Idle Reduction Technologies:
How to Lower Your Fuel Consumption and Save Money

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Fuel Reduction

- In-use idle reduction – not burning fuel at rest
  - Replace diesel with electricity
  - Auxiliary Power Units
- Work site vehicles have huge opportunity to use "off cycle" idle reduction technology
- Significance of driver behavior

Transport Refrigeration Unit (TRU) a.k.a Reefer

Big **refrigerators on wheels**

Problem Statement:
Transport Refrigeration Units (TRU)

Big **refrigerators on wheels,**
running on **diesel while parked,**
often **running parked for a long time**

} **Idling**

- Expensive
- Polluting
- Noisy

Solution: Grid-connected Electric Transport Refrigeration Units (eTRU)

Big **refrigerators on wheels**,

running on ~~**diesel**~~ **electricity** **while parked**,

often running **parked for a long time.**

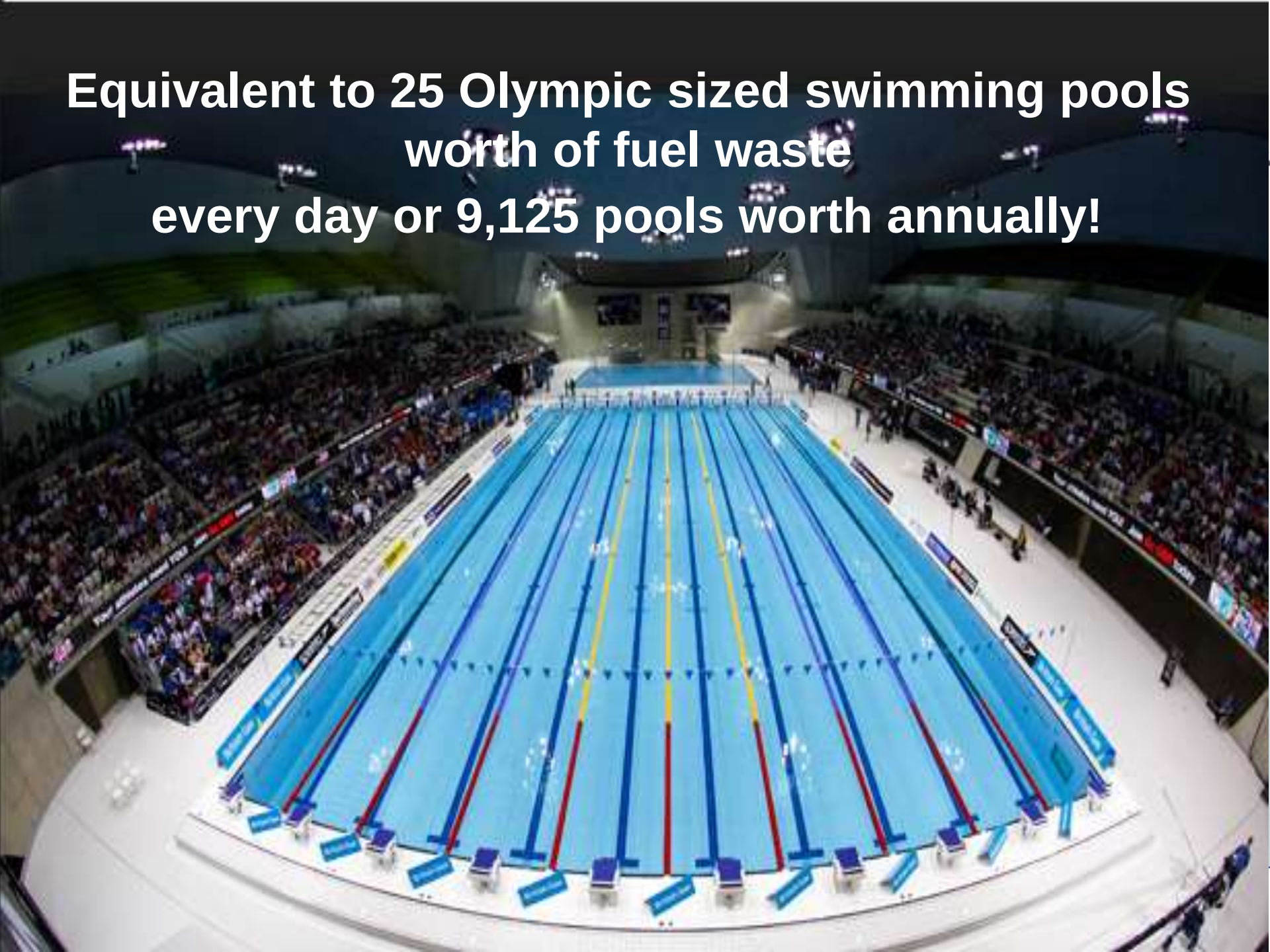
- Cheap (inexpensive)
- Quiet
- Clean (no source emissions)

