

ECONOMIC EFFECTS OF INCREASED BROADBAND USE IN CALIFORNIA

SUMMARY REPORT

Prepared by

*Sacramento Regional Research Institute,
A Joint Venture of SACTO and Sacramento State
400 Capitol Mall, Suite 2500
Sacramento, CA 95814-4436
916/491-0444
FAX 916/441-2312*

Dr. Kristin Van Gaasbeck, Assistant Professor of Economics, Sacramento State
Dr. Stephen Perez, Economist
Ryan Sharp, Director
Helen Schaubmayer, Deputy Director
Angela Owens, Research Analyst
Lindsay Cox, Research Analyst

Prepared for

AT&T

TABLE OF CONTENTS

	Page
TABLE OF CONTENTS	ii
SUMMARY	iii
INTRODUCTION.....	1
INTERNET ACCESS	3
<i>Figure 1 – Internet Access Type in California</i>	3
<i>Figure 2 – Broadband Use in Selected California Regions</i>	4
<i>Figure 3 – Dial-Up to Broadband Migration Ratio in California</i>	5
<i>Figure 4 – Dial-Up to Broadband Migration Ratios for Selected California Regions</i>	6
HISTORICAL EFFECTS OF BROADBAND	7
<i>Figure 5 – Historical Economic Effects of Broadband in California</i>	7
FORECASTS OF BROADBAND EFFECTS.....	8
<i>Figure 6 – California Employment Forecasts</i>	8
<i>Figure 7 – California Payroll Forecasts</i>	9
<i>Figure 8 – California Employment and Payroll Forecasts</i>	9
<i>Figure 9 – Employment Forecasts for Selected California Regions</i>	12
<i>Figure 10 – Forecasts of 10-Year Cumulative Employment Gains for Selected California Regions</i>	13
<i>Figure 9 – Payroll Forecasts for Selected California Regions</i>	14
<i>Figure 10 – Forecasts of 10-Year Cumulative Payroll Gains for Selected California Regions</i>	15
CONCLUSION.....	16
ABOUT SRRI.....	17

Summary

The increased availability of broadband Internet access and the demand for faster connections has certainly amplified the use of broadband in California. Nearly 54 percent of the state's adult population now accesses the Internet through a broadband connection, representing a significant increase from the mere 15 percent utilizing this connection type in 2001. While the use of broadband varies widely among the regions in the state, nearly every region has seen a notable increase in the use of broadband over the past few years. This increased broadband use has had a positive and significant effect on economic outcomes in California.

California's recent employment and payroll growth has benefited greatly from broadband use. Estimates of broadband's effects on annual changes between 2002 and 2005 show a total cumulative contribution of approximately 198,000 jobs and \$11.6 billion of payroll. Moving forward, increased investment in the deployment and, sequentially, the use of broadband will continue to incrementally boost the number of jobs retained by businesses in the state and the total amount of industry payroll.

If the state were to experience strong growth in the proportion of the adult population using a broadband connection over the next ten years (a 3.8 annual percentage point increase), it could see notable gains compared to what would be expected if the economy were to continue on a "business as usual" path. Through 2010, this level of broadband growth could generate a cumulative gain of 1.8 million jobs and \$132 billion of payroll in California relative to the baseline forecast of economic growth. All regions of the state could benefit from an incremental boost in jobs and total payroll as a result of a strong increase in broadband use, but the magnitude depends on the local economic conditions and unique distribution of Internet connections.

Introduction

The Internet has become an indispensable communications tool and information resource for businesses and individuals. The proliferation of broadband Internet access has changed both business practices and consumer behavior. Like the introduction of the telephone and personal computer, high speed Internet access has the potential to significantly influence economic activities and outcomes. Compared to other innovative phenomena, few empirical studies have been completed examining the economic effects of broadband. There are three reasons for this. First, broadband has only been accessible for a relatively short period of time. Second, there is limited consensus on the definition of broadband. Third, measures of broadband are not consistent and not widely available. Nonetheless, studies that have directly analyzed the economic effects of broadband have generally found that it generates a positive impact on the economy overall.¹ This would suggest that increased investment in the deployment and, in turn, the use of broadband would create additional economic benefits.

AT&T commissioned the Sacramento Regional Research Institute (SRRI), a joint venture of the Sacramento Area Commerce and Trade Organization (SACTO) and California State University, Sacramento (Sacramento State), to analyze how increased use of broadband (and the migration from dial-up to broadband) affects economic outcomes in California and selected regions within the state. This report serves as the project's Summary Report, highlighting key findings from the technical Research Report.

SRRI developed a model of economic growth using panel regression analysis to estimate the historical effects of broadband use at the statewide level and forecast three scenarios measuring a moderate, strong, and dramatic increase in broadband use for the state and its 24 regions. The model relies on a proprietary dataset from Scarborough Research, which presents the results of surveys measuring how individuals (in the adult population) access the Internet (through broadband or dial-up)—for this project, broadband is defined as cable or digital subscriber line (DSL).² The speeds for these connection types were not incorporated into this dataset, but it can be assumed that they represent those most commonly available to consumers in the related markets. The survey was conducted in 39 counties twice each year from 2001 to 2007. The aggregation of these counties accounts for close to 92 percent of California's population and is, therefore, used as a proxy for behavior of the state overall. To demonstrate effects at the regional level, these counties were bucketed into economically and socially integrated areas—metropolitan and micropolitan statistical areas and metropolitan divisions.

SRRI used the model to create four separate forecasts for this project. One forecast establishes a baseline of economic growth following typical historical trends or “business

¹ For example, the Gartner May 2003 report, *One Gigabit or Bust Initiative: A Broadband Vision for California*, measures an increase in broadband penetration and shows a positive impact on California's gross state product and employment, and the Department of Commerce February 2006 study, *Measuring Broadband's Economic Impact*, examines levels of broadband availability and finds a positive effect on employment and business establishments (especially those in IT-intensive sectors) across communities in the nation.

