CREATING JOBS IN ARIZONA BY BUILDING AND RENOVATING PHYSICAL INFRASTRUCTURE

A Report from the Office of the University Economist

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Since late 2007, the nation has been plagued by a deep and long recession followed by a slow economic recovery. Arizona has been particularly hard hit, losing more than 300,000 jobs between fall 2007 and fall 2010. While job growth has returned since then, it has been modest, with employment still about 266,000 lower than it was at the prerecession peak. Many Arizonans have been unemployed or underemployed for an extensive period of time. The loss of income has caused many to lose their homes to foreclosure.

The severe recession and mediocre recovery has led the federal government and many state governments to consider programs to stimulate the economy. The particular focus is on creating jobs: putting unemployed individuals to work until the economy strengthens and naturally provides enough jobs.

While the public sector has various ways to influence the economy in the long term, few government actions can have much of an impact in the short term. The federal government has more tools than state governments to affect the economy in the short term since the Federal Reserve Bank has various means, such as controlling the money supply and setting interest rates that are not available to state governments. One of the primary tools available to the federal government to fight a recession or a weak recovery is to stimulate the economy through an increase in federal spending. This was part of the 2009 American Recovery and Reinvestment Act. Additional federal stimulus spending currently is being debated in Congress.

The 2009 stimulus act and the proposed act include several ways of stimulating the economy. A study by the Congressional Budget Office, which is consistent with the findings of econometric firms, indicates that direct spending by government for infrastructure is the most efficient means of stimulating the economy — these actions have the largest multipliers. Extending benefits to the unemployed and providing funding to state and local governments so that teachers and other personnel are not laid off have the next highest multipliers. The multipliers associated with tax cuts are smaller — tax cuts to corporations and higher-income individuals are highly inefficient ways of stimulating the economy.

Thus, an increase in spending is the most efficient means available to a state government to stimulate the economy. It is the only means that can significantly boost employment in the short term. Public spending to repair existing, and to build new, physical infrastructure best meets these criteria. This public spending reaches the private sector quickly, has a strong multiplier effect, benefits the state in the long term, and can be implemented for a limited time without ill effects. Infrastructure spending has been used by several state governments as the major feature of their stimulus programs.

The Need for Infrastructure

Infrastructure needs in Arizona are considerable. Many infrastructure projects — for new infrastructure and for renovation of existing infrastructure — have already been approved and are “shovel ready,” only awaiting funding to proceed. Other projects could be started within a year. The inventory of projects is large since the state has lagged behind in the provision and

renovation of infrastructure for a number of years, with the recession reducing funding even further. Funding such projects would have a quick and substantial impact on job creation in Arizona. The state would merely be accelerating needed construction projects that will pay benefits both to individuals and the business community as soon as the construction is complete.

Many of the identified infrastructure projects are for transportation, particularly highways and roads. Education needs also are considerable. The funding that has been provided for maintenance and repair of elementary and secondary schools falls substantially short of the needs and funding for maintenance and repair of higher education facilities also is needed. The construction of facilities to house additional prison beds and/or the renovation of existing prison facilities is another type of needed infrastructure.

While an increase in infrastructure spending will most heavily impact the construction sector, this sector was the hardest hit during the recession. The effects of the spending, however, will be much broader. Some of the projects will need to be designed by engineers and architects. Mining and related rock product companies will benefit from an increase in demand for their products. An increase in the construction, mining, engineering and related workforces means that consumer spending will increase, benefitting a broad range of retail and service businesses. Wholesale trade and transportation will benefit from the rise in consumer demand and the increased demand for materials used in building the infrastructure. Thus, benefits will accrue across the economy.

Apart from the jobs impact, this is an opportune time to undertake infrastructure projects. Interest rates are low, reducing the cost of borrowing. Construction materials are readily available, lowering their costs. Construction companies are desperate for work and will bid lower than they would at times when their resources are stretched thin.

Paying for a Jobs/Infrastructure Program

Because of balanced budget requirements and limitations on debt, any increase in state government spending will necessitate an immediate increase in state government revenues. If long-term financing is used (say for 10 or 20 years), then the size of the tax/fee increase does not need to be nearly as large relative to the amount needed for a “pay-as-you-go” program. While Arizona state government continues to be plagued by financial difficulties, it does not carry a heavy debt burden as does the federal government. In addition, tax burdens are low in Arizona, from both a historical perspective and in comparison to other states. Some Arizonans have the capability to pay substantially higher levels of state and local government taxes and fees than they currently are being asked to pay. Thus, Arizona is in a position where it could increase public spending.

Though constitutional limitations on borrowing exist, long-term financing can be undertaken using revenue bonds that are tied to a revenue stream. Increases in taxes/fees would be put into effect, lasting until the debt was paid off.

While public spending has a strong positive effect on the economy, the net positive effect is diminished by negative effects from an increase in public revenues. Thus, an important consideration is to limit the negative impacts on the Arizona economy of a revenue increase; an

increase in business taxes should not be considered. Another very important consideration is to not raise taxes or fees on those individuals who are struggling financially.

Ideally, the additional revenue would come from affluent individuals who have the capability to pay additional taxes without reducing their spending. The most specific way of taxing affluent individuals is to raise the Arizona personal income tax rate on those reporting taxable incomes above a certain high level. Arizona's personal income tax rates have been lowered repeatedly over the last two decades and are among the lowest in the country.

Other possible means of raising revenues that target those able to pay include increasing the vehicle license tax on vehicles with a high dollar value and eliminating the homeowner's rebate on property with a high assessed value. Another possible revenue source is to increase tourist taxes. Since tourists utilize Arizona's transportation network and other physical infrastructure, it is reasonable to ask them to pay for a portion of the infrastructure costs.

Economic Impacts of a Jobs/Infrastructure Program

The primary economic benefits of investments in physical infrastructure accrue over decades as businesses and individuals use the infrastructure and as the existence of the infrastructure aids economic development. In addition to these benefits, short-term economic impacts result from the expenditure of funds to build/renovate the infrastructure.

As suggested by the national multipliers, spending on infrastructure has a much larger economic impact than a tax cut of the same magnitude, according to two economic models specific to Arizona. In general, the positive effect of public spending is about double the effect of a reduction in personal taxes.

The output from the economic models represents the net of several types of effects. While public funds are being expended, the large positive effects from spending on infrastructure are partially offset by the negative effects of a tax increase. If long-term financing is used, the negative effects of higher taxes last as long as loan payments are made. A small lasting positive effect from the construction of infrastructure is realized after the construction is completed.

As long as funds are expended, the net impact from infrastructure spending is greater when long-term financing is used than when a pay-as-you-go system is used. This is offset in subsequent years while the debt is being paid off. In the long term, the cumulative net effects of pay as you go and debt financing are similar. Since a primary objective of a stimulus program is to provide employment when most needed, the long-term financing option is preferable.

If a $1 billion stimulus package that used 10-year financing were implemented over three years, with $300 million expended in the first year, followed by $400 million in the second year and $300 million in the third year, a conservative estimate of job creation would be about 7,300 in the first year, 9,600 in the second year, and 7,000 in the third year. If the package consisted of $3 billion, the effects would be three times as large.

RECENT AND CURRENT ECONOMIC CONDITIONS

The national economy follows a cycle in which a period of growth is followed by a period of decline (a recession). The Arizona economy is closely tied to the national economy. However, the Arizona economy is more volatile than the national economy, growing much more during economic expansions but sometimes declining more during recessions.

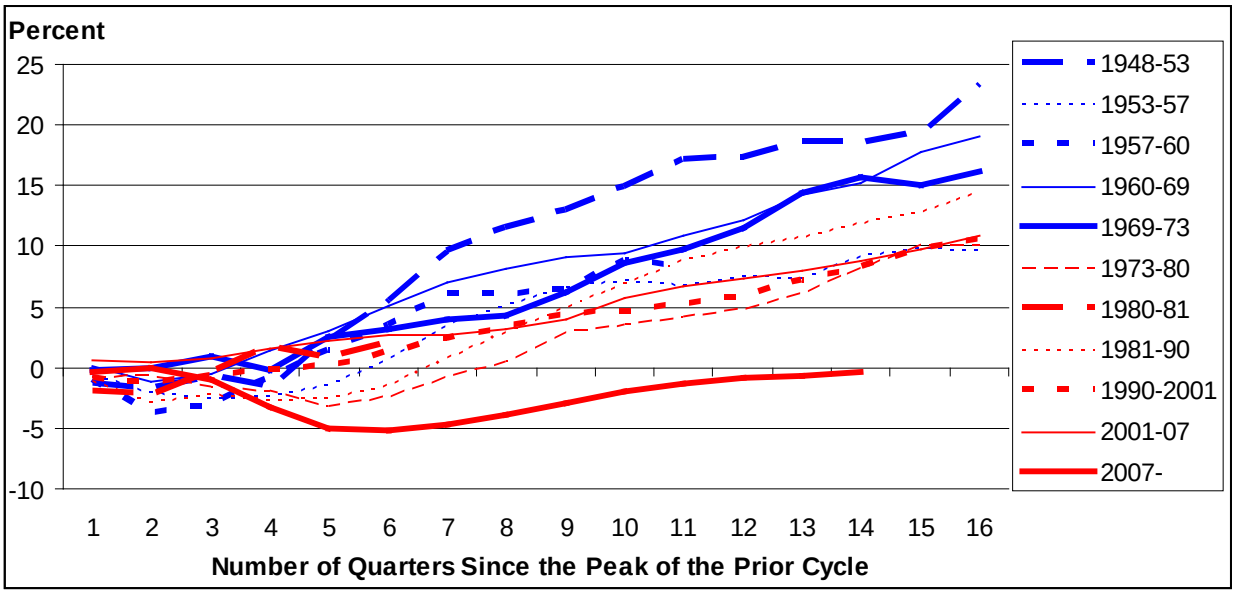
The 2008-09 Recession and the Current Recovery

The recent recession, dated as lasting from the beginning of 2008 through June 2009 (18 months) was the longest and deepest recession since the Great Depression of the 1930s. Since the end of the recession, the pace of the economic recovery has been mediocre.

United States

Gross Domestic Product (GDP) is the broadest indicator of national economic activity. The cumulative percent change in GDP by quarter during the first four years after the peak of an economic cycle is shown in Chart 1 for each cycle since World War II. The four-year period includes a recession and the first part of an expansion. Initially during the last recession, the decrease in GDP was similar to that of other cycles. However, at a time when many of the preceding cycles had begun to enter recovery, GDP continued to fall and at an accelerating rate, with the total decline reaching 5.1 percent after adjustment for inflation.

CHART 1
CUMULATIVE PERCENT CHANGE IN INFLATION AND SEASONALLY ADJUSTED GROSS DOMESTIC PRODUCT IN THE UNITED STATES OVER THE FIRST FOUR YEARS OF AN ECONOMIC CYCLE STARTING FROM THE PEAK OF THE PRIOR ECONOMIC CYCLE



Note: The official dating of the national economic cycle is used.

Source: Quarterly gross domestic product data from the U.S. Department of Commerce, Bureau of Economic Analysis.

Since the official end of the recession, nearly all of the loss in GDP had been made up by the middle of 2011 (the 14th quarter since the prior cyclical peak). While the pace of the recovery was the slowest in the period since World War II, it was not much more sluggish than in the two preceding cycles. The main reason that the line for the current cycle in Chart 1 is so far below its predecessors in quarter 14 is the length and depth of the recession.

Two components of GDP are responsible for the poor overall performance in the current cycle: personal consumption expenditures (which accounts for approximately 70 percent of GDP) and gross private domestic investment (which largely consists of investment in commercial and residential structures and investment in equipment and software). All types of consumption fell sharply during the recession; the weakness during the recovery particularly is in consumption of services. Similarly, all types of private domestic investment fell considerably during the recession but the weakness during the recovery has especially been in residential real estate, which has yet to begin to recover.