U.S IDLING PICTURE

- Over 6 billion gallons of fuel wasted through vehicle idling annually, 16.5 million gallons daily.
- ~Half from sleeper tractors pulling trailers idling overnight and during the workday, other half from passenger vehicles.
- Typical long haul truck idles 2,100 hrs per year/10 hrs per day.
- Typical refrigerated trailer idles 4 hours per day.
- Typical workday truck idles 1 hr per day

Equivalent to 25 Olympic sized swimming pools worth of fuel waste

every day or 9,125 pools worth annually!



What's going on?

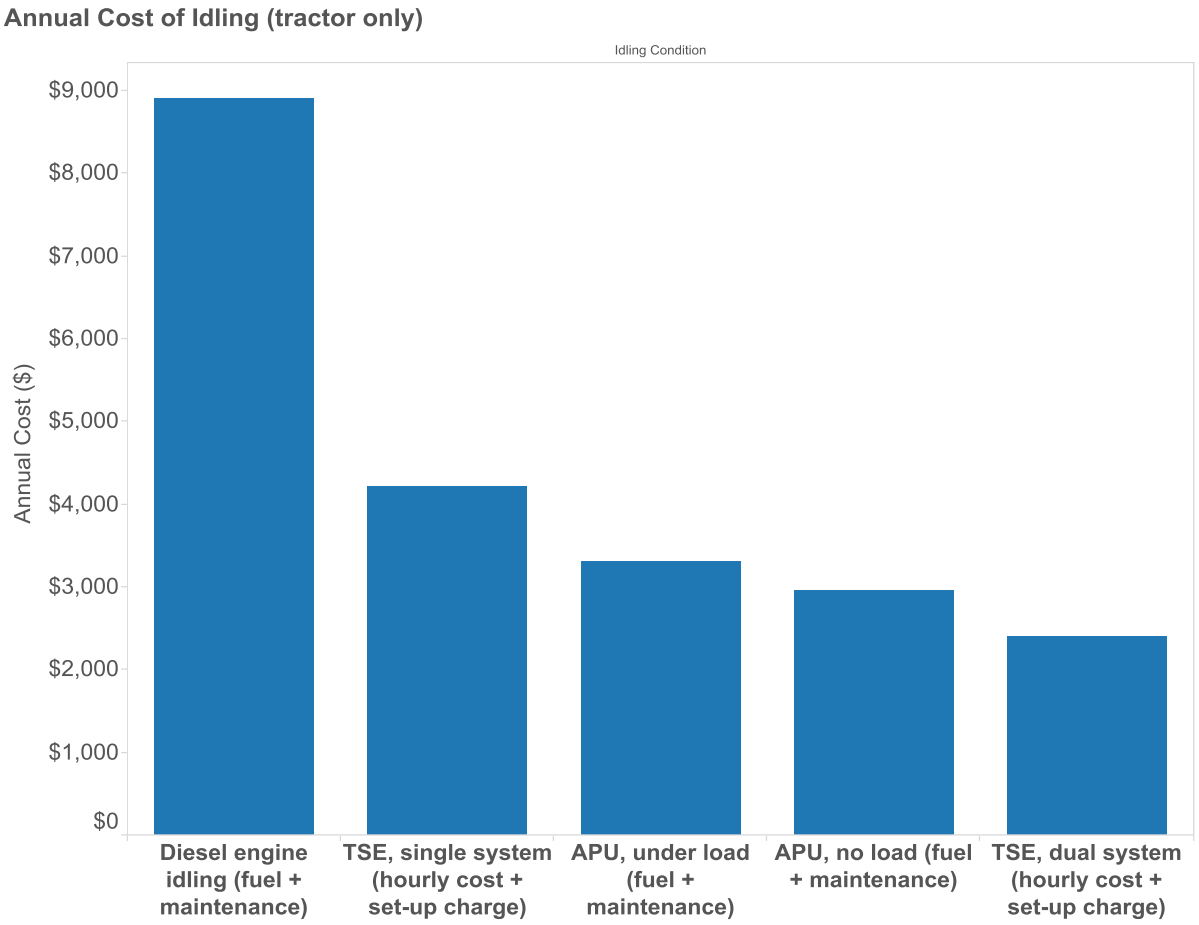
- General lack of awareness about idling
  - Force of habit
  - Outdated information
  - Unaware of negative impacts
  - Unaware of laws
- Lack of alternatives or knowledge of alternatives
- **Unaware of idling time**