² It is important to note that empirical measures of broadband use (such as those in this report) often rely on personal Internet access and do not account for workplace access. Individual household broadband use likely mirrors (and somewhat lags) workplace use—this measure serves as a proxy for overall adoption of broadband in the state, but could ultimately understate the magnitude of the economic effects.

INTRODUCTION

as usual.” The other three forecasts are based on scenarios of how broadband use and migration from dial-up to broadband change over time—the “moderate” scenario assumes a 0.2 annual percentage point increase in the adult population using broadband, “strong” is based on a 3.8 percentage point increase, and “dramatic” uses a 7.6 percentage point increase.³ In cases where the broadband growth scenario pushes the percentage of the adult population to extraordinarily high levels, SRRI applied an upper threshold of 94 percent, reflecting the penetration level of common telephone service.⁴

Overall, SRRI’s analysis demonstrates that increased broadband use (and migration from dial-up to broadband access) within California has had a positive effect on employment and payroll growth. Moving forward, further increases in broadband use will incrementally boost the number of jobs retained by businesses in the state and the total amount of industry payroll. Unlike employment and payroll, the empirical evidence related to the effect of broadband use on growth in total business establishments is mixed and sensitive to the particular factors accounted for in the statistical analysis. As such, forecasts for this variable were not produced.

³ The broadband growth scenarios were based on observed broadband growth levels in the Scarborough Research Survey data for the 39 California counties—moderate growth reflects the minimum value (0.2 annual percentage points); strong is the data average (3.8 percentage points); and dramatic follows the maximum value (7.6 percentage points).

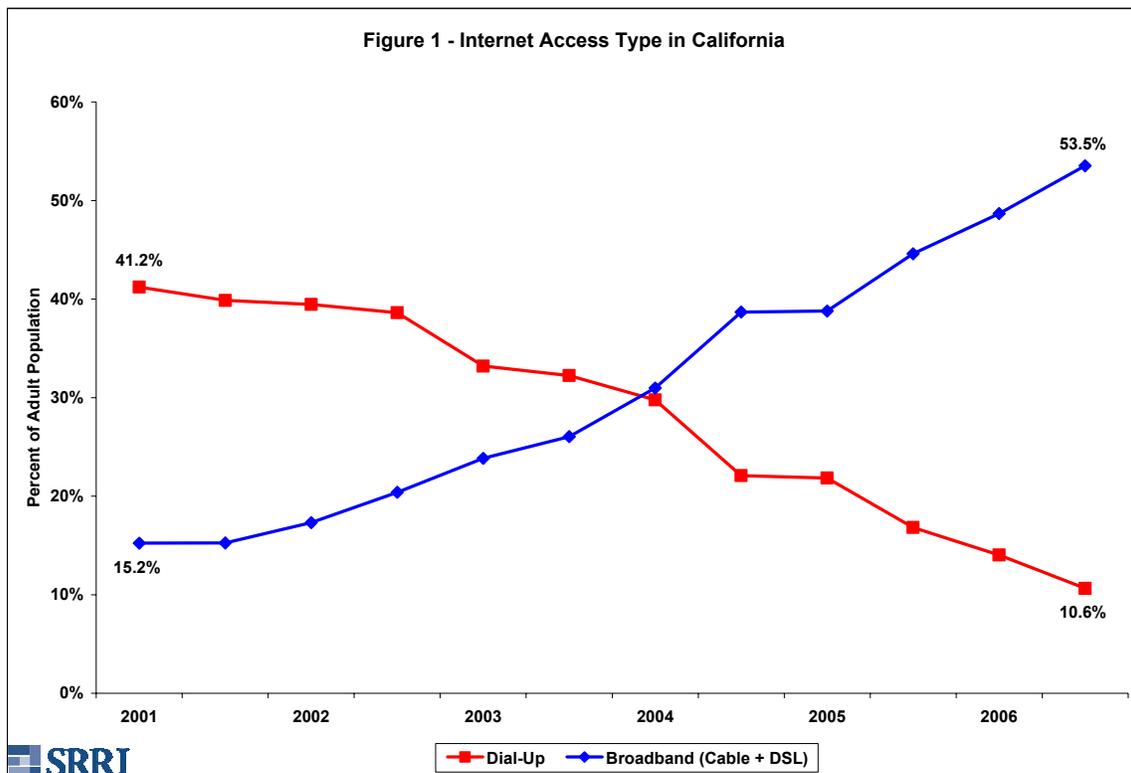
⁴ The July 2001 Crandall and Jackson study, *The \$500 Billion Opportunity: The Potential Economic Benefits of Widespread Diffusion of Broadband Internet Access*, cites 94 percent as the proportion of households that subscribe to ordinary telephone service based on the Current Population Survey for August 2000 (p. 19).

Internet Access

The increased availability of broadband Internet access and the demand for faster connections has certainly amplified the use of broadband in California. As illustrated in Figure 1, Scarborough Research data shows that, across the 39 measured counties in California, the proportion of the adult population using broadband has risen steadily over the past few years while dial-up access has seen a constant decline. These trends occurred while total Internet access from dial-up and broadband increased from roughly 55 percent of the adult population to close to two-thirds during the measured timeframe. The most recent measures show close to 54 percent of the adult population using broadband versus 11 percent accessing the Internet through a dial-up connection. The remaining adult population answered either “none” (no Internet connection) or “other” (some other access type) in the survey. If these trends continue, dial-up use will be minimal while broadband use will reach a considerable share of the adult population.

