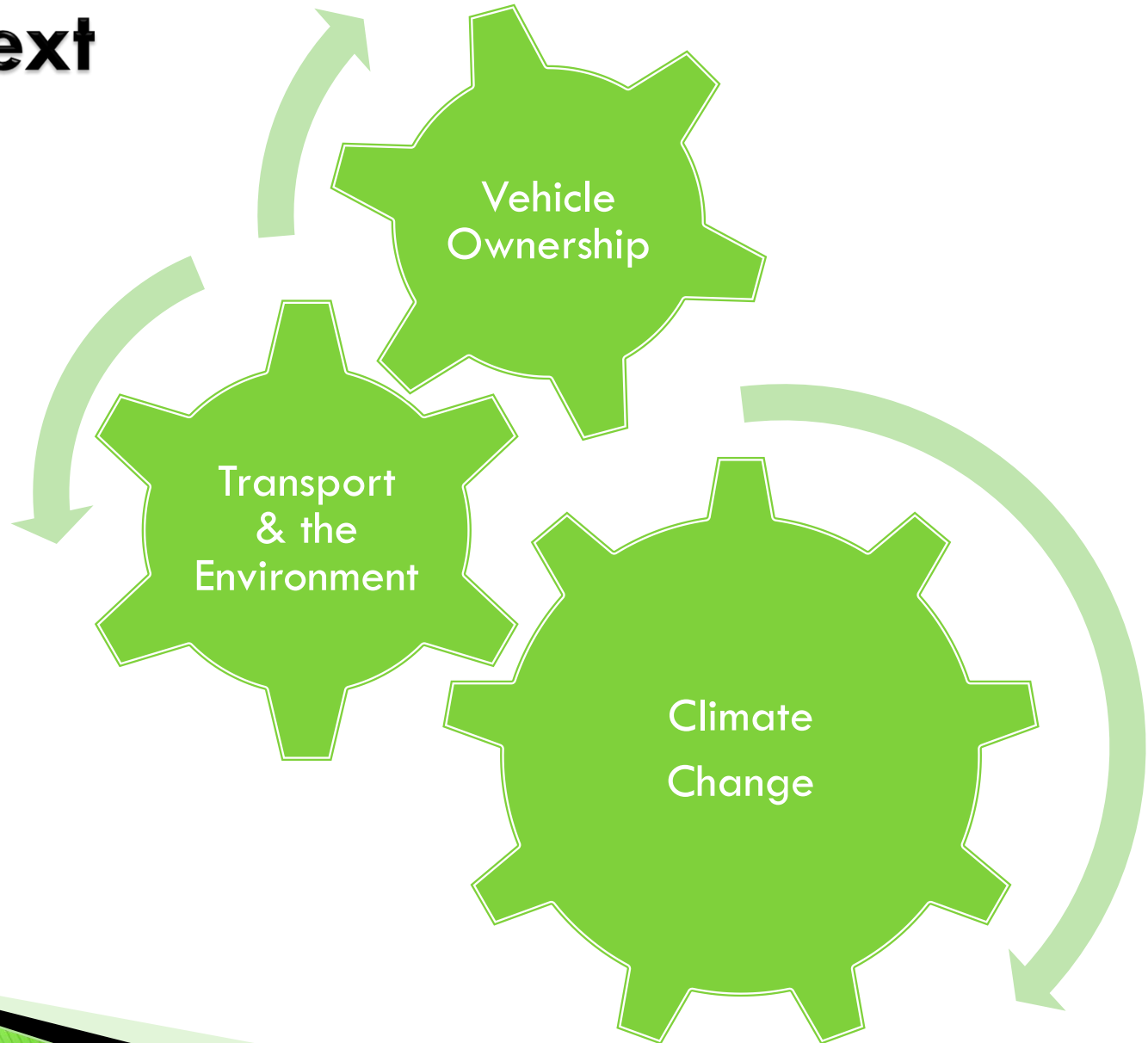


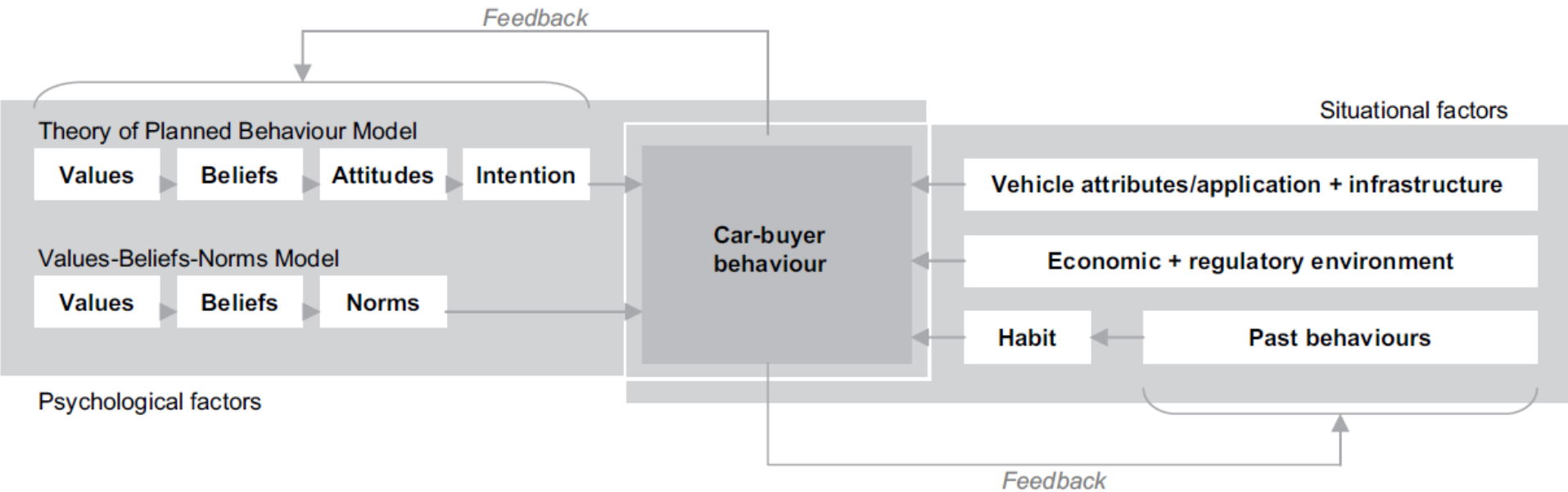
# The Potential for 'Green' Fiscal Measures to Lessen the Environmental Impact of Private Car Use in Scotland



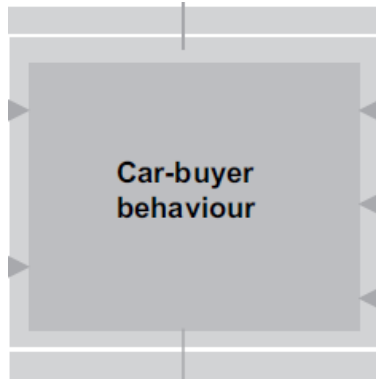
**Sarah Borthwick**

# Context



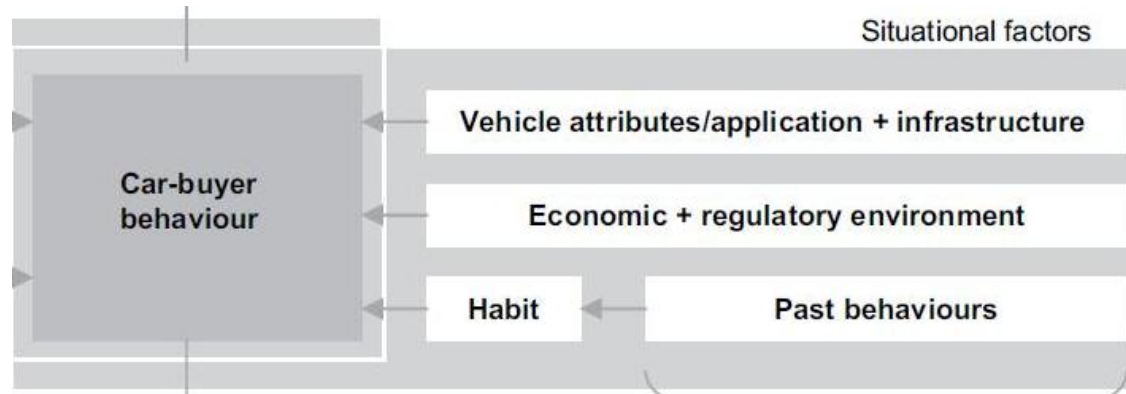


# The Lane & Potter (2007) Model of Factors Influencing Car Buyer Behaviour



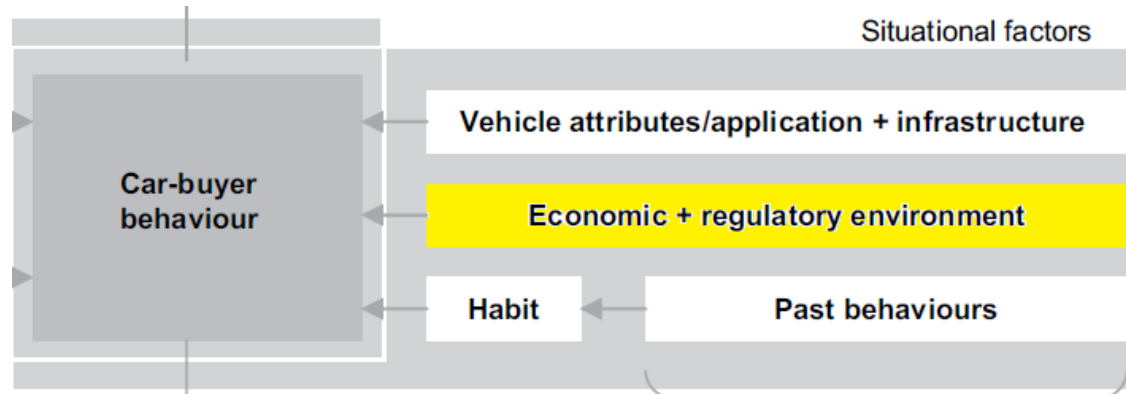
# Vehicle Purchasing Decision

# Situational Factors



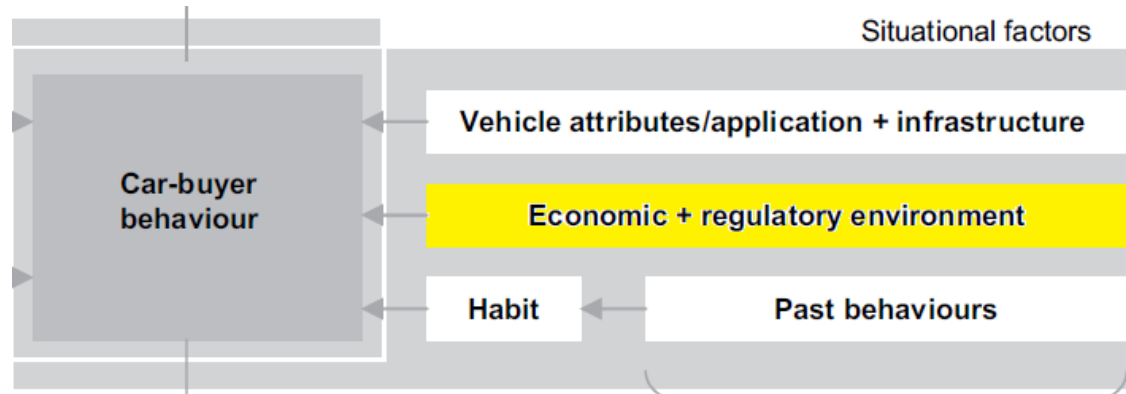
Aim to target the social conditions  
and structures in place

