

Telematics ROI Assessment

State of North Carolina

Presented by:

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Introduction

State of North Carolina Fleet Management Pilot Program

Overview:

Management and oversight of vehicles owned and operated by state agencies and institutions while utilizing fleet telematics through Verizon Telematics, Networkfleet.

Objectives:

To illustrate and institute best practices in fleet management, by proving costs savings by decreasing fuel costs, miles driven through route optimization, Fuel usage and MPG, idle time, correcting fleet utilization, reporting on greenhouse emissions, improving driver safety and liability concerns, decreasing maintenance costs and adding accountability and efficiencies by utilizing GPS and Telematics services.

Current Strategy:

Current pilot consists of Department of Administration, Department of Health and Human Services, Department of Transportation, NC State and UNC at Chapel Hill. These five agencies and institutions make up approximately 72% of the total fleet size for vehicles (33,000) owned and operated by the State of North Carolina. A total of 76 vehicles have been installed with Networkfleet equipment and all participants have been utilizing a full spectrum of services within the product suite. The pilot began February 2014, with a completion date after the long session of the Legislature 2015. All participants have been and will continue receiving scheduled weekly and monthly updates.

Why Networkfleet:

Verizon Networkfleet is a leading provider of wireless fleet management services that improve fleet operations by decreasing fuel use, optimizing vehicle utilization, decreasing maintenance costs with vehicle diagnostics, and improving driver management. The universal solution consists of an in-vehicle unit and an online application, and is compatible with light, medium, and heavy vehicles.

Verizon Networkfleet counts among its customers many local, state and federal entities. We have significant experience not just understanding the return on investment our current public fleet customers have gained, but also best practices during implementation. The purpose of this document is to explain, based on the recent limited implementation, the type of return on investment the State can expect to see during a full implementation.

Outcomes:

Results during the pilot are revealing. The data shows a significant number of areas of improvement possibilities, especially if applied to a larger subset of vehicles. With active management and driver coaching, the State of North Carolina can expect a significant ROI, both economically and environmentally.

Results

Speeding

Overall fleet average speed can have a significant effect on safety, as well as MPG and subsequently fuel usage. In fact, every 1 MPH reduction in fleet speed is about 1% savings in fuel cost (Fleet Owner Magazine, Edmunds.com).

The State's results show many instances of over posted speed during the pilot, about 5000 each month for 5 MPH or more over the posted speed and about 2000 per month for 10 MPH or more over the posted speed limit.

By applying these numbers to the State's entire set of vehicles and drivers it is apparent that the State has a significant amount of potential liability in the driver's behavior as well as a real opportunity to save on fuel. With an active program of transparency, coaching and formal development of telematics data into a vehicle use policy we often see these drop by 90% or more for our customers.

Chart 1: Speed Instances >5 MPH Over Posted Speed

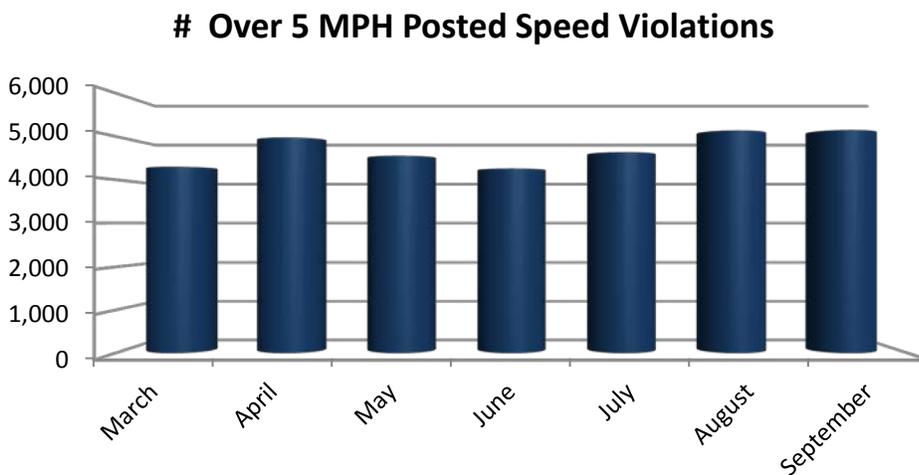
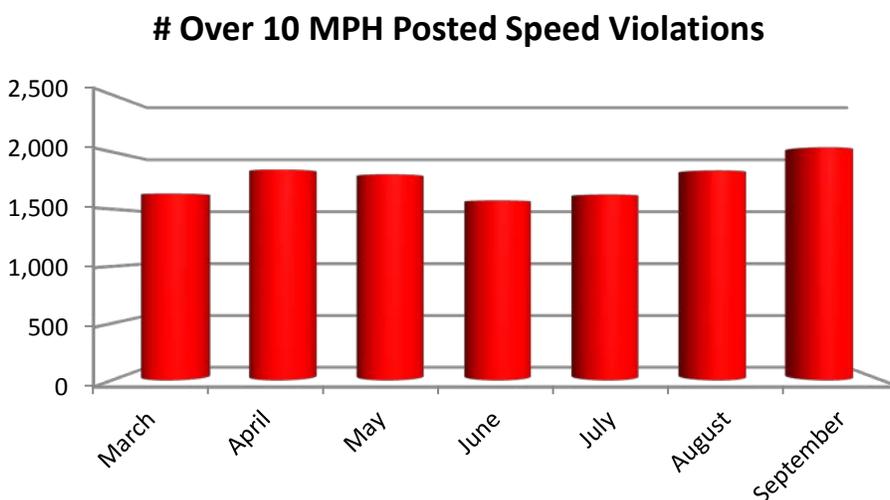


