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Alternative Fuel Use Among California Fleets: Current Use, Barriers, & Opportunities

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Overview

- Goal
- Methods
- Results
 - Users
 - Who is using alternative fuels?
 - What are the barriers to expansion?
 - What are the opportunities to promote expansion?
 - Non-users
 - Who is willing to use alternative fuels?
 - What are the barriers to alternative fuel use?
 - What are the opportunities to promote use?
- Recommendations

Goal

- To identify and describe niche opportunities for alternative fuel market penetration among California fleets by characterizing the attitudes of fleet operators likely to affect their alternative fuel decisions.

Objectives

1. Determine niche market penetration.
2. Verify vehicle and infrastructure performance.
3. Measure customer satisfaction.
4. Understand customer motivation.
5. Identify barriers and verify progress to overcome existing market barriers.
6. Identify requirements for government subsidies or other incentives.
7. Identify and describe niche market opportunities.

Methods

- Survey
 - Online survey
 - 1,330 respondents from DMV database and California Fleet News listserve
- Focus Groups
 - Northern California
 - 3 fleet operators using alternative fuels
 - Southern California
 - 6 fleet operators in the industries of agriculture, construction/maintenance, and short haul goods transportation

Survey

Fleet profile

Currently using AF's?

Users

AF use

Original Motivation

Satisfaction

Problems

Future Use

Changes to Expand Use

Overall Satisfaction

Non-Users

Willingness to Use

Potential Motivation

Concerns

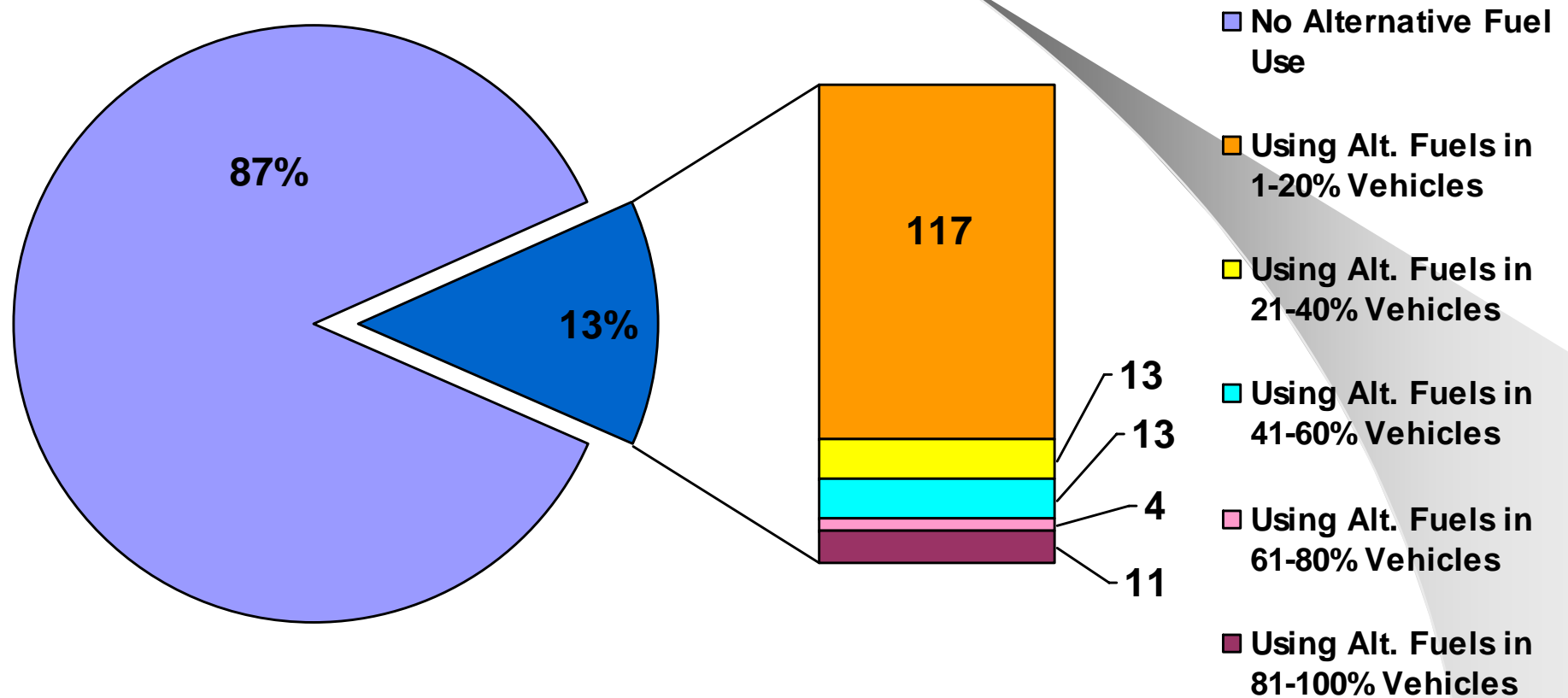
Changes to Begin Use

Users



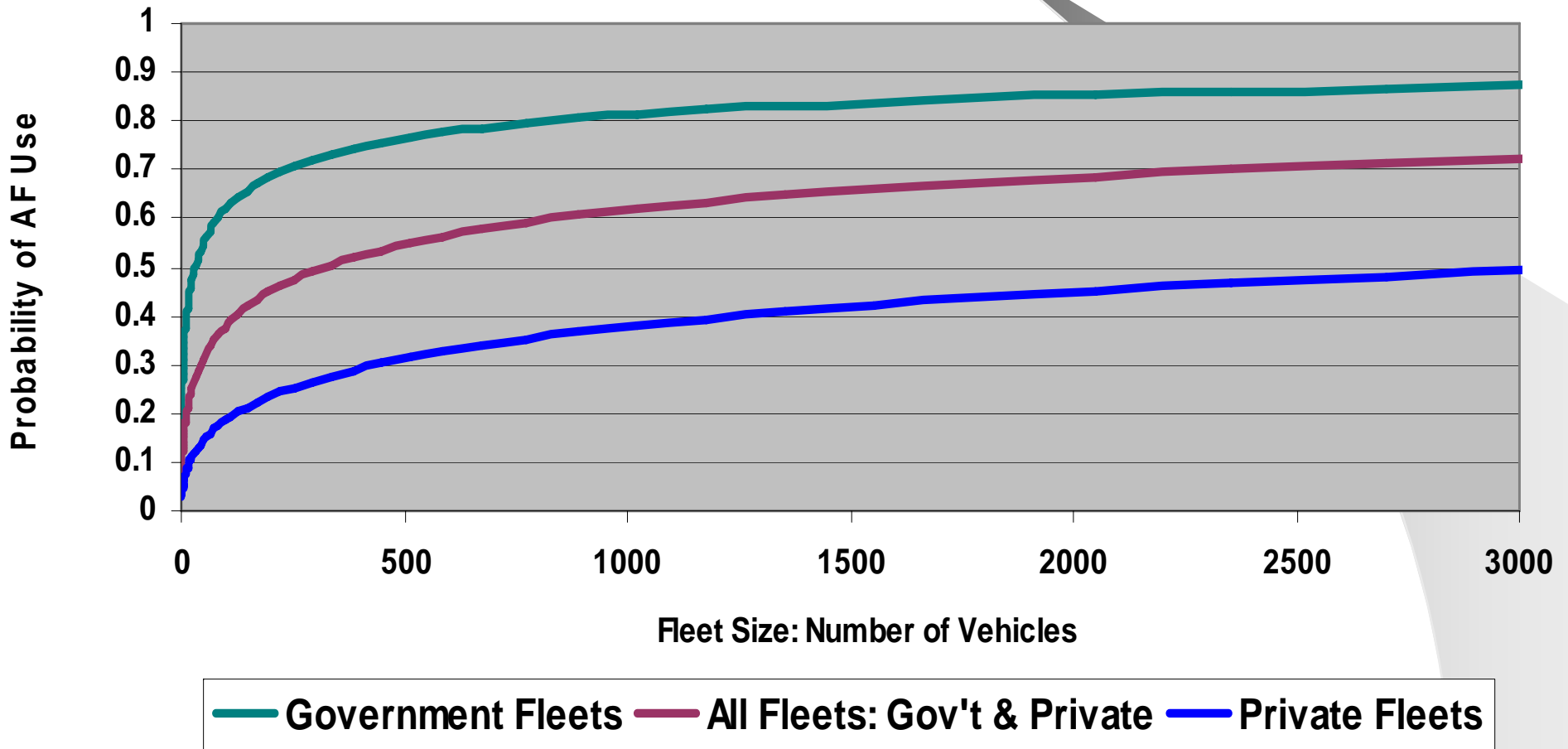
- Who is using alternative fuels?
- What are the barriers to expansion?
- What are the opportunities for expansion among users?

How many fleets are using alternative fuels?



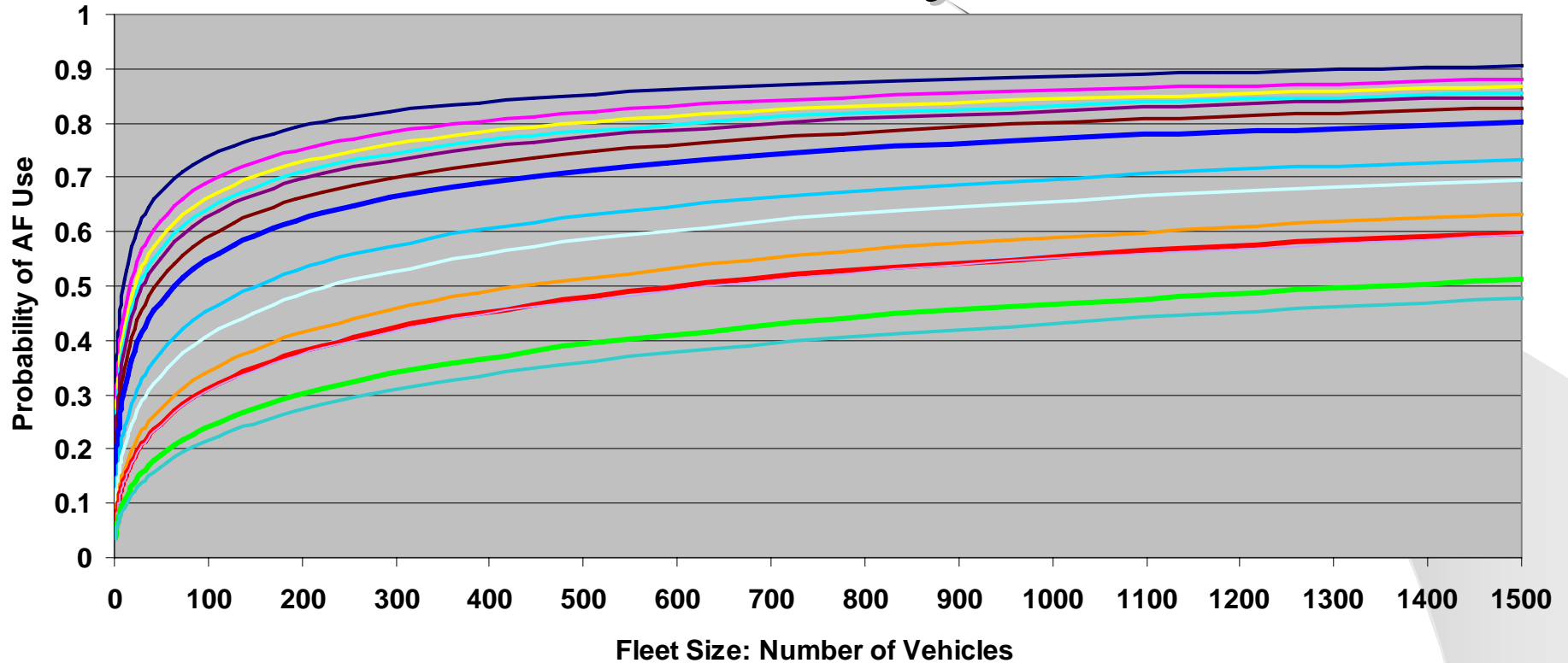
Source: 'What is the Future of Alternative Fuel in California?' survey data.

Alternative fuel use among government and private fleets

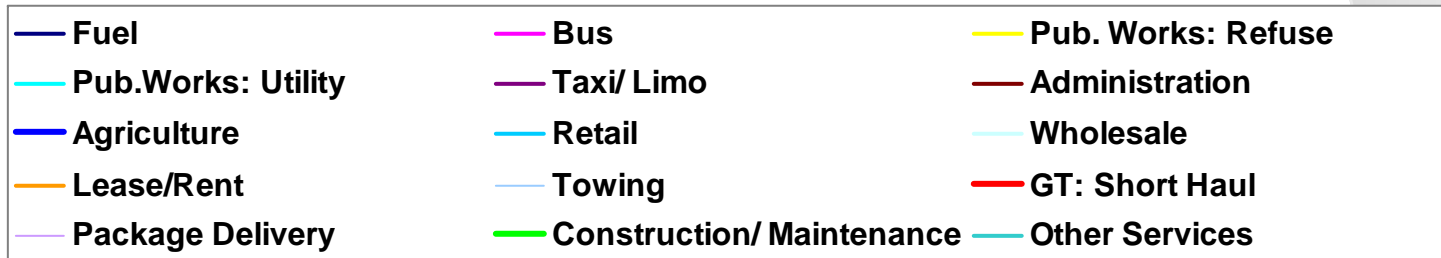


Source: 'What is the Future of Alternative Fuel in California?' survey data.

Alternative fuel use by industry



Source: 'What is the Future of Alternative Fuel in California?' survey data.