# Situational Factors



Aim to target the social conditions  
and structures in place

# Situational Factors



- First Year Rate of Road Tax
- VAT
- Plug-In Car Grant

**Purchase Tax**



- Standard Rate of Road Tax

**Circulation Tax**

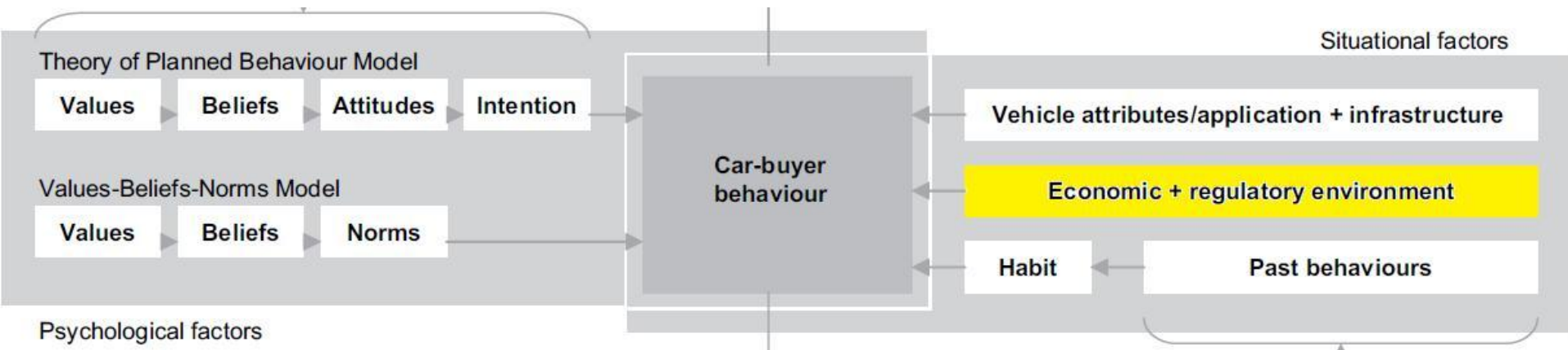


- Fuel Duty
- VAT

**Road Fuel Tax**



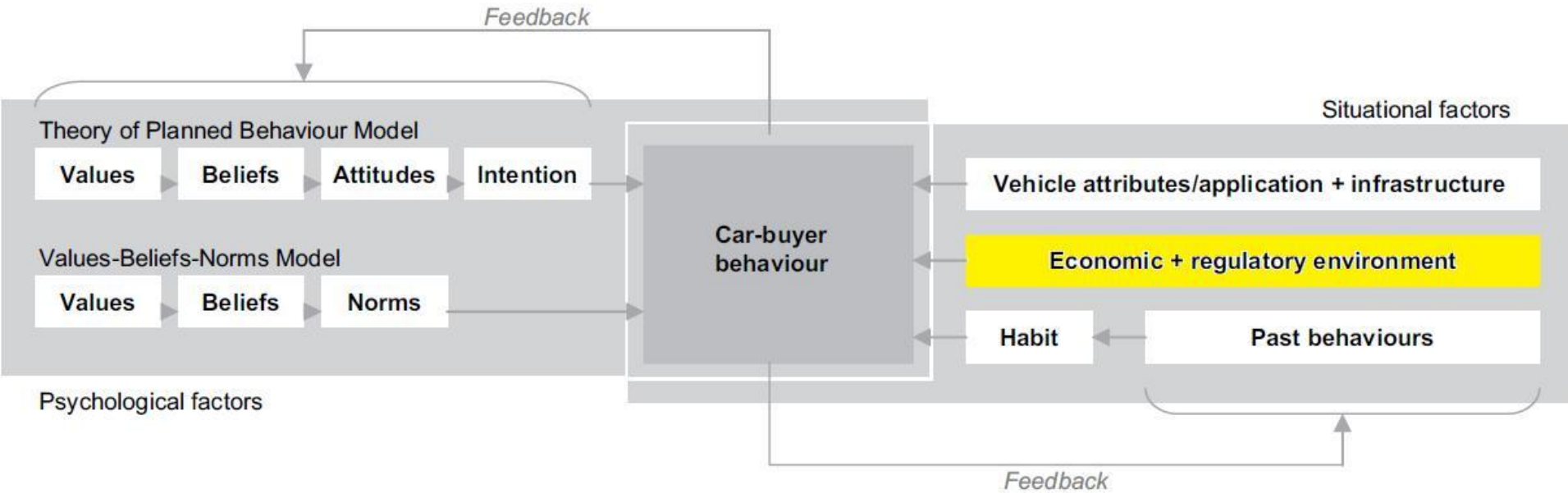
# Psychological Factors



Aim to influence people's perceptions, beliefs, values and norms



# Feedback



Feed into future car buyer behaviour

# Research Aim



# Research Aim

Review the potential for  
**encouraging the purchase of lower emission  
vehicles**

# Research Aim

Review the potential for  
**encouraging the purchase of lower emission  
vehicles**

via the use of  
**national 'green' vehicle taxation measures**



# Research Aim

Review the potential for  
**encouraging the purchase of lower emission  
vehicles**

via the use of  
**national 'green' vehicle taxation measures**

through a  
**psychological analysis of the vehicle  
purchasing decision**



# Research Objectives



# Research Objectives


- ▶ To assess **current attitudes & perceptions**

# Research Objectives

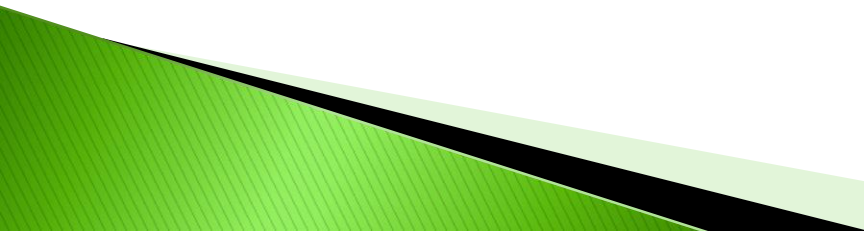
- ▶ To assess **current attitudes & perceptions**
  - ▶ To assess the **attitudinal barriers**
- 



# Research Objectives

- ▶ To assess **current attitudes & perceptions**
  - ▶ To assess the **attitudinal barriers**
  - ▶ To assess the **relative importance;**  
**independent & collective influence of**  
**taxation; & relative position to other factors**
- 

# Research Objectives

- ▶ To assess **current attitudes & perceptions**
  - ▶ To assess the **attitudinal barriers**
  - ▶ To assess the **relative importance;**  
**independent & collective influence of**  
taxation; & **relative position** to other factors
  - ▶ To conduct **segmentation analysis**
- 

