

## Climate Change Policy Initiative

March 23, 2015

# Efficiency and distributional effects of Illinois gas taxes

By Don Fullerton, Kaveh Nafari and Julian Reif

The current fiscal crisis in Illinois affects all parts of the state's budget. Infrastructure is no exception. For many years Illinois has spent more on highways than it has collected in highway-related revenue. One solution to this problem is to increase the state's gasoline tax. This report discusses the efficiency and distributional effects of increasing the state's gas tax, and also compares a gas tax increase to alternative solutions such as increased use of tolls.

In summary, the gasoline tax might efficiently reduce gasoline use and associated negative externalities such as pollution, but a tax on "vehicle miles traveled" (VMT) might be more efficient at reducing other negative effects of driving like congestion and accidents. Another alternative is increased use of tolls. If these tolls are set at higher rates during rush hour, they can be most effective at reducing the worst congestion. All of these alternative policies might have regressive distributional burdens, since low-income families spend a higher fraction of income on driving than do high-income families, but these "road user taxes" might be justified as a way to charge those who benefit from the use of roads in Illinois.

## Background on gasoline tax rates

Gasoline faces an excise tax per gallon at the city, county, state, and federal levels.<sup>1</sup> It is also subject to general sales tax. The

<sup>1</sup>The state has separate, but very similar, tax rates for gasoline and diesel. Because gasoline constitutes more than 80 percent of motor fuel consumption, this report will lump both of them together under the term "gasoline" unless otherwise noted.

single largest gasoline tax in Illinois is the state excise tax, but this accounts for only a quarter of total gasoline taxes. Figure 1 (page 2) lists all the different gasoline taxes that apply in the city of Chicago. A gallon of gasoline that sells for \$3.50 in Chicago will include a total of 76.2 cents in taxes. Starting from the bottom of the figure, that 76.2 cents includes 18.4 cents in federal excise tax; 19 cents in state excise tax;<sup>2</sup> 11 cents in county and city excise taxes; 26.7 cents in all sales taxes; and a 1.1 cent state environmental tax.

Figure 2 (page 2) shows how Illinois' state and federal gasoline excise taxes have changed over time. Illinois has not changed its gasoline excise tax since 1990, when it was raised to 19 cents per gallon. This places Illinois slightly below the current nationwide volume-weighted average of 21.7 cents per gallon, and it corresponds to the 19th lowest gasoline excise tax rate in the United States.<sup>3</sup> After accounting for inflation, the real total (state plus federal) tax rate peaked in 1970 and has declined steadily since it was last increased in the early 1990's.

## Highway revenue and spending

The gasoline tax is not the only source of

<sup>2</sup>The state excise tax rate for diesel fuel is 21.5 cents per gallon.

<sup>3</sup>The nationwide average gasoline tax rate comes from the OHPI's annual Highway Statistics publication, table MF-121T. If one accounts for average local, city, and county taxes, then Illinois' total tax rate rises to the 15th highest in the nation (American Petroleum Institute, January 2015 Notes to State Motor Fuel Excise Tax Report).

## About the Authors

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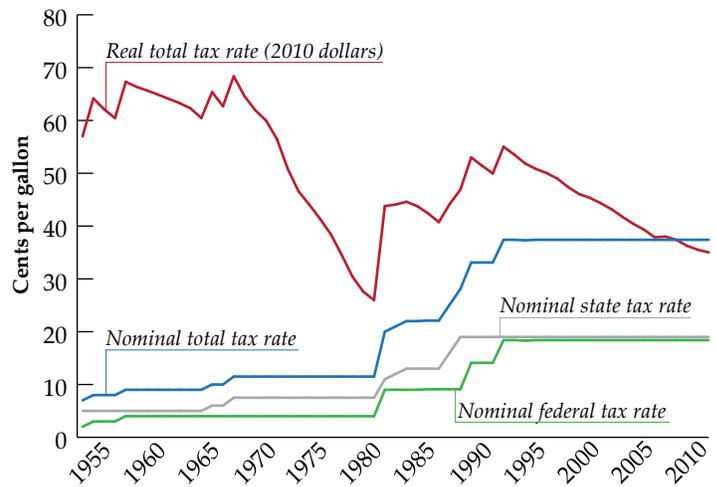
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**Figure 1: Chicago gasoline tax breakdown**



