

# 36-Year Analysis of Commuting Patterns in Ireland (1986–2022)

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## Project Overview

Over the past three decades, transport infrastructure, urban development and sustainability priorities have evolved significantly in Ireland.

This project analyses Irish Census commuting data (1986–2022) to understand:

- How commuting behaviour has changed over time
- Whether private car dependency has increased
- How commuting patterns differ by gender
- How travel behaviour varies across work and education

The goal was to move beyond simple population growth trends and identify structural behavioural changes in transport use.

## Data source

**Dataset:** F7122 - Persons Usually Resident and Present in the State

**Source:** Central Statistics Office (CSO), Ireland, <https://data.cso.ie>

**Time span:** 1986 - 2022

Classified by:

1. Census Year
2. Sex
3. Means of Travel
4. At Work, Childcare, School or College

## Tools Used

- R
- dplyr
- ggplot2
- tidyr
- scales
- purrr

## Analytical approach

To ensure meaningful comparisons across decades, the analysis focused primarily on proportional measures, not absolute counts. Population growth alone would inflate raw numbers across all travel modes. Therefore, modal share (%) was used to identify real behavioural shifts.

Data preparation included:

- Cleaning variable names
- Converting variables to appropriate types
- Removing non-informative categories
- Reordering travel modes for interpretability
- Creating grouped categories

