Workshop:
Mindmaps, Communication, Scenarios...

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Urban Transportation Planning
MIT Course 1.252j/11.380j
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Mindmapping

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- Brainstorming: MindMapping (by Tony Buzan)

  - From sequential thinking and note taking to tree structures
  - Rearrange ideas
  - Establish connections
  - Let associations emerge

Mindmapping

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- A whole-brain alternative to linear thinking
- Retain both the overall picture and the details
- Promote associations

- You see what you know and where the gaps are
- Clears your mind of mental clutter
- It works well for group brainstorming

Mindmapping

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- Let us do a joint MindMap

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Communication Tools

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- Transportation Policy depends to a great extent on two-way communications:
  - Policy analysts ⇦⇨ elected officials
  - Elected officials ⇦⇨ other politicians
  - Elected officials ⇦⇨ mass media
  - Public at large ⇦⇨ elected officials
  - ………………… ⇦⇨ …………………

- But impact of a message is based on:
  - words (7%),
  - how words are said (38%), and,
  - non verbal clues (55%)

Communication Tools

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	learned	used	taught
Listening	1st	Most (45%)	Least
Speaking	2nd	Next most (30%)	Next least
Reading	3rd	Next least (16%)	Next most
Writing	4th	Least (9%)	Most

Toastmasters? Speed reading?...

Communication Tools

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How Do you Visualize Change???
Remember that simulations could be critical

Other tools of the trade

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- **Creativity**: Lateral thinking, to think-out-of-the-box, thinkertoys…

Out-of-the-box thinkers

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- **Edward de Bono:**
  - Thinking Tools
  - Six thinking hats
  - Lateral Thinking
- **Michael Michalko:**
  - Cracking Creativity
  - ThinkerToys
- **Many others**

- The intelligence trap
- The Everest effect
- Plus.Minus.Interesting.
- C.A.F. consider all factors
- O.P.V. Other people view
- To look for Alternatives – beyond the obvious
- Analyze Consequences
- Problem Solving and Lateral Thinking
- Provocations

MIT Models and Forecasting...

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- **Forecasting:**
  - Short term extrapolation:The future on the basis of the past
  - Applicable to slow incremental change
  - The problem is that people believe that this situation will continue for ever
  - But...