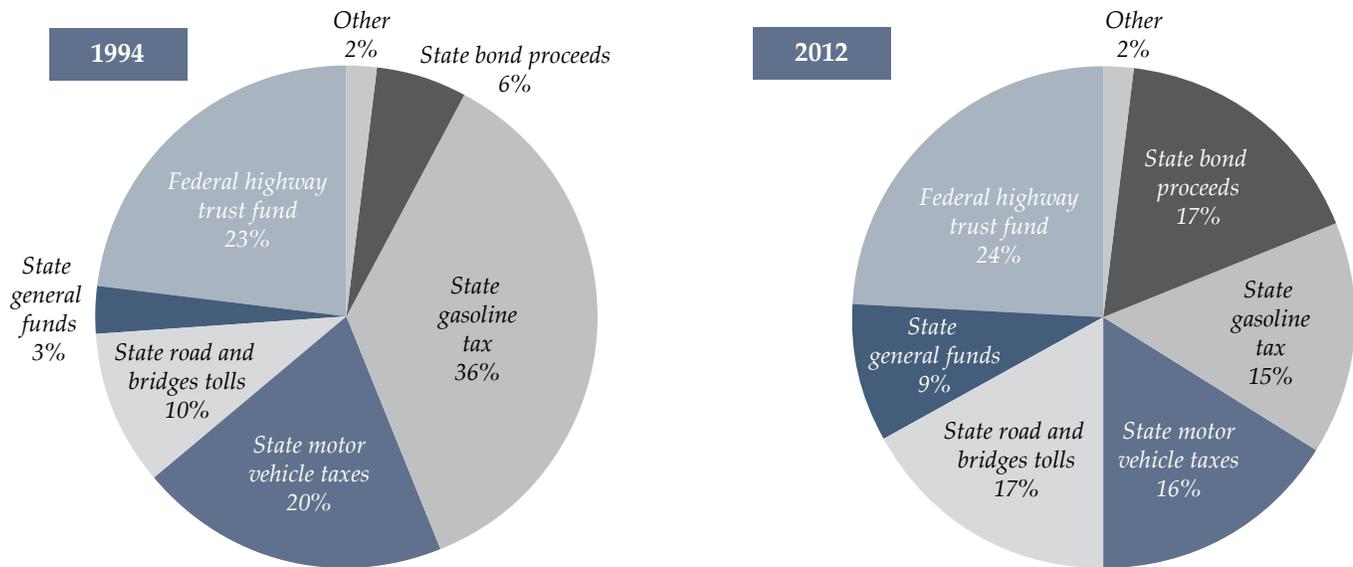
Note: This figure assumes a gasoline price of \$3.50 per gallon. Source: Illinois Policy Institute. Available at <https://www.illinoispolicy.org/hosed-at-the-pump-illinois-gas-taxes>.

**Figure 2: Illinois and federal gasoline excise tax rates, 1995-2010**



Note: Total tax rate is the sum of the state and federal tax rates. Source: U.S. Department of Transportation, Office of Highway Policy Information. Available at <http://www.fhwa.dot.gov/policyinformation>.

**Figure 3: Sources of highway revenue for Illinois, 1994 and 2012**



Note: Motor vehicle taxes include annual registration fees for drivers and cars. Source: U.S. Department of Transportation, Office of Highway Policy Information. Available at <http://www.fhwa.dot.gov/policyinformation>.

highway revenue for the state. Illinois also receives money from the Federal Highway Trust Fund, road and bridge tolls, and motor vehicle taxes.<sup>4</sup> The combination of these “user taxes” and the gasoline tax accounted for 72 percent of total highway revenue in 2012, as shown in Figure 3. The remainder comes out of the state’s general funds and bond proceeds.

State gasoline taxes provide only 15 percent of the total funds. This is down from 36 percent in 1994 (see Figure 3). By contrast, the fraction of revenue coming from bond proceeds, general funds, and tolls have increased.

