# Public Transport Use Analysis

Billy Brazil

# Introduction

- There is often an underlying assumption that public transport is a feasible option for all or most people

- Large scale investments being made in improving public transport services
    - More frequent services
    - Reduced prices
    - More jobs and services accessible

- Can we assume that everyone is aware of these improvements

- Are people making transport choices* based upon outdated impressions of public transport or perceptions rather than reality?

- What can we learn about the addressable market for public transport?

*Where realistic choices exist

# Introduction

Research questions:

- How many people never use public transport?

- What are the features of these non-users in terms of:
    - Socio-economic characteristics
    - Area type in which they reside
    - Access to and use of other modes of transport

- Intended to provide an overview for researchers and policy makers/planners to inform their understanding of the Irish transport landscape

- Not providing an examination of the specific reasons for non-use

# Data

- Analysis is based upon the 2022 National Household Transport Survey

- Survey of ~6k households and ~10k individuals (~8k complete responses for this study)

- Consists of a trip diary and a household survey

- Includes questions on the respondents' general transport habits

# Methods

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- Modelled using a binary logit model

- Standard model for discrete binary data

- Utilized throughout the NTA's transport models (and many other transport models)

$$P_{npt} = \frac{e^{\alpha + \beta x}}{1 + e^{\alpha + \beta x}}$$

$P_{npt}$ = the probability of being a non-PT user

$\alpha$ = the constant term

$\beta$ = the estimated parameters

x = the value of the independent variables

# Results

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**DO YOU EVER USE PUBLIC TRANSPORT?**