Chart 2: Speed Instances >10 MPH Over Posted Speed



Idling

Idle time also has a significant effect on MPG and subsequently fuel usage. Depending on vehicle type, between $\frac{1}{4}$ and $\frac{3}{4}$ of a gallon of fuel is burned per idle hour.

In Chart 3 you can see that the State actually experienced an increase in long idle events as weather warmed. For July-Sept. the average number of long idle events (10 minutes or more) average more than 1000 per month. For August, these pilot vehicles idled more than 650 hours on 10 minute + idling events. This represented 18% of all engine run time as idling more than 10 minutes at a time. The 650 hours represents about 200 gallons of fuel, about 2.5 gallons per vehicle on average. At \$2.95/gallon, that's \$7.38 per vehicle per month with a potential savings (7,662 vehicles or 23.5% of Total Fleet) of **\$56,545.56 per month**, just by eliminating 10 minutes + idle events.

Chart 3: Number of Idle Events over 10 minutes

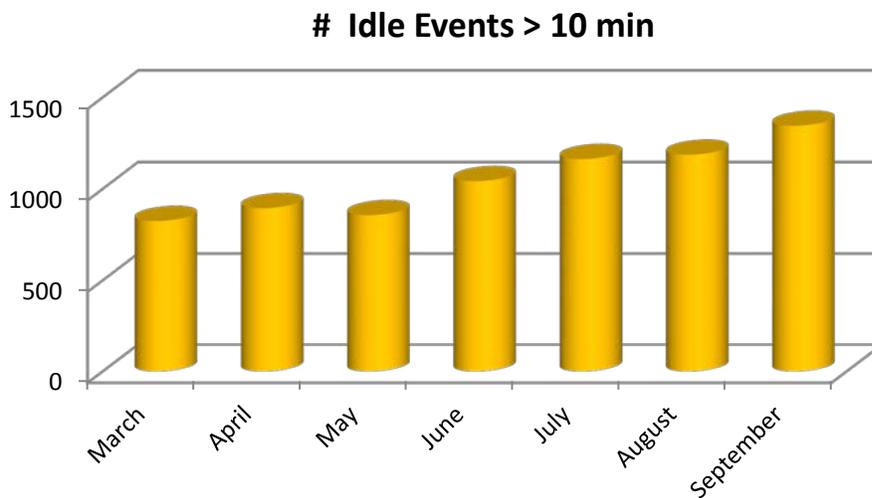


Exhibit 1: Arkansas DOT Slide Regarding Reduced Fuel Usage

LESS UNLEADED GASOLINE PURCHASED

- ➔ 62 months prior to implementation of GPS program:
Average gallons per month = 167,656
- ➔ 20 months since implementation of GPS program:
Average gallons per month = 142,938

- ➔ Average gallons per month savings = **24,718**
- ➔ Average price per gallon = \$3.31
- ➔ Average monetary savings per month = **\$81,816.58**
- ➔ Average monetary savings annually = **\$981,798.96**

Exhibit 1 shows Arkansas DOT's fuel savings after implementing vehicle telematics. Note that in addition to the \$981K+ monthly savings on unleaded fuel, they are also saving more than \$200K per month in diesel fuel. Much of this savings come directly from the improvement in driver behavior – reduction in speed, idle, and hard acceleration/braking.