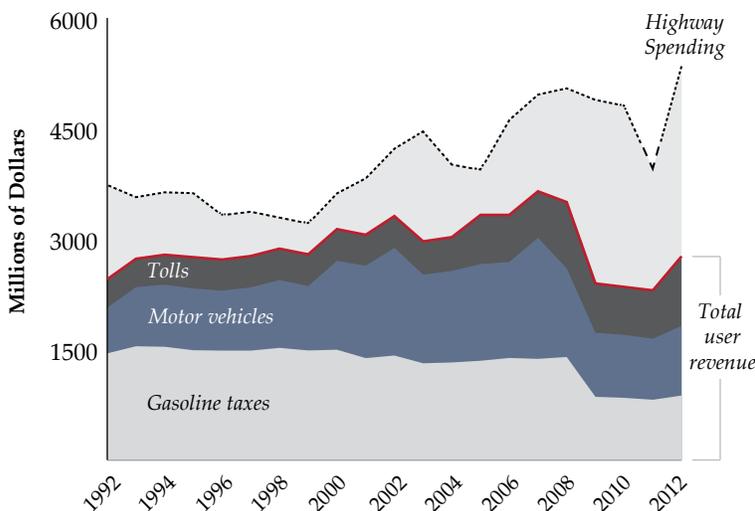
<sup>4</sup>The Federal Highway Trust Fund is financed by the 18.4 cent federal excise tax on gasoline.

Figure 4 (page 3) shows the trend over time in the state’s three main sources of user tax revenue—gasoline taxes, motor vehicle taxes, and tolls—as compared to the state’s total highway spending.

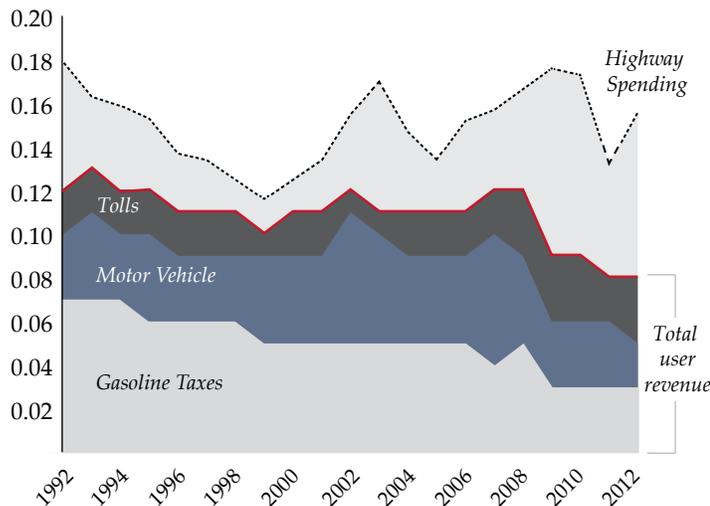
Because Illinois has not raised its gasoline tax rate since 1990, gasoline tax revenue has declined in absolute terms over the past 20 years. This decline has been partially offset by revenue increases for tolls and—in some years—motor vehicle taxes,<sup>5</sup> but a large gap remains between total user

<sup>5</sup>Revenue from motor vehicle taxes increased beginning in 1999 due to a hike in driver’s and vehicle license fees. Source: *Fiscal Focus*, A publication of the Illinois state comptroller, December 2006. Available at <http://www.ioc.state.il.us/index.cfm/resources/fiscal-focus/december-2006-transportation/>

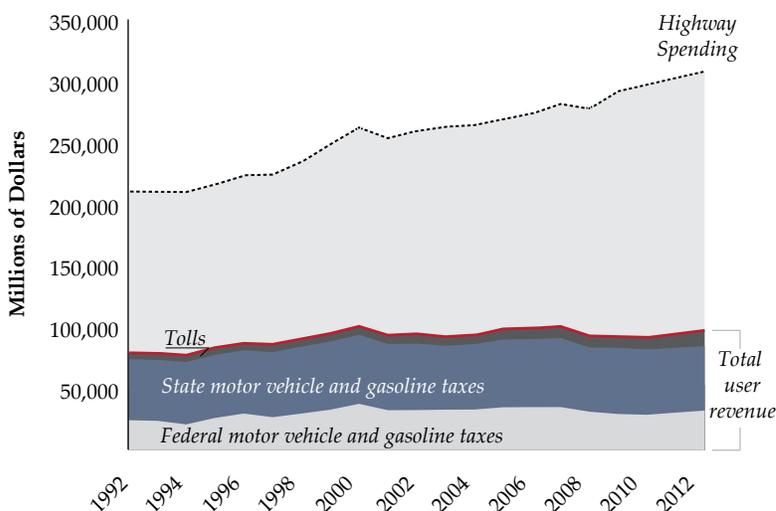
**Figure 4: Real Illinois highway spending and revenue from tolls, vehicle taxes, and gasoline taxes (2010 dollars)**



