



## Vehicle Trends & Maintenance Costs Survey

This survey analyzed the parts and labor costs of fleets in North America, with an emphasis on alternative fueled vehicles such as fully electric and plug-in hybrid vehicles.

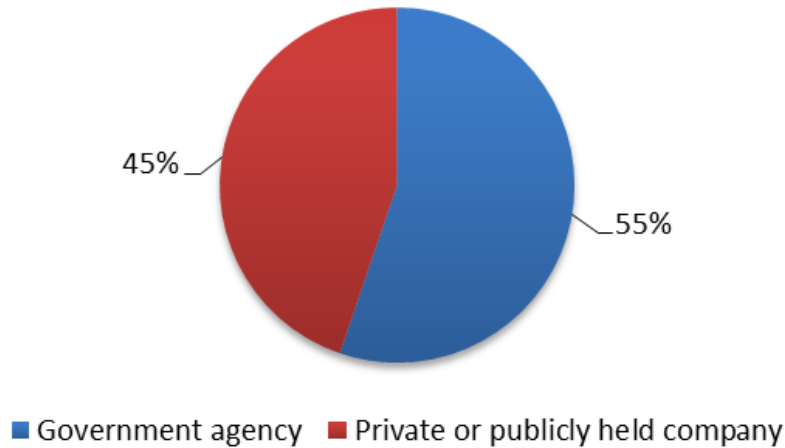
Over 180 Fleet Managers and Fleet Directors in North America participated in this survey effort with 105 qualified and completed responses. The estimated sum of new vehicles purchases that respondents are most likely to purchase in 2012 is over 24,000. 72% of respondents indicated that they intend to purchase a total of 3,800 - 5,800 alternative fueled vehicles.

---

## Demographics

Q) Which of the following best describes the organization you work for?

55% of respondents belong to government agencies, whereas 45% of respondents belong to private or publicly held company.

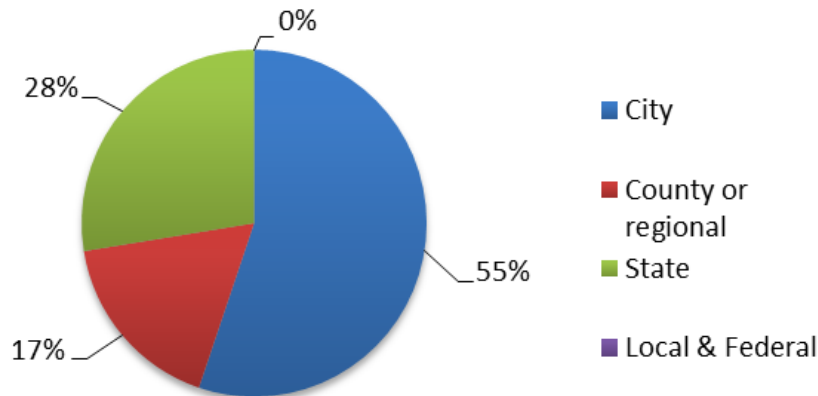


The total estimated budget for respondents who indicated a budget size for their organization is \$830 million. 54% of respondents did not indicate their organizations' capital budget size.

## Overview of Government Agency

Q) Which of the following best describes your government agency?

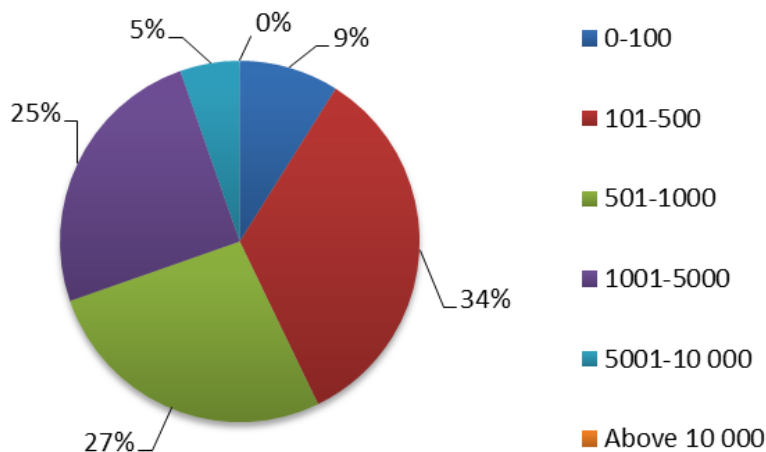
55% of respondents who belong to government agencies work for the city, whereas 28% work for the state.



## Overview of Government Agency – Fleet Size

Q) Which of the following best describes the number of vehicles in your fleet?

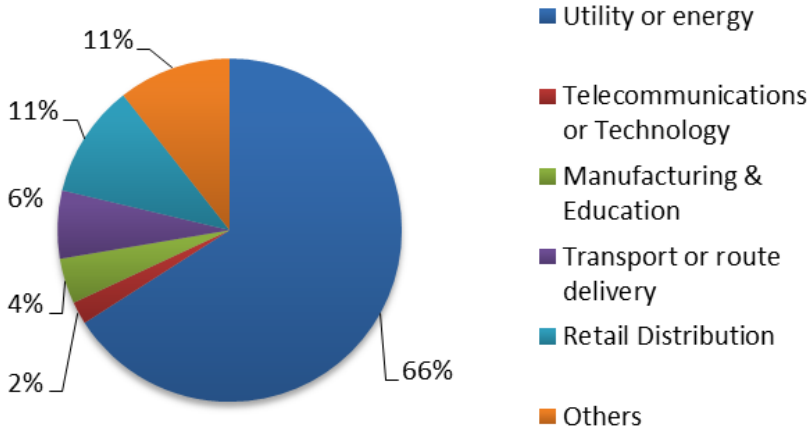
34% of respondents who work for government agencies have a fleet size of 101 – 500 vehicles, while 27% of respondents have a fleet size of 501 – 1000 vehicles.



# Overview of Private or Publicly Held Company

Q) Which of the following best describes the type of company you work for?

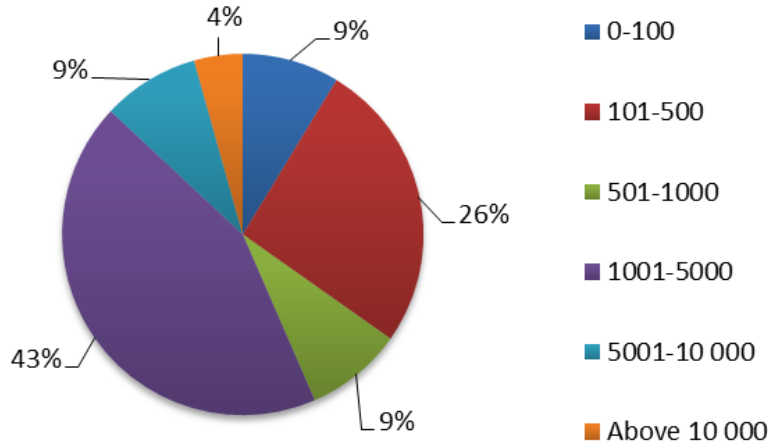
At 66%, the majority of respondents who belong to private or publicly held companies work for utilities or energy companies. 11% of respondents worked for either construction, insurance or rental/leasing companies.



# Overview of Private or Publicly Held Company – Fleet Size

Q) Which of the following best describes the number of vehicles in your fleet?

43% of respondents who work for private or publicly held companies have a fleet size of 1001 – 5000 vehicles, whereas 26% of those respondents have a fleet size of 101 – 500 vehicles.

