

COLORADO'S GENUINE PROGRESS INDICATOR (GPI): AN UPDATE

**A COMPREHENSIVE METRIC OF ECONOMIC WELL-BEING IN COLORADO
FROM 1960-2013**

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JANUARY 2016





HIGHLIGHTS OF THE COLORADO GPI

Broad-based measures of economic growth, while extremely useful, have limitations in depicting the actual economic well-being of citizens. In January 2014, the Colorado Fiscal Institute released a report calculating, for the first time, a Genuine Progress Indicator — or GPI — for Colorado. GPI is a metric expressed in dollars that is increasingly used by economists to measure *economic well-being* as opposed to merely *economic growth*. In our report, we also discussed why the standard measurement for economic growth, Gross Domestic Product — or GDP — was not a useful way to measure economic well-being.

Our research showed that from 1960 to 2011, the economic well-being of Coloradans had trailed far behind the state's economic growth.

This report updates Colorado's Genuine Progress Indicator, or the CO-GPI, with 2013 data. And what the data shows is that GDP per capita increased 2.2 percent from 2012 to 2013, or \$1,087 per Coloradan, while GPI per capita grew slightly slower at 0.5 percent from 2012 to 2013, or \$137 per Coloradan. Among the GPI indicators that had the largest influence, the modest growth in personal income and the well-being gains from having fewer Coloradans underemployed were negated by a decrease in the value of volunteering and an increase in income inequality.

Real GDP per capita has more than tripled since 1960 while real GPI per capita has a little more than doubled. Since 1960, GDP per capita in Colorado has changed by 219 percent, but GPI per

capita (a measure of economic well-being that is more thoughtful than GDP) increased by only 134 percent.

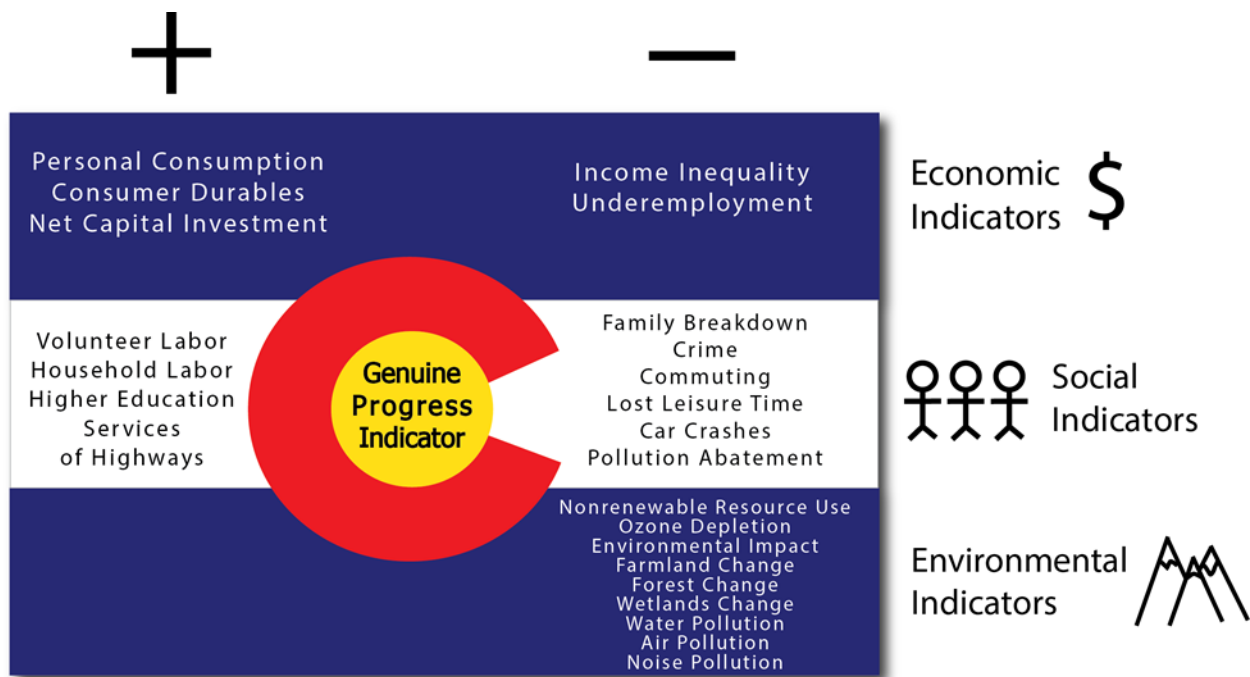
UNDERSTANDING GDP AND GPI

Being a broad measure of economic activity, Gross Domestic Product does not make any distinction between dollars spent that add to our economic well-being and dollars spent that do not. GDP also omits environmental externalities and ignores negative social conditions ranging from family breakdown to crime as well as positives like volunteerism, household labor and economic benefits from farms and forests.

The new metric, the Genuine Progress Indicator, gets closer to the reality of economic well-being by establishing an accounting method that considers factors that contribute to and detract from Coloradans' economic welfare.

GPI starts with a proxy for material welfare — the amount of goods and services Coloradans themselves buy each year — known as personal consumption expenditures. This is then adjusted for income inequality.

With adjusted personal consumption as the baseline, GPI adds the monetary value of activities that add to economic well-being but are not counted in the standard GDP framework. These include things like household labor, volunteer labor and benefits of higher education. GPI then subtracts the monetary cost of the expenditures that we incur to protect the depletion of our natural and social capital. These include things like the cost of auto accidents, costs of crime, lost leisure



time and pollution.

Twenty-four indicators were included to generate the initial Colorado GPI Report for the years 1960-2011. Our report herein uses 2013 data to update all of these indicators.

NOTES ABOUT THE UPDATED METHODOLOGY SINCE THE INITIAL REPORT

All dollar figures in the first release of the CO-GPI were in 2000 terms. For the 2012 update, all dollar figures were adjusted into 2009 constant dollars. Several of the environmental indicators that rely on land cover data get updated every five years. The 2011 data was just recently released and incorporated into the update, which had the effect of slightly changing data between 2007 and 2011, since before the actual 2011 figure was known, extrapolation from the 2007 levels was used. In the 2013 update, a slightly new method of calculating lost leisure time was utilized that incorporates state level average-hours-worked-a-week statistics. A change in the value of net capital investment was incorporated that utilizes net domestic business investment nationwide. The cost of traffic accidents was updated to include better data; the prior figures only included crashes on highways and now the data includes all roads in Colorado.