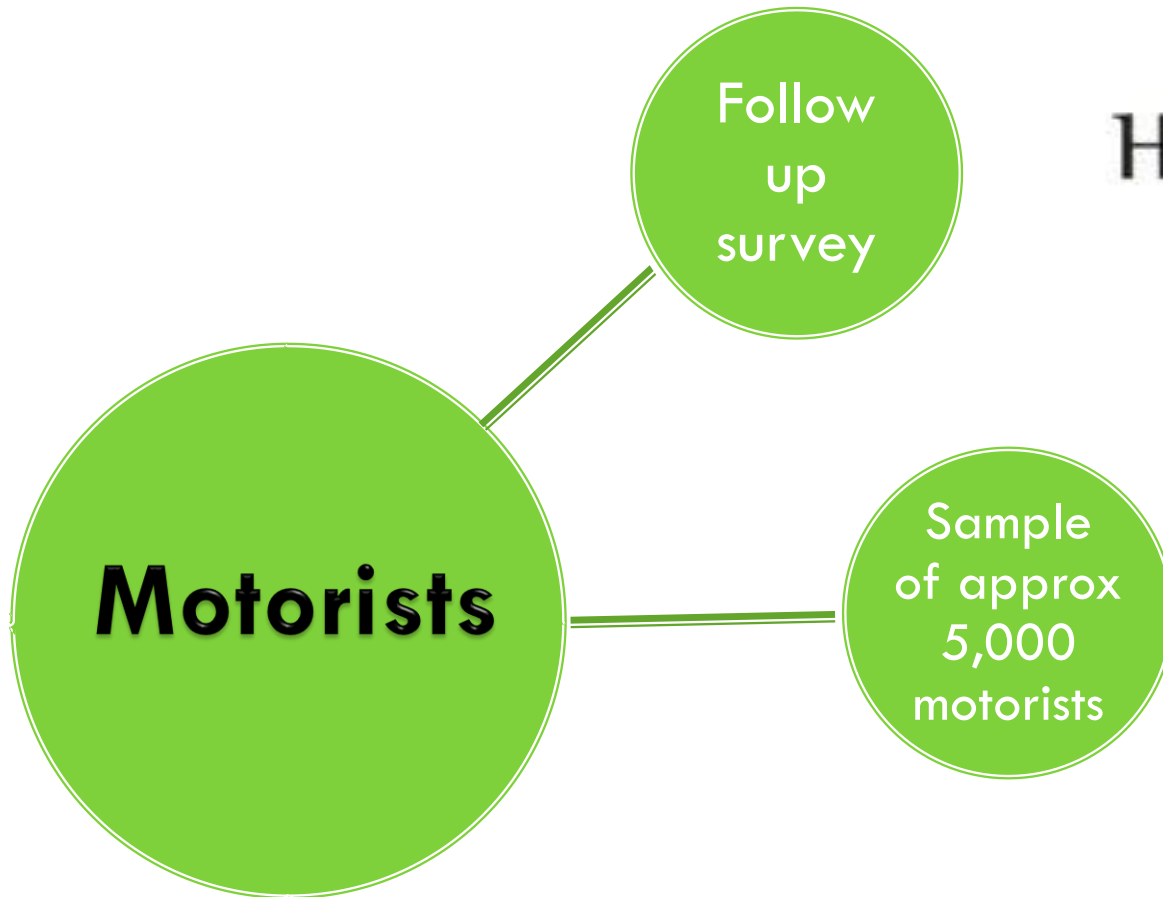


**Motorists**

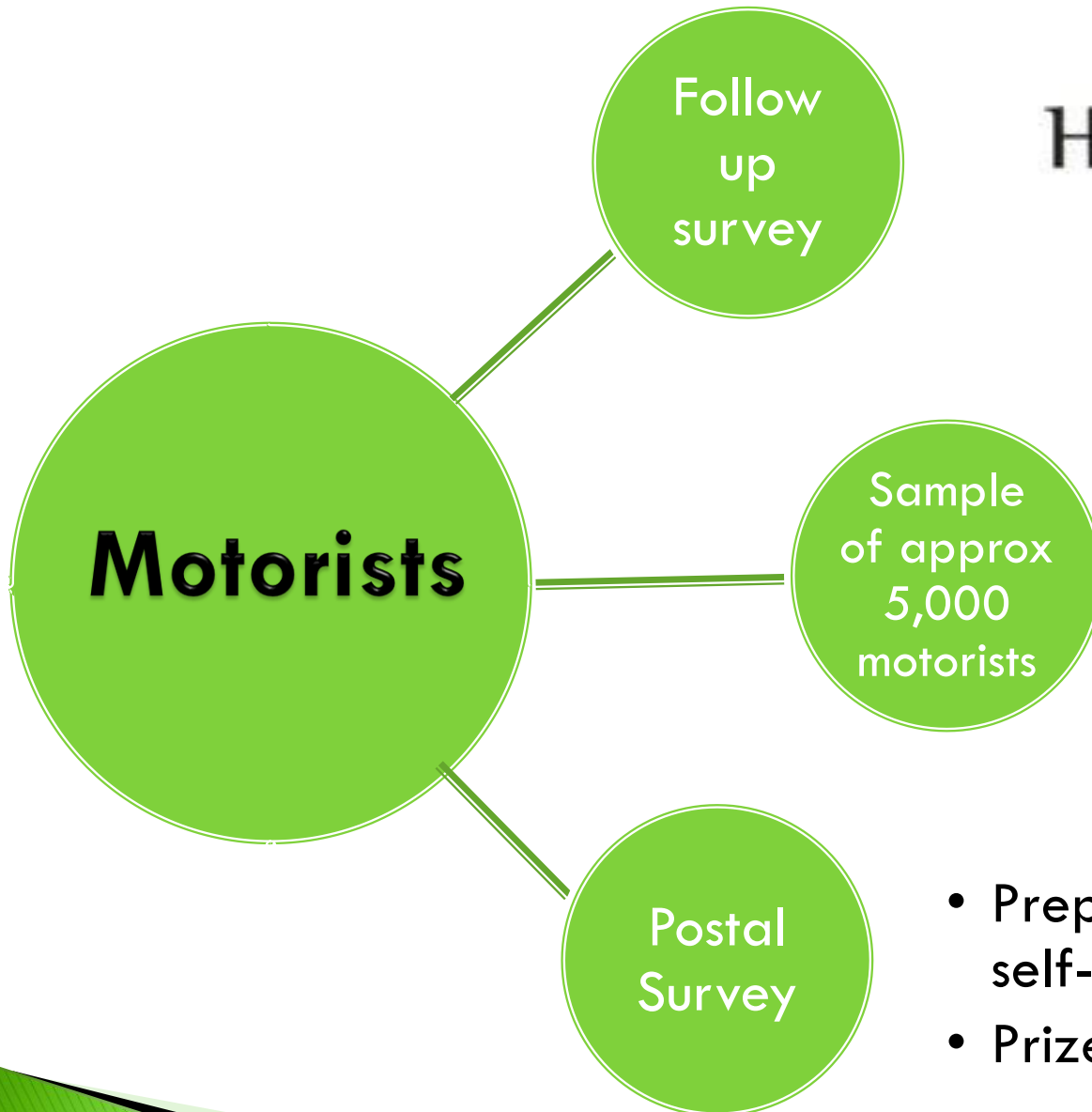
Follow  
up  
survey

**Motorists**

Scottish  
Household  
Survey



- LICENCE and FREDRIV variable



- LICENCE and FREDRIV variable

- Prepaid & self-addressed envelope
- Prize draw incentive



**Future  
Motorists**

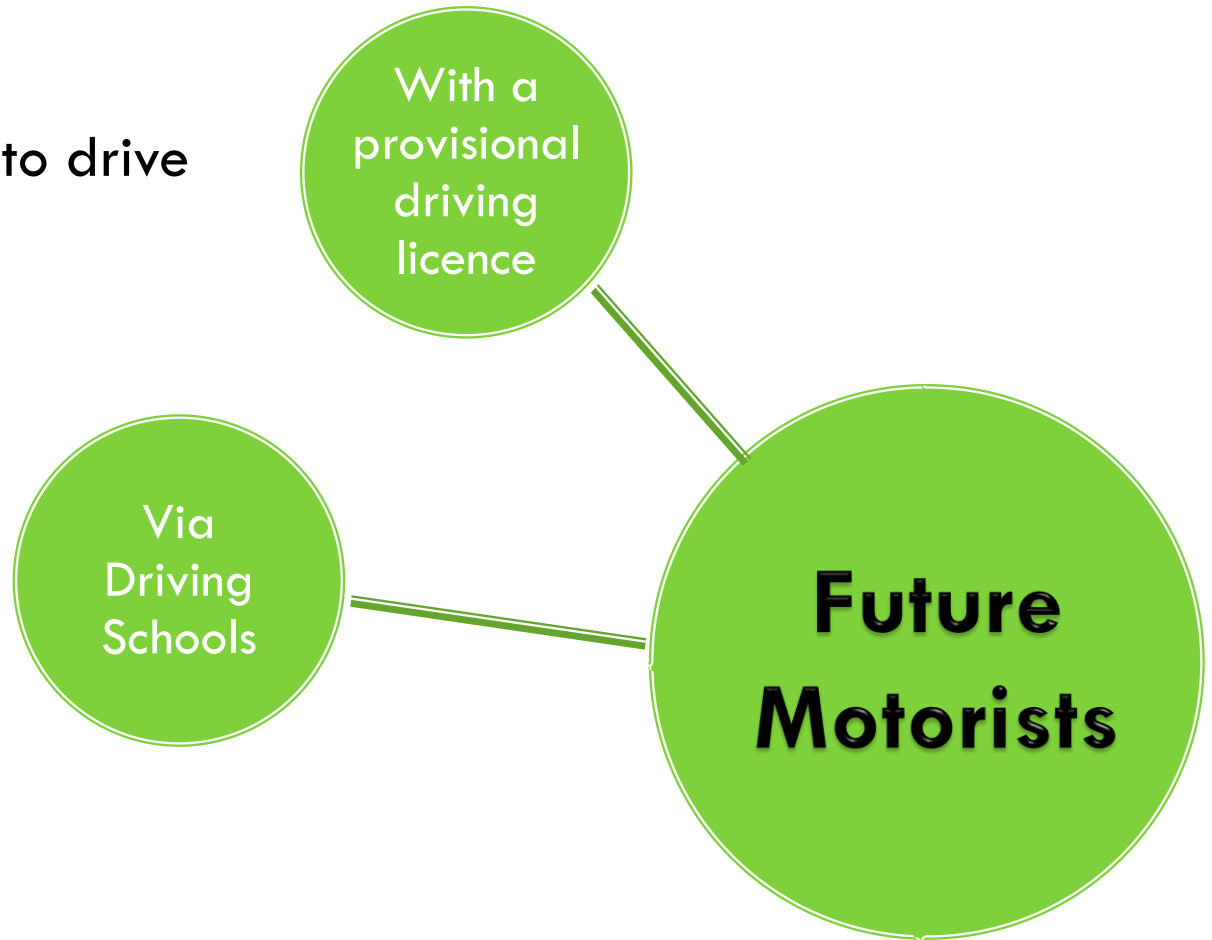
- Actively learning to drive

With a  
provisional  
driving  
licence

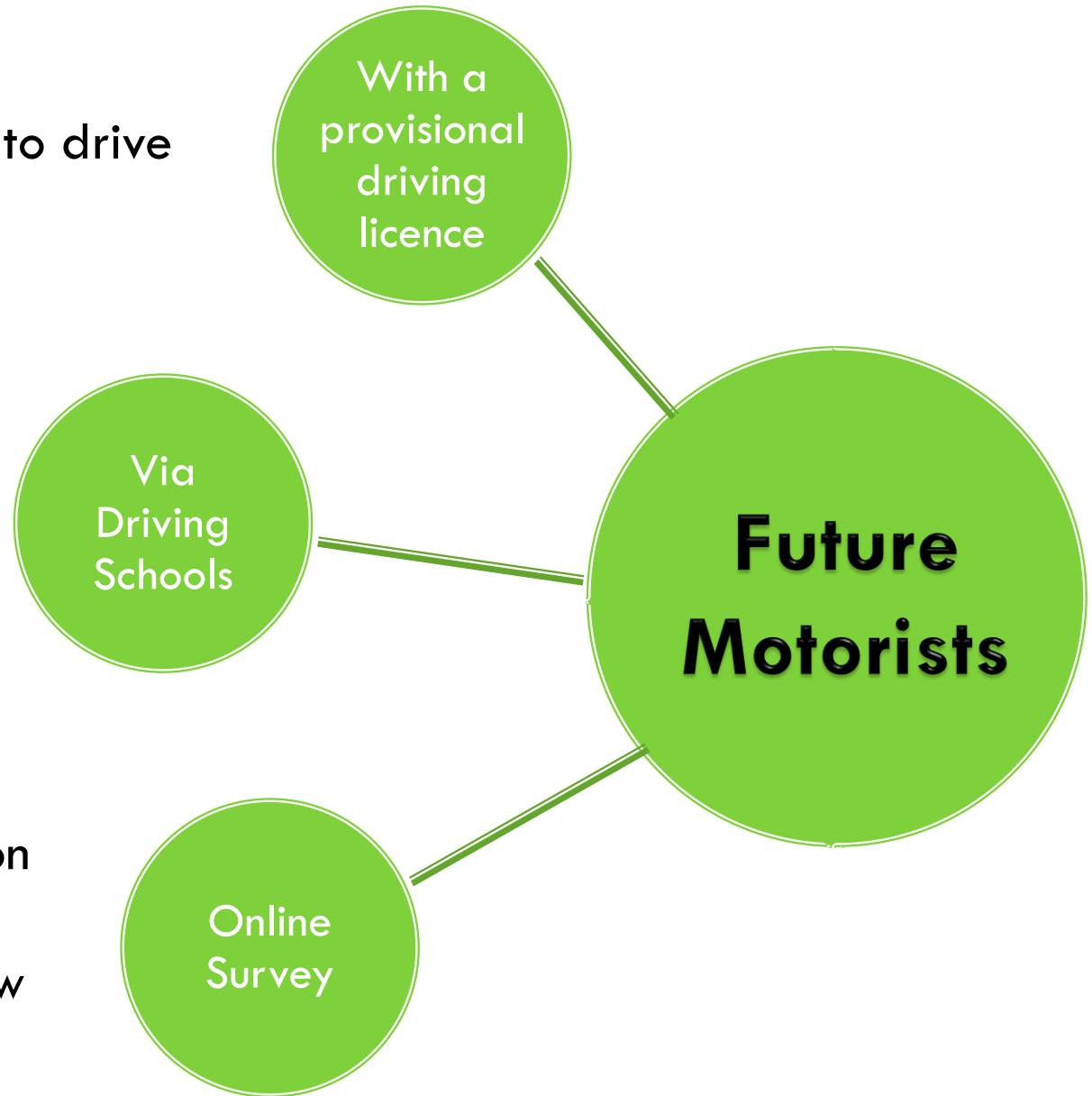
**Future  
Motorists**



- Actively learning to drive
- 'Postcard' given to students by instructors
- Poster in main office of school



- Actively learning to drive
- 'Postcard' given to students by instructors
- Poster in main office of school
- Simplified version of questionnaire
- Same prize draw incentive



# The Questionnaire

# Pilot Test One

## SECTION A

I WOULD LIKE TO FIRST OF ALL ASK YOU A FEW QUESTIONS ABOUT YOU AS A DRIVER

**Q1** What is your current licence status? (PLEASE TICK ONE)

Provisional UK car licence .....	<input type="checkbox"/>	Full UK car driving licence .....	<input type="checkbox"/>
Provisional car licence from another country .....	<input type="checkbox"/>	Full car licence from another country .....	<input type="checkbox"/>

**Q2** How long has your current licence status applied? (PLEASE TICK ONE)

5 or less years .....	<input type="checkbox"/>	21 to 30 years .....	<input type="checkbox"/>	51 to 60 years .....	<input type="checkbox"/>
6 to 10 years .....	<input type="checkbox"/>	31 to 40 years .....	<input type="checkbox"/>	61 to 70 years .....	<input type="checkbox"/>
11 to 20 years .....	<input type="checkbox"/>	41 to 50 years .....	<input type="checkbox"/>	71 or more years .....	<input type="checkbox"/>

**Q3** Do you have regular access to a vehicle (either a car or van) for private motoring? (PLEASE TICK ONE)

REGULAR ACCESS DEFINED AS HAVING A VEHICLE AT HAND, AS AND WHEN REQUIRED

Yes .....  | No ..... |  |

**Q4** How frequently do you drive? (PLEASE TICK ONE)

PLEASE INCLUDE ALL JOURNEYS FOR SOCIAL, DOMESTIC & PLEASURE PURPOSES, INCLUDING THE COMMUTE TO AND FROM YOUR PLACE OF WORK - BUT EXCLUDING DRIVING FOR THE PURPOSE OF YOUR EMPLOYMENT

Every day .....	<input type="checkbox"/>	At least two or three times a month .....	<input type="checkbox"/>
At least three times a week .....	<input type="checkbox"/>	At least once a month .....	<input type="checkbox"/>
Once or twice a week .....	<input type="checkbox"/>	Less than once a month .....	<input type="checkbox"/>

## SECTION B

NEXT, I WOULD LIKE YOU TO IDENTIFY THE VEHICLE YOU DRIVE MOST FREQUENTLY, AND USE THIS TO COMPLETE THE FOLLOWING SECTION (Q5 TO Q14):

**Q5** What is the make and model of this vehicle? (PLEASE WRITE YOUR ANSWERS)

Make .....

Model .....

Don't know .....

(PLEASE TICK ALL THAT APPLY, MORE THAN ONE IF A HYBRID)

natural gas ...	<input type="checkbox"/>	Hydrogen .....	<input type="checkbox"/>
LPG gas ...	<input type="checkbox"/>	Compressed air .....	<input type="checkbox"/>
...	<input type="checkbox"/>	Liquid nitrogen .....	<input type="checkbox"/>
...	<input type="checkbox"/>	Don't know .....	<input type="checkbox"/>

(PLEASE TICK ONE)

2.0 to 2.9 litres .....	<input type="checkbox"/>
3.0 litres or more .....	<input type="checkbox"/>
Don't know .....	<input type="checkbox"/>

(PLEASE TICK ONE)

61 to 70 mpg .....	<input type="checkbox"/>
71 mpg or more .....	<input type="checkbox"/>
Don't know .....	<input type="checkbox"/>

Please provide a best estimate.

201 to 225 g/km .....	<input type="checkbox"/>
226 to 255 g/km .....	<input type="checkbox"/>
256 g/km or more .....	<input type="checkbox"/>
Don't know .....	<input type="checkbox"/>

MORE THAN ONE IF JOINTLY

organisation .....

Much less .....

Don't know .....

## SECTION A

(PLEASE TICK ONE)

DATE OF COLLECTION

1 April 2010 or later .....  |

Don't know .....  |

(PLEASE TICK ONE)

know the year .....  |

(PLEASE TICK ONE)

100 TO 120 SCRAPPING A VEHICLE OF 10 OR MORE PHASE ALLOWANCE .....  |

Don't know .....  |

(PLEASE TICK ONE)

MOST FREQUENTLY PRIOR TO THE FOLLOWING QUESTION:

you drove most frequently in THIS VEHICLE TO COMPARE)

MORE THAN ONE IF JOINTLY

Much less .....

Don't know .....

(PLEASE TICK ONE)

STONGLY DISAGREE Don't know

6 7

continued overleaf...