Financial Costs

- Nationally ~$15 million spent daily on wasted fuel.
- ~$200/per vehicle in wasted fuel costs annually for passenger vehicle drivers
- ~$1,000+/per truck in wasted fuel costs annually for medium-heavy duty trucks.
- Plus estimated $2000 annual increase in maintenance costs per truck due to idling, per the American Trucking Association (ATA).

What does extended idling cost?

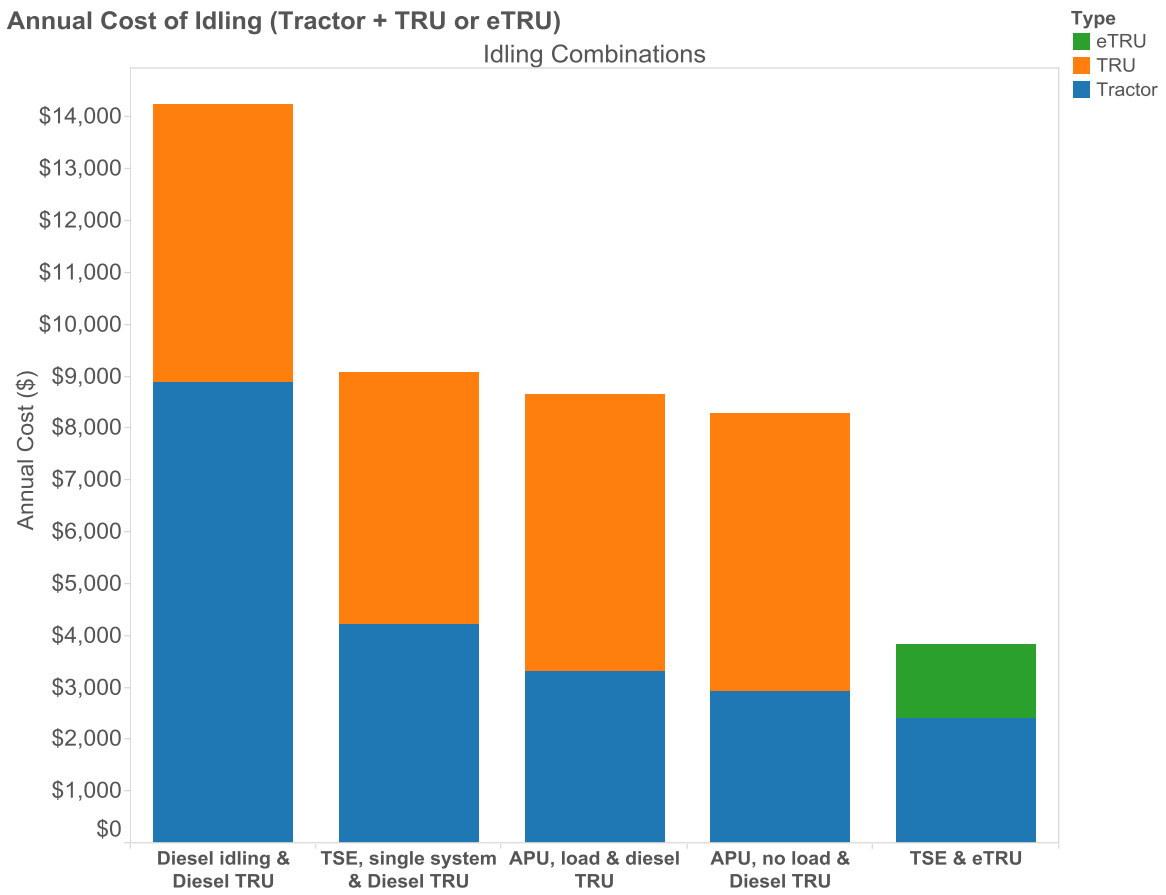
Long haul truck



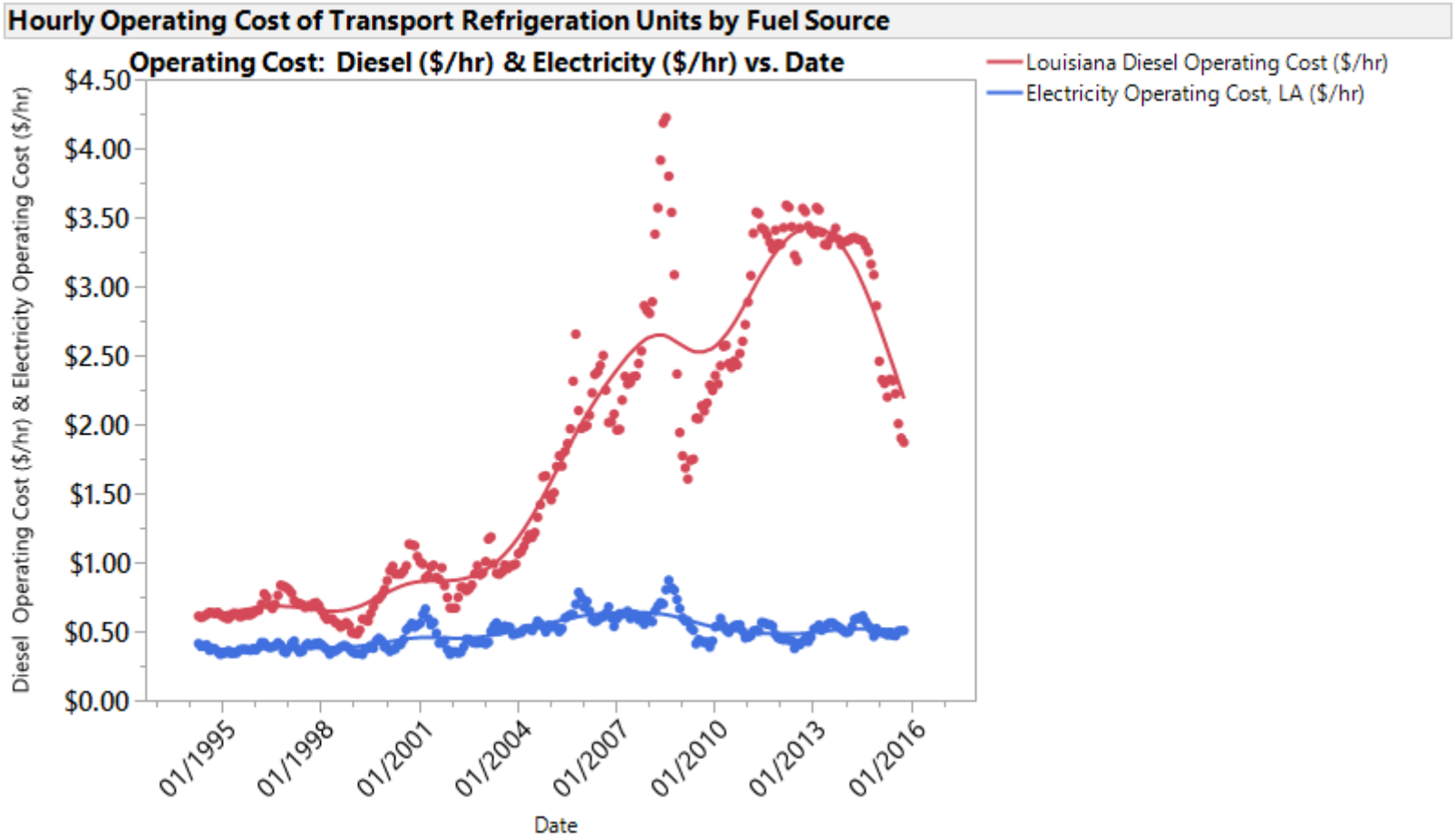
Source: Interstate Electrification Improvement Project

What does extended idling cost?

