of public land acreage, regional variation (east, west and front range metropolitan), number of business establishments, and proximity to the metro core. The inclusion of these variables did not improve the explanatory power of the estimations, typically due to a lack of variation over the time period under analysis (e.g., public land acreage, proximity to metro core). The results detailed here were the best obtainable given these considerations and the quality of the available data.

Data were assembled from the Colorado Department of Local Affairs (DOLA), Division of Property Taxation and the Colorado Department of Education for the years 1994 to 1999. Total expenditures are operating expenditures only. Urban and personal incomes are estimated based upon the 1990 Census estimates of per capita income in rural versus urban census tracts. Agricultural land acreages are taken from the DOLA Division of Property Taxation. Valuation data are collected from the county assessors offices by DOLA. Counties with particularly active open space programs may hold significantly more public land in agriculture or forestry than counties with less active open space programs. Unfortunately, available data did not allow consideration of nonfederal public lands used in agricultural activities or forestry.

IV. Results

Interpretation of the Econometric Estimations

The four estimated relationships can be meaningfully interpreted individually and in appropriate pairs. All of the parameter values for independent variables in all of the estimated equations were of the expected positive sign. Rural personal income (RUPINC) was a statistically significant predictor of county revenues (CREV) and county expenditures (CEXP). Total assessed value (TOTVAL) was a statistically significant predictor of CREV, CEXP and school expenditures (SCHEXP). Government employment (EMPL) was a significant predictor of county expenditures. Rural population (RURPOP) was marginally statistically correlated with school revenues (SCHREV) and SCHEXP. Urban personal income (URPINC) was predictive of SCHEXP. Acres of agricultural land (AGLAND) was only tenuously predictive of SCHREV and SCHEXP. When acres of agricultural land were broken out into cropland (CROPAC) and rangeland (RANAC), each variable was less statistically significant than the more aggregated variable, but their inclusion retained the expected signs and significance on the other predictive variables, whereas AGLAND did not.

The estimated coefficient on RUPINC in the CREV equation implies that a 1% increase in average rural personal income, either driven by an increase in rural population or income, is associated with a 0.19% increase in county revenues. However, the estimated coefficient on RUPINC in the CEXP equation implies that a 1% increase in RUPINC, presumably driven by rural population rather than income growth, is also associated with a 0.41% increase in county expenditures. A 1% increase in TOTVAL implies a 0.52% increase in CREV, while a 1% increase in county government employment implies a 0.32% increase in CEXP. Assuming that county revenues and expenditures balance over time, these results imply that an increase in rural personal income results in a net drain on county fiscal health. The results also suggest that for crop and rangelands, the marginal contributions to revenues are greater than those to expenditures. This would validate the supposition that rural residential development is a net fiscal loss to the county government and schools while agricultural land is a net fiscal gain.

On the other hand, the coefficient on URPINC in the CREV equation is not significantly different than its coefficient in the CEXP equation. This suggests that city dwellers payment to county tax rolls is not an unencumbered source of revenues. Urbanites pay taxes to and receive services from both the city and county. Since local governments often function under balanced budget provisions, the implication is that city population increases should generate revenues for county government such that county government can increase the quality and quantity of services provided. Counties often regard municipal population growth as a draw on their resources, particularly

in rural areas, since the county provides law enforcement, health, and other public services that very small communities cannot or do not provide.

The estimated coefficient on TOTVAL in the SCHREV equation implies that a 1% increase in county total assessed valuation is associated with a 0.53% increase in school revenues. The parallel coefficient in the SCHEXP equation implies a 0.58% increase in school expenditures, due to a 1% increase in total assessed valuation. Similarly, a 1% increase in rural population (RURPOP) is associated with a 0.054% increase in school revenues and a 0.056% increase in school expenditures, implying that a marginal increase in rural population is a net drain on school district fiscal health. Assuming that school revenues and expenditures balance over time, these results would imply that an increase in total assessed valuation and rural population result in a net drain on county fiscal health. The results also suggest urban population (URPOP) and acres of agricultural land (AGLAND) tend to influence school district budgets positively on balance, generally supportive of the central hypothesis.

While the negative net effect of rural residential development was expected, the effect of total assessed value may seem counter-intuitive. One explanation is that wealthier communities, those with greater total assessed value, spend a greater proportion of their tax dollars on public education than the average Colorado county. Alternatively, counties with higher total assessed values may be growing more quickly than average and may have found it necessary to invest in new school infrastructure, throwing the school district into deficit over the focal period of this study, at a greater rate than the average Colorado county. However, the most persuasive explanation for this result may be that wealthier and/or faster growing counties have a greater tendency to be experiencing sprawled rural residential development and that this type of development may increase total assessed value, but also results in service demands greater than the tax revenues it generates.

However, literal interpretation of these results should proceed with caution since none of these pairs of coefficients are clearly statistically distinct from one another. As a result, it can only be confidently asserted that changes in TOTVAL, URPOP, RURPOP, and AGLAND are fiscally neutral with respect to school finance. These equations show that the average difference between school revenues and expenditures is found in the intercept term rather than in the explanatory variables. This implies that a constant proportion of school revenues is spent and that Colorado school districts are, on average, operating in budget surplus by a constant proportion of revenues.

Simulated Effect of Dispersed Rural Residential Development

The econometrically estimated relationships can be used to simulate the fiscal impact of particular development scenarios in Colorado. One useful scenario would be to calculate the predicted fiscal impact of dispersed rural residential development in Colorado using ratios similar to those commonly found in the published literature. Thirty-five acres of agricultural land are replaced by one new rural household in the county to evaluate the relative role that rural residential development plays in a county fiscal structure. Average county household income, home value, and family size are assumed for the simulated change. Thirty-five acres are used for two reasons. First, a smaller acreage expansion (e.g. one or even five acre expansions) is usually connected with subdivision development which, while fragmentation nonetheless, can begin to approximate cluster development. This can allow for population growth without the more egregious consequences of fragmentation. Baseline analysis uses family sizes for rural populations equal to the average family size specific to the county. Likewise, county-wide average incomes are used. The scenario assumes a new rural residence that is approximately the same size and generating the same income as the average household in the specific county. As a result, the actual effect of any particular rural residential development will depend upon the extent to which the development is or is not consistent with these county averages. More expensive homes, higher incomes, and smaller families than the county average would tend to increase the revenue contributions and decrease the service expenditure demands of any particular rural residential development.

The models are used to calculate changes in revenues and expenditures for both county government and schools. County rural population (RURPOP), rural personal income (RUPINC), and assessed valuation (TOTVAL) rise as a result of the new household. Agriculture's contribution through total assessed valuation declines by a small amount. The predicted net changes in both revenues and expenditures are used to calculate average ratios of total county expenditure (CEXP and SCHEXP) changes to total county revenue (CREV and SCHREV) changes. On average, this simulation indicates that dispersed rural residential development in the conversion of 35 acres of agricultural land in Colorado costs county government and schools $1.65 in expenditures for every dollar of new revenue received. All Colorado counties, except Elbert County ($0.536:1), show a negative net fiscal impact of dispersed rural residential development and the majority lie within a range consistent with AFT (1999) findings (See Figure 1 and Table 4). It was impossible to calculate this ratio for Denver County since there is no private agricultural land within the jurisdiction.

However, there is substantial variation across counties. Rio Blanco ($1.052:1) and Sedgwick ($1.097: 1) Counties demonstrate the least negative fiscal impact of land conversion. Jefferson ($5.775: 1), La Plata ($5.145: 1), Summit ($4.758: 1), Clear Creek ($3.519: 1), San Juan ($2.23: 1), Larimer ($2.217: 1), and Gilpin ($2.195: 1) illustrate strongly negative fiscal impacts of agricultural land conversion to rural residential development and lie somewhat outside of the currently published range. One explanation for these latter results, potentially appropriate for all except Larimer County, is that a combination of large proportion of federal, state or local public land and a small proportion of private agricultural land relative to the Colorado average would have a greater tendency to generate such ratios and that they are misleading. An alternative explanation, potentially

appropriate for all except San Juan County, is that the population growth rate of these counties was substantially faster than the Colorado average over this period causing forward thinking local governments and school districts to invest in service and educational infrastructure at a rate somewhat greater than the state average and causing expenditures to be higher than average over the short term. This would imply that the ratios are accurate, but the analysis too short-term to reflect the true cost of development over time.

VI. Summary & Conclusions

The amount of land in a county is essentially fixed. Land can be converted from relatively low intensity uses (e.g. cropland, forestland, pastureland, idle land) to higher intensity uses (e.g., residential, commercial and industrial), but not the converse. As a result, county level economic development decisions affecting land use are largely irreversible.

Higher intensity land uses commonly require more government services than lower intensity uses on a per acre basis. Higher intensity land uses commonly require higher quality roads and more road maintenance, water and sewer infrastructure, and greater communications infrastructure. Higher intensity land uses, particularly residential land use, may also require greater school expenditures, emergency medical services, fire services, and public transportation services than lower intensity land uses. Generally speaking, these publicly provided human service costs increase with distance and dispersion on a per capita basis; less sewer pipe and fewer ambulances are needed to serve a dense development within the city limits than a widely spread development far from the city center.

On the other hand, higher intensity land uses tend to generate greater income, employment, and tax revenues than lower intensity uses. This is particularly the case in Colorado where agricultural land uses are taxed based upon their value in production rather than their "best and highest" use, which is often nonagricultural. The basic question facing community government leaders is whether a proposed land use generates more or less tax revenue than it demands in services. Fiscally, responsible governance may require a positive revenue balance to justify approval of a proposed land use in the absence of nonpecuniary objectives. A corollary question is whether a proposed land use generates the greatest amount of tax revenue relative to services demanded among all possible uses of the land; is this the highest and best use of the land from a public finance perspective, ceteris paribus?

Policy makers are right to be concerned about rural residential development. The abundance of AFT-type studies and this research also suggest that rural residential development in the aggregate is a net fiscal loss to county governments. What these results suggest though is that the character and type of development should be studied before one can say that a particular development is itself a net fiscal loss.

Rural residential development poses several policy questions for state and local policymakers. Rural residential development affects wildlife, public land access, open spaces, and ultimately fiscal structure of the county. The fiscal impact model developed in this research partially validates the AFT results that rural residential development costs taxpayers more than it contributes in revenues; conversely, that agricultural land contributes more to county coffers than it asks for in services. However, relying on simple averages to make the case is risky. County land use and planning policy should encourage agricultural land protection in order to capture the fiscal savings as well as the attending flows of public goods associated with non-fragmented lands.

Both the school district and county budget results suggest that the type of rural residential development may affect the fiscal impact to the county. Development distance from public service nodes, the composition of the in-migrating households, the density of development and the natural resource land base all may be important factors to integrate into a fiscal impacts model. Such data should be obtained and analyzed in order to assist county officials with planning strategies.

The AFT cost of community service methodology provides a simple way of calculating ratios that can be used in public policy formation that protects open spaces. It is important that the community leaders and policy makers use the ratios with caution. The results of the general test suggest that there is not a significant difference between rural residential revenues and public expenditures attributed to rural residents. However, the results of the simulation indicate that rural residential development costs taxpayers more than it contributes on average but not necessarily at the margin. The mix of services and service recipients in this case are simply re-allocated in order for county budgets to balance.

It is important to point out that this estimate does not include the broad array of other public good values associated with agricultural land, which includes wildlife habitat, water quality, and viewsheds. Thus, this fiscal value estimate is a conservative measure of the cost and benefit disparity resulting from dispersed rural residential development.

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VIII. Tables

Table 1: Explanatory Variables for the Estimated Equations

Variable	Definition	Expected Sign
CREV	County operating revenue	Endog.
CXPE	County operating expenditure	Endog.
SCHREV	School district revenues	Endog.
SCHXPE	School district expenditures	Endog.
RUPOP	Rural population, population in unincorporated areas in a county	+
URPOP	Urban population, population in incorporated areas in a county	+
RUPINC	County average personal income (earned and unearned) x rural population	+
URPINC	County average personal income (earned and unearned) x urban population	+
EMPL	Local (county) government employment, full-time equivalents	+
AGLAND	Acres of private agricultural land	+
RANAC	Acres of private range land	+
CROPAC	Acres of private crop land	+
TOTVAL	Total assessed valuation in county	+

Sources: RURPOP, URPOP, personal income, and EMPL, U.S. Census Bureau, August. 2002. "County Population Estimates and Demographic Components of Population Change: Annual Time Series, July 1,1990 to July 1, 1999". http://eire.census.gov/popest/archives/county/co_99_8.php, U.S. Census Bureau. August 2002. "Annual Time Series of Population Estimates Incorporated Places (Sorted Within County)"http://eire.census.gov/popest/archives/place/placeco.php, U.S. Dept of Commerce. Bureau of Economic Analysis. 2002. "Regional Economic Information System". CD-Rom. Washington, D.C. http://www.bea.doc.gov/. CREV, CXPE, SCHREV, SCHXPE, AGLAND, RANAC, CROPAC, TOTVAL, State of Colorado, Division of Property Taxation, Colorado Department of Local Affairs, Annual Report, 1995, 1996, 1997, 1998, 1999, and 2000.