THE NEXT VEHICLE YOU MI

importance of the following FINAN


STRONGLY DISAGREE Don't know

STRONGLY DISAGREE Don't know


ENVIRONMENTAL

STRONGLY DISAGREE Don't know


# Questionnaire Structure

- ▶ Section A –
  - ▶ Section B –
  - ▶ Section C –
  
  - ▶ Section D –
  
  - ▶ Section E –
- 


# Questionnaire Structure

- ▶ Section A – you as a driver
  - ▶ Section B –
  - ▶ Section C –
  - ▶ Section D –
  - ▶ Section E –
- 


# Questionnaire Structure

- ▶ Section A – you as a driver
  - ▶ Section B – the vehicle driven most frequently
  - ▶ Section C –
  - ▶ Section D –
  - ▶ Section E –
- 

# Questionnaire Structure

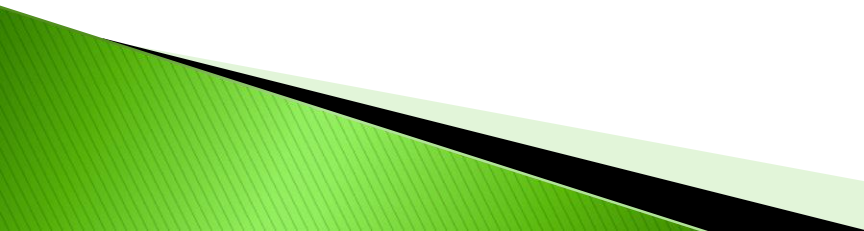
- ▶ Section A – you as a driver
  - ▶ Section B – the vehicle driven most frequently
  - ▶ Section C – the decision making process for purchasing a vehicle
  - ▶ Section D –
  - ▶ Section E –
- 

# Questionnaire Structure


- ▶ Section A – you as a driver
  - ▶ Section B – the vehicle driven most frequently
  - ▶ Section C – the decision making process for purchasing a vehicle
  - ▶ Section D – the level of incentive or disincentive to purchase a lower emission vehicle
  - ▶ Section E –
- 

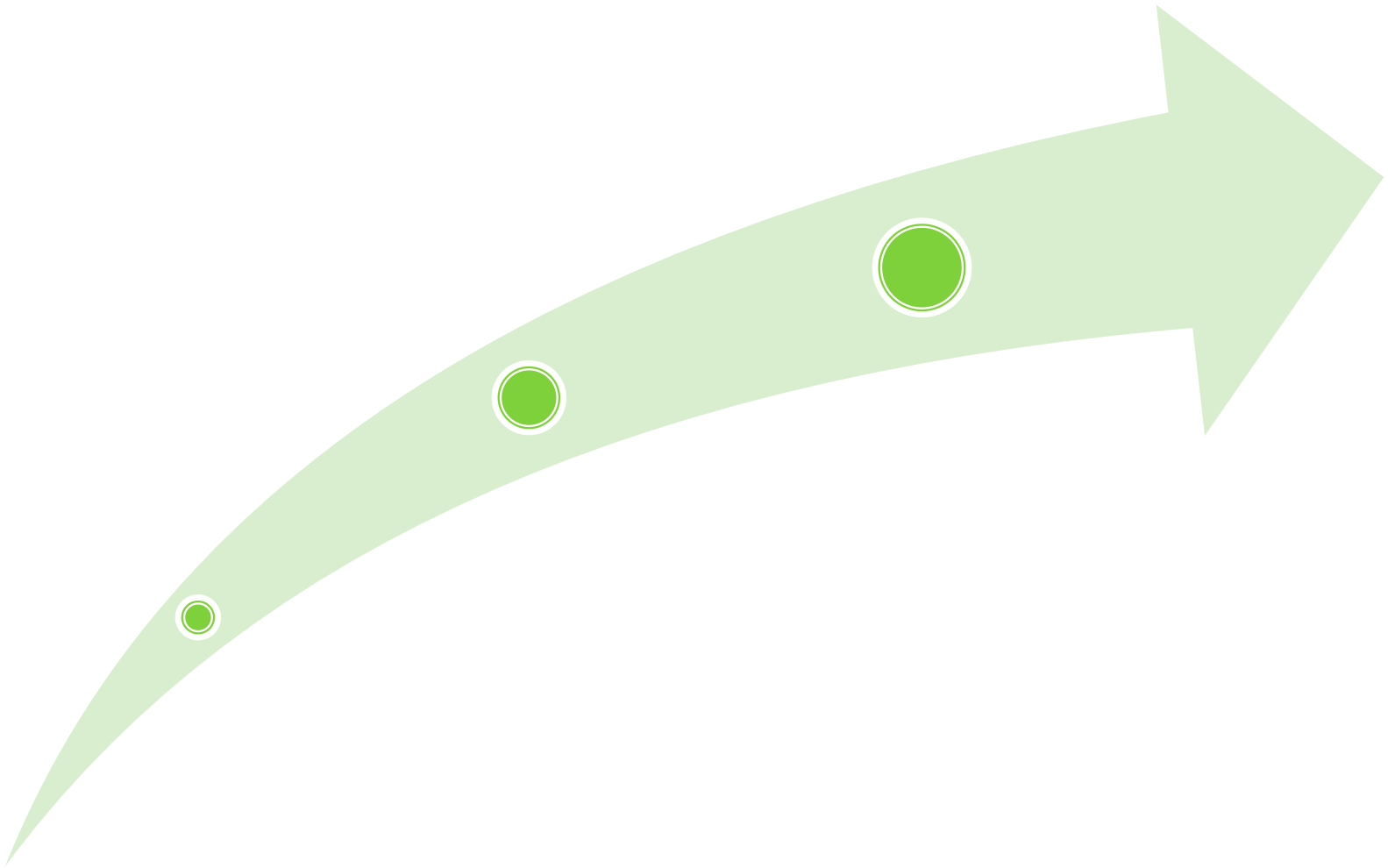


# Questionnaire Structure

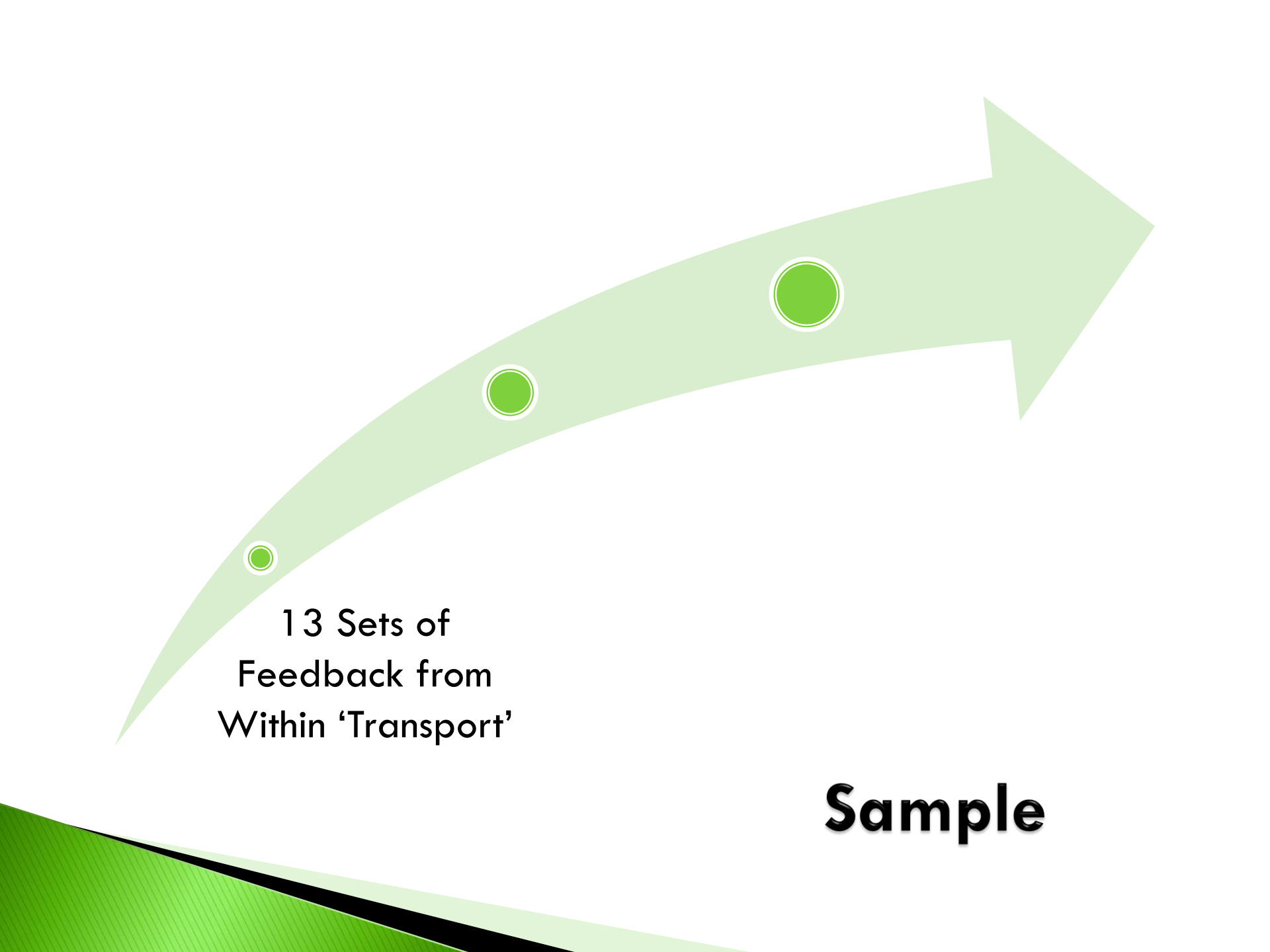
- ▶ Section A – you as a driver
  - ▶ Section B – the vehicle driven most frequently
  - ▶ Section C – the decision making process for purchasing a vehicle
  - ▶ Section D – the level of incentive or disincentive to purchase a lower emission vehicle
  - ▶ Section E – generic details
- 

# Questionnaire Structure

- ▶ Covering Letter
  - ▶ Section A – you as a driver
  - ▶ Section B – the vehicle driven most frequently
  - ▶ Section C – the decision making process for purchasing a vehicle
  - ▶ Section D – the level of incentive or disincentive to purchase a lower emission vehicle
  - ▶ Section E – generic details
- 



**Sample**



13 Sets of  
Feedback from  
Within 'Transport'

**Sample**

24 Completed  
Questionnaires,  
plus feedback  
from 'The  
Public'

13 Sets of  
Feedback from  
Within 'Transport'

**Sample**

24 Completed  
Questionnaires,  
plus feedback  
from 'The  
Public'

13 Sets of  
Feedback from  
Within 'Transport'

Total  
Sample  
of 37

**Sample**

# Questionnaire Design



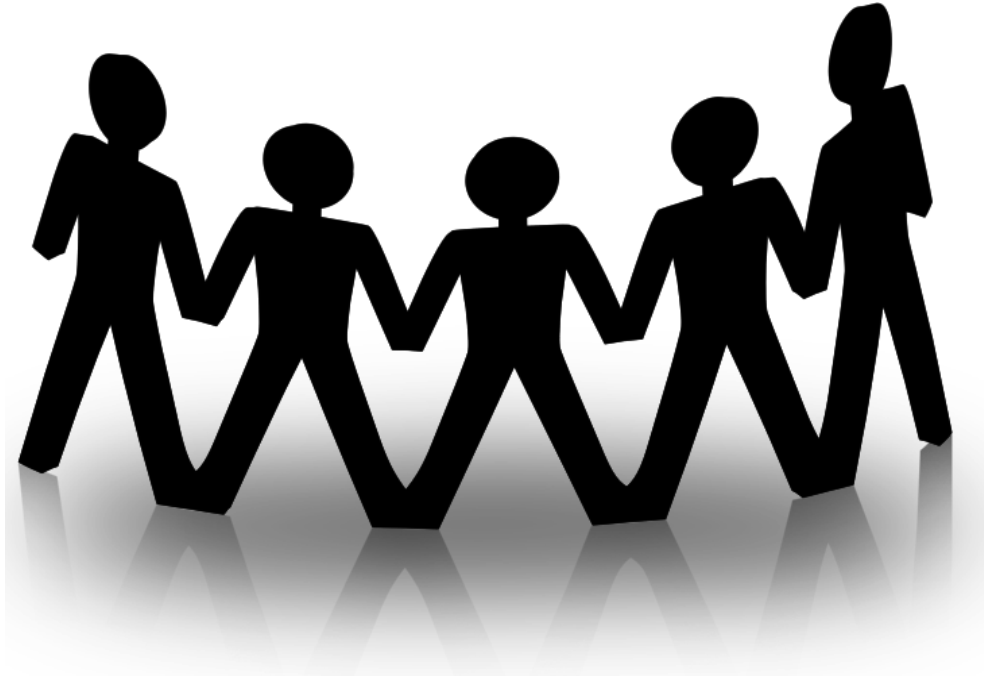
# Questionnaire Design

Wording?

Layout?

Comprehension?