Long haul truck with refrigerated trailer



Operating Cost ($ / hour)
Diesel vs. Electricity

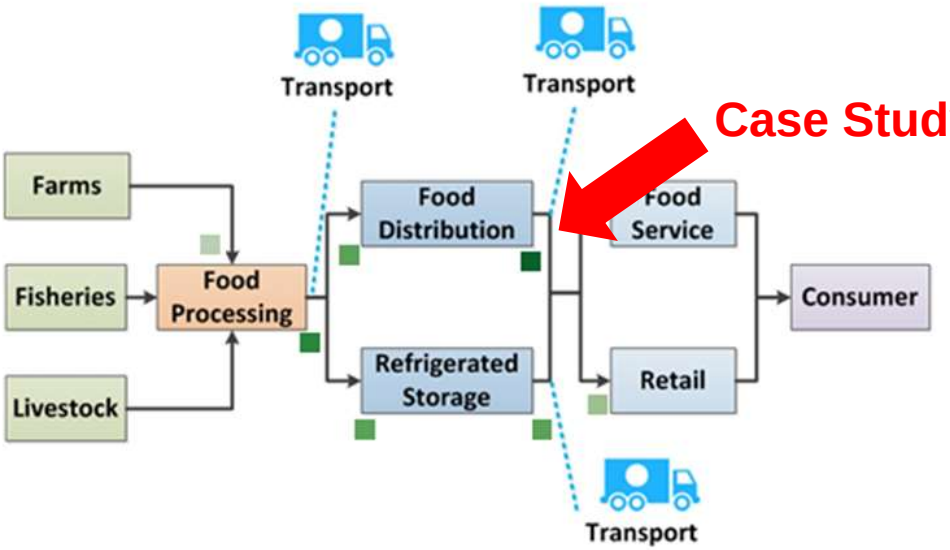


STEP #1: MEASURE

"You do not manage what you do not measure"

- Establish your idling baseline
- Utilize telematics

Case Study #1: Grocery Distribution



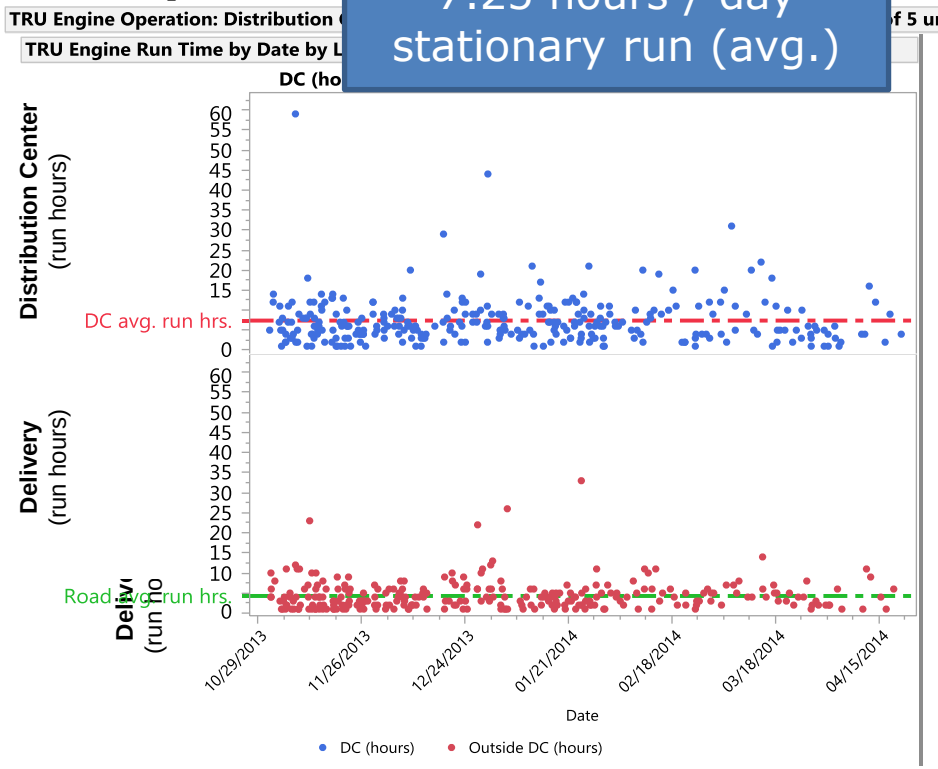
Case Study #1: TRU Engine Run Hours at a Grocery Distribution Center