METHODS BEHIND THE GPI

The GPI framework starts with personal consumption expenditures — which can be thought of simply as the amount of goods and services Coloradans themselves buy each year. This is then adjusted for income inequality. With adjusted personal consumption as the baseline, GPI adds the monetary value of activities that add to economic well-being but are not counted in the standard GDP framework. These include things like: household labor, volunteer labor and benefits of higher education. GPI then subtracts the monetary cost of the expenditures that we incur to protect the depletion of our natural and social capital. These include things like: cost of auto accidents, costs of crime, lost leisure time and pollution. It also subtracts the money Coloradans spent on items that must be spent to abate the negative outcomes that result from the way we live and consume. For example, money spent to dispose of our waste.

Table 1: Components and Methods of Calculation for Colorado's GPI

Indicator	Impact on Well-Being	Description	Formula
A. Personal Consumption Expenditure	+ baseline	Starting point for GPI.	Personal Income multiplied by the national ratio of consumption to income spending.
B. Income Distribution	+ or -	Severe income inequality has social and economic costs not captured by the GDP.	Gini coefficient in year divided by Gini coefficient at baseline low value multiplied by 100.
C. Inequality-adjusted Consumption Expenditure		Becomes the baseline from which other GPI components are added or deducted.	Row A divided by Row B.
D. Benefits of Consumer Durables	+	Estimates the services provided by household equipment, which is a more accurate measure of value than just the money spent on such long-term items.	Twenty percent of stock of consumer durables.
E. Cost of Consumer Durables	-	The price of durables is subtracted to avoid double counting the value in their services and personal consumption.	Personal Income multiplied by national percentage of spending on consumer durables.
F. Underemployment	-	Involuntary part-time workers, discouraged workers and the chronically unemployed represent reduced well-being.	Underemployed persons multiplied by unprovided work hours per constrained worker multiplied by average hourly wage.
G. Net Capital Investment	+ or -	To avoid consuming its capital as income, a state must increase or at least maintain the supply of capital for each worker to meet the demands of the future labor force.	Net domestic business investment nationwide which is adjusted to the state level based on population.
H. Water Pollution	-	Impairment of water systems creates loss to society but is ignored by GDP.	Total benefit of unimpaired waters multiplied by the percentage of streams, rivers, and lakes that are impaired.
I. Air Pollution	-	Money spent to repair damage to health, infrastructure and environment from poor air quality is ignored by GDP.	Emissions of particulate matters, Nitrogen Oxide, Sulfur Dioxide and Volatile Organic Chemicals multiplied by their respective costs per ton.
J. Noise Pollution	-	The World Health Organization (WHO) produced an estimate for damaged caused by noise pollution in U.S.	Ratio of Coloradans living in cities compared to Americans living in cities multiplied by the WHO cost of noise pollution.

Table 1: Components and Methods of Calculation for Colorado's GPI			
K. Wetland Change	+ or -	The value of ecosystem services provided by wetlands like flood control, purified water and dust suppression are not counted in GDP.	Acres of lost or gained wetland multiplied by value per acre.
L. Farmland Change	+ or -	Trading farmland for urbanization creates costs like reduced local food supply that aren't captured in the GDP.	Acres of lost or gained farmland multiplied by the farmland value per acre.
M. Forest Cover Change	+ or -	Losing services like flood control, wildlife habitat and recreation from lost forest land are not captured in GDP.	Acres of forest land lost multiplied by value of forests per acre.
N. Environmental Impact	-	GPI tries to quantify the costs from environmental damage associated with climate disruption.	Consumption of energy multiplied by marginal social cost of CO2 emissions associated with each energy source.
O. Ozone Depletion	-	GPI captures the economic costs of increased exposure to harmful solar radiation.	Chlorofluorocarbon (CFCs) emissions multiplied by cost per ton.
P. Nonrenewable Resource Depletion	-	Depleting nonrenewable resources creates costs for future generations. The GPI tabulates their cost in the year in which they get used.	Consumption of coal, natural gas, and petroleum multiplied by the cost to replace that energy with renewable resources.
Q. Value of Housework	+	An important economic activity that is omitted in GDP which includes meal preparation, cleaning, repairs and parenting.	Total hours of household work multiplied by the wage one would pay to hire someone else to do that equivalent work.
R. Family Breakdown	-	GDP counts the money spent on divorces as positive as well as traditional family bonding activities that are moved to the market economy such as babysitting.	Costs of divorce on parents and children plus the societal cost of television viewing.
S. Crime	-	Harms well-being from medical expenses and damaged property as well as non-monetary mental costs to the victims.	Monetary costs of each crime plus the non-monetary costs to the victims.
T. Pollution Abatement	-	Money spent to restore quality back to a baseline doesn't add to well-being, so spending on air filters and waste treatment only compensates for externalities created by our economic activity.	Spending on automotive air filters and catalytic converters, plus the cost of sewage, plus the cost of solid waste disposal.

Table 1: Components and Methods of Calculation for Colorado's GPI			
U. Volunteer Work	+	Another activity omitted in GDP since no money is exchanged, but nonetheless is an important part of community well-being.	Total hours of volunteer work multiplied by the average hourly wage for volunteers.
V. Lost Leisure Time	-	GPI counts all work as a positive without accounting for the tradeoff of leisure.	People employed multiplied by each year's lost leisure compared to a baseline year multiplied by the average hourly wage rate.
W. Higher Education	+	The GPI captures the indirect personal and societal benefits of an educated population.	Bachelor's degree holders multiplied by the social benefits per bachelor's degree holder.
X. Services of Highways	+	These services are provided by the government but could be sold. Assumes 75 percent of miles are driven for pleasure and 10 percent of net stock is annual value.	Seven-point-five percent of net stock of highways and streets
Y. Cost of Commuting	-	Commuting adds costs that don't necessarily add to well-being but must be incurred.	Miles traveled to work multiplied by the cost per mile for vehicle use, added to the hours spent commuting multiplied by a reduced wage rate, added to spending on public transport fares.
Z. Car Accidents	-	GDP counts the money spent on property and health damage from car crashes as a positive. GPI corrects for this.	Number of fatal accidents, injury accidents and property-damage-only accidents multiplied by their respective costs.

