

To Buy or Repair?

Comparing the Cost of Buying a New Car to Repairing the Old One

The time has come to either declare my worn-out 1999 Saturn dead (therefore inciting the purchase of a new car), or to try and revive this failing car. Although the decision will not be based on cost alone, the price comparisons for each vehicle will be broken down in this project. Choosing this topic for my project was a wonderful opportunity to detail what my financial obligations would be for each vehicle. Oftentimes, a financial choice is made based only on what a monthly payment would be and if that payment seems to be affordable. I believe that I could afford a car loan payment, but am curious to see what a monthly “payment” would be for investing in my old car and making all of its needed repairs. I will include comparisons such as cumulative repairs on the 1999 Saturn versus a monthly car loan payment, monthly standard maintenance projections for each car, average gas mileage costs and insurance differences and then draw these expenses out over a period of three years to see their long term impact.

The root of the decision lies with the old car. It is a 1999 Saturn SC1, with approximately 145,000 miles racked up. It has plugged along for many years without much trouble, but in the past year has begun



to break down rapidly. If I were to fix every single part, the list and associated cost would be as follows:

- Spark plugs $\$8/\text{plug} \times 4 \text{ plugs} = \32

- Spark plug wires \$17.00
- Tires \$59.99/tire x 4 tires = \$240.00
- Replacement wheel rim \$65.00 (used)
- Alignment \$81.00
- EGR valve \$115.00
- Brakes (shoes and rotors/drums) \$592.62
- Purolator fuel filter \$79.99
- O2 sensor replacement \$61.49
- Front and rear shocks and struts \$510.72
- Power flush on the radiator \$80.00
- Transmission fluid flush \$89.95

The grand total for these repairs comes to a whopping \$1,964.77. Realistically, I do not have this cash waiting to be spent on my car. In fact, since most

of these repairs need to be done all at once before the car will pass safety and emissions, I would take out a personal loan of \$2,100 to finance this project. This led me to thinking about auto loans in general and what I could expect as a loan payment if I were to decide against fixing the Saturn and instead purchase



a new car.

The new car in question is a 2008 Honda Civic EX 4D Sedan. This car would suit my current driving needs (it's small with good gas mileage) as well as offers a Honda history of reliability and a spunky body style. I found this car listed through CarMax at \$18, 599. The Civic's specifications boast: only 8,000 miles on the engine, a 4 cylinder Automatic transmission and 25 city/36 highway miles per gallon. Considering that this vehicle is so new with so few miles on it, I could drive this car for several years with peace of mind about it being in good repair.

Thus far, I've determined that keeping the 1999 Saturn would cost me \$2,100 while buying a 2008 Honda would cost at least \$18,999. Oddly enough, both cars would require a loan. The Saturn would require a generic personal loan, while my Honda would be an auto loan. The auto loan for the Honda would be increased to \$19,000 to help cover taxes and fees. My lending institution would be America First Credit Union and would be able to offer me the following rates for each loan:

\$2,100 Loan for the '99 Saturn SC1

\$19,000 Loan for the '08 Honda Civic

Personal: 12%, 5 year, fixed

Auto: 3.99%, 5 year, fixed

4.74%, 6 year, fixed

5.49%, 7 year, fixed

Using the payment formula I have calculated a monthly loan payment for each loan option:

$$\text{Pmt} = \frac{P \times (\text{APR}/n)}{1 - (1 + \text{APR}/n)^{-nY}}$$

$$\text{Monthly Pmt for Saturn} = \frac{2,100 \times (.12/12)}{1 - (1 + [.12/12])^{-12 \times 5}} = \frac{2,100 \times .01}{1 - (1.01)^{-60}} = \frac{21}{1 - .55} = \mathbf{\$46.66/mo}$$

$$\text{Mo. Pmt for 5 yr Auto Loan} = \frac{19,000 \times (.0399/12)}{1 - (1 + [.0399/12])^{-12 \times 5}} = \frac{19,000 \times .003325}{1 - (1.003325)^{-60}} = \frac{63.175}{1 - .819} = \mathbf{\$349.03/mo}$$

$$\text{Mo. Pmt for 6 yr Auto Loan} = \frac{19,000 \times (.0474/12)}{1 - (1 + [.0474/12])^{-12 \times 6}} = \frac{19,000 \times .00395}{1 - (1.00395)^{-72}} = \frac{75.05}{1 - .753} = \mathbf{\$303.84/mo}$$

$$\text{Mo. Pmt for 7 yr Auto Loan} = \frac{19,000 \times (.0549/12)}{1 - (1 + [.0549/12])^{-12 \times 7}} = \frac{19,000 \times .004575}{1 - (1.004575)^{-80}} = \frac{86.925}{1 - .682} = \mathbf{\$273.35/mo}$$

The cheapest auto loan (7 years at 5.49%) comes to \$273.35 per month, which is approximately 5.8 times higher than the personal loan monthly payment of \$46.66 to fix my old Saturn.

