

The Genuine Progress Indicator

From the website "Genuine Progress: Moving Beyond GDP"
at <http://genuineprogress.net/genuine-progress-indicator/>

What if we defined success not by the money we spent and the goods we consumed but by the quality of life we create not only for ourselves but for everyone with whom we share the planet? What if we added up the positives of economic growth and subtracted from them the clear negatives, so we had a better picture of whether we were headed in the right direction?

The Genuine Progress Indicator (GPI) does exactly that. With 26 indicators, the GPI consolidates critical economic, environmental and social factors into a single framework in order to give a more accurate picture of the progress – and the setbacks – we have made.

From the costs of crime, pollution, commuting and inequality to the value of education, volunteer work, leisure time and infrastructure, the GPI helps us understand the true impacts of our policies and will lead us on the path toward a genuinely sustainable economy.

There are 26 separate indicators that comprise the Genuine Progress Indicator. The following description of each indicator is drawn from the latest national [GPI report](#).

Economic Indicators

Life is not all about work and it is worth more than the goods and services you buy. The GPI looks at consumption and investment in new ways while bringing income inequality into the picture.

- Personal Consumption Expenditures

Personal consumption expenditures on goods and services are the key driver of the GDP. Personal consumption expenditures are a valid starting point for the GPI, as well; however, we are ultimately interested in the welfare associated with this consumption rather than the monetary value of production, and so we start with this indicator, but flesh it out with additional indicators.

- Income Inequality

There is strong empirical evidence that widening income inequality hampers the overall economic welfare of a society. A highly unequal distribution of income can increase crime, reduce worker productivity, and reduce investment. Moreover, when growth is concentrated in the wealthiest income brackets, it counts less towards improving overall economic welfare because

the social and economic benefits of big-ticket items purchased by the super-rich tend as much as increases in spending on items that allow revenue to circulate through the economy more broadly.

The GPI accounts for income inequality by discounting—or calculating the present value of anticipated future cash flows—personal consumption expenditures by the amount of inequality that persists in a given year using the Gini and income distribution indices (IDI).

The Gini index ranges from 0, where every household has the same income, to 1 where one household has all the income. Thus the higher the Gini index the greater the income inequality, or the greater the portion of aggregate income earned by the top household income bracket. The Gini index aggregates data into a single statistic, which summarizes the dispersion across the entire income distribution. The Gini index is published regularly by the U.S. Census Bureau. The IDI simply measures the relative change in the Gini index. It is set at a value of 100 in 1968, the year the Gini index was at its lowest value.

- Adjusted Personal Consumption

Adjusted personal consumption is calculated by dividing personal consumption expenditures by the income distribution index and multiplying it by 100. Adjusted personal consumption then becomes the base number from which the remaining Columns in the GPI are either added or subtracted.

- Cost of Consumer Durables

The actual expenditures on consumer durables are a negative adjustment in the GPI to avoid double counting the value of their services (See “Value of Consumer Durables”).

- Value of Consumer Durables

The money spent on durable items, such as cars, refrigerators, and other appliances is not a good measure of the actual value consumers receive from them. It is important to take account, as well, of how long the item lasts. For example, when you buy a furnace or a dishwasher, you do not “consume” it in one year. The appliance (or “consumer durable”) provides service for a number of years. Because of this, the GPI treats the services of household capital as a benefit and the initial purchase price as a cost. This column adds the annual services derived from consumer durables, which economic theory defines as the sum of the depreciation rate and the interest rate. If a product lasts eight years, it depreciates at 12.5 percent per year and thus provides that much of its service each year. At the same time, if the interest rate is 5 percent, the purchaser of the product could have received that much interest by putting the money into the bank instead. Economists therefore regard the interest rate as part of the monetary value of the product to the consumer.