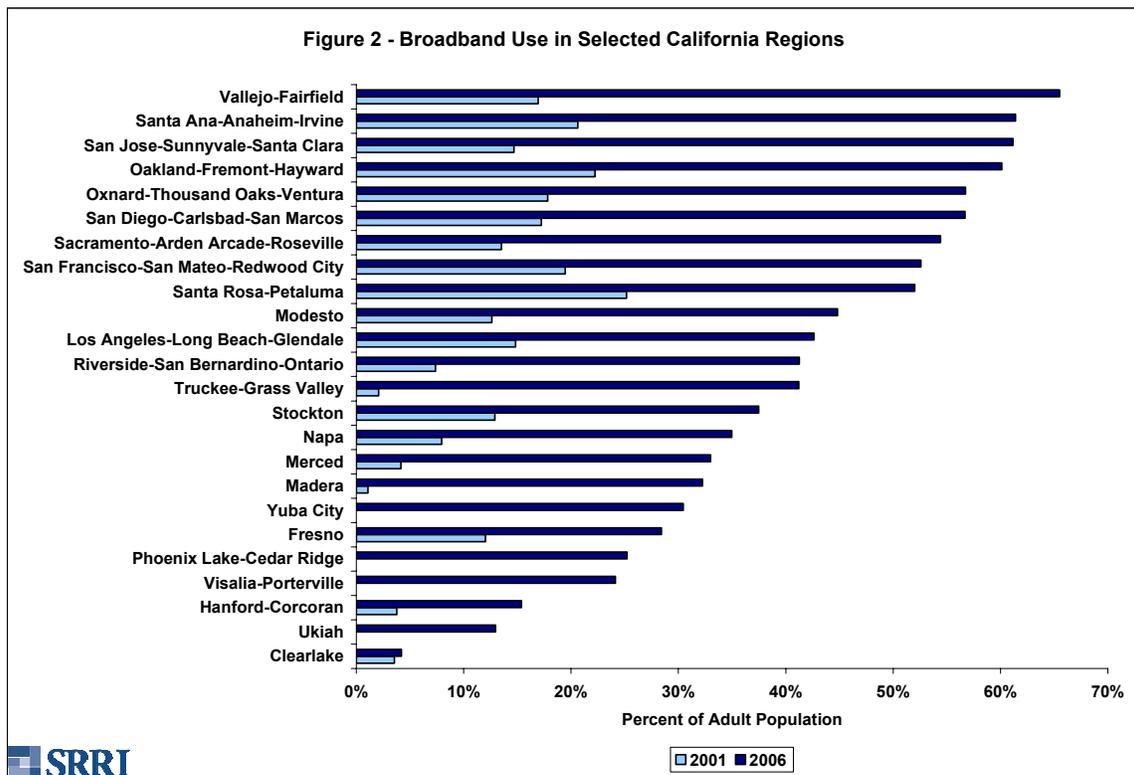
“As we reach the upper thresholds of broadband use in California, there is an iterative process where broadband increases personal computer adoption rates and personal computers increase broadband adoption rates. But the devices people use to access the Internet are diversifying – what we are now seeing is a virtuous cycle between the greater numbers of people who have broadband and the wider array of technologies they have to access broadband connections.”

Robert Pepper, Senior Managing Director, Global Advanced Technology Policy, Cisco Systems, Inc.



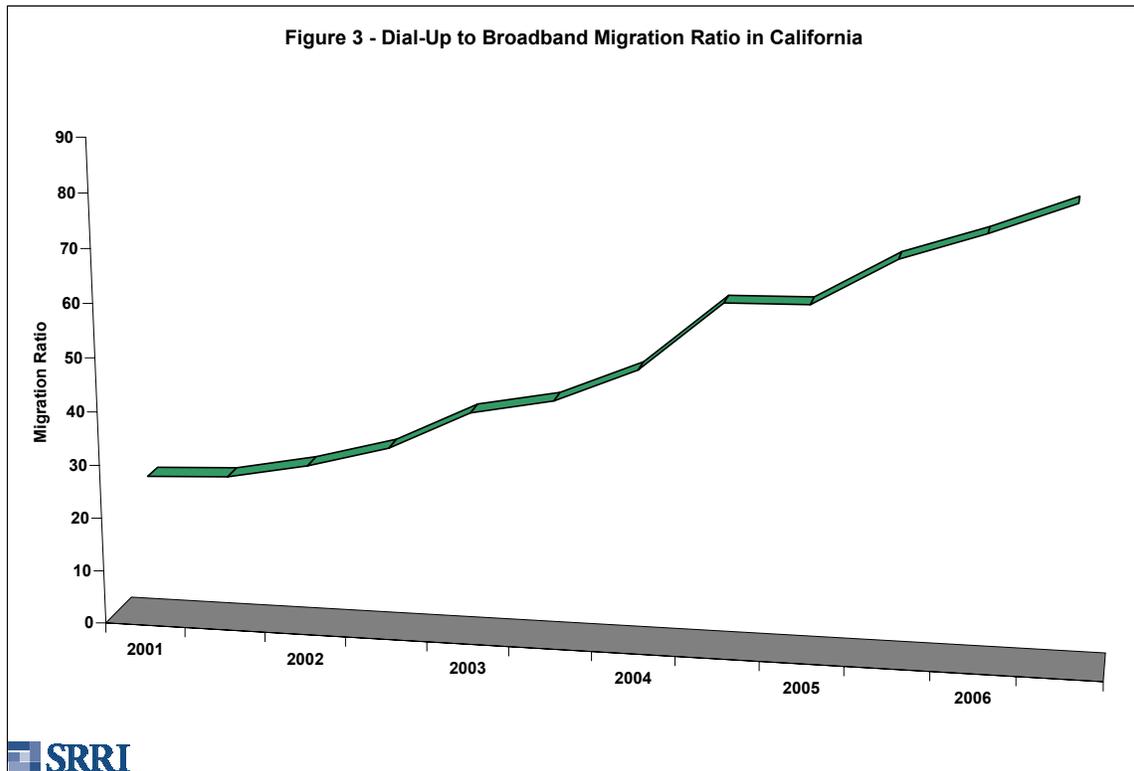
INTERNET ACCESS

Figure 2 shows that the use of broadband varies widely among the selected regions in the state (based on measures for the first half of 2001 and 2006), ranging from about 4 percent of the adult population (Clearlake) to close to 66 percent (Vallejo-Fairfield) in 2006. The larger, more established regions have generally demonstrated higher broadband use than smaller rural and Central Valley areas. In addition, SRRI analysis shows that areas with higher levels of per capita personal income tended to show greater broadband use relative to lower-income areas (similarly lower-income regions typically have higher unemployment rates). Nearly every measured region has seen a notable increase in the use of broadband over the past few years. The greatest percentage point gains in the proportion of adult population using broadband occurred in Northern California regions (including Vallejo-Fairfield, San Jose-Sunnyvale-Santa Clara, and Sacramento-Arden Arcade-Roseville).