## Key Findings

### 1. Structural Shift Toward Private Motor Transport

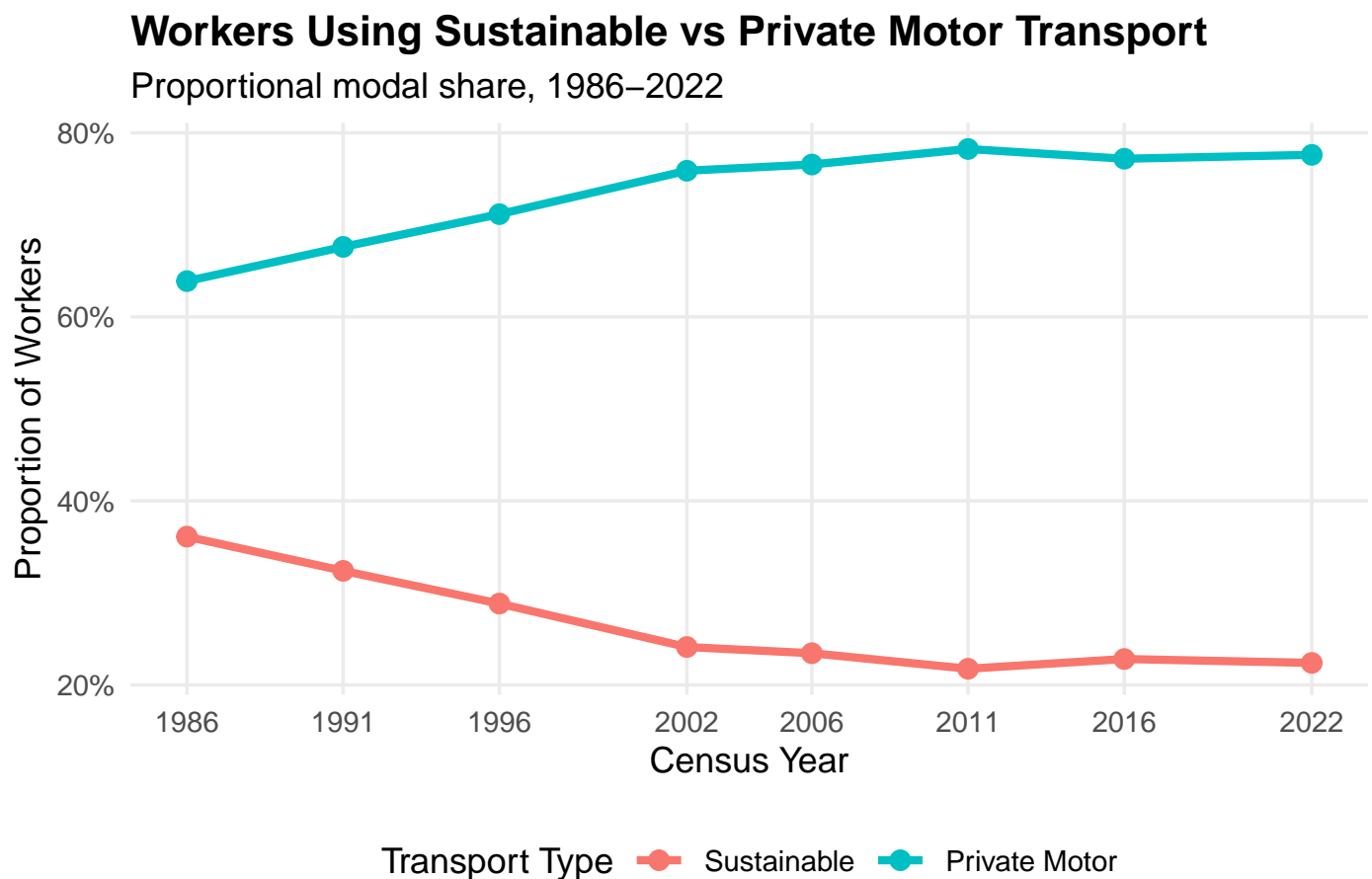


Figure 1: Workers Shift from Sustainable to Private Motor Transport (1986–2022).

## KPI: Worker Modal Share (Private vs Sustainable)

Between 1986 and 2011:

- Private motor transport increased from ~64% to nearly 80%
- Sustainable transport declined from ~36% to just over 20%

After 2011, the trend stabilised but did not reverse.

### Insight:

Ireland has experienced a long-term structural shift toward car dependency, particularly for work-related commuting.

This has significant implications for:

- Climate policy
- Urban planning
- Public transport investment
- Sustainable mobility strategies