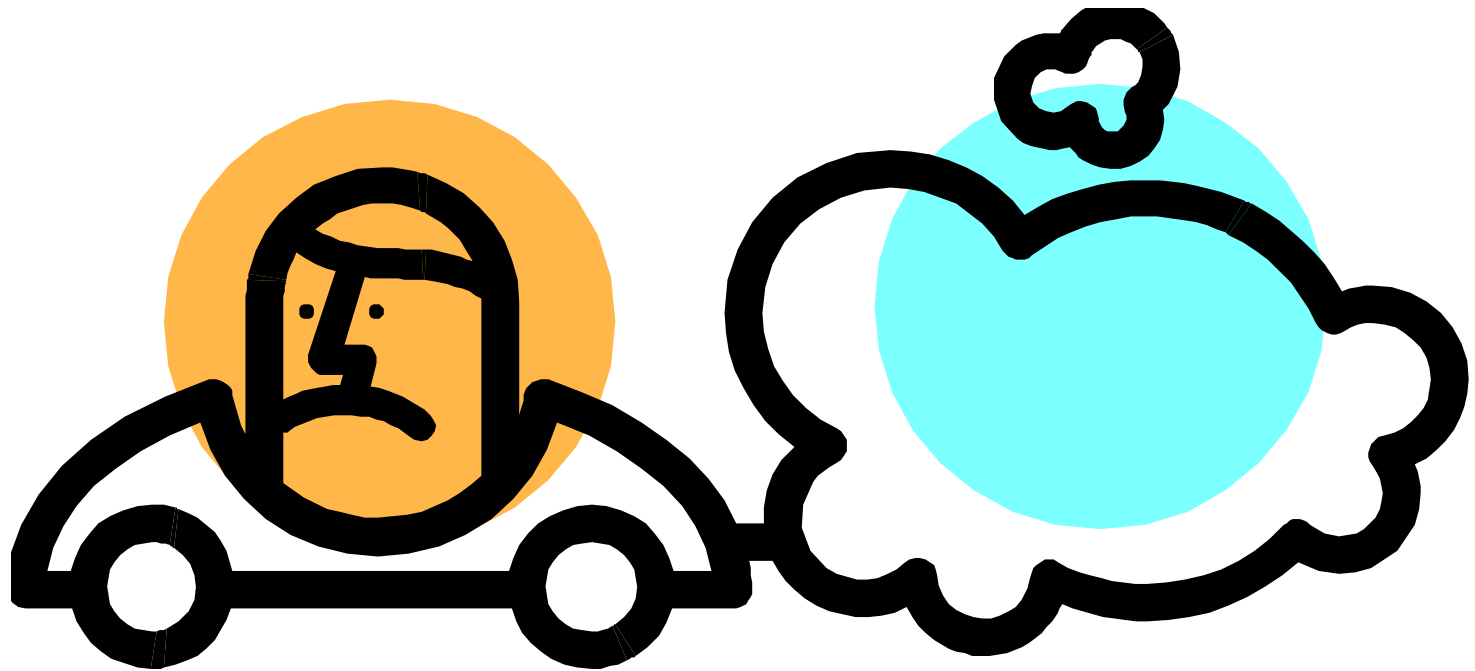
# **Preliminary Results**



# **The Ability of Respondents to Estimate the CO<sub>2</sub> Emissions of their Vehicle**



# The Ability of Respondents to Estimate the CO<sub>2</sub> Emissions of their Vehicle



# **Financial Considerations**

**(scores out of 7)**



# Financial Considerations

(scores out of 7)



## High

- Vehicle price  
= 6.25
- Overall  
purchase cost  
= 6.25



## Medium

- Maintenance  
costs  
= 5.67
- Warranty  
= 4.95



## Low

- Depreciation  
= 4.54
- Finance deals  
= 4.00

# Vehicle Attributes

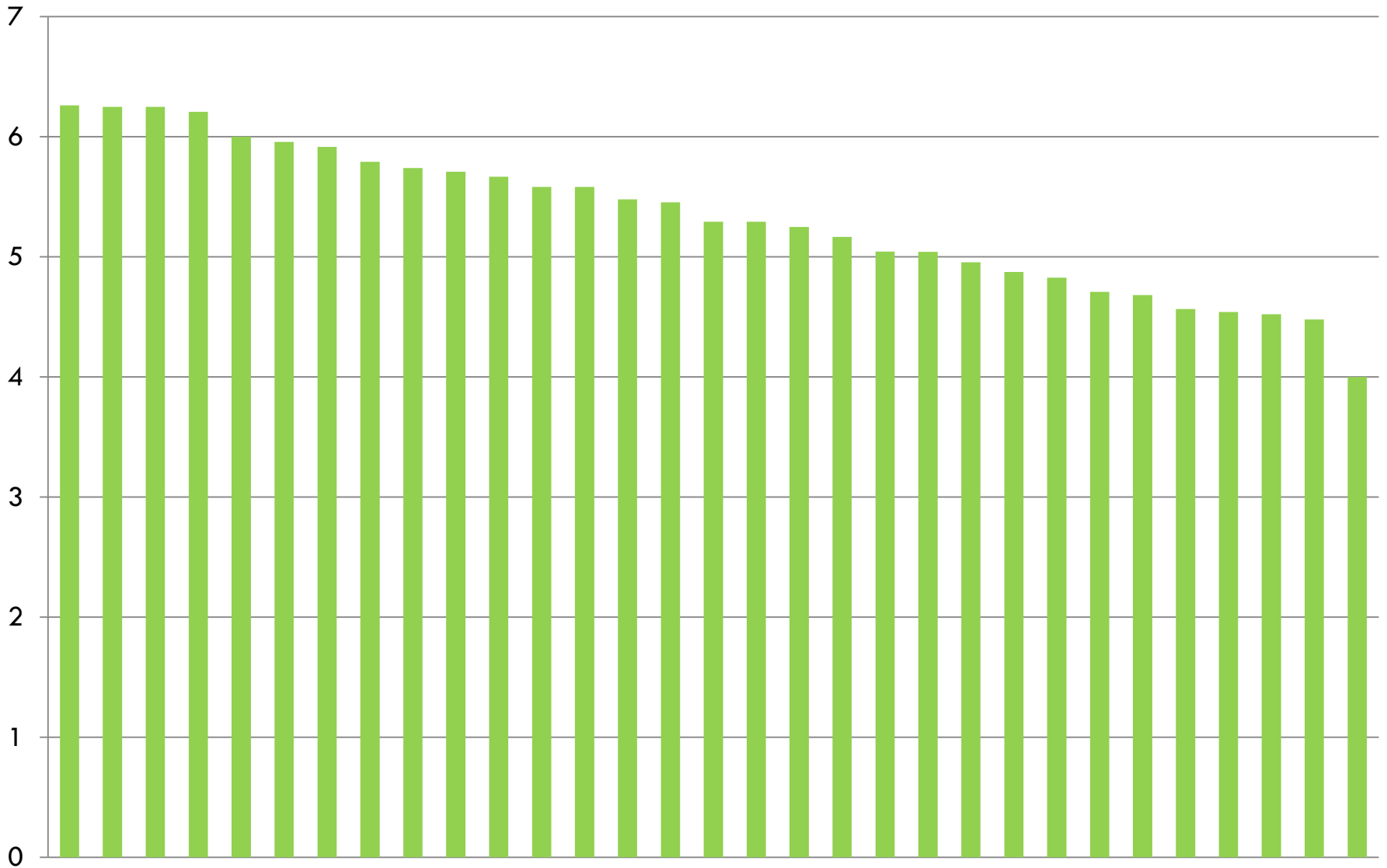
(scores out of 7)



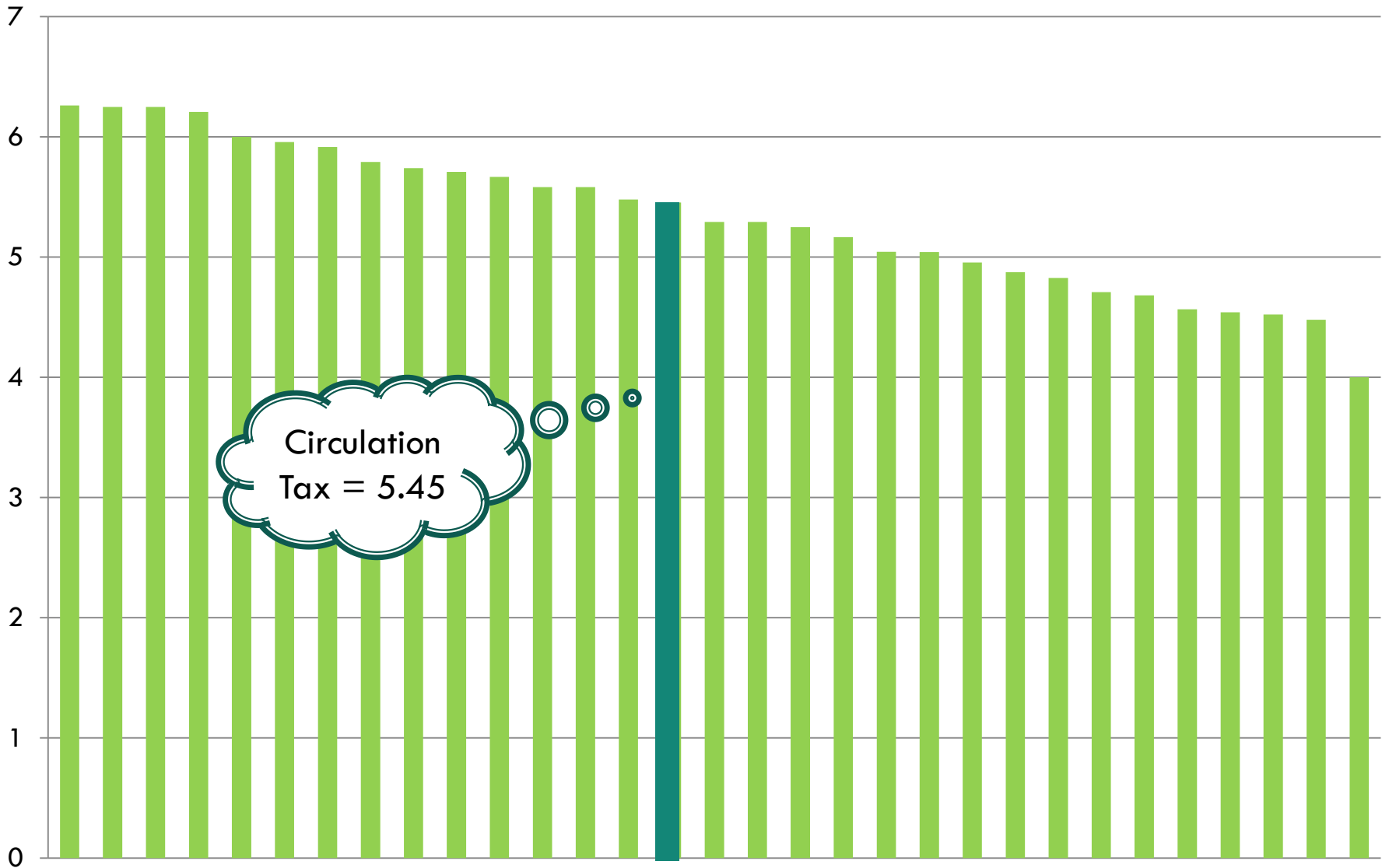
- ▶ Performance & driveability = 6.26
- ▶ Type & size of engine = 6.00
- ▶ Make of vehicle = 5.96



- ▶ Fuel type = 5.04
- ▶ Overall sales package = 4.88
- ▶ Acceleration time = 4.71