CHANGE IN ECONOMIC WELL-BEING IN COLORADO FROM 2012 TO 2013

The Colorado GPI increased by 0.5 percent, or \$137 per capita, from 2012 to 2013. This was a gain in GPI but not nearly as strong a jump as the 4.2 percent gain from 2011 to 2012. The 2013 GPI figure is still below the pre-recession peak in 2007.

The increase in GPI was largely driven by an increase in the economic components of the GPI, most of which came from increases in personal consumption and continued gains from additional employment growth. These gains were dampened by an increase in the cost of income inequality.

The environmental components improved by 1.7 percent, or \$143 per capita between 2013 and 2012. This improvement was driven by the decreases cost of nonrenewable resource depletion. The environmental component was also boosted by increases in farmland and forest acreage.

The social components had a slight increase by 0.8

percent, or by \$47 per capita. This was mainly the result of fewer hours spent performing volunteer labor. The cost of lost leisure time increased from 2012.

COLORADO GDP VS. GPI

While GPI is useful in better reflecting economic well-being and shining a light on the things that a broad-based measure like GDP overlooks from year to year, GPI is even more versatile when looking at the difference and the trends in GDP vs. GPI over several decades.

As shown in figure 1, GDP per capita more than tripled since 1960 while GPI per capita only doubled.

Figure 2 (see page 7) plots the percent change in both GDP and GPI, which illustrates two distinct periods. During the period from 1960 to 1980, GPI per capita growth rates closely matched that of the GDP. Beginning around 1980, growth in GPI per capita began to bottom out while GDP per capita continued with strong growth rates.

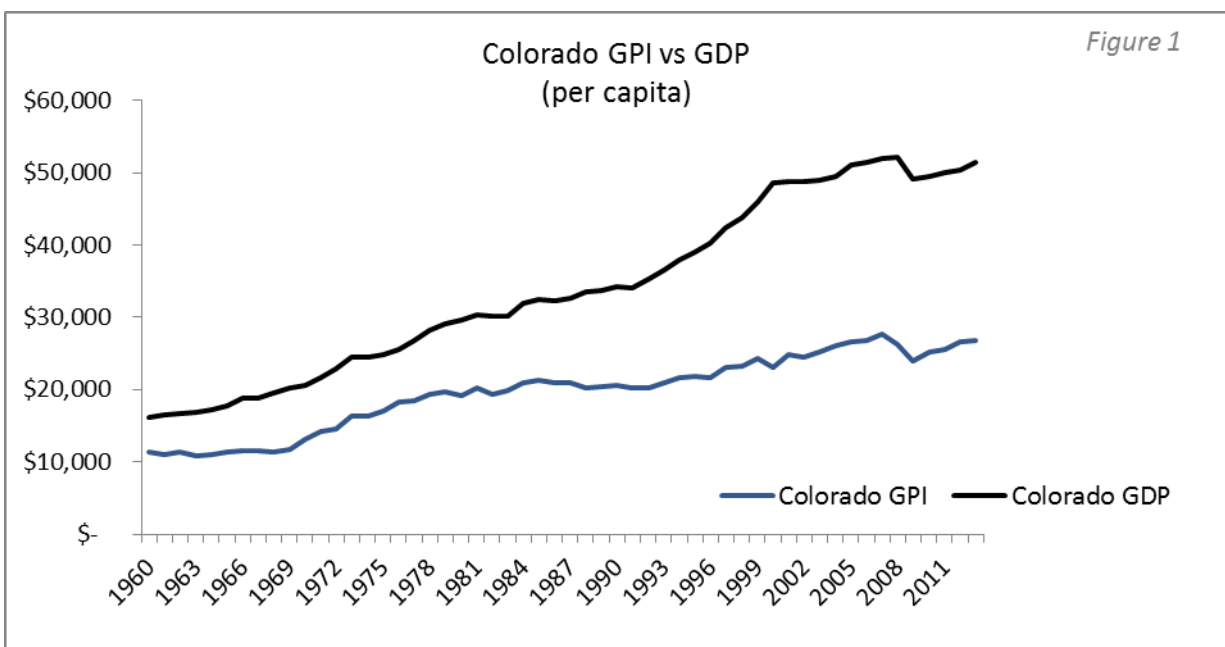
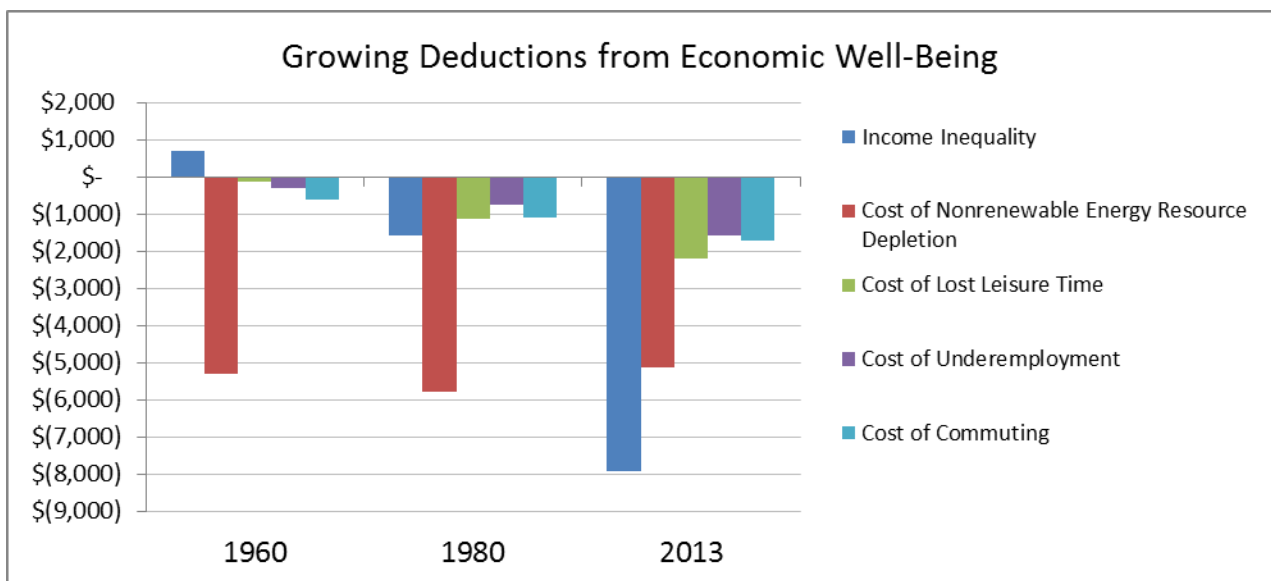
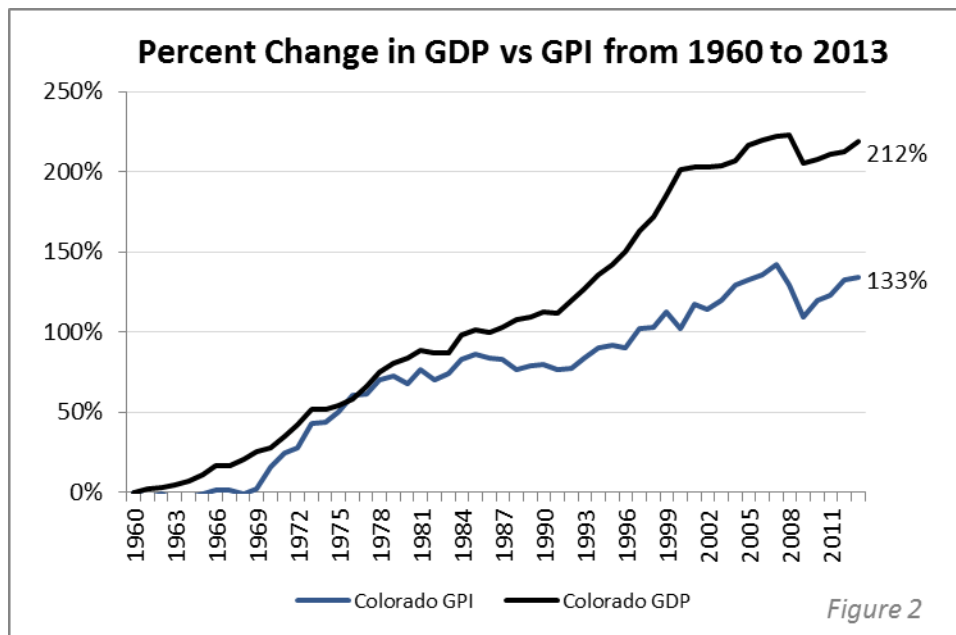