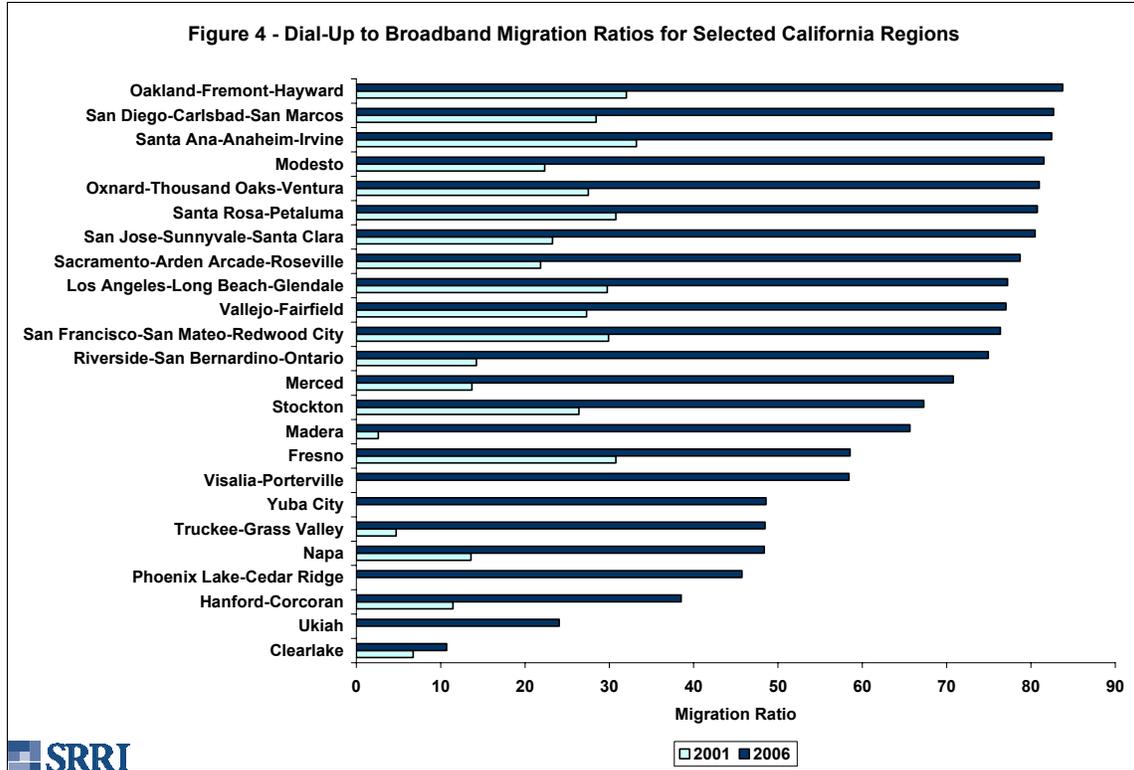
INTERNET ACCESS

A related issue in Internet access is the migration from dial-up to broadband connections. The aggregate migration ratio (calculating the share of broadband to all access types) for the 39 counties in the sample is shown in Figure 3. This measure accounts for the extent to which individuals have switched from dial-up to broadband over time, demonstrating the increased use of broadband in relation to all Internet access types (the general broadband use measure does not take dial-up access into consideration). If someone accesses the Internet for the first time using a broadband connection, the value increases, just as if someone switches from dial-up to broadband. Over the past few years, this ratio has dramatically risen as a result of both the general increase in Internet access using a high-speed connection and individuals switching from dial-up to broadband connections.



INTERNET ACCESS

Figure 4 demonstrates the migration ratio for the selected California regions in 2001 and 2006 (based on the measures for the first half of each year). Like the data for broadband use overall, migration ratios also have a fairly wide range between the regions in the state and have typically increased considerably in the past few years.



Historical Effects of Broadband

Between 2002 and 2005, the increased use of broadband appears to have made a positive contribution to economic activity in the state. SRRI's model estimates that a 1 percentage point increase in the share of the adult population using broadband increases the employment growth rate by as much as 0.075 percentage points and the payroll growth rate by up to 0.088 percentage points. The interrelated migration from dial-up to broadband seems to have had a similar, but generally smaller, effect on employment and payroll growth.

Figure 5 puts these estimates in context and reports the approximate marginal effects of increased broadband use and the migration from dial-up to broadband on employment and payroll in California. The historical effects have not been trivial. In 2005, increased broadband use contributed about 52,000 of the 281,000 net new jobs created in California. Migration from dial-up to broadband contributed roughly the same amount of jobs (53,000), demonstrating the economic effects of broadband net any new increases in dial-up use. Similarly, in 2005, increased broadband use contributed approximately \$3.2 billion of the \$36 billion in net new payroll. Estimates for the migration of connection type show a contribution of close to \$2.7 billion of payroll to the state's economy. Over the entire 2002 to 2005 period, broadband use or the migration from dial-up to broadband generated between roughly 195,000 and 198,000 jobs and approximately \$9.3 billion and \$11.6 billion of payroll in California.