Alternative Fuel Use by Industry

Most likely to use

Moderately likely to use

Least likely to use

Fuel-related

Retail

People transportation

Busing

Wholesale

Other services

**Public works-
Refuse**

Goods transport-Long haul

**Construction/
Maintenance**

Public works-Utility

Goods transport-Short haul

“Other” fleets

Administration

Lease/rental

Goods transport

Towing

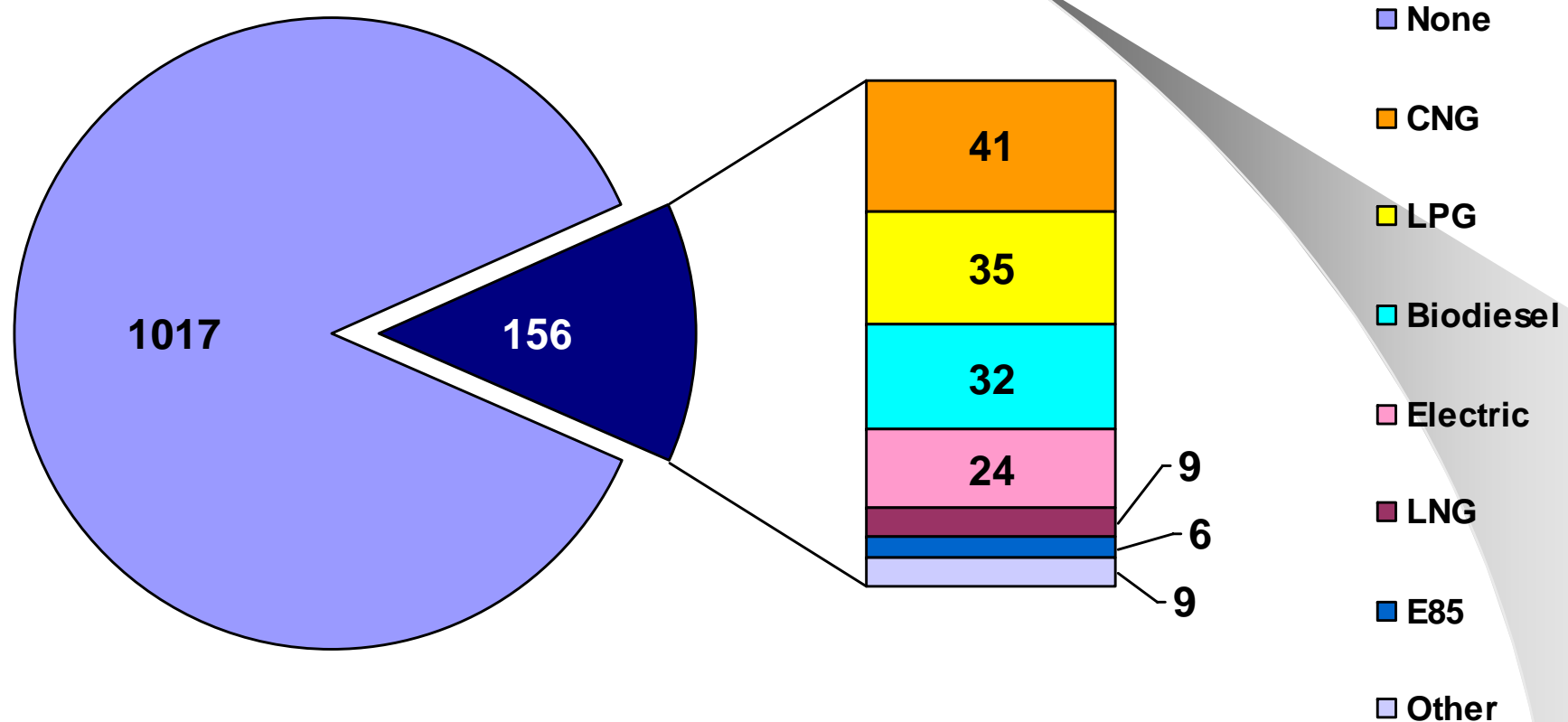
Agriculture

Package/Mail delivery

Public works - Other

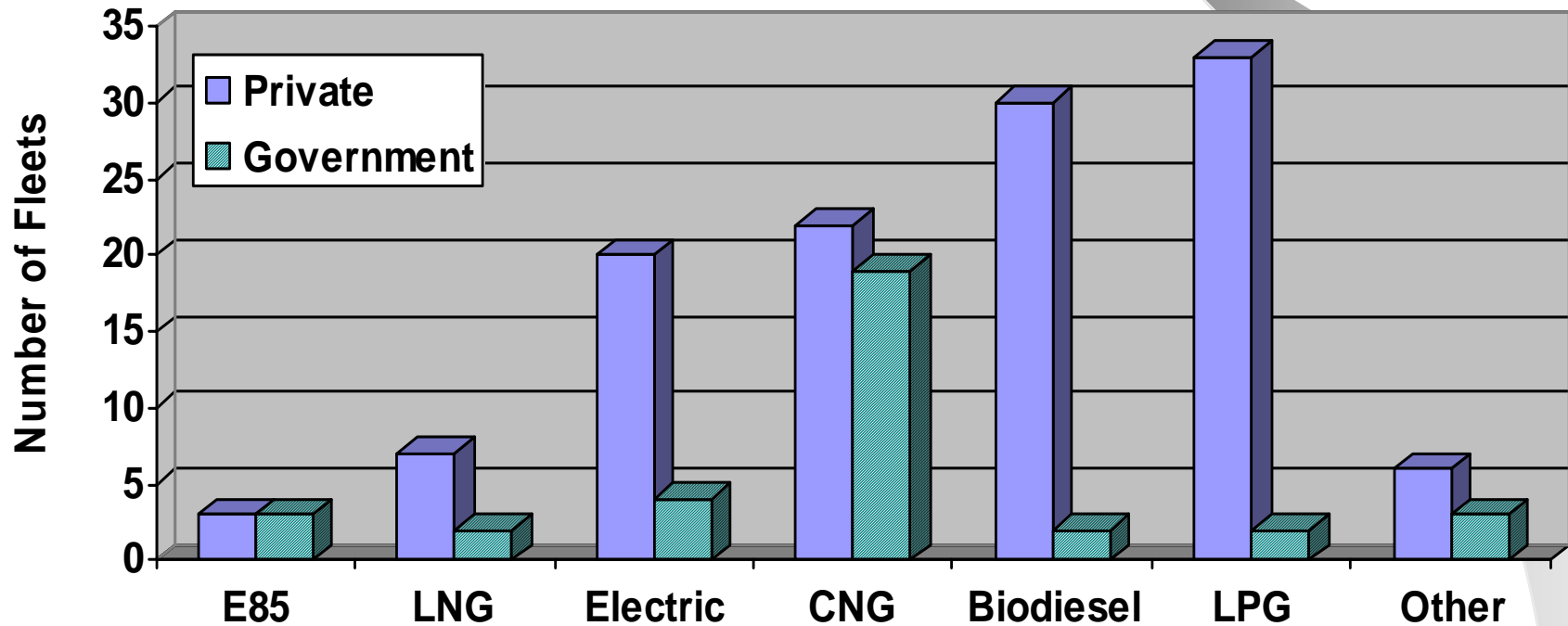
Source: 'What is the Future of Alternative Fuel in California?' survey data

Which alternative fuels are being used?



Source: 'What is the Future of Alternative Fuel in California?' survey data.

Alternative fuels used by government and private fleets



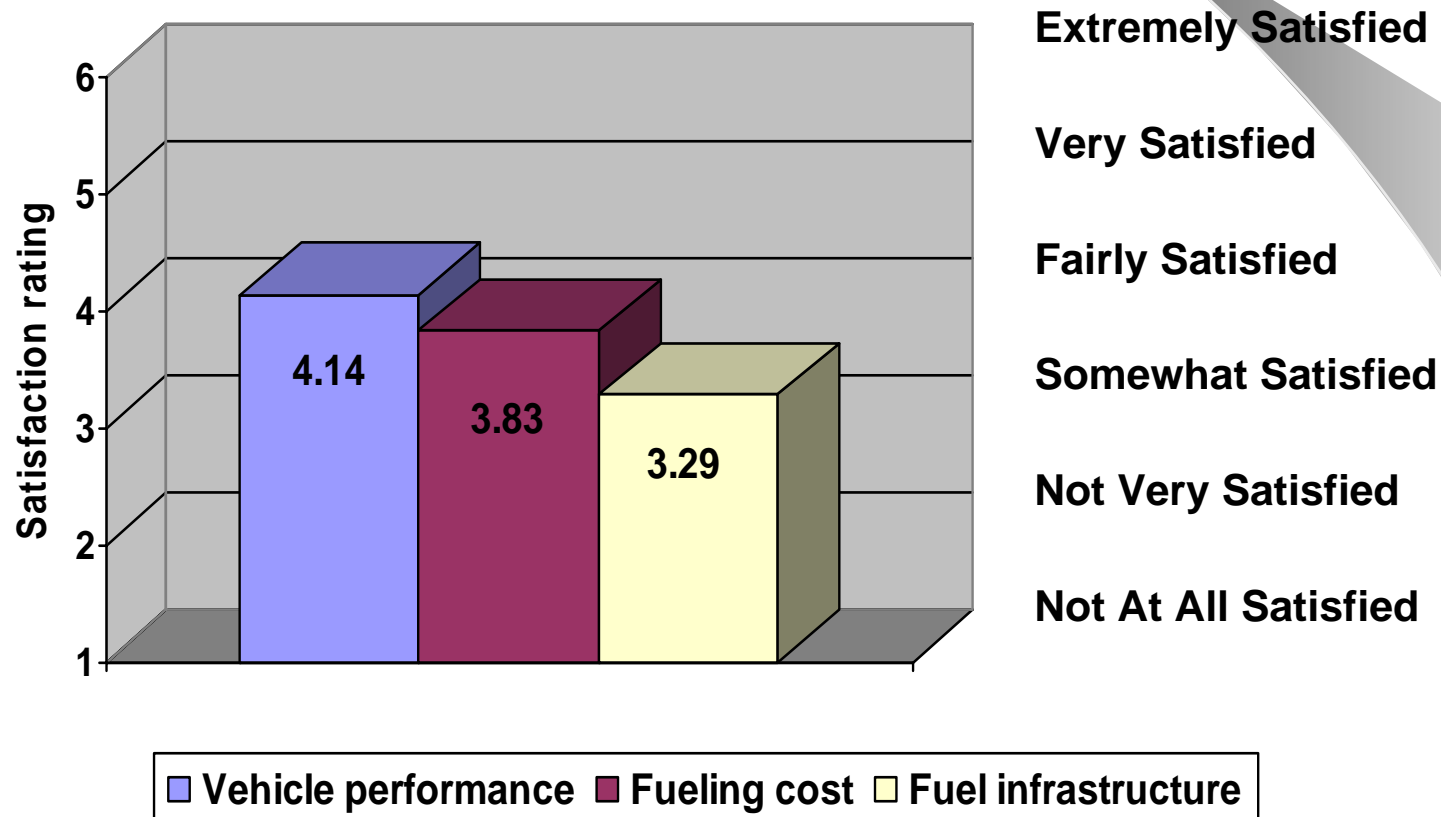
Source: 'What is the Future of Alternative Fuel in California?' survey data.

Which industries are using each alternative fuel?

	CNG	LNG	LPG	E85	Biodiesel	Electric	Other
Administrative	2			1		1	1
Agriculture	1		8		9	1	1
Bus transportation	6	1	1		4		
Construct/Maintenance	4	2	9	1	5	10	1
Fuel		1	2		1		
Goods Transport		1			1		
Goods Transport: Long					2		
Goods Transport: Short	2		4		5	1	
Lease/Rental	1		1			1	1
People Transport		1					1
Public Works: Other	11	1	1		1	2	2
Public Works: Refuse	5	1					
Public Works: Utility	6		3		1	1	
Retail Sales			3	2	2	2	
Other Services			1			2	
Taxi/Limousine/Charter	3			2			
Wholesale	1	1	2		1	2	1

Source: 'What is the Future of Alternative Fuel in California?' survey data.

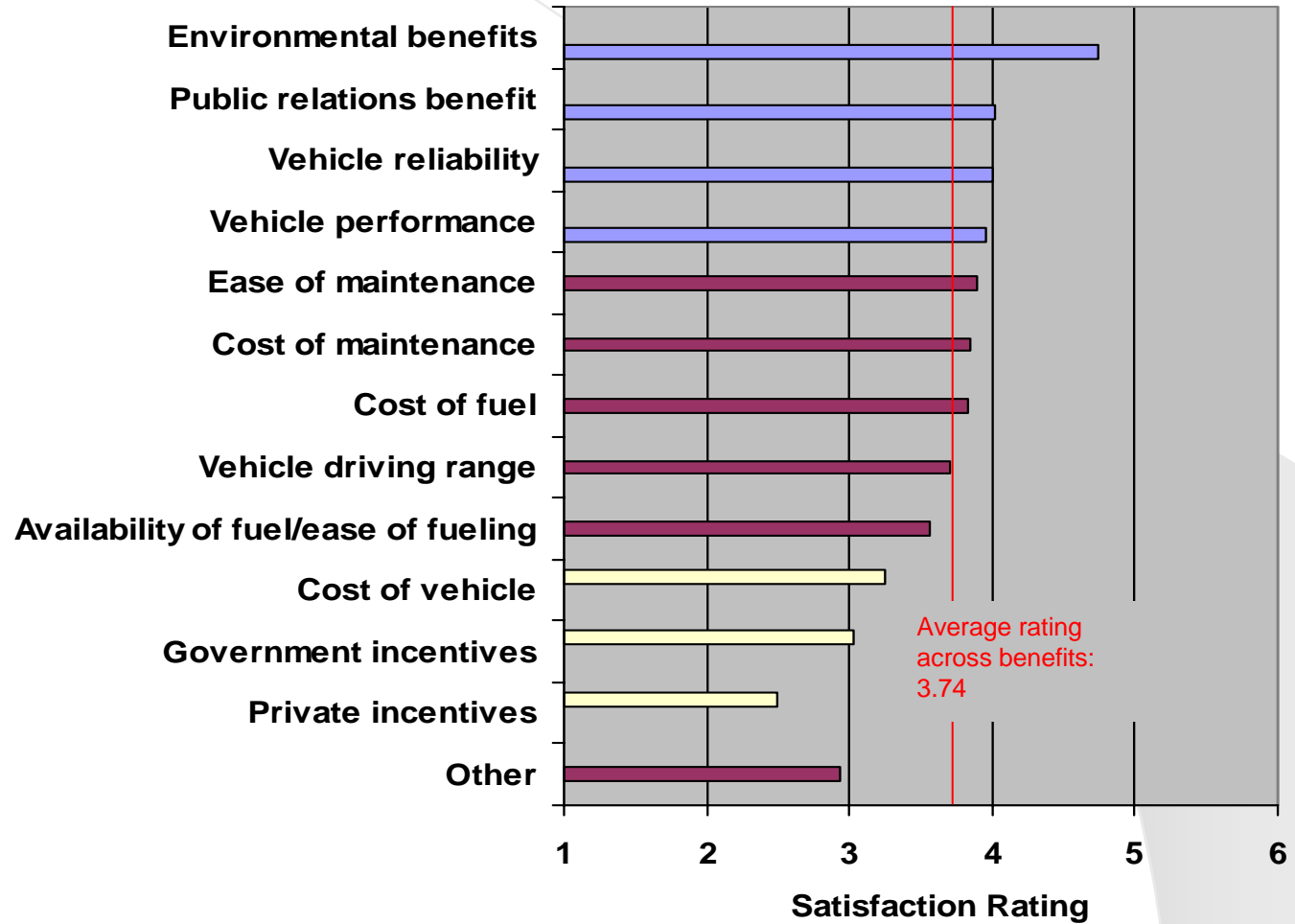
Overall satisfaction of users



Source: 'What is the Future of Alternative Fuel in California?' survey data.