Employment is a particularly narrow indicator of the economy since it is not measured in dollars. It does not consider differences in wages across jobs and no distinction is made between a part-time and full-time job. Moreover, most measures of employment include only nonfarm wage and salary workers. Thus, the apparent economic health as measured by employment can be very different from the picture based on broader indicators such as GDP. Relative to the decline in the overall economy and to the relationship between employment and broader economic indicators in prior recessions, employment was affected disproportionately during the last recession and is experiencing a very slow recovery.

Using the official dating of the recession for an analysis of employment can be misleading since the timing of the employment recession can be quite different from that of the overall economy. Nonfarm wage and salary employment (seasonally adjusted and excluding Census Bureau hiring of temporary workers for the 2010 census) fell in every month from February 2008 through February 2010 (25 months). Thus, decreases continued for eight months after the official end of the recession. A total of 8.75 million jobs (6.3 percent) were lost over these 25 months. Since the employment recovery began in March 2010, nearly 2.1 million jobs have been added (24 percent of the jobs lost). During the summer of 2007, however, the pace of the employment recovery slowed.

Nationally, employment fell in nearly all sectors during the 2008-10 time frame — the exceptions are health care and private educational services. Declines from peak to trough were largest in construction and manufacturing, each of which began to decline well before early 2008. While the percentage drop was not as great as in construction and manufacturing, job losses also continued for a long period in the information, finance and insurance, and real estate sectors. Employment has begun to recover in most sectors, but as of September 2011 gains had not yet returned in finance and insurance; arts, entertainment and recreation; and government.

Arizona

Arizona's recession was longer and deeper than that of the nation. Since GDP by state is only calculated annually, the earnings component of personal income is the broadest available measure of the economy. Earnings began to decline in second quarter 2007 and continued to

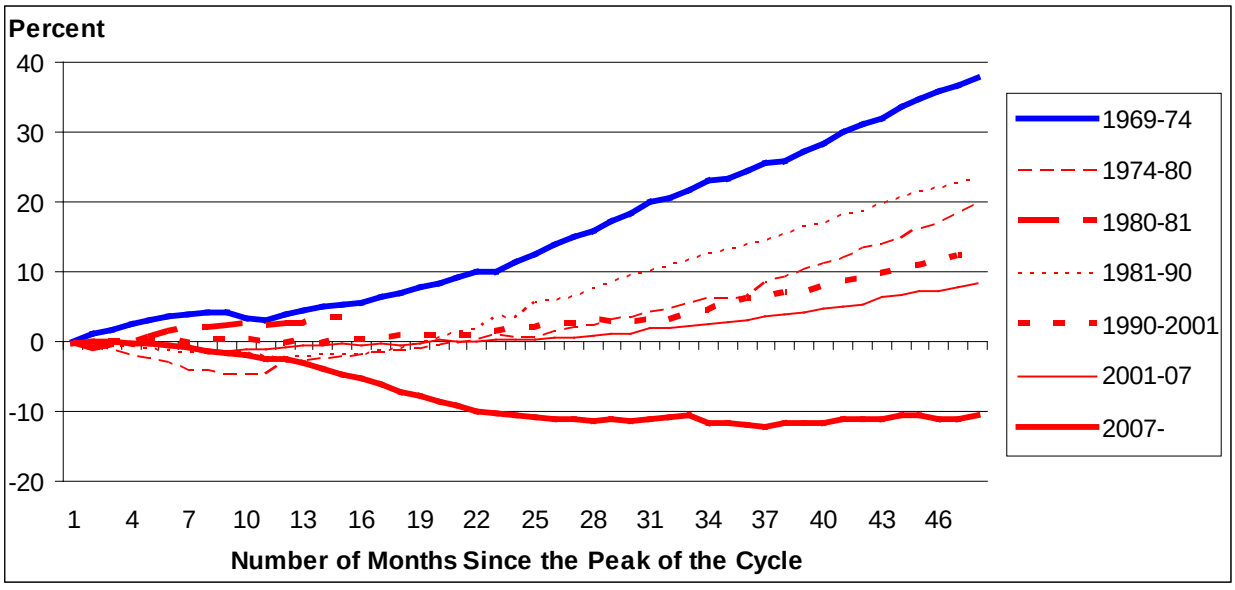
drop through first quarter 2010. The total inflation-adjusted and seasonally adjusted decrease was 9.5 percent in Arizona but only 6.4 percent nationally. The recovery also has lagged behind in Arizona, with the increase from the low point 3.0 percent in Arizona and 4.2 percent nationally.

Employment (seasonally adjusted) dropped in every month from November 2007 through December 2009 in Arizona, then on net fell further through September 2010. Arizona lost 324,000 jobs (12.1 percent) over this nearly three-year period. While job growth has returned since then, the recovery in Arizona has lagged behind the national average: only 18 percent of Arizona's lost jobs have been recovered. As of September 2011, employment in Arizona still was about 266,000 lower than it was at the prerecession peak.

Chart 2 is similar to Chart 1, except it presents employment in Arizona. The focus for Arizona is on the period since 1970. With the economy in Arizona still evolving and maturing through the 1960s relative to the national economy, economic performance in Arizona prior to 1970 is not particularly relevant as a comparison to recent conditions. The recent employment recession in Arizona was much longer and deeper than in the preceding six cycles. Employment has barely begun to recover.

Chart 3 indicates that the last employment recession in Arizona was longer and deeper than the national average and that Arizona has not yet begun to make up for the inferior performance.

CHART 2
CUMULATIVE PERCENT CHANGE IN SEASONALLY ADJUSTED ARIZONA EMPLOYMENT OVER THE FIRST FOUR YEARS OF AN ECONOMIC CYCLE STARTING FROM THE PEAK OF THE PRIOR ECONOMIC CYCLE



Note: The dating is based on Arizona employment.

Source: Monthly employment data from the U.S. Department of Labor, Bureau of Labor Statistics.

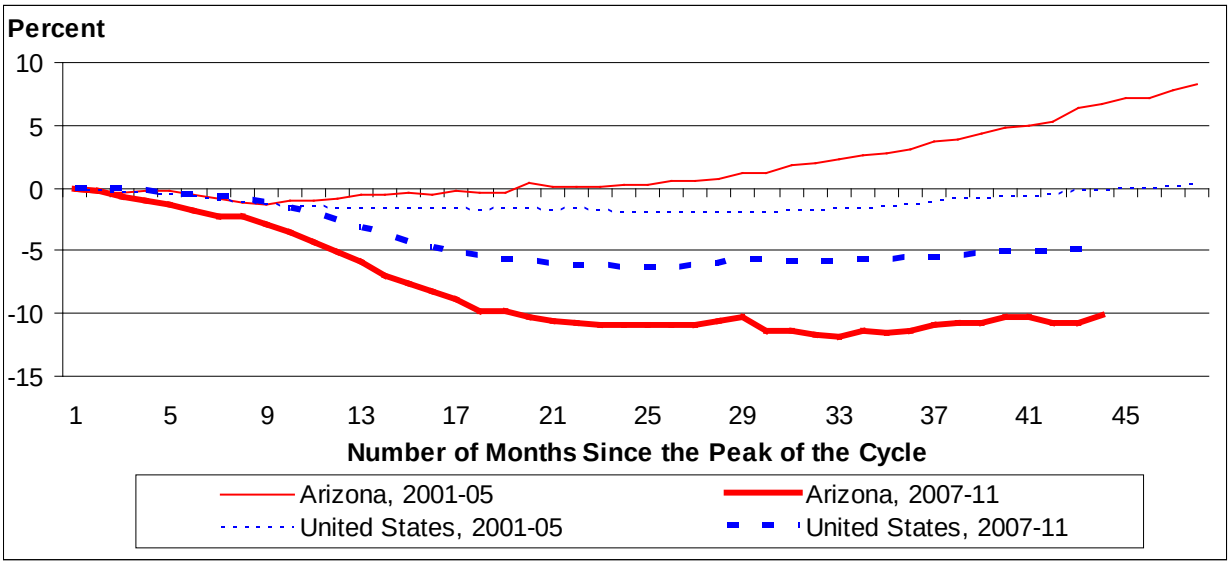
This is in sharp contrast to the preceding cycle, which is representative of earlier cycles, in which employment fell much more modestly and for only a short period in Arizona relative to the U.S. average. During the expansion, Arizona's growth quickly outpaced the national average.

Like the nation, Arizona lost jobs during the recession in all sectors except health care and private educational services (see Table 1). The decline was especially deep in construction.

The gains in health care and private education services during the recession were faster in Arizona than in the nation. In all of the other sectors, job losses in Arizona were deeper than the national average; in most sectors the period of decline was longer. One sector — construction — stands out as having experienced a much larger drop in Arizona than the national average (see Table 2).

Relative to the nation, the pace of the employment recovery accelerated in Arizona during the late summer. After being behind the nation, the percentage increase in employment since the trough has passed the U.S. average. However, the performance has varied widely by sector, with the administrative support and natural resources sectors lagging far behind the nation. Though strong gains have been realized in recent months in construction, that sector's employment remains far below the last peak relative to the U.S. average.

CHART 3
CUMULATIVE PERCENT CHANGE IN SEASONALLY ADJUSTED EMPLOYMENT OVER THE FIRST FOUR YEARS OF AN ECONOMIC CYCLE STARTING FROM THE PEAK OF THE PRIOR ECONOMIC CYCLE



Note: The official dating of the national economic cycle is used.

Source: Monthly employment data from the U.S. Department of Labor, Bureau of Labor Statistics.

TABLE 1
EMPLOYMENT CHANGE IN ARIZONA BY SECTOR SINCE LAST PEAK, THROUGH SEPTEMBER 2011

	Peak	Trough	Length of Decline in Months	Percentage Decrease from Peak to Trough	Percentage Increase Since Trough	Percentage Change Since Peak
TOTAL	Oct 2007	Sep 2010	35	-12.1%	2.4%	-9.9%
Natural Resources	Sep 2008	Sep 2011	36	-25.9	0.0	-25.9
Construction	**Jun 2006**	**Sep 2010**	**51**	**-56.0**	**7.6**	**-52.6**
Manufacturing	Apr 2006	Sep 2010	53	-22.1	3.8	-19.2
Wholesale Trade	Feb 2008	Jan 2011	35	-12.5	2.5	-10.3
Retail Trade	Nov 2007	Sep 2010	34	-13.3	1.7	-11.9
Transportation and Utilities	Dec 2007	Jun 2010	30	-9.3	5.1	-4.7
Information	Jan 2006	Oct 2010	57	-21.6	2.2	-19.8
Finance and Insurance	Jan 2007	Sep 2010	44	-13.1	0.7	-12.5
Real Estate and Rentals	Dec 2006	Dec 2010	48	-19.0	4.7	-15.3
Professional and Technical Services	Feb 2008	Mar 2011	37	-12.4	1.9	-10.7
Management of Companies	Apr 2008	May 2010	25	-10.3	4.0	-6.8
Administrative Support	Mar 2007	Apr 2011	49	-24.7	1.9	-23.2
Private Educational Services	no cycle					
Health Care and Social Assistance	no cycle					
Arts, Entertainment and Recreation	Mar 2008	Apr 2009	13	-11.6	10.9	-1.9
Accommodation and Food Services	Dec 2007	Feb 2010	26	-9.0	5.3	-4.2
Other Services	Jan 2008	May 2011	40	-16.0	2.1	-14.2
Government	Aug 2008	Jul 2011	35	-7.4	3.3	-4.4