Forecasting

Scenarios

uncertainty

predictability

Time into the future
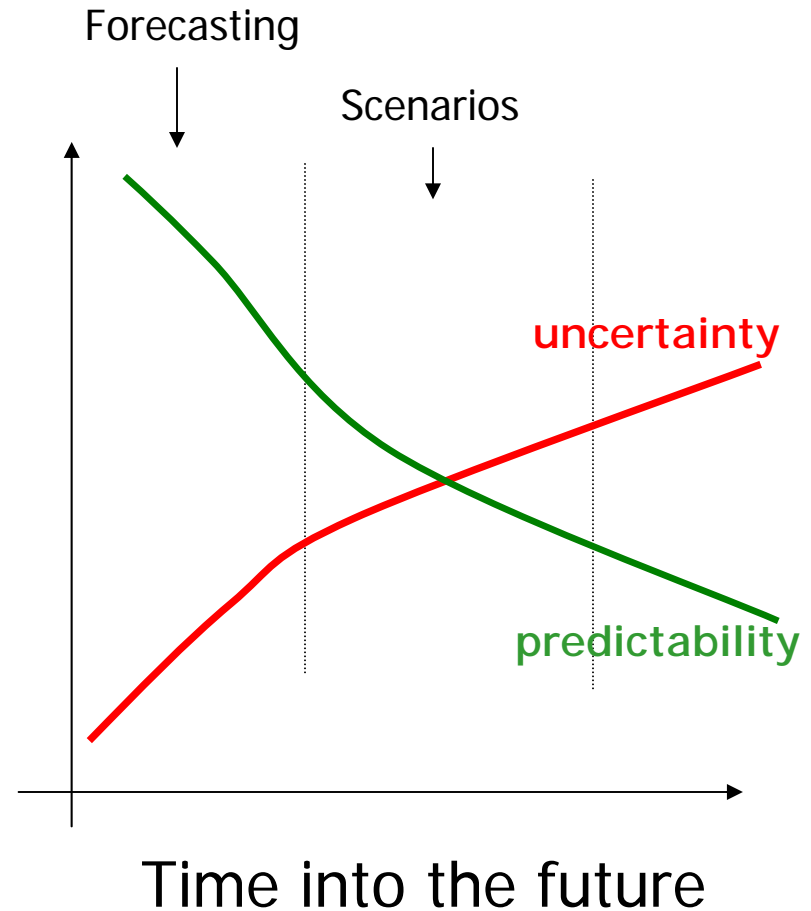
...And Scenarios

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- A conceptual description of the future based on cause and effect

- Invent and analyze **several stories** of equally plausible futures to bring forward surprises and unexpected leaps of understanding

- Goal is not to create a future, nor to choose the most probable one, but **to make strategic decisions that will be sound** (or *robust*) **under all plausible futures**

Scenarios: Why?

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- History is a continuum of *pattern breaks*
- We react to uncertainty thru denial
  (that is why a quantitative model is so reassuring!)
- But we can't predict the future with certainty
- By providing alternative images of the future:
  - We go from facts into perceptions, and,
  - Open multiple perspectives
- Mental models, and myths, control what you do and keep you from raising the *right* questions
- Goal: *Suspend disbelief in a story long enough to appreciate its potential impact*

Scenarios: How?

- Examine the environment in which your actions will take place and see how those actions will fit in the prevailing forces, trends, attitudes and influences

- Identify driving forces and critical uncertainties

- Challenge prevailing mental modes

- Rehearse the implications

Scenarios: Stages

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1. Identify focal issue or decision
2. Identify driving forces in the local environment
3. Identify driving forces in the macro environment
4. Rank the importance and uncertainty of each
5. Select scenario logics (so as to tell a story)
6. Flesh-out the scenario in terms of driving forces
7. Analyze implications
8. Define leading indicators for monitoring

Scenarios: Rules

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- Goal:
    - Required decisions under each scenario? Vulnerabilities? Can we control the key driving forces?...

- Good scenarios should be plausible, but also surprising by breaking old stereotypes

- Do not assign probabilities to each alternative scenario

- Assign a name to each scenario

- A total of 3-4 scenarios: Not just two extremes plus a *probable* one. Good to have a wildcard