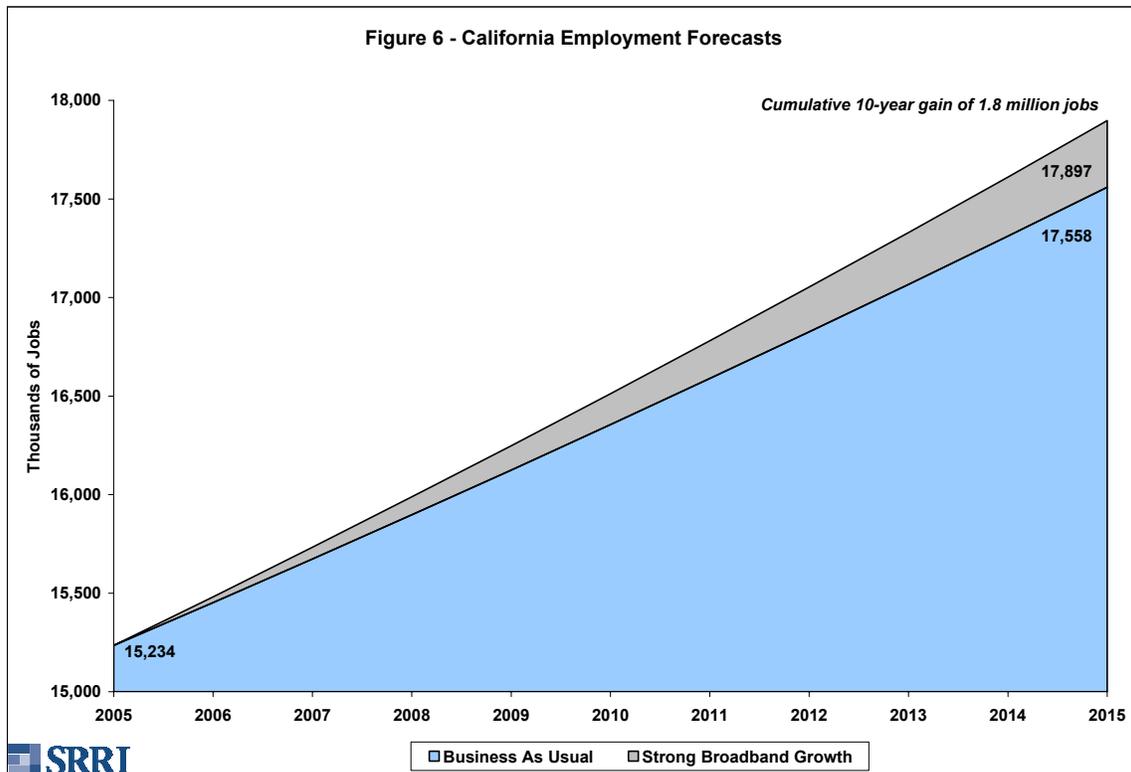
Figure 5 - Historical Economic Effects of Broadband in California

<i>Year</i>	<i>Total</i>	<i>Change from Previous Year</i>	<i>Increased Broadband Use Contribution</i>	<i>Migration from Dial-Up to Broadband Contribution</i>
<i>Employment</i>				
2002	14,837,334	-144,423	26,808	24,556
2003	14,807,656	-29,678	44,565	50,260
2004	14,953,022	145,366	74,181	67,031
2005	15,234,188	281,166	52,332	53,125
<i>Cum. Gain</i>	-	<i>252,431</i>	<i>197,886</i>	<i>194,971</i>
<i>Payroll (millions of dollars)</i>				
2002	\$614,542	-\$4,604	\$1,478	\$1,105
2003	\$630,692	\$16,150	\$2,527	\$2,325
2004	\$667,522	\$36,829	\$4,407	\$3,250
2005	\$703,993	\$36,471	\$3,219	\$2,667
<i>Cum. Gain</i>	-	<i>\$84,846</i>	<i>\$11,630</i>	<i>\$9,347</i>



Forecasts of Broadband Effects

Looking forward, broadband use, and the migration from dial-up to broadband connections, will likely continue to have a significant effect on economic growth throughout the state. Any incremental gains in broadband use have the potential to marginally impact economic outcomes. Assuming California experiences a strong increase in the proportion of the adult population using broadband (3.8 percentage points per year), the state could expect to see higher levels of employment and payroll than what would be anticipated if business as usual trends were to continue. Figures 6 and 7 (below and on the next page) illustrate the marginal effects of the strong broadband growth scenario on employment and payroll at the statewide level. Over the next ten years, this level of broadband growth could generate a cumulative gain of 1.8 million jobs and \$132 billion of payroll in California relative to the baseline forecast of economic growth.