Users are fairly satisfied with alternative fuel experience

- 1 = "Not at All Satisfied"
- 2 = "Not Very Satisfied"
- 3 = "Somewhat Satisfied"
- 4 = "Fairly Satisfied"
- 5 = "Very Satisfied"
- 6 = "Extremely Satisfied"

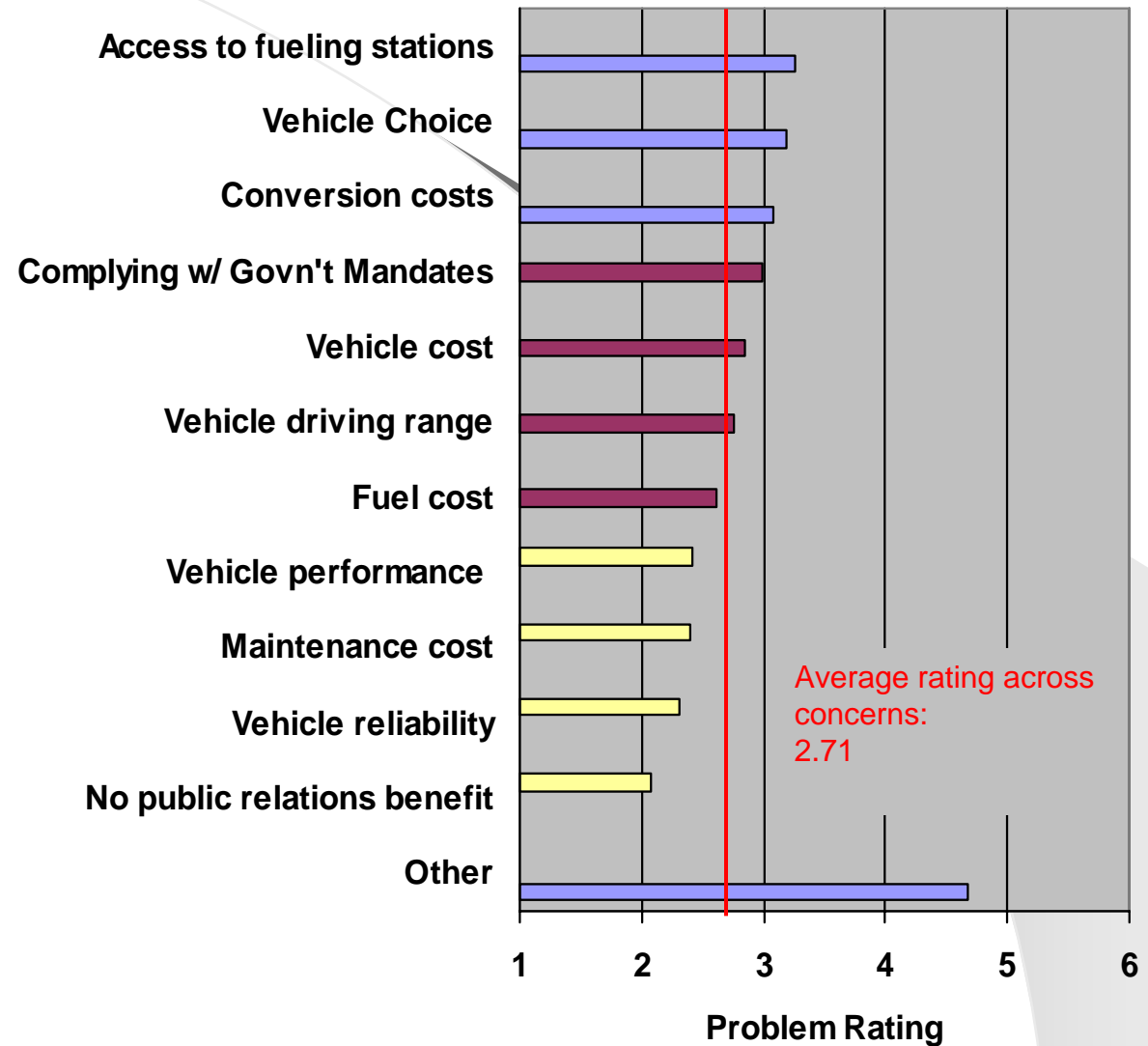


■ Higher than Average
 ■ Average Rating
 ■ Lower than Average

Source: 'What is the Future of Alternative Fuel in California?' survey data.

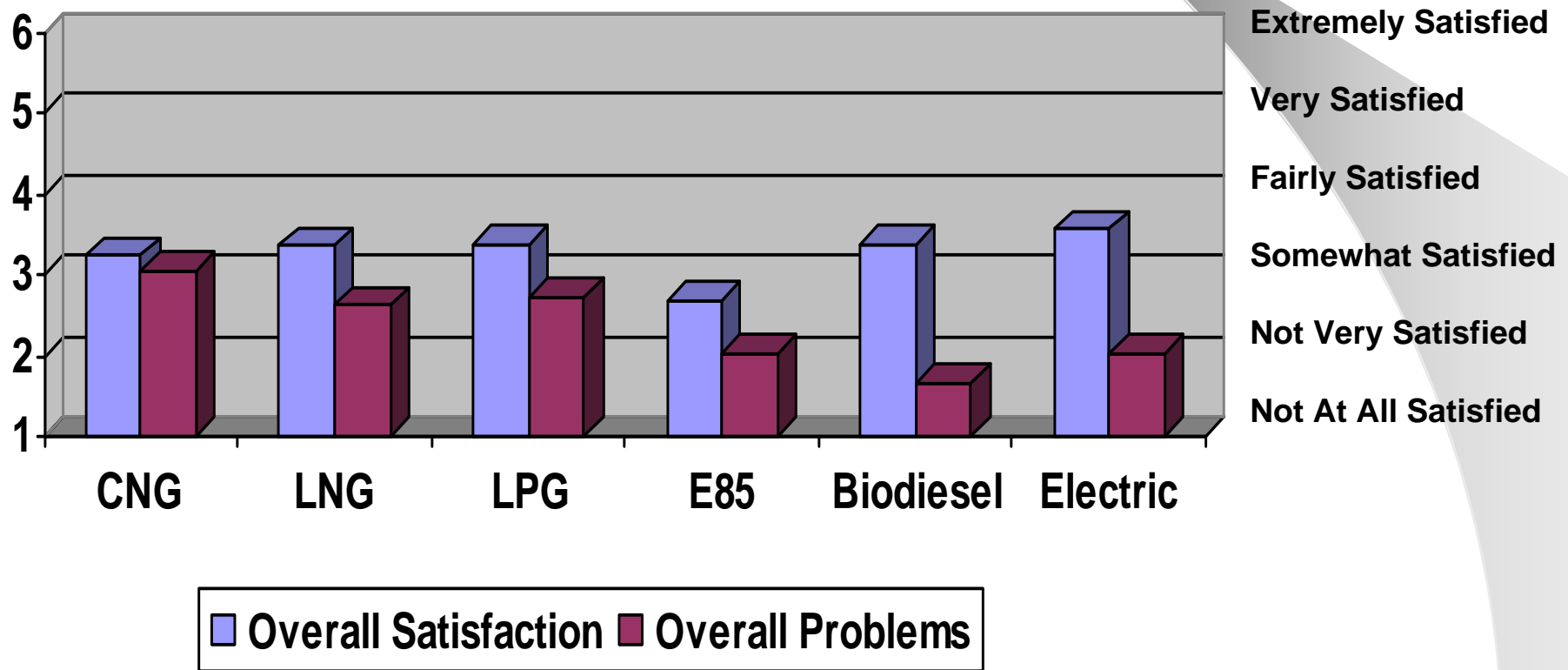
Users' experiences are somewhat problematic

- 1 = "Not at All Problematic"
- 2 = "Not Very Problematic"
- 3 = "Somewhat Problematic"
- 4 = "Fairly Problematic"
- 5 = "Very Problematic"
- 6 = "Extremely Problematic"



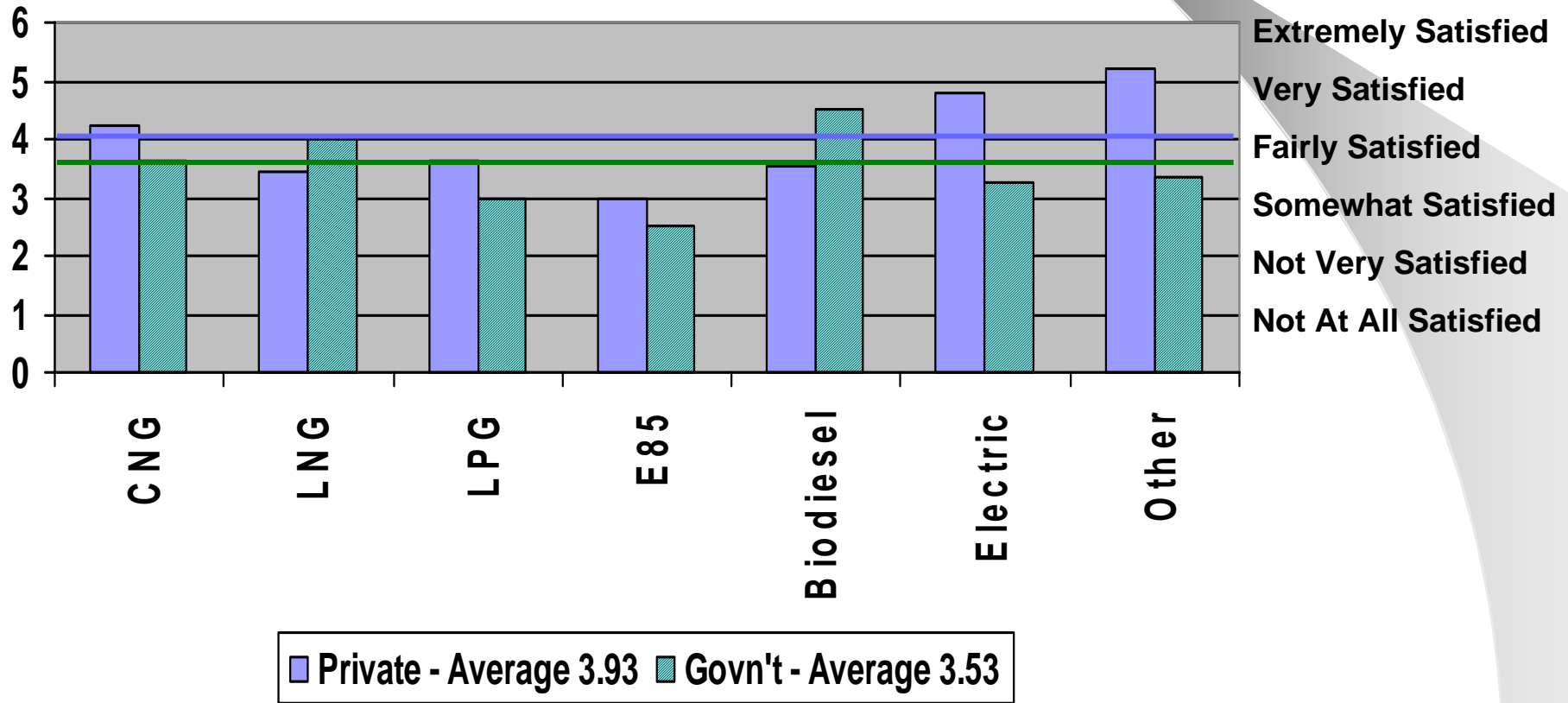
■ Higher than Average ■ Average Rating ■ Lower than Average

Problems and satisfaction vary by alternative fuel type



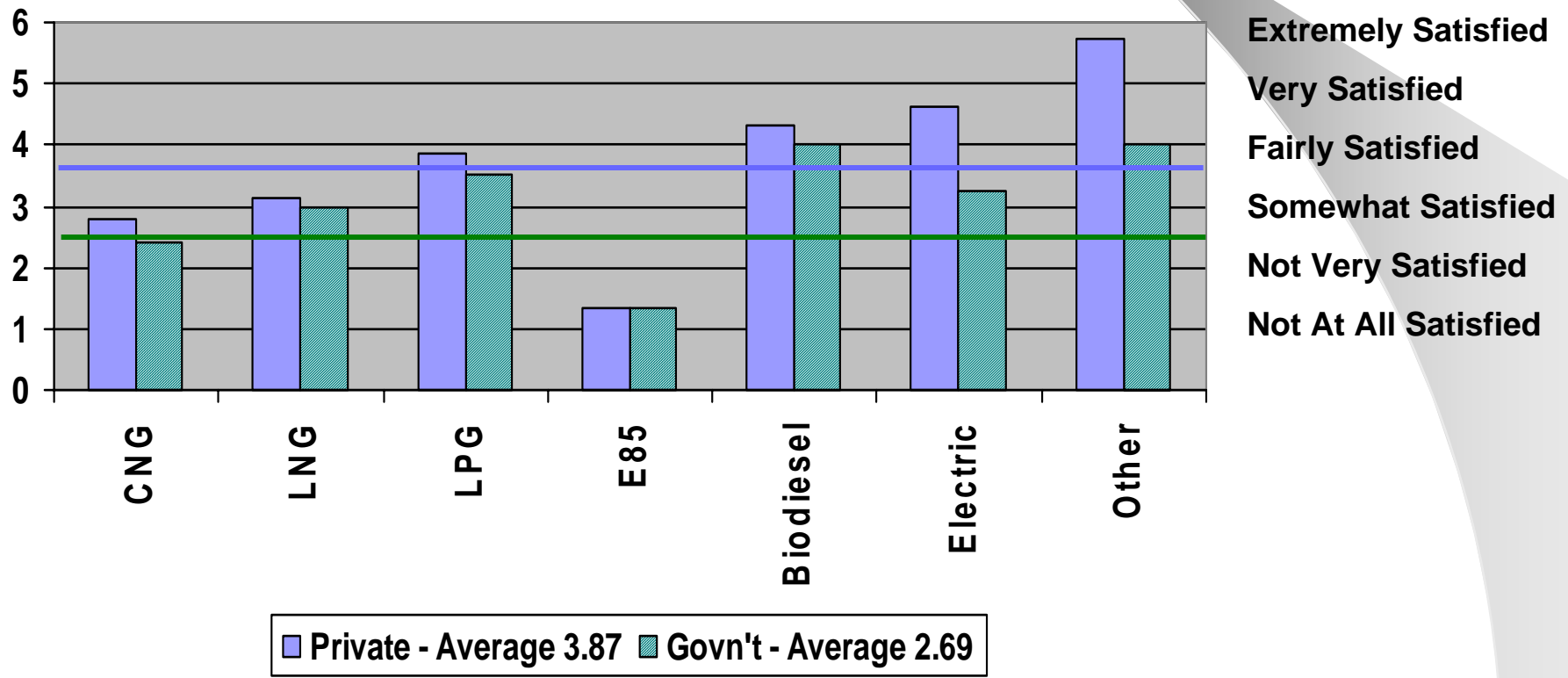
Source: 'What is the Future of Alternative Fuel in California?' survey data.