**Figure 5: Illinois user tax revenue as a fraction of total tax collections**



**Figure 6: Real U.S. highway spending and user tax revenue (2010 dollars)**



Sources, Figures 4-6: U.S. Department of Transportation, Office of Highway Policy Information, available at <http://www.fhwa.dot.gov/policyinformation>, and U.S. Census Bureau, available at <http://www.census.gov>.

tax revenue and total highway spending, and this gap has grown substantially in recent years.<sup>6</sup>

Another way to examine the trend in gasoline tax revenue is to compare it to other revenue sources. Figure 5 shows that gasoline tax revenue has fallen from 7 percent of total state tax collections in 1992 down to 3 percent in 2012. By contrast, highway spending as a fraction of total tax collections has fluctuated but remains at roughly the same level in 2012 as it did back in 1992.

Illinois' highway funding shortfall is not unique. Figure 6 shows that while highway spending has increased enormously across the whole country, national user tax revenue has barely budged. This has put pressure on the U.S. Federal Highway Trust Fund, which has been teetering on bankruptcy in recent years. If its funding is not shored up, this source of highway revenue for the state may dwindle.

Absent a significant change in policy, the gap between Illinois' highway spending and user tax revenue is likely to grow over time, for two reasons. First, real gasoline tax revenue is likely to continue decreasing due to inflation and the improved fuel efficiency of automobiles. Second, highway spending will probably increase because the state's infrastructure remains in shambles. The American Society of Civil Engineering's (ASCE) 2014 report card for Illinois infrastructure says that more than 40 percent of Illinois' major roads are in "poor or mediocre condition" and concludes that additional long-term funding sources will be required to pay for the repairs.<sup>7</sup>

### What is the purpose of the gasoline tax?

Before evaluating the advantages and disadvantages of an increase in Illinois' gasoline tax, we first discuss three different potential purposes for the tax.

#### A. To correct externalities

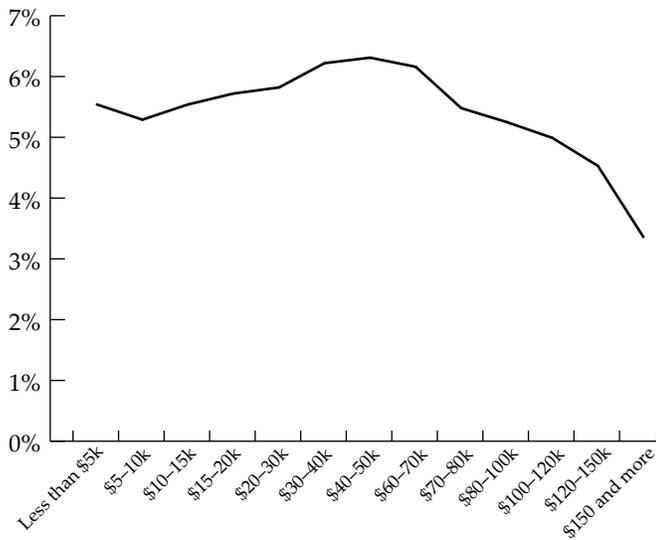
Each driver's gasoline consumption generates negative externalities because it adversely affects other individuals. For example, air pollution from vehicle exhaust affects not just the driver, but also anybody in the vicinity of the automobile. If uncorrected, this will result in overconsumption: drivers will consume more gasoline than what is socially optimal because they do not account for the negative effects of their consumption on others.

Each driver also creates additional negative externalities by causing additional traffic congestion that slows down other drivers. One estimate puts this cost for the Chicago area

<sup>6</sup>A large part of the increase in highway spending is attributable to big infrastructure programs such as the 1999 Illinois Fund for Infrastructure, Roads, Schools and Transit program (FIRST), which spent approximately \$4 billion on road projects over five to seven years. Available at <http://www3.illinois.gov/PressReleases/ShowPressRelease.cfm?SubjectID=3&RecNum=270>.

<sup>7</sup>ASCE Illinois section, 2014 Report Card p. 2.