Notes:
Employment is seasonally adjusted and limited to nonfarm wage and salary workers.
The dating of the peak and trough is based on the highest and lowest seasonally adjusted values in each sector in Arizona.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

TABLE 2
EMPLOYMENT CHANGE IN ARIZONA RELATIVE TO THE NATIONAL AVERAGE BY SECTOR SINCE LAST PEAK, THROUGH SEPTEMBER 2011

	Length of Decline in Months	Percentage Decrease from Peak to Trough	Percentage Increase Since Trough	Percentage Change Since Peak
TOTAL	10	-5.8	0.8	-5.1
Natural Resources	23	-10.2	-21.8	-28.6
Construction	**3**	**-26.9**	**6.3**	**-24.4**
Manufacturing	-11	-2.0	1.3	-1.1
Wholesale Trade	8	-2.6	0.7	-2.0
Retail Trade	10	-5.4	0.0	-5.6
Transportation and Utilities	8	-1.1	2.5	1.1
Information	-6	-7.2	0.9	-6.5
Finance and Insurance	-13	-4.7	0.7	-4.1
Real Estate and Rentals	-3	-7.4	4.0	-4.4
Professional and Technical Services	14	-7.0	-1.9	-8.8
Management of Companies	8	-7.1	1.9	-5.5
Administrative Support	19	-8.2	-7.0	-14.1
Private Educational Services	no cycle			
Health Care and Social Assistance	no cycle			
Arts, Entertainment and Recreation	-29	-6.5	10.9	3.2
Accommodation and Food Services	0	-4.6	2.4	-2.5
Other Services	17	-12.0	-0.5	-12.6
Government	6	-4.3	3.3	-1.3

Notes:
Employment is seasonally adjusted and limited to nonfarm wage and salary workers.
The dating of the peak and trough is based on the highest and lowest seasonally adjusted values in each sector in Arizona and the United States.

Interpretation: For example, for the total economy, employment in Arizona declined for 10 months longer than the national average and the decrease from peak to trough was 5.8 percentage points larger than the national average.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

Causes of the Slow Recovery in Employment

The real estate bust clearly contributed significantly to the severity of the recession. Since the real estate cycle was much more severe in Arizona than the national average, this helps explain why the Arizona economy has done so much worse than the national economy in recent years. With imbalances still remaining in real estate markets — large numbers of homes continue to fall into foreclosure and an unusually high number of vacant homes and commercial buildings preclude much new construction — the bust continues to be a drag on the economy more than two years after the official end of the recession.

In part because of the real estate bust in Arizona, the percentage decline in retail sales (inflation adjusted) in Arizona was more than double that of the nation. Sales continued to decline in Arizona for more than a year after the national figure began to recover. The percentage increase since the low point has been barely more than half the national average.

Like the stock market boom from 1995 to 2000, the real estate boom of the mid-2000s disguised underlying issues by creating jobs that were not sustainable in the longer term. Despite the real estate boom, percentage job growth during the 2001-07 cycle was less than the historical norm.

International competition coupled with relatively high wage levels in the United States are driving this shift of jobs to other countries. This is not a trend that can be reversed, at least not without a substantial decline in the American standard of living. The solution is for more Americans to enhance their educational attainment and technical skills so that the United States can reassert its leading global role in innovation — but this is a long-term solution.

Some of the jobs that were lost during the recent recession probably will not return during the economic recovery. Instead, they already have been, or will be, replaced by jobs in other countries. While not a new phenomenon, permanent shifts in jobs from the United States to other countries continue. Combined with the large excess of vacant housing units and commercial space preventing the construction sector from leading the economic recovery as it has in the past, there is little to drive a recovery in employment — and little that the public sector can do to significantly change the dynamics in the short term.

The Current Financial Status of Individuals

During the mid-2000s, too many houses and commercial buildings were constructed, too many unwise real estate loans were made, too much borrowing was undertaken, and too much of the short-term profits from real estate appreciation were spent. Many Americans were left with no, or greatly reduced, tangible reserves (savings) once the real estate boom went bust. The boom-bust cycle was much more severe in Arizona than in most of the country.

The general recession worsened the situation: the value of investments in the stock market fell sharply, and many households were affected by job losses, reductions in wage rates, and cutbacks in hours worked. During the recession, both household and corporate debt rose more than in prior cycles and household net worth dropped far more than typical. Even with some recovery in stock prices and the beginnings of a recovery in the jobs market, a large segment of Americans continue to be in no position financially to contribute to an economic recovery — especially significant since personal consumption expenditures make up such a large proportion of GDP.

While simplistic, it is useful to divide Americans (and Arizonans) into three rough groups:

- Those who have been directly affected by the loss of a job, reduction in hours worked, reduction in wages, loss of home, etc. In response, people in this group greatly reduced their spending and still are in no position to increase spending significantly, even if given a tax cut or an extension/expansion in public aid. Instead, part of any additional income they receive is used to pay off existing debt. According to the October 2011 Rocky Mountain Poll, 52 percent of Arizonans have “cut back a lot” on their spending since the recession started.
- Those who have not been affected by job losses or other loss of income, but whose savings have been substantially depleted due to the reduction in real estate values and stock prices. Moreover, during the recession, many of these individuals felt they were at risk of losing their job or of suffering a reduction in income; as a result, this group

reduced spending during the recession. While the end of the recession coupled with a rebound in stock market values during 2010 and early 2011 led to an increase in consumer spending, the slowing of economic growth since May 2011 and the stock market losses that have occurred since July have led to a reduction in confidence. Some members of this group still, or again, are concerned about job loss or other loss of income. As a whole, this group is likely to remain very cautious consumers for some months to come. According to the Rocky Mountain Poll, 21 percent of Arizonans have reduced their spending "some."

- Affluent individuals little affected by the economic conditions. Though their investments may have lost considerable value, people in this group still are financially comfortable. This group has spent all along and has no pent-up demand that will result in a boost in their spending. According to the Rocky Mountain Poll, 27 percent of Arizonans have not reduced their spending, or have done so "only a little."

The large baby-boom generation that is approaching retirement age (baby boomers currently are between 47 and 65 years of age) is of particular interest. While many baby boomers feel secure in their short-term income and retain some savings, many lost so much in home equity and other investments that they feel they must save considerably more than in the past in order to prepare for retirement.

PUBLIC-SECTOR ECONOMIC STIMULUS

The public sector — even the federal government — has a limited ability to affect the course of the economy in the short term. Relative to state and local governments, the federal government is in the best position to fight recessions or otherwise stimulate the economy:

- The federal government is in the best position to utilize a primary tool to stimulate the economy — increasing public-sector spending — since the federal government does not have constitutional restrictions related to the assumption of long-term debt and to balance its budget annually. Moreover, the federal government has more resources at its disposal, allowing it to put forth a sizable stimulus package that the 50 states working together would be unable to match.
- The other tools to stimulate the economy are wielded by the Federal Reserve Bank and are not available to state and local governments.
- A national solution to economic problems is most efficient since national economic conditions affect all states to some extent.

Federal Government

The federal government has been stimulating the economy throughout the recession and the succeeding weak recovery, through Federal Reserve Bank actions and the American Recovery and Reinvestment Act (ARRA).

Federal Reserve Bank

The Federal Reserve Bank (Fed) has aggressively used its powers, which fall into three categories:

- Setting reserve requirements, which dictate the ease at which banks can make loans based on their existing reserve deposits.
- Setting the discount rate, which is the rate charged by the Fed on its loans to banks.
- Engaging in open-market purchases and sales of U.S. Department of the Treasury securities. Open-market transactions allow the Fed to essentially monetize Treasury debt during recessionary periods in an attempt to stimulate the economy. (Monetization is the conversion of securities into currency that can be used to purchase goods and services.)

The Federal Reserve Bank's actions to make credit lines available to prospective borrowers and those looking to finance business investment appears to have had limited success. While the Fed can make the cost of borrowing very cheap, it is the individual or business that has to take an action to actually use the credit. Expectations of adverse events, such as insufficient aggregate demand, make persons and corporations with liquid assets unwilling to invest, even if credit is available at a zero interest rate — a situation described as a "liquidity trap."

When the economy falls into a liquidity trap, the ability of the Federal Reserve Bank to stimulate the economy is limited. Monetary policy will increase demand at zero interest rates only if the Fed changes expectations about the future money supply or, equivalently, the path of future interest rates. During the recession, the Fed recognized the possibilities of a liquidity trap and pursued a policy of quantitative easing, an aggressive form of open-market operations where a wider array of financial assets are purchased directly from banks using newly printed money so as to insure that credit expands in the banking system. A second round of quantitative easing took place in fall 2010.

The Federal Reserve Bank continues to take action to improve the weak economy. In August 2011, it announced it will keep short-term interest rates near zero through at least mid-2013. In September, it announced another round of quantitative easing in which it would purchase a large amount of Treasury securities maturing in six-to-30 years while selling an equivalent amount with maturities of three years or less in order to lower long-term interest rates. The Fed also stated that it would maintain its mortgage-related holdings at current levels to support the housing market. The Fed's actions have been so aggressive that rising inflation is a concern in the longer term.

American Recovery and Reinvestment Act

This federal stimulus package was passed by Congress in February 2009 in order to inject money into the economy in the short term that will be paid for in the long term. In essence, the funding was borrowed, raising the size of the federal deficit. Of the estimated eventual impact of $825 billion, $719.1 billion had been spent as of September 30, 2011. While the bulk of the impact occurred during fiscal year 2010 (October 2009 through September 2010), the stimulus package still is having a positive effect today (see http://www.recovery.gov/Pages/default.aspx).

Two primary means of injecting money into the economy were used. First, tax reductions were implemented; 42 percent of the ARRA spending has gone to tax reductions, especially on payroll taxes. The goal of the tax reductions is for the recipients to spend that money; an increase in consumer spending could result in hiring increases across a broad segment of the economy.

Second, direct spending by the federal government was increased, which raises demand at private-sector companies, resulting in additions to the workforce. The increase in direct spending took two forms. Of the $719 billion that has been spent as part of ARRA, 29 percent has been used for extensions to entitlements, particularly unemployment benefits and food stamps. Another 29 percent has taken the form of government contracts, grants, and loans. This funding has been used to repair and build physical infrastructure and to prevent further state and local government layoffs from occurring in the educational system.

ARRA has been criticized as not working, but it is impossible that $719 billion of federal expenditures of the nature described did not have a positive effect on the economy. Without this injection of funds, the recession would have been even deeper and longer, and the recovery weaker, than has actually occurred. The Congressional Budget Office (CBO) quantified these effects in its August 2011 report *Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output from April 2011 through June 2011* (http://cbo.gov/ftpdocs/123xx/doc12385/08-24-ARRA.pdf).

The CBO reports that 550,000 full-time-equivalent jobs were reported by recipients of ARRA funds, but that this measures the impact of only a portion of the ARRA spending. The CBO estimates the total effect of ARRA to be between 1.4 million and 4 million jobs nationally, including jobs saved that otherwise would have been lost as well as job creation. The unemployment rate is estimated to be 0.5 to 1.6 percentage points lower than what it would have been if ARRA spending had not occurred.

In order to evaluate the effects of ARRA, the CBO has estimated output multipliers, based on the direct and indirect effects of ARRA spending on GDP over a period of several quarters. Multipliers estimate the effects of the changes in the output of one or more industries on the output, employment, and labor earnings in the other industries. A multiplier of 1 indicates that $1 of ARRA spending caused GDP to increase by $1. A multiplier of more than 1 indicates that the ARRA funding rippled through the economy, causing positive effects in industries other than that of the beneficiary. For example, in the case of infrastructure spending, some of the funding was used to hire an unemployed construction worker, who used some of his increase in income to purchase goods and services beyond what he had been buying while unemployed. A multiplier of less than 1 indicates that the beneficiary of ARRA funding did not spend all of the money received. For example, in the case of a tax cut to a wealthy individual, the money was saved instead of spent.