Hard Braking and Acceleration

Hard Braking and Acceleration events, like Speeding, speak to a pattern or culture of driving among some drivers. According to fueleconomy.gov, hard acceleration and braking can reduce fuel economy on the freeway by 33% and 5% around town. Moreover, this pattern of driving also leads to more frequent repair of vehicle brakes, tires, windshields and more. Moreover, while some drivers don't speed, many brake and acceleration unnecessarily and don't even know it. Charts 4 and 5 show there is an opportunity for improvement among the pilot vehicles and certainly among the state's fleet as a whole.

Chart 4: Total Hard Braking Events

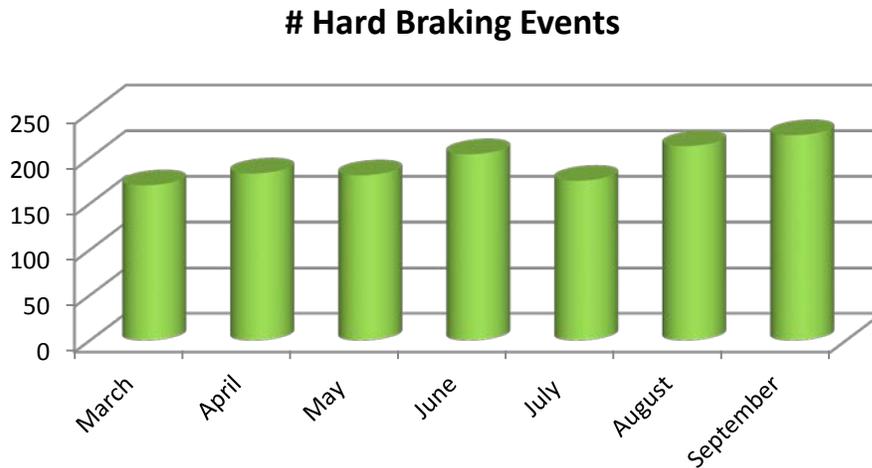
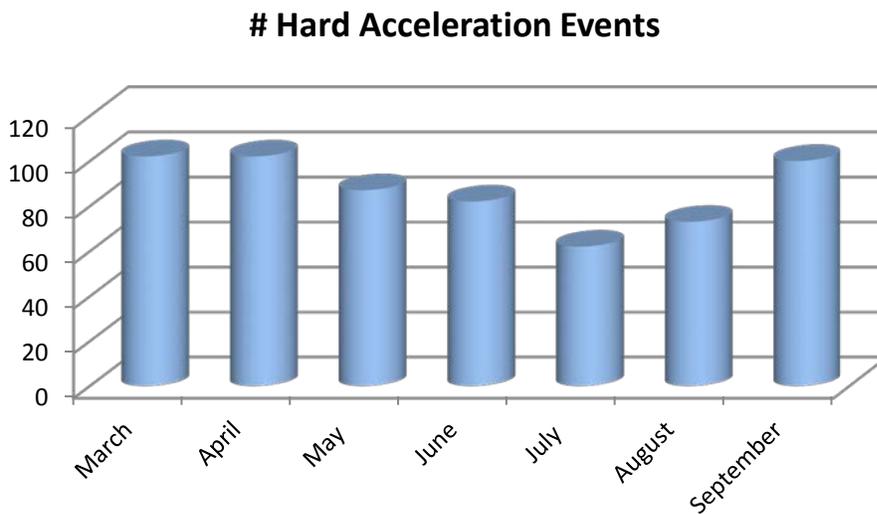


Chart 5: Total Hard Acceleration Events



Miles Driven

Reducing miles driven by a fleet can be the single largest return on investment for fleets. There are obvious benefits like reduced fuel used. However, the downstream benefits are even more significant. Less miles means less time behind the wheel and potential labor/overtime savings. PM schedules are extended because vehicles are used less. Vehicle life can be extended, leading to fewer vehicle purchases and a reduced fleet size in general – without sacrificing the amount of work completed.