**Figure 7: Fraction total spending on gasoline, by income group in 2013**



Source: Department of Labor Statistics – 2013 Consumer Expenditure Survey. “Annual income” is defined as income before taxes. Available at <http://www.bls.gov/cex/tables>.

alone at \$4 billion annually.<sup>8</sup> Moreover, unlike pollution emissions, this problem is worsening. Vehicle travel on interstate highways in Illinois increased 25 percent between 1990 and 2012, even though the population grew by only 13 percent and lane miles grew by just 11 percent during the same period.<sup>9</sup> In short, the societal costs of driving have increased significantly. Yet, the drivers who are the main producers of these negative externalities are actually paying less in the way of user fees like tolls and gasoline taxes.<sup>10</sup>

An obvious remedy is to implement a tax on gasoline equal to the social harm it causes. By discouraging driving, a gasoline tax can return us to the socially optimal amount of driving. For example, a higher gasoline tax will encourage individuals to drive less and, in some cases, turn to alternative modes of transportation such as train or bus.

Is the tax rate in Illinois sufficiently high to offset these negative side effects? Existing research suggests it is not. For example, a 2005 article in the *American Economic Review* estimated that the optimal gasoline tax in the United States would now be about \$1.40 per gallon, which is significantly higher than current tax rates in Illinois.<sup>11</sup>

<sup>8</sup>The American Society of Civil Engineers. Available at [www.isasce.org/report-card](http://www.isasce.org/report-card).

<sup>9</sup>The American Society of Civil Engineers. Available at [www.isasce.org/report-card](http://www.isasce.org/report-card).

<sup>10</sup>User tax revenue, displayed in Figure 4, is flat despite a growing population.

<sup>11</sup>Parry I. W. H. and K. A. Small (2005). “Does Britain or the United States Have the Right Gasoline Tax?” *American Economic Review* 95 (4): 1276-128. The authors estimate an optimal tax of \$1.01 in 2000 dollars, which corresponds to \$1.39 in 2014 dollars.

*B. To collect tax from those with “ability to pay”*

Some think the burden of taxation should be on those who can afford it, and not on struggling low-income families. Under this view, all public spending (including spending on infrastructure such as roads and bridges) ought to be financed by use of the income tax, since those with more income have more ability to bear the burden of taxation. Figure 7 shows that the gasoline tax does not fare well under this criterion: high-income people spend a relatively low fraction of their income on gasoline. Middle-income individuals spend the greatest fraction of their income on gasoline.

*C. To collect tax from those who benefit*

In contrast, others think that the burden of paying for public spending should be placed on those who receive the benefits of that spending. For example, a national park funded by admission fees operates on this principle, because only those who enjoy the benefits of the park pay for it.

To some extent, gasoline taxes also operate on this principle, since the revenue goes into highway-related funds used to pay for roads and bridges. For example, the revenue collected from federal excise taxes goes into the United States Highway Trust Fund and is returned to the states for various highway programs. Similarly, Illinois collections from gasoline taxes are divided among state and local governments and are directed to the state’s Road and State Construction Funds, which are used exclusively for the construction, reconstruction and maintenance of the state’s highway system.<sup>12</sup>

**Policy options**

What is the best way for Illinois to close its highway funding shortfall? The answer depends on the aims of the policymaker. Does she want to: reduce negative externalities; collect the tax from those with most ability to pay; or collect the tax from those who benefit the most from highways?

We consider the relative merits of three different options: (i) raise the state’s excise tax on gasoline; (ii) implement a tax on vehicle-miles-traveled (VMT); and (iii) increase the use of road and bridge tolls.

*Raise the gasoline tax*

Perhaps the most obvious solution is to raise the state’s excise tax on gasoline. Not only would this raise revenue, it would also curb—to some extent—negative externalities such as air pollution and traffic congestion. A 10 cent increase in the gasoline tax would raise about \$600 million per year of extra revenue for the state of Illinois.<sup>13</sup> To put this in context, Illinois’ revenue from tolls totaled \$1 billion in 2012.

<sup>12</sup>REVENUE (35 ILCS 505/) Motor Fuel Tax Law.

<sup>13</sup>Illinois consumes 6 billion gallons of gasoline annually, according to the Illinois Department of Revenue’s *Annual Report of Collections and Distributions*.