Yes, 46.7%

No, 53.3%
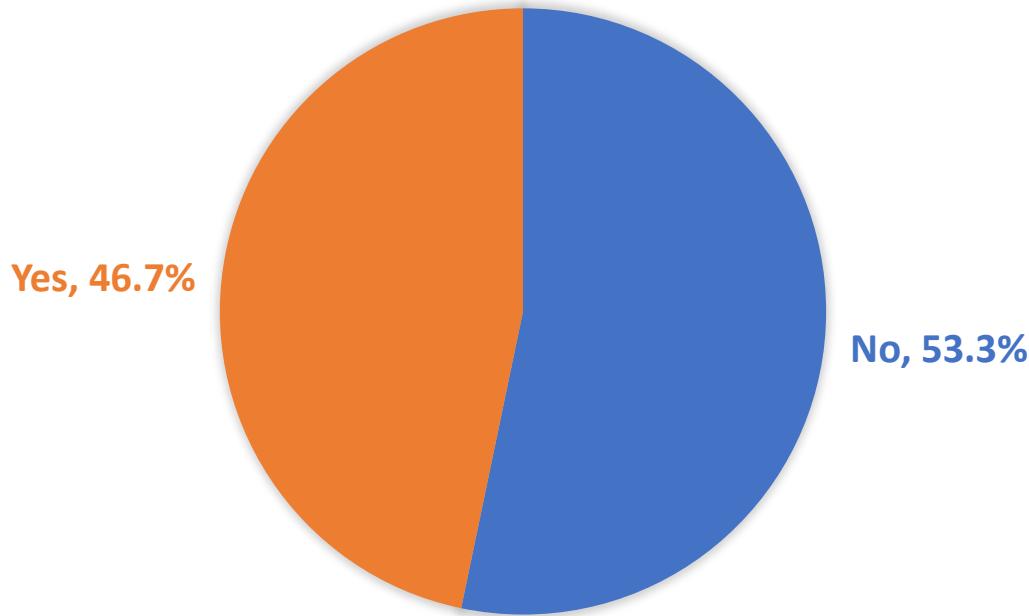
# Results



Never Use Public Transport by Age Group

| Age Group | Percentage |
|-----------|-----------|
| U10 | 82% |
| Teens | 55% |
| 20s | 39% |
| 30s | 52% |
| 40s | 59% |
| 50s | 60% |
| 60s | 50% |
| 70s | 32% |
| 80+ | 38% |
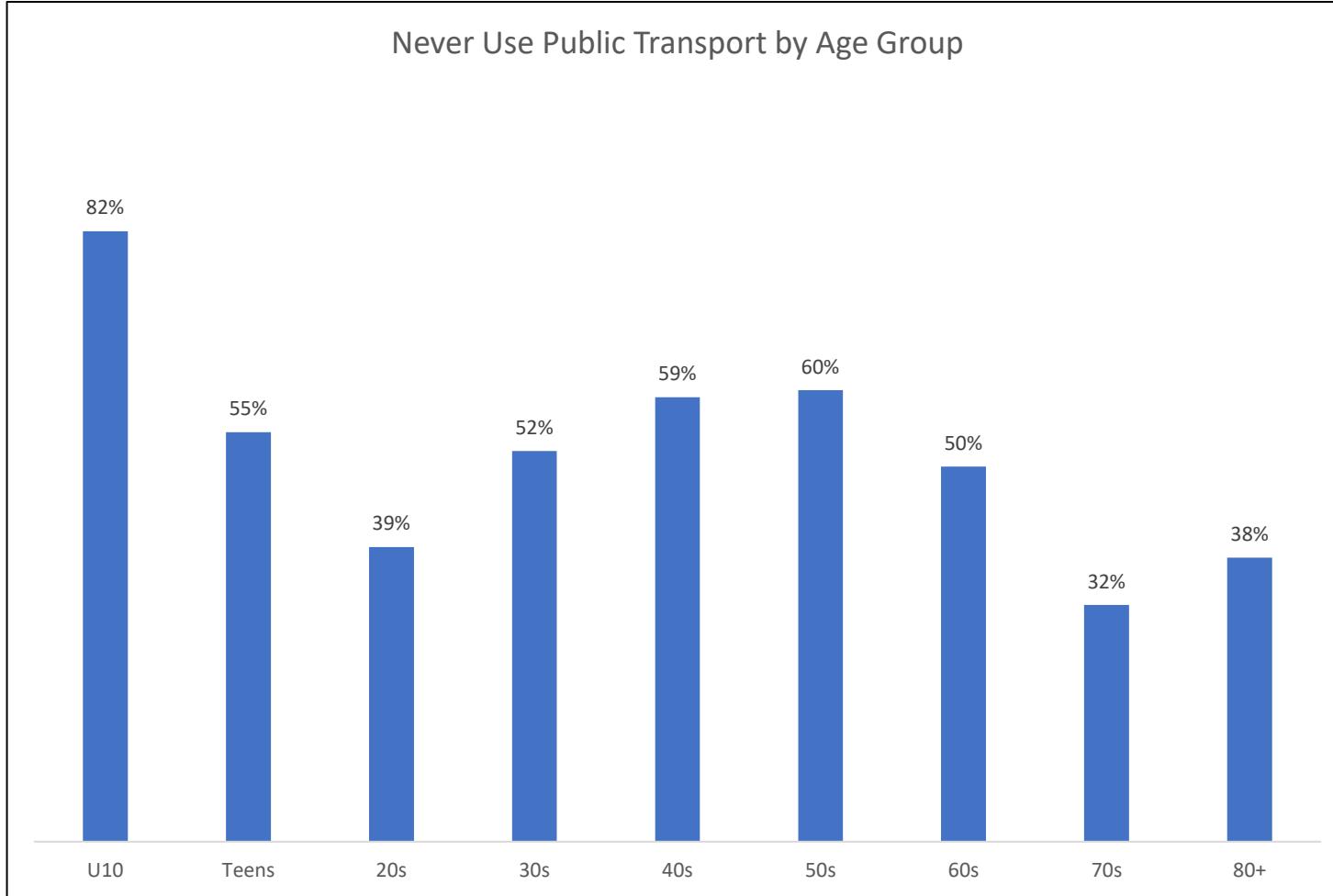
# Results