Figure 1

So while Colorado is much “richer” than what we were 50 years ago, those gains in economic growth come at the cost of lost leisure time, longer time commuting to work, less time spent with family, higher levels of income disparity and depletion of our environmental capital, such as farmland and wetland acreage in addition to other breakdowns in social and economic well-being that are captured by the GPI — reaffirming the

fact that pure economic data does not tell the whole story.

Figure 3 shows the trend of the largest deductions from the Colorado GPI. The cost of nonrenewable resource depletion has always been a large deduction, while other costs like income inequality and the cost of lost leisure time have dramatically increased over the past several decades.



A LOOK AT EACH OF THE CO-GPI'S INDICATORS FOR 2013

Personal Consumption (\$35,012)

Since hitting its peak in 2007 at \$35,920, personal consumption per capita fell four consecutive years until 2012, when it increased again. However, there was a slight decrease from 2012 to 2013. But the very slight decline is not necessarily bad news.

Remember that “personal consumption” is generated from multiplying “personal income” by the national ratio of income to consumption. In 2012, Americans spent 83.2 percent of personal income on consumption, and in 2013 that ratio fell to 81.1 percent. So Colorado had strong growth in personal income and slightly lower growth in personal consumption, since a slightly higher proportion of that income was saved instead of consumed. In conjunction with population growth of 1.6 percent between 2012 and 2013, Colorado’s per-capita personal consumption actually fell from \$35,099 to \$35,012.

Income Inequality (\$7,925)

Colorado’s Gini coefficient ticked up to 0.4594 in 2013 from 0.4576, which indicates greater levels of income disparity. The GPI measures the cost of inequality as the difference between personal consumption (which doesn’t take into account income distribution) and adjusted-personal-consumption (which does). The cost of income inequality per capita increased from \$7,837 in 2012 to \$7,925 in 2013.

Services of Consumer Durables (\$5,747)

For the sixth straight year, services of consumer durables per capita declined from the 2007 peak. It was \$5,747 in 2013, down from \$5,984 in 2012.

Cost of Consumer Durables (\$3,904)

Although Colorado still is not buying as many durables per capita as before the recession, durable spending is still up. As more Coloradans have more income, more is spent on durables. In 2013, the cost of consumer durables per capita was \$3,904, and in 2012 it was \$3,690. Eight-point-eight percent of personal income was spent on consumer durables in 2013.

Cost of Underemployment (\$1,579)

The underemployment rate fell from 14.6 percent in 2012 to 12.5 percent in 2013. With 2.78 million workers in the Colorado labor force in 2013, a drop in the underemployment rate of nearly 2 percentage points means more than 50,000 more Colorado workers are employed or working their desired amount of hours compared to the year prior. In GPI terms, the per capita drop in the cost of underemployment went from subtracting economic well-being at \$1,887 per capita to subtracting well-being at \$1,579 per capita. That was a 16 percent decrease in the cost of underemployment from 2012 to 2013.

Net Capital Investment (\$1,218)

Four years since the dramatic drop of 2009 in U.S. net business investment, the nation began to reinvest in capital as the economy pulled itself out from the Great Recession. U.S. net domestic investment increased 11 percent from 2012 to 2013. In Colorado, this caused the per capita value of net capital investment to grow from \$1,104 per capita in 2012 to \$1,218 per capita in 2013.