Satisfaction with fuel cost varies by fuel type



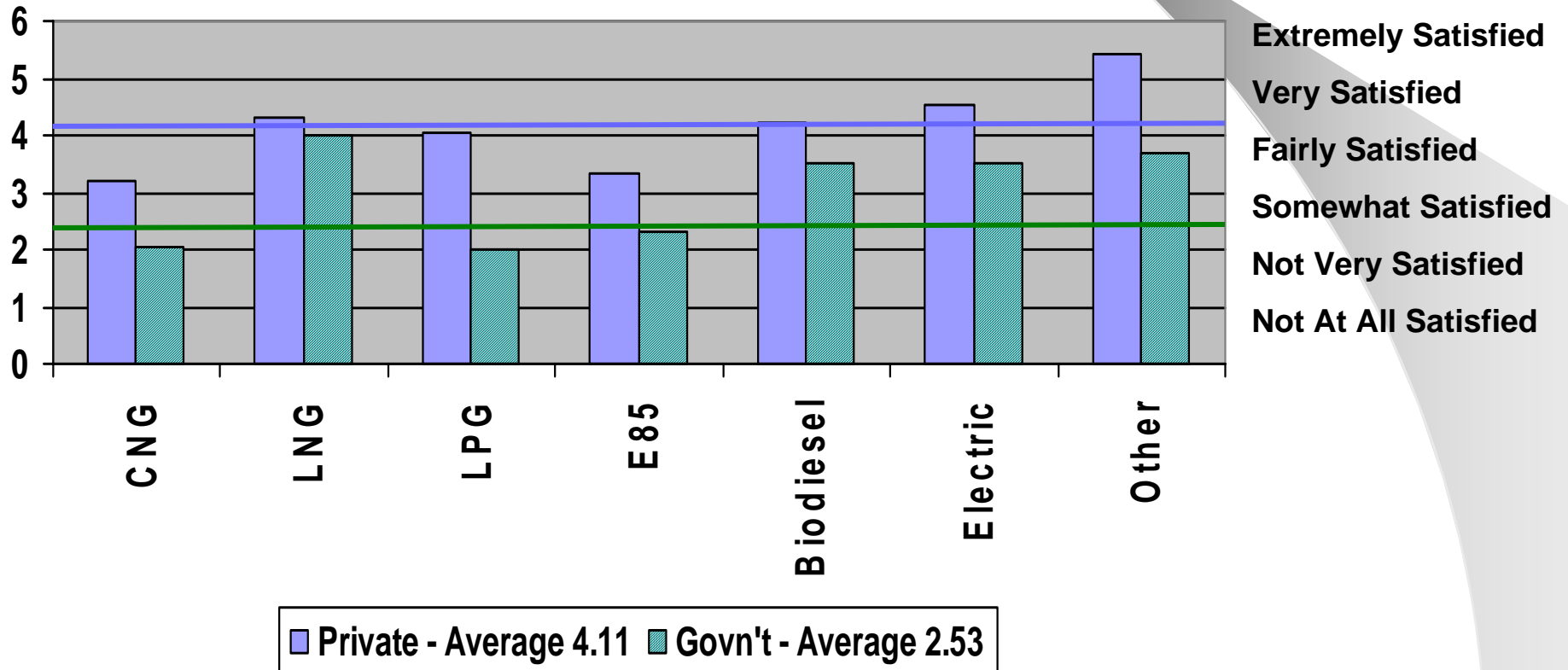
Source: 'What is the Future of Alternative Fuel in California?' survey data.

Satisfaction with fuel availability varies by fuel type



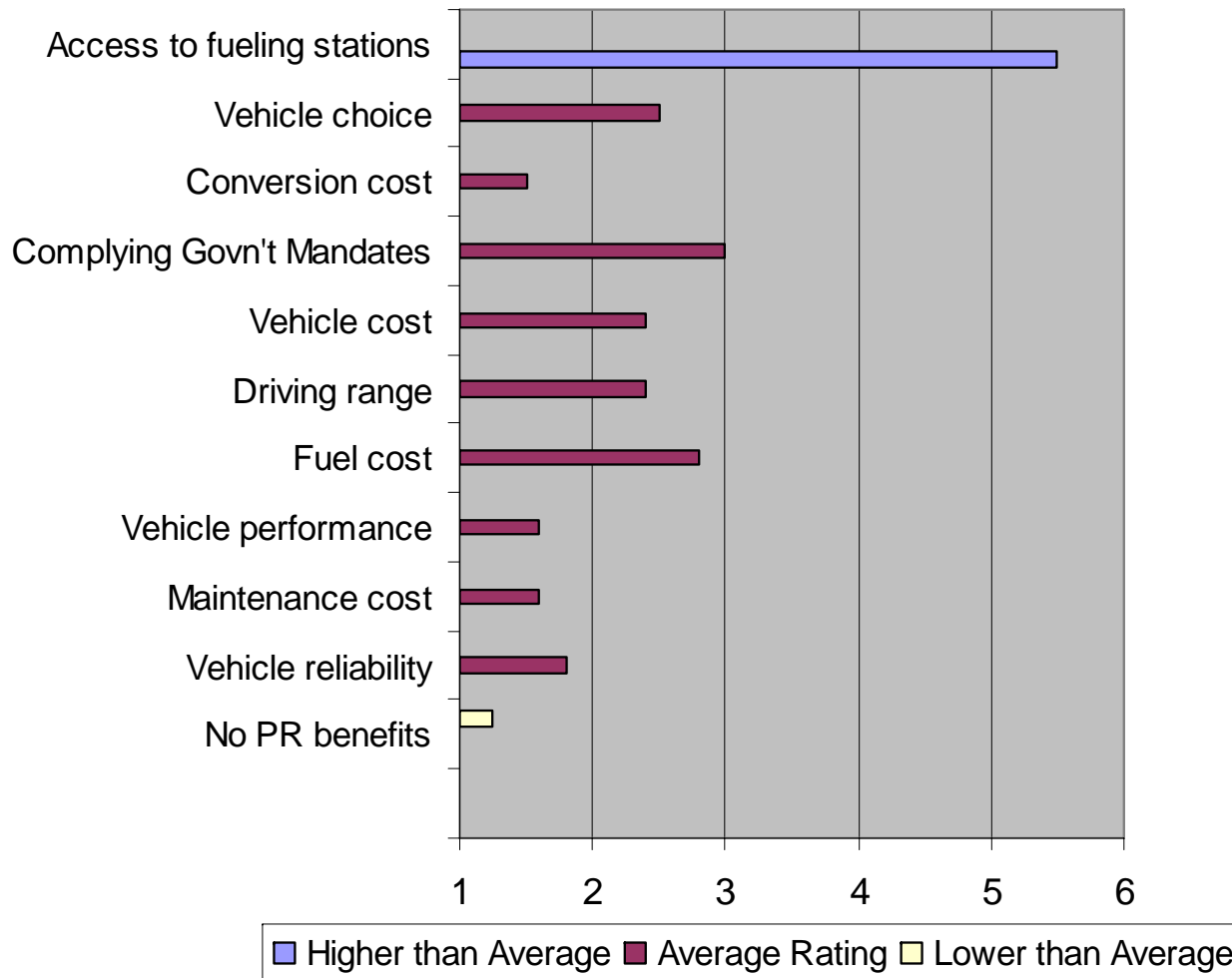
Source: 'What is the Future of Alternative Fuel in California?' survey data.

Satisfaction with driving range varies by fuel type



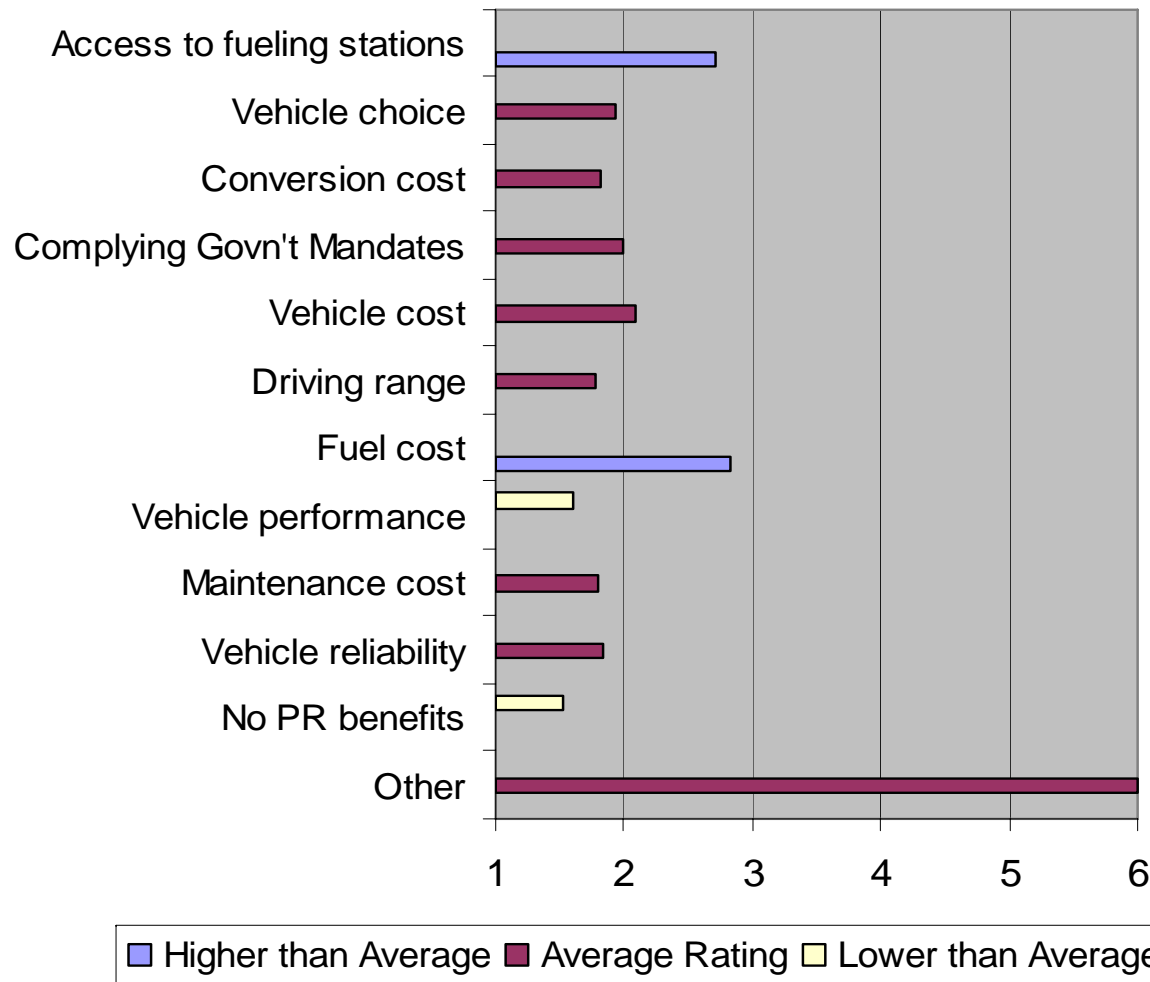
Source: 'What is the Future of Alternative Fuel in California?' survey data.

Problems of E85 users: access to fuel



"I have vehicles that will run on ethanol – can't find the fuel."

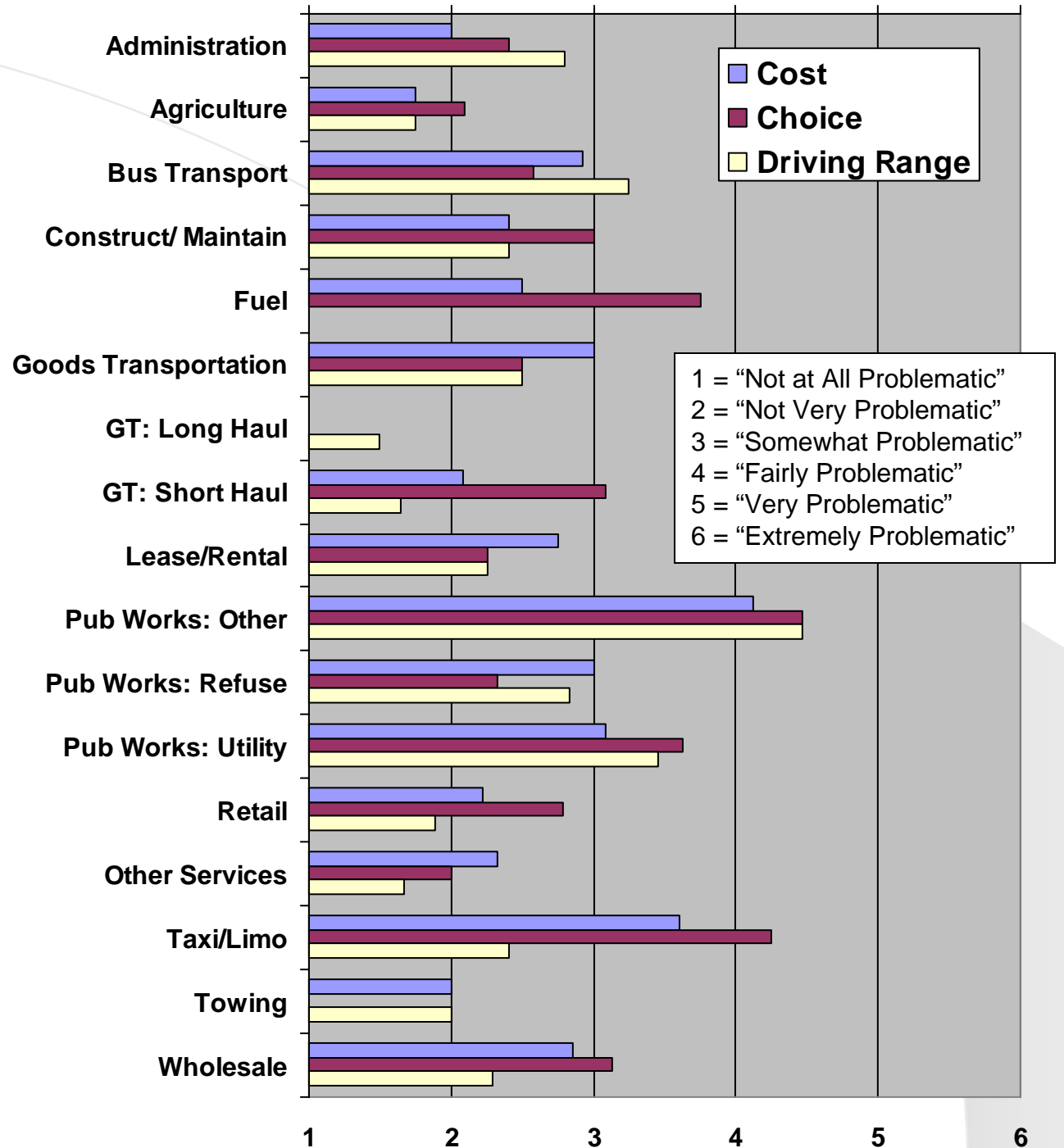
Problems of Biodiesel users: fuel access and cost



“Our local provider can't supply my demand to even 50% of the diesel I'm currently using now.”