## 2. Growth in Car Driving as Primary Mode

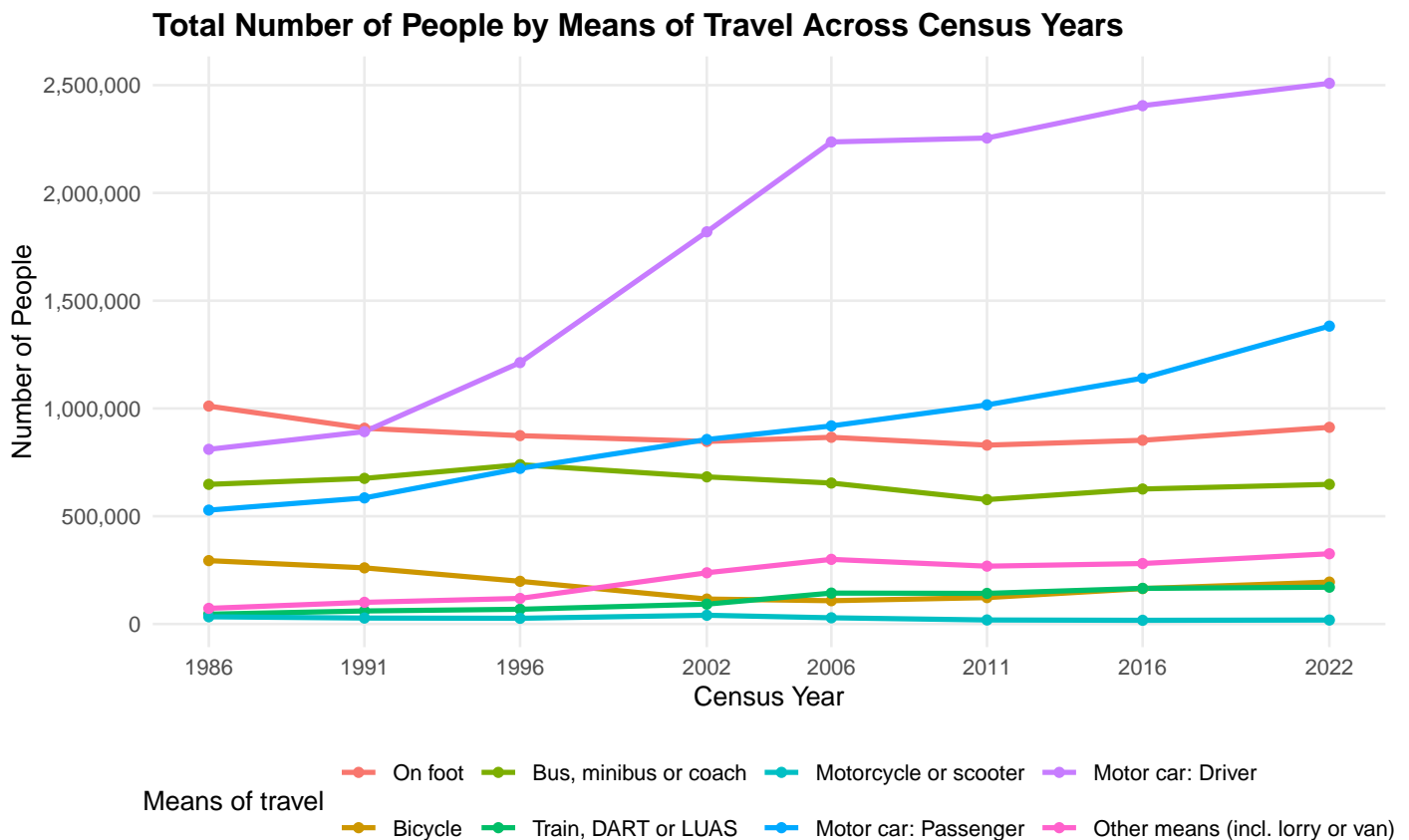


Figure 2: Total Number of People by Means of Travel Across Census Years (1986–2022).

Although total travel increased across all categories, growth was overwhelmingly driven by: *Motor car: Driver*. This indicates that increased travel volume is not merely demographic - it reflects a behavioural shift toward independent car use.

