

Analysing/modelling changing patterns in housing preferences/markets and travel behaviour. Or Analysing impacts of changing travel behaviour on retail centres.

Housing markets and travel behavior

Urban Marginalization and Commuting Pressures: As housing prices rise, residents may choose housing away from city centers to reduce costs, which may lead to increased commuting times and reliance on private car travel, thus increasing traffic congestion and environmental pollution.

Housing density and public transport use: Higher-density housing areas are usually better equipped with public transport facilities, and residents are more likely to use public transport. For example, residents living in high-rise apartment buildings are likely to use the underground or bus more frequently than those living in detached houses in suburban areas.

Housing type and travel patterns: Households living in detached houses in the suburbs may be more likely to travel by car, while residents of small flats in city centers may rely more on walking, cycling, or public transport.

Impacts of changing travel behavior on retail centers

Changes in traveling patterns - increased public transport accessibility: When public transport facilities (e.g., metro, bus routes) are improved or extended in an area, more people are able to reach the retail center easily, potentially increasing footfall and sales in the retail center.

Changes in travel frequency and routes - Changes in teleworking and residential patterns: The prevalence of teleworking has resulted in people traveling less into the town center for work, potentially reducing daily visits to the town center retail area. Residents may be more likely to shop in smaller retail centers near to where they live or online, impacting footfall and turnover in larger retail centers.

Changes in travel preferences - increased awareness of sustainable travel: As concerns about environmental issues increase, more consumers prefer to walk, cycle, or use public transport for their shopping, which may promote increased support for these modes of travel in retail centers, e.g. provision of more cycle parking, improved walking paths, links to public transport stops, etc.

Research process:

(1) The preparation before analysis - Literature Review:

Analyses findings from previous studies on the impact of housing choices on travel mode and frequency. Examine trends in the housing market, such as urban marginalization, changes in density, and diversification of housing types, and how these trends affect travel patterns.

(2) Clarify research questions and objectives:

Identify specific urban areas or case study subjects and the specific housing and transport parameters on which the research will focus. Setting quantitative objectives, such as predicting the impact of certain housing market changes on public transport usage.

(3) Data collection:

Time series data: collect housing sales data and traffic flow data for the target area over the past several years.

Demographic and socio-economic data: including residents' education levels, income levels, employment, etc., to assess the impact of these factors on housing choices and travel behavior.

Geospatial data: including housing locations, transport facility locations (e.g., bus stops, metro stations), retail center locations, etc.

(4) Data processing and analysis methods

Spatial analysis: using GIS tools to analyse the relationship between the spatial distribution of housing and transport facilities.

Time series analysis: assessing trends in housing markets and travel behavior over time.

Regression analysis: to explore the relationship between housing characteristics (e.g., price, type, location) and travel behavior (e.g., travel mode choice, travel frequency).

(5) Model construction and validation:

Construct models to simulate the impact of changes in housing preferences on travel behavior. The accuracy and reliability of the model are tested using real case data.

(6) Interpretation of Results

Based on the model results, specific recommendations for urban planning and transport policy are made.

Discuss research limitations and directions for future research.

Tools and Techniques:

GIS: for analyzing and presenting data related to geographical location.

Statistical analysis software: e.g. R, Python (libraries such as Pandas, SciPy, etc.) for data processing and statistical analysis.

Data visualization tools: e.g., Tableau, D3.js for graphical representation and interactive visualization of data.

Modeling tools: building models using Agent-Based Modeling (ABM), multiple regression analysis, etc., software such as NetLogo, AnyLogic, or professional statistical software.