Cost of Water Pollution (\$22)

Overall, the cost of water pollution in 2013 remained fairly similar to 2012. There was a slight decrease in the number of lakes impaired, from 13.9 percent in 2008 to 13.5 percent in 2012. Extrapolating 2013 data from this trend meant that a slightly higher portion of waterways were impaired in 2013 than 2012. Because the value of 100 percent clean water is calculated on a per capita basis (multiplying \$162 by the state population), the increase in population balanced out the slight decrease in impaired waters.

Cost of Air Pollution (\$237)

Colorado saw a slight decrease in air pollution per capita dropping from \$242 in 2012 to \$237 in 2013. The drop in air pollution costs was driven by a decrease in emissions of Nitrogen Oxide (NOX), which are mostly found in vehicle emissions, and Sulfur Oxide (SO₂), found mostly in industrial emissions. There was also a slight decrease in the emissions of Volatile Organic Chemicals (VOCs).

	Cost To Economic Well-being per Ton	2012 tons	2013 tons
Nox	\$340	264,782	256,188
PM10	\$678	331,312	331,022
PM2.5	\$4,313	102,570	102,241
SO2	\$1,571	51,699	51,253
VOC	\$842	496,520	493,024

Noise Pollution (\$88)

There was very little change in the cost of noise pollution. The trend continues that more people are living in urban locations. Eighty-six percent of Coloradans now live in urban areas. The cost of noise pollution per capita is very low, at \$88.

Cost of Wetland Change (\$930)

The National Land Cover Database updates figures every five years. The 2011 figures were published in 2014, as were some revisions on the 2006 figures. The 2006 figures were revised downward from 1,051,303 wetland acres to 1,025,806 acres. There was a slight decline in wetland acres from 2011 to the revised 2006 figures. Extrapolating the trend from 2006 to 2001, Colorado continues to lose a slight amount of wetland acreage each year. The cost per capita fell from \$944 to \$930 in 2013.

Cost of Farmland Change (\$984)

Farmland acreage data is available every five years. New data was recently released on 2012 acreage levels. Colorado has gained 282,000 acres of farmland since 2007. Colorado has 31.9 million acres of farmland in 2013, which is still down from the acreage in 1960, when Colorado had 38.6 million acres. Extrapolating the trend between acreage data from 2007 and 2012, the cost of farmland change fell from \$1,013 in 2012 to \$984 in 2013.

Cost of Forest Cover Change (\$54)

Colorado gained 2.5 million acres of forest cover since the last official measurement in 2007. This puts Colorado above the 1960 level of forest cover acreage. The year 2012 was the first in which the value of forest cover change was positive in the GPI, meaning GPI improved in 2012 because of the added forest acreage. In 2013, Forest Cover Change added \$54 per capita to the Colorado GPI.

Cost of Environmental Impact (\$690)

Total emissions of CO2 from energy consumption rose from 97 million tons in 2012 to 97.5 million tons in 2013. This raised the cost per capita of environmental impact from \$683 in 2012 to \$690. **Cost of Ozone Depletion (<\$1)**

No change to a very minor deduction in the CO-GPI

Cost of Non-Renewable Energy Depletion (\$5,151)

There was a slight decrease in the per capita cost of non-renewable energy depletion, dropping from \$5,220 in 2012 to \$5,151 in 2013. This was driven by a decrease in the amount of millions of kilowatt hours of electricity consumed in Colorado. In 2012, 52,692 million kilowatt hours were used compared to 50,337 in 2013. There was also a decrease in the amount of coal consumed.

	2012 tons	2013 tons
CO2 from Coal	36,091,172	35,452,498
CO2 from Natural Gas	25,074,169	26,464,502
CO2 from Petroleum	34,943,668	34,425,847
CO2 from Wood and Waste	900,100	1,194,891
CO2 Total Emissions from Energy Consumption	97,009,109	97,537,738

Value of Household Work (\$6,461)

There was a slight increase in hours spent on household activities, from 1.74 hours a day in 2012 to 1.78 hours a day in 2013. This amounts to about 22 more hours of household work per year in 2013 compared to the year prior for a Coloradan. This led to an increase in value of household work per capita from \$6,275 in 2012 to \$6,461 in 2013.

Cost of Family Changes (\$350)

There was very little change in the rate of divorce between 2012 and 2013. The cost per capita of family changes ticked up slightly from \$348 to \$350 in 2013.

Cost of Crime (\$200)

The cost of crime per capita slightly increase from \$197 in 2012 to \$200 in 2013. The cost of crime is down significantly since the peak in 1981, when it was at \$413 per capita.

	Cost to Economic Well-being per Incident	2012	2013	Annual Change
Murders	\$ 2,836,085	162	178	9.9%
Sexual Assaults	\$ 121,009	2,113	2,050	-3.0%
Robberies	\$ 9,804	3,395	3,151	-7.2%
Aggravated Assaults	\$ 11,620	10,353	9,963	-3.8%
Break-And-Enters	\$ 1,886	26,157	25,081	-4.1%
Larceny Thefts	\$ 401	101,021	102,443	1.4%
Vehicle Thefts	\$ 5,345	12,092	12,533	3.6%

Cost of Pollution Abatement (\$236)

This indicator is made up of three factors: air pollution abatement, water pollution abatement and waste disposal. Air pollution abatement increased slightly driven by the rise in car registrations from 4,561,896 in 2012 to 4,683,410 in 2013. Water pollution abatement costs declined because of a smaller number of new septic tanks. The cost of waste removal also declined because about 20,000 fewer tons of waste were removed in 2013, which means Coloradans are throwing away less garbage per capita. Overall, the per capita cost of personal pollution abatement decreased from \$241 in 2012 to \$236 in 2013.

Value of Volunteer Work (\$469)

The volunteer rate fell from 33.1 percent to 29.7 percent in 2013, which resulted in a 23 percent decrease in the total number of volunteer hours in Colorado. The last year that the volunteer rate was below 30 percent was 2002. Overall, this caused the per capita value of volunteer work to drop from \$622 in 2012 to \$469 in 2013. Colorado's volunteering rankings fell from the 13th best volunteer state to 20th — although rankings are normally calculated on a three-year rolling average, for which Colorado ranks 14th.