Never Use PT by Area

- City: 24.4%
- Large Town: 54.2%
- Small Town: 65.3%
- Rural: 70.8%
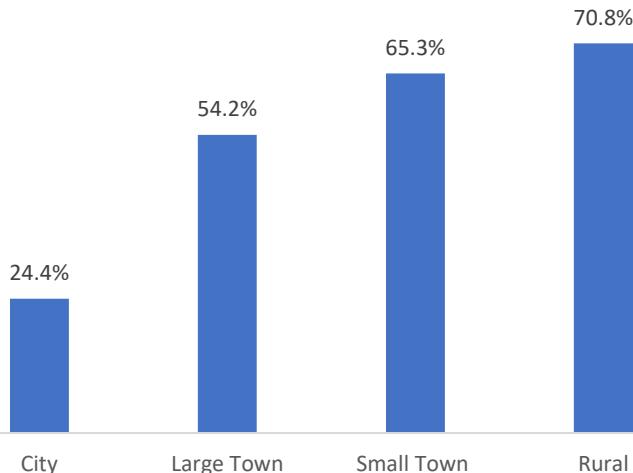


Never Use PT by Car Ownership

- No Car HH: 48.8%
- Car HH: 56.0%

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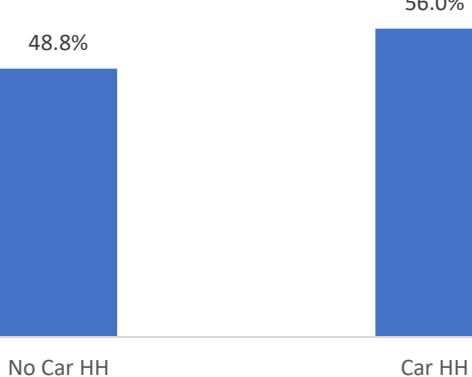


Never Use PT by Bike Ownership

- No Bike: 52.4%
- Bike: 54.3%
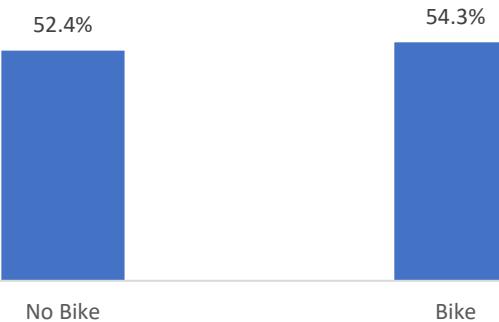


Never Use PT by Shared Bike

- Share Bike: 19.0%
- No Share Bike: 54.1%
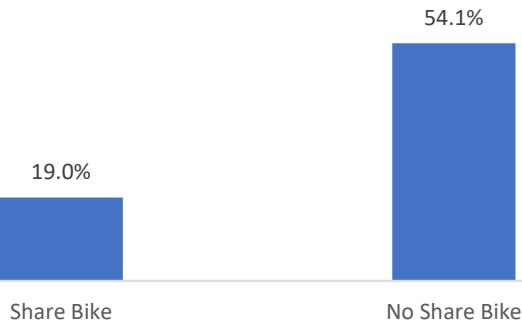
# Results