In Table 3, the output multipliers estimated by the CBO are shown for each of the types of activity included in ARRA. Economy.com has estimated multipliers for various possible stimulative activities, some of which match the categories listed by the CBO. In each case, the Economy.com multipliers are in the middle half of the CBO's range.

The largest multipliers have come from direct expenditures by the federal government for goods and services and from transfers to state and local governments used for infrastructure. Conservatively, $1 of those types of spending resulted in an increase of $1 in GDP, but due to indirect effects, the total impact likely was more than $1 and perhaps as much as $2.50. Economy.com estimates the multiplier for infrastructure spending to be 1.59. The multiplier for transfers to state government for purposes other than infrastructure — largely to retain the jobs of teachers — is estimated to be somewhat lower: 0.7 to 1.8 according to the CBO and 1.36 according to Economy.com.

TABLE 3
OUTPUT MULTIPLIERS OF MAJOR PROVISIONS OF THE AMERICAN RECOVERY AND REINVESTMENT ACT

	Estimated Multiplier	
	Low	High
Purchases of Goods and Services by the Federal Government	1.0	2.5
Transfers to State and Local Governments for Infrastructure	1.0	2.5
Transfers to Individuals	0.8	2.1
Transfers to State and Local Governments for Purposes Other Than Infrastructure	0.7	1.8
Two-Year Tax Cuts for Lower- and Middle-Income People	0.6	1.5
One-Time Payments to Retirees	0.3	1.0
Extension of First-Time Homebuyer Credit	0.3	0.8
One-Year Tax Cut for Higher-Income People	0.2	0.6
Corporate Tax Provisions	0.0	0.4

Source: The Congressional Budget Office.

Transfers to individuals, mostly in the form of enhanced benefits to those unemployed and those receiving food stamps, also has had a relatively high multiplier, estimated by the CBO as between 0.8 and 2.1. Economy.com reports multipliers for this type of spending are slightly higher than those for infrastructure: 1.73 for a temporary increase in food stamp payments and 1.64 to extend unemployment insurance benefits.

In contrast, the tax cut provisions of the stimulus act have had lower multipliers. In particular, the tax cut for higher-income individuals and the corporate tax provisions have multipliers of much less than 1. That means that for each dollar of tax reduction, less than $1 of spending occurred. Economy.com concurs, calculating the multiplier for corporate tax rate reductions to be only 0.3. Thus, tax reductions for corporations and high-income individuals are highly inefficient means of stimulating the economy.

Other forms of tax cuts have higher multipliers, but not as high as for transfers directly to needy individuals, infrastructure spending, or transfers to state and local governments to save jobs for teachers. Economy.com reports the highest multipliers from changes in taxes to be 1.29 for a temporary reduction in the payroll tax, 1.26 for a refundable lump-sum tax rebate, 1.02 for a nonrefundable rebate (low-income individuals receive less than the full amount of the rebate), and 1.03 for a temporary across-the-board tax cut. In contrast, other changes to the tax code would have very low multipliers:

- Extension of the alternative minimum tax patch: 0.48
- Make the dividend and capital gains tax cuts permanent: 0.37
- Make the Bush income tax cuts permanent: 0.29
- Temporarily accelerate depreciation: 0.27

On the whole, ARRA has not had as much impact on jobs as some expected or hoped, though those who argue that the “program did nothing” might examine the performance of the economy in 1930 and 1931 when the government made virtually no response to a massive adverse wealth shock. Still the results of the ARRA were disappointing. The primary reason for this is that the largest portion of the funding was for tax cuts for individuals, which have only a low-to-moderate multiplier. In order to have a positive effect on employment, the money that otherwise would have been used to pay taxes must be used to increase consumer spending.

None of the three groups of Americans discussed in the prior section have had much motivation to use the money realized by a reduction in taxes to increase spending. The group most directly affected by the recession likely used a significant portion of the money to pay existing bills and mortgages. Given the loss of income experienced by this group, the amount of their consumer debt, and the size of their mortgage payments, the reduction in taxes barely began to resolve the plight of this group. Instead of increasing their spending, the middle group, especially baby boomers approaching retirement age, likely saved a sizable share of the tax reductions in an effort to offset their significant losses in investments. The affluent group may not have increased their spending since they already were in a position to have bought what they liked. Thus, the tax reduction portion of the stimulus package, while a benefit to households in need, was an inefficient means of increasing the number of jobs.

Proposed Additional Stimulus

In September 2011, President Obama proposed a second stimulus package, titled the American Jobs Act, which is similar in nature to the 2009 package. The proposed total funding is $447 billion, a little more than half of the ARRA amount. The breakout of the proposed funding is shown in Table 4. With more than half of the funding allocated to tax cuts, the effect of this plan on jobs will fall short of a plan dominated by infrastructure spending and direct assistance to needy individuals.

Whether this proposal will be enacted by Congress is a matter of conjecture. In addition to the typical political disagreements, the similarity of this package to the one passed in 2009 combined with the perception among some that the 2009 package did not work lessens the likelihood of passage. A further complication is the federal government's already very large deficit.

The tax reduction portion of the plan likely will again be only partially effective in restoring jobs. Consumer confidence currently is nearly as low as in 2009 when the original package was passed, debt levels remain high, and households continue to lose their homes to foreclosure. While the stock market rebounded considerably from mid-2009 to mid-2011, it has dropped since then. Under these conditions, it is likely that a significant portion of the tax reduction will again be used to pay existing debt or be put into savings rather than used to increase consumer spending.

Though the payroll tax cuts in the proposal are extended to include employers, tax reductions to businesses will not increase demand for companies' goods and services — the primary hindrance

TABLE 4
AMERICAN JOBS ACT

	Cost in Billions of $	
TOTAL		**447**
TAX CUTS		**245**
Businesses		70
Employer Payroll Tax	65	
Extend 100 Percent Expensing	5	
Individuals: Employee Payroll Taxes		175
INFRASTRUCTURE/JOB RETENTION		**140**
Immediate Infrastructure (largely surface transportation)		50
Modernize Schools		30
Infrastructure Bank		10
Rehabilitate Vacant Properties		15
Nationwide Wireless Internet Services		0
Retain/Expand Jobs for Teachers, Police, and Firefighters		35
Veterans' Hiring		na
PATHWAYS TO WORK		**62**
Unemployment Insurance Reform and Extension		49
Tax Credit for Hiring Long-Term Unemployed		8
Pathways Fund for Low-Income Youths and Adults		5

Source: The White House (http://www.whitehouse.gov/jobsact).

to companies expanding their workforces. Many companies are highly profitable — corporate profits currently are nearly as high as the peak of the last economic cycle — but this has not translated into increased hiring.

In contrast, the infrastructure/job retention portion of the proposal would again have a positive impact on employment. Much of the $140 billion in funding will be used to repair and build physical infrastructure, particularly surface transportation and schools. This spending directly results in the hiring of construction workers and ancillary positions. The increased spending of these individuals would ripple through the economy, affecting many industries. Similarly, the funding to keep teachers, firefighters and police from being laid off by state and local governments still experiencing budgetary difficulties and to hire additional workers in these occupations likely will result in a multiplier of more than 1.

The White House has estimated the impacts of the proposed act in each state. The estimated effects in Arizona in the infrastructure/job retention category include

- $602.7 million in immediate investments in transportation that is expected to create approximately 7,800 jobs. This calculates to one job per $77,300 expended.
- $544.4 million to elementary and secondary schools for school infrastructure and $116.6 million to community colleges, creating 7,100 jobs: one job per $76,700 expended.
- $484.3 million for the rehabilitation of vacant homes and businesses.
- $625.5 million for job retention and expansion for teachers, firefighters and police officers, resulting in 9,700 jobs, or one job per $64,500 expended.

Funding on these programs in Arizona would total nearly $2.4 billion; an incomplete estimate of the effect on jobs is 25,000. In addition, the Pathways Fund could provide jobs to 10,000 (mostly youths) and the extension of unemployment benefits could assist 27,000 Arizonans.

Infrastructure Bank. The President's proposal includes the creation of an infrastructure bank to fund a portion of the infrastructure work. Despite being discussed in the past, a national infrastructure bank has not been created. (However, California has had an operating infrastructure bank for more than a decade.) The idea is to create a government agency to help arrange financing for infrastructure projects using funding from private investors. Through inexpensive loans and loan guarantees, the bank would attract investments from sources such as pension funds, hedge funds, and foreign nations. However, the need for seed money from the federal government is acknowledged as necessary. The bank would then lend the money to states and municipalities.

In the context of a near-term stimulus package, a national infrastructure bank will not produce results. It is expected to take a minimum of one year, and more likely several years, to become operational.

State and Local Governments

A number of states have considered some form of an economic stimulus plan separate from the federal government actions and some have been implemented. The stimulus packages proposed or passed in other states have varied widely in content. Many have focused on tax credits, loans, and other actions to benefit businesses. In the current economic environment, businesses are not expanding and moving; enticements for them to do so will not be enough to overcome the

negative economic fundamentals. While these programs may be worthy from a long-term perspective, their benefits are not likely to be realized to a significant extent until the economy has already recovered. Even when the economy is stronger, actions to enhance economic competitiveness typically take years to realize substantial success.
Tax reductions have been notably absent from the state plans. The public finance difficulties of recent years that have plagued every state to some extent no doubt have contributed to their absence. However, a strong consensus exists among economists that state and local government spending is much more effective than tax cuts in stimulating economic activity at a state or local level. Though one can find an article/study to support any position, the bulk of the literature supports the conclusion that state and local government taxes and incentives have little effect on economic activity or job creation.

Some state plans have focused on the unemployed. Those programs that increase unemployment benefits have an immediate economic impact, but those featuring job training will have little if any impact in the short term. Since the recession began, the problem is not that employers cannot find qualified workers. Instead, the demand for goods and services is so low that companies have no need to hire additional workers.

A number of states have considered, and some passed, stimulus programs that mostly or entirely consist of infrastructure spending. Such plans are in line with the economic literature — that such spending has an immediate impact on the economy and that the economic multiplier is relatively high for this type of spending.

Most of the states considering or implementing an infrastructure program have estimated the effect of the program on jobs, including construction and other jobs directly paid for with stimulus funding and those jobs created indirectly through the multiplier effect. These estimates vary widely. Some states estimate that one job will be created per $25,000-to-$30,000 spent, which matches a nationwide estimate that transportation projects create one job per $26,600 spent. In other states, the estimate is that as much as $80,000 must be spent to create one job. The estimates of the Obama Administration on the effect of spending in Arizona from the proposed stimulus package are at the upper end of this range.

Of the states that already have implemented job creation programs, the “Jobs Now!” program in Illinois is the most aggressive. The program, which was passed by the legislature in mid-2009, is almost entirely focused on infrastructure, with two-thirds of the total funding allocated to transportation. Lesser amounts will be spent on physical infrastructure that supports education, community development, environmental, and economic development purposes. The state, which has twice as many residents as Arizona, will spend $13 billion of its own funds over six years. Combined with federal stimulus funds and federal and local government matching funds, the total package is $31 billion. Even with a conservative estimate of one job created per $70,600 spent, 439,000 jobs would be created over the six years. The state portion of the funding is in the form of 20-year bonds supported by fee and tax increases. Various fees related to driver licenses and vehicle registrations account for one portion of the new revenue. Taxes on alcoholic beverages have increased and the sales tax has been extended to candy and selected other products. Another substantial source of new revenue is a tax on video gaming terminals.