While it is easy to implement, a higher gasoline tax may not be the ideal way to mitigate the negative externalities of driving. Why? Because a gasoline tax affects the consumption of gasoline, not driving itself. While this distinction is not important for reducing air pollution emissions, it does matter for addressing the other main externalities associated with driving behavior: traffic congestion and traffic accidents. For example, a gasoline tax might encourage drivers to switch to more fuel-efficient cars, which would not reduce traffic congestion.<sup>14</sup>

Another potential problem with the gasoline tax is that it is regressive, as shown in Figure 7. Thus, the gasoline tax is not a good solution for a policymaker who wishes to collect the tax from those most able to pay.

A gasoline tax is also not ideal for taxing those who receive the most benefits from highways. To return to a previous example, a driver of a fuel-efficient car derives the same benefits from the use of highways as a driver of a gas guzzler, but the former will pay much less in tax.

#### *Implement a tax on vehicle-miles-traveled (VMT)*

A good way to reduce traffic congestion and traffic accidents is to tax driving directly. For example, the state could levy a tax on the number of miles driven, based on annual odometer readings. This solution has the added benefit of taxing drivers in the exact proportion to their benefits: the more you drive, the more you pay.

The amount of VMT tax a driver pays will in general be different from what she would pay under a gasoline tax due to factors such as differences in fuel-efficiency amongst cars. However, for many people, a vehicle-miles-traveled tax will not differ substantially from a gasoline tax. For this reason, a vehicle-miles-traveled tax is also likely to be regressive.

#### *Increase the use of tolls*

Similar to a VMT tax, road and bridge tolls tax driving directly. However, these tolls can be made to vary by location and time of day, with a higher toll during congested rush hours. This allows tolls to target congestion and traffic accidents more efficiently. While a driver pays the same VMT tax regardless of whether she drives during rush hour or during the middle of the night, a toll can be set to vary with the level of congestion. Thus it encourages drivers to use roads when they are least congested. Moreover, as with a VMT tax, a primary advantage of tolls is that they collect taxes from those who benefit the most from using highways.

## **Conclusion**

The combination of inflation, the popularity of fuel-efficient cars, and large highway expenses has created a persistent funding shortfall for Illinois' highways. An increase in the

gas tax is one obvious solution to this problem. However, this report has also discussed two alternatives—a vehicle-miles-traveled tax and an increased use of tolls. These alternatives have advantages not shared by the gasoline tax. In particular, they are better able to reduce the twin problems of traffic congestion and traffic accidents, because they tax driving directly.

Although a vehicle-miles-traveled tax and a toll tax are quite feasible to implement with current technology, they may face significant political obstacles from people accustomed to “free” roads. In addition, like the gasoline tax, they are regressive: poor consumers spend a larger fraction of their income on driving than do rich consumers. If policymakers' primary goal is to collect highway revenue from those with “ability to pay,” the state's best option might be to do nothing about the gas tax, but let it wither away and instead use general revenues from the income tax to pay for roads.

## **Further Reading**

Parry I. W. H. and K. A. Small (2005). “Does Britain or the United States Have the Right Gasoline Tax?” *American Economic Review*, 95 (4): 1276-128.

U.S. Department of Transportation, Office of Highway Policy Information, *Highway Statistics Series*. Available at: <http://www.fhwa.dot.gov/policyinformation/statistics.cfm>.

Illinois Department of Revenue, *Annual Report of Collections and Distributions*. Available at: <http://www.revenue.state.il.us/AboutIdor/TaxStats>.

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IGPA's Climate Change Policy Initiative is led by University of Illinois at Urbana Champaign finance scholars Don Fullerton and Julian Reif. The initiative seeks to understand how public policy can protect people from the effects of climate change in Illinois. Hotter temperatures will require more power for air conditioning, and greater weather volatility will mean increased numbers of droughts, floods, and storm damage. Beyond these consequences, Illinois will also be greatly affected by the interactions between uncertain water supplies and energy needs. The Climate Change Policy Initiative evaluates forward-thinking public policies that can help protect Illinois's productivity, health, and future economic welfare.

**Contact Don Fullerton, [dfullert@uillinois.edu](mailto:dfullert@uillinois.edu) or Julian Reif, [jreif@uillinois.edu](mailto:jreif@uillinois.edu), to learn more about the initiative.**

<sup>14</sup>The consumer may actually decide to drive more after buying a fuel-efficient car, because it reduces her marginal cost of driving another mile.