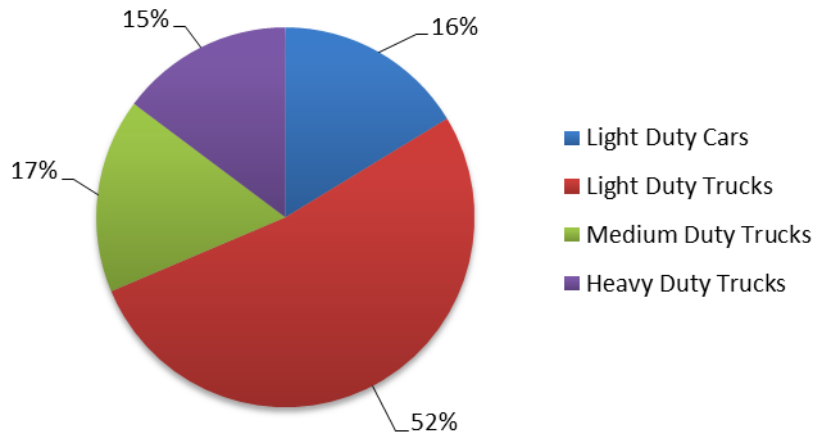


## New Vehicles in 2012

*Q) How many new vehicles will you purchase in 2012? What is the percentage of new vehicles in 2012 according to vehicle types?*

Respondents indicated that the estimated sum of new vehicle that they intend to purchase in 2012 is over 24,000. Of these new vehicles, 81% of them will be purchased by private or publicly held companies and 19% of the new vehicles will be purchased by government agencies.

52% of respondents indicated that they will purchase new light duty trucks and 17% of respondents indicated that they will purchase new medium duty trucks in 2012.

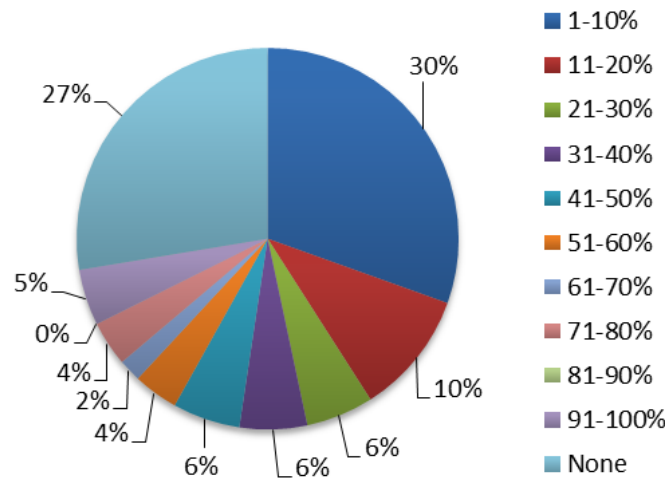


## New Vehicles – Alternative Fueled Vehicles

Q) *What percentage of your new vehicle purchases will be alternative fueled vehicles?*

30% of respondents indicated that 1 – 10% of their new vehicle purchases will be alternative fueled vehicles, followed by 10% of respondents who indicated that 11 – 20% of their new vehicle purchases will be alternative fueled vehicles.

27% of respondents indicated that they do not intend to purchase new alternative fueled vehicles.



Of the 73% of respondents who indicated that they intend to purchase new alternative fueled vehicles, they intend to purchase between 3,800 - 5,800 new alternative fueled vehicles.

Respondents who belong to government agencies indicated that they intend to purchase between 800 – 1,200 new alternative fueled vehicles. On the other hand, respondents who belong to private or publicly held companies indicated that they intend to purchase between 2,900 – 4,600 new alternative fueled vehicles.

# Factors Impacting Decision to Not Purchase Alternative Fueled Vehicles

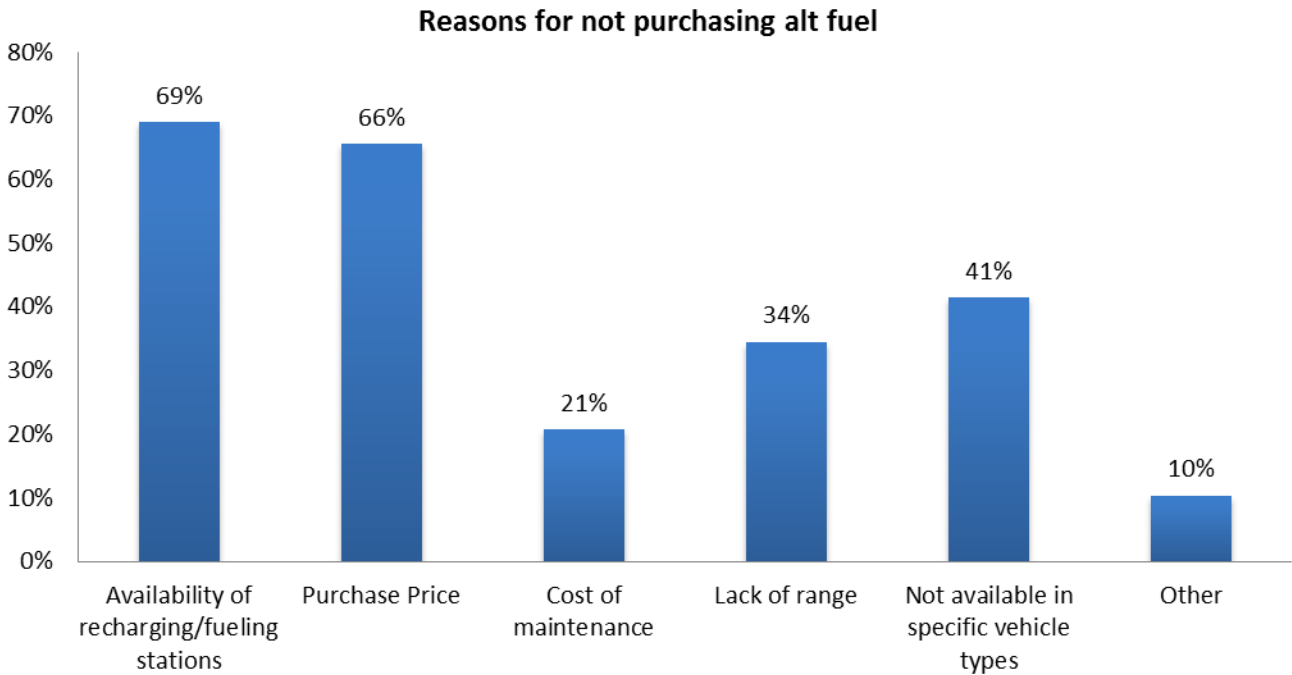
*Q) What are the reasons impacting your decision to not purchase alternative fueled vehicles?*

The top three reasons for not purchasing alternative fuel vehicles are:

- Availability of recharging/fueling stations
- Purchase price
- Not available in specific vehicle types.

Respondents who selected other gave the following reasons:

- Lack of training
- Do not meet fleet specs
- Weather conditions resulting in corrosion from salt