Table 2: Fiscal Impact Model Results

Var	Coef.	Std. Error	t-Stat	P-Value	F	df
County Revenues	476.55	366				
CONSTANT	3.3102	0.3918	8.4481	0.000		
RUPINC	0.1869	0.0346	5.4043	0.000		
URPINC	0.0360	0.0294	1.2241	0.222		
RANAC	0.0205	0.0216	0.9495	0.343		
CROPAC	0.0163	0.0123	1.3197	0.188		
TOTVAL	0.5225	0.0306	17.0815	0.000		
County Expenditures					7173.07	366
CONSTANT	8.3901	0.4337	19.345	0.000		
RUPINC	0.4093	0.0564	7.2571	0.000		
URPINC	0.0497	0.0632	0.7862	0.432		
RANAC	0.0026	0.0158	0.1614	0.872		
CROPAC	0.0023	0.0163	0.1391	0.889		
EMPL	0.3187	0.0829	3.8449	0.000		
School Revenues				21109.36	373	
CONSTANT	2.2213	0.6335	3.5062	0.001		
RURPOP	0.0540	0.0353	1.5273	0.128		
URPOP	0.3970	0.0404	9.8228	0.000		
AGLAND	0.0421	0.0292	1.4440	0.150		
TOTVAL	0.5282	0.0360	14.678	0.000		
School Expenditures				22352.50	373	
CONSTANT	1.5271	0.6001	2.5449	0.011		
RURPOP	0.0556	0.0342	1.6260	0.105		
URPOP	0.3717	0.0389	9.5587	0.000		
AGLAND	0.0378	0.0279	1.3535	0.177		
TOTVAL	0.5779	0.0338	17.0902	0.000		

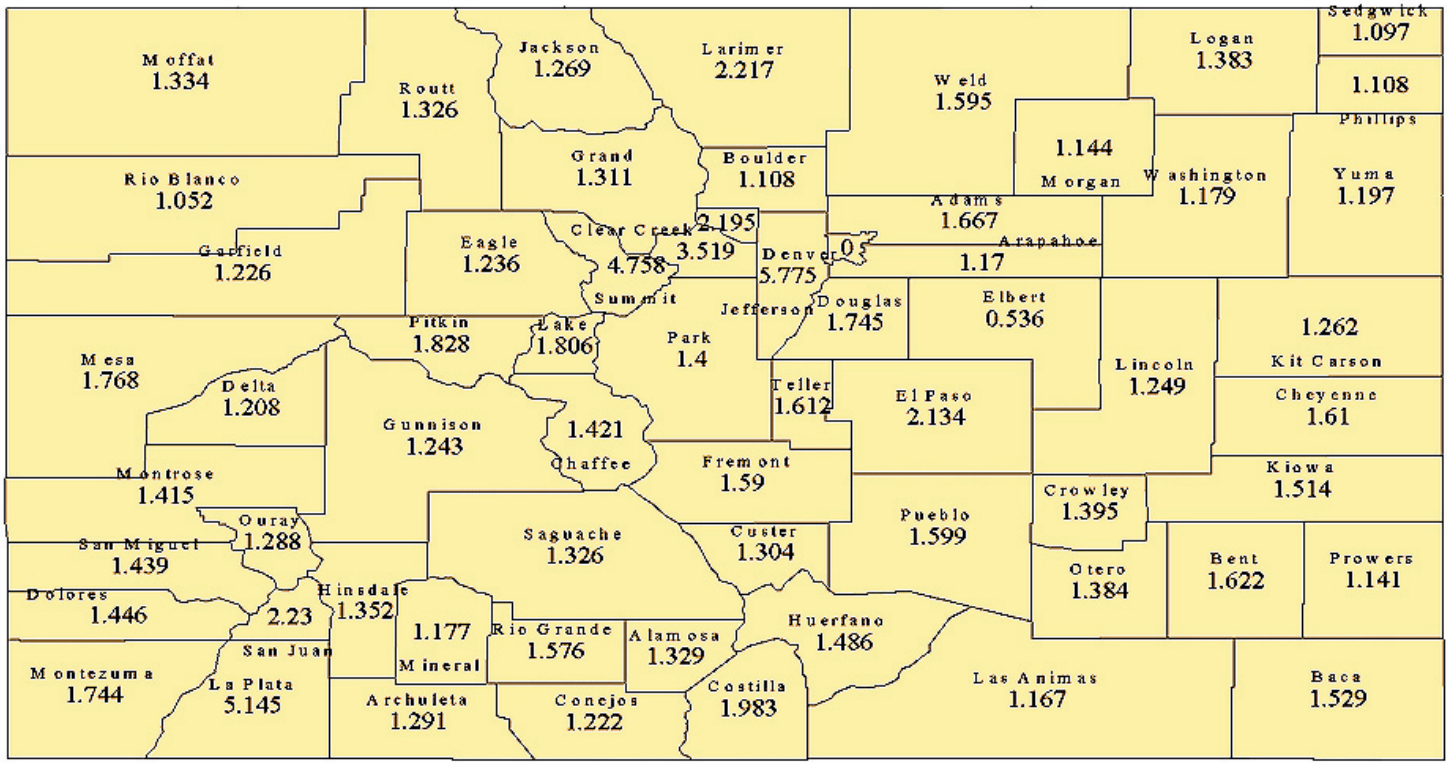
Table 3. Data and Ratios for Colorado Counties

Counties	2000 Urban population	2000 Rural Population	Household size	Agricultural land as of 2000	County Government Ratio (including schools)
Adams	285,529	78,328	2.81	611,936	1.67
Alamosa	8,083	6,883	2.56	284,431	1.33
Arapahoe	338,262	149,705	2.53	302,240	1.17
Archuleta	1,591	8,307	2.47	234,819	1.29
Baca	2,749	1,768	2.33	1,382,971	1.53
Bent	2,758	3,240	2.53	786,911	1.62
Boulder	245,993	45,295	2.47	93,745	1.11
Chaffee	8,165	8,077	2.26	57,478	1.42
Cheyenne	1,263	968	2.5	1,086,891	1.61
Clear Creek	3,535	5,787	2.31	11,458	3.52
Conejos	3,984	4,416	2.8	250,009	1.22
Costilla	1,130	2,533	2.44	252,939	1.98
Crowley	2,103	3,415	2.59	431,352	1.39
Custer	929	2,574	2.36	196,438	1.30
Delta	13,965	13,869	2.43	271,009	1.21
Denver	554,636	0	2.27	1,806	NA
Dolores	903	941	2.35	201,762	1.45
Douglas	48,952	126,814	2.88	251,147	1.74
Eagle	20,087	21,572	2.73	148,715	1.24
Elbert	2,648	17,224	2.93	1,058,495	2.13
El Paso	386,957	129,972	2.61	668,837	0.54
Fremont	20,746	25,399	2.43	311,967	1.59
Garfield	24,446	19,345	2.65	404,710	1.23
Gilpin	633	4,124	2.32	14,268	2.19
Grand	5,643	6,799	2.37	231,230	1.31
Gunnison	7,874	6,082	2.3	335,686	1.24
Hinsdale	375	415	2.2	15,153	1.35
Huerfano	5,106	2,756	2.25	637,091	1.49
Jackson	734	843	2.37	327,807	1.27
Jefferson	345,390	181,666	2.52	81,955	5.78
Kiowa	897	725	2.4	1,061,562	1.51
Kit Carson	5,459	2,552	2.5	1,305,828	1.26
Lake	2,821	4,991	2.59	197,588	5.14

Table 3 cont. Data and Ratios for Colorado Counties

Counties	2000 Urban Population	2000 Rural Population	Household size	Agricultural Land as of 2000	County Government Ratio (including schools)
La Plata	16,140	27,801	2.43	130,601	1.81
Larimer	182,675	68,819	2.52	479,449	2.22
Las Animas	9,900	5,127	2.4	2,041,545	1.17
Lincoln	3,411	2,676	2.44	1,502,647	1.25
Logan	12,600	7,904	2.45	1,033,770	1.38
Mesa	51,882	64,373	2.47	476,942	1.77
Mineral	377	454	2.2	26,846	1.18
Moffat	9,508	3,676	2.58	1,082,463	1.33
Montezuma	9,953	13,877	2.54	328,255	1.74
Montrose	15,286	18,146	2.52	368,566	1.42
Morgan	18,249	8,922	2.8	718,423	1.14
Otero	14,492	5,819	2.49	439,676	1.38
Ouray	1,526	2,216	2.36	134,139	1.29
Park	789	13,734	2.45	212,935	1.40
Phillips	3,285	1,195	2.47	410,582	1.11
Pitkin	8,465	6,407	2.14	37,005	1.83
Prowers	11,151	3,332	2.67	972,083	1.14
Pueblo	102,646	38,826	2.52	1,058,187	1.60
Rio Blanco	4,338	1,648	2.5	456,291	1.05
Rio Grande	6,867	5,546	2.59	171,700	1.58
Routt	12,741	6,949	2.44	707,154	1.33
Saguache	3,142	2,775	2.56	330,455	1.33
San Juan	531	27	2.06	153	2.23
San Miguel	3,775	2,819	2.18	250,669	1.44
Sedgwick	1,988	759	2.31	301,679	1.10
Summit	9,576	13,972	2.48	30,667	4.76
Teller	8,121	12,434	2.56	92,936	1.61
Washington	2,245	2,681	2.46	1,491,336	1.18
Weld	139,104	41,832	2.78	2,009,181	1.59
Yuma	5,750	4,091	2.55	1,462,803	1.20

IX
tax revenues generated ($).



Corporate Citizenship, Public Policy, and Urban Sustainability:

Why REI Chose Downtown

Brian Dunbar is an Associate Professor in Construction Management at Colorado State University, director of the Institute for the Built Environment, and a U.S. Green Building Council LEED Accredited Professional. His research on sustainable architecture, historic preservation, and healthy buildings has been presented at numerous design, construction, and planning conferences and has been published in Journal of Education, Housing and Society and *The Journal of Interior Design.*

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In his address to the Center for Colorado Policy Studies 2002 Conference, Kee Warner (2002) discussed the "potential for urban sustainability to create bridges with other communities concerned with quality of life issues." Certainly, in recent years, the value of considering sustainability in personal, business, and political decisions has gained increasing attention. However, as a society, we have not yet tapped the full potential of urban sustainability to bridge the diverse short-term objectives of business and government communities who often share broader social goals of protecting the natural environment and enhancing the health and vitality of urban life.

The purpose of this research was to explore how governmental policies can support corporate philosophies and practices that foster urban sustainability. Specifically, this case study identified the stakeholders, conditions, and policies that supported the integration of sustainability, historic preservation, and urban renewal in the design of the new REI store, which is located in the rehabilitated Denver Tramway Building. The main research questions framing this work were the following: What role can government agencies (e.g., Colorado Historic Society, Denver Urban Renewal Authority)

play in creating a sense of place through urban sustainability and historic preservation? How does the REI Denver project contribute to a sense of place in lower downtown through the successful enhancement of built and natural environments?

Sustainable Development and Sense of Place

Sustainable development implies growth that meets the needs of present society while ensuring that the ability of future generations to meet their own needs is not compromised. Broadly defined, sustainable development refers to the connection or interdependence between the built and natural environments. In practice, it calls for the efficient and responsible use of energy, land, and other natural resources in the context of new development (Brown, Fox, & Pelletier, 2000; Gladwin, Kennelly, & Krause, 1995; Mendler & Odell, 2000). Historic preservation falls within the definition of sustainable development because it involves the practice of using processes or materials to "sustain the existing form, integrity, and materials of a historic property" (Weeks & Grimmer, 1995, p. 1).

The inherent value of sustainable development is its contribution to the economic, environmental, and social psychological well-being of communities. The tendency of businesses and governments has been to focus on the economic and environmental outcomes of sustainable development; however, this practice also can foster a "sense of a place" that, in turn, contributes to the social psychological well-being of communities. The term "sense of place," derived from the Latin genius loci, refers to an individual's attachment to a geographic setting stemming from a combination of use, attentiveness, and emotion (Norberg-Schulz, 1980; Stokowski, 2002). In other words, a sense of place is the intangible, inviting quality of a geographic setting that fosters interactions among its inhabitants (e.g., residents, visitors, tourists). Although a sense of place emerges from the gestalt of physical and cultural aesthetics of a setting, it also is important to note that places are dynamic contexts that reflect surrounding social and political values, such as a commitment to the preservation of the natural and built environment.

Sustainable Development and Stakeholder Collaboration

Literature (Brown et. al., 2000; Guy, 2000) suggests that stakeholder collaboration is key to successful sustainable development. Although architects and design professionals may be well positioned to provide leadership, the implementation of sustainable development practices requires support from the multiple stakeholders involved. Tri-sectoral models (Waddell, 2002; Warhurst, 2001) suggest that there are three types of stakeholders—business, government, and community (representing economic, political, and social systems, respectively)—from which collaborations can be established to achieve sustainable development. Waddell (2002) situates the three types of stakeholders within a broader, natural environment context, and argues that each category has distinct attributes, strengths, and weaknesses that make the achievement of common goals more attainable when collaborations among stakeholders are formed.