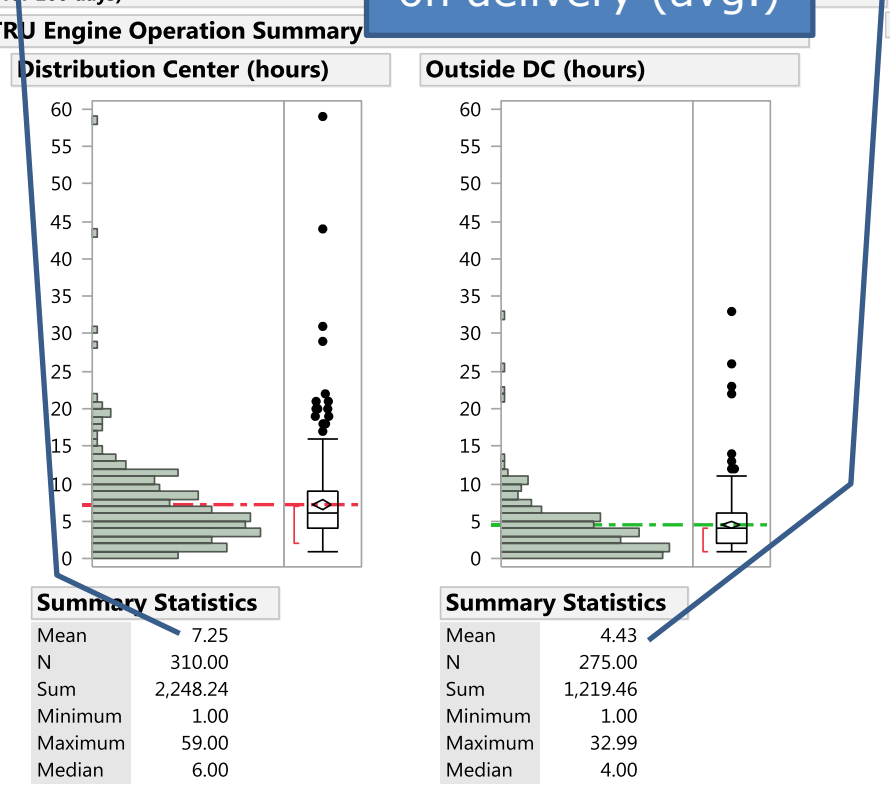
Perception: "We make good utilization of our equipment, we don't run our equipment stationary very much."

Reality:

7.25 hours / day stationary run (avg.)

4.43 hours / day on delivery (avg.)

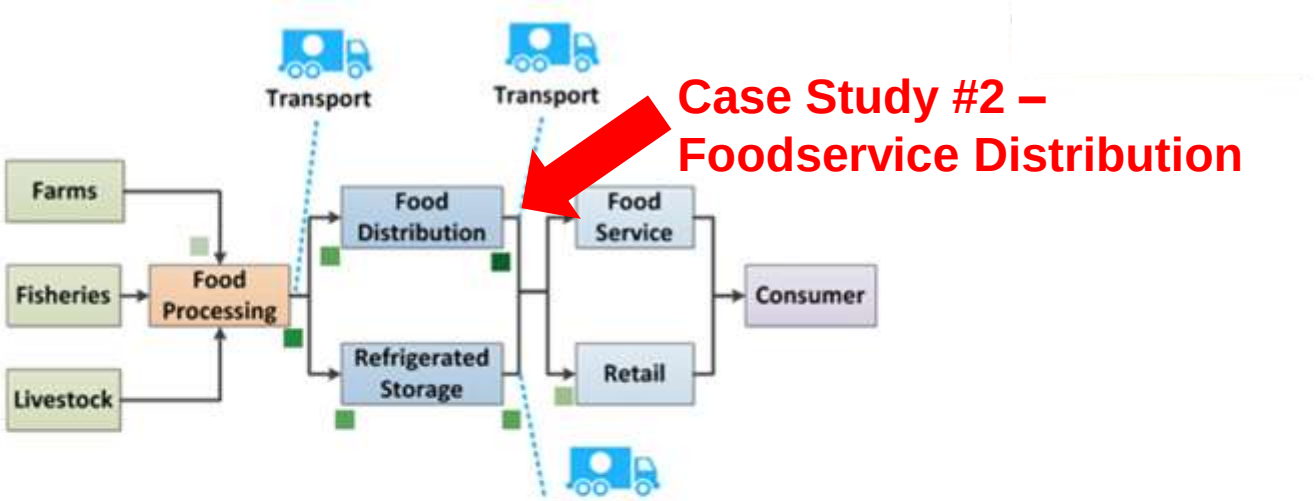




Summary Statistics	
Mean	7.25
N	310.00
Sum	2,248.24
Minimum	1.00
Maximum	59.00
Median	6.00