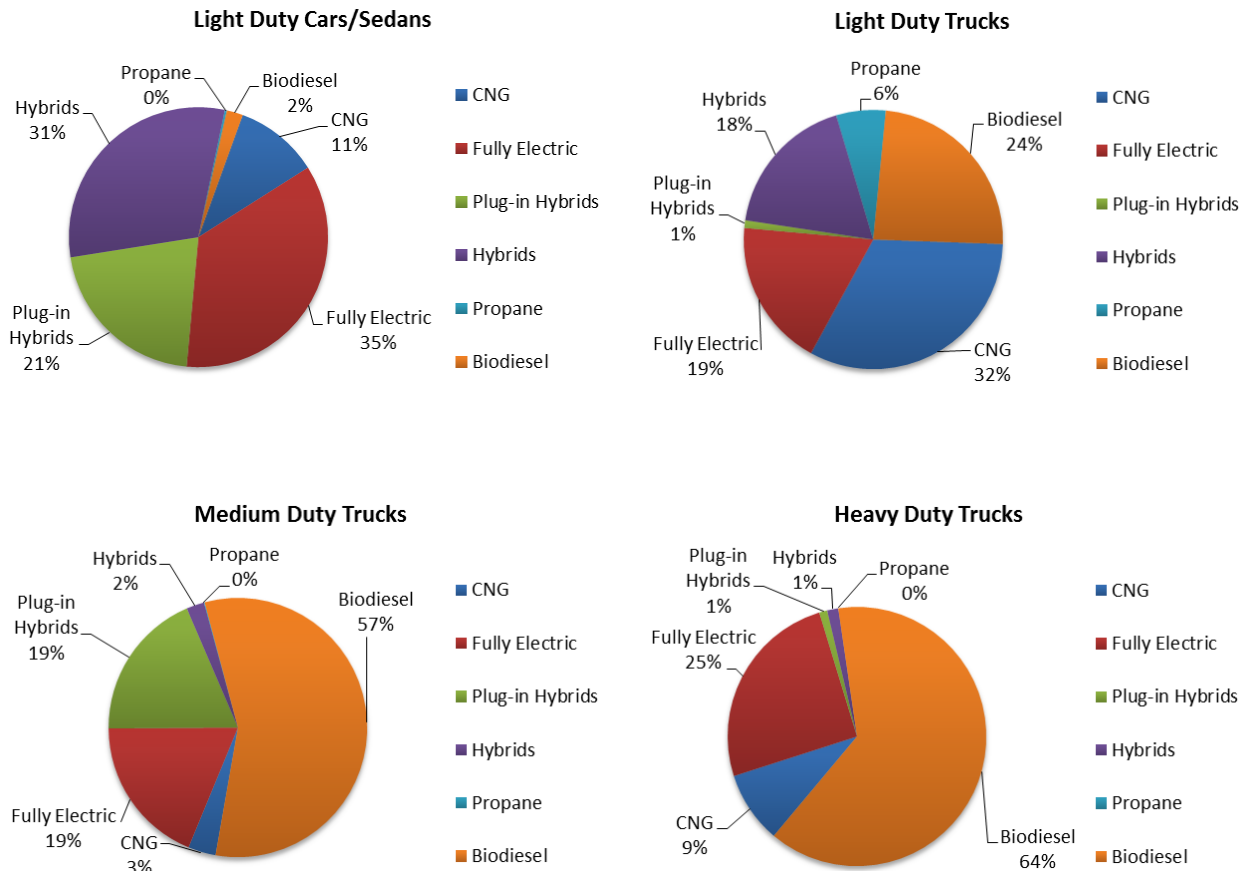


# Types of Alternative Fueled Vehicles Ownership

Q) What types of alternative fueled vehicles do you plan on purchasing in 2012 according to vehicle types?

The 73% of respondents who have indicated that they plan on purchasing alternative fueled vehicles intend to purchase the following types of alternative fueled vehicles:

- 35% of them plan on purchasing fully electric light duty cars/sedans.
- 32% of them plan on purchasing CNG light duty trucks.
- 57% of them plan on purchasing biodiesel medium duty trucks.
- 64% of them plan on purchasing biodiesel heavy duty trucks.



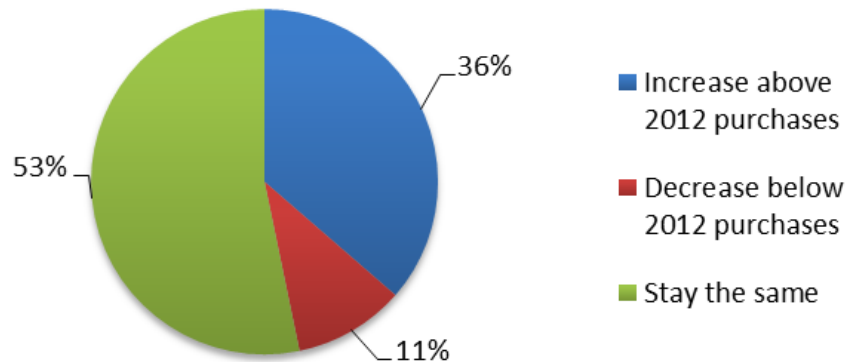


---

## Alternative Fueled Vehicles Purchase Trends

Q) *How will your purchases change in 2013 to 2015?*

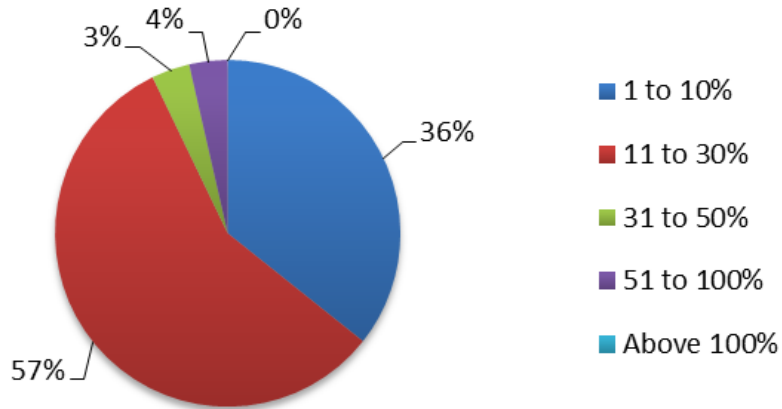
Of the 73% of respondents who intend to purchase alternative fueled vehicles, 36% of them indicated that their vehicle purchases in 2013 to 2015 will increase. 53% of them said that their purchase plan will stay in the same.



Regardless of vertical and ownership of fully electric and plug-in hybrid vehicles, the majority of respondents indicated that their purchases in 2013 to 2015 will stay the same.

Q) If your purchases will increase in 2013-2015, by what percentage will it increase?

Of the respondents who indicated that their purchases will increase in 2013-2015, 57% of them indicated that their purchases will increase by 11 – 30%. 36% of respondents indicated that their purchases will increase by 1 – 10%.



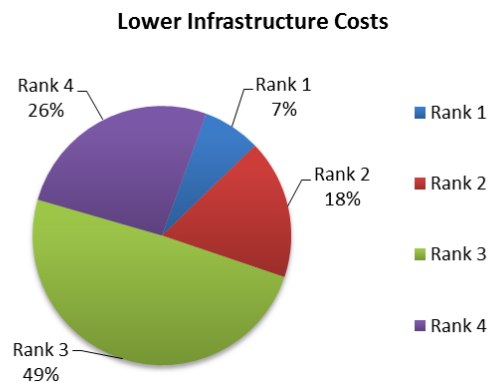
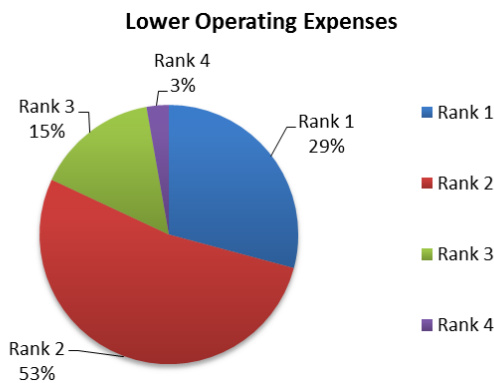
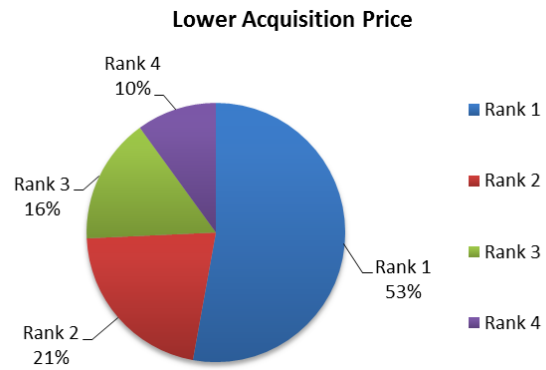
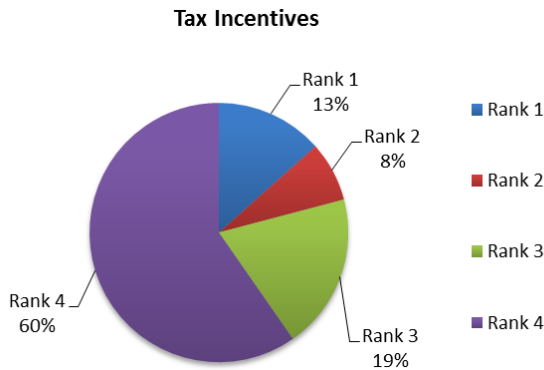
Regardless of vertical, the majority of respondents who indicated that their purchases will increase in 2013-2015 estimated that their vehicle purchases will increase by 11 to 30%.

# Factors Affecting Alternative Fueled Purchase Decision

Q) Please rate in order of importance the factors that motivate you to choose one alternative fuel over another.