Halal (2001) has built upon original theories of stakeholder interaction to suggest that stakeholder collaboration involves a two-way working relationship that combines the capabilities of partners to create added value for their mutual benefit. If this two-way collaboration is attained, the result is an exchange of economic and social benefits among the business and its stakeholders. Halal proposed a model of stakeholder collaboration based on three principles: (1) shared information increases trust and understanding in stakeholder relationships, (2) political partnerships build common support for the given project, and (3) collaborative problem-solving yields creative solutions, which, in turn, generate economic and social value.

The Case of REI Denver: Sustainable Development through Stakeholder Collaboration

REI as Corporate Citizen

In recent years, a growing number of companies have been recognized as outstanding corporate citizens, that is, businesses whose practices enrich the society in which they operate. One retailer that has positioned itself as a leader in corporate citizenship, and in particular, environmentally friendly business practices, is Recreational Equipment Inc. (REI). REI, a customer-owned cooperative, has a corporate giving program which provides direct financial assistance and visibility to nonprofit environmental/outdoor groups. In the past 25 years, REI has donated more than $8 million to conservation and restoration causes (Kass, 2001; REI fact sheet, n.d.). REI is a member of Conservation Alliance, a group of approximately 70 companies that offers financial assistance to grassroots environmental efforts. REI also supports volunteerism, donating time, human-power, and expertise to local service and education projects (REI Denver flagship store, 2000; REI fact sheet, n.d.).

Stakeholders

To gain understanding about the processes and public policies that supported REI's decision to invoke principles of sustainable development in the design of their new Denver flagship store, in depth interviews were conducted with primary stakeholders in the REI Denver project. Interview questions focused upon the role that each stakeholder played in the decision-making process as well as the missions, core values, policies, and interactions that shaped each stakeholder's contributions to the REI project. Primary stakeholders included (1) REI Denver store manager and 20 year REI employee, (2) J.D. Forney Jr., owner/seller of the Tramway Building; (3) the Denver Urban Renewal Authority (DURA); (4) the Colorado Historic Society (CHS); (5) Mithun Partners Architects and Interior Designers, Inc., Seattle; and (6) Hensel Phelps Construction Co., Greeley, Colorado. Interview data were transcribed and then analyzed using content analysis methods. Transcripts were examined for emergent themes as well as evidence of information sharing, partnership building, and collaborative problem-solving among stakeholders (Halal, 2001). Also of interest was the role of public policy in making possible REI's implementation of sustainable development principles in the design of their new flagship store.

The roles and contributions of secondary stakeholders

(e.g., the City of Denver Mayor's Office of Economic Development, the Denver Landmarks Preservation Commission, the South Platte River Commission, neighboring business owners, and the National Register of Historic Places) were identified through interviews with primary stakeholders. The data gathered from these interviews were interpreted to understand how government policy shaped the project decisions and outcomes.

Facilitating the REI Project Through Stakeholder Collaborations: The Importance of Public Policy

By 1998, REI's Denver store could no longer accommodate full merchandise assortments in all product lines. Thus, REI began to search for a new retail site where they could establish a Denver flagship store. REI initially considered expanding operations into the soon to be vacated, adjacent Best Buy store, which would have doubled REI's retail space. When plans to purchase this property fell through, REI shifted their attention to the recently revitalized lower downtown region of Denver and considered the option of constructing a new, built-to-suit facility that would allow them to implement sustainable development principles. During this search process, REI recognized the untapped potential of the historic Tramway Building, which housed the electric power generator for the Denver street car system from 1901 through 1950. In particular, REI management was drawn to the building for several reasons, including (a) its spacious size, which could adequately house REI's diverse merchandise assortment; (a) its location, which offered visibility from nearby Interstate 25, (c) its legacy as the home of the electric power generator for the Denver street car system, which presented REI with the opportunity to preserve a historically important landmark, and (d) its position in Denver's Confluence Park neighborhood, a clustering of businesses, parks, and residences that reflect a unique spirit of urban revitalization and a commitment to the enhancement of built and natural environments. Also key to REI's decision was the issue of cost, and, in particular, whether the costs of rehabilitating the Tramway Building would exceed those of build to suit alternatives.

REI's selection and subsequent rehabilitation of the Tramway Building as the home for its new flagship store was made possible through the collaboration of multiple stakeholders. Of particular relevance to the purpose of the present paper are the contributions and policies of two public agencies: the Denver Urban Renewal Authority and the Colorado Historic Society. As is outlined below, it was the support of these two agencies that made the REI project financially viable.

The Denver Urban Renewal Authority, or DURA, is a public economic development agency that operates within the city and county of Denver in accordance of Colorado Urban Renewal Law. In keeping with the principles of social responsibility and ethical accountability, DURA uses public money, such as tax revenues generated from completed redevelopment projects, to fulfill its mission of eradicating slum and blight through redevelopment activities that enrich the surrounding community.

Initial contact between REI and DURA was made through the City of Denver Mayor's Office of Economic Development prior to REI's purchase of the Tramway Building. After reviewing REI's application for support from the City of Denver, DURA concluded that the project represented potential economic and social value, estimating that the new REI store would generate more than $650,000 annually in property and sales taxes that would support urban revitalization in the city of Denver. Thus, confident in the promise of the REI project, DURA and REI created a cooperative agreement detailing a plan for tax increment financing that required approval by the Denver City Council. The Council's approval of a 15-year sales tax increment rebate was a significant benchmark in REI's ability to actualize their plans to rehabilitate the building. During this rebate period, the City of Denver receives all post-rehabilitation property tax, but only a small percentage of the increased sales tax generated from the new retail site. More specifically, DURA reimburses 90% of the increase in sales tax revenue generated from the new property to REI for seven years, after which the reimbursement rate falls to 80% for the remainder of the agreement. Once the agreement expires, the City of Denver will collect 100% of the sales tax. Additionally, DURA facilitated communication between REI and the South Platte River Commission, who came to an amenable agreement regarding REI's use of the river for retail/consumer use.

Recognizing the Tramway Building as an important historical resource and fiscal opportunity, DURA solicited Colorado Historic Society's (CHS) involvement in the REI project. Through its activities, the Colorado Historic Society, a unit within the Colorado Department of Higher Education, seeks to meet two objectives: to educate the public about Colorado history and to preserve Colorado's historic built environments. These ends are met through a variety of programs, including (a) legislation that allows state gaming tax revenues to be used for the preservation of historic buildings, (b) operation of state museums, (c) publication of educational materials, and (d) open, inclusive communication within the organization and in dealings with grant applicants and the public.

In their support of historic buildings, CHS administers tax credit programs and monetary grants to support restoration and preservation projects. In reviewing tax credit applications and administering grants, CHS evaluates "contract deliverables" of potential projects. CHS's relationship with the Denver Regional Office of the National Park Service, the organization that awards federal tax credits, also helps them to support local restoration projects. Consistent with federal law, businesses that spend at least the value of the building on rehabilitation efforts are eligible to apply for a 20% tax credit through CHS's Office of Archaeology and Historic Preservation. Businesses also may apply for state grant funds and state income tax credit to carry out restoration projects. CHS employees help applicants to understand and complete the grant application process and the obligations of grant recipients, which include compliance with Secretary of the Interior preservation standards (e.g., zoning, codes, American Disabilities Act, materials). In addition, CHS encourages and suggests ways for applicants to retain the historic character of buildings.

With respect to the REI project, CHS played a key role in preserving the historic integrity of the Tramway Building through the award of a $412,400 grant to cover the restoration or replacement of 167 windows and related costs such as masonry work, roof repair, brick re-pointing, painting, and caulking. This project was appealing to CHS because of the "quality of the resource" and the

historical significance of the Denver tramway system, which was critical in providing transportation to the Denver community in the first half of the 1900s. Other factors that attracted CHS to the project included the large size of the building, its visibility from a major interstate highway, and its location in a recently revitalized and historically important downtown location. Finally, REI's plans to rehabilitate and use the entire building, rather than to subdivide it for varied uses, furthered CHS's interest in the project.

CHS also played an important role in facilitating the addition of the Denver Tramway Power Company Building (REI) to the National Register of Historic Places in September 2001, an honor that brought both the city of Denver and REI much public recognition. To this end, the CHS Office of Archaeology and Historic Preservation guided the nomination by revising the written document and inserting historical and architectural context material. Additionally, CHS coordinated the review of the nomination by the State Review Board and prepared the final materials for submission to the National Register in Washington, D.C.

As such, REI's collaborations with DURA and CHS were integral to bringing to fruition the rehabilitation of Tramway Building to house its new flagship store; without strong governmental assistance, the costs of rehabilitating and renovating the Tramway Building would likely have been prohibitive for REI in their efforts to increase company presence in Denver. With tax incentives and the CHS grant, however, the purchase and rehabilitation of the Tramway Building was estimated to be comparable to purchasing an existing retail site or to constructing a built-to-suit facility.

REI Outcomes: Creating Urban Sustainability through Corporate Citizenship and Public Policy

The REI project is an example of urban sustainability that contributes to economic, environmental, and social psychological well-being of the Denver community. The value of projects like this to the nearby communities is reflected in former Denver Mayor Wellington Webb's 2001 State of the City Address, in which he identified the REI project as a prime example of Denver's exciting redevelopment efforts along the Platte River Valley (DenverGov.org, n.d.). REI's decision to locate its new store in a historic building near downtown Denver is an example of how corporate philosophy and public policy can sustain a business, a neighborhood, and the natural environment. REI's relocation to the Tramway Building has increased its customer base, company image, and company profits while stimulating neighborhood development and rehabilitating the natural environment. In its first year of operation in the Tramway Building, sales at the new REI Denver store had exceeded company projections, thereby contributing to overall corporate profitability. In turn, increased profitability also will support Denver's revitalization and economic development throughout the 15-year tax increment financing period facilitated and approved by DURA.

The value of the natural environment is reflected in the design of the new REI Denver store. The building rehabilitation includes numerous examples of environmentally-sensitive materials, building components, and facility management practices. REI's implementation of sustainable building practices is reflected in their adaptive reuse of floor decking and structural columns reclaimed from an abandoned Montana mine as well as their incorporation of new materials with low environmental impact. Significant sustainable attributes include the use of abundant daylighting; efficient heating, cooling, and ventilation systems; wood flooring from certified sustainable forests; acoustical ceiling tiles with highly recycled content; and biocomposite (recycled newspapers and soy bean fibers) countertops, shelving and display fixtures. The REI Denver project was selected by the American Institute of Architects as one of the 10 Top Green Buildings for 2001 (AIA, n.d.).

The REI project contributes to the aesthetics of Denver's urban landscape through the rehabilitation of a historically significant building, thereby preserving the legacy of Denver's public transportation system. By cleaning-up the building site and grounds, REI has helped this Denver neighborhood to reclaim some of its natural beauty, creating an inviting and safe environment for recreation (e.g., biking along the South Platte River). Further, REI's use of the indigenous and low-maintenance landscaping on its grounds demonstrates concern for place and local resources. Similarly, REI's responsible use of the adjacent Platte River (as governed by the South Platte River Commission) reflects a commitment to sustainability and future generations. When taken together, REI Denver and the surrounding area have reemphasized and enhanced the unique character and history of the neighborhood, creating a renewed sense of place.

Thus, the REI Denver project illustrates how business can partner with government to enhance the built and natural environments and to create a sense of place. The REI project demonstrates responsible decision-making made possible through the collaboration of the business, government, and community sectors committed to sustainability and urban revitalization. Further, the REI project lends support for Halal's (2001) proposed model of stakeholder collaboration, in that it demonstrates how private and public entities share information, build political partnerships, and develop collaborative and innovative solutions in an effort to create economic and social value. REI's decision to purchase and rehabilitate the Tramway Power Company Building was driven by factors such as location, cost, and opportunities for sustainable development. The decision required stakeholder collaborations and interactions based in part upon three principles that Halal (2001) identified as essential to the creation of shared economic and social value: sharing information to establish trust and understanding, building political partnerships to create common support for the project, and implementing collaborative problem-solving to yield creative solutions.

Learning from REI: Policy Implications in Support of Urban Sustainability

The success of the REI project and the value that it created highlights the importance of existing public policy in bringing sustainable projects to fruition and points to the need to develop additional policies in support of urban sustainability efforts. In the paragraphs that follow, we propose two directions for policy development.

Policy Direction 1: Educating the Community

Sustainable values and practices have emerged as an important local, national, and global topic. Although the public education system provides an ideal opportunity for raising awareness about sustainability among future leaders and citizens, research (Fowles., et al 2003, Szenasy, 2003) suggests that in both the U.S. and the United Kingdom, colleges and universities have failed to thoroughly infuse sustainability concepts in their curricular offerings. Specifically, these findings indicate that when concepts of sustainability are taught in secondary and higher education, the concepts are often taught as a separate, special subject. As such, we suggest that while the comprehensive notion of sustainability and related subtopics is still maturing, school districts, colleges and universities, and business and governmental agency training programs should integrate sustainability topics into curricula. We believe that integrated teaching and learning about sustainable issues at all education levels would increase awareness and potentially lead to positive action and informed policy development.