FORECASTS OF BROADBAND EFFECTS

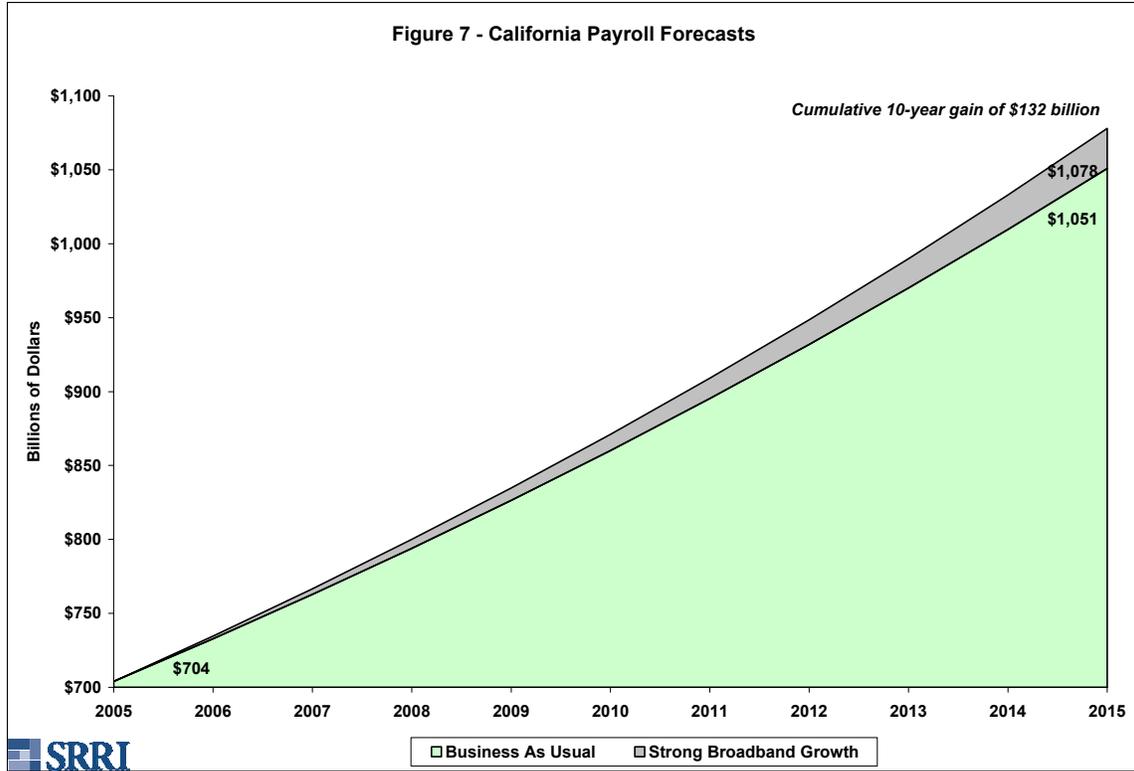


Figure 8 presents the results of all three broadband growth scenarios and demonstrates that even a moderate increase in broadband use (0.2 percentage points per year) could make a notable contribution to the state's economy—a 10-year cumulative gain of 57,000 jobs and \$7 billion of payroll compared to the business as usual forecast. The dramatic broadband growth scenario (7.6 percentage points per year) would push the state to the threshold level (94 percent of the adult population) toward the middle of the 10-year timeframe. All in all, this scenario could lead to a statewide cumulative gain over the 10 years of about 2.2 million jobs and \$267 billion of payroll weighed against the baseline forecast.

Figure 8 - California Employment and Payroll Forecasts

Year	Business As Usual	Broadband Growth Scenario		
		Moderate	Strong	Dramatic
<u>Employment (thousands of jobs)</u>				
2005	15,234	15,234	15,234	15,234
2015	17,558	17,565	17,897	17,829
10-Yr. Cum. Gains	-	57	1,780	2,176
<u>Payroll (billions of dollars)</u>				
2005	\$704	\$704	\$704	\$704
2015	\$1,051	\$1,052	\$1,078	\$1,106
10-Yr. Cum. Gains	-	\$7	\$132	\$267

SRRI

Figures 9 and 11 (on the following pages) show the regional employment and payroll forecasts for the baseline and three broadband growth scenarios and Figures 10 and 12 (on the subsequent pages) report the cumulative gains in employment and payroll over the next 10 years compared with the business as usual growth prospects. In both the strong and dramatic broadband growth scenarios, some regions reach the threshold broadband use proportion in the forecast period. The regional analysis allows each affected area to reach the threshold point at different times in the strong and dramatic scenarios, which differs from the statewide model that essentially caps the entire state at the same time under the dramatic scenario.⁵ As a result of varying economic conditions and dissimilar levels of Internet access, each region is impacted differently by an increase in the proportion of the adult population using broadband. In all cases, every selected region could benefit from an incremental boost in broadband use over what is expected in the baseline forecasts.

“Broadband access allows someone working from home to have the same access to technology as the most advanced office setting. This is particularly important for places like the Los Angeles area where travel time between places can be lengthy.”

Gary Toebben, President & CEO, Los Angeles Area Chamber of Commerce

“Widely-used broadband is a driver of growth in California’s coastal economies, like San Diego. Every industry is increasingly technology-dependent, if not technology-driven.”

Julie Meier Wright, President & CEO, San Diego Regional Economic Development Corporation

The major southern California, Bay Area, and Sacramento markets could see the greatest marginal economic gains from a strong increase in broadband use compared to business as usual trends. In southern California, the Los-Angeles-Long Beach-Glendale, Riverside-San Bernardino-Ontario, Santa Ana-Anaheim-Irvine, and San Diego-Carlsbad-San Marcos regions all rank in the upper third of the list with potential cumulative expansion of between 152,000 and 456,000 jobs and between \$11 billion and \$33 billion of payroll over the next 10

years. Due to the creative and innovative cultures in the main southern California regions, the entertainment, design, defense, telecommunications, and life sciences industries are some of the most reliant on broadband infrastructure according to representatives from the Los Angeles Area Chamber of Commerce and San Diego Regional Economic Development Corporation.

The core Bay Area markets (Oakland-Fremont-Hayward, San Francisco-San Mateo-Redwood City, and San Jose-Sunnyvale-Santa Clara) could benefit from 10-year a cumulative gain between 93,000 and 109,000 jobs and between \$8.9 billion and \$9.3 billion of payroll. As a

“Broadband is a critical asset to entrepreneurial regions like the Silicon Valley. It allows entrepreneurs to reach beyond their kitchen table or garage and carry on business around the world.”

Pat Dando, President & CEO, San Jose Silicon Valley Chamber of Commerce

hub of the high technology industry, the Bay Area is a driver of broadband use. The San Jose Silicon Valley Chamber of Commerce believes that high-tech activities have driven the wider use of broadband with adoption in larger companies transcending down to

⁵ The differences in threshold behavior generate varying growth assumptions between the statewide model and the aggregate of all regions in the individual regional models.

FORECASTS OF BROADBAND EFFECTS

smaller firms and other venues. As such, they feel that broadband is becoming the core infrastructure of businesses and communities of tomorrow.

“Technology is an amplifier of job growth in the Sacramento region, both in the urban core and rural areas. Broadband allows outlying areas to connect to products and services they would not normally have access to on a day-to-day basis.”

Michael Faust, Senior Vice President, Public Policy and Advocacy, Sacramento Metro Chamber

The Sacramento-Arden Arcade-Roseville region also places among the top third of the list with possible incremental growth over the next decade of 114,000 jobs and \$7.9 billion of payroll. The Sacramento region’s government, healthcare, telecommunications, finance, clean

energy technology, and education sectors, as well as small business in general, see some of the greatest benefits from broadband according to representatives from the Sacramento Area Commerce and Trade Organization and the Sacramento Metro Chamber.

At the other end of the spectrum, the small, more rural Clearlake region could expect a 10-year cumulative gain of about 1,700 jobs and \$96 million of payroll under the strong broadband growth scenario relative to the baseline forecast. These estimates highlight the important impact increased broadband use could generate throughout the state—compounded over time, even the smaller regions of the state could benefit from notable economic gains, including more jobs and additional income to ripple through the economy.