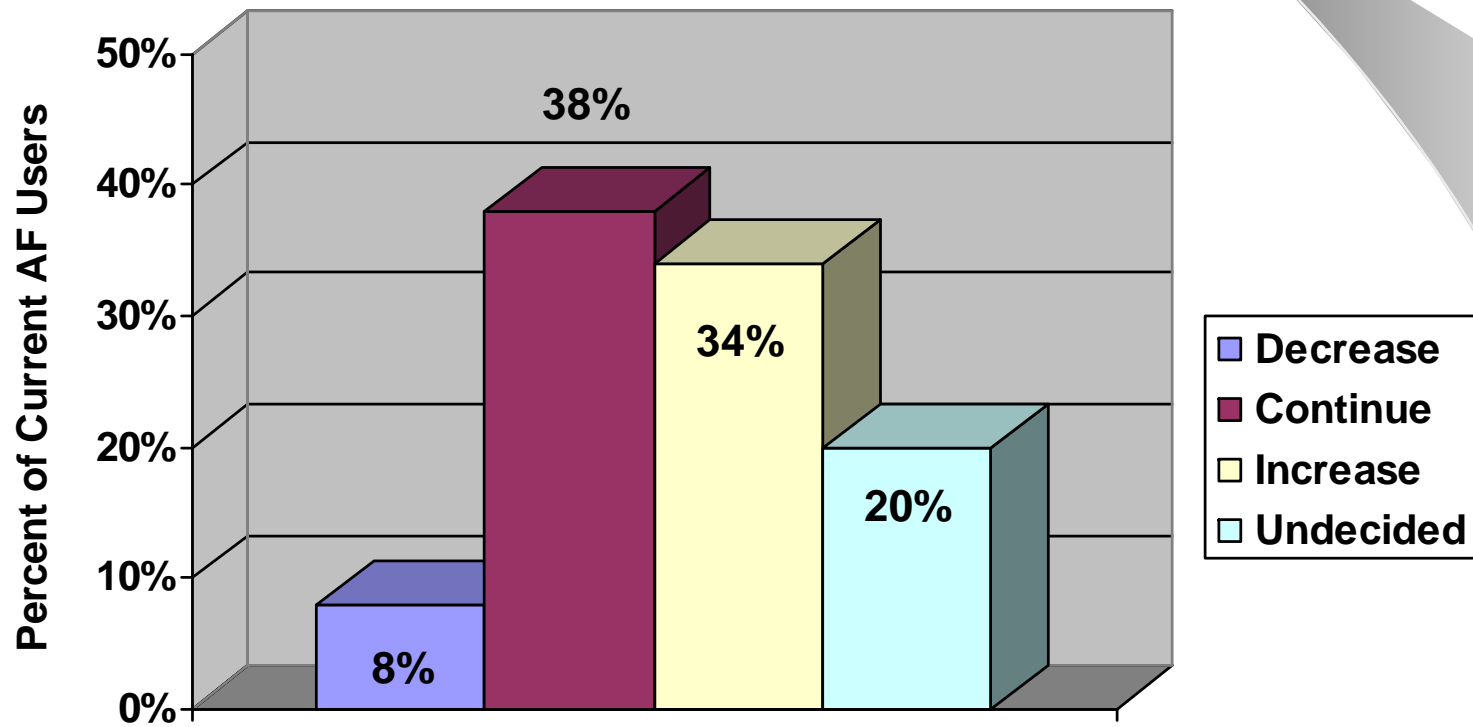
“The fuel cost is greater than regular diesel when I use virgin soybean oil. The fuel cost is the same when I use used vegetable oil. (I am not including the federal tax credit)”

Industries vary in experience of vehicle problems



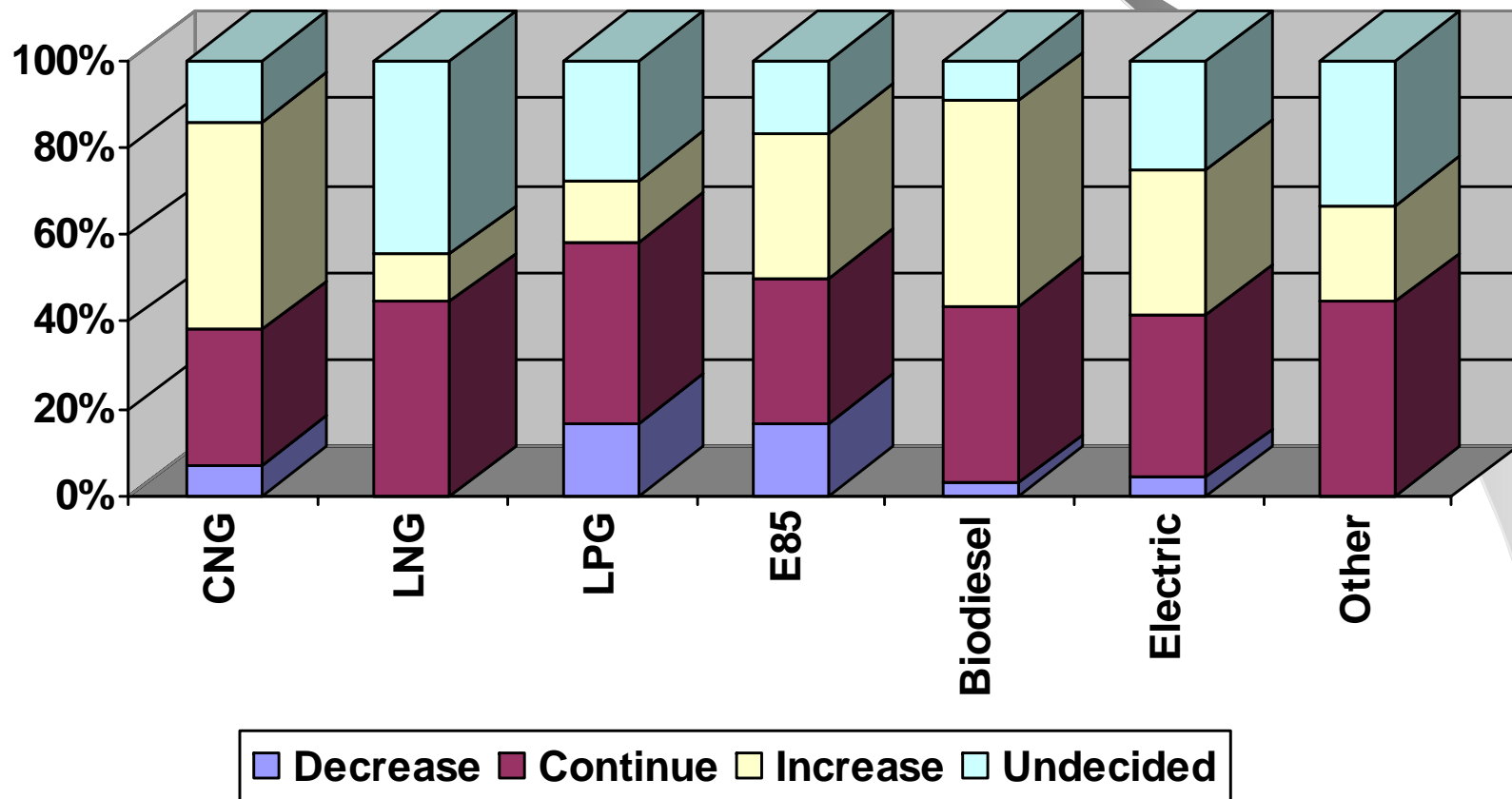
Source: 'What is the Future of Alternative Fuel in California?' survey data.

Future use of alternative fuels



Source: 'What is the Future of Alternative Fuel in California?' survey data.

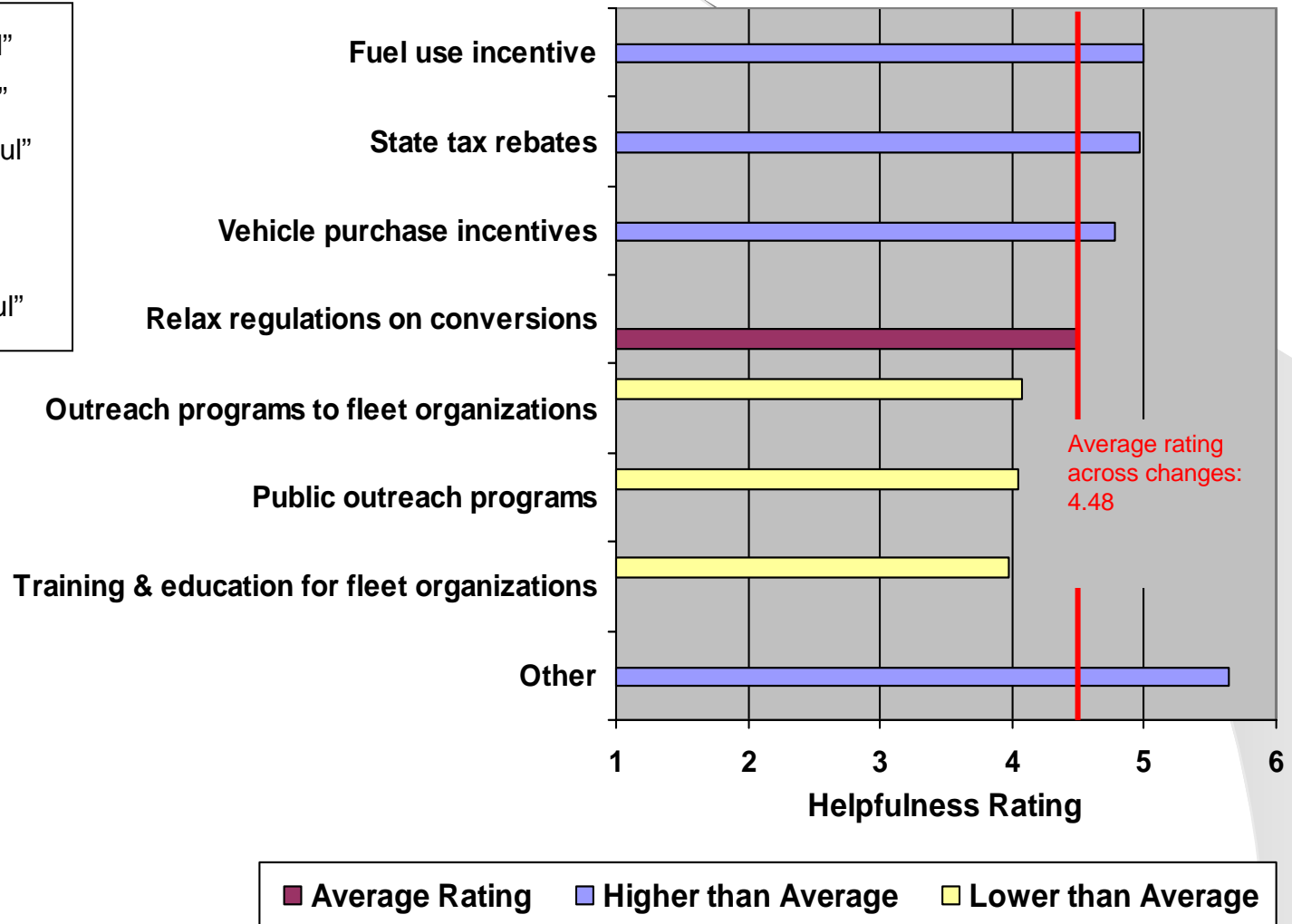
Future use by fuel type



Source: 'What is the Future of Alternative Fuel in California?' survey data.

Changes to expand alternative fuel use among users

1 = "Not at All Helpful"
 2 = "Not Very Helpful"
 3 = "Somewhat Helpful"
 4 = "Fairly Helpful"
 5 = "Very Helpful"
 6 = "Extremely Helpful"



Changes by fuel type

- **Biodiesel:** Fuel availability at a competitive price
- **CNG:** Vehicle choice and fuel availability
- **E85:** Fuel availability
- **Electric:** Technology development for better driving range
- **LNG:** Start-up cost
- **LPG:** Vehicle choice and technology

Expansion among users

- Increase supply and availability of alternative fuels
- Increase supply and selection of alternative fuel vehicles
- Improve alternative fuel vehicle technology

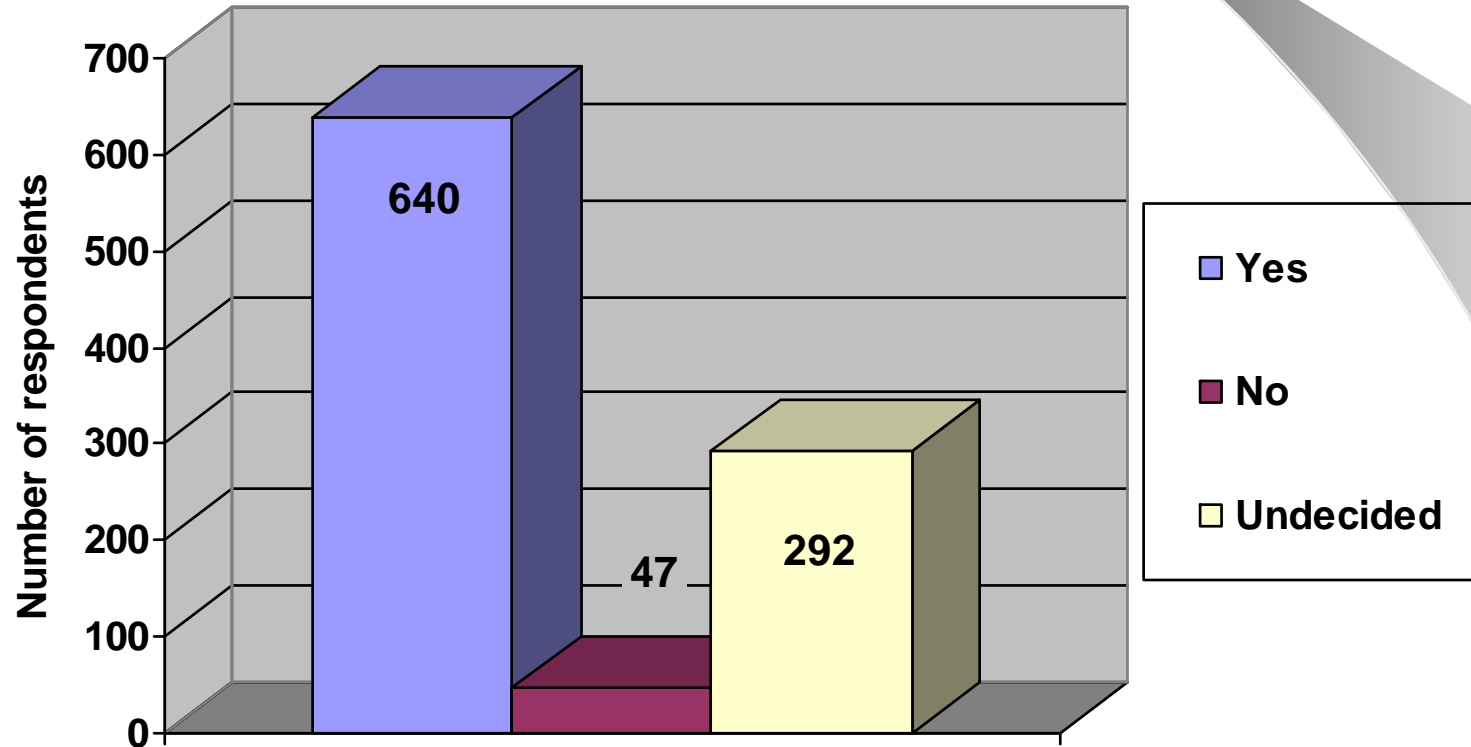
Expansion opportunities

- Agriculture fleets
 - Large industry
 - 20% already using
 - ***Promote biodiesel availability***
- Large fleets
 - More easily manage initial costs
 - More likely to be using already
 - ***Promote vehicle choice availability***

Non-Users

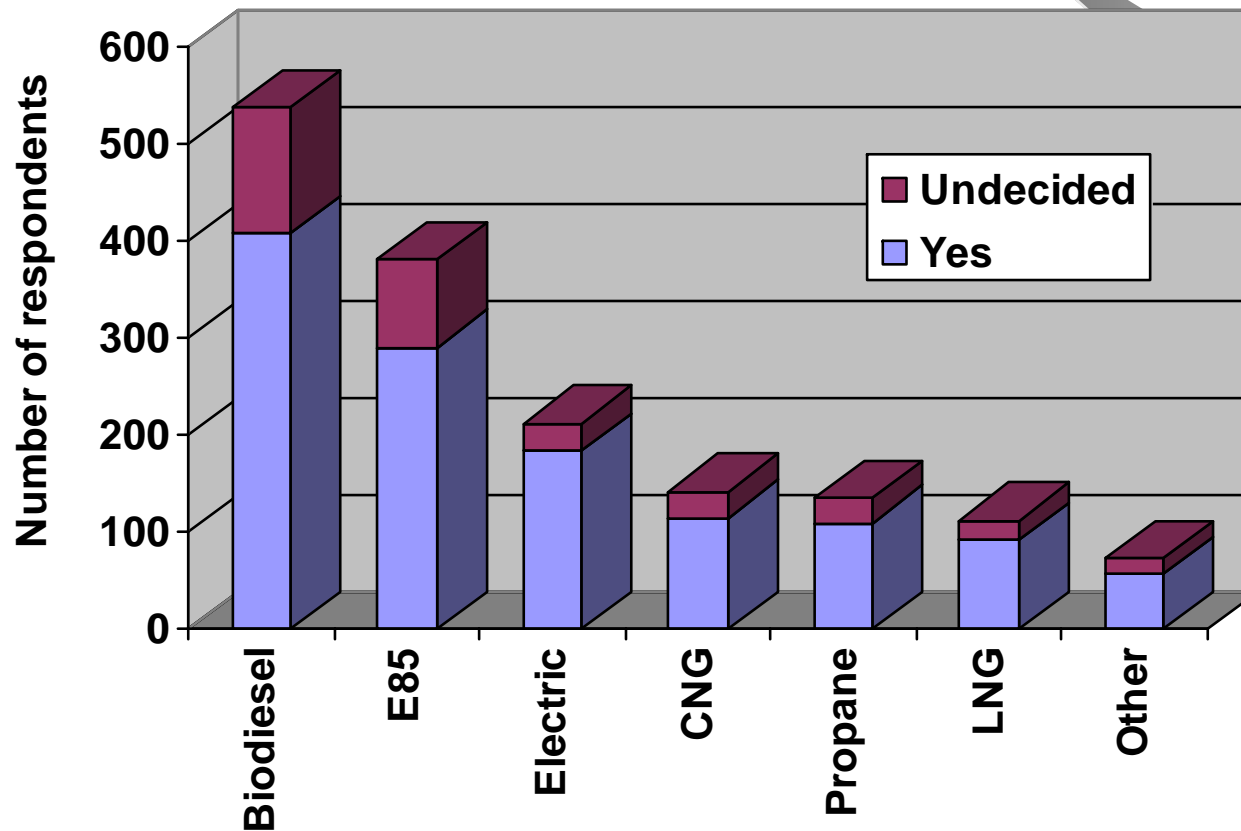
- Who is willing to use alternative fuels?
- What are the barriers to alternative fuels use?
- What are the opportunities to promote use?