Factors affecting the decision to purchase one alternative fuel over another in order of importance, regardless of vertical:

- Lower Acquisition Price
- Lower Operating Expenses
- Lower Infrastructure Costs
- Tax Incentives



---

# Factors Affecting Alternative Fueled Purchase Decision – Fully Electric & Plug-In Hybrid Vehicles

Respondents who own fully electric vehicles rank lower acquisition price as the top motivating factor influencing their decision to choose one alternative fuel over another.

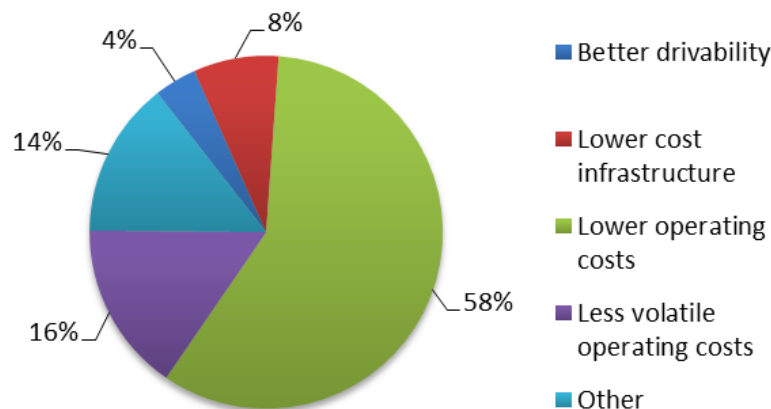
On the other hand, respondents who own plug-in hybrid vehicles rank lower operating costs as the top motivating factor driving their decision to choose one alternative fuel over another.

Ranking	Fully Electric	Plug-in Hybrid
Rank 1	Lower Acquisition Price	Lower Operating Costs
Rank 2	Lower Operating Expenses	Lower Acquisition Price
Rank 3	Lower Infrastructure Costs	Lower Infrastructure Costs
Rank 4	Tax Incentives	Tax Incentives

## Reasons for Purchasing Electric Vehicles

Q) Why would you purchase an electric vehicle in particular over another type of alternative fuel?

At 58%, lower operating costs appears to be the main reason driving electric vehicle purchase decision over other types of alternative fuel regardless of fleet size, capital budget or vertical.



Respondents who selected other gave the following reasons:

Government incentives

Support research and development

Shorter driving distances

Range and costs per mile of operations

Lower cost and less difficult infrastructure setup

We've tried LPG but operator expressed fear in using it. Bio diesel is not consistent, and CNG has no local station.

No infrastructure issue

Meets state law on alternative fuel

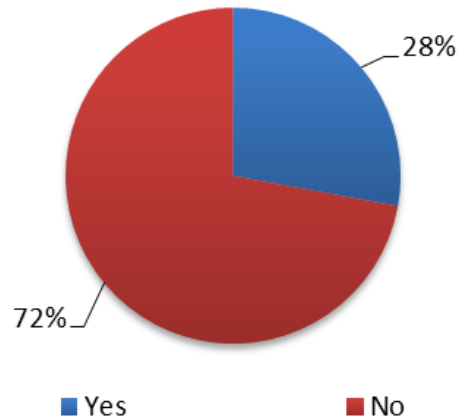
Optics

Corporate policy

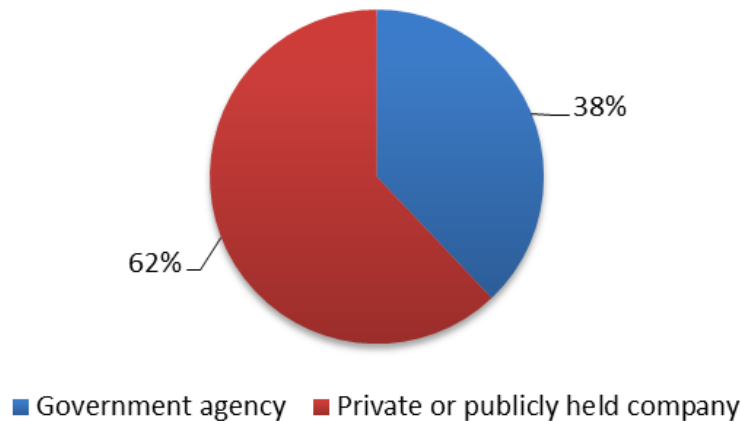
# Fully Electric Vehicles

Q) Do you have fully electric vehicles in your fleet?

28% of respondents indicated that they have fully electric vehicles in their fleet compared to 72% of respondents who do not.

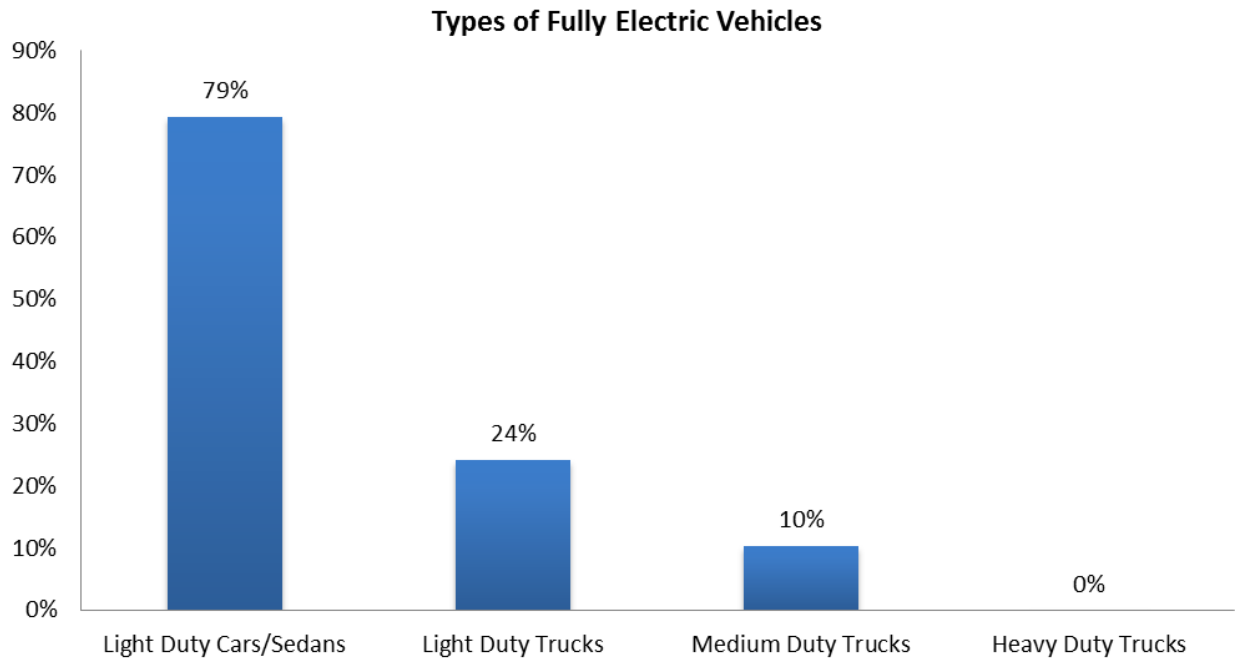


Of the 28% of respondents who indicated that they have fully electric vehicles in their fleet, 62% of them belong to private or publicly held companies, with the majority of them working for utility or energy companies. The remaining 38% of respondents belong to government agencies, with the majority of them working for the city.



Q) If yes, what kinds of vehicles are fully electric?

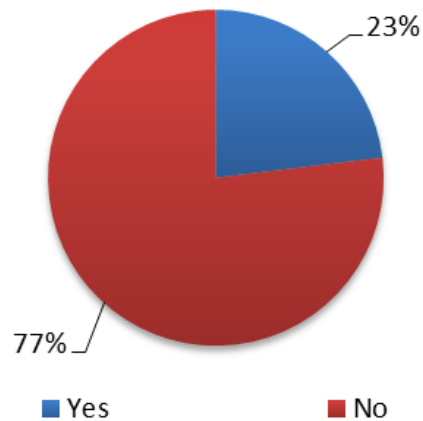
Of the 28% of respondents who indicated that they own fully electric vehicles, 79% of them own light duty cars/sedans and 24% of them who own light duty trucks.



