Pollution Prevention (P2) for the Transportation Industry

The transportation industry plays a significant role in supporting a positive economy and providing society with needed goods and services. However, there are many associated adverse impacts to the environment as a result of the transportation industry. This informational fact sheets provides basic tips to reduce pollution in the transportation industry.

Road Freight

Maintenance and Repair is Important!

- Maintain fleet trucks according to the instructions found in the owner's manual. A poorly maintained fleet truck can pollute more and be less fuel-efficient than one that is well maintained.

- Remind truck drivers to be mindful of their speed. Obeying highway speed limits can optimize engine efficiency, reduce hydrodynamic or aerodynamic loads, and save fuel, as well as prevent pollution. At highway speeds, a one percent improvement in fuel economy results in saving of about two hundred million gallons of fuel for the U.S. heavy truck fleet.

- Have a mechanic regularly inspect fleet trucks for 1) properly inflated tires - low tire pressure reduces fuel economy; 2) clogged air filters - this can significantly reduce fuel economy; and 3) "Service Engine Soon" light - this could indicate an emissions problem.

- Implementation of gap seals, side-skirts and tails[1] can result in a four to seven percent fuel economy improvement.

- Low rolling resistance (LRR) tires[2] and underbody devices can also increase fuel economy by three to seven percent.

Fleet Trucks

Optimize Load Capacity

- Ensure fleet trucks are at one hundred percent load capacity. About fifteen to twenty-five percent of U.S. trucks on the road are empty and about thirty-six percent of trailers are underutilized.

  ⇒ Fleet trucks that want to increase load capacity by eight to fifteen percent, (excluding weight-based trucks), can side load pallets by ninety degrees when loading them on the truck if trailer configuration allows. This technique may require pallets with different construction.

- Use load bars to create a second layer for products so multiple stacks of pallets can be loaded on a truck. Seek out and plan to take advantage of backhaul opportunities to avoid running empty.

- Balance high density and low density products by matching internal freight or co-loading with a company similar to yours. This can result in a twenty to thirty percent net reduction in process and resource costs.

- Conduct loading dock audits to ensure trucks leaving your distribution centers are fully loaded. This can reduce costs by four to eight percent on outbound moves. For a three percent or more cost reduction, set-up consolidation operations to reduce the amount of trucks needed to move a given amount of freight.

Upgrade and Retrofit

- Buy and/or retrofit conventional gasoline freight trucks with alternative energy sources such as electricity, biodiesel, liquefied natural gas (LNG), ethanol, hydrogen, propane, compressed natural gas (CNG) or biomethane, which is renewable natural gas (RNG).

- Utilize smaller hybrid and/or all-electric vans as an alternative for delivering and picking up materials and goods in cities.

- Implement advanced tractor-trailer technologies, such as electrification, light weighting, improved aerodynamics and fuel-efficient tires to increase fuel efficiency.

Reducing Greenhouse Gas Emissions

- Consider participating in EPA's SmartWay Transport Partnership[3] to help achieve sustainability goals. This program can provide tools and data to help improve your facility's environmental performance.

- Reach out to other shippers with significant overlapping air pollution footprints in your area to discuss sharing shipping schedules and vehicles.

- Consider how you could jointly work with key service providers and facilities to enable them to move to cleaner equipment.

- Consider joint bids for government grants.

- Choose the most carbon-efficient transport mode.

RESOURCE SUMMARY

Reducing pollution in other areas of transportation: Rail and Air Freight

Rail Freight

- Use intermodal rail transport for less time sensitive products such as grains, coal and metals. This can lower costs by fifteen to twenty percent on fuel savings alone.

- Retire older and less fuel efficient locomotives. Purchase and/or retrofit to more efficient locomotives such as "Gensets" that have several independent engines, which turn on and off depending on how much power is needed to perform a particular task.

- Install new idling reduction technologies, such as stop-start systems that shut down a locomotive when it is not in use and restart it when needed.

- Lubricate rails to reduce friction in the wheel-rail interface, saving fuel and reducing wear and tear on track and locomotives.

- Incorporate new and highly advanced computer software systems to calculate the most fuel-efficient speed for a train over a given route, determine the most efficient spacing and timing of trains on a railroad's system and monitor locomotive performance to ensure peak efficiency.

Air Freight

- Retrofit older aircraft with winglets[4] to reduce drag and fuel consumption.

- Reduce fuel consumption by practicing single-engine taxiing[5].

- Use smaller electric powered vehicles to taxi, load and unload aircraft.

- Travel light by removing unnecessary items or equipment prior to takeoff. Extra items equal extra weight, which increases fuel consumption.

- Paint aircraft with lighter-weight paint to reduce aircrafts overall weight.

- Offer carbon offset programs to be carbon neutral for every departure and arrival.

- Reduce use of auxiliary power units by using ground power whenever possible instead.

- Fuel planes with only the fuel they need for each flight. Too much fuel correlates with more weight and drag.

- Use navigation technologies to efficiently strategize departure, arrival, taxi times and flight paths.

- Read the Federal Aviation Administration's *Aviation & Emissions A Primer*[6] to read on current initiatives and future initiatives to reduce emissions.

References

[1] Department of Energy. *DOE's Effort to Improve Heavy Vehicle Aerodynamics through Joint Experiments and Computations*: http://energy.gov/sites/prod/files/2014/03/f13/vss006_salari_2013_o.pdf.

[2] EPA's SmartWay Verified Technologies for SmartWay and Clean Diesel. *Learn About Low Rolling Resistance (LRR) New and Retread Tire Technologies*: https://www.epa.gov/verified-diesel-tech/learn-about-low-rolling-resistance-lrr-new-and-retread-tire-technologies

[3] EPA's SmartWay: https://www.epa.gov/smartway

[4] Dryden Flight Research Center: *Winglets -* https://www.nasa.gov/centers/dryden/about/Organizations/Technology/Facts/TF-2004-15-DFRC.html

[5] Laboratory for Aviation and the Environment, Massachusetts Institute of Technology - *Reducing Airport Operations Environmental Impacts*: http://lae.mit.edu/reducing-airport-surface-operations-environmental-impacts/.

[6] Federal Aviation Administration Office of Environment and Energy. *Aviation & Emissions A Primer.* January 2005. https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/media/AEPRIMER.pdf.

Additional Resources

EPA. Verified Technologies for SmarWay and Clean Diesel. *Learn About SmartWay Verified Aerodynamic Devices:* https://www.epa.gov/verified-diesel-tech/learn-about-smartway-verified-aerodynamic-devices

National Aeronautics and Space Administration (NASA) *The aerodynamics of saving a seemingly simple, NASA-proven wingtip feature is saving airlines billions of dollars in fuel costs:* https://www.nasa.gov/offices/oct/home/tech_life_winglets.html.

Federal Aviation Administration *Next Gen Environment and Energy*: https://www.faa.gov/nextgen/update/progress_and_plans/environment/.