FORECASTS OF BROADBAND EFFECTS

Figure 9 - Employment Forecasts for Selected California Regions

<i>Region</i>	<i>2005</i>	<i>2015 Business As Usual</i>	<i>2015 Broadband Growth Scenario</i>		
			<i>Moderate</i>	<i>Strong</i>	<i>Dramatic</i>
Los Angeles-Long Beach-Glendale	4,082,533	4,412,707	4,414,481	4,497,752	4,532,227
Riverside-San Bernardino-Ontario	1,238,361	2,184,358	2,185,236	2,226,457	2,247,748
Santa Ana-Anaheim-Irvine	1,489,269	1,892,209	1,892,970	1,928,677	1,928,677
San Diego-Carlsbad-San Marcos	1,291,900	1,505,078	1,505,683	1,534,085	1,534,085
Sacramento-Arden Arcade-Roseville	906,812	1,155,943	1,156,408	1,178,221	1,184,920
Oakland-Fremont-Hayward	1,015,218	1,038,841	1,039,259	1,058,862	1,058,862
San Francisco-San Mateo-Redwood City	960,379	960,379	960,765	978,676	978,465
San Jose-Sunnyvale-Santa Clara	871,239	887,045	887,402	904,141	904,375
Fresno	340,775	411,690	411,855	419,624	424,458
Oxnard-Thousand Oaks-Ventura	312,638	382,865	383,019	390,243	391,736
Stockton	218,216	254,640	254,742	259,547	262,537
Modesto	173,937	213,268	213,354	217,378	219,044
Santa Rosa-Petaluma	189,073	197,670	197,749	201,480	201,480
Visalia-Porterville	140,360	167,113	167,180	170,334	172,955
Vallejo-Fairfield	129,185	145,589	145,648	148,395	149,532
Merced	68,625	81,840	81,873	83,417	84,378
Napa	65,201	70,418	70,446	71,775	72,879
Madera	44,071	67,534	67,561	68,835	69,894
Hanford-Corcoran	39,918	50,316	50,336	51,285	52,274
Yuba City	44,042	48,760	48,779	49,699	50,573
Truckee-Grass Valley	29,776	35,383	35,398	36,065	36,620
Ukiah	32,500	32,500	32,513	33,126	33,765
Phoenix Lake-Cedar Ridge	18,170	21,862	21,871	22,284	22,369
Clearlake	15,619	16,359	16,366	16,675	16,931



FORECASTS OF BROADBAND EFFECTS

**Figure 10 - Forecasts of 10-Year Cumulative
Employment Gains for Selected California Regions**

<i>Region</i>	<i>Broadband Growth Scenario</i>		
	<i>Moderate</i>	<i>Strong</i>	<i>Dramatic</i>
Los Angeles-Long Beach-Glendale	14,638	455,753	813,940
Riverside-San Bernardino-Ontario	6,070	196,613	358,281
Santa Ana-Anaheim-Irvine	5,910	186,478	267,730
San Diego-Carlsbad-San Marcos	4,854	152,075	219,518
Sacramento-Arden Arcade-Roseville	3,606	113,790	192,534
Oakland-Fremont-Hayward	3,518	109,041	158,679
San Francisco-San Mateo-Redwood City	3,281	101,297	145,393
San Jose-Sunnyvale-Santa Clara	3,010	93,250	136,649
Fresno	1,310	41,163	78,043
Oxnard-Thousand Oaks-Ventura	1,212	38,131	62,042
Stockton	821	25,717	48,784
Modesto	675	21,233	37,784
Santa Rosa-Petaluma	664	20,618	29,963
Visalia-Porterville	535	16,779	33,127
Vallejo-Fairfield	475	14,853	26,496
Merced	262	8,213	15,575
Napa	234	7,275	14,369
Madera	197	6,315	12,451
Yuba City	160	4,998	9,980
Hanford-Corcoran	158	4,970	10,008
Truckee-Grass Valley	113	3,555	7,018
Ukiah	111	3,435	6,917
Phoenix Lake-Cedar Ridge	70	2,188	3,564
Clearlake	55	1,705	3,369



FORECASTS OF BROADBAND EFFECTS

Figure 11 - Payroll Forecasts for Selected California Regions (millions of dollars)

Region	2005	2015 Business	2015 Broadband Growth Scenario		
		As Usual	Moderate	Strong	Dramatic
Los Angeles-Long Beach-Glendale	\$189,303	\$255,931	\$256,068	\$262,521	\$266,556
Santa Ana-Anaheim-Irvine	\$70,296	\$119,606	\$119,670	\$122,685	\$123,311
Riverside-San Bernardino-Ontario	\$43,592	\$97,655	\$97,707	\$100,169	\$101,709
San Diego-Carlsbad-San Marcos	\$56,616	\$90,983	\$91,031	\$93,325	\$93,801
Oakland-Fremont-Hayward	\$53,405	\$71,685	\$71,724	\$73,531	\$73,906
San Francisco-San Mateo-Redwood City	\$62,431	\$65,314	\$65,349	\$66,996	\$67,179
Sacramento-Arden Arcade-Roseville	\$38,811	\$65,124	\$65,159	\$66,801	\$67,557
San Jose-Sunnyvale-Santa Clara	\$62,703	\$63,045	\$63,079	\$64,669	\$65,008
Oxnard-Thousand Oaks-Ventura	\$13,943	\$24,776	\$24,789	\$25,414	\$25,674
Fresno	\$10,995	\$18,246	\$18,256	\$18,716	\$19,100
Stockton	\$7,644	\$12,384	\$12,391	\$12,703	\$12,898
Modesto	\$5,970	\$9,951	\$9,956	\$10,207	\$10,364
Santa Rosa-Petaluma	\$7,566	\$9,042	\$9,047	\$9,275	\$9,323
Vallejo-Fairfield	\$4,965	\$8,177	\$8,181	\$8,387	\$8,516
Visalia-Porterville	\$4,012	\$6,605	\$6,608	\$6,775	\$6,949
Napa	\$2,620	\$4,069	\$4,072	\$4,174	\$4,282
Merced	\$2,073	\$3,753	\$3,755	\$3,849	\$3,929
Madera	\$1,294	\$2,570	\$2,571	\$2,636	\$2,704
Yuba City	\$1,415	\$2,162	\$2,163	\$2,218	\$2,275
Hanford-Corcoran	\$1,197	\$2,015	\$2,016	\$2,067	\$2,120
Truckee-Grass Valley	\$1,012	\$1,616	\$1,617	\$1,658	\$1,701
Phoenix Lake-Cedar Ridge	\$587	\$1,217	\$1,217	\$1,248	\$1,261
Ukiah	\$933	\$1,156	\$1,156	\$1,185	\$1,216
Clearlake	\$455	\$797	\$798	\$818	\$839