Policy Direction 2: Building Community Support Structures

A second policy recommendation that emerged from our analysis points to local and state policies and guidelines that permit and encourage private-public collaboration on projects that potentially support urban sustainability. As Halal's (2001) model suggests, once successful business and governmental collaborations are established, mutual benefits and added value are often realized. The fact that the City of Denver could seek tax incentives through DURA policies, and, in turn, that DURA could foster working relationships with the Colorado Historic Society, the Denver Landmark Preservation Commission and the South Platte River Commission, illustrates how two-way stakeholder collaboration can yield creative solutions and generate economic and community value.

Realizing that business, governmental, and community participants change from project to project, a broader policy recommendation could focus on the establishment of local councils or task forces created to guide policy, search for sustainable ways to remove obstacles to urban business development, and respond to opportunities which enhance both urban redevelopment and sustainability. For example, the Ft. Collins Chamber of Commerce recently established an environmental committee that includes city officials from planning and natural resources, educators of sustainable building, and owners of businesses that have incorporated environmental sustainability into their mission. These councils could serve as valuable community resources whose membership, roles, and activities could ebb with the current issues while working to support and uphold the community's economic, environmental, and social sustainability.

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Discussant Session 3

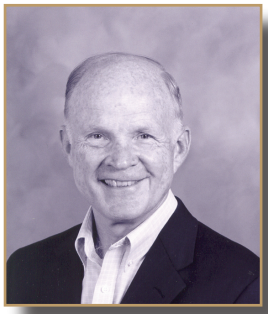
Byron Koste joined the CU Real Estate Center as its first director, in September 1996. Mr. Koste came to the Center from Westinghouse Communities, Inc., a wholly owned subsidiary of Westinghouse Electric, where he held a variety of financial and managerial posts, culminating in his appointment to President in 1992. At WCI, Mr. Koste was chiefly responsible for the development of the company's Florida West Coast operations, including Pelican Bay, Bay Colony and Pelican Marsh in Naples, Pelican Landing in Bonita Springs and Gateway in Fort Myers. For his efforts, Mr. Koste was awarded in 1989 the Order of Merit, Westinghouse's highest honor bestowed upon an employee for distinguished service to the company and the community. He was awarded the 2002 ULI Pathfinder award from Urban Land Institute's Southwest Florida District Council for his pioneering efforts in establishing high-quality, master-planned communities in that region.

Mr. Koste received his Bachelor of Arts degree, majoring in Economics and Fine Arts, from Dickinson College in Carlisle, Pennsylvania; a Master of Business Administration from Duquesne University in Pittsburgh, Pennsylvania; and graduated from the Executive Program at Stanford University in Pal Alto, California.

Mr. Koste is also a board and executive committee member for the Philharmonic Center for the Arts at Pelican Bay, a trustee for Dickinson College, past chair of the Environmental Council for the Urban Land Institute (ULI), past chair for ULI Colorado District Council, and a board member for the Colorado Chapter of National Association of Office and Industrial Parks.


Ted Lopez


Tara Kelley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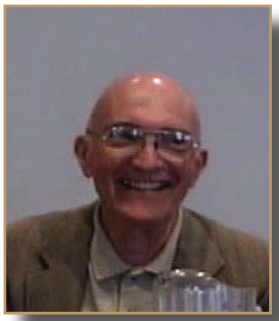
Chuck Howe

Session 4 - *Water and Public Policy*

Keynote Speaker
Ted Lopez

(B.S., Marine Engineering U.S. Merchant Marine Academy; A.A., Accounting County College of Morris, Fellow-National League of Cities Leadership Training Institute) is a self-employed accountant and former Pueblo City Councilman. While in office, he served on the Pueblo Planning and Zoning Commission, Regional Building Authority Board, Airport Advisory Committee, 2010 Commission, and Pueblo Area Council of Governments. He is a current member of the Environmental Policy Advisory Committee and helped develop a Comprehensive Solid Waste Management Plan for Pueblo County. He actively campaigned for passage of the Smoke- Free Air Act in Pueblo.

Whiskey's for Drinking and Water's for Fighting: Was Mark Twain Right?

In the Funk & Wagnalls New Standard Dictionary of the English Language (Copyright 1913) "water" is defined as "a colorless limpid compound of Oxygen and Hydrogen (H2O) in the proportion of two volumes of hydrogen to one of oxygen, or by weight of 2 parts of hydrogen to 16 parts of oxygen." It also gives the physical properties of water -- a simple compound but not completely understood nor appreciated by its users.

I grew up in an ethnic neighborhood, just southeast of downtown Pueblo, outside the city limits, called Salt Creek. I recall that most of the houses had a hand-dug well in the back yard. Water was obtained by dipping a bucket tied to a 15-20 ft. rope into the pool at the bottom, then transferring it to another bucket which was kept in the kitchen. Other houses, without wells, could obtain water at a natural spring, called the "Ojito," the little eye. As a child, I thought it was odd that people did this. Why didn't they have a well?

But, things change and the wells became contaminated because the backyards also had outhouses. So, forming an improvement committee, the citizens of Salt Creek taxed themselves to develop their own water system. A deep well was dug, the necessary infrastructure was installed, and running water indoors was made possible in the mid 60's. This was followed by a second "public works" project. The same community formed a taxing district and taxed themselves, again. This time with the help of grants from the State, they developed and installed a sanitary sewer system. Now, bathrooms inside the house appeared. We no longer had to brave the elements in the middle of the night. However, water consumption in my family of seven siblings and two parents went from less than five gallons per days per person to almost 75 gallons per day per person. The cost increased from almost nothing to about $25 or more per month. A large portion is consumed outdoors on my parent's lawn. I didn't grow up with grass, and I hate mud!

In July 2001, I participated in a tour of the water delivery system of the City of Pueblo which is managed by the Board of Water Works. The first part of the tour took us past the main water treatment plant on the west end of town, next to the Arkansas River, on the north bank. It included Pueblo Reservoir. We drove west on Highway 50 along the Arkansas River upstream to Clear Creek Reservoir above Buena Vista, on to the Twin Lakes and Turquoise Lake Reservoir near Leadville. At the time of the tour, these storage facilities were all below capacity.

We visited the sources of the water supply at the headwaters of the Arkansas. The main source of water comes from decreed water rights that allow the diversion of "direct flow" water of the Arkansas. Water from three, large watershed areas on the western slope of the Continental Divide is another source. This is called "transmountain" water, and it is diverted into canals and ditches that direct this water across the Continental Divide into the Arkansas River.

Our narrator and tour guide was Alan Hamel, Executive Director. He provided us with the history of water and its collection from the mid 1800's to the present. As far back as the 1850's and 1860's, the importance of having a sufficient supply of water was recognized by early settlers to this arid region. It has taken the efforts of many, many individuals to identify the sources and to establish facilities that have served purposes other than just the storage of water. From an engineering standpoint and looking at this entire system as a large public works project, I marvelled at the foresight and the ingenuity necessary to put all of the parts together. This water delivery system has served Pueblo well for many decades. The tour gave me a better appreciation of the continuing efforts by water system personnel to provide "the highest quality of water at the lowest possible cost." Water doesn't just magically appear at the faucet by turning a valve.

Speaking of taking things for granted...For decades the popular notion in Pueblo was that the City of Pueblo had "perfected water rights capable of supplying water in a drought year to a population of 369,000 with associated commercial and industrial development as well as the requirements of Public Service Company's Comanche Power Plant." (There was quite a debate on Council last year on the subject of interrupting the supply of water to Comanche Plant and then possibly affecting the operations of Rocky Mountain Steel Mills. Leasing water outside the city limits is supposed to take us beyond the year 2040. That sort of assurance was maintained by the Board of Water Works and held by the public in April 2002. In July 2002, the City of Pueblo experienced its first water restriction in about 40 years. Our population was about 104,000.)

We used to think we were the master of water. Now it appears we may be its slave. Civilizations have risen and fallen on the quantity of water. People have even been killed over it. Not enough water--droughts! Too much, too soon—flooding, with loss of lives and property destruction!

Water has extensive uses, in our homes for cooking, cleaning and bathing, and to carry away wastes. We irrigate dry land to grow more food. We use water to manufacture electricity. The demand for water is constantly increasing. We believe the supply of water is diminishing. Yet, there is as much water today as there will ever be. Remember the water cycle? the unending circulation of the earth's water? Water is used and reused, over and over, again. It is never used up.

The problem is the location of water and the location of where it is needed: 97% of it is in the oceans and it is salty. 3% of it is fresh, and most of it is locked up in ice caps over Antarctica, Greenland, and the north polar region. Rivers and lakes contain 1/50th of 1% of the earth's water. The atmosphere contains 1/1000th of 1% of the earth's water. However, what is available is unevenly distributed.

The availability of water is not dependent just on the weather cycles and patterns. Water management practices have an impact. Population centers have located near ready sources, but because of pollution have had to look for new sources. The lack of storage facilities, treatment plants and distribution pipes results in a given supply not being fully utilized. What about leaking infrastructure?

Our problem is that we've had a plentiful supply of water. It has been too readily available. It has been cheap, and we've been wasteful and careless. Developing new supplies has become more and more costly. Maybe we need to revive some "old" techniques on how to harvest water. Managing water wisely is the key to helping drought-prone areas. Reusing water will be cheaper. As the water supply becomes more stressed and constrained, we will have to get used to recycling.

Before my right to speak that has been decreed to me is called out, I'll say this: it is my intent to show that things do not remain static. Rather, they evolve. How we look at water and how we use it has changed over time. It appears that our view of water and its use will continue to change. The Funk & Wagnalls dictionary begins by saying that "the chief function of a dictionary is to record usage [of a word], not to seek to create usage. Yet, when custom or usage varies, it is important...to give sanction to best forms and tendencies"..." Management Practices," if you will. Therefore, let's listen and consider two viewpoints, two perspectives that discuss managing this most important compound, this essential natural resource... WATER!

The Potential for Recycling Water for Residential Landscape Use

Tara Kelley
(B.S., Environmental Resource Management, The Pennsylvania State University) is currently a graduate student at the University of Colorado at Colorado Springs pursuing her master's degree in Geography and Applied Environmental Studies with an interest in water resources management. She is currently employed by Colorado Springs Utilities as an Environmental Specialist. She has professional experience in natural resources management at the county, state, federal, and private sector.

Feasibility of a Residential Reuse Program Using Reclaimed Water for Landscape Irrigation in Colorado Springs, Colorado

The ensuing drought situation on the Colorado Front Range, in conjunction with the growing population in this area, has led many to consider the utilization of reclaimed wastewater for nonpotable uses. Agricultural and landscape irrigation is the largest current and projected use of water, offering significant opportunities for wastewater reuse. Research has shown that utilization of reclaimed wastewater for landscape irrigation has led to significant savings in potable water in many cities throughout the United States and the world. The purpose of the proposed research is to determine the feasibility of implementing a residential reuse program in the Colorado Springs Utilities service area within Colorado Springs, Colorado to lessen the demand on this finite resource and still allow for continued growth.

Despite a national per capita decrease in water use from 1980 to 1990, Colorado ranks fifth in the nation in per capita use of publicly supplied domestic fresh water behind Nevada, Utah, Idaho, and Wyoming (Solley et al., 1998). This evokes the question of whether Colorado is doing all it can to conserve this finite resource. More importantly, do Coloradans have any other choice? Recently, municipal water demands have increased in Colorado Springs due to population growth and impeding drought conditions. Will limited new water sources in this rapidly growing city mean no new development?

One solution is to examine the concept of the beneficial reuse of wastewater. Colorado Springs has been involved in a developed reclaimed wastewater program since 1967, supplying tertiary-treated wastewater, hereon referred to as reclaimed wastewater, to 22 sites throughout the city such as parks, golf courses, a school, a cemetery, a multi-family apartment complex, and commercial buildings for landscape irrigation. However, reclaimed wastewater for residential (single-family dwelling) landscape irrigation is currently not addressed in Colorado law and thus is not an accepted use of reclaimed wastewater in the state. Colorado Springs must examine this untapped beneficiary of reclaimed wastewater as so many others have in the nation.

Asano and Tchobanoglous (1991) address the fact that development and use of available water resources provided annually through precipitation (stream flow and groundwater) is neither possible nor desirable as many of these water sources are unattainable or bound by water rights issues and water providers, in general, don't want to fully deplete these sources as they are considered the lifeline of any self-sufficient city. Providing additional storage may be infeasible, and when droughts occur (such as in Colorado Springs), it is often found that increases in water demand have eliminated the drought protection that the system was designed to provide.