### 3. Gender Differences in Commuting

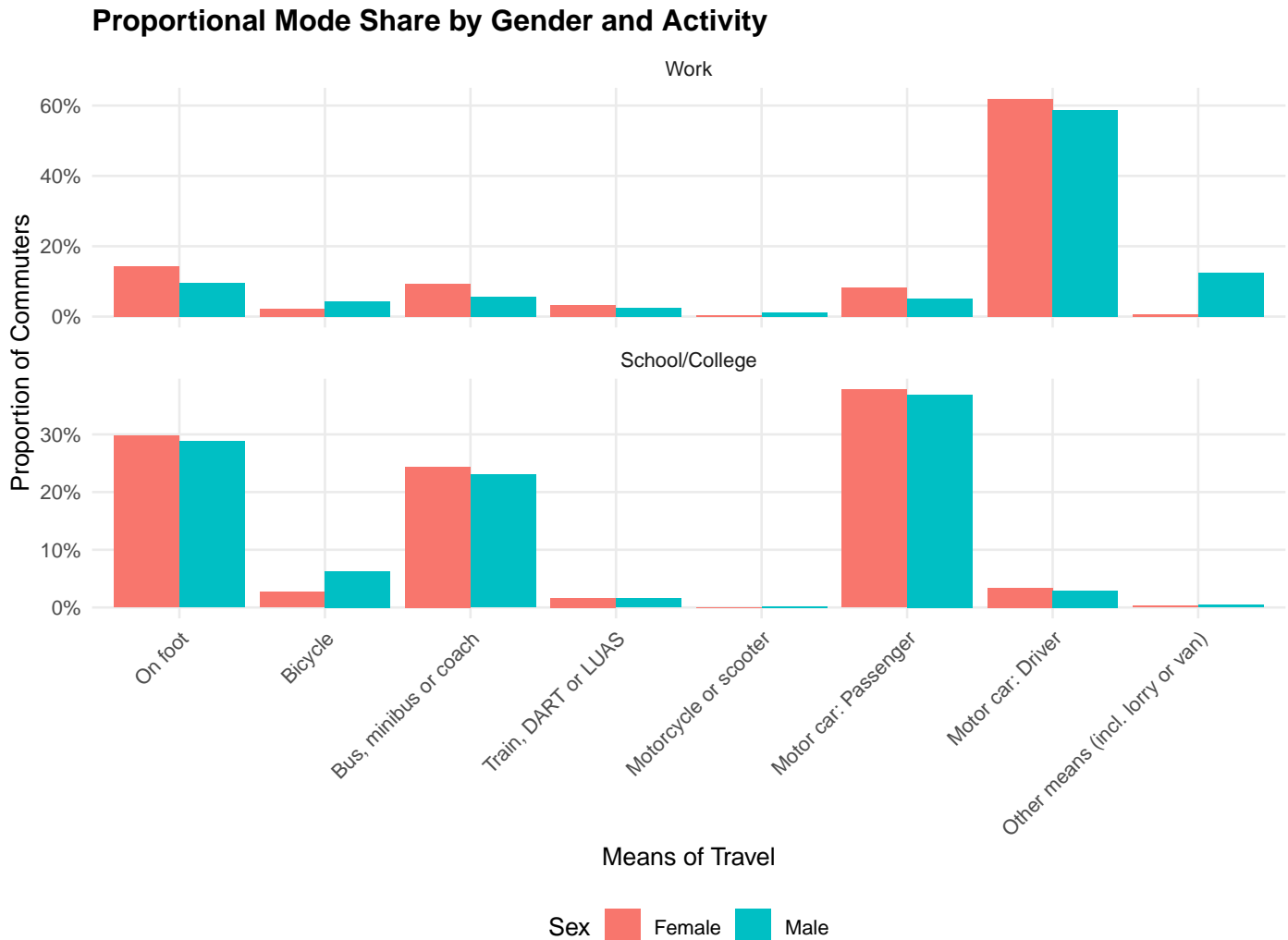


Figure 3: Proportional Mode by Gender Across Work and School/College Activities (1986–2022).

Gender differences exist but are relatively modest overall.

Key patterns:

- Males are more likely to drive
- Females are slightly more likely to walk or use public transport
- Cycling and motorcycling remain strongly male-dominated modes

However, differences across activity type (work vs school) are more pronounced than gender differences.

