Why is cycling so hard to model?

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Introduction

- Reflections on experience of modelling transport in urban areas for bids to DfT for funding
- Transport Innovation Fund - road pricing
- Community Infrastructure Fund - housing
- Local Sustainable Transport Fund - sustainable travel, jobs

Standard model structure

- Trip generation? How many trips
- Trip distribution? Where are they going
- Mode choice? Car / public transport / cycle
- Route assignment? Which roads / bus services will people use

How did this tool develop

- To answer road building questions
  - How many cars will use this new by-pass?
  - What will conditions on road network be, if we build a load of new houses here?

- Extended to answer public transport questions
  - How many people will use this new tube line?
  - What will conditions on road network be like if we build it?

Trip Generation

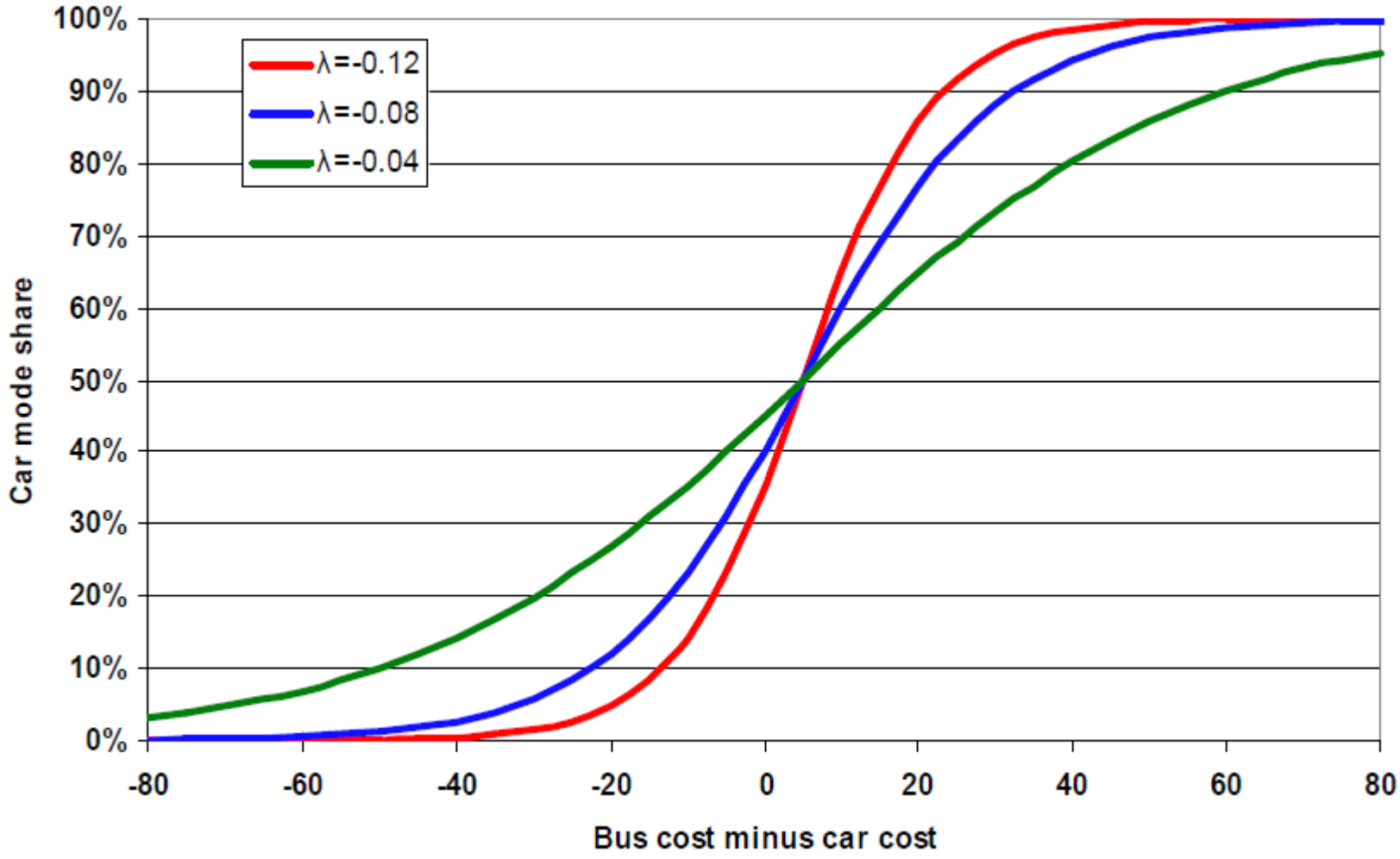
- More data available for car trips than cycle trips
- Better quality data

- Databases available e.g. TRICS
- Analysis of travel diary surveys
- Counts, automatic traffic counters
- Size of zones; problem of intrazonals

Trip Distribution

- Based on surveys
- More difficult to interview cyclists

Mode Choice: the logit model



Mode choice

- Main components of ‘cost’ of each mode is time, money cost and mode penalty
- Segmentation dictated by needs of car/pt choice
- Matrix based, so adjustment factors are by zone
- Small numbers
- Response to non time and cost factors not captured
- Choosing to cycle ‘confuses’ our logit models

Route Assignment

- Our assignment algorithms designed for cars:

  quickest/ shortest route
- Are all the routes in the network?
- How do people choose a cycle route, different types of cyclists?

Different types of cyclists

LSTF experience

- Remembered the TIF experience
- Model car/pt system – struggled with cycle
- Looked at evidence from Sustainable Travel Towns etc
- Removed trips from car matrix
- Allocated to ‘not travel’, transfer to bus, transfer to walk/cycle

LSTF experience

- What benchmark figures to use?
- How to decide which trips no longer made by car were made by cycle?
- Where are they going?
- Lack of feedback loop – convergence?
- Single point in time, what about decay?
- Route choice issues still remain?
- Not know about existing cycle trips?

Reflections

- Our models are about people
- Influenced by factors not captured in current models e.g health, environmental concerns
- Matrix based software makes more segmentation very difficult
- Are we using the wrong tool?

Conclusions

- We need to consider new types of tools
  - System dynamics (high level)
  - Agent based models (low level)
- Can we amend our existing tools