Specifically, the use of reclaimed wastewater for residential landscape irrigation is currently practiced throughout the United States in places such as Florida, California, South Carolina, and Arizona. The first dual distribution system (separate piping for providing both potable and nonpotable water to one home or area) was installed more than 70 years ago to provide secondary water for the Grand Canyon Village in Arizona (Asano & Levine, 1995). Florida is a leader in residential dual-distribution systems, using more than 870 million gallons per day (mgd) of reclaimed wastewater. Residents have direct access to reclaimed wastewater for watering lawns, ornamentals and vegetables, or for washing cars. Bringing reclaimed wastewater to homes has created special challenges for Florida utilities (Swichtenberg 1998). Residents must be continuously monitored and educated in the proper uses of reclaimed wastewater. Cocoa Beach, FL, even requires residents to attend a seminar before reclaimed wastewater is made available at their home site. Other communities in the United States, including St Petersburg, Florida, and Irvine Ranch, California, have successfully installed dual distribution systems to private residences (Heaton, 1981).

In order for Colorado Springs to effectively implement a residential reuse program, several factors must be examined to determine feasibility. Some of these factors include public perception, regulatory issues, costs and benefits, and effective implementation. Community acceptance is a key factor in the success of any reclaimed wastewater irrigation proposal. Important characteristics include the difference in cost of potable water and reclaimed wastewater, the extent of public contact with the reclaimed wastewater, and the quality of treatment given to the wastewater (Thomas & Croome, 2001). In Victoria, Austrailia, the major objections to irrigation with reclaimed wastewater are perceived aesthetic (odor), environmental (salinity), and health effects.

Experience in public acceptance of biosolids recycling (Draman, 1995) highlights the importance of using existing scientific data to prove that there is no human health or environmental risk associated with beneficial use projects, including the use of tertiary-treated wastewater for landscape irrigation. To garner public acceptance, residential reuse programs must promote recycling, provide information, create partnerships, and become more proactive. Methods employed by a study by Keenan et al. (1999) utilized surveys of residential water customers to determine public perceptions of water transfers and markets. These methods could be employed by a similar study of Colorado Springs residents to determine current attitudes towards residential reuse. Similarly, this study would be examined by factors such as occupation and length of residence. It would also incorporate other factors examined by Baumann (1983) that correlate with attitudes towards reclaimed wastewater. These included intended use of the reclaimed wastewater, respondent knowledge concerning use of reclaimed wastewater, age of respondent, and his/her perception of the quantity of alternative water sources. Another important aspect to public involvement in a residential reuse program is timing, or when the public should be included in the planning process.

Regulations established for reclaimed wastewater use are already stringent and may be tightened further to relieve public apprehension about pathogens and toxins that have prompted political restrictions on wastewater reuse. According to the U.S. Environmental Protection Agency, more than 500 reclaimed water projects have been in operation in the U.S. for at least ten years. Studies have shown no increase in harmful contaminants or health risks, and no disease outbreaks due to reclaimed wastewater use have been reported (Carter, 1994). Colorado Springs Utilities conducted an epidemiological study in 1986 that concluded that there was no evidence of a gastrointestinal illness effect attributable to exposure to nonpotable wastewater used for landscape irrigation in public areas (Durand et al., 1986: VI-1). Although many wastewater reuse standards, including Colorado's, lack explicit epidemiological evidence on which to base an assessment of health risks, they have been adopted as the attainable and enforceable regulation in the planning and implementation of wastewater reclamation and reuse projects (Asano & Tchobanoglous 1991: 2057). Regardless, it has been concluded that consumer acceptance in not a formidable obstacle in planning for wastewater reuse (Baumann 1983: 83): The public will accept reclaimed wastewater provided the proper information programs are designed and implemented.

Local environmental groups, including the Land and Water Fund of the Rockies, have supported research in alternative water supply, citing that "it would be irresponsible for the state to spend billions on new projects that divert water from the Western Slope before it wrings every last drop out of its existing supplies" (Stein, 2002: Dry West Section). Unfortunately, many politicians see new dams, reservoirs, and pipelines as the only solution to the water crisis facing Colorado today.

Currently, federal and state regulations are in place that address prevention of groundwater and surface water pollution and public health risk from the use of reclaimed wastewater for landscape irrigation. However, more research is required to assess other states' regulations with respect to residential reuse of reclaimed wastewater and the evolution of these regulations. In addition, it is necessary for city utilities (i.e., Colorado Springs Utilities) to be directly involved in legislative development to ensure all factors are considered in residential reclaimed wastewater use. This has been successfully employed in the development of Colorado's Regulation

No. 84 (Colorado Department of Public Health and Environment, 2000). In addition, Regulation No. 84 is currently being modified to include additional reclaimed water uses, including managed single-family residential landscape irrigation. To finance wastewater reclamation and reuse projects, several financial assistance programs have been developed in the United States. These programs must be assessed to determine applicability in Colorado Springs. The specific factors affecting wastewater reuse decisions include (1) local and regional water supply conditions, (2) water quality requirements for intended water reuse applications, (3) existing or proposed wastewater treatment facilities and requirements for the degree of treatment reliability, (4) mitigation of potential health risks and public acceptance, and (5) financing wastewater reuse facilities including sale of reclaimed wastewater (Asano & Tchobanoglous, 1991: 2054).

Important issues that should be covered in the agreement between a supplier and user include definition of roles and responsibilities; contract duration (term, conditions for termination); cost of reclaimed wastewater; ownership of facilities; reclaimed wastewater characteristics; commencement of use; responsibility for operation, maintenance, monitoring, and auditing processes; nature of the reclaimed wastewater use; reliability of supply; environmental improvement plan; and liabilities. Legal responsibility should be shared between the supplier and user.

All states must equally contribute to the United States' campaign to change the way we use water. Governments–federal, state, and local–must equally take responsibility for infrastructure, distribution, and treatment of wastewater. Individuals, too, should act: Admit that water is rare and that it will become still rarer unless we are careful; realize that preservation of water is preservation of our future; accept the idea of paying what it is worth, even if there are sharp price rises in the short term.

Although the current uses of reclaimed wastewater in Colorado are relatively limited, residential reuse of reclaimed wastewater has the potential to be a permanent component in the City of Colorado Springs' integrated water supply system. Colorado Springs' response to water management must incorporate large-scale and longer term water resource planning issues such as residential reuse of reclaimed wastewater. The implementation of a residential reuse program in Colorado Springs will require Colorado Springs Utilities to become a more involved service provider and take a more active approach in interaction with customers.

The Water Resource Plan for Colorado Springs Utilities (Black & Veatch, 1996) and the Nonpotable Master Plan (Black & Veatch, 2001) must be examined in more detail to determine where a residential reuse program could fit into the master plan for Colorado Springs. The Nonpotable Master Plan (Black & Veatch, 2001) determined that from the history of the nonpotable system in Colorado Springs, small customers do not drive expansion. Rather, the larger customers can economically justify system expansion and relatively smaller customers tend to be add-ons. Potentially, developers could be viewed as larger customers, with the city requiring consideration if not mandatory incorporation of residential reuse programs in new residential complex planning. This incorporation must focus solely on the utilization of reclaimed wastewater rather than using existing untreated surface water sources for residential landscape irrigation. Colorado Springs Utilities currently supplies nonpotable water customers with a combination of reclaimed wastewater, untreated surface water, and untreated groundwater. However, it has become increasingly important to utilize the surface water and groundwater components for potable purposes, thereby leaving the only one viable source of nonpotable water–reclaimed water. Implementation of a residential reuse program must be reexamined to ensure Colorado Springs Utilities is realizing its goal to "efficiently utilize all available sources for their most reasonable purpose" (Black & Veach, 2001). The reason why residential reuse had not been considered practical in the past was the complex structure of the Colorado regulations that effectively made Colorado Springs Utilities responsible for users actions. However, the recent adoption of Regulation No. 84 has now expanded the responsibility to both the provider and users, making this option more feasible. Effectively, a new water ethic (Mayor, 1997) must be embraced, which will view residential reuse of reclaimed wastewater as a necessary component to water conservation.

The idea of residential reuse in Colorado Springs has been minimally considered in the past, but has not been determined to be a viable alternative in comparison to other major capital projects largely in part to its relative unimportance, difficulty in public monitoring, and regulatory hurdles. However, due to recent drought conditions and local and state regulatory changes, I expect that my research will shed new light on this somewhat dormant concept and show that a residential reuse program can be successfully implemented by Colorado Springs Utilities and the residents of Colorado Springs.

The study area will be the Colorado Springs Utilities service area, or, more specifically, the city limits of Colorado Springs. This area, serving 105,424 residential wastewater customers and 107,808 residential water customers, is a typical to small-sized area suitable for implementation of a residential reuse. Other communities throughout the United States that supply reclaimed wastewater for residential reuse include the Tucson Water Department, Arizona (potable water service to 675,000, over 300 residential reuse customers); the City of Tampa Water Department, Florida (potable water service to 432,000 customers, projected reclaimed wastewater service for over 4,700 residential and commercial customers); the Irvine Ranch Water District, California (potable water service to 266,000, 2,818 residential and commercial customers of reclaimed water for landscape irrigation); and Casselberry, Florida (potable

water service to 45,000, 1,200 residential reuse customers).

I plan to conduct a thorough analysis of the components necessary to implement such a residential reuse program to determine the feasibility in Colorado Springs. The research will include an attitude/perception survey of Colorado Springs Utilities water and wastewater customers in conjunction with an analysis of trends found in public perception studies; a comparison of current laws and their effectiveness in regulating residential reuse programs, including a critique of the status of Colorado's Regulation No. 84 and its potential incorporation of residential reuse; an analysis of successful residential reuse programs in the United States, focusing on their implementation techniques; and a cost/benefit analysis using existing data contained in the Water Resource Plan for Colorado Springs Utilities (Colorado Springs Utilities, 1996), Nonpotable Master Plan (Black & Veatch, 2001), and Nonpotable Operational Plan (Black & Veatch, 2000), and other previous reports addressing reclaimed water use in Colorado Springs as well as current cost/benefit data obtainable from Colorado Springs Utilities master planning and collection/distribution construction/maintenance personnel. This data will be compiled to determine the feasibility of a residential reuse program in Colorado Springs, taking into consideration public perception, planning/implementation cost/benefits, regulatory requirements, and Colorado Springs Utilities planner acceptance.

Regulatory incorporation of new residential reuse standards will continue to be an on-going process, fostered by interested water providers and conservation groups including Colorado Springs Utilities, working closely with rulemaking bodies. A comparison of other communities' implementation processes will be conducted with assistance from other regional professionals in the industry. I will work closely with the contributors to the Water Resource Plan for Colorado Springs Utilities (Colorado Springs Utilities, 1996), Nonpotable Master Plan (Black & Veatch, 2001), and Nonpotable Operational Plan (Black & Veatch, 2000), and other studies to assess potential residential reuse implementation regions or candidate developing projects from a cost/benefit perspective. This will incorporate an analysis of distribution material and installation cost, potential (present and future) customer base (demand, revenues, and design/construction cost-sharing), and operation/maintenance costs.

If Colorado Springs Utilities can successfully implement the State's first residential reuse program, it can become a leader in Colorado and influence the development of alternative water sources throughout the Arid West. If a residential reuse program is found to be feasible, our community can work together to modify policies on new development, influence State regulators to consider residential reuse in Colorado, and lessen the impacts of drought and the growing demand to conserve our precious water resources. Even if a residential reuse program is found to be unfeasible for Colorado Springs, my research may provide useful information to other communities considering the implementation of a residential reuse program.

Analyzing Water Storage for Colorado:
Colorado's Water Storage: Adequate or Not?

Neil S. Grigg (Ph.D., Colorado State University) is Professor and former Head of the Department of Civil Engineering at Colorado State University. His current work focuses on civil infrastructure and water systems and, in particular, on infrastructure management and security; water policy, drought and water resources; public works management; disaster preparedness; and flood control. His career includes assignments as a civil engineering educator, university administrator, consulting engineer, state government official, and Corps of Engineers officer. Since 1988 he has served as River Master of the Pecos River for the U.S. Supreme Court. In 1968 he was co-founder of Sellards & Grigg Inc., a Denver-area consulting engineering firm.

Water storage is an important policy instrument to provide water supplies and security against drought in Colorado. If providing more storage is needed, the state has made little progress in the last fifty years, particularly along the Front Range. Currently, the state's attention is focused on two statewide initiatives: Referendum A and the Statewide Water Supply Initiatives Study. Whether either of these will increase water storage significantly is an open question. A number of policy issues must be confronted if the state is to come to grips with its full range of water needs. In studying them, investigators will confront institutional issues that include a property rights system for managing water, regional competition, environmental issues, and a court-based water management system.

Introduction

During the drought of 2000-2002, Colorado faced a water crisis because population has increased rapidly and little new water storage had been built for decades. With historic patterns of growth and water-use, new storage may have made little difference anyway because the drought was so severe and unpredictable that water officials would be unlikely to conserve enough water for the driest years. Regardless, water storage remains the most important policy instrument for security against drought.

The paper discusses growth, drought, and the research base for Colorado's water storage strategy, and it identifies policy issues that should be studied further.