4. Education Cohort Travel Patterns (Lifecycle Effect)

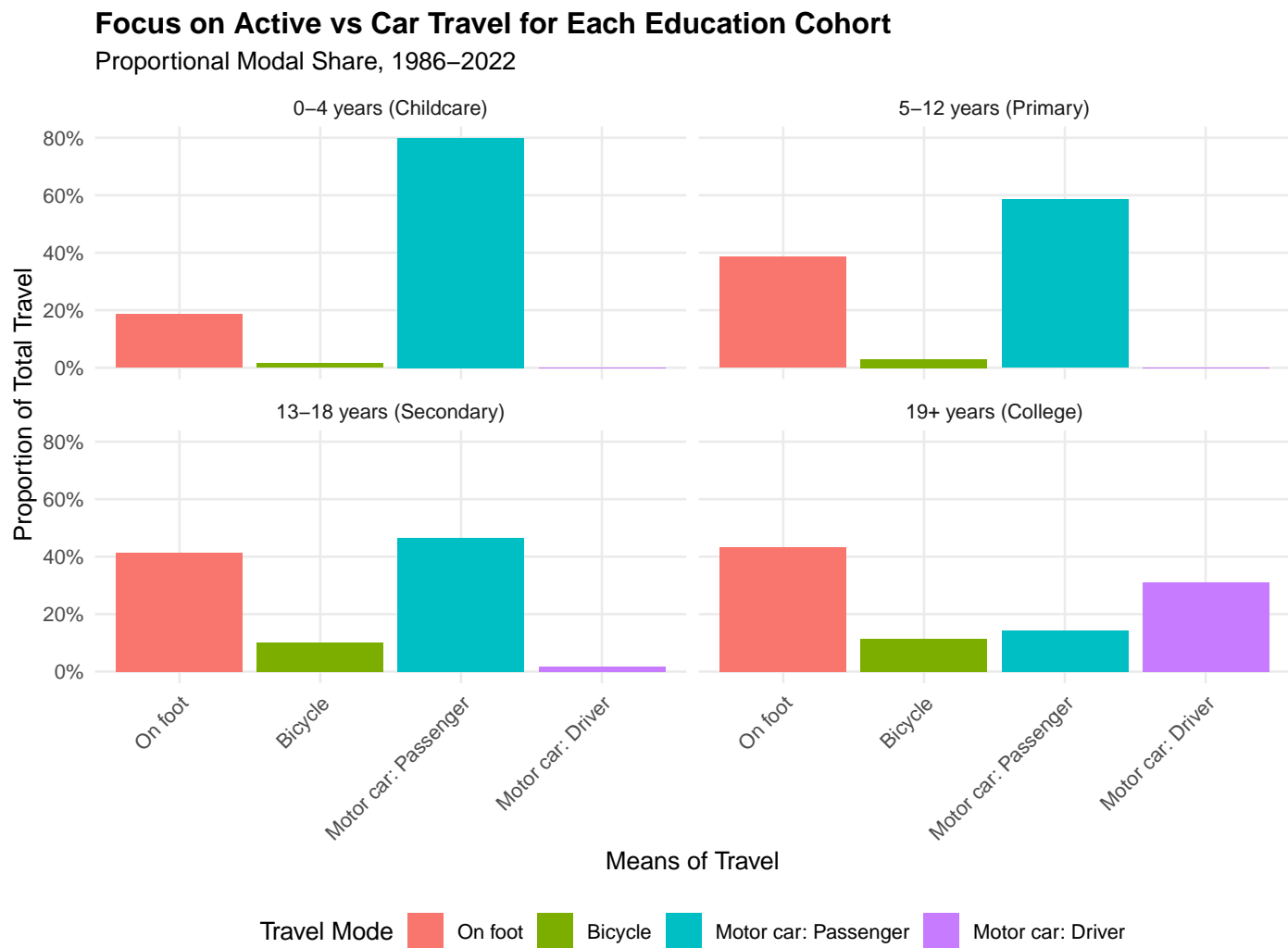


Figure 4: Active Travel Modal Share Across Specific Education Cohorts (Aggregated 1986–2022).

Travel behaviour varies significantly by age group:

Age Group	Dominant Mode	Key patterns
0-4 years	Car Passenger	Heavy reliance on escorted travel
5-12 years	Car Passenger + Walking	Increase in active travel
13-18 years	Walking	Peak independent active travel
19+ years	Car Driver	Transition to independant driving

**Insight:**

Car dependency begins early and strengthens as individuals gain independence and travel longer distances. This suggests long-term behavioural reinforcement of private motor transport.

## What This Project Demonstrates

This analysis showcases the ability to:

- Clean and structure real government datasets
- Perform longitudinal analysis
- Use proportional metrics correctly
- Avoid misleading absolute trends
- Segment data by demographic group
- Communicate insights clearly
- Translate data into policy-relevant conclusions

## Business & Policy Implications

The sustained dominance of private motor transport suggests:

- Infrastructure investment in sustainable transport may not yet be sufficient to reverse long-term trends
- Behavioural change requires structural incentives, not short-term interventions
- Urban design and land-use planning play a major role in commuting behaviour

This analysis highlights the complexity of achieving modal shift toward sustainable mobility.