Cost of Lost Leisure Time (\$2,206)

Average hours worked per worker in Colorado ticked up from 38.7 to 38.8 hours a week in 2013. The cost of lost leisure time per capita increased from \$2,154 in 2012 to \$2,206. The cost of lost leisure time is based on the extra amount of hours each worker performs compared to 1969. The methodology for calculating lost leisure time improved for the 2013 update to incorporate state-based hours of work per worker.

Value of Higher Education (\$3,299)

The percent of Coloradans with at least a bachelor's degree continues to grow. The rate of 25-year-old Coloradans who have bachelor's degrees or higher ticked up slightly in 2013, from 37.5 percent to 37.8 percent. The population growth of Colorado balanced out the growth in bachelor's degree holders, so the value between 2012 and 2013 remained about the same.

Services of Highways and Streets (\$955)

The stock of highways and streets grew between 2012 and 2013, but the population grew faster, so the value of highways and streets per capita fell slightly from \$961 to \$955.

Cost of Commuting (\$1,713)

From 2012 to 2013, the mean travel time to work rose slightly from 24.5 minutes to 24.6 minutes. The percentage of people carpooling remained stable at 9.7 percent. There was also an increase in the proportion of workers driving to work from 74.4 percent to 74.7 percent. The number of people with jobs also increased. The number of cars on the road commuting each work day rose by 50,000, which was a 2.4 percent increase from 2012. However, the cost per capita of commuting actually fell from \$1,742 to \$1,713. This is because the GPI measures the opportunity cost of time spent commuting by multiplying each commuter hour by the state's average wage. Because the average wage

dropped from \$26.59 to \$25.88, which decreased the value of time, the per capita cost of commuting fell even though more cars were on the road for longer periods in 2013.

Cost of Car Crashes (\$454)

Colorado saw more injuries from car accidents and less property-damage-only crashes than the year prior. Taking this in conjunction with population growth meant there was a slight increase in the cost of car crashes per capita, from \$452 to \$453 in 2013. The number of injuries from car crashes rose by 12.3 percent while the number of crashes with property-damage-only fell by 11.4 percent.

	2012	2013	Annual In-crease
Total Fatalities from Car Crashes	434	431	-0.7%
Number of Injuries from Car Crashes	23,833	26,768	12.3%
Number Property Damage Only Crashes	90,714	80,398	-11.4%

APPENDIX A: DETAILED CO-GPI RESULTS

Colorado GPI Components in Billions 2009 Dollars							
	+	+ or -	+	+	-	-	
	Genuine Progress Indicator	Personal Consumption Expenditures	Income Inequality	Adjusted Personal Consumption	Services of Consumer Durables	Cost of Consumer Durables	Cost of Underemployment
1960	20.185	23.460	0.337	24.710	4.356	3.226	0.543
1961	20.340	24.705	0.342	25.655	4.544	3.193	0.653
1962	21.389	25.699	0.337	27.133	4.702	3.503	0.617
1963	21.108	26.634	0.353	26.854	4.934	3.774	0.660
1964	21.730	27.888	0.350	28.309	5.111	4.042	0.664
1965	22.438	29.281	0.353	29.520	5.341	4.383	0.643
1966	23.263	30.515	0.355	30.584	5.609	4.552	0.644
1967	23.759	31.425	0.360	31.040	5.966	4.583	0.684
1968	23.955	33.543	0.366	32.580	6.251	5.103	0.719
1969	25.319	35.260	0.372	33.679	6.626	5.278	0.764
1970	29.384	37.219	0.355	37.219	7.044	5.171	0.956
1971	32.637	40.370	0.362	39.585	7.377	5.897	1.156
1972	35.073	44.293	0.376	41.817	7.802	6.701	1.256
1973	40.603	47.634	0.371	45.669	8.334	7.303	1.280
1974	41.619	48.163	0.384	44.527	8.918	6.728	1.382
1975	44.214	49.265	0.371	47.175	9.353	6.783	1.809
1976	48.310	52.431	0.366	50.960	9.793	7.685	1.810
1977	49.622	55.508	0.376	52.501	10.309	8.347	2.043
1978	53.675	59.249	0.379	55.587	10.923	8.861	1.971
1979	55.996	61.201	0.380	57.266	11.661	8.713	1.881
1980	55.568	61.455	0.384	56.824	12.224	7.929	2.224
1981	60.028	63.362	0.379	59.361	12.470	7.976	2.235
1982	59.360	65.551	0.390	59.695	12.604	7.996	2.963
1983	62.356	70.361	0.393	63.600	12.858	9.077	2.898
1984	66.073	73.104	0.392	66.240	13.317	10.013	2.491
1985	68.092	75.642	0.396	67.832	13.782	10.568	2.737
1986	67.929	77.480	0.406	67.853	14.227	11.264	3.256
1987	68.199	78.011	0.412	67.363	14.707	11.151	3.253
1988	65.712	79.073	0.432	65.082	15.195	11.224	2.946
1989	66.915	81.125	0.443	65.029	15.854	11.161	2.746
1990	67.879	82.066	0.445	65.558	16.491	10.663	2.653
1991	68.243	83.848	0.445	67.010	17.024	10.103	2.853
1992	70.830	87.896	0.448	69.790	17.229	10.593	3.228
1993	75.754	94.108	0.436	76.710	17.345	11.608	3.139
1994	80.776	100.081	0.434	81.972	17.553	12.817	2.910
1995	83.772	105.130	0.436	85.665	17.864	13.408	2.931
1996	85.137	110.055	0.446	87.610	18.315	14.128	3.157
1997	92.826	115.686	0.442	92.995	18.896	14.885	3.043
1998	95.455	122.982	0.451	96.978	19.641	16.250	3.358
1999	102.606	133.136	0.458	103.295	20.758	18.070	3.364
2000	99.613	144.356	0.465	110.323	22.351	19.436	3.167
2001	109.642	149.898	0.446	119.327	24.120	19.958	3.766
2002	109.690	151.859	0.444	121.447	25.790	20.399	4.824
2003	113.685	152.601	0.436	124.469	27.306	19.944	5.507
2004	119.666	157.344	0.434	128.979	28.614	20.227	5.137
2005	122.920	163.545	0.447	130.039	29.833	20.567	4.841
2006	126.770	168.873	0.450	133.380	30.970	20.578	4.502
2007	132.739	172.553	0.452	135.684	31.835	20.545	4.264
2008	128.075	173.278	0.457	134.763	32.330	18.966	5.547
2009	118.881	166.701	0.453	130.792	32.236	17.385	8.826
2010	126.747	171.550	0.457	133.419	31.722	18.254	10.181
2011	130.339	174.588	0.459	135.249	31.293	18.684	9.964
2012	137.769	182.078	0.458	141.421	31.041	19.146	9.791
2013	140.637	184.458	0.459	142.708	30.825	20.332	8.316