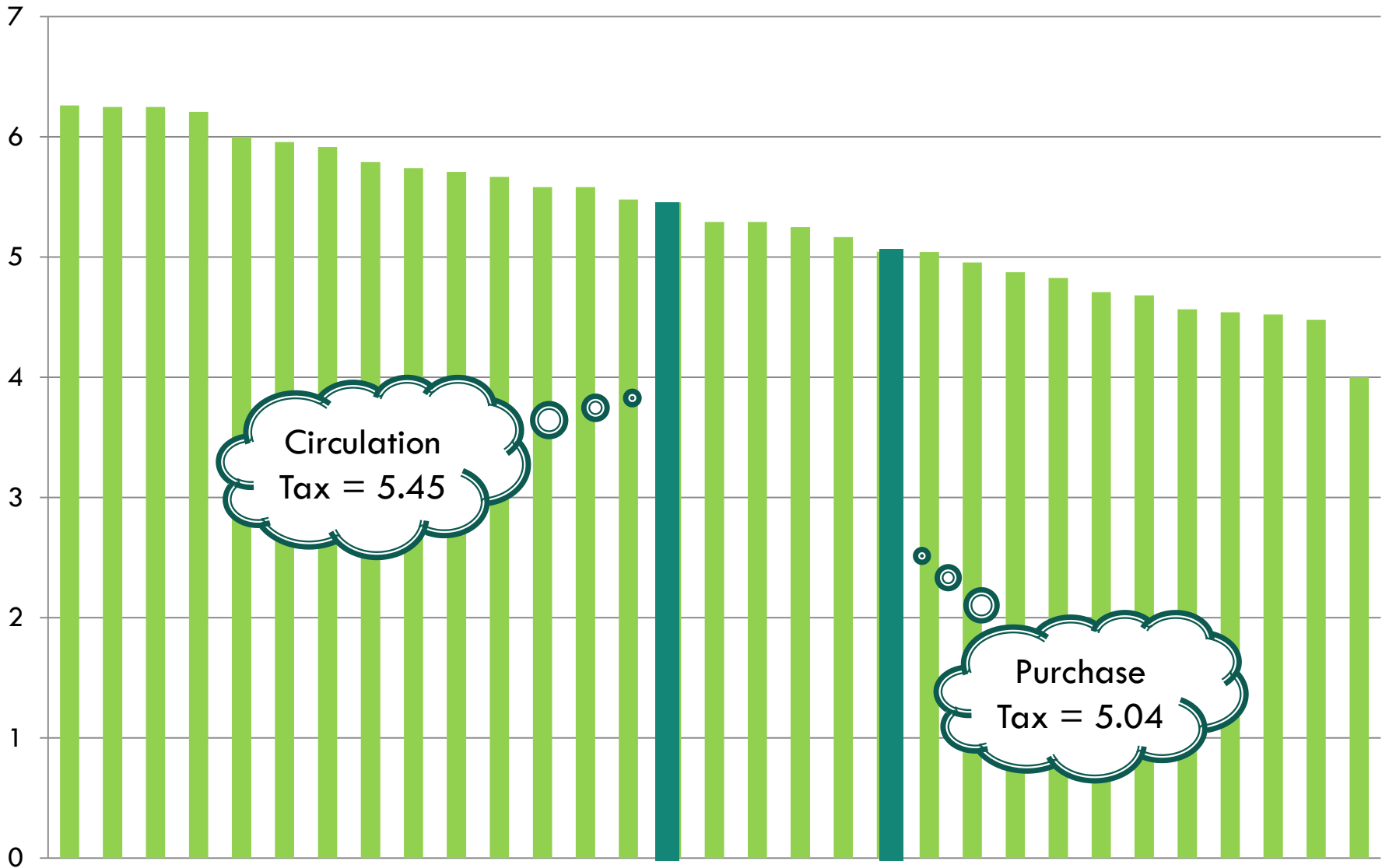


**At A Glance (scores out of 7)**

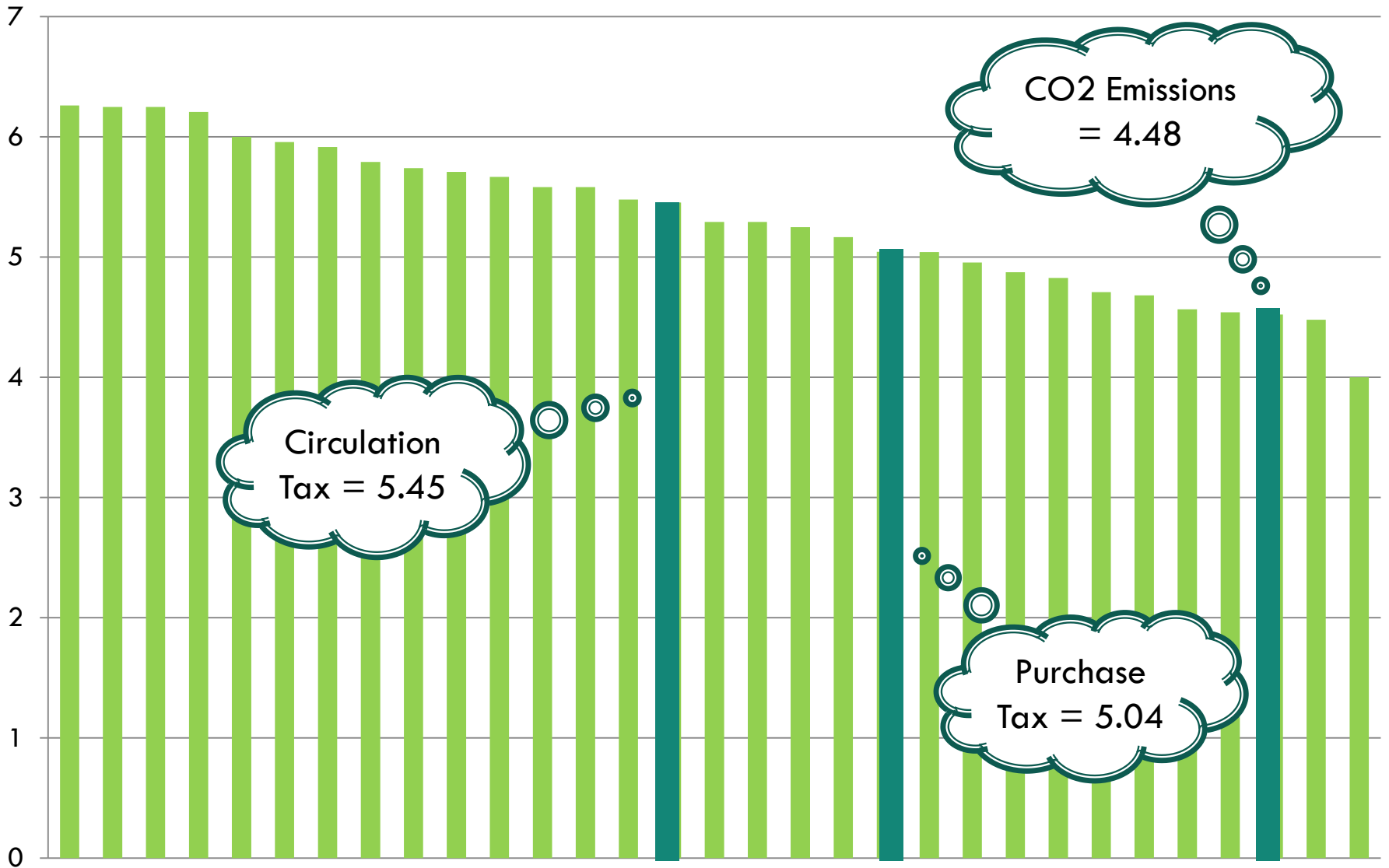


**At A Glance (scores out of 7)**





**At A Glance (scores out of 7)**



**At A Glance (scores out of 7)**

# **Psychological Constructs**

**(scores out of 7)**



# Psychological Constructs (scores out of 7)

## Of Great Importance

- Perceived negative consequences = 5.45
- Perceived behavioural control = 5.19
- Attitudes = 5.09

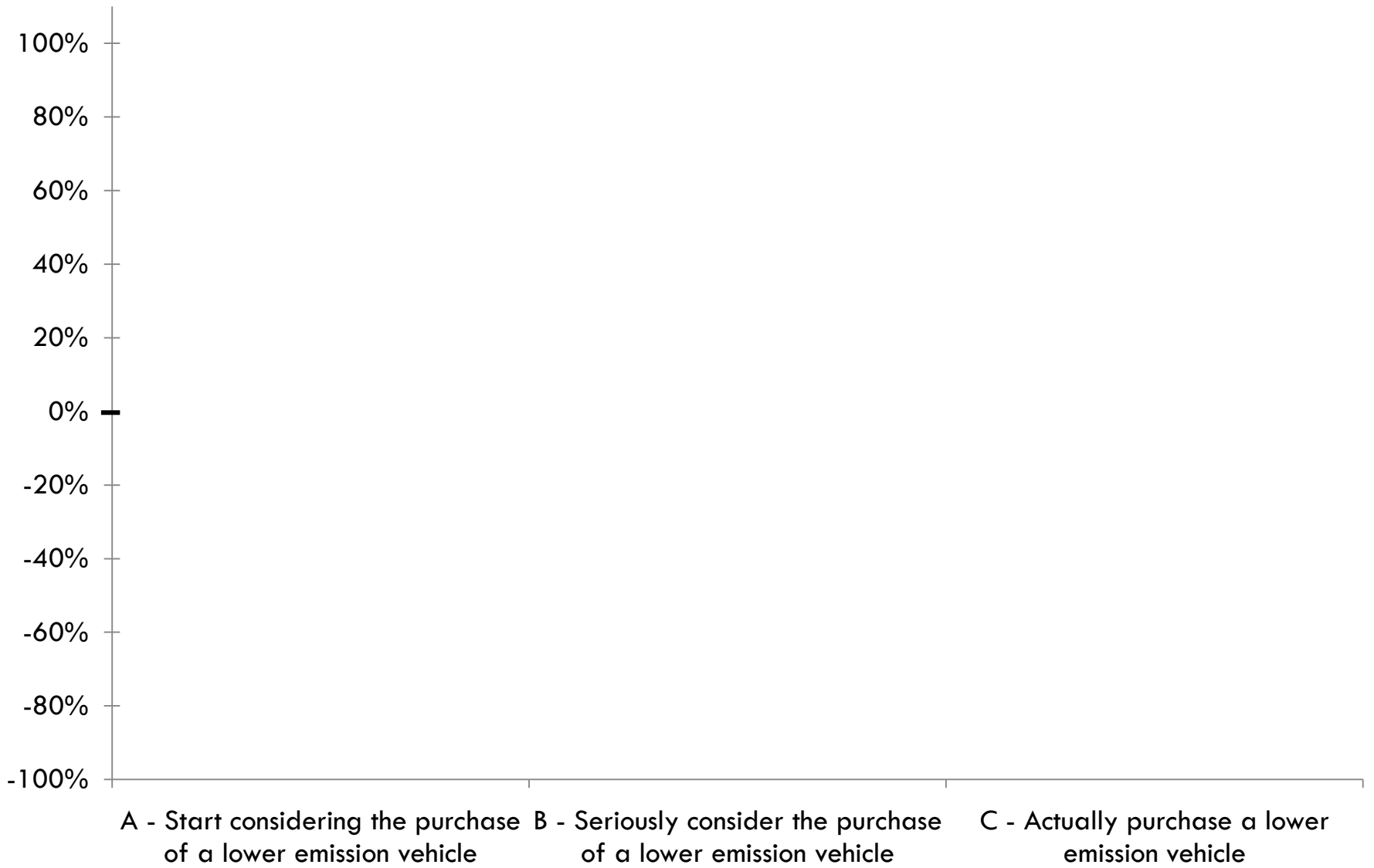
# Psychological Constructs (scores out of 7)

## Of Great Importance

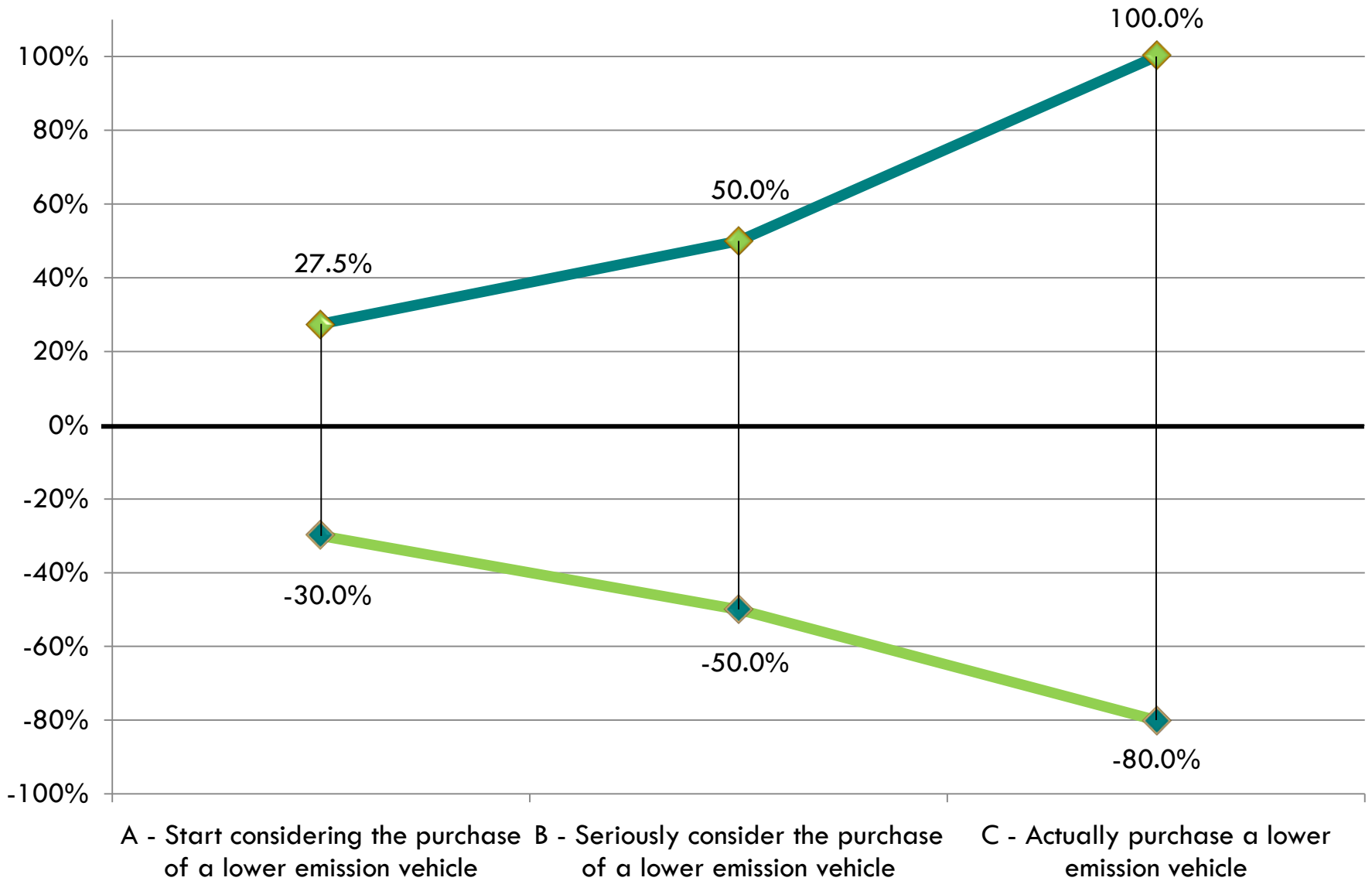
- Perceived negative consequences = 5.45
- Perceived behavioural control = 5.19
- Attitudes = 5.09

