

Measure: Anti-Idling Ordinance (T20)

Design and implement a City-wide ordinance establishing time restrictions on voluntary idling and imposes a series of graduated penalties from warnings to fines for non-compliance. The measure should be accompanied by an extensive public outreach and education campaign, and a pilot program of idle-free zones throughout the City.

Nationwide, voluntary idling results in the estimated waste of 3.84 million gallons of gasoline each day (~1.4 billion gallons/year) and emits 33,433 metric tonnes of CO₂/day (12,203,804 tons/year).

COT ARRA RFP Summary:

Emission reduction potential by 2020:	15,188 tCO ₂ e
Percentage of goal (2012):	.2 %
Percentage of goal (2020):	.7 %
Total annual average implementation costs:	Nominal implementation cost to COT
Entity that bears the costs of implementation:	City of Tucson
Cost/Savings per tCO ₂ e:	\$336 savings
Net annual savings:	\$5.1 million
Entity that realizes the financial return:	Tucson driving population
Equitability (progressive/regressive, income/revenue neutral, etc):	Equity-neutral
Potential unintended consequences:	Possible initial public resistance

Background information:

Voluntary idling of vehicles is one of many daily actions that seem negligible but that, when taken cumulatively, can have a large impact on total emissions of carbon dioxide and on the environment more generally.

On a daily basis, Americans as a whole may be burning as much as 3.8 million gallons of gasoline from voluntary idling, which, in turn, results in producing about 35,000 metric tons of carbon dioxide.¹ Annually, the cumulative effect is significant, as U.S. drivers may be burning 1.4 billion gallons of gasoline and emitting over 12 million tons of carbon dioxide as a result.

An anti-idling ordinance is one of a suite of measures that a municipality can take to reduce idling. An anti-idling ordinance generally involves establishment of a time limit for individual vehicle idling after which penalties can be enforced. Other important variations in an ordinance include anti-idling fleet policies, the creation of idle-free zones with appropriate signage, education and community-based social marketing programs.

Business-as-Usual:

There are no anti-idling restrictions currently in place in Tucson. Absent this initiative, there will continue to be a significant amount of gasoline wasted on a daily and yearly basis.

Using the Hinkle Foundation analysis as a basis, Americans waste 3.8 million gallons of gasoline a day (or nearly 1.4 billion gallons/year). Arizona drivers (at 1.9% of the licensed drivers in the U.S.) would be responsible for 72,200 gallons of wasted fuel/day.² Based on a 2009 population estimate, Tucson's population of 548,555 is approximately 8% of the State's 6,683,129.^{3 4}

Uncontrolled and unnecessary idling by Tucson drivers may thus be responsible for 5,776 gallons of fuel wasted per day (3.8 million gallons/day x Arizona's 1.9% of licensed US drivers = 72,200 gallons/day by Arizona drivers x .08 Tucson percent of State population = 5,776 gallons/day). Annually, this amounts to over 2.1 million gallons of gasoline wasted due to idling by Tucson drivers.

Description of Measure and Implementation Scenario:

The recommended action is an ordinance that places time restrictions on voluntary idling and imposes a series of graduated penalties from warnings to fines for non-compliance.

There are several model idling control ordinances available online and one model by-law from Natural Resources Canada is referenced for use in framing a Tucson-specific ordinance.⁵ The measures should be accompanied by an extensive public outreach and

education campaign, enlisting experts in the automotive sector (mechanics, garages, auto dealers, etc.) to help deliver messages on the wear and tear, possible reduced engine life, and other vehicle damage of voluntary idling.

The City should also develop a pilot program of idle-free zones as part of the measure along with the public education and enforcement tools necessary to ensure that the benefits of reduced idling can be achieved.

We assume that a significant proportion of the city's licensed drivers, perhaps as many as 50%, drive very infrequently or are only part-time residents and do not drive for periods of the year. In our analysis, the bulk of the potential energy and emissions savings can be achieved by reaching the most active driving population in the city with outreach and education efforts.