Water storage in Colorado

After developing the readily-available river and well water, Colorado's settlers, aided by the federal government, initiated dam-building that lasted from about 1890 to 1970. By then, Colorado had some 9 million acre-feet of reservoir storage (Grigg, 2003). Thirty years later, the state's storage capacity about the same, although some deterioration has occurred in the form of aging, sedimentation, and unsafe dams. This capacity, along with wells and direct-flow river water, serves more than four million residents and provides about 14 million acre-feet of water to irrigated farmland.

While since 1970 growth has been rapid, with most occurring in the South Platte Basin, little new water storage has been built. Figure 1 shows the relationship between total population and storage in the state.

Actually, the situation is even worse. Much of the storage added in the 1960s was for the West Slope's Colorado River Storage Project,and does not help Front Range water supply needs. Figure 2 shows a significant decline in storage per capita, particularly in Division 1, the South Platte River Basin.

Figure 1. Population and water storage in Colorado

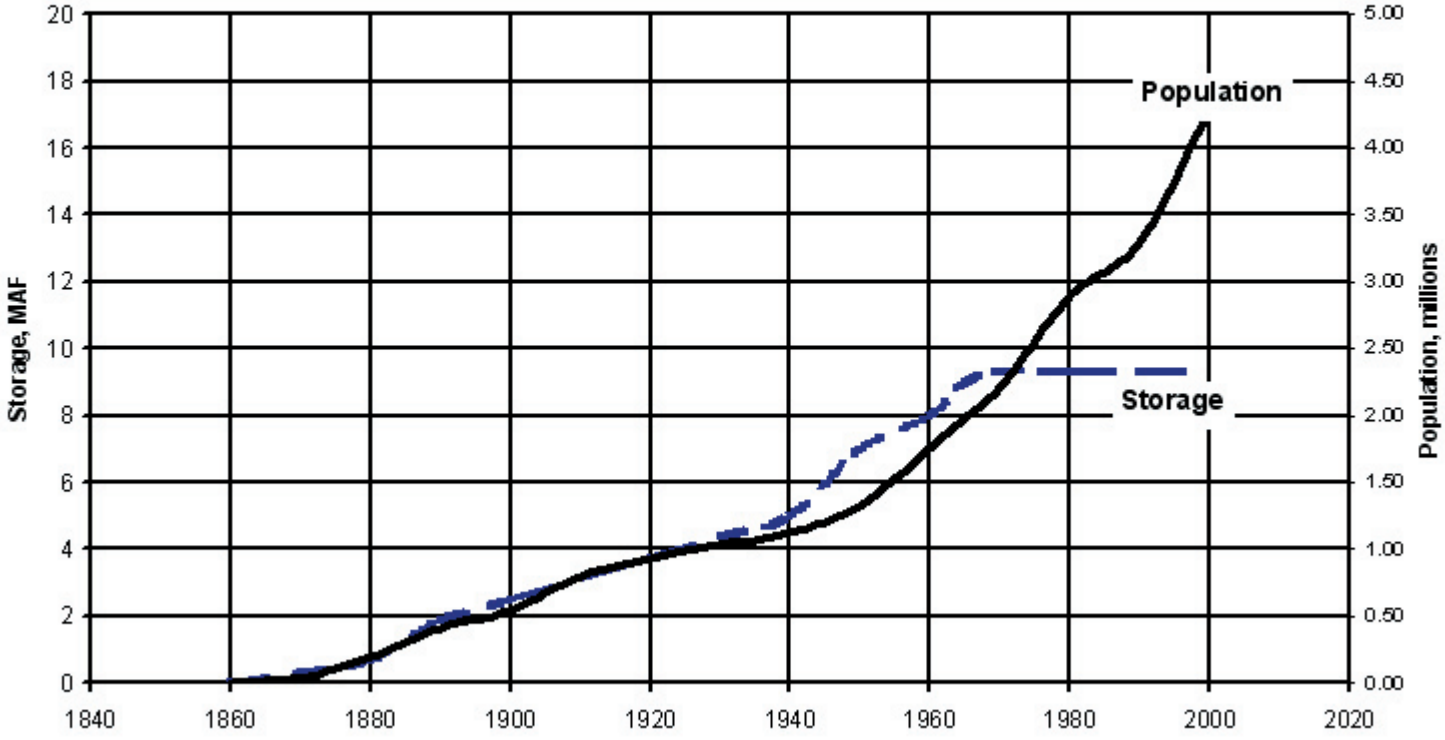

Figure 2. Water storage per capita in Colorado and in Division 1

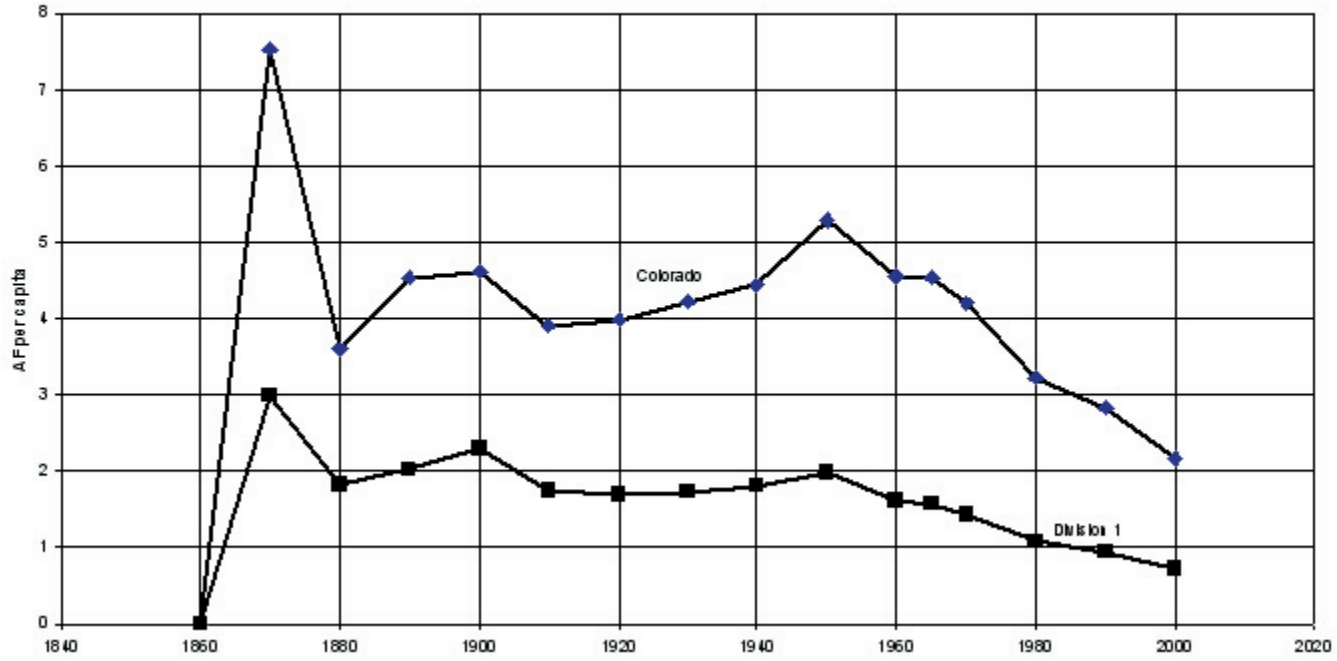

Figure 2 introduces important issues, such as the shift of water from agriculture to urban use. Two important research questions about this are the following: How does the state measure the transferability of agricultural water to urban use and how much storage capacity per capita is required?

Policy issues

Bringing the issues together, we can say that the driving forces of the policy issue are

·Growing population, concentrated along the Front Range

·A declining capacity to store water on a per-capita basis

·Lack of new storage located near population centers

·Growing urban water demands

Growing population, declining per-capital storage, and growing demands are illustrated in Figures 1 and 2. These lead to greater vulnerability to drought.

As the drought of 2000-2002 showed, the population-storage dilemma places Colorado's Front Range water supplies under much greater stress than a generation ago. While the drought was historically significant in severity, drought will recur in Colorado.

These policy elements point to several problems:

·Insufficient water for growth and economic development

·Deterioration of habitat and water for natural systems

·Vulnerability of water supply systems to natural and hu man-caused threats

·Inter-regional conflict over water

On-going policy initiatives

The state's legislative and executive branches study water policy continually. During the past several years, water storage has been high on the list of policy topics. Also, the drought caused water supply organizations to focus on their options. Currently, the state's attention is focused on two statewide initiatives: Referendum A and the Statewide Water Supply Initiatives Study.

Referendum A, scheduled for the November election, would authorize the Colorado Water Conservation Board to issue up to $2 billion in bonds, to be repaid from revenues derived from water projects. Supported by the Owens Administration, its fate is unknown at this time. It appears to split the state, both by regions and political affiliation.

The Statewide Water Supply Initiatives Study is an effort to compile needs by basin. Currently, it is in the phase of conducting stakeholder meetings around the state. It would be a "framework" type study, similar in scope to those undertaken after the passage of the Water Resources Planning Act in the 1960s.

Policy research needed

Policy research for water supply and storage involves technical, management, and institutional factors. To carry out this research in Colorado's institutional environment is challenging because of the factors that cause competition for water, such as water transfers, city versus suburb conflicts, interstate water politics, environmental politics, rural-city and inter-rural conflicts, water quality issues, and federal vs state interests (Grigg, 2003).

The technical aspects of water storage in Colorado are daunting, but the state has studies available, such as the Metropolitan Water Supply Investigation Final Report (Hydrosphere Resource Consultants, Inc., 1999), the studies of river basins by the Colorado Water Resources Development and Power Authority, and the upcoming Statewide Water Supply Initiatives Study.

Economics define the limits of practicality of physical schemes. However, sociology also enters the picture because there are upper limits to how much organizational complexity the water community can fathom. In that sense, visionary schemes for more cooperation, for example, might founder on the rocks of every day exigencies of work and on sociological practicality. These begin to look like institutional barriers.

I compiled the following list of institutional issues that are commonly mentioned as operating in water issues, and all are operable in Colorado's water picture:

·Law (statutes, constitutional law, administrative law, case law)

·Government (political processes and relationships)

·Regulations (regulations and executive orders)

·Policy (agency policies and rules)

·Processes (policy-setting and decision-making processes)

·Organizations (agencies, firms, public organizations)

Colorado's version of the appropriation doctrine originated in the 1876 state constitution and has been expanded by many statutes and court decisions over the years.

·Authority (roles, authorities, shared authorities)

·Contracts (inter–local agreements, mutual aid pacts)

·Relationships (coordination arrangements, associations, informal relationships)

·Values and attitudes (financial values, valuing of social and environmental values)

·Customs (traditions, operating manuals, procedures)

This institutional structure is a complex web that determines how decisions are made. It works with a group of water users, a judicial system, and a regulatory system. A "water market" operates among the water users, but it involves relatively few participants and is tightly controlled by the regulatory system, which enforces water right priorities.

Colorado's version of the appropriation doctrine originated in the 1876 state constitution and has been expanded by many statutes and court decisions over the years. The state's founders implemented the doctrine in a simpler era. They would not have foreseen the tremendous complexity it must deal with today. Some of the criticisms of the system are the following:

·While water transfers involve relatively few particpants, the number of water rights and owners is large, and water managers face data complexity.

·The legislature constantly considers bills to tune up the system. None dare to change the basic system, which is based on property rights in the use of water.

·Owners of large and valuable water rights are powerful players in the water industry, constituting an oligarchy.

·The system promotes litigation rather than cooperation and increases transaction costs. The system is complex hydrologically. Unpredictable water quantity, quality, and environmental constraints may alter yields.

·The system requires expensive control structures and systems to maintain access to water.

·Temporary exchanges and transfers should not be so difficult.

·The appropriation doctrine gives inadequate attention to public trust issues.

The state must define its problems, clarify the applicable public policies, identify alternative policies and instruments, evaluate them, and make recommendations on questions such as

·Does Colorado need more storage, or to use its storage more efficiently?

·If it needs more storage, where should it be and which projects should be built?

·Who has responsibility?

·How should the projects be financed?

·How should systems be managed?

One might say that, although no central authority has studied these questions, the institutional structure has already provided the answers. Proponents for storage say that it is obvious that more is needed, as shown by the drought. Opponents say that we need "smart storage, not more storage" (Kassen, 2003). Both are right. Unless the state has adequate storage, it cannot grow; unless it uses storage wisely, it will continually run short of water. The problem is in the details of these questions, including both physical and institutional aspects.

On the question of which projects should be built, current state policy mostly leaves the decision to local water users. Referendum A would provide assistance in financing but state policy does not provide for any central coordination of project development, such as occurred in California to build the State Water Plan. By the same token, current policy leaves responsibility, financing, and management to local water users.

Two over-arching areas of state interest deserve special attention. The first is balance and opportunity among regions, a policy that appears in the "principles" advocated by the state's county governments in 2002. Competition between regions and sub-regions for water inhibits cooperation and coordination among power centers and fear of losing water in regions is a major cause of water wars. The second matter of state interest is environmental sustainability, where there is also broad agreement on the policy, but lack of agreement on the details.