FORECASTS OF BROADBAND EFFECTS

Figure 12 - Forecasts of 10-Year Cumulative Payroll Gains for Selected California Regions (millions of dollars)

<i>Region</i>	<i>Broadband Growth Scenario</i>		
	<i>Moderate</i>	<i>Strong</i>	<i>Dramatic</i>
Los Angeles-Long Beach-Glendale	\$1,041	\$33,079	\$62,726
Santa Ana-Anaheim-Irvine	\$448	\$14,512	\$23,296
San Diego-Carlsbad-San Marcos	\$348	\$11,211	\$18,042
Riverside-San Bernardino-Ontario	\$333	\$11,022	\$20,738
Oakland-Fremont-Hayward	\$292	\$9,282	\$15,057
San Francisco-San Mateo-Redwood City	\$292	\$9,080	\$14,116
San Jose-Sunnyvale-Santa Clara	\$286	\$8,878	\$14,619
Sacramento-Arden Arcade-Roseville	\$245	\$7,928	\$14,209
Oxnard-Thousand Oaks-Ventura	\$91	\$2,971	\$5,240
Fresno	\$69	\$2,229	\$4,402
Stockton	\$47	\$1,523	\$2,879
Modesto	\$38	\$1,214	\$2,295
Santa Rosa-Petaluma	\$38	\$1,211	\$1,974
Vallejo-Fairfield	\$31	\$1,001	\$1,892
Visalia-Porterville	\$25	\$809	\$1,632
Napa	\$16	\$506	\$1,022
Merced	\$14	\$448	\$884
Madera	\$9	\$299	\$604
Yuba City	\$8	\$270	\$545
Hanford-Corcoran	\$8	\$245	\$495
Truckee-Grass Valley	\$6	\$200	\$403
Ukiah	\$5	\$153	\$309
Phoenix Lake-Cedar Ridge	\$4	\$140	\$246
Clearlake	\$3	\$96	\$194



Conclusion

There has been a dramatic rise in California's reliance on broadband Internet access between 2001 and 2006. Both the proportion of the adult population using a broadband connection and the migration from dial-up to broadband have demonstrated clear upward trends in the past few years. SRRI's analysis shows that this migration and the growth in broadband use appears to have had a positive and significant effect on employment and payroll in the state. Economic theory would suggest that increased investment in the deployment and, sequentially, the use of broadband has the potential to generate incremental benefits to many of the state's regions and California overall.

SRRI's forecasts of different broadband growth scenarios demonstrate that even a small increase in broadband use could generate a substantial cumulative gain over the next 10 years compared to what could be expected under business as usual conditions. Strong growth in the proportion of the adult population using broadband (defined in the analysis as a 3.8 percentage point increase per year) could lead to a net cumulative gain of 1.8 million new jobs and \$132 billion in additional payroll across California. A dramatic increase could push the state to universal diffusion of broadband within the next 10 years (94 percent of the adult population) and create considerable net economic effects. All regions of the state could benefit from an incremental boost in jobs and total payroll with increased broadband use, but the magnitude depends on the local economic conditions and unique distribution of Internet connections.

The findings from this analysis are similar to those from recent studies examining the effects on broadband on comparable economic variables in California and the United States. While not directly comparable, the results of the strong broadband growth scenario are consistent (although somewhat smaller) with the Gartner May 2003 report, *One Gigabit or Bust Initiative: A Broadband Vision for California*, which projects an incremental addition of 2 million jobs between 2000 and 2010 with increased broadband utilization. Despite differing broadband measures and focus geographies, the historical effects of broadband use are remarkably similar to the Department of Commerce February 2006 study, *Measuring Broadband's Economic Impact*, which finds that broadband added between 1 percent and 1.4 percent to the nation's employment growth rate between 1998 and 2002.

In addition to adding another piece of support to the concept that broadband has a positive impact on the economy, this analysis makes three distinct contributions to the discussion of the economic effects of broadband. First, the measure of broadband is based on actual use, as opposed to availability or penetration. Second, the panel regression approach allows the model to capture the dynamic effects of broadband use and migration from other connection types. Third, regional effects are presented, rather than simply national or statewide estimates. Overall, this analysis paints a clear picture of how increased broadband use (and the migration from dial-up to broadband) affects employment and payroll in California and a select group of its regions—the direction of the effect is always positive and the magnitude depends on the size of the shift in the percentage of the adult population using a broadband Internet connection.

About SRRI

The Sacramento Regional Research Institute (SRRI) was established in 2001 as a joint venture of the Sacramento Area Commerce and Trade Organization (SACTO) and California State University, Sacramento (Sacramento State). The Institute acquires, analyzes and distributes economic information for the purpose of providing a greater understanding of the regional and statewide economies.

SRRI provides a full range of objective economic and demographic research services to businesses, government entities, educational institutions, and non-profit organizations. The Institute's primary services include:

- Economic Development Strategies
- Industry Studies
- Economic and Tax Impact Studies
- Market and Feasibility Analyses
- Workforce Studies
- Economic and Demographic Profiles
- Policy Analysis and Program Evaluation Support
- Site Selection Information and Research

The experienced staff at SRRI possesses extensive knowledge of economic and demographic research, economic development practices, and urban planning. Every project is successfully completed on time, within budget, and in accordance with the highest quality standards.

Public and private clients from inside and outside the Sacramento Region look to SRRI's unique economic and demographic research expertise to help them work smarter and more competitively in realizing their objectives.