Based on an assumed depreciation rate of 15 percent and an average interest rate of 7.5 percent, the value of services from household capital is

estimated at 22.5 percent of the value of the net stock of cars, appliances, and furniture at the end of each year as estimated by the Bureau of Economic Analysis. To avoid double counting, we make an adjustment by subtracting out actual expenditures on consumer durables. Focusing on annual services that household appliances and equipment provide rather than on the purchase price corrects the way the GDP treats money spent on durables. The value of services from consumer durables is treated as a benefit and is thus an addition to the GPI account. The benefits from household capital is generally the GPI's third largest addition to personal consumption. (See the column "Cost of Consumer Durables" for more.)

- **Cost of Underemployment**

The GPI does not deal with the effects of short-term and cyclical unemployment. Although such hardships are not without social consequences and costs, much of the financial hardship is mitigated by unemployment insurance benefits.

Underemployment is a more inclusive concept than unemployment. It refers to persons who are either chronically unemployed, discouraged (gave up looking for work), involuntary part-time (would prefer full-time work but are unable to find it), or constrained by other factors, such as lack of child care or transportation. The costs of underemployment fall on the discouraged workers and their families. But the community and society also pay a price when limited work opportunities may lead to frustration, suicide, violence, crime, mental illness, or alcoholism and other substance abuse. The GPI treats each hour of underemployment (the number of unprovided hours for constrained workers) as a cost, just as leisure time is considered a benefit. An hour of leisure time is a desirable objective whereas an hour of underemployment is a burden.

- **Net Capital Investment**

The economic sustainability of a nation is affected by the extent to which it relies on foreign funding to finance its current consumption. A nation that borrows from abroad to pay for a spending spree will feel rich for a short time. But the illusion of wealth will vanish when the debt comes due or when the value of the currency drops as foreign investors lose confidence in that nation's ability to repay its loans.

This indicator measures the amount that Americans invest overseas minus the amount foreigners invest in the United States, or the net change in our international investment position. The annual change indicates whether the U.S. is moving in the direction of net lending (if positive) or net borrowing (if negative). If the change is positive, the U.S. has in effect increased its capital assets. If it is negative, part of U.S. capital formation is in fact based on wealth borrowed from abroad that must eventually be repaid with interest. We have thus included annual changes in the net international position as a measure of the long-term viability of our economy.

The GPI accounts track the change in the five year rolling average of net international investment position from the Bureau of Economic Analysis and add or subtract this change depending on its sign.

Environmental Indicators

Environmental quality matters. The GPI factors in the cost of air and water pollution and value of lost forests, wetlands and farmland so we can more fully evaluate the true impacts of our factories, car exhaust and urban sprawl. By taking these costs into account, GPI will help reverse these harmful policies.

- **Cost of Water Pollution**

Water is the one of the most precious of all environmental assets, yet the national income accounts provide neither an inventory of the quantity or quality of water resources nor an account for the cost of damage to water quality. In the GPI framework, the costs of water pollution arise from (1) damage to water quality and (2) damage from siltation which reduces the life span of water impoundments or channels. Although this may involve some double counting (insofar as siltation also damages water quality), on the whole the estimates in this column understate damage because of the lack of data on non-point sources of pollution.

- **Cost of Air Pollution**

The annual economic cost of air pollution to households, infrastructure, the environment, and human health is a typical example of an environmental externality—a cost that lies outside the boundary of the traditional national accounts. It represents a significant omission from conventional economic indicators like the GDP. The GPI corrects for this. The damage estimate includes damage to agricultural vegetation, materials damage (to paint, metals, rubber), costs of cleaning soiled goods, acid rain damage (both aquatic and forest losses), reduced property values and wage differentials, and aesthetics.

Since 1975, the decline in emissions of sulfur dioxide and particulates (which outweigh the small increase in nitrogen dioxide emissions) suggests a decreasing economic cost of air pollution for these three emissions.

- **Cost of Noise Pollution**

While the U.S. has noise pollution regulations, there are no official inventories of its extent or severity. The damage caused by noise pollution in the U.S. in 1972 was estimated at \$4 billion by the World Health Organization. Starting with that estimate, we assumed that the quality of the auditory environment declined by 3 percent per year from 1950 to 1972, based on industrialization and increased noise emissions from motor vehicles and airplanes. From 1972 to 1994, noise abatement regulations are

assumed to have reduced the rate of deterioration to 1 percent per year, but not to have improved it. With no new noise pollution data since the 1995 GPI estimates, we assume a constant rate of decline in the auditory environment at 1 percent per annum.