After loan payment estimates, I wanted to know what monthly insurance and gas would cost for the Honda compared to what I currently pay with the Saturn. I ran the following quote for insurance and gas costs. I will calculate few gallons lower on the Honda Civic for a higher ballpark number:

1999 Saturn SC1

Insurance:

\$50/month x 12 months = \$600/year

Gas:

$\frac{19 \text{ miles}}{1 \text{ mi.}} \times \frac{1 \text{ gallon}}{\$3.00} = \frac{19 \text{ miles}}{\$3.00} = \underline{\underline{\$16 \text{ mi.}}}$

$\frac{800 \text{ miles}}{1 \text{ mo.}} \times \frac{\$16}{1 \text{ mi.}} = \frac{(800)(.16)}{1 \text{ mo.}} = \underline{\underline{\$128 \text{ mo.}}}$

2008 Honda Civic

Insurance:

\$78.80/month x 12 months = \$945.60/year

Gas:

$\frac{23 \text{ miles}}{1 \text{ gallon}} \times \frac{1 \text{ gallon}}{\$3.00} = \frac{23 \text{ miles}}{\$3.00} = \underline{\underline{\$13 \text{ mi.}}}$

$\frac{800 \text{ miles}}{1 \text{ mo.}} \times \frac{\$13}{\text{mi.}} = \frac{(800)(.13)}{1 \text{ mo.}} = \underline{\underline{\$104 \text{ mo.}}}$

The insurance would increase with the new car by \$28.80, or by 57% each month. The gas mileage is rather even. There is only a \$24 difference each month between the two vehicles, with the cheaper of the two cars being the new Honda.

Regular maintenance, such as oil changes and tire rotations, would cost the same for each vehicle, which is approximately \$30 every other month (averaging to about \$15 per month). Since the cost of *regular* maintenance would not increase or decrease with one vehicle or the other, I needn't draw a comparison between these particular expenses.

Each car will have a monthly expense: one that would either go to repair or to payment. This monthly cost is comprised of insurance, gas mileage, a loan payment and regular maintenance. Adding all factors together, I reach an expected monthly cost of:

1999 Saturn SC1

Loan: \$46.66
Gas: \$128.00
Insurance: \$50.00
Maintenance: \$15.00

Total: \$239.66/month

2008 Honda Civic

Loan: \$273.35
Gas: \$104.00
Insurance: \$78.80
Maintenance: \$15.00

Total: \$471.15/month

The monthly cost of the new Honda is 49% more than the monthly cost of repairing the Saturn. After one year the cost of keeping the Saturn would reach \$2,875.92 while the cost of the new Honda (loan, gas, insurance and maintenance) would be \$5,653.80. Over the years I can expect:

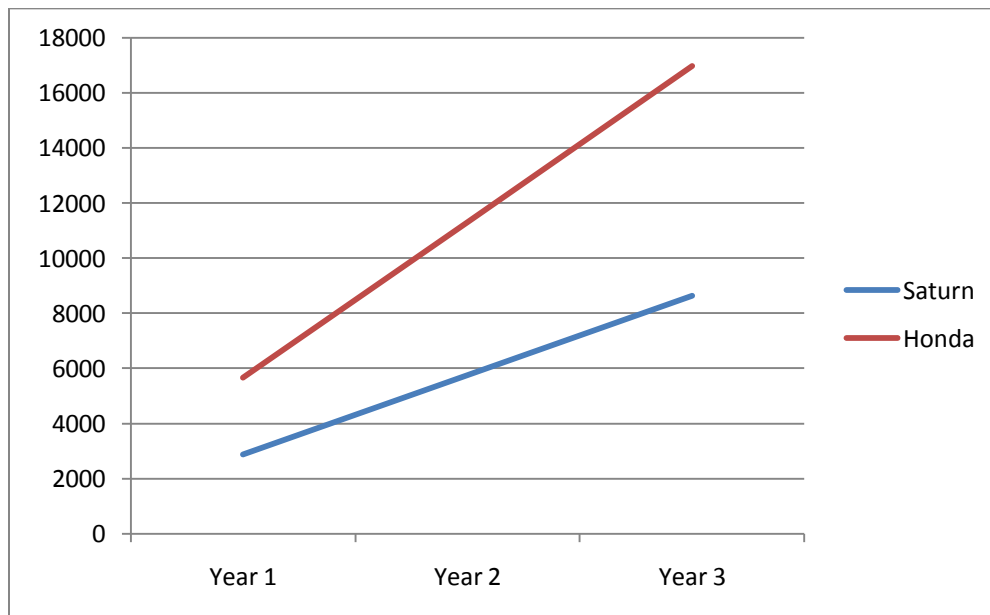
1999 Saturn SC1 - \$239.66/month

Year 1: $(239.66)(12) = \$2,875.92$
Year 2: $(239.66)(24) = \$5,751.84$
Year 3: $(239.66)(36) = \$8,627.76$

Honda Civic - \$471.15/month

Year 1: $(471.15)(12) = \$5,653.80$
Year 2: $(471.15)(24) = \$11,307.60$
Year 3: $(471.15)(36) = \$16,961.40$

After three years with each car, the Honda would cost me \$16,961.40 while the Saturn would cost \$8,627.76. By keeping the Saturn I could potentially save \$8,336.64. The difference in costs over the years is illustrated in the graph below.



These costs grow linearly over the years, by an absolute difference of \$2,777.88, \$5,555.76 and \$8,333.64 respectively. However, the relative difference between each year remains at 49%, with the Honda being the more costly option.

Over three years, I could expect to pay for the Honda nearly 50% more than that of the Saturn. And with yearly projections for the Honda laid out in black and white, these large costs are a little painful to consider. A new car is not an investment, but it is an asset. The Saturn is not an asset, it is a headache. Even after this laundry list of repairs is complete, it is only going to get older. After these things are fixed, I will just be waiting until the day that something else becomes worn out and needs to be repaired or replaced. \$471.15 each month is a considerable amount money. But is it a small price to pay for peace of mind. Because peace of mind, as they say, is priceless.