	+	-	-	-	+ or -	+ or -	+ or -	-	-	-
								Cost of Envi- ronmental Impact (Climate change)	Cost of Ozone Depletion	Cost of Non- renewable Energy Re- source De- pletion
Net Capital Investment	Cost of Water Pollution	Cost of Air Pollution	Cost of Noise Pol- lution	Cost of Net Wet- land Change	Cost of Net Farm- land Change	Cost of Net Forest Cover Change				
0.203	0.038	1.489	0.132	0.000	0.043	0.000	0.000	0.414	9.416	
0.203	0.041	1.525	0.138	0.223	0.089	0.019	0.000	0.462	10.308	
0.278	0.043	1.561	0.144	0.447	0.136	0.038	0.000	0.576	10.415	
0.303	0.046	1.599	0.150	0.670	0.185	0.058	0.000	0.608	10.252	
0.350	0.048	1.637	0.157	0.894	0.237	0.077	0.000	0.630	10.956	
0.476	0.050	1.677	0.163	1.117	0.396	0.096	0.027	0.721	11.173	
0.586	0.052	1.717	0.170	1.340	0.562	0.115	0.058	0.721	11.602	
0.518	0.054	1.758	0.177	1.564	0.732	0.135	0.090	0.759	12.091	
0.571	0.058	1.800	0.184	1.787	0.905	0.154	0.133	0.800	13.614	
0.651	0.061	1.843	0.192	2.011	1.079	0.173	0.170	0.875	14.098	
0.551	0.064	1.888	0.199	2.234	1.179	0.192	0.214	0.946	14.584	
0.651	0.069	1.850	0.210	2.457	1.290	0.211	0.252	0.961	14.728	
0.811	0.074	1.803	0.221	2.681	1.413	0.231	0.314	1.083	16.149	
1.085	0.079	1.756	0.228	2.904	1.543	0.250	0.379	1.154	17.099	
1.030	0.080	1.710	0.234	3.128	1.673	0.269	0.413	1.052	16.518	
0.541	0.082	1.666	0.241	3.351	1.768	0.288	0.463	0.788	16.313	
0.943	0.083	1.636	0.248	3.575	1.871	0.308	0.539	0.730	17.013	
1.302	0.085	1.607	0.255	3.798	1.980	0.327	0.619	0.615	17.190	
1.819	0.088	1.579	0.261	4.021	2.092	0.346	0.668	0.531	17.220	
2.189	0.090	1.551	0.268	4.245	2.594	0.365	0.726	0.432	17.144	
1.797	0.092	1.524	0.275	4.468	3.079	0.385	0.764	0.395	16.884	
2.601	0.094	1.495	0.279	4.692	3.557	0.404	0.800	0.393	15.887	
1.629	0.097	1.467	0.283	4.915	4.045	0.423	0.862	0.312	16.237	
1.637	0.099	1.438	0.287	5.138	3.949	0.442	0.884	0.356	16.057	
3.483	0.100	1.410	0.291	5.362	3.860	0.458	0.999	0.401	16.814	
3.157	0.102	1.382	0.295	5.585	3.778	0.473	1.060	0.360	16.618	
2.641	0.102	1.361	0.300	5.848	3.701	0.488	1.099	0.408	16.325	
2.586	0.103	1.340	0.304	6.110	3.630	0.504	1.151	0.383	16.648	
2.528	0.103	1.319	0.308	6.372	3.639	0.519	1.251	0.462	17.289	
2.877	0.104	1.299	0.312	6.634	3.649	0.535	1.321	0.365	17.328	
2.514	0.105	1.278	0.316	6.897	3.658	0.550	1.406	0.216	17.586	
1.632	0.107	1.296	0.324	7.159	3.667	0.566	1.488	0.180	18.441	
1.905	0.108	1.314	0.332	7.421	3.676	0.581	1.564	0.158	18.492	
2.525	0.110	1.332	0.340	7.075	3.876	0.618	1.713	0.131	20.001	
3.701	0.111	1.350	0.347	6.728	4.083	0.656	1.791	0.080	19.875	
4.045	0.112	1.368	0.355	6.381	4.297	0.693	1.847	0.035	20.294	
4.652	0.112	1.386	0.363	6.035	4.517	0.730	1.986	0.001	21.251	
6.000	0.113	1.316	0.370	5.688	4.744	0.767	2.037	0.001	20.983	
6.560	0.113	1.347	0.378	5.341	5.010	0.805	2.182	0.000	21.994	
7.350	0.114	1.119	0.386	4.995	5.280	0.842	2.266	0.000	22.222	
8.037	0.114	1.294	0.393	4.648	5.550	0.879	2.501	0.001	23.430	
5.066	0.114	1.120	0.398	4.301	5.823	0.916	2.778	0.000	25.893	
3.800	0.114	1.583	0.404	4.418	6.101	0.916	2.773	0.000	25.681	
3.784	0.113	1.522	0.409	4.534	6.004	0.916	2.875	0.000	25.849	
5.073	0.111	1.469	0.414	4.651	5.902	0.916	3.020	0.000	26.638	
6.095	0.111	0.863	0.420	4.767	5.798	0.916	3.143	0.000	27.361	
7.146	0.110	0.903	0.425	4.884	5.690	0.916	3.250	0.000	27.375	
7.277	0.110	0.950	0.431	4.886	5.580	0.745	3.436	0.000	28.353	
5.180	0.110	0.988	0.436	4.888	5.518	0.574	3.453	0.000	28.431	
-1.820	0.111	1.061	0.442	4.891	5.454	0.402	3.398	0.000	27.929	
2.050	0.111	1.141	0.447	4.893	5.388	0.231	3.568	0.000	28.601	
3.534	0.111	1.275	0.453	4.895	5.322	0.060	3.515	0.000	27.621	
5.728	0.113	1.257	0.458	4.897	5.255	-0.111	3.543	0.000	27.080	
6.414	0.114	1.248	0.464	4.900	5.186	-0.282	3.637	0.000	27.136	