- **Loss of Wetlands**

Wetlands contain some of the most productive habitat in the world. Yet their value is not represented in economic accounts because the benefits—such as regulating and purifying water and providing habitat for fish and waterfowl—are generally “public goods,” for which there is no overt price. When a farmer drains and fills a marsh, the GDP rises by the increased output of the farm. However, the loss of services from the wetland goes uncounted. The GPI rectifies this by estimating the value of the services that are given up when wetlands acreage is converted to other purposes.

- **Loss of Farmland**

Loss of either natural or human-built capital generates costs to both present and future generations in the form of lost services from that capital. By destroying farmland, we are losing a vital ecosystem service – a sustainable food supply. Farmland losses also generate costs in the form of lost scenic, aesthetic, and historic values, increased flooding, deterioration in water quality, and degradation of wildlife habitat. In the GPI accounts, we address farmland losses resulting from urbanization and lost productivity.

The cumulative loss figure is obtained by multiplying each year’s value per acre by the acres lost in that year, then adding it to the previous year’s loss. As with wetlands, the reason for tracking cumulative, and not marginal losses, is the fact that we are still incurring the costs of farmland lost in 1950, 1960, etc. because we are no longer receiving the stream of benefits these lands once conferred (and still could if they are restored). The GPI assumes that the initial pre-1950 loss was roughly \$3.31 billion.

Urbanization removes the productive potential of farmland in a highly visible way. But it may not be as serious in the long run as the deterioration of soil due to poor management. The decline of soil quality over the past 50-60 years has been masked by higher inputs of fertilizer, pesticides, and fuel. In addition, soil depletion is not necessarily linear. It may not show up gradually in yield reductions, but rather in a sudden and irreversible decline.

In addition to urbanization and soil erosion, soil compaction from heavy machinery is another form of damage to soil. Studies from 1980 estimate the damage from soil compaction at \$3.0 billion in 1980 dollars, or \$5.5 billion in 2000 dollars. We assumed a 3 percent increase per year in the losses due to compaction prior to and following 1980.

- **Loss of Primary Forests and Damage from Logging Roads**

Whenever native, or primary forest land is cut for timber, converted into tree

plantations, or cleared to build a road, that forest's ability to control floods, purify air and water, maintain biological and genetic diversity, provide habitat for sensitive species, produce non-timber forest products or provide scenic, recreational, and aesthetic values to nearby communities is impaired or lost forever. The GPI accounts measure this loss by assigning a price tag to year by year estimates of key primary forest losses and adding such losses to the cumulative damage from previous years. In particular, we assign costs to the loss of longleaf pine forests in the southeastern U.S., old growth forests in the Pacific Northwest, Sierras, and southeast Alaska, and inventoried roadless areas on national forests.

- **Carbon Dioxide Emissions Damage**

Few scientists dispute the link between carbon dioxide emissions and global warming or the link between global warming and increasing incidence and severity of damaging storms, floods, and droughts. And as hurricanes Katrina, Rita and Sandy have illustrated all too well, this erratic weather is exacting an enormous economic toll each year on our households, infrastructure, and natural capital. As the incidence of severe weather events escalates, the costs in insurance payouts and replacing lost or damaged homes, buildings, livestock, and other household resources mount. Ironically, these natural disturbances result in a positive feedback loop whereby increasing frequency and intensity of storms and other severe weather leads to increasing use of natural capital resources as we rebuild shattered homes and infrastructure in the aftermath. Yet neither the cost of our impacts on the Earth's climate, nor the increasing costs of cleaning up after the storm, nor the increased depletion of nature's capital is accounted for by GDP.