## Of Lesser Importance

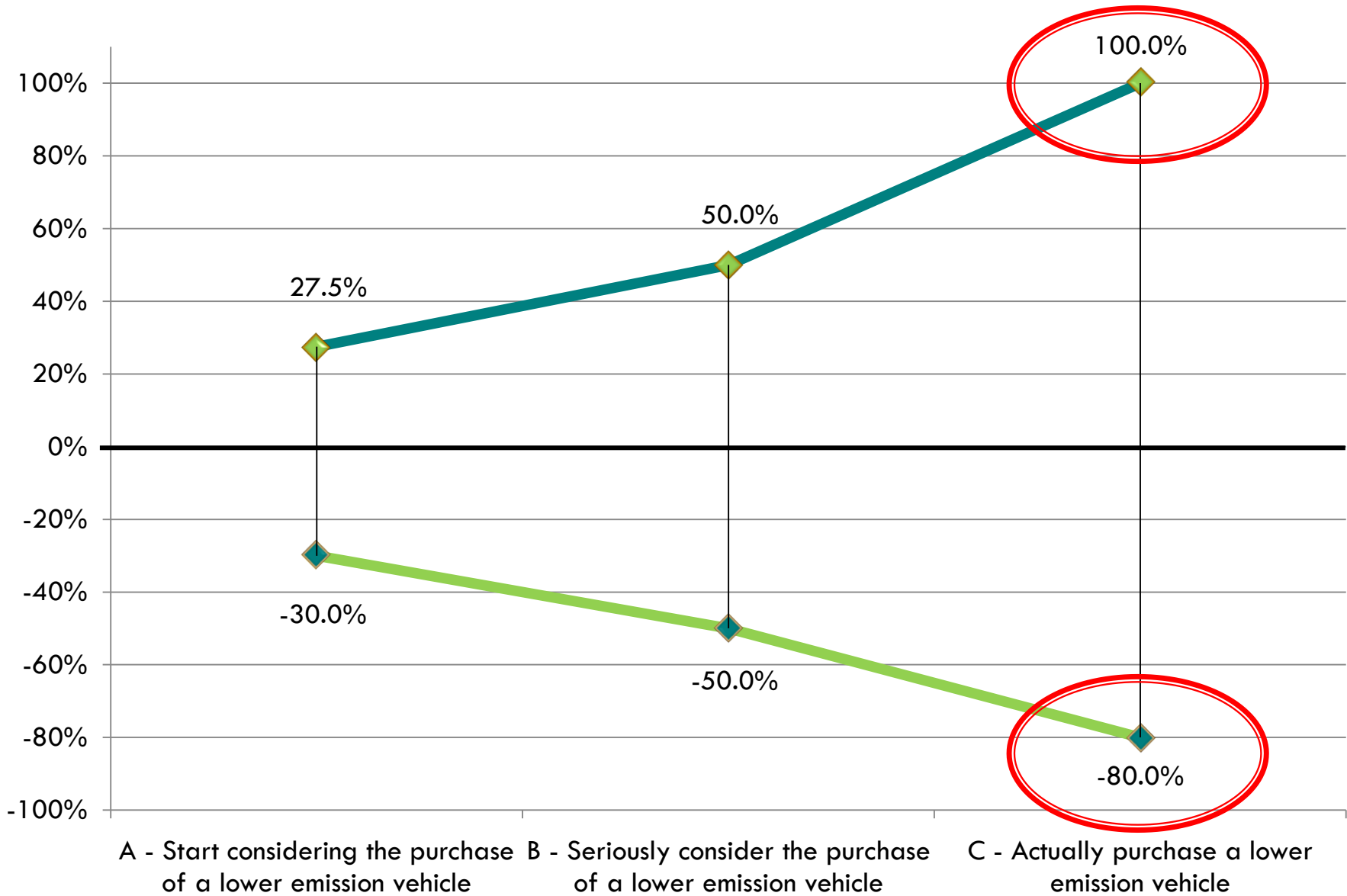
- Goal intention = 3.59
- Implementation intention = 3.48
  - Emotions = 3.35



# Road Tax



# Road Tax



# Road Tax



## The Questionnaire

### SECTION A – ABOUT YOU AS A DRIVER:

**Q1 What is your current licence status? (PLEASE TICK ALL THAT APPLY)**

- Provisional EU/UK car licence.....  Full EU/UK car driving licence.....   
 Provisional car licence from outside EU.....  Full car licence from outside EU.....

**Q2 How many years have you held this licence? Please think back to when you originally acquired this. (PLEASE TICK ONE)**

- 5 or less years.....  31 to 40 years.....   
 6 to 10 years.....  41 to 50 years.....   
 11 to 15 years.....  51 to 60 years.....   
 16 to 20 years.....  61 to 70 years.....   
 21 to 30 years.....  71 or more years.....

**Q3 Do you have regular access to a vehicle (car or van) for private motoring? (PLEASE TICK ONE)**

- REGULAR ACCESS IS DEFINED AS HAVING A VEHICLE AT HAND, AS AND WHEN REQUIRED.  
 Yes.....  No.....

**Q4 How frequently do you drive for private purposes? (PLEASE TICK ONE)**

- PLEASE INCLUDE ALL JOURNEYS FOR SOCIAL, DOMESTIC & PLEASURE PURPOSES, INCLUDING THE TRAVEL TO AND FROM YOUR PLACE OF WORK – BUT EXCLUDING DRIVING FOR THE PURPOSE OF YOUR EMPLOYMENT OR EDUCATION  
 Every day.....  At least two or three times a month.....   
 At least three times a week.....  At least once a month.....   
 Once or twice a week.....  Less than once a month.....

**Q5 On average, how many miles per year do you drive for private purposes? (PLEASE TICK ONE)**

- 5,000 miles or less.....  20,001 to 30,000 miles.....   
 5,001 to 10,000 miles.....  30,001 to 40,000 miles.....   
 10,001 to 15,000 miles.....  40,001 to 50,000 miles.....   
 15,001 to 20,000 miles.....  50,001 miles or more.....

### SECTION B – IDENTIFY THE CAR OR VAN THAT YOU DRIVE MOST FREQUENTLY (IN TERMS OF MILEAGE) FOR PRIVATE PURPOSES:

**Q6 What is the make of the vehicle you drive most frequently? (PLEASE WRITE YOUR ANSWER)**

- Make..... Don't know.....

**Q7 What is the model of this vehicle? (PLEASE WRITE YOUR ANSWER)**

- Model..... Don't know.....

**Q8 What is the size of engine for this vehicle, measured in litres? (PLEASE WRITE YOUR ANSWER)**

- E.g. 1.3 litres, or 3.0 litres.  
 ..... litres Don't know.....   
 ..... N/A.....

..... (PLEASE TICK ALL THAT APPLY, MORE THAN ONE IF A

..... liquid petroleum gas (LPG).....   
 ..... fuel (e.g. E85).....   
 ..... hydrogen.....   
 ..... I don't know.....

**(PLEASE TICK ONE)**  
 ..... automatic.....   
 ..... manual.....

..... I don't know.....

..... what is the FIRST LETTER of the.....   
 ..... (PLEASE WRITE YOUR ANSWER BELOW)

..... what is the NUMBER component of.....   
 ..... (PLEASE WRITE YOUR ANSWER)

..... in terms of the number of grams of.....   
 ..... (PLEASE WRITE YOUR ANSWER AND TICK ONE)

..... I don't know.....

..... ONLY, MORE THAN ONE IF JOINTLY

..... (PLEASE TICK ONE)

..... (PLEASE TICK ONE)

..... DRIVING A VEHICLE OF 10 OR MORE  
 ..... (PLEASE TICK ONE)

..... (PLEASE TICK ONE)

..... (PLEASE TICK ONE)

..... which you drove most frequently,.....   
 ..... (PLEASE TICK ONE FROM EACH ROW)

..... (PLEASE TICK ONE FROM EACH ROW)

..... (PLEASE TICK ONE FROM EACH ROW)

..... (PLEASE TICK ONE FROM EACH ROW)

..... (PLEASE TICK ONE FROM EACH ROW)

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..... (PLEASE TICK ONE FROM EACH ROW)

..... (PLEASE TICK ONE FROM EACH ROW)

### SECTION D – CONSIDERATIONS BEING IN A FUTURE VEHICLE PURCHASING DECISION?

..... (PLEASE TICK ONE FROM EACH ROW)

..... (PLEASE TICK ONE FROM EACH ROW)

..... (PLEASE TICK ONE FROM EACH ROW)

..... (PLEASE TICK ONE FROM EACH ROW)

..... (PLEASE TICK ONE FROM EACH ROW)

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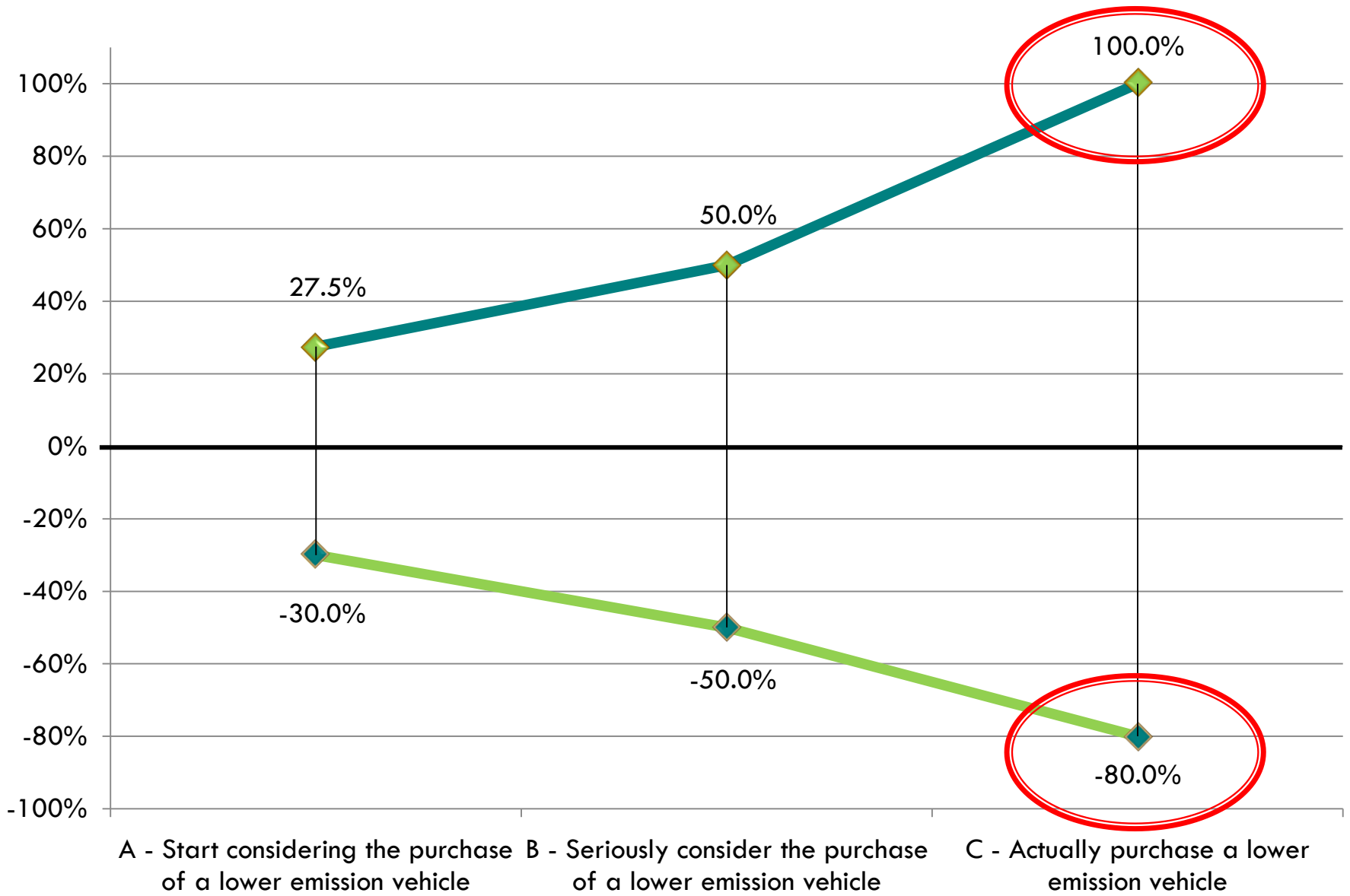
..... (PLEASE TICK ONE FROM EACH ROW)

..... (PLEASE TICK ONE FROM EACH ROW)