How many fleets will consider using alternative fuels?



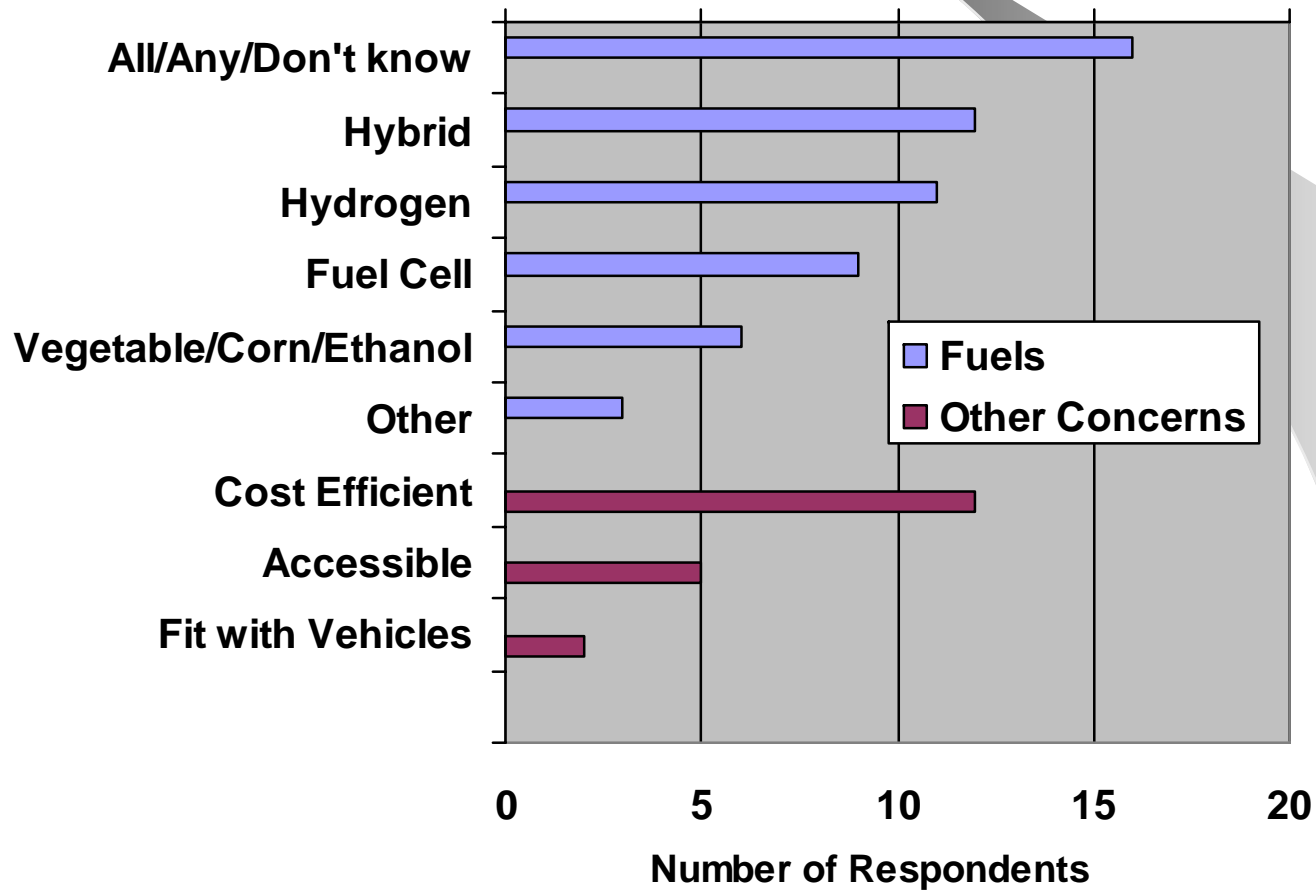
Source: 'What is the Future of Alternative Fuel in California?' survey data.

Which alternative fuels are non-users most interested in?



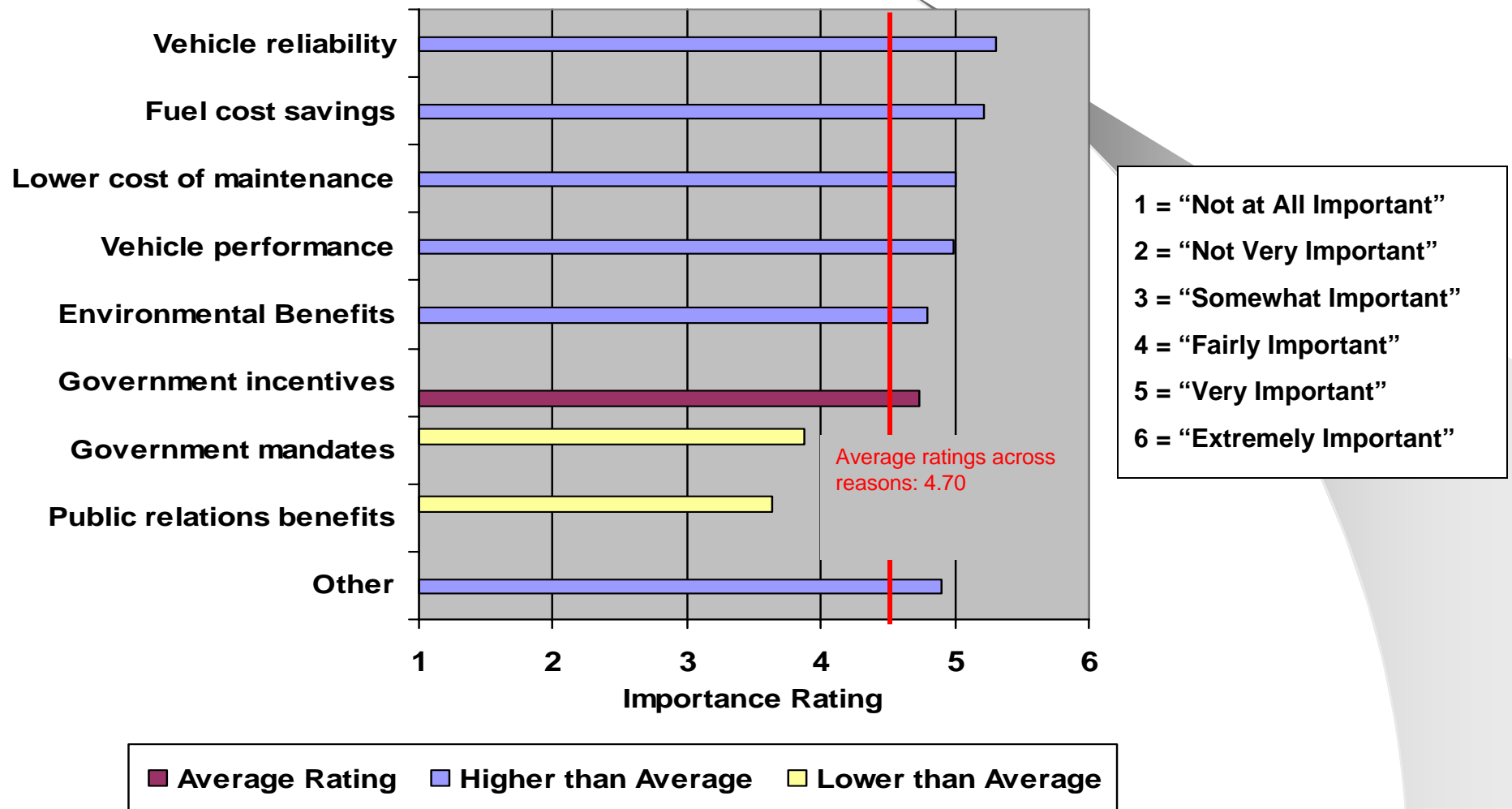
Source: 'What is the Future of Alternative Fuel in California?' survey data.

Other fuels and concerns



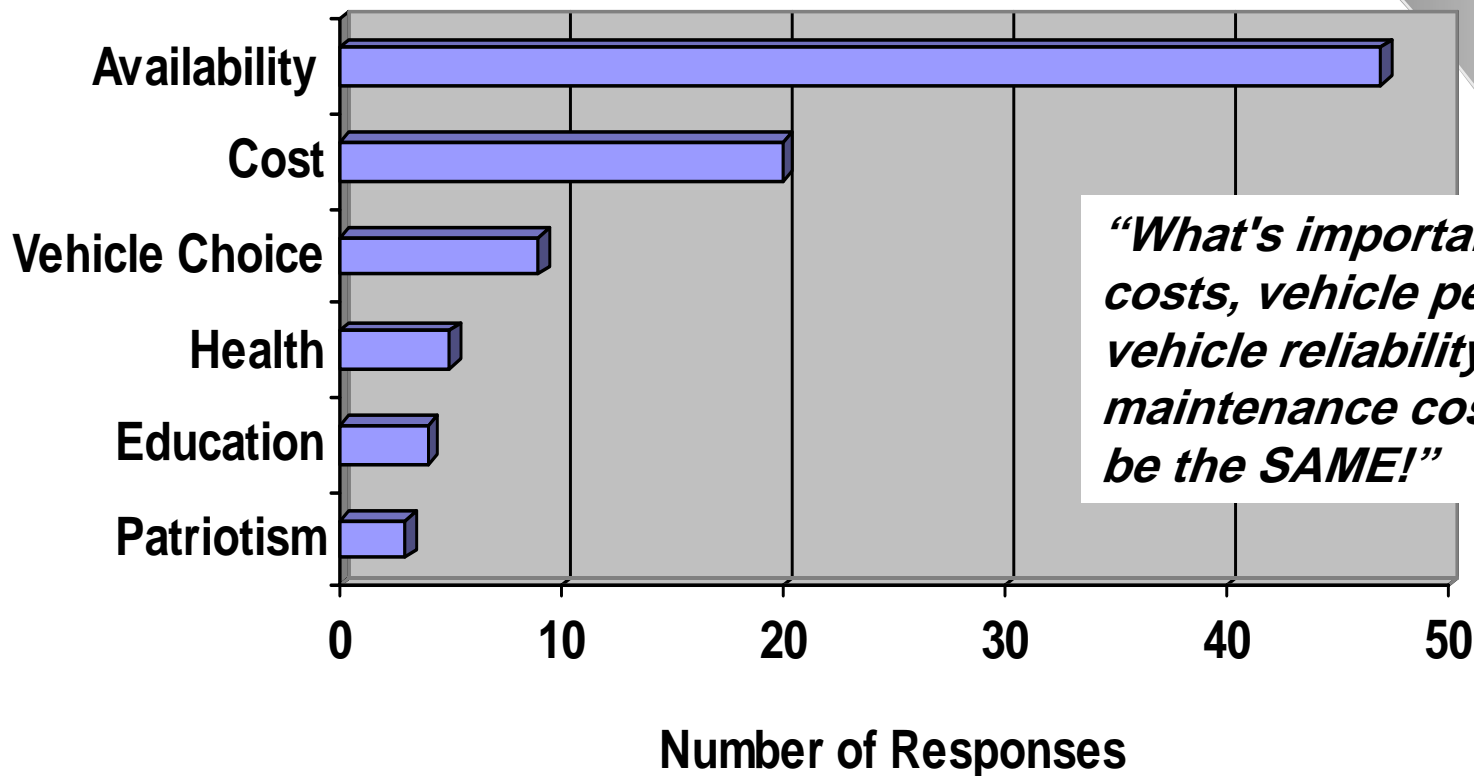
Source: 'What is the Future of Alternative Fuel in California?' survey data.

Motivations to begin using alternative fuels



Source: 'What is the Future of Alternative Fuel in California?' survey data.