Oregon's Jobs and Transportation Act passed in 2009. It provides nearly $1 billion for transportation projects. An increase in fees for vehicle registration, titles, and license plates combined with an increase in the gas tax from 24 to 30 cents per gallon is estimated to raise about $300 million per year. The projected creation of 40,000 jobs seems overstated, as this amounts to one job per $24,000 of spending. Oregon also passed other legislation in 2009 that approved $175 million in bonds for construction and renovation projects, mostly at universities and community colleges.

Several other states also have invested in infrastructure. Iowa is borrowing $830 million for flood repair and other infrastructure projects. North Carolina is spending $744 million on construction projects, mostly for education and corrections. Virginia has provided $230 million for university construction projects. In the small state of Vermont, $100 million in bonding is being used for transportation projects.

Ohio's $1.57 billion "Bipartisan Job Stimulus Plan" was passed in mid-2008. Funding comes from multiple sources, including the general fund, a tobacco fund, general obligation bonds, and revenues from state liquor stores and the Ohio Turnpike. It is a mixture of short- and longer-term programs that largely provide grants and loans to companies in selected export industries, but it also includes $400 million in infrastructure grants to local governments. Its estimated impact of 57,000 jobs seems unlikely, as that translates to one job per $27,500, with the bulk of the funding going to purposes other than infrastructure for which any job benefits are speculative.

A Possible Stimulus Package in Arizona

The Arizona economy remains weak, with unemployment high and job growth slow. Conditions are not expected to improve much over the next couple of years. Thus, a stimulus package that delivers results in the near term would directly benefit many Arizonans and indirectly would boost the entire economy.

In contrast, a stimulus package that slowly produces positive effects could on net be counterproductive. The Arizona economy is expected to recover in a few years, again creating jobs at a rapid pace. Stimulating an economy that already is operating at full capacity produces negative effects, increasing inflationary pressures, raising the rate of population growth at a time when the public sector is having difficulty keeping pace with increased demands, and increasing the costs of government. For example, the costs of public capital projects are higher when they are competing with numerous private-sector projects, due to the need for contractors to raise wage rates in order to attract a workforce and from cost increases resulting from material shortages. Thus, the focus of any stimulus package has to be to provide more jobs in the near term, with the effects tailing off with time.

It also makes little sense to pursue inefficient options to boost the economy. Based on the CBO analysis discussed earlier, state and local government tax cuts, tax incentives, and similar actions have a limited impact on economic growth, and whatever impact such actions have take years to develop. Tax reductions and tax credits invariably reduce revenues available for public services, resulting in the need to decrease other government spending. The Arizona Legislature already has reduced taxes significantly. In a special session in early 2011, it passed legislation that

reduced a variety of business taxes, created tax credits, and formed a “deal-closing” fund. Thus, a potential stimulus program should entail other strategies than those already taken.

Cost-effective options to state and local governments to create jobs in the local economy in the near term are highly limited. Increased spending is the only tool available to state and local governments to have a meaningful impact on the economy in the short term. Econometric models consistently indicate that increased government spending on infrastructure has a net positive economic impact, stronger than what is derived from a tax reduction of an equivalent magnitude (see the Economic Impacts section later in this report). Similarly, a decrease in public spending has a more adverse impact on the economy than an increase in taxes.

The increase in public spending as part of a stimulus plan needs to be of a short-term duration that reaches the private sector quickly, has a strong multiplier effect, and benefits the state. As seen earlier, two types of spending meet these goals: spending for public infrastructure and enhanced benefits to those in need. In addition to meeting these goals, an infrastructure plan will direct assistance to the segment of the economy suffering the most — construction — and it will yield economic benefits that stem from putting needed infrastructure in place in a very cost-effective manner. The next section of this paper looks at infrastructure in Arizona, showing that a substantial number of needed infrastructure projects have been approved, but lack funding. While some of these projects will build new physical infrastructure, many of the projects involve repair and renovation of existing structures. Options for funding a stimulus package are considered after the discussion of infrastructure.

As part of a potential state stimulus package, the Arizona Legislature could take a simple action to enhance benefits to those in need without any cost to the state. Earlier in 2011, legislators chose not to extend unemployment insurance benefits, even though the source of funding was the federal government. Not only would this have assisted people truly in need, the multiplier from this type of spending is high, estimated by Economy.com at 1.64 — marginally higher than the multiplier for infrastructure spending.

INVESTING IN INFRASTRUCTURE IN ARIZONA

To be economically competitive, an area's physical infrastructure must meet the needs of employers. However, Arizona's physical infrastructure generally is not perceived favorably. Capital spending in the state, especially for transportation, has consistently been lower relative to other states than would be expected of a state that generally ranks second in the nation in population growth.

The availability of a quality infrastructure is consistently rated as one of the most important factors affecting economic development. For example, Site Selection Magazine's 2009 Corporate Real Estate Executive Survey — cited as a foundational basis for the 2011 special legislative session's "jobs bill" — put the transportation infrastructure as the number one item on its list of top site selection factors. The utility infrastructure was ranked fourth.

The Arizona Legislature in January 2011 addressed other factors on the Site Selection list that pertained to business taxes, incentives, and regulatory issues. Thus, legislation to improve Arizona's infrastructure would round out the state's economic development strategy.

Much of the physical infrastructure, such as the transportation network, is provided wholly or largely by the public sector. With the limited public investment in infrastructure in the state and with the size of the budget difficulties facing state and local governments that will continue for some additional years, the state's physical infrastructure is at risk of becoming a major negative factor on its economic competitiveness. The state's existing infrastructure must be improved in order for the state to be economically competitive. Then, as growth of the Arizona population returns, additional infrastructure will need to be built.

Infrastructure needs in the state were documented in the 2008 study "Infrastructure Needs and Funding Alternatives for Arizona: 2008-2032" that was produced by the W. P. Carey School of Business at Arizona State University. In general, over the next 25 years billions of dollars in currently unfunded infrastructure needs that will be the responsibility of state and local governments in Arizona were identified. The largest single need is for transportation projects; the deficiency over the next 25 years could exceed $100 billion.

Some of the infrastructure needs will ultimately be funded by the private sector or by public-private partnerships. The possibility of using public-private partnerships to build some types of infrastructure has received increasing attention over time. Various possibilities are being explored for transportation projects. However, because of the length of time needed to work out such partnerships, the short-term focus for a stimulus package needs to be on projects that state and/or local governments can initiate quickly on their own. A variety of public infrastructure projects fit these criteria. Transportation, particularly highways and roads, is a prime example as well as a major need.

Though construction and related industries are the most affected by infrastructure spending, construction was the sector hardest hit during the recession. The effects, however, will be much broader. Some of the projects will need to be designed by engineers and architects. Mining companies will benefit from an increase in demand for their products. An increase in the construction, mining, engineering and related workforces means that consumer spending will

increase, benefitting a broad range of retail and service businesses. Wholesale trade and transportation will benefit from the increase in consumer demand and the increased demand for materials used in building the infrastructure. Thus, benefits will accrue across the economy.

In the discussion that follows, various existing infrastructure needs are identified. Though certainly not a complete list, the cost of these state government projects sums to nearly $5 billion. If local government needs are considered, the total is greater.) The need for these projects has already been established, but funding has not been provided. Many of the projects represent renovation needs that were identified years ago, but which have not been funded by the Legislature despite existing formulas meant to assure that such needs would be taken care of. Many of these projects could begin immediately, with others ready to start within a year.

Higher Education

A useful example of an infrastructure project is the Stimulus Plan for Economic and Educational Development (SPEED) that was approved by the Arizona Legislature in 2009. The program is primarily designed to fund the renovation and restoration of university buildings. As of 2009, the projects covered by this package had been delayed for years, with many buildings in desperate need of repair. In addition to creating jobs during a recession, the timing of the project was optimal due to lending costs near record lows and relatively low construction costs. In short, needed work could be done at a favorable cost, stimulating a slumping economy.

The original request was for $1.4 billion; the Legislature approved $1 billion. Funding comes from the securitization of a portion of Arizona Lottery proceeds: a form of long-term borrowing. Estimates of the potential economic impact with spending of $1 billion included an increase in employment of 22,200 (one job per $45,000 spent — in the midrange of various estimates across states).

Implementation of SPEED initially was delayed, then only $800 million was allocated. Less than $300 million has been issued (spent) to date. Thus, the economic impact of this program so far has been modest. Currently, there are plans to spend $171 million in the current fiscal year and an additional $50 million in fiscal year 2013. This leaves nearly $300 million of the $800 million in allocated funds unspent.

Since the funding mechanism for SPEED is already in place, and since universities are not included in President Obama’s proposal to update and improve educational facilities, accelerating SPEED funding represents an excellent means of providing jobs to Arizonans. Since the needs exceed the currently allocated $800 million, the state could provide even more jobs by allocating the full $1 billion funding to this project.

For example, Arizona State University has identified immediate needs for general building maintenance and repair, information technology infrastructure, renovation of labs and classrooms, installation and repair of sprinkler and alarm systems, etc. It estimates that projects totaling about $100 million could be implemented within 6-to-12 months, with an additional $50 million ready in the 12-to-24 month time frame. It is reasonable to assume that similar needs exist at the University of Arizona, Northern Arizona University, and the community colleges. The total likely exceeds $300 million.

K-12 Education

The School Facilities Board (SFB), a state agency, was created in response to a court decision that Arizona's system of school capital finance was unconstitutional. The SFB provides partial funding for the construction of new public elementary and secondary schools across Arizona and for the renovation of existing buildings ("building renewal"). The remainder of the funding comes from school districts.

The SFB received its first funding from the state government general fund in fiscal year 1999. Since then, annual funding has varied widely, with limited funding provided in years in which the general fund is in deficit.

New construction of K-12 schools has slowed markedly in recent years. This is due in part to funding constraints resulting from the very large general fund deficits of recent years. However, growth in student populations has slowed significantly in response to the economic recession and the implementation of the employer sanctions law. Thus, a significant backlog in funding for new facilities does not seem to be present.

In contrast, the current fiscal year (2012) is the fourth consecutive year that no funding has been appropriated by the Legislature for building renewal (maintenance and repair). These needs do not disappear during recessions and periods of slow growth in student enrollments. This lack of funding in recent years follows a decade in which appropriations for building renewal fell short of the amount indicated by the building renewal formula. This amount is annually calculated on a building-by-building basis, taking into account the building's square footage, age, student capacity, and prior renovations. Cumulatively, the building renewal formula recommended funding of $2 billion from fiscal years 1999 through 2011. Slightly less than $650 million was appropriated, leaving a shortfall of $1.35 billion. The shortfall has exceeded $200 million in each of the last few years.

A current professionally conducted needs assessment would not necessarily indicate that $1.35 billion is required; no formula can be that accurate. Those familiar with the situation suggest that actual needs are not that great, though no other estimate exists. It is reasonable to assume that the needs amount to at least several hundred million dollars.

Thus, a significant need is present to boost funding for school maintenance and repair. As with the higher educational system's needs, these K-12 projects could start quickly, providing a short-term economic stimulus.

Transportation

The Arizona Department of Transportation (ADOT) has a long-run transportation plan that extends to 2035. The needs statement expressed in the plan includes roads, highways, rail, and airports; maintenance and repair and new construction are included. The projected costs range from $89 billion to $250 billion (in 2009 dollars) over the 25-year planning horizon. The wide cost range reflects differing assumptions regarding future growth in the state.

Despite these substantial needs, funding of only approximately $1 billion annually is expected to be available over the next 25 years, an amount in line with spending during each of the last

several years. The ADOT report clearly reveals the choice that Arizonans must make: either increase funding so that the state's transportation infrastructure will adequately support the state's population and businesses, or continue the current fiscally constrained path. The latter option will provide only modest support for maintenance of existing transportation infrastructure; few resources will be available to support the state's expected growth. Moreover, no funding will be available to support a transportation-based economic development strategy.