| | Coefficient | Odds Ratio | P>z | Low CI | High CI |
|---|---|---|---|---|---|
| **Area of Residence** | | | | | |
| City | 0.00 | **1.00** | | | |
| Large Town | 1.39 | **4.00** | 0.00 | 1.25 | 1.53 |
| Small Town | 1.84 | **6.32** | 0.00 | 1.68 | 2.01 |
| Rural | 2.05 | **7.77** | 0.00 | 1.90 | 2.20 |
| | | | | | |
| **Age Band** | | | | | |
| U10 | 0.95 | **2.59** | 0.00 | 0.42 | 1.49 |
| Teens | 0.58 | **1.78** | 0.01 | 0.15 | 1.00 |
| 20s | -0.19 | **0.83** | 0.11 | -0.42 | 0.04 |
| 30s | 0.00 | **1.00** | | | |
| 40s | 0.24 | **1.28** | 0.01 | 0.06 | 0.43 |
| 50s | 0.24 | **1.27** | 0.01 | 0.06 | 0.43 |
| 60s | 0.03 | **1.03** | 0.78 | -0.18 | 0.24 |
| 70s | -0.56 | **0.57** | 0.00 | -0.85 | -0.27 |
| 80+ | -0.08 | **0.92** | 0.72 | -0.54 | 0.38 |
| | | | | | |
| **Cars in Household** | | | | | |
| No Car Household | 0.00 | **1.00** | | | |
| Car Household | 0.24 | **1.27** | 0.00 | 0.10 | 0.39 |
| | | | | | |
| **Driver's Licence** | | | | | |
| Full Licence | 0.00 | **1.00** | | | |
| Provisional Licence | -0.80 | **0.45** | 0.00 | -1.03 | -0.58 |
| No Licence | -0.93 | **0.40** | 0.00 | -1.15 | -0.70 |

# Results

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| | Coefficient | Odds Ratio | P>z | Low CI | High CI |
|---|---|---|---|---|---|
| **Bike Ownership** | | | | | |
| Doesn't Own Bike | 0.00 | **1.00** | | | |
| Owns Bike | -0.33 | **0.72** | 0.00 | -0.44 | -0.22 |
| | | | | | |
| **Gender/Sex** | | | | | |
| Male | 0.00 | **1.00** | | | |
| Female | -0.31 | **0.73** | 0.00 | -0.42 | -0.21 |
| Other | 1.47 | **4.36** | 0.17 | -0.62 | 3.57 |
| PNTS | -0.31 | **0.73** | 0.55 | -1.35 | 0.72 |
| NA | -0.20 | **0.81** | 0.34 | -0.62 | 0.21 |
| | | | | | |
| **Principal Economic Status** | | | | | |
| Employed | 0.00 | **1.00** | | | |
| Looking First | 0.19 | **1.22** | 0.69 | -0.75 | 1.14 |
| Unemployed | 0.15 | **1.17** | 0.44 | -0.23 | 0.54 |
| Primary Student | 1.64 | **5.18** | 0.00 | 1.16 | 2.13 |
| Secondary Student | 0.23 | **1.25** | 0.31 | -0.21 | 0.66 |
| Tertiary FT | -1.14 | **0.32** | 0.00 | -1.47 | -0.80 |
| Tertiary PT | -0.34 | **0.71** | 0.43 | -1.19 | 0.51 |
| Home | -0.08 | **0.92** | 0.51 | -0.33 | 0.17 |
| Retired | -0.99 | **0.37** | 0.00 | -1.20 | -0.78 |
| Unable to Work | -0.50 | **0.61** | 0.00 | -0.83 | -0.16 |
| Other | 0.02 | **1.02** | 0.92 | -0.32 | 0.36 |
| NA | 0.43 | **1.54** | 0.09 | -0.07 | 0.94 |
| | | | | | |
| **Shared Bike Scheme** | | | | | |
| Shared Bike Member | 0.00 | **1.00** | | | |
| Not Shared Bike Member | 1.36 | **3.90** | 0.00 | 0.95 | 1.77 |

# Results

| | Coefficient | P>z | Low CI | High CI |
|---|---|---|---|---|
| Constant | -2.19 | 0.00 | -2.64 | -1.74 |

| | |
|---|---|
| Number of observations | 7,993 |
| LR chi2(31) | 2,036 |
| Prob > chi2 | 0 |
| Pseudo R2 | 0 |
| Log likelihood | -4,505 |

# Conclusions

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- Understanding public transport usage is key for planning and service provisions, as well as mode choice modelling

- Data suggests that roughly half of the population **never** use public transport

- This differs significantly by age, gender/sex, car ownership, and household location

- Important implications when considered the real-world choice sets that individuals encounter

- Implies choices may be somewhat based on previous perceptions rather than existing reality

- Also has implications regarding the population's ability to detect service improvements

# Thank you

Any questions?