The GPI attempts to address this oversight by assigning costs to carbon emissions. But what price do we put on a ton of carbon? There are many ongoing studies that attempt to calculate economic damages per ton of carbon emitted into the atmosphere through our burning of fossil fuels. In one recent meta-analysis of 103 separate studies, Tol (2005) found a mean of \$93 per metric ton, or \$89.57 in year 2000 dollars. Though hotly debated, we adopt this figure as a conservative starting point for incorporating carbon emissions damages into GPI accounts. This is the second largest cost included in the GPI.

- **Cost of Ozone Depletion**

While annual production of CFCs may have declined dramatically, the cumulative impacts on the depletion of the earth's ozone layer continues.

There are no definitive studies showing the combined health and ecological consequences of ozone depletion over the next half century. However, scientists warn that the ozone loss could result in increased exposure to harmful solar radiation that can destroy plants and cause cataracts and skin cancer in humans. Given the potentially catastrophic effects on all forms of life, the GPI includes an estimate reflecting our expectation of the economic costs associated with this long-term

environmental problem – \$49,669 per ton.

- Depletion of Non-Renewable Resources

The depletion of nonrenewable resources is a cost shifted to future generations that should be borne in the present. Nonrenewable natural capital cannot be increased; it can only be diminished. Our current accounting system counts our liquidation of natural capital wealth as income. A prudent approach to sustaining the income and wellbeing of America's households would require investment of a portion of the net rents derived from, for example, mining nonrenewable natural capital into sustainable renewable energy and productivity or energy efficiency gains. In this vein, the GPI uses estimates of renewable energy replacement costs—specifically biomass fuel production costs— as an approximation for the costs of depleting nonrenewable energy reserves, because biomass fuel tends to comprise the largest share of the renewable energy market in annual data compiled by the Energy Information Administration.

The longer we defer investment in renewable energy resources, the greater the economic impact on the well-being of current and future American households when those resources run dry.

Social Indicators

- Value of Housework Work and Parenting

Much of the work performed in households is more essential than much of the work done in offices, factories, and stores. Yet most of this valuable work goes uncounted in GDP. However, commercial childcare in the monetized “service sector” adds to the GDP. Parents regularly make calculations around whether or not it is “worth it” to stay at home and care for a child or pay someone else to care for their child. These calculations and their consequences are nowhere to be found in our GDP.

Other unpaid household labor, such as the physical maintenance of the housing stock (from cleaning to light repairs), also constitutes valuable economic activity.

The GPI corrects for this lost calculation in GDP. The value of household labor in the GPI is derived from the amount that a family would have to pay to hire someone else to do equivalent work in their home.

- Cost of Family Changes

Families are affected by the society around them. If that society is healthy, with plenty of economic opportunities for all, many families remain intact. Changes in the society around them often show up first in family changes. The GPI brings this information into focus in order to ensure that those indicators that measure family life—including the purchase of household goods and time spent with family— are fully understood, and in order to avoid double-counting when dual parent households split and become single

parent households.

- **Cost of Crime**

Crime takes a large economic toll on society. Some of these costs are obvious, such as medical expenses and lost property. But others are more elusive, because they are psychological, such as the trauma of being violated, or are incurred in the form of lost opportunities, such as activities foregone because people fear the possibility of theft or violence. The GPI relies on the Bureau of Justice Statistics National Crime Survey year to year estimates of the cost of crime to victims in terms of their out-of-pocket expenditures or the value of stolen property. Undoubtedly, the full cost of crime is underestimated given the absence of estimates of the more elusive costs.

We also include other defensive expenditures on locks, burglar alarms, security devices, and security services. Most of us would not otherwise purchase these personal, household, or business security items. In the GPI we subtract these expenditures on crime prevention because they represent personal consumption that does not add to the well-being of our households but merely prevents its deterioration or violation.

- **Cost of Household Pollution Abatement**

One of the costs that pollution imposes on the households of the nation is the expenditures made for equipment such as air and water filters. These defensive expenditures do not improve the well-being of households, but merely compensate for the externalities—that is, pollution—imposed upon them as a result of economic activity. Such expenditures merely attempt to restore environmental quality to a baseline level.