ADOT also has a detailed plan for transportation projects over the next 5 years. For highway projects, the plan calls for an expenditure of approximately $5.5 billion, with projects planned across the state. However, ADOT officials report that there is the need and nonfinancial capacity to build and repair transportation infrastructure at a rate that is at least twice as fast as the $1.1 billion per year in the current plan. The constraint is fiscal — ADOT does not have the funding to pursue this higher work load.

If funds were available, projects currently slated for 2013 and 2014 could be moved forward a year and plans for 2015-16 could be accelerated into the 2013-14 time frame. The five-year plan includes projects across the state that could be accelerated if funding were available. For example, work on the South Mountain freeway could be moved forward, helping to alleviate the congestion in the Ahwatukee area.

These projects are "shovel ready," only waiting for funding to proceed. Funding such projects could have a quick and substantial impact on job creation in Arizona. The state would merely be accelerating needed construction projects that will pay benefits both to individuals and the business community as soon as the construction is complete.

Corrections

The construction of new prisons and/or the expansion of existing prisons represent another physical infrastructure need. Though funding for the Arizona Department of Corrections has increased substantially over time, the number of prisoners has increased at a faster pace, due in part to Arizona's mandatory sentencing laws. The current prison bed deficit is reported to be 4,638. Assuming a construction cost of $50,000 per bed, the total cost to eliminate this deficit exceeds $225 million. A concern also has been expressed that existing facilities are in need of additional funding for repair and maintenance.

Local Government

In addition to the transportation needs identified by the Arizona Department of Transportation, most cities and towns have a backlog related to the construction, maintenance, and repair of streets. The backlog results in part from the Legislature transferring transportation funds intended for local governments into the state government's general fund in order to balance the budget. Some cities and towns also report a backlog related to the construction, maintenance, and repair of their water systems. Though data are available for only a minority of the state's cities and towns, the need for $100 million in transportation projects and another $100 million in water projects has been identified. *If* these needs are representative of all cities and towns, the state total would be about $1.5 billion in combined transportation and water system needs. County governments representing unincorporated areas are not included in this figure.

To provide a mechanism for financing local government infrastructure building, the idea of creating an infrastructure bank has been discussed. Some of the new revenue collected for an infrastructure program could be placed in an infrastructure bank. California has operated a state infrastructure bank for more than a decade that finances public infrastructure and private development that promotes economic development, revitalizes communities, and enhances quality of life for Californians. The bank has broad statutory powers to issue revenue bonds, make loans, and provide credit enhancements for a wide variety of infrastructure and economic development projects, and other government purposes.

Establishing and funding an infrastructure bank in Arizona likely will take a few-to-several years. It will take time to set up the infrastructure bank due to legal issues, the need to create administrative and financial oversight, etc. Even with seed money provided by state government, it will take time to accumulate a significant amount of private funding. Once ready for operation, more time will elapse while local governments apply for funding and the bank evaluates the merit of the proposals. Thus, just as a national infrastructure bank will not create jobs in the near term, a state infrastructure bank should be considered based on its long-term merits, not as part of a short-term stimulus package.

Discussion of Infrastructure Needs

It is widely documented that the state of Arizona has massive infrastructure needs. Though the recent economic downturn has reduced consumption/use of public infrastructure and has greatly slowed Arizona's population growth — temporarily alleviating the pressure for building new infrastructure — the needs remain. In addition, the downturn has exacerbated the state's tendency to neglect maintenance and repair needs. Many policymakers have argued that there simply is no money available to support those needs. Yet, the state and local government tax burden is much lower than in the past, productivity/cost savings would be realized if these needs are addressed sooner rather than later, and spending on infrastructure would provide employment for thousands.

Given that the current favorable financing costs and construction costs will not last, and that the needs for jobs is greatest now, an infrastructure program should be focused on taking on as many projects as quickly as possible. Since the Arizona economy is expected to recover and again achieve fast growth by around 2015, the infrastructure program should be limited to a length of around three years. Over these three years, documented state government needs on projects already planned and identified as needed run into the billions of dollars. If funding for transportation were doubled, this would amount to $3,300 million in additional funding over three years; capacity and needs likely exceed this amount. Additional spending could total $300 million on higher education, $225 million on corrections, and as much as $1,350 million on K-12 schools. Thus, upwards of $5 billion could be expended in the next three years — not including local government needs.

Objections to public spending in order to "make work" for the unemployed are reasonable. In contrast, the need for each of the projects discussed above has already been demonstrated; in many cases plans are already in place — only funding is lacking. Thus, these are not arbitrary public works projects.

The Department of Transportation already has a process in place to oversee the selection of projects and to maintain oversight during the construction phase. The Board of Regents could provide oversight for the universities, the SFB is fully capable of assessing and prioritizing school construction and renovation, and the Department of Corrections is similarly situated to assess prison needs. If needed, independent private consultants and civil engineers could be retained to undertake needs assessments, helping to boost employment in the private sector.

FINANCING A STATE GOVERNMENT STIMULUS PACKAGE

Any stimulus program will cost money. A means of paying for an increase in public spending must be found.

Funding a stimulus program out of government surpluses might be viewed as an option: state government general fund revenues in the last fiscal year were higher than what had been budgeted and probably will be higher than budgeted again in the current fiscal year. However, the size of any surplus likely will be relatively small; for a stimulus package to have much of an effect in offsetting the many jobs lost in Arizona since 2007, the amount of funding needs to be substantial. Further, with a $1 billion loss in revenue coming in less than two years when the temporary sales tax rate increase ends, any surplus is likely to be short-lived — a budget deficit in fiscal year 2014 is more likely. Moreover, there are many competing uses for any surplus funds: rebuild the rainy-day fund, reverse transfers undertaken in recent years that sent monies from other state funds into the general fund, pay off some of the borrowing of recent years, and reverse some of the spending reductions passed in recent years.

Thus, the state government can meaningfully stimulate the economy in the near term through an increase in public spending only by raising revenues. Tax burdens in Arizona are low, from both a historical perspective and in comparison to other states, making even a substantial increase in revenues feasible. While there is a cost to increasing public revenues, the net benefit still is substantial if the revenues are used for infrastructure spending. Economic impacts are presented in the following section.

The costs arising from a tax or fee increase can be minimized by limiting, to the extent possible, tax hikes to those who are able to pay without reducing their spending. Some Arizonans have the capability to pay much higher levels of state and local government taxes and fees than they currently are being asked to pay.

In a “pay-as-you-go” plan, revenues would need to be raised substantially, but only temporarily. Long-term borrowing — that is structured so as to not violate the constitutional prohibition — would require a much smaller increase in revenues, but the higher level would continue for a greater number of years. While state and local governments continue to be plagued by financial difficulties, they do not carry a heavy debt burden, making long-term borrowing feasible.

Borrowing

Some Arizonans are opposed to borrowing on the basis that it is unfair to burden future generations for expenses contracted today. Indeed, the use of debt financing to pay for current operations (for example, to balance the general fund) transfers the cost of programs from those who receive the services today to future Arizonans. However, this objection does not apply to the use of debt financing to pay for physical infrastructure that will benefit future generations. In fact, it is equitable and fair to transfer some of the costs of infrastructure to future Arizonans.

Another objection to borrowing is the magnitude of the debt being amassed. Certainly this is a concern at the federal level. However, state and local governments have limits on the amount of debt that can be assumed. The amount of debt owed by Arizona governments currently is less than the limit. According to the Arizona Department of Revenue’s bonded indebtedness report,

government jurisdictions in Arizona have a total of $43.2 billion in outstanding debt obligations, less than the aggregate limit of $49.8 billion.

The difficulty with borrowing is that state and local governments are restricted by the Arizona Constitution from traditional borrowing using full faith and credit obligations. Thus, borrowing that has been undertaken in recent years has been in one of two forms. Lease-purchase agreements and certificates of participation are legal tools that are the economic equivalent of general obligation bonds. An example is the sale/leaseback of state-owned buildings. The other option is debt tied to revenue streams ("revenue bonds"). An example is the securitization of lottery funds used for the SPEED project. In general, securitization is the process of taking an illiquid asset, or group of assets, and through financial engineering, transforming them into a security.

Revenue Enhancement

To get a sense of the ability of Arizonans to pay for a revenue enhancement to fund a stimulus program, revenues collected for the general fund are examined. Presumably, the general fund would not be used for either the revenues or expenditures for a stimulus package that consists of capital spending for infrastructure.

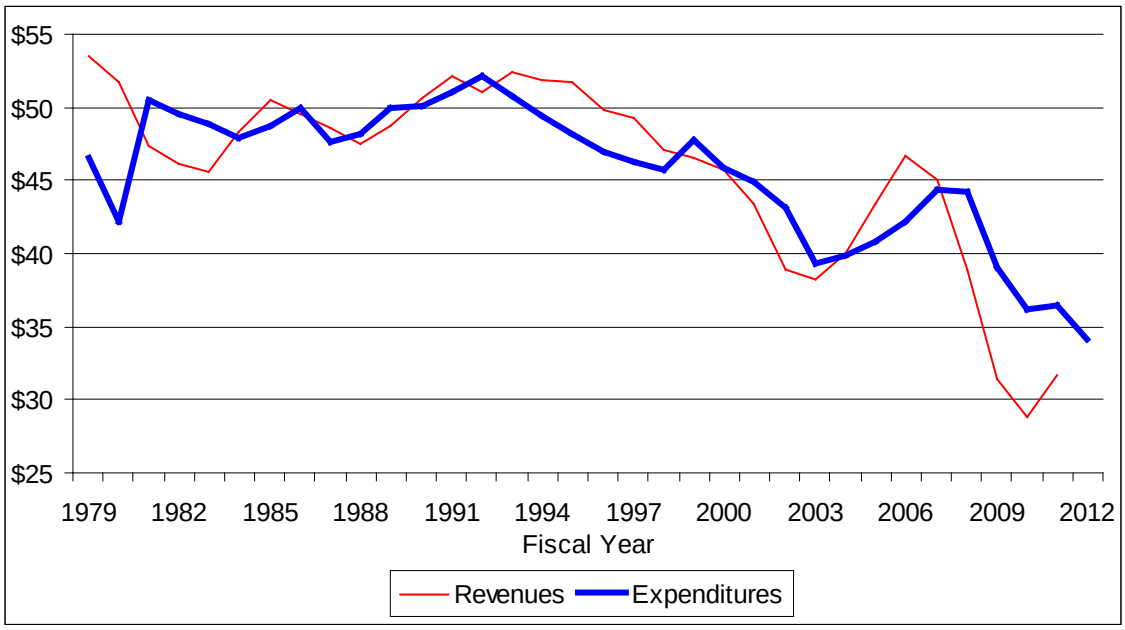
Ongoing revenues to the state government general fund (which exclude certain types of revenues, for example the temporary sales tax rate increase) have been far lower in recent years than they were previously after adjusting for personal income, as seen in Chart 4. Dividing revenues and expenditures by personal income controls for inflation and population growth, and provides a measure of the aggregate ability to pay. The decline in revenues per $1,000 of personal income in the last few years occurred despite a drop in personal income during the recession. That is, Arizonans in aggregate paid less in taxes even after considering their ability to pay had dropped with their loss of income.

Per $1,000 of personal income, ongoing general fund revenues were less than $32 in fiscal years 2009, 2010, and 2011. Prior to fiscal year 2001, the figure was more than $45 in each year. Even after the economy recovers, revenues per $1,000 of personal income likely will remain below $40, reflecting the numerous and substantial tax cuts implemented over the last 20 years.