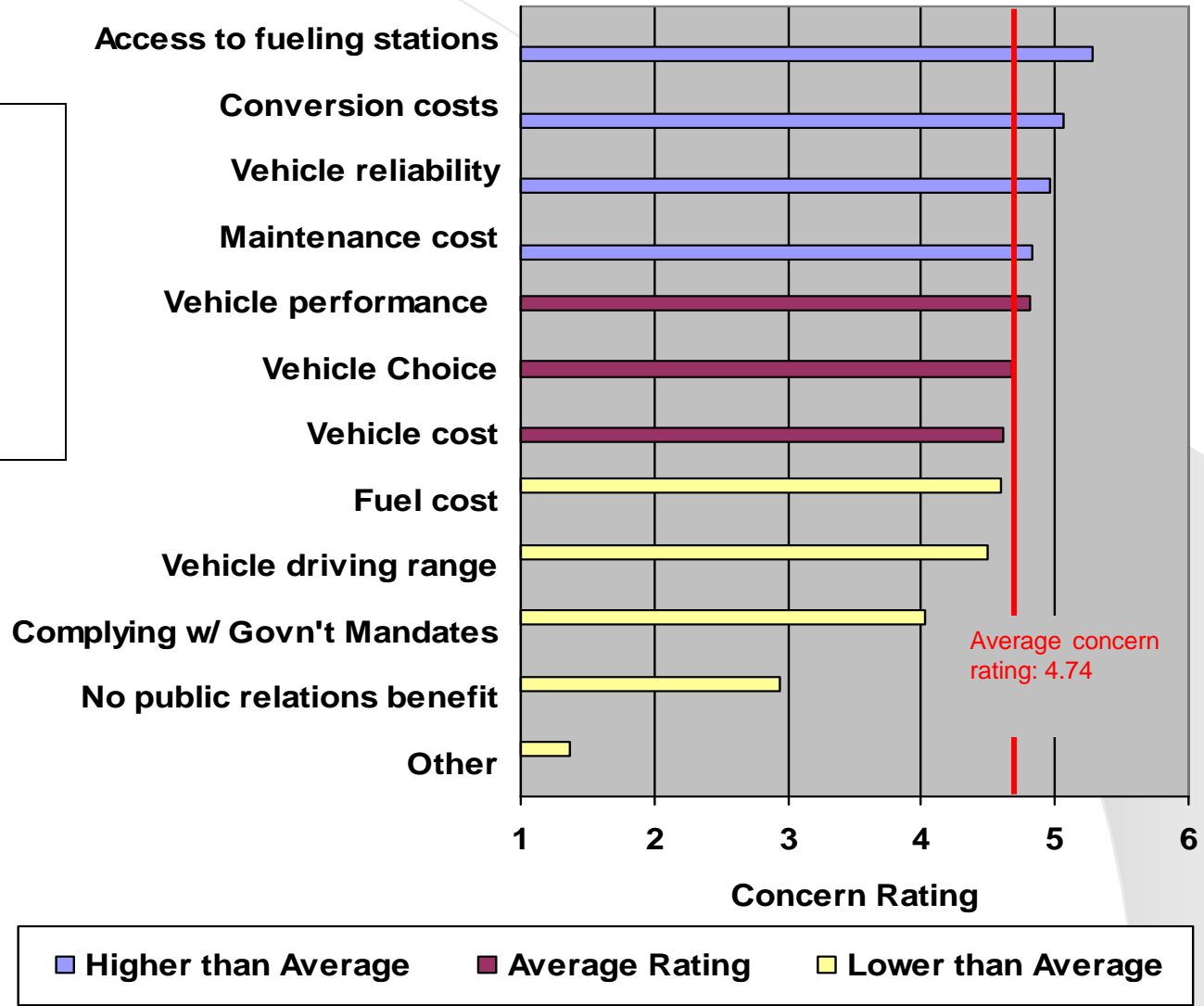
Other motivations to begin using



Source: 'What is the Future of Alternative Fuel in California?' survey data.

Concerns about using alternative fuels

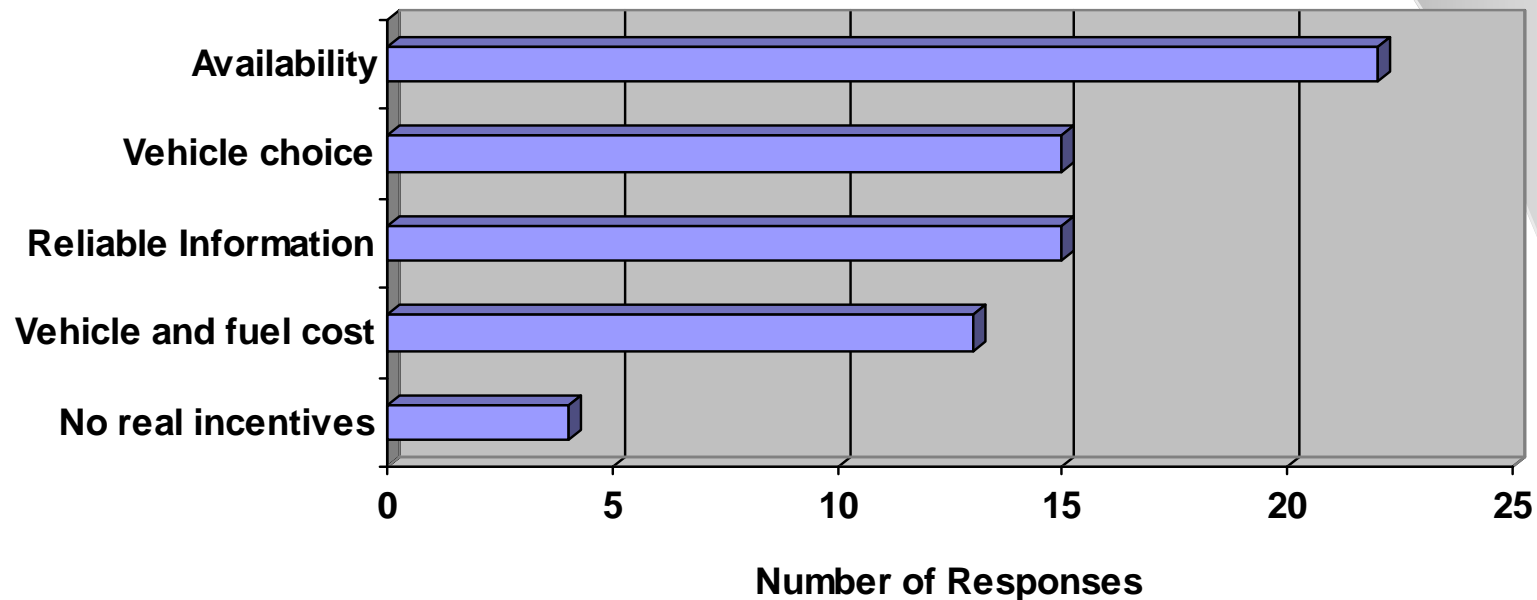
1 = "Not at All Concerning"
 2 = "Not Very Concerning"
 3 = "Somewhat Concerning"
 4 = "Fairly Concerning"
 5 = "Very Concerning"
 6 = "Extremely Concerning"



Source: 'What is the Future of Alternative Fuel in California?' survey data.

Other concerns about using: supply of fuel, vehicles, and information

“We just never really checked into it. There are no real incentives and not a lot of information that is handed out as to the pros and cons of alternatives. If we don't have any information about why we should change, why would we think about it? Don't fix it if it isn't broken.”



Problems for small fleets: start-up costs

- Small businesses have a harder time overcoming start-up costs:
 - *“I would have to win the lottery to re-invest in new equipment. Due to the states strangling of small business through taxes, DMV, EPA, Workers Comp., Health care, etc. It is impossible to make enough to upgrade equipment.”*

High concern of non-users vs Low problems of users

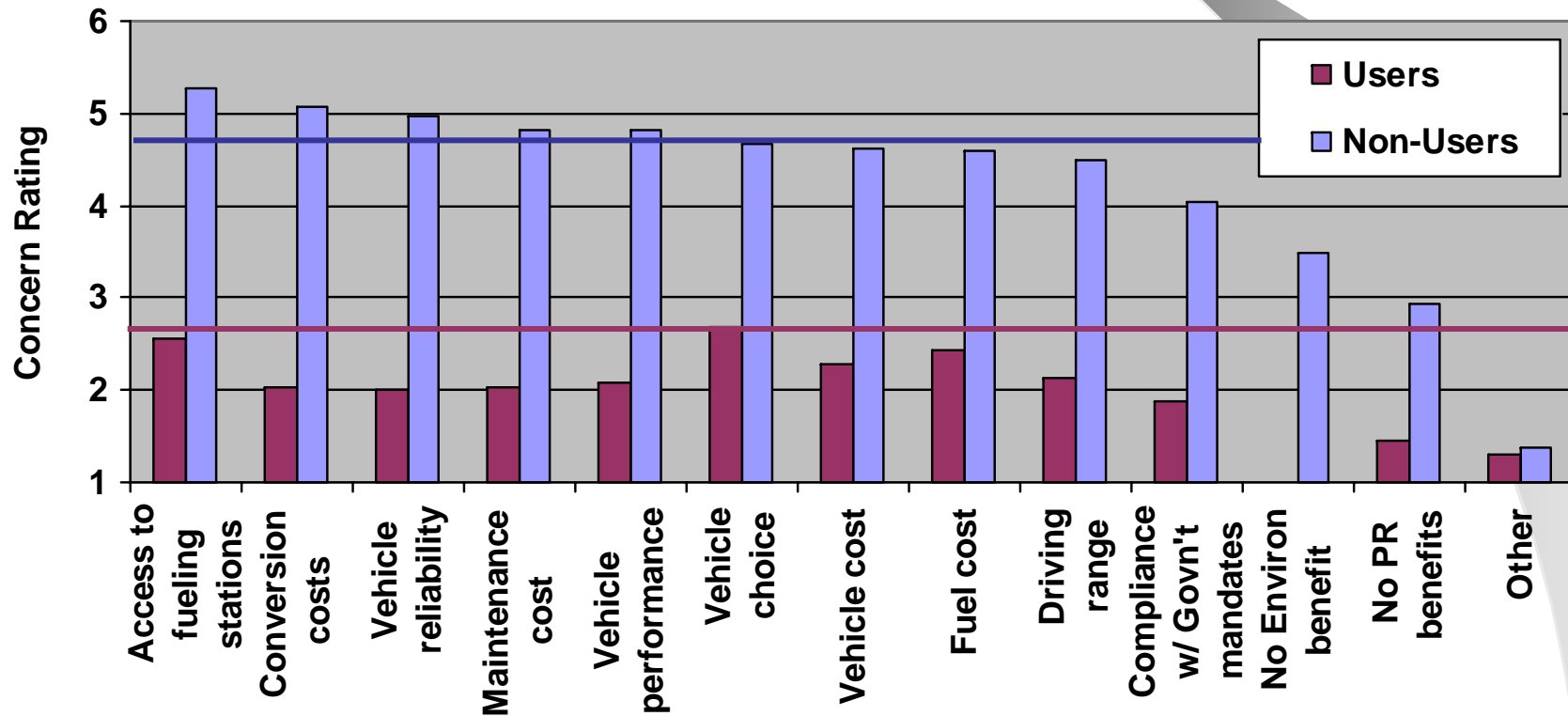
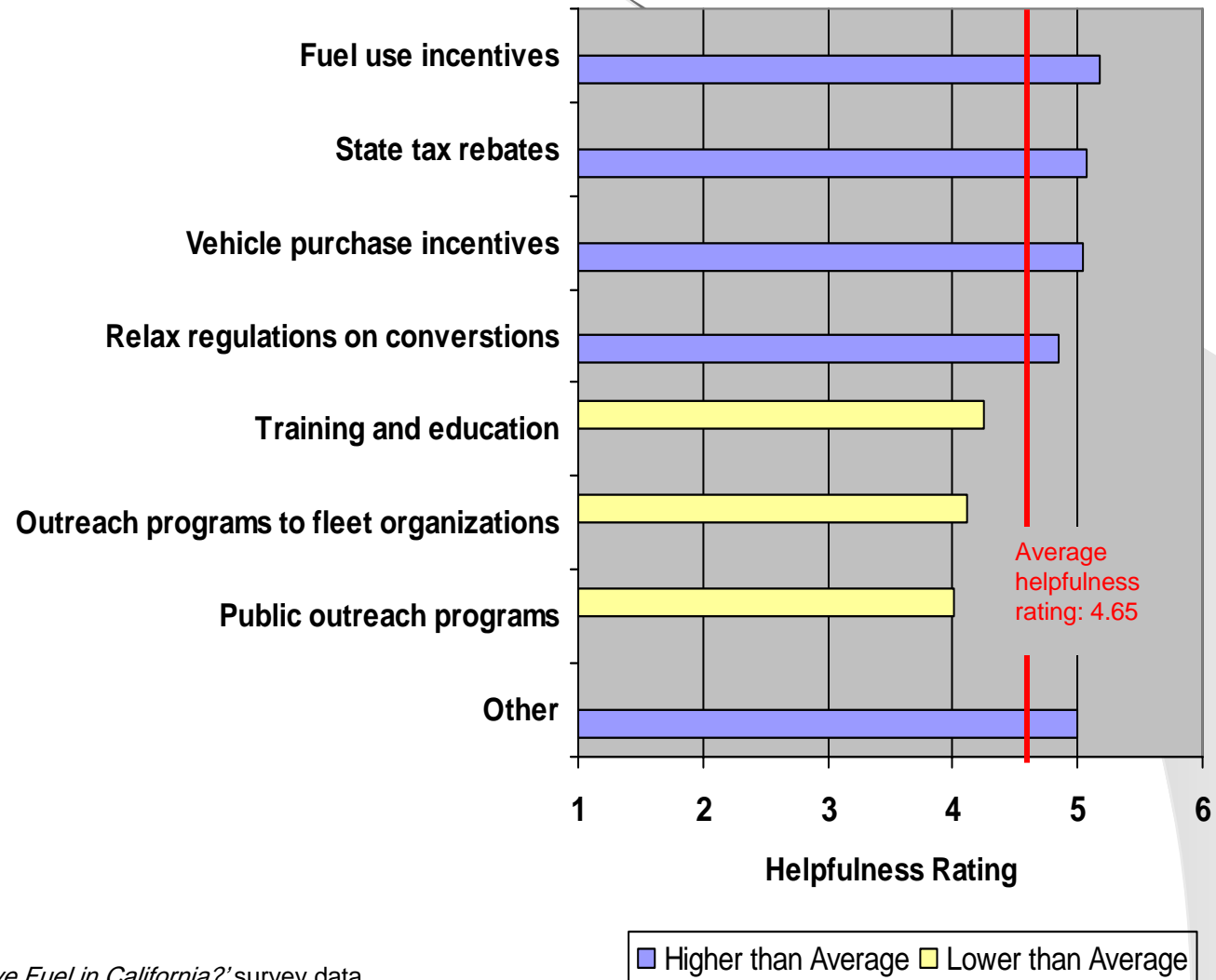


Figure 5.2 Source: 'What is the Future of Alternative Fuel in California?' survey data.

Changes to encourage use among non-users

- 1 = "Not at All Helpful"
- 2 = "Not Very Helpful"
- 3 = "Somewhat Helpful"
- 4 = "Fairly Helpful"
- 5 = "Very Helpful"
- 6 = "Extremely Helpful"

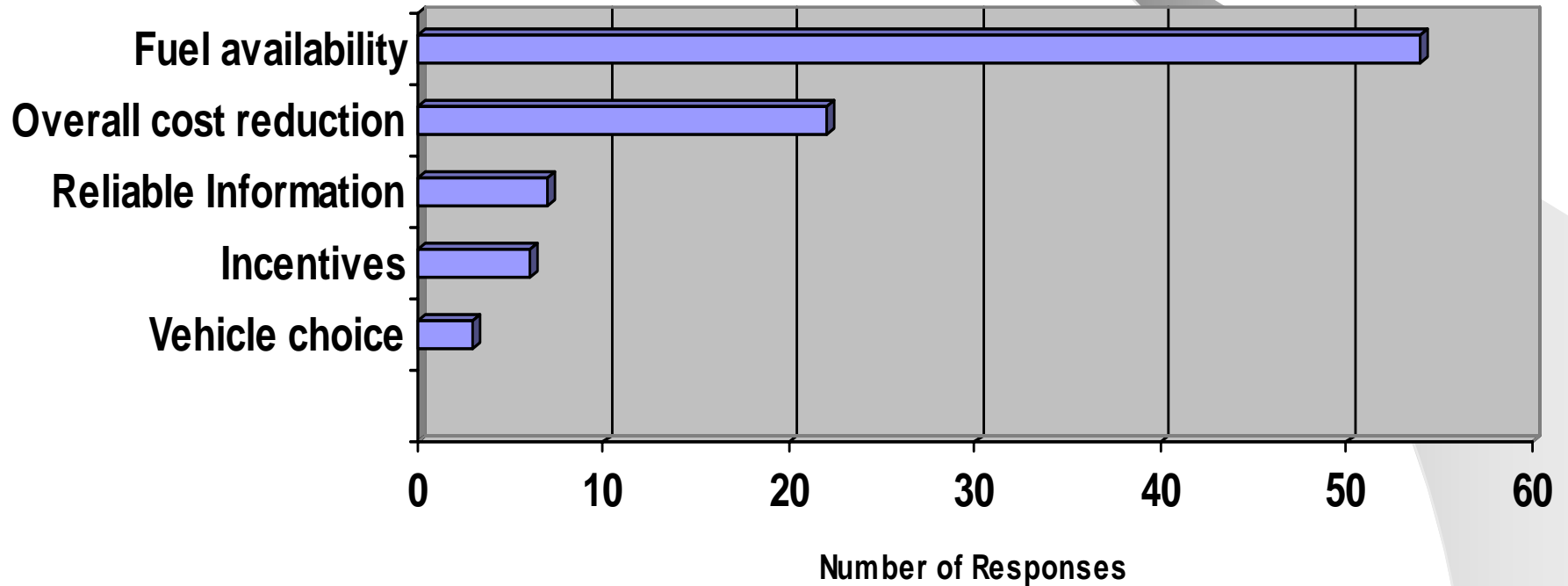


Source: 'What is the Future of Alternative Fuel in California?' survey data.