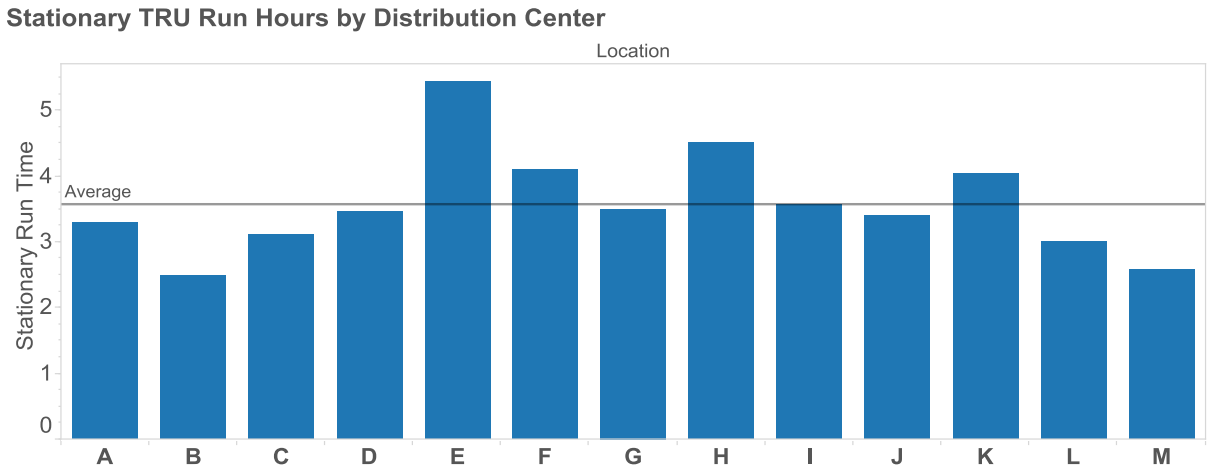
Summary Statistics	
Mean	4.43
N	275.00
Sum	1,219.46
Minimum	1.00
Maximum	32.99
Median	4.00

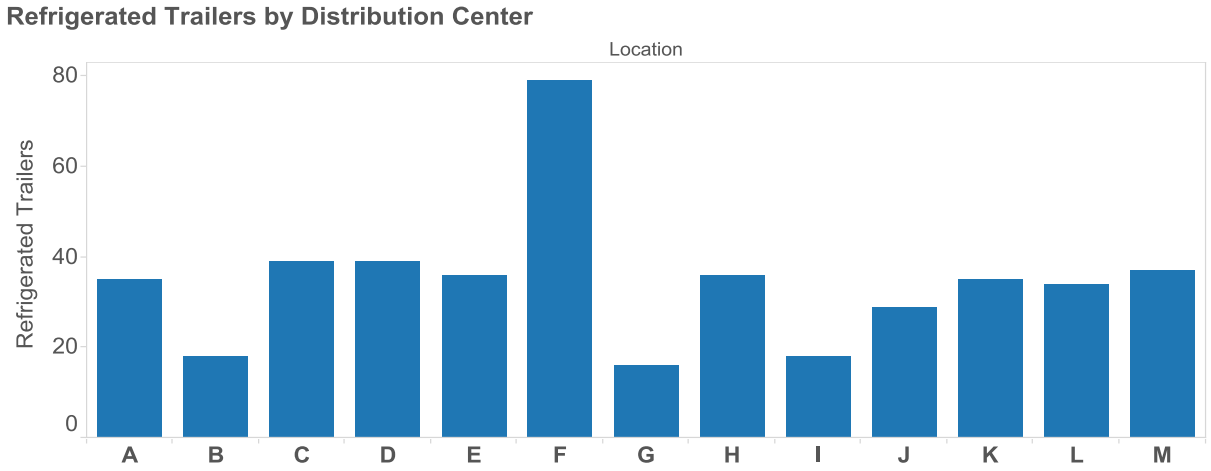
Case Study #2: Foodservice Distribution



- Distribution Center Locations: 25+
- Fleet size: > 900 Refrigerated trailers
- Sampling: 12 Distribution Centers
- Sample Size: 300 Refrigerated Trailers
- Measurement Period: 3 – 6 weeks
- Operation: 5 – 6 days / week

Case Study #2: Foodservice Distribution





STEP #2: POLICY & GOALS

- Establish goals and KPIs
- Set idling limits for individual events
  - At minimum set to local laws
- But also daily idling limits