- **Value of Volunteer Work**

Volunteers are the glue that keeps much of our social fabric together. Such work is not only performed at home, but also in the broader realm of our neighborhoods and communities. Work done here is the nation's informal safety net, the invisible social matrix on which a healthy market economy depends. Whether each additional lawyer, broker, or advertising account executive represents a net gain for the nation is arguable. But there is little question that workers in the underserved community and volunteer sectors—the churches and synagogues, schools, civic associations and informal neighborly efforts—are doing work that is desperately needed. Despite its crucial contribution, however, this work goes entirely unmeasured in the GDP. The GPI begins to correct this omission.

- **Loss of Leisure Time**

The GDP creates the illusion that the nation is getting richer, when in fact people are working harder to produce and buy more and to pay interest on mounting personal indebtedness. People often complain that they are spending too much time on the job, with too little left for family, chores, or leisure. And with good reason: they are. Since the 1980s, our time spent on

leisure has been gobbled up by longer work hours. A more accurate measure of genuine progress and well-being would consider the loss of leisure that went along with increased output. Accounting for the nation's well-being ought to include the value of leisure time lost or gained.

In order to provide a reasonable estimate, the GPI includes only the value of leisure lost in relation to 1969, the year with the greatest leisure since 1950.

- Value of a Higher Education

The value of higher education is both monetary and non-monetary. It can be measured in the form of increases in the stock of knowledge, productivity of workers and capital, civic participation, job market efficiency, savings rates, research and development activities, charitable giving, and health. Some estimates suggest the total value of this social spillover effect to be \$16,000 per year per college-educated worker. This represents the GPI's second largest addition to personal consumption expenditures.

- Value of Highways & Streets

The GPI does not include most government expenditures since they are largely defensive in nature; they protect against erosions in the quality of life, rather than enhancing it.

On the other hand, some government activities, such as transit systems and sewer or water districts, provide services for a fee in a manner similar to private business. These fees show up in personal consumption figures in the national income accounts and thus are already included in column B. This leaves other government services that could be sold in theory, but are difficult to price with regard to individual users.

Overwhelmingly, the largest item in that category is the use of streets and highways, which we include here as a separate GPI category. The annual value of services from highways and streets is derived the Bureau of Economic Analysis figures of the net stock of federal, state, and local government streets and highways. The annual value of services from streets and highways is estimated by taking 7.5 percent of the net stock value. This is based on the logic that around 10 percent of the net stock (2.5 percent for depreciation and 7.5 percent for average interest rates) is the estimated annual value of all services from streets and highways. However, since we assumed that 25 percent of all vehicle miles are for commuting (a defensive expenditure), this leaves 75 percent as net benefits. Thus the GPI assumes the net service value of streets and highways is 75 percent of 10 percent, or 7.5 percent of net stock.

- Cost of Commuting

Urban sprawl has put more cars on the road, exacerbated traffic congestion, decreased air quality, and increased the time Americans must spend getting to and from work. According to the U.S. Department of Transportation, there has been a 66% increase in the number of vehicles per household and

significant increases in commute times since 1960. While commuting is for most people an unsatisfying and sometimes frustrating experience, the GDP treats it as a benefit to consumers. The more time and money spent commuting, the more these regrettable activities contribute to the GDP. Moreover, GDP does not account for the opportunity costs of time spent commuting; time that could be spent freely with family, at leisure, sleeping, or at work.

The GPI corrects for the shortcoming of the GDP account by subtracting the cost of commuting. There are two distinct types of costs incurred in commuting. The first is the money spent to pay for the vehicle, or for bus or train fare; the second is the time lost that might have been spent on other, more enjoyable or productive activities. In the GPI accounts, the direct (out-of-pocket) costs of commuting are a function of the portion of non-commercial vehicle miles used in commuting, the cost of user operated transport, the cost of depreciation of private cars, the portion of passenger miles on public transportation used for commuting, and the price of purchased local transportation. Data for these variables were taken from the Statistical Abstract of the United States and BEA's National Income and Product Accounts

- Cost of Automobile Accidents

The damage and economic loss due to automobile accidents represents a real cost of industrialization and increasing traffic densities. Economic losses peaked in 1996 at \$206.98 billion.