	Fuel use incentives	State tax rebates	Veh purchin cent	Relax conver sion regulati ons	Training & educ for fleet org's	Outreach programs for fleet org's	Public outreac h
Administrative	Purple	Purple	Purple	Yellow	Purple	Purple	Purple
Agriculture	Purple	Purple	Purple	Purple	Purple	Purple	Purple
Bus transportation	Purple	Purple	Purple	Yellow	Blue	Purple	Purple
Construction/ Maintenance	Purple	Purple	Purple	Purple	Purple	Purple	Purple
Fuel-Related	Purple	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Goods Transportation	Purple	Purple	Purple	Purple	Purple	Purple	Purple
Goods Transportation-Long Haul	Purple	Purple	Purple	Purple	Purple	Purple	Purple
Goods Transportation-Short Haul	Purple	Purple	Purple	Purple	Purple	Purple	Purple
Lease/Rental Cars & Trucks	Yellow	Purple	Purple	Yellow	Purple	Purple	Purple
Package/Mail Delivery	Purple	Yellow	Purple	Yellow	Purple	Blue	Purple
People Transportation	Purple	Yellow	Purple	Purple	Blue	Blue	Purple
Public Works/Safety-Other	Purple	Yellow	Purple	Purple	Blue	Blue	Purple
Public Works/Safety- Refuse Collection	Purple	Purple	Purple	Purple	Blue	Blue	Blue
Public Works/Safety- Utility	Purple	Purple	Purple	Purple	Purple	Blue	Purple
Retail Sales	Purple	Purple	Purple	Purple	Purple	Purple	Purple
Other Services	Purple	Purple	Purple	Purple	Purple	Purple	Purple
Taxi/Limousine/Charter	Purple	Purple	Purple	Yellow	Blue	Purple	Purple
Towing	Purple	Purple	Purple	Purple	Blue	Blue	Blue
Wholesale	Purple	Purple	Purple	Yellow	Purple	Purple	Purple

Blue = Change is a little more helpful than average for this industry. Purple = Change is as helpful as average for this industry. Yellow = change is a little less helpful than average for this industry.

Non-users need assurance of availability and effects on bottom dollar

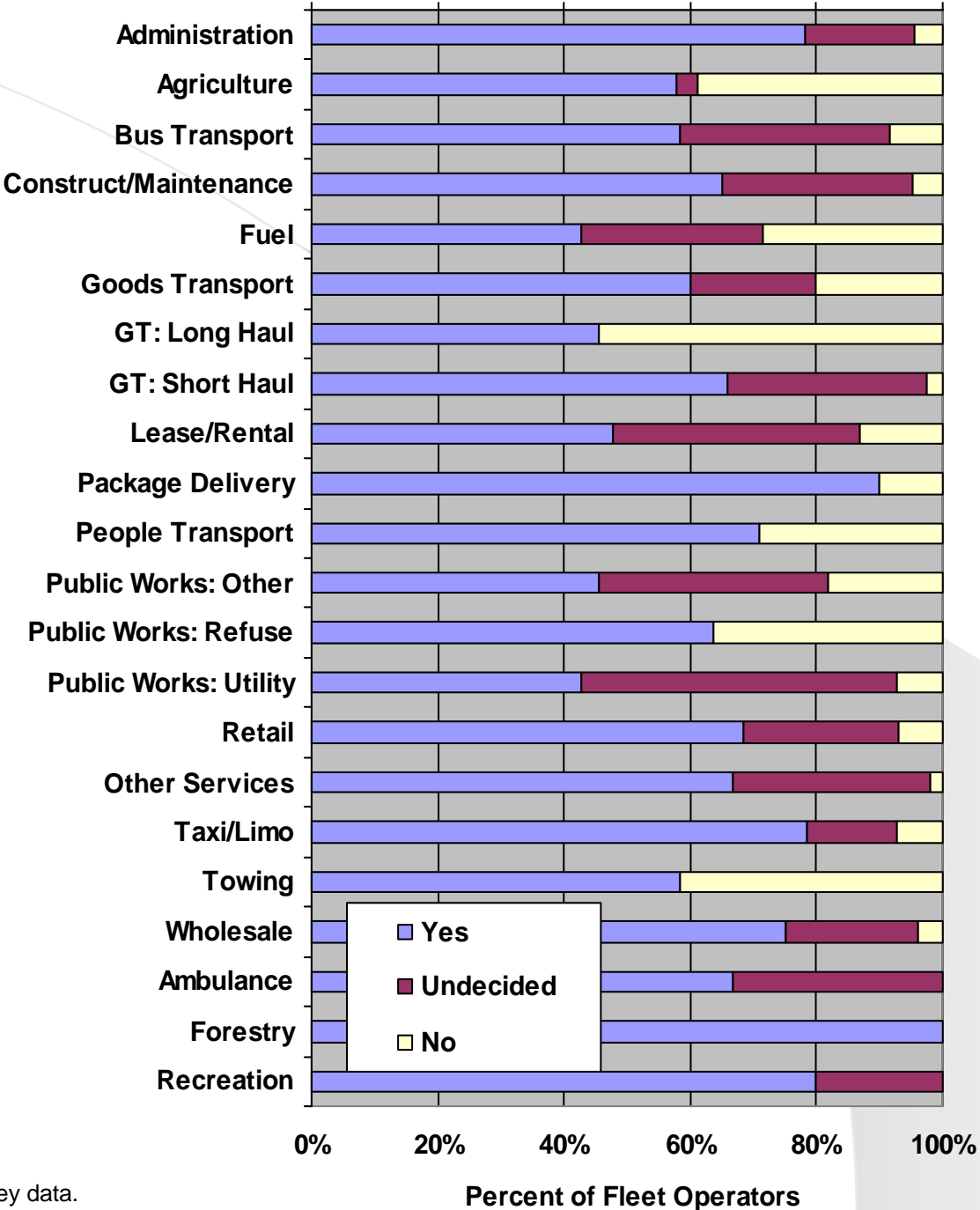


Source: 'What is the Future of Alternative Fuel in California?' survey data.

Opportunities to promote alternative fuel use

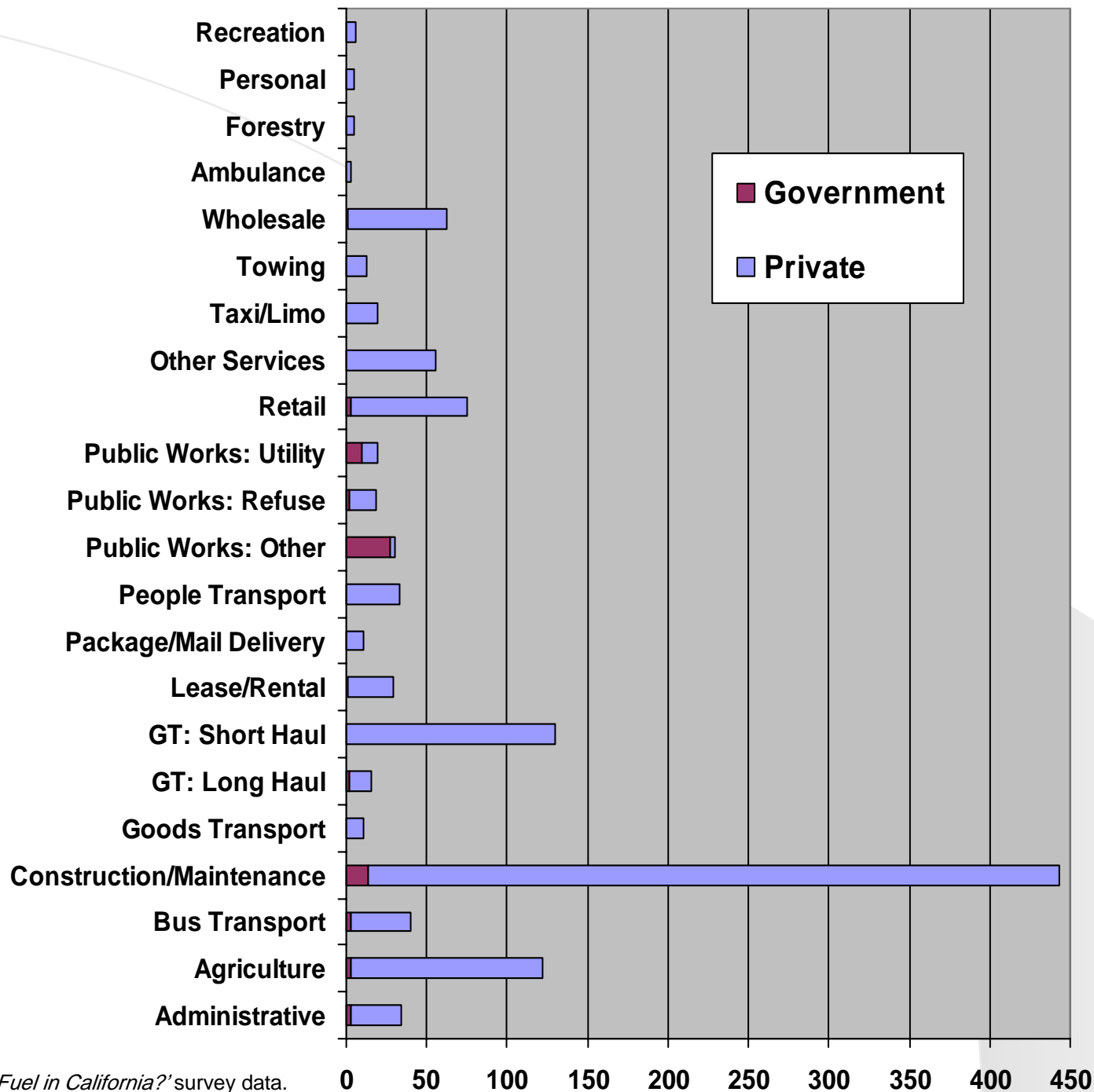
- Industry
 - Willing industries
 - Biggest industries
 - Industry-fuel match
- Fleet size
 - Small businesses

Willing industries



Source: 'What is the Future of Alternative Fuel in California?' survey data.

Industry size



Source: 'What is the Future of Alternative Fuel in California?' survey data.

Industry-fuel match

	CNG	LNG	LPG	E85	Bio-diesel	Electric	Other
Administrative	2	3	2	11	5	11	5
Agriculture	8	6	12	38	59	18	8
Bus transportation	4	3	2	6	14	9	1
Construction/ Maintenance	66	60	62	169	235	70	16
Goods Transport: Short Haul	12	10	16	36	70	20	11
Lease/Rental Cars & Trucks	2	2	2	5	11	8	1
People Transport	6	3	4	17	9	8	7
Public Works: Refuse Collection	4	5	1	2	10	1	0
Retail Sales	8	4	7	21	26	16	6
Other Services	7	6	7	23	18	19	9
Taxi/Limo/Charter	5	1	5	9	2	3	1
Wholesale	7	5	9	17	28	17	3

Fleet size

- Most fleets are small fleets (< 20 vehicles)
- Small businesses:
 - have flexible decision-making
 - are at higher risk when trying new technology
 - need help with start-up costs

Opportunities to promote alternative fuel use

- **Large industries are interested in biodiesel:**
 - Promote biodiesel availability and information for:
 - Agriculture
 - Construction/Maintenance
 - Short Haul Goods Transportation
- **Small fleets are flexible but need help with start-up costs**
 - Provide incentives for start-up costs, with clear phase-out plan.

Top 4 Recommendations

- **Disseminate all current information on alternative fuel use in an easily accessible format from a trusted source.**
- **Generate accurate information on the costs and benefits of alternative fuel use.**
- **Address the supply of alternative fuels and vehicles by facilitating conversations between fleet operators and suppliers/manufacturers.**
- **Help small businesses afford the start-up costs; include a clear plan for phase-out of incentives.**

Thank you!

For invaluable assistance with this project,
Zetetic Associates would like to thank:

- California Energy Commission
- Katin Engineering
- Kevin Nesbitt and Dan Sperling
- California Department of Motor Vehicles
- 20 pilot survey participants
- 1330 survey participants
- 9 focus group participants



**Alternative Fuel Use
Among California Fleets:
Current Use, Barriers, & Opportunities**

Zetetic Associates, Inc.

9 Recommendations

- I. Disseminate all current information on alternative fuel use in an easily accessible format from a trusted source such as a government agency Web site.
- II. Generate accurate information on the costs and benefits of alternative fuel use for businesses.
- III. Develop common alternative fuel agenda with county and city government bodies.
- IV. Address the supply of alternative fuel vehicles – including choice and performance – by facilitating conversations between manufacturers and fleet operators.
- V. Address alternative fuel supply and accessibility.
- VI. Incentivize alternative fuel costs to make them comparable to gasoline and diesel.
- VII. Do not remove non-monetary incentives once they are offered; make the phase-out of plan for monetary incentives transparent.
- VIII. Help small businesses afford the start-up costs involved in alternative fuel vehicle purchase or conversion
- IX. Recognize businesses for alternative fuel use and exemplary alternative fuel practices.

Recommendation 1: Develop a definitive source for alternative fuel information

- Develop a definitive, accessible, and frequently updated source of accurate information on:
 - Costs and benefits of alternative fuel use
 - Current availability of each alternative fuel statewide
 - Current monetary and non-monetary incentives; planned changes to incentives
 - How to convert vehicles for alternative fuel use
 - Current regulations on fuels, vehicles, conversions; including any planned changes in regulations
 - Maintenance tips and training opportunities for mechanics and fleet operators
 - Manufacturers warranties for converted vehicles
 - Common problems and solutions for current technology

Recommendation 2: Generate accurate information of costs and benefits

- Fund an experimental study conducted by impartial experts in partnership with private businesses that have small to midsize vehicle fleets. The study should determine the following:
 - Costs of converting to alternative fuel
 - Fuel cost and efficacy (work performed per fuel unit) of alternative fuels compared to gasoline and diesel
 - Costs and requirements of maintenance relative to gasoline and diesel
 - Problems encountered and solutions identified for current fuel accessibility and vehicle conversions
- Prioritize research on:
 - Effects of fuels E85, biodiesel, and electric
 - Industries of construction/maintenance, goods transport-short haul, and agriculture; retail and wholesale fleets if possible