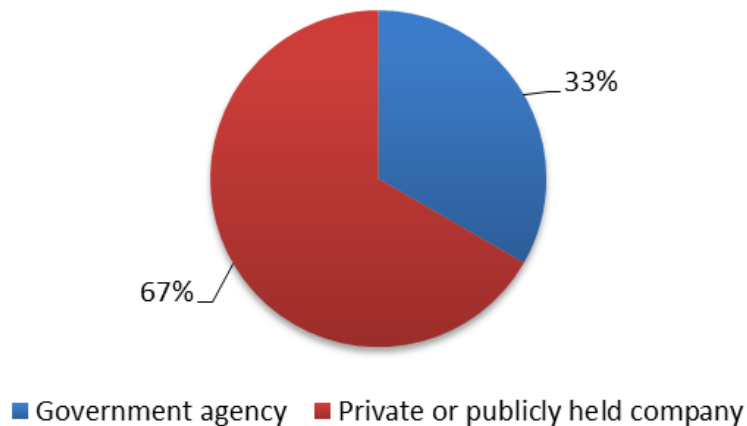
## Plug-In Hybrids

Q) Do you have plug-in hybrids in your fleet?

23% of all respondents indicated that they have plug-in hybrid vehicles in their fleet. 16% of all respondents indicated that they have both fully electric and plug-in hybrid vehicles in their fleet.



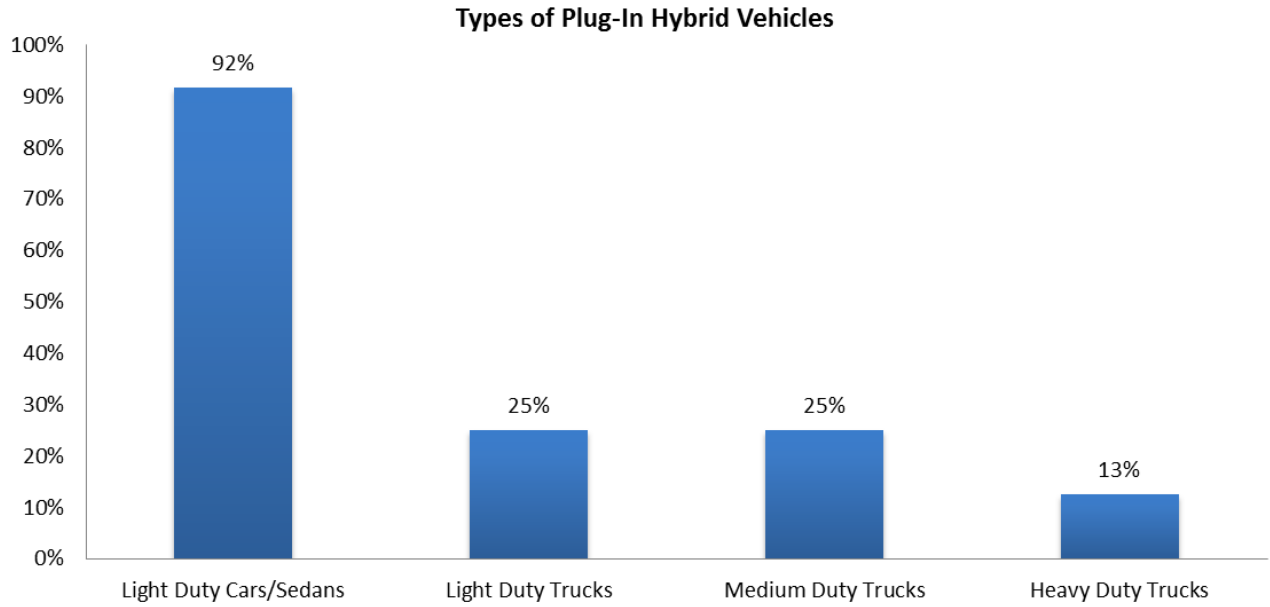
Of the 23% of respondents who indicated that they have plug-in hybrid vehicles in their fleet, 67% of respondents belong to private or publicly held companies, with the majority of them working for utility or energy companies. The remaining 33% of them belong to government agencies, with half of them working for the state and the other half for the city.





Q) If yes, what kinds of vehicles are plug-in hybrid vehicles?

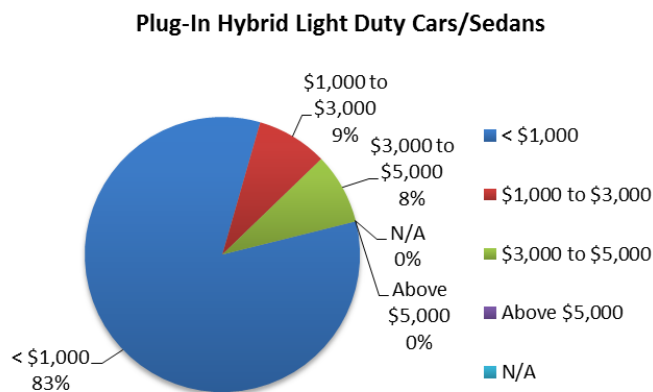
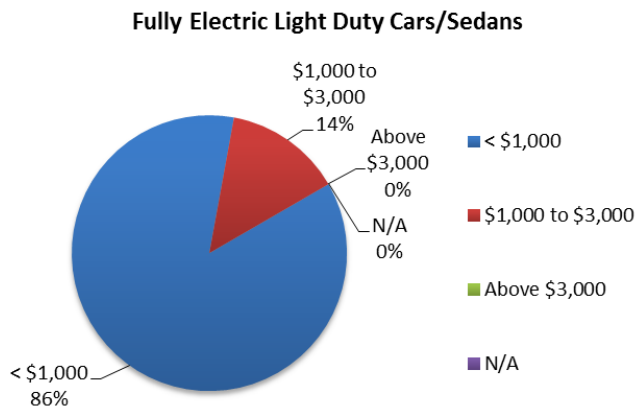
Of the 23% of respondents who own plug-in hybrid vehicles, 92% of them own plug-in hybrid light duty cars/sedans.



## Parts and Labor – Light Duty Cars/Sedans

Q) How much do you typically spend on maintenance per year for your cars/sedans?

86% and 83% of respondents typically spend less than \$1,000 on parts and labor per annual per vehicle on their fully electric and plug-in hybrid light duty cars/sedans respectively.