While there is no downward trend during the pilot, our customers often see a reduction in miles as part of active coaching and other measures used to inform employees about how telematics is being used.

Chart 6: Miles Driven

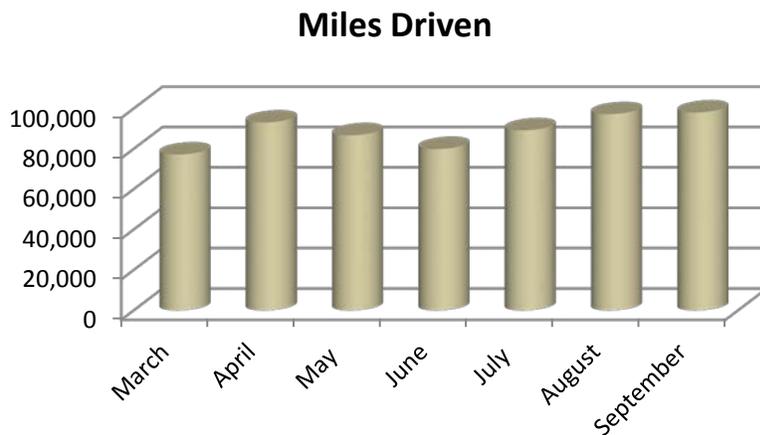


Exhibit 2 – Arkansas DOT Slide Regarding Miles Driven

LESS MILES DRIVEN

- ➔ Prior to implementation of GPS program:
Total miles driven FY2012 by vehicle groups designated for GPS installation = 35,762,287
 - ➔ After implementation of GPS program:
Total miles driven FY2013 by same vehicle groups with GPS installed = 34,028,853
-
- ➔ Average less miles driven per month = 144,453
 - ➔ Total less miles driven annually = 1,733,434
 - ➔ Average monetary savings per month (.25/mile) = \$36,113
 - ➔ Average monetary savings annually = \$433,359

Exhibit 2 is a slide from Arkansas DOT depicting their miles reduced and subsequent savings. The \$433,359 represents a savings of more than \$14/month/vehicle.