Has the Measure been implemented elsewhere and with what results?

The impact of idling has long been recognized. Many countries have pursued anti-idling initiatives, including a nationwide campaign in Canada and regional campaigns in Japan and Great Britain. Domestically, at least 13 states have statewide anti-idling laws, and scores of counties and cities have their own anti-idling rules.⁶

In Arizona, there is an anti-idling ordinance in Maricopa County that limits idling to 5 minutes, with a set of fines along with exemptions to its 5-minute rule.⁷

No verifiable fuel savings data could be found from any anti-idling program. However, it is possible to estimate the extent to which drivers might change behavior as a result of an anti-idling ordinance and derive some conservative fuel savings, which we make an effort to do below.

Energy/Emission analysis:

From above, we estimate that Tucson drivers waste 5,776 gallons of fuel per day. The ordinance proposed in this initiative aims to reduce that number significantly, perhaps by as much as 80%.

While individual driver behavior change cannot easily be measured, we know that estimates of the amount of time an individual driver voluntarily idles each day he or she drives ranges from 5 to 10 minutes per car or more.⁸

We assume that the creation of an enforceable anti-idling ordinance results in the elimination of at least 5 minutes of idling per driver per day, perhaps more.

By designing an ordinance to discourage voluntary idling beyond 5 minutes, we project an annual gasoline savings of about 4,600 gallons per day (or 1.7 million gallons/year). This amount approximates the total volumes estimated above to be lost to idling within

the city. This is justifiable to us in that we believe the bulk of the energy and emissions savings can be achieved by reaching the most active driving population in the city, here estimated at 50% of the licensed drivers, or 165,000 drivers.

This would begin with a phase-in of expected benefits as the new restriction becomes institutionalized beyond the first year. We project a quarter of the estimated 165,000 drivers (41,250) begin changing behavior the initial year with full implementation taking the balance of the decade to be realized.

A gallon of gasoline, when burned, creates 19.7 pounds of CO₂. Using the gallons-saved values in the preceding paragraph, the greenhouse gas emission reductions at full implementation of the anti-idling program would amount to 15,188 tCO₂e.

In the first year, with 25% of the targeted savings achieved, emissions reductions would come to 3,797 tCO₂e.

Savings per tCO₂e in 2020: \$238

Climate Change Impact Summary:

COT 1990 Citywide GHG emissions (baseline):	5,461,020 tCO ₂ e
MCPA 7% reduction target for COT:	5,078,749
2012 BAU GHG emissions projection:	7,000,000
2020 BAU GHG emissions projection:	7,343,141
GHG emissions reduction to meet 7% goal (2012):	1,921,251
GHG emissions reduction to meet 7% goal (2020):	2,264,392
Contribution of this Measure (2011-2020):	15,188 tCO ₂ e

Economic analysis:

The cost of implementing an anti-idling ordinance would be subsumed in the routine traffic law enforcement responsibilities of the Tucson Police Department. However, coupled with an effective community-based marketing campaign an anti-idling ordinance may experience a fairly high degree of voluntary compliance, thus minimizing enforcement costs absent such a campaign.

Using Westmoreland's projections of gasoline and diesel prices in Tucson, the potential savings to Tucson drivers from lower vehicle fuel costs is estimated to total ~\$65,554,000 from 2011 to 2020.

To estimate the total net financial impact of reducing voluntary idling, wear and tear costs from the increase in engine restarts needs to be considered. The maintenance costs from reducing voluntary idling are estimated to be no more than \$9 per year per vehicle. Since each driver can only drive one vehicle at a time, we translate the \$9 per

vehicle to \$9 per driver multiplied by 50% of the 330,000 drivers in Tucson for a cost to drivers of \$1,485,000 per year.

Average net annual savings to Tucson's citizens is projected as \$6,580,700 fuel savings less \$1,485,000 maintenance costs = ~\$5.10 million/year.

