Fill 'Er Up Commuting and the Real Cost of Gas in LA County

By Lars Carlson | May 31, 2011

Introduction

"Anxiety at the pump" has been an oft-reported phenomenon of late as Americans cope with the consequences of near-record-high gas prices nationwide. No doubt, with roughly 86 percent of Americans' trips to work occurring via automobile,¹ rising fuel prices can cut into expendable income and limit mobility for many. Some studies and



reports document nationwide fuel price trends; however, few look at how fuel prices fluctuate within smaller geographic scales or how local commuting patterns may increase or decrease total household dollars spent on gasoline. This study attempts to look at both of these factors by creating an index incorporating local gas prices, average commuting times, and commute mode. This index will determine the areas within LA County most affected by rising gas prices.

Average LA County Gas Price

[Pictured, Left]

Gas price data was obtained from OPIS, the Oil Price Information Service, a for-profit data collection agency that reports gas prices on a daily basis. For the date January 20, 2011, OPIS reported fuel price data from 2,054 unique stations throughout Los Angeles County. The average price of all stations was \$3.35 per gallon, which was higher than the Energy Information Administration's reported \$3.11 pergallon nationwide average for January 24, 2011.

LA County Commutes

[Appendix A]

Commuting data was obtained from the U.S. Census's American Community Survey 2005 – 2009. The Census records commuting times at intervals and reports the total number of individuals falling within these intervals. Therefore, in order to get a figure for average commute time, we assigned the median to all commuters reporting

¹Bureau of Transportation Statistics/RITA

[Pictured, Left]: OPIS's 2,054 unique reporting gas stations for Los Angeles County. Source: OPIS. [Above]: Credit: www.sxc.hu.

for a time interval. Then, the median was multiplied by the number of commuters in the given interval to find the total minutes driven among those drivers. Next, the total minutes for all intervals were aggregated and divided by the total number of commuters in a census tract. This process provided an average number of commuting minutes spent per commuter in each tract.

From the map of average Los Angeles County commuting times, two main trends are clear. First, the lowest average commute times generally occur in the LA Basin and near major freeways. Second, the highest average commute times occur in the vicinity of Santa Clarita and the Antelope Valley. One census tract near Santa Clarita had an average commute time of over 60 minutes.

Gas & High Commutes

[Appendix B]

As a first step in the investigation of the relationship between gas prices and commuting patterns, the study examined the price of gas near areas within the county with the highest commute times. Using ArcMap, we selected those census tracts with average commute times of greater than 55 minutes—primarily areas in the Santa Clarita and Antelope Valley areas. For these "High Commute" tracts, average gas price was \$3.33 per gallon, or just under the countywide average of \$3.35 per gallon.

Mode Share & High Commutes

[Appendix B]

Of course, high commute times do not necessarily mean more money going to gasoline, since commuters do not all commute to work by automobile. The study therefore examined reported mode of transit to work, sometimes referred to as "modal split," in those areas with high commute times. Within the Santa Clarita and Antelope Valley areas—places where 55-minute or more average commutes are common—there were very high rates of automobile commuting. Some tracts reported automobile commuting rates of over 93%. Almost all reported automobile commuting rates are over 80%. Data was obtained via the United States Census American Community Survey.

Fuel Cost Index

[Appendix C]

We assembled the above data pieces into an index that provides a dollar figure for the price of gas for one year. The methodology for the index is provided in the figure below. For each census tract, we calculated a hypothetical price of fuel for one commute to work, weighted the figure by modal split, and then multiplied the figure by 480 trips per year. In all, this provided an indexical figure for the price of gas for one year's commute.

Two things are worth noting about the construction of this index. First, not all census tracts contained gas stations reporting price. For these tracts, the countywide average gas price was used. Second, this number does not provide an *actual* dollar figure for money spent per person per year commuting. Rather, it should be used to compare fuel expenditure across census tracts.

The ArcMap visualization of this index **(Appendix C)** shows that the north and northeastern portions of Los Angeles County are likely to spend more on gas than other areas of the county. Low gas expenditures primarily occur around Downtown Los Angeles, along the Wilshire corridor, and in patches of the San Fernando Valley and South Los Angeles.

Conclusion

The Fuel Price Index presented in this study attempts to provide a means of comparing fuel expenditure levels across different sections of Los Angeles County. As gas prices continue to rise, policy makers would be wise to consider the Antelope Valley and Santa Clarita, areas highly affected by rising gas prices, first when selecting locations for programs intended to provide alternatives to automobile travel.



Note: Data for this study was collected in conjunction with Urban Planning 206A, Winter Quarter 2011. Gas prices have risen significantly since the time of data collection, and thus projections are likely far lower than present realities.

[Pictured, Left]: Derivation for the Fuel Price Index. ⁸22.6 MPG average U.S. passenger car fuel efficiency, 2008. Source: RITA/Bureau of Transportation Statistics

LA County Average Commute Time



Source: American Community Survey 2005-2009

Average Gas Price Near High Commutes



Source: American Community Survey 2005-2009

Commute Mode Near High Commutes



Source: American Community Survey 2005-2009

Fuel Cost Index [Dollars Per Year]



Source: OPIS, RITA/Bureau of Transportation Statistics, American Community Survey 2005-2009