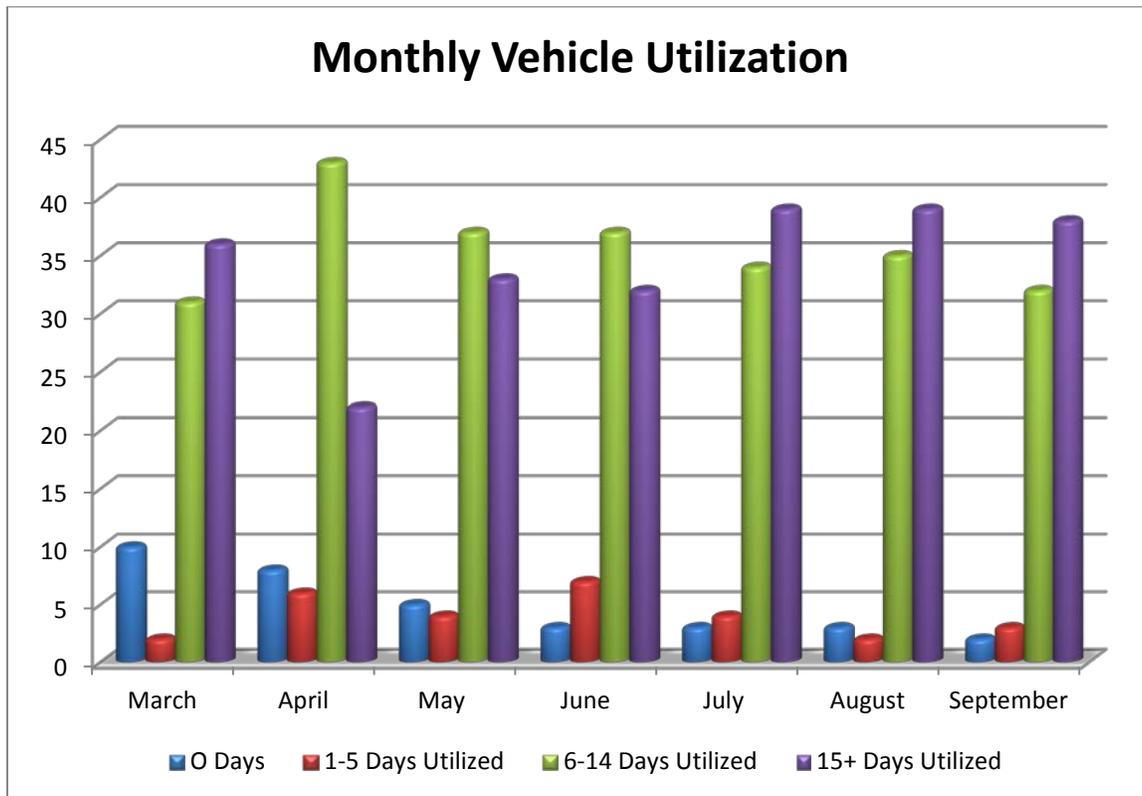
Fleet Utilization

Chart 6 shows a monthly vehicle utilization report broken down by the number of days utilized.

Total was 34 vehicles with zero days utilized for all 7 months. On average that's 4.85 vehicles per month not being utilized in any given month. With that, pilot of 76 vehicles equates to 6.39% of pilot vehicles with no use. Take that same percentage with 7,662 x's 6.39% = 489.60 not being utilized.

Additionally, 28 vehicles had 1 to 5 days utilized for all 7 months. On average that's 4.0 vehicles per month being utilized 1 to 5 days. With that, pilot of 76 vehicles equates to 5.3% of pilot vehicles with 1 to 5 days of use. Take that same percentage with 7,662 x's 5.3% = 406.08 possible reduction. **In theory, 11.69% of fleet consisting of 7,662 vehicles or (23.5% of Total Fleet) had 0 to 5 days of utilization with a possible reduction of 896.00 vehicles.**

Chart 5: Miles Driven



Return on Investment

Financial Summary

Financial Benefit by Category

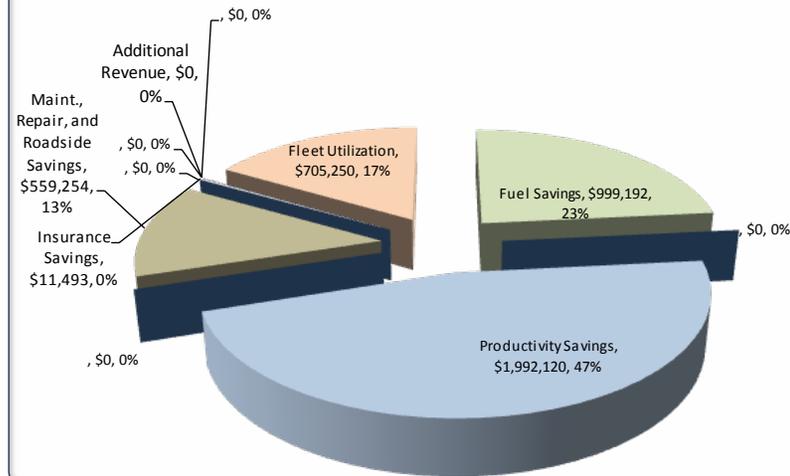
Category	Fleet Monthly	Fleet Annually	Per Vehicle Annually
Fuel Savings	\$83,266	\$999,192	\$130
Productivity Savings	\$166,010	\$1,992,120	\$260
Maint., Repair, and Roadside Savings	\$46,605	\$559,254	\$73
Insurance Savings	\$958	\$11,493	\$2
Additional Revenue	\$0	\$0	\$0
Fleet Utilization	\$58,771	\$705,250	\$92
Total Financial Benefit	\$355,609	\$4,267,309	\$557