Should the state as a matter of policy guarantee its regions water to achieve balance and opportunity and reduce tension? Doing this is an implicit goal of what Getches (2002) called a "comprehensive water planning process, basin by basin, with full public participation." Some resist this idea because it sounds like basin-of-origin protection, a controversial policy idea that hasn't passed in Colorado. However, balancing water opportunity does not rule out interbasin transfers; it would make sure they were negotiated with all regional interests in mind and include compensation. By creating regional institutions to handle them on behalf of the regions, the public interest could be served better.

Opposition to this policy might come from water developers or even from farmers, who would oppose negotiation about water because they will think that it might affect the value of their water rights. Some environmental groups might also think that "guaranteeing water" to regions would unleash unbridled growth

on the Front Range. These fears should be recognized and dealt with through plans and negotiation, not by covert actions and court battles.

How could an institutional mechanism provide for negotiations among regions? After all, regions are not sovereign governments, like states. It could not negotiate agreements to bind parties in a region, but it could work with power centers, including federal and state government agencies, to arrange projects and programs that would work in the state's interests. Its specific roles need to be studied.

The principle of compensatory storage or water insurance might be expanded to provide senior water right owners security that water changes would not injure them. Rather than hypothetical case-by-case water court decisions, perhaps computer-based mathematical models could show in real time what is actually happening in basins, and indicate water entitlements and compensatory schemes. Who would operate such a system would have to be determined.

To implement this approach, a regional group would prepare water supply plans and meet with neighbor regions on shared interests and agreements. All would come together in an annual meeting to evaluate water policy and results. The regional groups would look after the interests of their regions, and not be parochial. To achieve that perspective, they could be appointed by an authority with areawide interests or even be elected. They might have funding authority, depending on whether they could acquire water rights and enter into projects. They would report annually on the state of the water supplies in their regions, and a central office would report on the state's water.

Given the record of years of mistrust and false starts, designing and implementing this institutional arrangement would be slow and painful. It will not be achieved quickly or simply and it would not happen by the action of one legislative committee or even by starting a few river basin committees or commissions. However, what it needs to do is to provide mechanisms within each region or river basin to negotiate their internal interests in water and their exchanges with other regions and to provide backup technical support to study issues and make plans.

As examples of how this can work, consider Northern Colorado and the Denver Region and the East Slope-West Slope water transfers. In the first case, a rapidly-developing I-25 corridor needs water supplies. Coordinated action will be required to supply raw and treated water to large and small water purveyors. Should this occur from the competitive actions of many players, or can the region cooperate to coordinate raw and treated water services for the economic and environmental advancement of all? A coordination mechanism could be an organization of water providers who work together to study and manage aspects of water in the corridor. While models such as Israel's National Water Carrier might be studied, Colorado's system would have to recognize private ownership of water rights, not government control.

East Slope and West Slope interdependence involves different issues. To the West Slope, water transfer to the East Slope is a threat. While the East Slope fuels part of the West Slope's economy, some power centers oppose more water transfers and, in fact, would like to diminish existing ones. East Slope and West Slope cooperation in water management is a strategic issue because most of Colorado's unused water entitlements are in the Colorado River. Can East Slope and West Slope interests be negotiated together? Could, for example, the East Slope provide attractive compensatory enhancements for the West Slope in exchange for more access to water, and could this be done without harm to environmental values?

On the issue of environmental sustainability, simply stated, the state needs a process where more stakeholders buy into its plans and environmental interests agree that the plans implemented promote sustainability, rather than work against it.

Conclusions

Clearly, water storage will continue to be Colorado's most important policy instrument to provide water supplies and security against drought. In studying policy alternatives, investigators will confront issues that include Colorado's property rights system, regional problems, environmental issues, and the court-based water management system. They must raise difficult questions. Some policy options seem to be blocked, such as state water management and regional organizations.

If providing more storage is needed, the state has made little progress in the last fifty years, particularly along the Front Range. It is now engaged in a continual process of converting agricultural water to urban use, rather than building new storage. It will inevitably be difficult to build much new storage, and even with a large new project, the ratio of storage-to-population will not change much. Developing projects is left to water providers, who work in a complex and interdependent system. Their constraints lead them to focus on narrow needs, and not always in the broad public interest. There is no overall authority to coordinate among competing uses and balance the public interest.

Lack of water management capacity saps the state's capacity for growth and economic development, threatens habitat and water for natural systems, creates inter-regional conflict over water, and makes water supply systems more vulnerable to natural and human-caused threats.

Currently, the state's attention is focused on two statewide

initiatives: Referendum A and the Statewide Water Supply Initiatives Study. Whether either of these will increase water storage significantly is an open question.

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Discussant Session 4

Chuck Howe is Professor Emeritus of Economics and a member of the professional staff of the Environment and Behavior Program, Institute of Behavioral Science at the University of Colorado at Boulder—a program he directed for 12 years. He has served as consultant to international agencies and numerous countries. He is a Fellow of the American Geophysical Union, recipient of the American Water Resources Association Icko Iben Award and the Warren Hall medal from the Universities' Council on Water Resources. His most recent article is "Water Transfers and Their Impacts: Lessons from Three Colorado Water Markets," *Journal of the American Water Resources Association* (forthcoming).

RESEARCH SUMMARIES

Colorado's Future, and the policy choices we must make to protect and enhance it, encompass a whole range of topics beyond those covered earlier. Researchers from Colorado faculties and nonprofits presented summaries of their work in a poster session while other attendees enjoyed refreshments and the opportunity to have direct discussion with the authors.

GROWTH ISSUES

HEALTH ISSUES

INFORMATION SYSTEMS

COMMUNITY-BASED RESEARCH

YOUTH ISSUES

Paying for Growth: Do Increased Revenues Offset the Costs of Growth?

Does population growth "pay for itself"" from a local government perspective? The answer to this depends on whether revenues per person rise more rapidly than costs per person. Per person revenues increases only if average income levels rise when population grows and if the local tax structure captures more revenue from this income growth The local government service costs per person depend on either "economies of scale" that cause existing resources to be used more efficiently with more population or "density efficiencies" if costs fall with more compact forms of development. National research indicates that these may be as high as 25% for roads and 15% for utilities. To analyze all of these relationships for Colorado Springs, we adjusted annual city spending levels on police, fire, roads and traffic engineering and water for changes in inflation and population growth.

Key findings for the city of Colorado Springs in the 1980's-1990's:

•**Total developed land area increased by 32% while population grew by 68%.** Density (population per square mile of developed land) increased by almost 27% over the decade, as smaller residential lots outweighed continued "sprawl" in commercial development.

•**Tax revenues increased, but not as fast as population and inflation.** Colorado's TABOR amendment effectively requires that "fiscal dividends" to government can not come from increased revenues per capita. If growth in revenues exceeds the cap of population growth plus increase in the Denver-Boulder CPI, refunds must be given or tax rates cut unless there is a special authorizing vote. **The combined effect of the TABOR and Gallagher amendments was that city per capita revenues were 7% lower in 2000 than in 1980 after adjusting for inflation.**

•**The city adjusted to falling revenues by increasing the public safety share of the budget substantially and decreasing the share for roads, drainage and traffic engineering.** National research suggests that half of the sharp decline in spending on public works may be due to efficiencies caused by more compact development. The remaining decline probably indicates backlogs and/or declines in quality.

Daphne Greenwood (Ph.D., University of Oklahoma) is Professor of Economics and Director of the Center for Colorado Policy Studies, University of Colorado at Colorado Springs. She has published work in areas of health and education policy, measuring poverty and wealth, and tax policy. Most recently, she has been working on how community indicators can be used to measure quality of life and sustainability and how to measure the full costs and benefits of different patterns of local growth. Dr. Greenwood was formerly anelected representative to the Colorado legislature, Honors Professor at the U.S. Naval Academy, visiting scholor at the U.S. Treasury Department, and corporate economist with Esmark, Inc., a Fortune 100 company. She is on the Board of Directors of the Catamount Institute and is a member of the City of Colorado Springs Trails and Open Space Advisory Committee.

**The full paper is available on the Center for Colorado Policy Studies website growth issues section.*

The city adjusted to falling revenues per capita by increasing the public safety share of the budget substantially and decreasing the share for roads, drainage and traffic engineering

Figure 1a
1980 Budget Shares

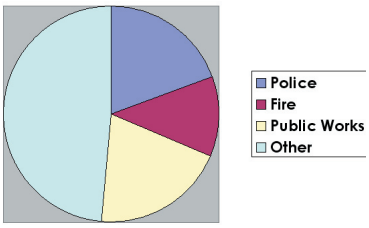
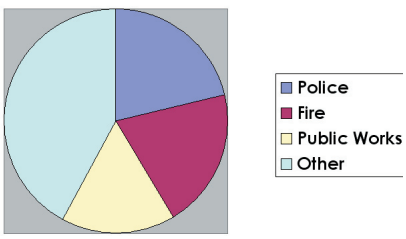


Figure 1b
2000 Budget Shares



Total developed land area increased by 32% while population grew by 68%

Figure 2a **Urban Densities in Colorado Springs and El Paso County** **Figure 2b**

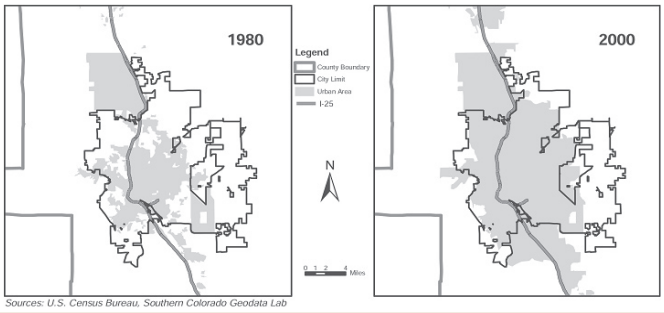
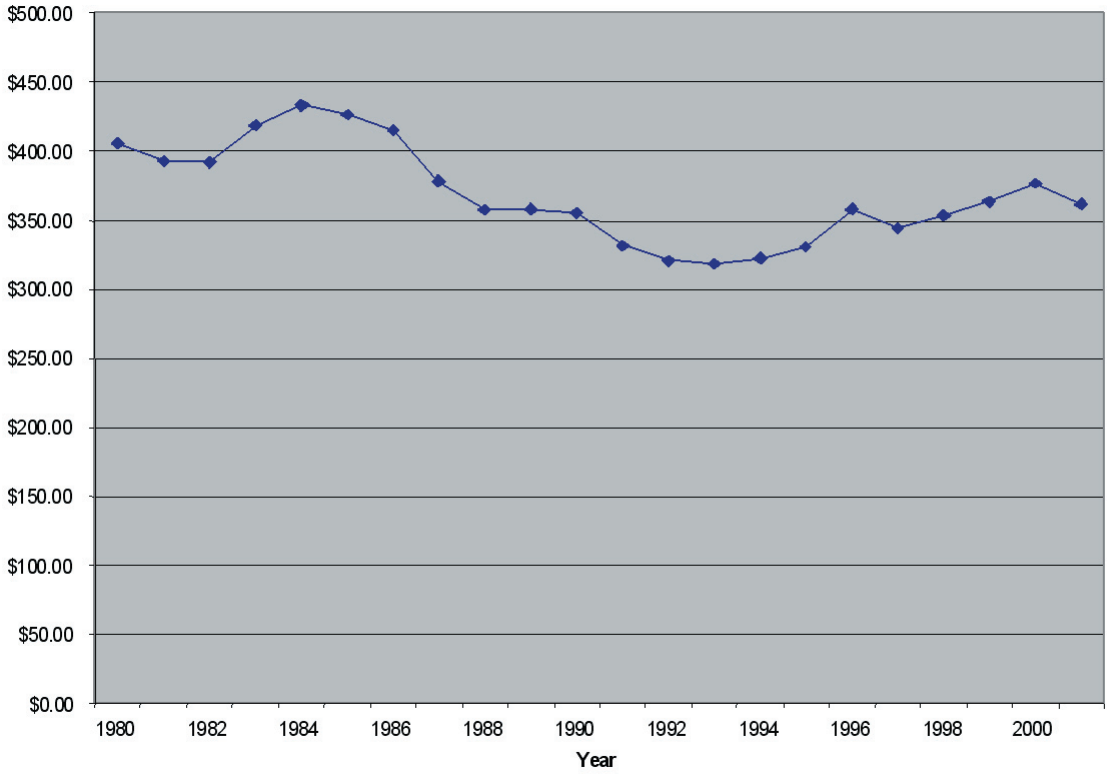
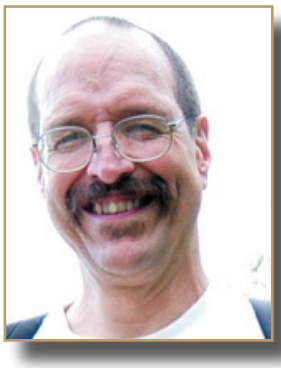


Fig. 3 Inflation adjusted revenues per capita, City of Colorado Springs

The combined effect of Tabor and Gallagher was that city revenues were 7% lower in 2000 than in 1980.



Can Cannabinoids Protect Cells from the Harmful Effects of Excess Sugar Consumption?