Using the economic impact multiplier of savings for Tucson citizens of 1.5, the net economic impact is projected to be ~\$7.65 million.

Co-benefits:

There are several co-benefits to implementing idling reduction programs that target either municipal employees or drivers in the community:

1. Reducing idling from fleet vehicles reduces fuel consumption and extends engine life.⁹
2. Less idling also leads to reductions in smog precursor emissions and thus may reduce respiratory ailments.
3. Idling reduction programs are often very popular with residents who benefit from reduced noise and localized air quality deterioration.¹⁰

Equitability:

An anti-idling ordinance would be as equitable as any other motor vehicle moving violation law (speeding, illegal turns, etc.). Adherence to an anti-idling ordinance would be neither regressive nor progressive as it applies to drivers rather than to age, style, or cost of vehicle. Benefits in the form of reduced operating costs might actually be progressive in nature as vehicle operating costs generally represent a larger portion of a low-income individual's budget than they do for someone in a higher income bracket.

Potential unintended consequences:

Depending on the effectiveness of public outreach demonstrating economic advantages to reduced idling in conjunction with an anti-idling ordinance, such an ordinance could be viewed as an intrusion into the driving convenience and patterns of some everyday drivers.

Endnotes:

¹ Anti-idling Primer: Every Minute Counts. Hinkle Charitable Foundation.
<http://www.thehcf.org/antiidlingprimer.html>

² http://www.statemaster.com/red/pie/trn_lic_dri_tot_num-transportation-licensed-drivers-total-number

³ <http://www.azcommerce.com/econinfo/demographics/Population+Estimates.html>

⁴ <http://www.city-data.com/city/Tucson-Arizona.html>

⁵ A Model Idling Control By-Law. Natural Resources Canada.
<http://oee.nrcan.gc.ca/communities-government/transportation/municipal-communities/reports/model-bylaw.cfm?attr=28>

⁶ For a summary of anti-idling regulations in the US, see:
<http://epa.gov/smartway/documents/420b06004.pdf>

⁷ Compendium of Idling Restrictions. American Transportation Research Institute. 2010.

⁸ Anti-idling Primer. Op cit.

⁹ Historically, rules of thumb for driving cars derived mostly from a time before electronic ignition became universal. New drivers were taught that turning off and on the car repeatedly would (a) wear out the battery, (b) wear out the starter, and (c) waste gas. Today, nearly every passenger vehicle engine (cars, SUVs, and pickups) uses electronic ignition and none of these three concerns exists any longer.

Battery technology has evolved today and early battery death is no longer common. In modern automobiles, batteries use less power per engine start, have greater power reserves, and recharge faster than they used to. Also, starters are stronger and more reliable today than they once were. When an engine idles it is not running at its optimum operating temperature and condition. This results in the incomplete combustion of gasoline that can leave fuel residues on the spark plugs, the cylinder walls, and other engine parts. These residues can corrode the engine parts, thereby shortening the life of the system, and can impair fuel efficiency when driving by as much as 4 to 5% according to Natural Resources Canada. For most cars in the fleet, idling neither protects the vehicle engines nor saves fuel. Rather, idling degrades the engine's ability to operate smoothly and efficiently while actually wasting gasoline.

Through field tests, the American Society of Mechanical Engineers Florida Section showed that restarting a car with a six-valve (V6) engine consumes approximately the same amount of fuel as idling for five seconds. Several other environmental groups advocate for either a "10-second" or a "30-second" rule. Natural Resources Canada (A Canadian Government Agency) stresses that idling is not an effective way to warm up a car. Even in winter, only 30 seconds is needed to warm the car's engine. Other vehicle parts, such as the axles, do not warm up until the vehicle is driven. For more information on this topic, see "Idling Reduction Programs for the Chicago Metropolitan Area. Illinois Sustainable Technology Center. October 2008.