Thus, a small but long-term increase in revenues that would be needed to fund an infrastructure package through debt financing would leave the tax burden in Arizona far below the historical norm. Even with a substantial increase in revenue that would be needed for a large pay-as-you-go stimulus package, the burden would remain well below the historic norm. For example, had revenues in fiscal year 2011 been $1 billion higher than they actually were, revenues per $1,000 of personal income would have increased only from $31.70 to $36.09.

In determining the means of raising additional public revenues, an important consideration is to maximize the net positive effect of infrastructure spending by limiting the negative impacts on the Arizona economy of a revenue increase. In particular, an increase in business taxes should not be considered. Another very important consideration, especially given the length and depth of the recession and the weak recovery, is to not raise taxes on those individuals who are struggling financially.

CHART 4
ONGOING REVENUES AND EXPENDITURES PER $1,000 OF PERSONAL INCOME, ARIZONA STATE GOVERNMENT GENERAL FUND



Note: If an economic measure other than personal income were used to adjust revenues and expenditures, the pattern of the lines in the chart would essentially be the same.

Source: Arizona Joint Legislative Budget Committee (revenues and expenditures) and U.S. Department of Commerce, Bureau of Economic Analysis (personal income).

One possibility for raising revenue is to close tax loopholes, particularly in the sales tax. However, the amount of revenue to be gained is uncertain and the length of time that would be necessary to evaluate the tax code and to legislatively close the loopholes would preclude any stimulus package from having an effect when it is needed. Instead, taxes and/or fees will need to be increased quickly in order to fund a near-term stimulus program.

Ideally, the additional revenue for a short-term stimulus package would come from affluent individuals who have the capability to pay additional taxes without reducing their consumer spending. Targeting this group would minimize the negative effects of a tax increase. For most affluent taxpayers, the additional tax payment would be in lieu of an increase in savings rather than a decrease in spending. Since most of the savings are placed in out-of-state financial instruments, the beneficial impact of increased government spending would hardly be offset by the negative effects from a tax increase. To the extent that spending by affluent taxpayers would be reduced, a relatively large share of the cutback likely would come from luxury spending made outside Arizona, such as out-of-state travel.

The following discussion indicates that approximately $1 billion per year in additional revenues to pay for a stimulus package could easily be realized without raising tax rates past historical

norms and without increasing the tax burden of individuals struggling to make ends meet. For comparison, the temporary increase in the sales tax rate is raising close to $1 billion in a year.

Personal Income Tax

The most specific way of taxing affluent individuals is to raise the Arizona personal income tax rate on those reporting adjusted gross incomes above a certain high level. Individual income tax rates in Arizona are among the lowest in the country. The 2009 personal income tax burden of a household of three earning $150,000 in Arizona (as measured in Phoenix) ranked 41st among the 50 states and District of Columbia, according to the Government of the District of Columbia, *Tax Rates and Tax Burdens in the District of Columbia: A Nationwide Comparison* http://cfo.dc.gov/cfo/cwp/view,a,1324,q,612643.asp. Arizona also ranked 41st on the overall tax burden of this affluent household. According to the Tax Foundation, *State-Local Tax Burdens Fall in 2009 as Tax Revenues Shrink Faster than Income* http://www.taxfoundation.org/publications/show/22320.html, the overall tax burden of Arizonans in 2009 was 8.7 percent, 38th highest in the nation. Prior to the mid-1990s, the tax burden in some years was 10 percent, with Arizona ranking among the highest 20 states in the nation.

In addition to being low relative to other states, current personal income tax rates in Arizona are lower than in the past. Arizona's personal income tax rates have been lowered repeatedly over the last two decades, by a total of 35 percent. For those individuals with *taxable income* (after exemptions and deductions) of more than $150,000, the tax rate currently is 4.54 percent; it was 7 percent during the early 1990s. Revenues would increase by approximately $800 million if tax rates were increased as follows:

- From 4.24 to 5.42 percent for individuals reporting taxable income of between $100,000 and $150,000, and for those married filing jointly and for heads of households reporting taxable income between $200,000 and $300,000.
- From 4.54 to 7 percent for individuals reporting taxable income of more than $150,000, and for those married filing jointly and for heads of households reporting taxable income of more than $300,000.

Taxpayers earning $200,000 or more currently contribute 32 percent of the total individual income taxes collected. With the specified rate increases, this share would rise to 42 percent, but would still be less than the 47 percent share paid in 2006.

Property Tax

Increasing the property tax collected on homes with a high assessed value is another way of collecting additional revenue from affluent Arizonans. Residential owners receive a "homeowner's property tax rebate." The rationale for this rebate originally was to assist low-income homeowners, but the rebate was applied to all residential properties. The rebate is 40 percent of the primary school district tax levy, up to a maximum of $600. Effectively, this is a subsidy given to residential property owners, paid for out of the general fund. The total cost was close to $400 billion in 2010. If the rebate were eliminated for homes *assessed* at more than some high value, such as $250,000, revenues likely would rise by tens of millions of dollars.

Transportation Taxes

Since a significant portion of any stimulus funding likely would be used for transportation projects, raising revenues from the vehicle license tax and other transportation-related taxes and fees to help fund a stimulus package would provide a link between the source of revenue and the proposed spending. Vehicle license taxes in Arizona are currently substantially lower than in the past. Prior to 1999, the rate was $4 per $100 of assessed value; the current rate is $2.89. The current depreciation rate also is accelerated relative to the pre-1999 period. At the time of these reductions, the impact on revenues was estimated by the Joint Legislative Budget Committee to be $160 million. If the tax rate was returned to $4 per $100 of assessed value, the revenue increase would be considerably more than $160 million, given the growth of Arizona's population and the inflation in car prices. However, such an across-the-board increase would negatively affect those individuals who currently are struggling financially. An option would be to limit any increase in the vehicle license tax rate to vehicles with a high dollar value, which might raise tens of millions of dollars.

The fuel tax is another candidate for a rate increase since this tax has been assessed at a steady 18 cents per gallon since 1990. Thus, revenue collections have not reflected inflation over the last two decades. While the potential exists to realize substantial additional revenues without putting the tax rate out of line with that of other states or Arizona's past, any increase in rate would affect all automobile owners; it would not be possible to limit the rate increase to those able to pay. Similarly, fee increases could be imposed for driver licenses, vehicle registrations, and the like, but could not be limited to those able to pay.

Tourist Taxes

Direct expenditures in Arizona by visitors to the state were estimated at nearly $18 billion in 2010. These visitors contributed around $550 million in various taxes, including some specific to tourists, or about 3 percent of their total expenditures. The tourism industry relies on a quality infrastructure, particularly for transportation — tourists heavily use roads and airports. Thus, it is reasonable to ask tourists to pay for a portion of the infrastructure costs. Additional revenues assessed on hospitality, airline, and local transportation services that totaled $100 million per year would amount to a 1.8 percent assessment on the $5.7 billion currently spent by tourists on those services.

Discussion of Increasing Revenues

Tax increases have never been particularly popular and the concept has arguably fallen even further from favor in recent years. Arizonans have been less averse to sales tax increases (indeed, an increase in the sales tax rate was passed by voters in 2000 to boost education funding and the 2010 ballot measure for the temporary sales tax passed by a 64-36 margin). However, sales tax rates are already quite high in the state. Not only do lower-income people pay a higher share of their incomes in sales taxes, but the substantial sales tax paid by companies is a negative for economic development. If an infrastructure program were to be financed by sales taxes, it would be prudent to obtain the additional revenue from a broader sales tax base that includes personal services rather than from a rate increase. Moreover, a low-income tax credit should be implemented to mitigate regressivity.

The Arizona tax base has been dramatically reduced over time. Moreover, the revenue enhancements required to finance a short-term infrastructure program would be temporary, lasting only as long as needed to finance the projects. Concerns over the adverse impact of raising taxes during times when the economy is struggling can be mitigated by focusing the rate hikes on those able to pay without reducing their consumer expenditures and by financing the projects with long-term revenue bonds that match the benefits of the new infrastructure improvements with the costs of the projects. Long-term financing would sharply reduce the annual amount of tax/fee increase that would be required relative to a pay-as-you-go program.

Similar concerns were voiced by opponents of the temporary sales tax initiative in the spring of 2010 — that the higher taxes would have significant adverse impacts on the economy. There is no evidence that the one-cent temporary sales tax rate increase has had any adverse impacts. Moreover, as seen in the following section, a net benefit to the economy will result from an increase in revenues that are used to fund needed infrastructure projects.

ECONOMIC IMPACTS OF A STIMULUS PACKAGE

The primary economic benefits of investments in physical infrastructure accrue over decades as businesses and individuals use the infrastructure and as the existence of the infrastructure aids economic development. In addition to these benefits, short-term economic impacts result from the expenditure of funds to build/renovate the infrastructure.

The economic impact of the infrastructure proposals can be obtained by application of economic models designed to measure the effects of particular initiatives on overall economic activity. Two economic forecasting/economic impact estimating models — Minnesota IMPLAN Group (IMPLAN) and Regional Economic Models, Inc. (REMI) — have been used. IMPLAN is a static model designed to measure the economic impact of an initiative by measuring the direct impacts of the project and tracing the induced effects through the economy. IMPLAN implicitly assumes that all effects can be captured within a specific year. REMI is a dynamic model designed to measure how the growth trajectory of an economy is altered by a particular initiative, for example by changes in tax rates, price increases, or new capital investments.

Conceptually, REMI is the superior application for measuring the impact of any infrastructure investment because investments in infrastructure — both new infrastructure and renovation of existing infrastructure — have impacts that last beyond a year. IMPLAN was used to compare its results to the REMI results in order to demonstrate that the results from REMI are not somehow aberrant from a realistic portrayal of the economic effects of infrastructure spending.

The infrastructure spending is assumed to be comprised of a mix of investments on highways, new public buildings, and maintenance/repair of existing infrastructure. Changes in the mix of projects do not have much impact on the analysis. The spending initiatives are assumed to improve or enhance the public infrastructure of the state, adding to the stock of public capital and the public amenities, which in turn makes the state more attractive to in-migration and new businesses. In REMI, this creates a lasting positive effect even after the construction is completed.

Funding of the infrastructure projects is assumed to come from personal taxes; the simulation results are not sensitive to the mix of personal taxes. However, results would be considerably different (much less favorable) if the source of funding was business taxes.

Even if numerous “shovel-ready” projects exist, as indicated in the section on infrastructure, the length of time required to complete many of the infrastructure projects will exceed a year; that is, much of the money will not be expended until after the first year. Combined with the time required for any stimulus bill to work its way through the Legislature, the reality is that the majority of the spending will not occur until calendar year (CY) 2013 or later. Thus, while any stimulus package should try to spend the funding as quickly as possible, the reality is that some of the expenditures will not be made until two or more years after the passage of the stimulus package. For modeling purposes, it was assumed that 30 percent would be expended in calendar year 2012, 40 percent in CY 2013, and 30 percent in CY 2014.

The models were used to provide insight into two analyses, as explained in the next two subsections. The economic impacts reported in these subsections include direct effects and

indirect (multiplier) effects. The results are expressed per $1 billion of stimulus funding, with $300 million expended in the first and third years and $400 million in the second year. The results from both models are scalable. For example, the impacts of spending $3 billion over three years would be triple those discussed below. At some point, however, increasing the amount of spending would realize diminishing returns. The assumed spending of $1 billion is less than half of 1 percent of the state's gross product. If spending were, say, 20 times higher, it would represent a large enough share of the economy that it would start to crowd out private-sector spending. In addition, the higher tax burden would become a negative factor on economic development.