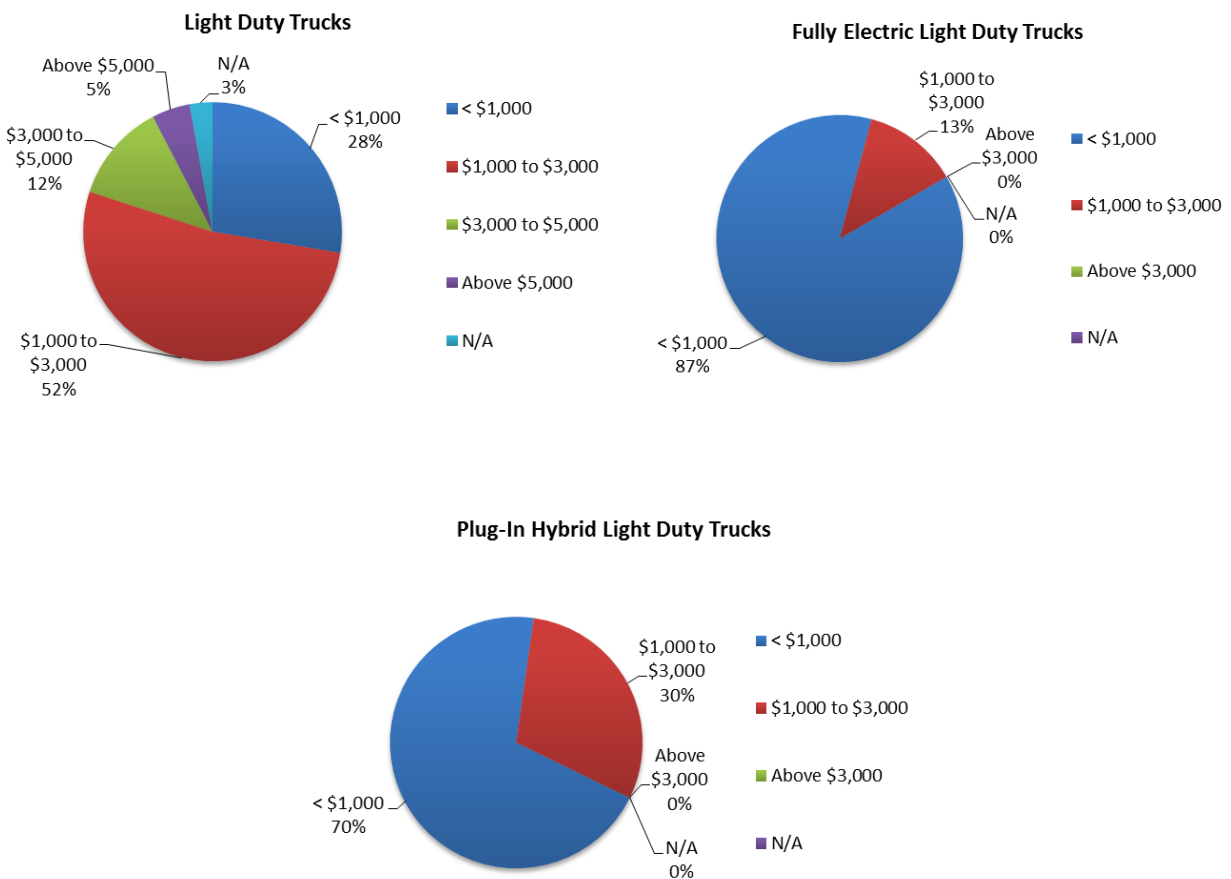


## Parts and Labor – Light Duty Trucks

Q) How much do you typically spend on maintenance for your light duty trucks?

52% of respondents typically spend \$1,000 - \$3,000 on parts and labor per vehicle annually on their light duty trucks. The majority of respondents typically spend \$1,000 - \$3,000 on parts and labor per vehicle annually regardless of vertical.

87% and 70% of respondents who own fully electric and plug-in hybrid light duty trucks respectively typically spend less than \$1,000 on parts and labor per vehicle annually.

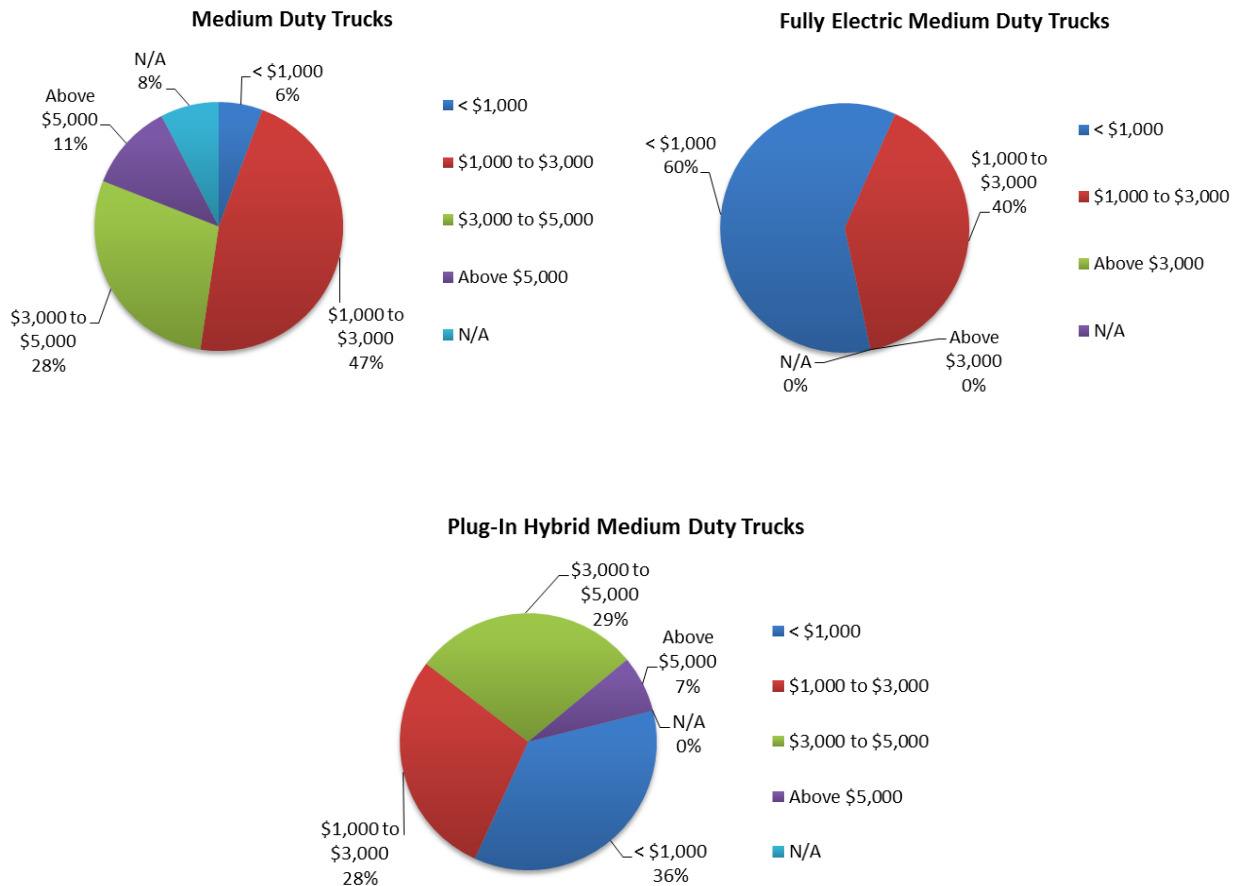


## Parts and Labor – Medium Duty Trucks

Q) How much do you typically spend on maintenance for your medium duty trucks?

At 47%, the majority of respondents typically spend \$1,000 - \$3,000 on parts and labor per vehicle annually on their medium duty trucks. The majority of respondents typically spend that much on parts and labor per vehicle annually regardless of vertical.

60% and 36% of respondents who own fully electric and plug-in hybrid medium duty trucks respectively typically spend less than \$1,000 on parts and labor per vehicle annually.