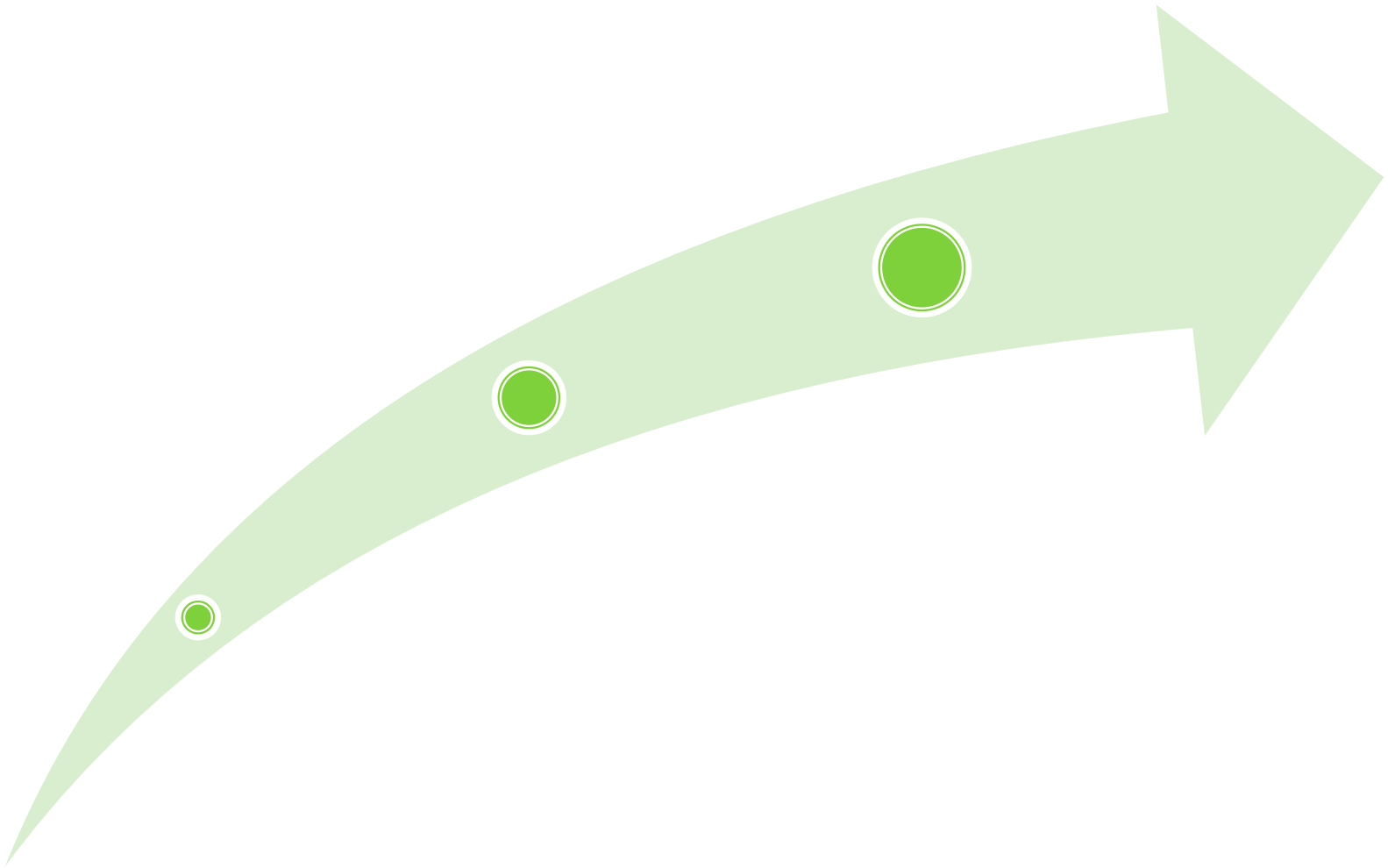
..... (PLEASE TICK ONE FROM EACH ROW)

..... (PLEASE TICK ONE FROM EACH ROW)

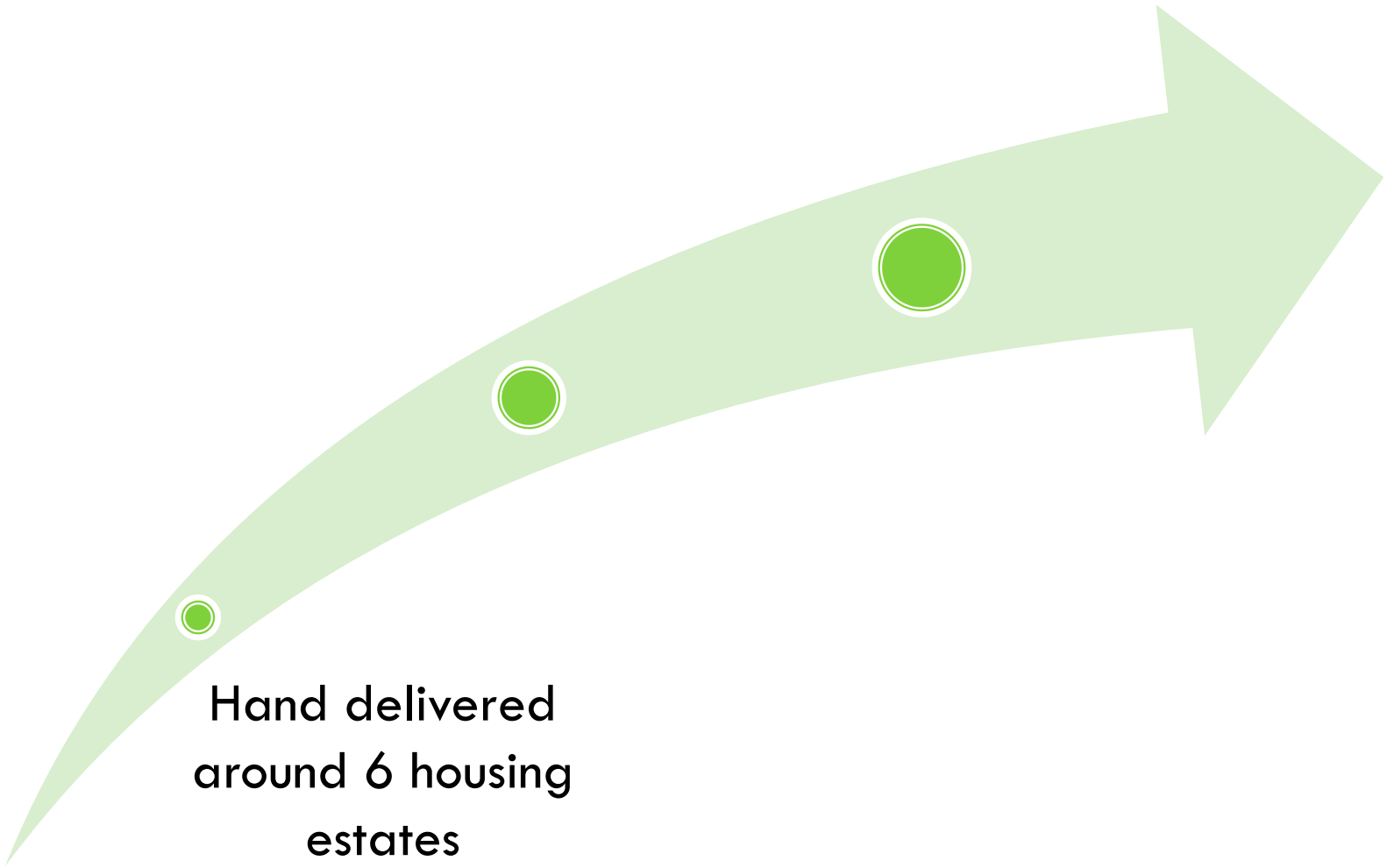
..... (PLEASE TICK ONE FROM EACH ROW)



**Road Tax**



**Sample**



Hand delivered  
around 6 housing  
estates

**Sample**

254  
questionnaires  
in total

Hand delivered  
around 6 housing  
estates

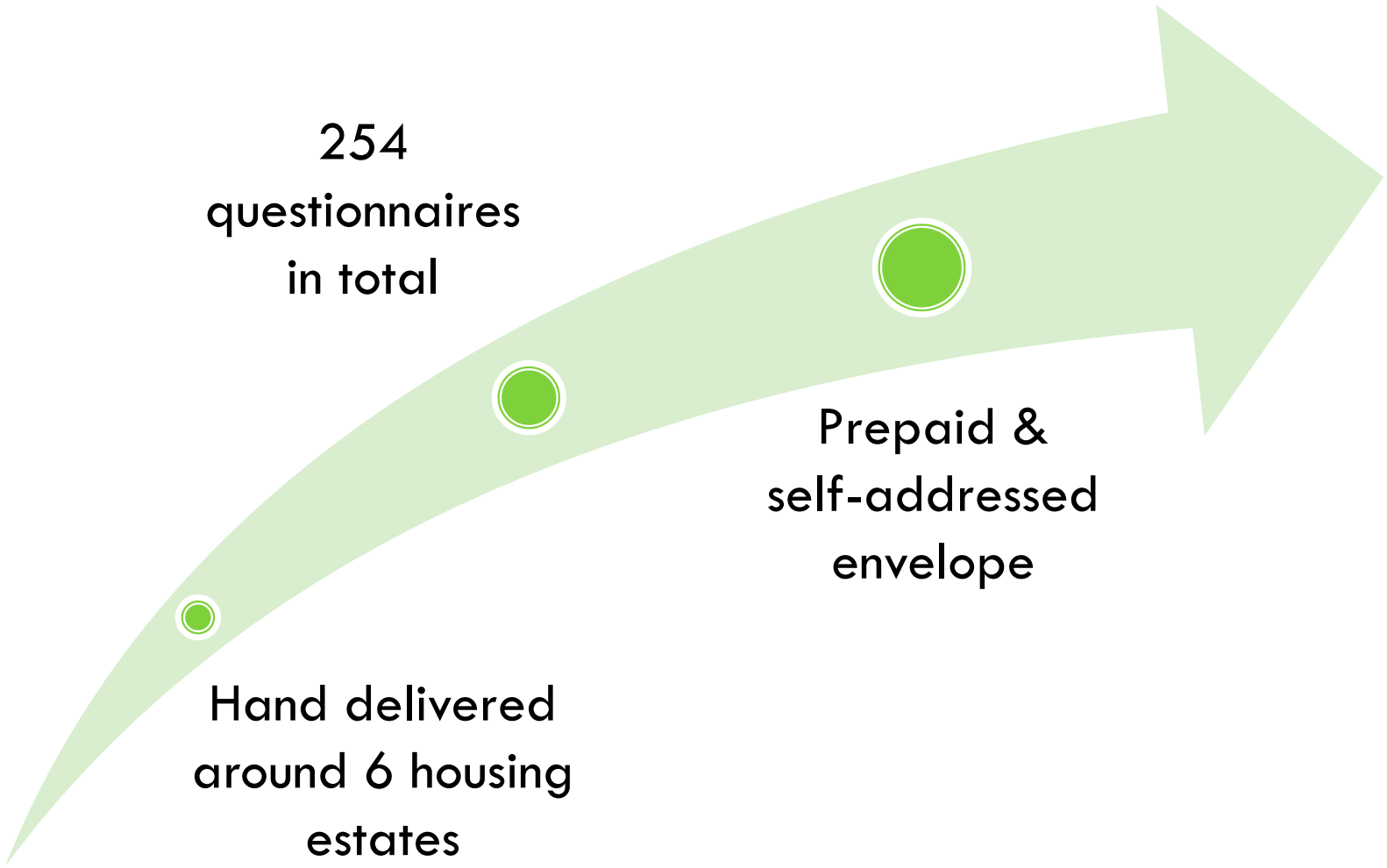
**Sample**

254  
questionnaires  
in total

Prepaid &  
self-addressed  
envelope

Hand delivered  
around 6 housing  
estates

**Sample**



# Questionnaire Design

## ▶ Minor Issues

- Wording
- Examples
- Layout etc

# Questionnaire Design

- ▶ Minor Issues
  - Wording
  - Examples
  - Layout etc
  
- ▶ Overall...





## Postal Survey

- Pilot testing of questionnaires (September & November)
- Changes implemented at each stage
- Issue fully February 2011

**Timescale**

## Postal Survey

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## Online Survey

- Amendment of questionnaire (suitability for future motorists)
- Online from February 2011

**Timescale**

## Postal Survey

- Pilot testing of questionnaires (September & November)
- Changes implemented at each stage
- Issue fully February 2011

## Online Survey

- Amendment of questionnaire (suitability for future motorists)
- Online from February 2011

## Then...

- Six weeks for returning of questionnaires
- Analysis... Results
- Writing up of thesis

# Timescale

# Expected Outputs



# Expected Outputs

- ▶ **Revision of the Lane & Potter Model of Factors Influencing Car Buyer Behaviour**
  - Basic feed from 'Economic & Regulatory Environment' to 'Car Buyer Behaviour'
  - Psychological factors exist in isolation

# Expected Outputs

- ▶ **Revision of the Lane & Potter Model of Factors Influencing Car Buyer Behaviour**
  - Basic feed from 'Economic & Regulatory Environment' to 'Car Buyer Behaviour'
  - Psychological factors exist in isolation
- ▶ **Informing future tax policy**
  - Scottish Government  
(contacts)

# **Sarah Borthwick**

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Merchiston D42

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