Financial Return on Investment Summary

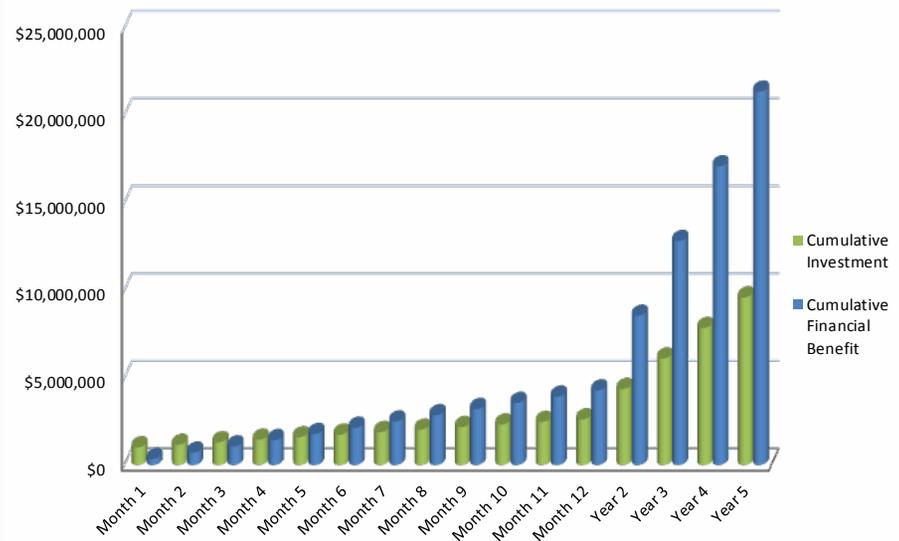
	Fleet Total	Per Vehicle
Up Front Investment of Hardware and Installation	\$865,806	\$113
Monthly Software Hosting Investment	\$145,195	\$18.95
Year 1 Investment Total	\$2,608,145	\$340
Year 1 Benefit Total	\$4,267,309	\$557
Year 1 ROI - Dollars	\$1,659,165	\$217
Year 2 Investment Total	\$1,742,339	\$227
Year 2 Benefit Total	\$4,267,309	\$557
Year 2 ROI - Dollars *	\$2,524,971	\$330

* Return on Investment for Year 2 applies for all subsequent years as well.

Annual Fleet Financial Benefit by Category



Five Year Fleetwide ROI



Return on Investment

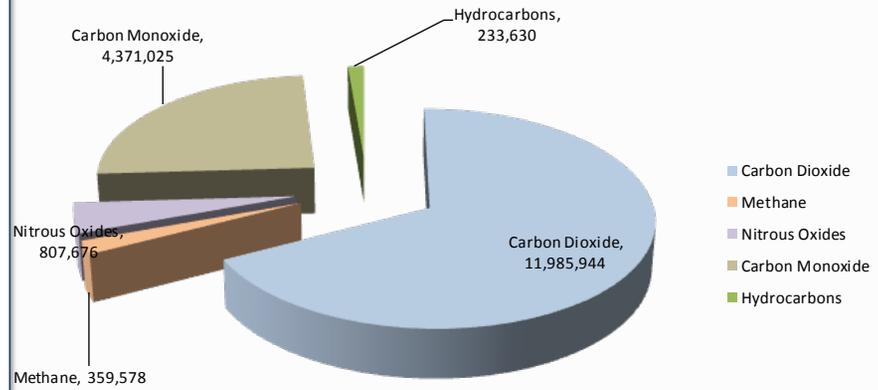
Environmental Summary

Annual Environmental Benefit by Emission Type		
Emission Type	Fleet Reduction (lbs.)	Per Vehicle (lbs.)
Carbon Dioxide	11,985,944	1,564
Methane	359,578	47
Nitrous Oxides	807,676	105
Total Annual Greenhouse Gas Reductions	13,154,915	1,717
Carbon Monoxide	4,371,025	570
Hydrocarbons	233,630	30
Total Annual Other Emissions Reductions	4,605,256	601
Total Annual All Emissions Reductions	17,760,171	2,318

Environmental Return on Investment Summary		
	Fleet Total	Per Vehicle
Up Front Investment of Hardware and Installation	\$865,806	\$113
Monthly Software Hosting Investment	\$145,195	\$18.95
Year 1 Investment Total	\$2,608,145	\$340
Year 1 Environmental Benefit Total (lbs.)	17,760,171	2,318
Cost Per Ton Year 1 - Reduced Emissions	\$294	
Year 2 Investment Total	\$1,742,339	\$227
Year 2 Environmental Benefit Total (lbs.)	17,760,171	2,318
Cost Per Ton Year 2 - Reduced Emissions*	\$196	
Gallons of Fuel Saved Per Year	338,709	44

* Return on Investment for Year 2 applies for all subsequent years as well.

Annual Emissions Reductions by Type (lbs.)



5 Year Cumulative Emissions Reductions (lbs.)