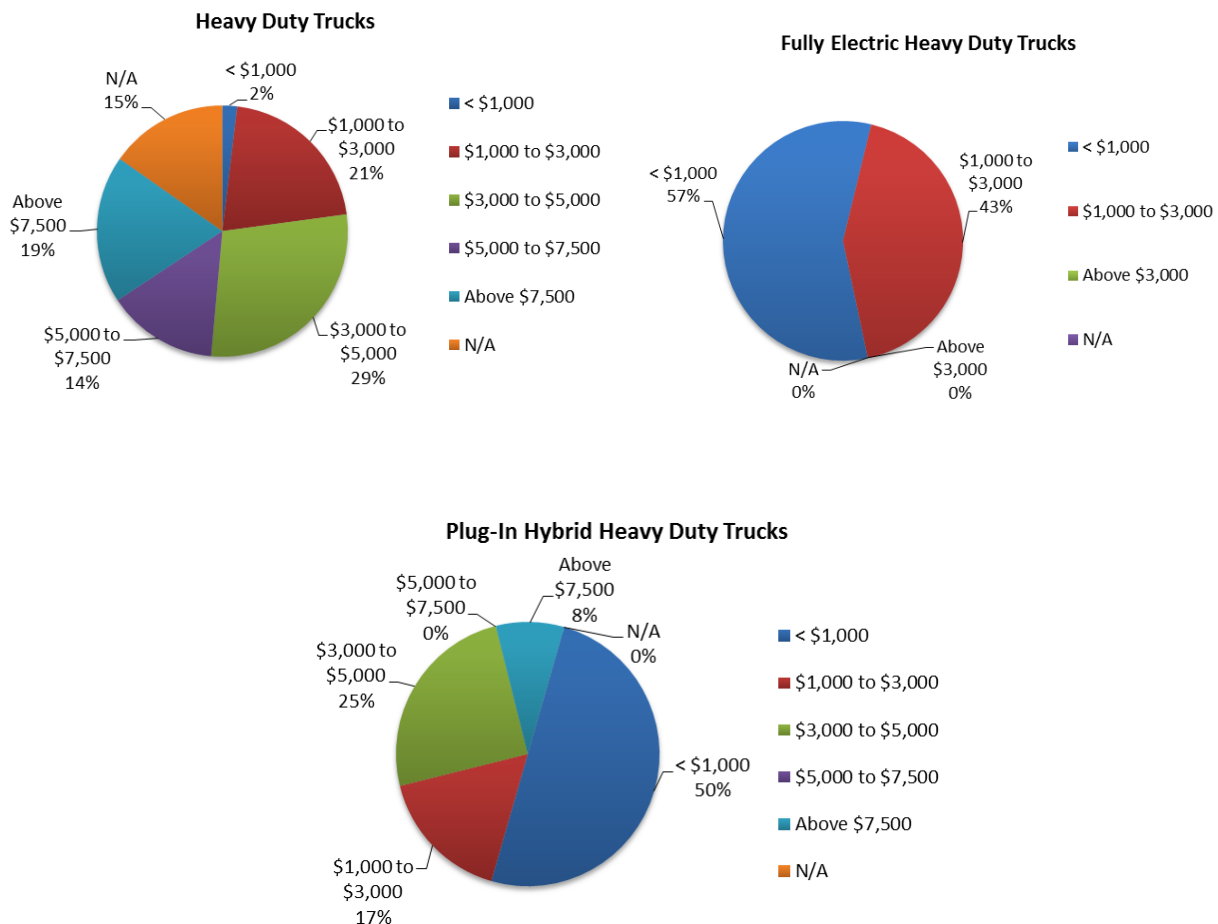
## Parts and Labor – Heavy Duty Trucks

Q) How much do you typically spend on maintenance for your heavy duty trucks?

At 29%, the majority of respondents typically spend \$3,000 - \$5,000 on parts and labor per vehicle annually on their heavy duty trucks. The majority of respondents typically spend that much on parts and labor per vehicle annually regardless of vertical.

The majority of respondents who typically spend \$1,000 - \$3,000 on parts and labor per vehicle annually keep their vehicles for 6 to 8 years. The majority of respondents who typically spend over \$3,000 on parts and labor per vehicle annually keep their vehicles for over 9 years.

57% and 50% of respondents who own fully electric and plug-in hybrid light duty trucks respectively typically spend less than \$1,000 on parts and labor per vehicle annually.



## Parts and Labor – Average Annual Miles Driven

The tables below show the parts and labor cost according to average annual miles driven:

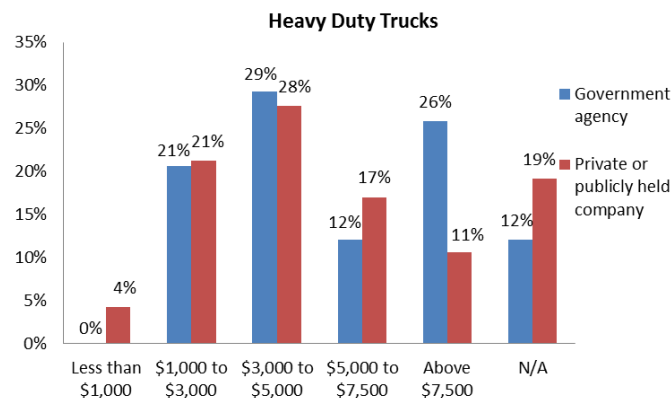
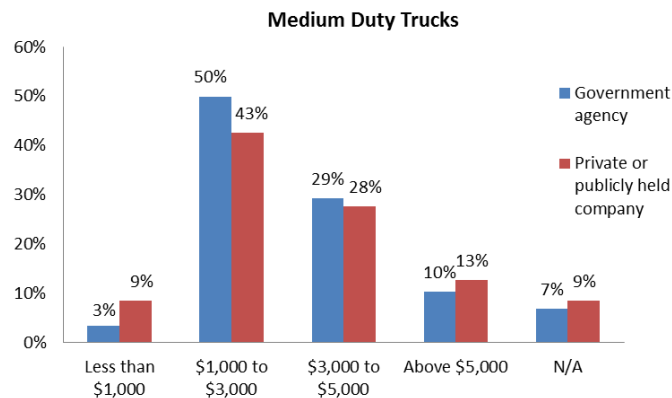
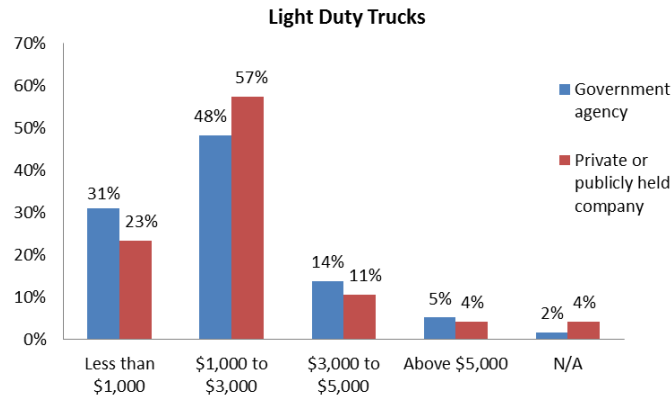
<b>Parts and Labor Cost (per annual per vehicle)</b>	<b>Average Annual Miles Driven for Light Duty Trucks</b>
Less than \$1,000	12,300
\$1,000 to \$3,000	16,000
\$3,000 to \$5,000	18,000
Above \$5,000	12,000

<b>Parts and Labor Cost (per annual per vehicle)</b>	<b>Average Annual Miles Driven for Medium Duty Trucks</b>
Less than \$1,000	15,000
\$1,000 to \$3,000	20,000
\$3,000 to \$5,000	12,000
Above \$5,000	14,000

<b>Parts and Labor Cost (per annual per vehicle)</b>	<b>Average Annual Miles Driven for Heavy Duty Trucks</b>
Less than \$1,000	17,000
\$1,000 to \$3,000	12,000
\$3,000 to \$5,000	16,000
\$5,000 to \$7,500	9,000
Above \$7,500	11,000

## Parts and Labor – Vertical

Regardless of vertical, over 43% of respondents who own light and medium duty trucks typically spend \$1,000 - \$3,000 on parts and labor costs per annual per vehicle. On the other hand, the majority of respondents who own heavy duty trucks typically spend \$3,000 - \$5,000 on parts and labor costs per annual per vehicle, regardless of vertical.



# Largest Share of Parts and Labor Costs

Q) What is the largest share of maintenance according to vehicle types?

The top three parts and labor costs according to vehicle types are as follow:

## Light Duty Trucks

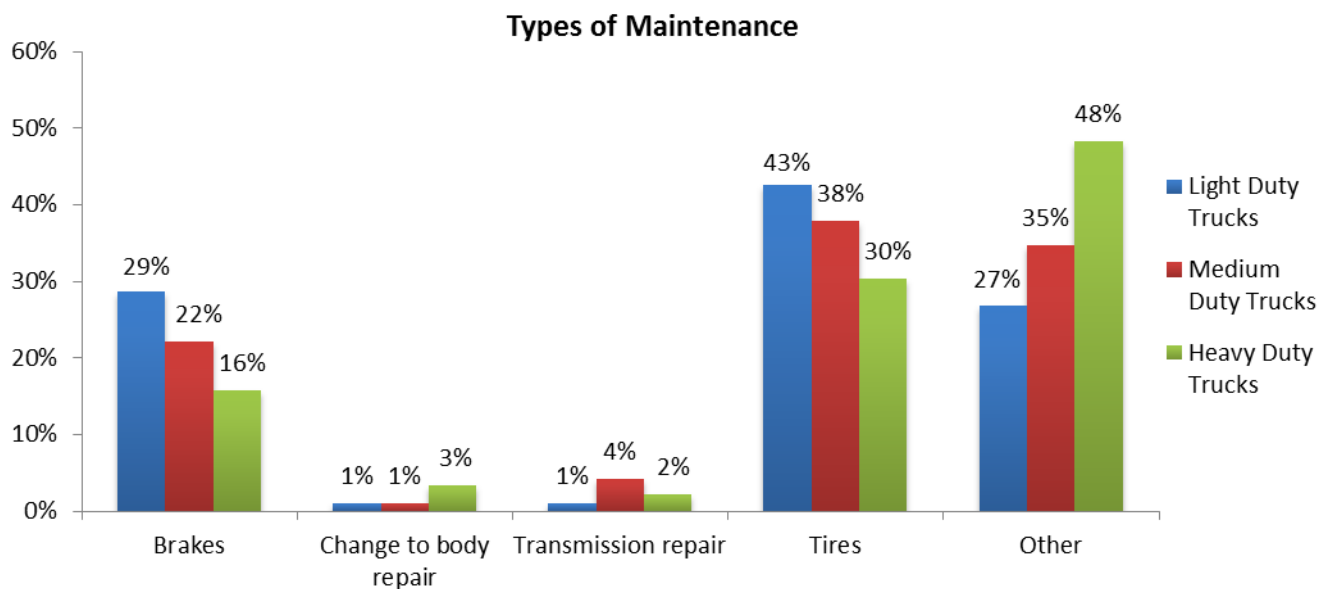
- 43% of respondents indicated tires
- 29% of respondents indicated brakes
- 27% of respondents indicated other