Robert Melamede (Ph.D., Molecular Biology and Biochemistry, City University of New York) is Associate Professor and Chairman of the Biology Department at the University of Colorado at Colorado Springs. He studies the impact of free radicals on biological systems, including aging, cancer, autoimmune diseases, and neuronal dysfunction. His research focuses on free radical-induced DNA damage and repair. He has a strong belief that social policies must be guided by factual data if they are to be effective.

Written in association with **Dr. Karen Newell, Susan Schweitzer,** and **Steve Barton**

The age of molecular biology has resulted in unprecedented understandings in the areas of gene expression, cloning, DNA sequencing, signal transduction and bioinfomatics. Our new scientific capacity has provided mankind with the ability, as never before, to rationally attack diseases based on sound modern scientific principles. Yet, the translation of new scientific understandings to the layman and to policy makers often lags far behind. An issue that remains extremely controversial, and that has an enormous impact on both spending and health, is medical marijuana. What does modern science tell us about the medical uses of cannabis?

The cannabinoids system is now known to have evolved about 600 million years ago and to play numerous fundamental homeostatic roles in most living animals including man. Science shows that there is a cannabinoids specific ligand/receptor system that homeostatically maintains the human nervous, immune, endocrine, cardiovascular, digestive, excretory, and reproductive systems. We now know that these systems do not exist in isolation but are tightly interwoven. Both health and disease emerge from the success, or lack of this biochemical weave.

The discoveries of Dr. Karen Newell reveal a fundamental relationship between the type of fuel that a cell burns (sugar or fat) and how the immune system views that cell. There are strong parallels between the mechanisms that she has discovered and the biological activities of endocannabinoids. They both regulate cell life/death decisions via lipid metabolic pathways. Recent work in my (Melamede) lab reveals a probable link between excess sugar consumption and diabetes with the cannabinoid system. The hypothesis that will be examined is whether or not cannabinoids can counter the harmful affects of a sugar-rich diet.

Colorado's Information Highway:

Moving Towards Data-Driven Decision Making for Policy Makers and Citizens

Sooyoung So (M.A., University of California at Santa Barbara; M.L.I.S., University of California at Berkeley; M.Ed., Harvard University) is Assistant Professor and Reference Librarian with collection and liaison responsibilities in Business, Economics, Political Science, Public Administration, and Philosophy. He has published work in the areas of diversity and strategic long range planning. He was 1993-94 American Library Association (ALA) Fellow and has served as member of ACRL Research Committee, ACRL Racial & Ethnic Diversity Committee and ALA's Office for Library Outreach Services Advisory Committee. His current interest is in public service quality improvement.

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The use of the Internet is revolutionizing every aspect of our social fabric, including the way our government operates. Unlike e-commerce and e-trading, however, e-government has been lagging behind in using the Internet to its fullest potential.

According to the Progressive Policy Institute's latest State New Economy Index rankings, the state of Colorado is ranked number one out of 50 states in the category of "Aggregated Knowledge Jobs" and "Information Technology Jobs," second in "High-Tech Jobs" and "Workforce Education," and third in "Aggregated Innovation Capacity." In contrast to these excellent rankings reflecting the state's abundant and rich resources, the state of Colorado's government website is ranked 39th out of 50 states in the latest e-government study by Brown University's Center for Public Policy.

These contrasting findings should serve as an incentive to incorporate available technology and to better manage and disseminate information. Benchmarking Colorado's management of information against other states considered leaders in using the Internet will improve democratic outreach, government-citizen interactivity, and equitable citizen access to online information and services.

Moving towards a comprehensive information management, and dissemination process should provide
1) more efficient and effective state government and
2) improved citizen involvement and understanding of decisions demonstrated based on data collected and organized with taxpayer funds.

IMPROVING THE STATE WE'RE IN

1. Use top ranked state websites as benchmarks to improve Colorado's website
2. Work with higher education and high-tech companies

- Technical writing faculty and high-tech companies to improve design, clarity, layout, navigation, information density
- Education and communication faculty to address issues of readability and disability access and to initiate feed back mechanisms both on- and off-line

3. Develop list of core elements for each agency

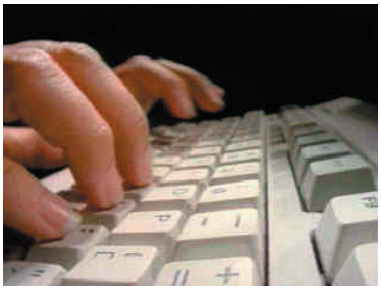
Colorado Community Based Research Network

The Colorado Community-Based Research Network connects university students and faculty with community organizations needing research and information. We believe that higher education is uniquely positioned to help address pressing issues within our local communities such as environmental threats, school and educational decline, growing crime rates, immigrant issues and economic inequality. One goal is to expand the current range of university scholarship to include research that goes beyond "social inquiry" and serves as a catalyst for real change and action within our communities. The CCBRN also believes that community-based research is a unique tool for preparing students for lives of civic engagement and social responsibility. It allows them to apply the skills and knowledge gained in the classroom in situations that expand their understanding of the world, increasing their commitment to our democratic society.

Activities and products included the following:

- Writing workshops and oral histories of day laborers at El Centro Humanitarion
- Data analysis for South West Improvement Council (findings were disseminated at a community meeting on July 28, 2003)
- Review of best practices in environmental education for Earth Walk
- Evaluation of after school programs in 3 middle schools in Aurora
- Literature review of youth empowerment activities for Assets for Colorado Youth
- Curriculum development project on immigrant voices for the Mizel Museum
- Evaluation design of the Harmony Project at Remington School
- Data collection and analysis for the North East Denver Schools Collaborative
- Technical assistance for the North East Denver Schools Collaborative
- Grant writing assistance for Curtis Park Community Center
- Analysis of Transforming Schools/MOPP data
- An evaluation of 18 university-community partnerships around the US
- Technical assistance provided to the University of Brighton, England for development of their outreach program

Nick Cutforth is Associate Professor in Educational Leadership at the University of Denver. His research and teaching interests include university/community partnerships, community based research, and physical activity and youth development. Most recently he is co-author of Community Based Research: Principles and Practices for Higher Education (Jossey Bass, 2003). He coordinates the Colorado Community Based Research Network (www.ccbrn.org).



Suzanne Discenza (M.S., University of Oklahoma) is an Assistant Professor of Health Care Management at the Metropolitan State College of Denver. She is currently completing her doctoral studies in the Graduate School of Public Affairs at the University of Colorado at Denver, with an emphasis in Health and Social Policy issues. Her dissertation research has focused on addressing the needs of homeless youth in Colorado, and she has presented this topic at both national and international conferences. Other research interests and publications involve trends in health care delivery systems and services to disadvantaged populations (the elderly, disabled, and homeless). Ms. Discenza has more than 25 years of experience as a rehabilitation manager and speech pathologist in hospitals, home health, long-term care, public health, and private practice.

Jamie Van Leeuwen (M.A., M.P.H.) currently works as the Program Director at Urban Peak, the only licensed homeless and runaway youth shelter in Colorado. With extensive experience researching and working with street youth in New Orleans, Louisiana, and Denver, Colorado, Mr. Leeuwen chaired the Denver Outreach Forum and sits on the Sexually Transmitted Diseases (STD) Advisory Board and the Mayor's Safety Task Force. At Urban Peak, via traditional street outreach as the Outreach Coordinator, he developed a program that employs non-traditional interventions including STD and HIV testing on the streets. Three years of experience working with heroin addicts, he is currently involved in an on-going effort in Denver to coordinate and deliver effective drug and alcohol treatment interventions to a high-risk adolescent population. He is currently working toward his Ph.D. in Public Policy at the Graduate School of Public Affairs at the University of Colorado at Denver with an emphasis on homeless and runaway youth.

Collaborations and Mergers to Maximize Services to Colorado's Homeless Youth Population

In the wake of severe budget constraints in Colorado state government as well as reduction in charitable donations to not-for-profit institutions, organizations serving disadvantaged youth populations have been particularly hard pressed to meet the ever-growing needs of these young people. The numbers of homeless youth, one such underserved group in Colorado, have continued to rise at alarming rates, with a recent 2003 survey indicating approximately 400 youths (up from 250 the prior year) younger than the age of 21 sleeping on the streets of central Denver alone every night. Moreover, more than 200 homeless young people have sought services in Colorado Springs during the past year.

How do not-for-profit organizations such as Urban Peak, serving homeless youth in Colorado's two largest urban communities, continue to meet the needs of these young people with ever-dwindling resources? This research effort explores one solution involving mergers and collaborations between not-for-profit service agencies (such as that between Urban Peak and The Spot in downtown Denver for outreach services) and between university researchers and the youths themselves (through advocacy and service as well as research) in order to do "more with less." Findings indicate that the merger between Urban Peak and the Spot has not only increased efficiency and reduced duplication of resources, but has allowed a significant increase in outreach services to Denver's homeless youth population. The authors have also found research and collaboration with the youths themselves have provided a myriad of practical suggestions applicable to program upgrades and policy changes.

Jean N. Scandlyn is Adjunct Assistant Professor of Anthropology at the University of Colorado at Denver and Visiting Faculty in Anthropology at Colorado College. She has recently completed an ethnographic study of homeless and runaway youth in collaboration with Urban Peak in Denver, Colorado.

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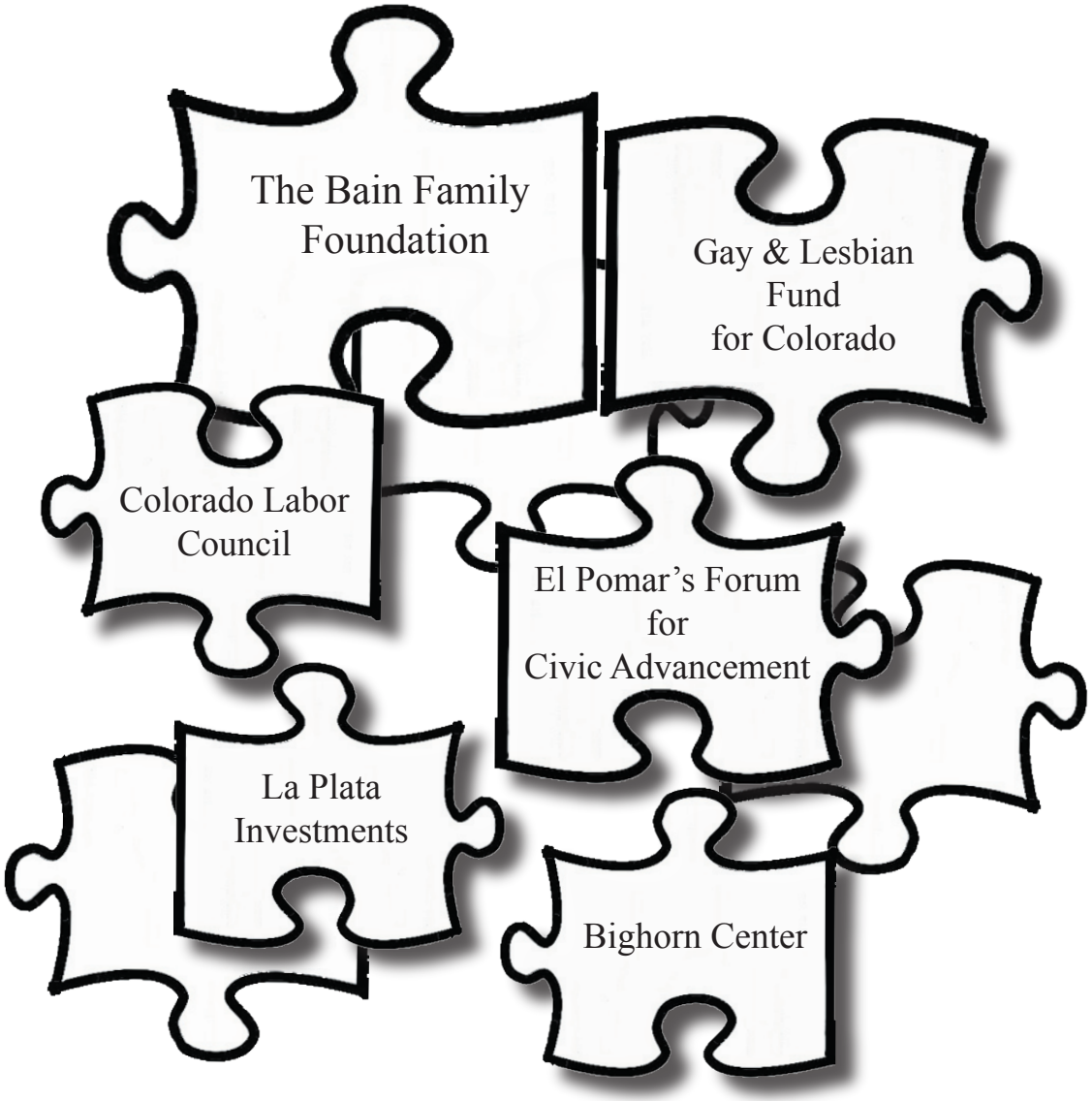

With special thanks to