+	-	-	-	+	-	+	+	-	-
Value of Housework	Cost of Family Changes	Cost of Crime	Cost of Personal Pollution Abatement	Value of Volunteer Work	Cost of Lost Leisure Time	Value of Higher Education	Services of Highways and Streets	Cost of Commuting	Cost of Motor Vehicle Crashes
7.43	0.43	0.30	0.35	0.85	0.22	1.10	0.71	1.13	1.44
7.87	0.48	0.35	0.36	0.89	0.21	1.12	0.75	1.19	1.46
8.08	0.52	0.40	0.37	0.91	0.19	1.16	0.81	1.25	1.48
8.31	0.55	0.39	0.38	0.93	0.17	1.21	0.86	1.31	1.49
8.57	0.60	0.37	0.39	0.95	0.15	1.28	0.90	1.37	1.51
8.71	0.63	0.33	0.40	0.95	0.12	1.35	0.97	1.42	1.53
9.19	0.67	0.37	0.41	0.96	0.10	1.44	1.05	1.53	1.55
9.98	0.71	0.39	0.42	0.99	0.07	1.54	1.11	1.60	1.56
11.19	0.75	0.53	0.43	1.02	0.04	1.65	1.16	1.71	1.75
12.26	0.79	0.57	0.45	1.04	0.00	1.78	1.24	1.81	1.80
13.62	0.81	0.71	0.46	1.07	0.04	1.96	1.37	1.91	1.89
15.70	0.85	0.77	0.48	1.11	0.10	2.07	1.39	2.06	1.91
18.65	0.88	0.93	0.50	1.16	0.16	2.23	1.44	2.28	2.16
21.36	0.94	0.93	0.53	1.20	0.23	2.41	1.61	2.48	1.97
21.82	0.98	0.84	0.55	1.22	0.61	2.60	1.95	2.47	1.82
22.76	1.00	0.97	0.58	1.24	0.99	2.80	1.77	2.47	1.86
24.86	1.06	0.91	0.60	1.26	1.46	3.01	1.65	2.63	2.03
25.98	1.16	0.94	0.63	1.28	1.98	3.24	1.57	2.79	2.20
27.36	1.10	1.05	0.67	1.30	2.61	3.48	1.54	3.02	2.25
27.60	1.09	0.99	0.67	1.32	3.21	3.73	1.64	3.15	2.28
27.50	1.15	1.12	0.73	1.34	3.32	3.88	1.81	3.17	2.30
28.42	1.17	1.23	0.73	1.36	3.56	4.27	1.90	3.32	2.53
29.77	1.15	1.05	0.78	1.38	3.78	4.56	1.87	3.44	2.35
29.87	1.23	1.09	0.78	1.40	3.95	4.86	1.75	3.53	2.41
30.25	1.21	1.03	0.82	1.41	4.23	5.18	1.69	3.70	2.31
31.27	1.24	1.08	0.83	1.43	4.41	5.50	1.72	3.79	2.30
32.29	1.24	1.24	0.83	1.45	4.57	5.84	1.83	3.85	2.32
32.42	1.22	1.08	0.84	1.47	4.64	6.20	1.90	3.84	2.25
32.31	1.22	1.05	0.87	1.49	4.77	6.56	1.88	3.87	2.11
32.31	1.22	0.93	0.89	1.51	4.93	6.94	1.89	3.93	2.14
32.08	1.21	0.95	0.88	1.61	5.19	7.43	1.92	4.01	2.16
32.55	1.26	1.15	0.89	1.72	5.54	7.73	1.91	4.21	2.10
33.66	1.30	1.23	0.91	1.82	6.01	8.14	1.92	4.49	2.22
33.79	1.32	1.19	0.96	1.92	6.49	8.57	1.95	4.77	2.38
33.14	1.33	1.14	0.93	2.02	6.98	9.01	2.05	5.06	2.49
33.00	1.37	1.16	0.99	2.12	7.49	9.46	2.30	5.35	2.61
33.56	1.39	1.07	1.09	2.23	8.03	9.93	2.36	5.66	2.60
34.58	1.42	0.98	1.05	2.33	8.83	10.40	2.50	6.15	2.52
35.95	1.46	1.08	1.05	2.43	9.81	10.89	2.59	6.74	2.67
37.60	1.50	1.03	1.13	2.53	10.80	11.40	2.72	7.33	2.60
27.22	1.49	0.92	1.07	2.64	10.86	11.88	2.86	7.30	2.64
33.67	1.53	1.05	1.25	2.74	11.20	12.14	2.92	7.38	2.87
33.73	1.55	1.14	1.12	2.39	11.53	12.56	2.99	7.47	2.99
32.87	1.53	1.14	1.13	3.14	11.96	12.99	3.00	7.73	2.70
32.76	1.58	1.21	1.14	2.99	12.44	13.41	3.37	7.94	2.73
32.50	1.60	1.17	1.16	3.29	12.86	13.77	3.65	8.13	2.56
31.85	1.62	1.10	1.18	2.46	13.57	13.99	4.06	8.41	2.59
33.37	1.60	1.03	1.19	3.94	14.11	14.67	4.44	8.73	2.53
31.51	1.61	1.03	1.20	2.90	14.37	15.20	4.63	8.94	2.37
34.18	1.64	1.04	1.20	3.26	14.71	15.47	4.62	9.03	2.32
34.05	1.67	0.94	1.23	3.30	10.72	15.85	4.75	8.76	2.23
33.50	1.77	1.01	1.26	2.92	10.68	16.66	4.96	8.89	2.26
32.55	1.80	1.02	1.25	3.23	11.18	16.89	4.98	9.04	2.35
34.04	1.84	1.05	1.24	2.47	11.62	17.38	5.03	9.03	2.39



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