## Medium Duty Trucks

- 38% of respondents indicated tires
- 35% of respondents indicated other
- 22% of respondents indicated brakes

## Heavy Duty Trucks

- 48% of respondents indicated other
- 30% of respondents indicated tires
- 16% of respondents indicated brakes

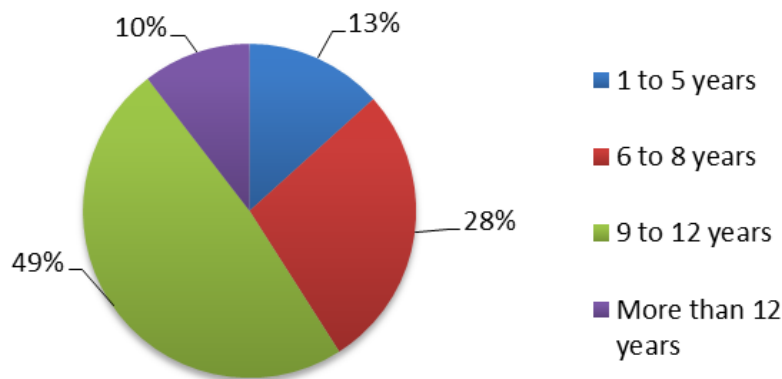




## Duration of Ownership

Q) *How long do you typically keep your vehicles?*

49% of respondents indicated that they keep their vehicles for 9 – 12 years, followed by 28% of respondents who keep their vehicles for 6 – 8 years.

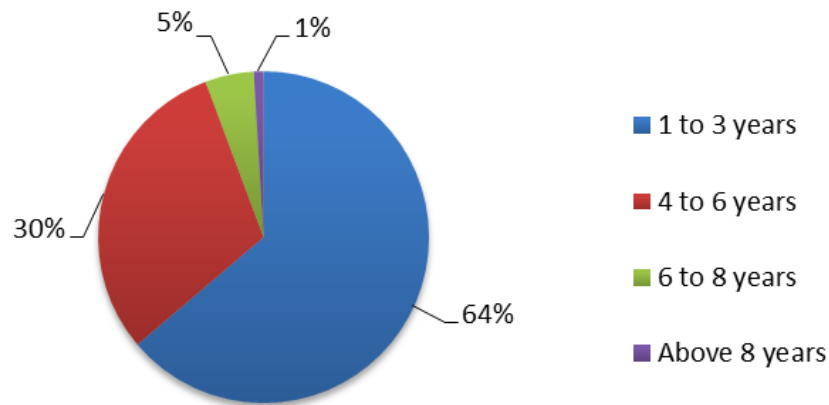


Of the respondents who work for government agencies, 55% of them typically keep their vehicles for 9 to 12 years. Of the respondents who work for private or publicly held companies, 40% of them typically keep their vehicles for 9 to 12 years.

## Expectation of Warranty

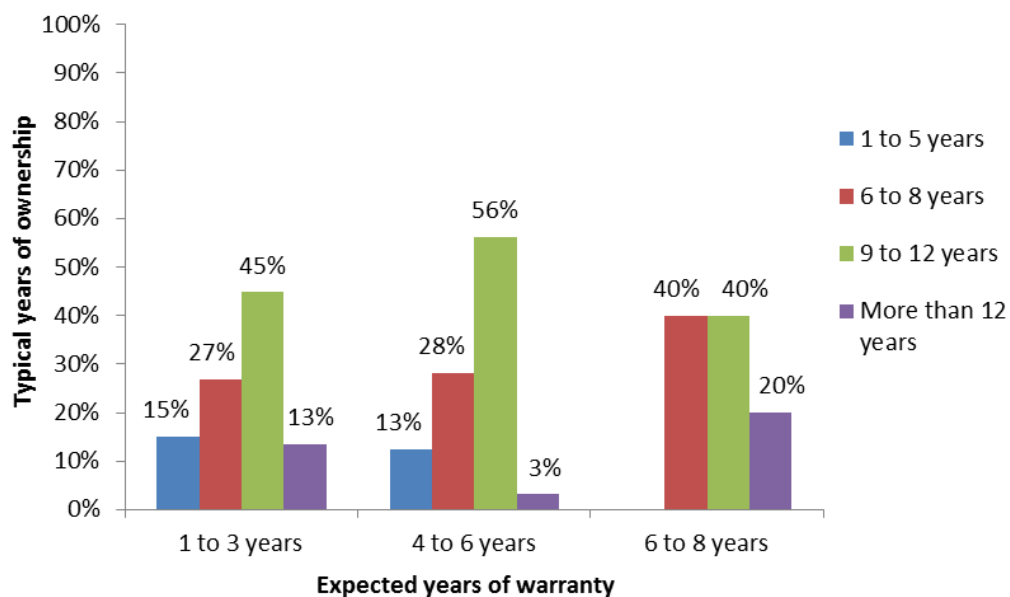
Q) What is the typical warranty that you expect for your vehicle and vehicle components?

64% of respondents expect a typical warranty of 1 – 3 years and 30% of respondents expect a typical warranty of 4 – 6 years.



Similarly, 66% of respondents who own fully electric vehicles and 58% of respondents who own plug-in hybrid vehicles expect a typical warranty of 1 to 3 years.

Over 45% of respondents who expect a typical warranty of 1 to 3 years and 4 to 6 years typically keep their vehicles for 9 to 12 years.



## Average Annual Miles Driven

Q) *How many miles on average per annual do you drive your vehicles?*

The following tables show average annual miles driven for light duty vehicles, medium duty vehicles, and heavy duty vehicles.

<b>Respondents who own</b>	<b>Percent of Respondents</b>	<b>Average Miles Driven</b>
<b>Light Duty Cars/Sedans</b>		
Fully Electric Cars/Sedans	22%	11,000
Plug-In Hybrid Cars/Sedans	21%	11,000

88% of respondents indicated that they own light duty vehicles in their fleet. The average estimated miles of all the light duty vehicles are 15,000 miles.

<b>Respondents who own</b>	<b>Percent of Respondents</b>	<b>Average Miles Driven</b>
<b>Light Duty Trucks</b>		
All Light Duty Trucks	88%	15,000
Fully Electric Trucks	7%	12,000
Plug-In Hybrid Trucks	6%	14,000

76% of respondents indicated that they own medium duty vehicles in their fleet. The average estimated miles of all the medium duty vehicles are 17,000 miles.

<b>Respondents who own</b>	<b>Percent of Respondents</b>	<b>Average Miles Driven</b>
<b>Medium Duty Vehicles</b>		
All Medium Duty Trucks	76%	17,000
Fully Electric Trucks	3%	15,000
Plug-In Hybrid Trucks	6%	7,000

75% of respondents indicated that they own heavy duty vehicles in their fleet. The average estimated miles of all the heavy duty vehicles are 13,000 miles.

<b>Respondents who own</b>	<b>Percent of Respondents</b>	<b>Average Miles Driven</b>
<b>Heavy Duty Vehicles</b>		
All Heavy Duty Trucks	75%	13,000
Plug-In Hybrid Trucks	3%	4,000