STEP #3: EDUCATION

- Education and awareness – Don’t sit idle!
- Personal vehicles – Save at home
- Incentive programs

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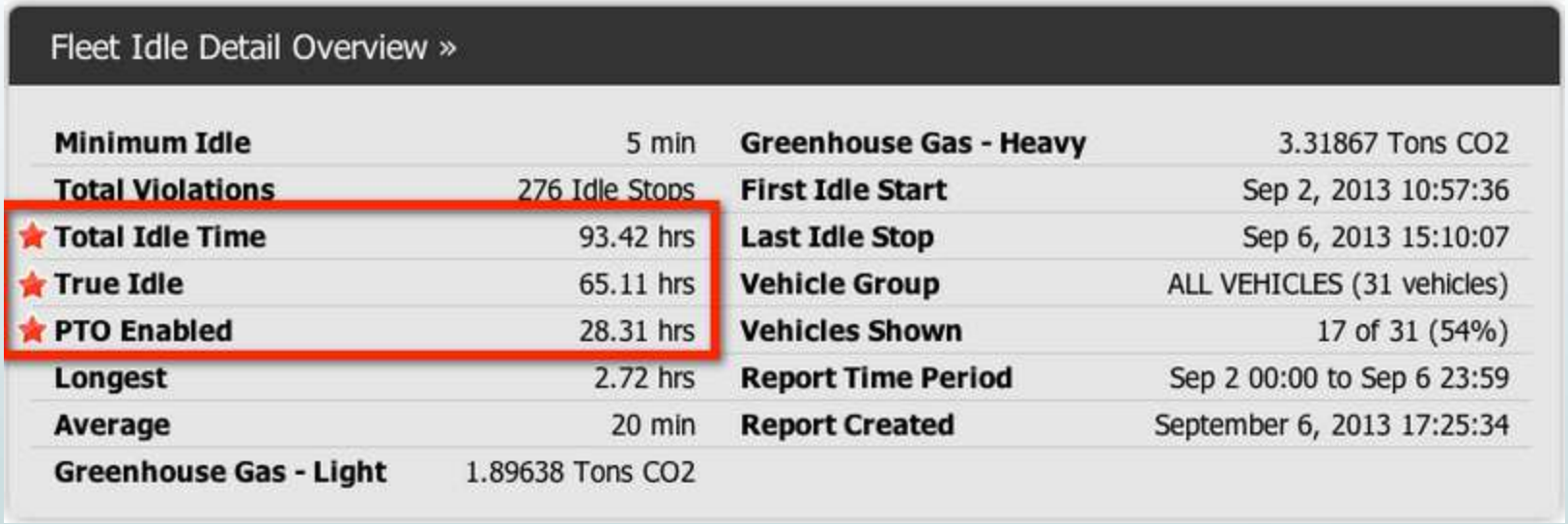
STEP #4: MONITOR

- Monitor your fleet daily or weekly



Fleet Idle Detail Overview »

Minimum Idle	5 min	**Greenhouse Gas - Heavy**	3.31867 Tons CO2
Total Violations	276 Idle Stops	**First Idle Start**	Sep 2, 2013 10:57:36
Total Idle Time	93.42 hrs	**Last Idle Stop**	Sep 6, 2013 15:10:07
True Idle	65.11 hrs	**Vehicle Group**	ALL VEHICLES (31 vehicles)
PTO Enabled	28.31 hrs	**Vehicles Shown**	17 of 31 (54%)
Longest	2.72 hrs	**Report Time Period**	Sep 2 00:00 to Sep 6 23:59
Average	20 min	**Report Created**	September 6, 2013 17:25:34
Greenhouse Gas - Light	1.89638 Tons CO2		

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STEP #5: EXPLORE ALTERNATIVES

- Idle limiters/shutdown systems
- Automatic start-stop technology
- Auxiliary power systems
  - Diesel, batteries, thermal, solar!
- Truck Stop Electrification / Electrified Parking Spaces
- Learn more:
  - Confidence Report: Idle-Reduction Solutions
    http://www.truckingefficiency.org/idle-reduction

Next Steps

- Measure idling / establish baseline
  - Utilize telematics
    - "You do not manage what you do not measure"
  - Go measure!
    - FleetPrint Program
      http://iturnitoff.com/
    - CleanFuture Fleet Assessment
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Questions

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