IDLING REDUCTION BASICS

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SO, WHAT’S THE BIG DEAL ABOUT IDLING?

Idling consumes a resource while returning little or no benefit

- Slashes fuel efficiency
  - Costs for businesses and consumers
- Consumes an often-nondomestic fuel source
- Affects air quality

Because more than 70% of petroleum in the U.S. is consumed by the transportation sector, transportation fuel efficiency is key to energy resilience.
IDLING IMPACTS

Idling in the U.S. consumes more than 6 billion gallons of fuel at a cost of $20+ billion each year.

- Idling vehicles consume from 0.2 to 1+ gallons of fuel per hour.
- Idling increases vehicle maintenance costs and can shorten engine life, especially for heavy-duty trucks.
- Idling vehicles emit and contribute to the formation of air pollutants, including nitrogen oxides (NOx), particulate matter, and ozone.
- Each gallon of fuel burned produces about 20 pounds of CO₂.
- Idling may be against the law.
WHY DO DRIVERS IDLE?

Habit and comfort

• “Doesn’t idling uses less fuel than stopping and restarting?”
  • The answer is *no* (more on that in a bit)

Need for stationary power

• Some vehicles need power while stopped for:
  • HVAC, communications, emergency lights, hotel load
  • Performing nonpropulsion work
    • Examples: Fire engines, bucket trucks, sewer-line maintenance trucks, cement mixers

*Also: “Creep mode”—the need to move slowly in queue*
Data from an Argonne National Laboratory study showed that for brief passenger car stops, idling for more than 10 seconds uses more fuel (and produces more CO₂) than does stopping and restarting the engine.

Reduced idling = increased fuel efficiency

If you’re likely to be stopped for more than 10 seconds—and you’re not in traffic—consider stopping and restarting while:

• Waiting to pick someone up (e.g., school or work)
• In a drive-through line (e.g., pharmacy, bank, fast food restaurant, dry cleaners)
• Stopped at railroad crossings and bridge lifts

The best way to warm up a vehicle is by driving it with gentle acceleration, not by idling.

ENGINE IDLE MANAGEMENT SYSTEMS

Systems that reduce, but don’t eliminate, idling

• Idle timer/limiter
  • Simply turns engine off after a preset amount of idle time

• Automatic engine shut-down/start-up system
  • Turns engine off when vehicle is stationary and restarts it when certain thresholds (e.g., cabin temperature, battery state-of-charge) exceeded
AUXILIARY POWER UNITS (APUs)

Can be fuel- or battery-powered

• Power provided for heat, A/C, communications, electronics, hotel load, and sometimes power take-off (PTO)
• May be wayside-power (electric) compatible
• Uses range from police cruisers to long-haul trucks to military vehicles

Far left, auxiliary battery in police cruiser (Courtesy of ZeroRPM). Near left, diesel APU on a long-haul, heavy-duty truck (photo by Terry Levinson).
HEATERS AND AIR CONDITIONERS

Some are wayside-power (electrical) compatible

**Heating**

- Heats the cab/sleeper using a fraction of the fuel used in engine idling
  - Air heaters
  - Coolant heaters
- Block heaters (keep diesel engines warm during off hours so that a long idling warm-up isn’t needed)
- Suitable for a range of vehicles, from heavy-duty trucks to snow plows

**Cooling**

- Powered by energy stored in an auxiliary battery (e.g., Li-ion)
  - Increases operational fuel use by a small amount
- Evaporative coolers are an option for hot, dry climates
WAYSIDE POWER

Also called shore power or electrified parking spaces

- Single system and dual system

Ambulance connected to MediDock kiosk (HVAC and power) means no idling emissions next to hospital emergency departments. (Courtesy of the Vermont Department of Environmental Conservation)

Power pedestal for a refrigerated trailer (Courtesy of Shorepower Technologies)
COMPLEMENTARY TECHNOLOGIES
From the basic to the advanced, such as telematics
Based on data from Argonne research, IdleBox is an electronic, modular toolkit to inform fleet managers, drivers, policymakers, and others about the benefits of idling reduction.

cleancities.energy.gov/IdleBox
There's no one-size-fits-all solution.
RESOURCES ON EMERGENCY VEHICLE IDLING REDUCTION

Fact sheets and technical reports

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**Idling Reduction for Emergency and Other Service Vehicles**

Emergency vehicles such as police cars, ambulances, and fire trucks, along with other service vehicles such as airport shuttles, are often operated at low speeds that limit engine idling. However, these vehicles can use fuel and increase emissions and technologies that are being developed to perform their service without idling.

**Police Vehicles**

Police vehicles are equipped with advanced technology to help officers perform their duties safely and efficiently. This technology includes thermal imaging, license plate recognition, and advanced communication systems.

**Ambulances**

Ambulances are equipped with a new generation of emergency response systems that are designed to reduce idling time. These systems help to minimize idling and increase the efficiency of the emergency response.

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**Idling Reduction for Emergency Vehicles: A Case Study**

Emergency vehicles are often equipped with advanced technologies to reduce idling. This case study examines how these technologies can be used to reduce idling in emergency vehicles.

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**Case Study – Idling Reduction Technologies for Emergency Service Vehicles**

Energy Systems Division

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**Vehicle Technologies Office**
IDLING CALCULATOR

Estimate potential savings with idling reduction

IDLEBOX TOOLS CAN SUPPORT YOUR IDLING REDUCTION INITIATIVES

Examples of IdleBox in use. Above, Bank of Utah. Right, ComEd, electric utility in Illinois.
THANK YOU!

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STOP Idling.
START $aving.