Infrastructure Spending Versus Tax Reductions

The purpose of this hypothetical analysis is to establish that increased public spending on infrastructure has a more stimulative impact than lowering taxes. First, spending for infrastructure was increased by $300 million in the first year, $400 million in the second year, and $300 million in the third year — without considering the means of financing the spending. While generally unrealistic, such a situation would occur if the federal government were to build infrastructure in the state without increasing federal tax obligations.

Second, personal taxes were decreased by the same amounts — without considering how to resolve the budget deficit created by the reduction in revenues. This situation could occur if taxpayers received one-time rebates of taxes paid during a period of government surpluses.

According to REMI, net positive economic effects accrue in both cases, but the net positive effects are approximately twice as large for a spending increase as for a tax reduction. For example, in the first year, 7,760 jobs would be created from a spending increase of $300 million while only 3,694 jobs would be gained from a tax reduction of the same size. The REMI effects are about one-third larger than those from IMPLAN, though IMPLAN also indicates that the positive impact of the infrastructure investment is larger than the positive impact of the personal tax cut by about a 2-to-1 order of magnitude.

The positive impact from the spending increase is larger than the effect from a reduction in personal taxes because the money spent on infrastructure initially will largely stay in the Arizona economy, being used to hire workers and buy materials to build and repair the state's infrastructure. In contrast, with a tax reduction, more of the money will immediately leave the state's economy. Not everyone who receives a tax cut will spend the money in Arizona. Some of the money would go to paying off existing debt, most of which is held by a company headquartered outside Arizona. Some of the money would be saved, again with most of it invested in funds or deposited in savings accounts of institutions not based in Arizona. Some of the money would be spent, but not in Arizona (for example, on an out-of-state vacation).

Of the money spent in Arizona, that coming in the form of a tax cut would escape the Arizona economy more quickly than the money initially spent on infrastructure. In other words, the multiplier is higher for infrastructure spending, as demonstrated earlier in this report. In the case of tax cuts, the first round of any spending will be for consumer purchases, with most of the goods not being produced in Arizona. The first round of the infrastructure spending will in part be in the form of wages to unemployed or underemployed Arizonans; another part will be in the

form of purchases of materials from Arizona companies. It is not until the second or later rounds of spending that leakages from consumer purchases occur.

Pay-As-You-Go Versus Long-Term Debt Financing

The second analysis looks specifically at infrastructure spending. Unlike the previous analysis, the infrastructure spending is financed by an increase in personal taxes. The economic impacts of two different financing plans are compared: (a) "pay as you go," with funding coming from a temporary tax/fee increase; and (b) long-term debt financing based on an increase in taxes/fees. In order to raise the desired amount of stimulus funding, the long-term debt financing option would only require a relatively small increase in taxes/fees, but the higher rates would last for a longer period of time.

In the pay-as-you-go option, the magnitude of tax/fee increases would need to be much larger. In the example of a spending schedule of $300 million the first year, followed by amounts of $400 million and $300 million, revenues would need to be increased by these amounts. In contrast, if revenue bonds with a 10-year duration at a 4 percent rate of interest are used, the magnitude of the tax increase would only need to be around $120 million per year. If 20-year financing were used, the revenue increase would only need to be $72 million, but would last twice as long. An interest rate somewhat different from 4 percent would not impact the results substantially.

The results that are displayed in Table 5 are the net of several types of effects. In the first three years, the large positive effects from infrastructure spending are partially offset by the negative effects of a tax increase. A small lasting positive effect from the infrastructure spending is realized in subsequent years. In the long-term financing alternative, as long as loan payments are made, this long-term positive effect is outweighed by the negative effect of the higher revenues required to make the payments.

In the first three years, the economic effects are larger when using debt financing since the amount of revenue that needs to be raised is lower, reducing the negative effects from a revenue increase. Somewhat more jobs would be realized if the financing period is longer than the 10 years assumed, though this additional positive effect disappears in later years. In the long term, the cumulative effects on employment from long-term financing are not much different than in the pay-as-you-go option. Since a primary objective of a stimulus program is to provide employment when most needed, the long-term financing option is preferable. The small losses that occur in subsequent years come at a time when the economy presumably will be expanding.

A further disadvantage of the pay-as-you-go option is that in reality the funding would be slower to be realized than in the #1 alternative in Table 5. It is not realistic to assume that 30 percent of the total spending would occur in CY 2012. Revenues could not be spent until realized, unlike the long-term financing option, in which the full amount of funding would quickly be available. Thus, while the net effect on employment over the three years is similar in alternatives #1 and #2, hardly any positive effect could be expected in the first year in alternative #2 — in fact, the negative effects of a revenue increase could outweigh the positive effects of any spending.

The results from the IMPLAN model are generally similar to those of the REMI model. Though IMPLAN shows a somewhat smaller net positive impact, it verifies that spending for

infrastructure will have a net positive effect on the Arizona economy and that the benefits in the first few years will be much larger if long-term financing is used.

Though REMI produces larger effects than IMPLAN, the results for employment appear to be conservative compared to the effects estimated in other states for a stimulus program. In the first three years under the pay-as-you-go option, approximately one job would be created for every $70,000 spent. Using 10-year financing, the cost per job appears to be only around $42,000, but this does not take into account the net job losses that occur in subsequent years.

TABLE 5
ECONOMIC IMPACTS OF $1 BILLION IN INFRASTRUCTURE FUNDING

	Pay As You Go #1 *	Pay As You Go #2 **	10-Year Financing ***
		Effect on Employment	
2012	4,066	-1,231	7,316
2013	5,518	7,213	9,621
2014	4,364	7,533	6,984
2015	472	521	-440
2016	460	478	-710
2017	468	469	-845
2018	471	465	-887
2019	483	472	-881
2020	484	471	-878
2021	484	471	-869
2022	483	469	-498
2023	480	467	18
2024	479	465	435
2025	478	465	499
		Effect on Gross Product in Millions of 2005 Dollars	
2012	215	-89	448
2013	295	392	595
2014	240	419	435
2015	36	40	-34
2016	35	37	-56
2017	36	36	-69
2018	37	37	-76
2019	38	38	-77
2020	39	38	-78
2021	39	38	-79
2022	39	38	-48
2023	39	38	-3
2024	39	38	3
2025	40	39	4

* Assumes spending and revenues of $300 million in 2012, $400 million in 2013, and $300 million in 2014.
** Assumes revenues of $100 million in 2012 and $450 million in each of the next two years; no spending occurs in 2012, with $500 million occurring in each of the next two years.
*** Assumes spending of $300 million in 2012, $400 million in 2013, and $300 million in 2014, with financing costs of $36 million in 2012, $84 million in 2013, $120 million in each year from 2014 through 2021, $84 million in 2022, and $36 million in 2023.

Source: Modeled using REMI.

DISCUSSION

Spending on infrastructure has been a significant feature of proposed and implemented stimulus programs of the federal government and of state governments. The logic is simple: needs exist, some projects are "shovel-ready" (only waiting for funding to start), construction and financing costs are at or near historical lows due to the considerable slack in the economy, and the spending will put unemployed Americans back to work. Spending now is akin to savvy investors taking action when assets are inexpensive so as to reap handsome returns in the long run.

These are not "make work" projects to help the unemployed. Instead, these are important investment projects that once completed will benefit individuals and companies by meeting needs in transportation, education, and other public services. Spending for infrastructure sooner rather than later will provide a cost saving and enhance productivity once completed. Undertaking these projects now, while the economy remains weak, produces the added benefit of providing jobs to individuals at a time of high unemployment. While construction workers and related occupations will directly benefit from these projects, the indirect effects will spread throughout the economy.

Some naysayers will argue that the state should not be undertaking these types of activities until the economy improves, that is until Arizonans can "afford" these projects. However, this argument ignores the immediate need to provide jobs, the existing needs for new and improved infrastructure, that investment in infrastructure can be growth enhancing, that capital costs and state and local government tax burdens are at historical lows, and that many economists believe the Federal Reserve Bank's recent policies will ignite an inflationary spiral, pushing future costs up dramatically. So, a "wait-and-see" strategy will likely cost taxpayers far more than will an immediate action plan.

Waiting also ignores the role that infrastructure plays in an economic development agenda. Substandard infrastructure is a substantial deterrent to economic development. Even before the recession began, Arizona had substantial infrastructure needs. Recent fiscal decisions and budget shortfalls have placed the state in a situation where the objectives of economic development initiatives may be hampered by the quality and quantity of the state's infrastructure.

State government infrastructure projects totaling around $5 billion have been identified — these projects are essentially ready for implementation and are needed now or in the very near future. Since no attempt was made to comprehensively identify all needed projects, total state government needs certainly are higher. Local governments also have substantial infrastructure needs that are essentially "shovel ready."

Approximately $1 billion per year in potential additional revenue has been identified, without raising tax rates higher than historical norms and without burdening those most affected by the adverse economic conditions. Again, no attempt was made to comprehensively identify all possible revenues, so the actual figure that could be raised within these parameters exceeds $1 billion per year. To the extent possible, an attempt has been made to connect funding needs (e.g. transportation) with funding sources (e.g. tourist taxes, vehicle license tax, and other transportation-related fees). However, transportation needs far exceed the amount of revenue that could be raised from transportation-related taxes and fees, particularly without significantly

raising the burden on those with a limited ability to pay. Thus, more generalized revenue sources, particularly the personal income tax, will need to be heavily used to provide funding for infrastructure.

If the infrastructure spending were undertaken entirely under a “pay-as-you-go” system, then raising revenues by $1 billion per year for three years would allow $3 billion to be spent on infrastructure projects. Alternatively, the infrastructure projects could be partially or entirely funded through long-term financing. In this option, the short-term increase in revenues does not need to be as large as in a pay-as-you-go plan and the costs are spread out over time, better matching the long-term benefits provided by infrastructure. Moreover, as seen in the economic impacts section, long-term financing produces more jobs more quickly. If long-term financing is used, it is feasible to increase the total size of the infrastructure program beyond the $3 billion limitation of the pay-as-you-go alternative.

Though public sentiment against debt financing seems to have grown, this largely is the result of the increasing federal debt that is being used to provide for current needs. The use of debt financing to pay for infrastructure projects that will be in place for decades or longer, thereby benefitting future generations, cannot be placed in the same category as debt used to finance current spending. It is sound fiscal policy to invest in infrastructure when it is needed and to maintain intergenerational equity in paying for this investment by financing the projects over a number of years.

A useful analogy is that a family does not wait to purchase a house until they have saved enough to buy the house with cash. Instead, the family treats the purchase as an investment and expects to use the house for a number of years. Taking on a mortgage is seen as a wise action. In contrast, no one would recommend that a family should take on a long-term loan to buy goods and services that would be used up in the short term.

In the previous section, the impacts of a stimulus package were presented per $1 billion of spending spread over three years. Based on 10-year debt financing, about 7,300 jobs would be created in the first year. A $3 billion program would create nearly 22,000 jobs in the first year; a $5 billion program would have an effect of more than 36,000 jobs. The latter figure amounts to 14 percent of the 266,000 jobs that Arizona employment remains below the prerecession peak. Employment in the construction sector remains less than half of the peak level in 2006 — 129,000 jobs lower.

A $3 billion infrastructure investment over three years financed with 10-year revenue bonds would cumulatively generate more than 71,000 jobs over the next three years, with nearly 29,000 coming in 2013. If the current number of unemployed were reduced by 29,000, the unemployment rate would be 8.2 percent instead of 9.1 percent.

These projections of job creation are conservative since the economic models are not detailed enough to specify the explicit nature of the revenue increase. If, as discussed in the financing section, tax increases are carefully crafted to primarily affect affluent Arizonans who would not reduce their consumer expenditures, then the negative effects from a tax increase would be smaller than those modeled, causing the net effect on employment to be greater than modeled.