Reading on Scenarios

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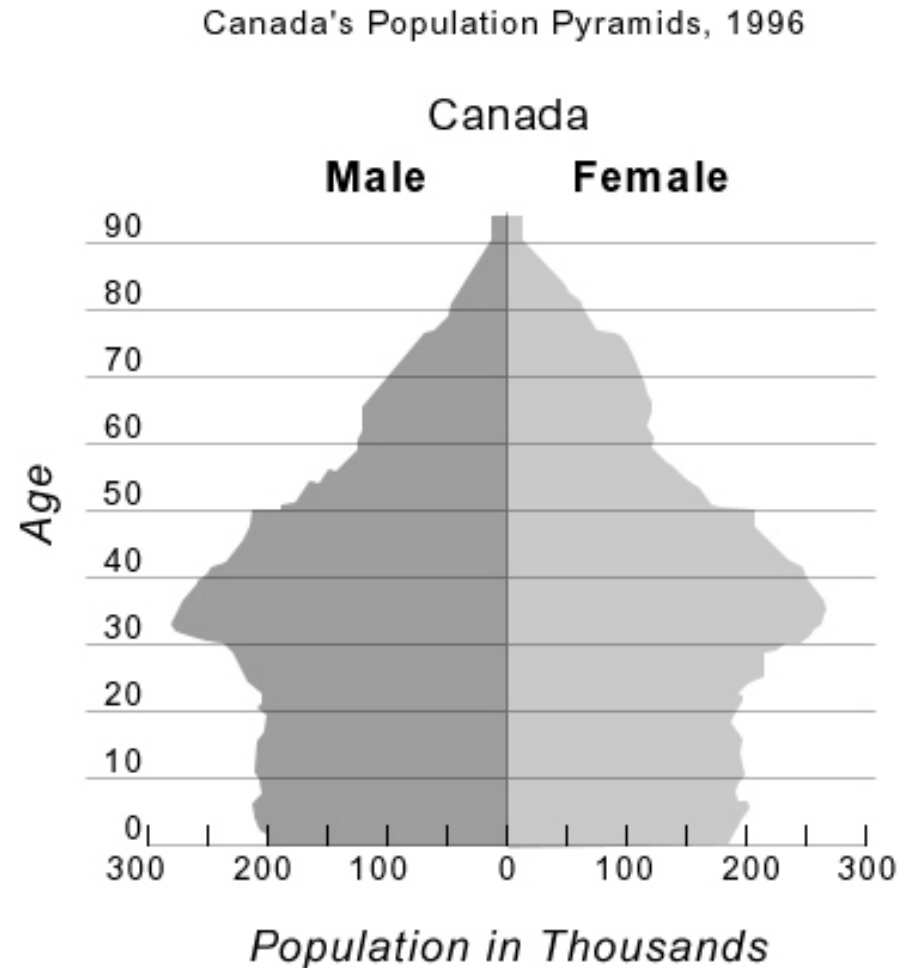Massachusetts Institute of Technology

- "The Art of the Long View" by Peter Schwartz

- "Scenarios: The Art of Strategic Conversation" by Kees van der Heijden

Both authors work for the Global Business Network (www.gbn.org) and come from the Shell Planning Group

Scenarios …and Demographics

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- **Fertility rate:**
  - Avg no. of children born to women over their lifetime
- **Birth rate:**
  - Total no of births divided by the size of the population
- Canada claims a low fertility rate (1.7) but a high birth rate. **How come?**

Day 4.5

Canada's Population Pyramids, 1996

Canada

Male   **Female**

Age

Population in Thousands

Scenarios ...and Demographics

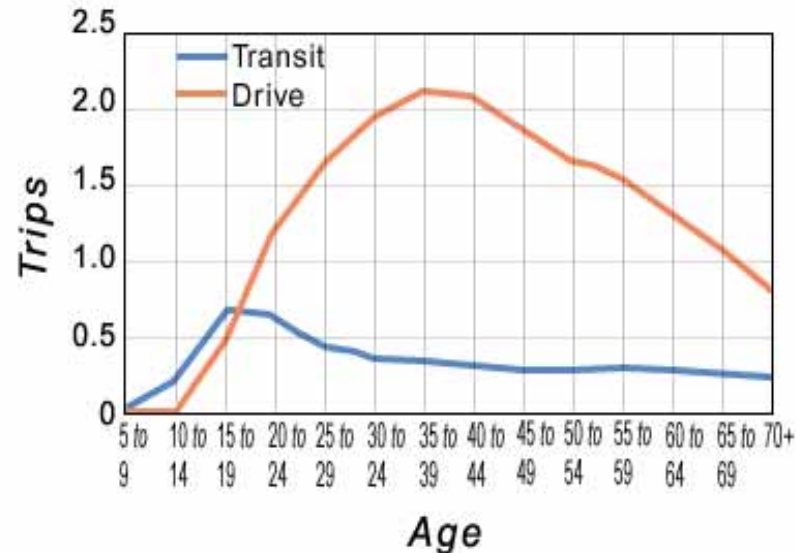**Massachusetts Institute of Technology**

- According to Professor David K. Foot ("Boom, Bust and Echo"), future scenarios entail some certainty: *In 10 yrs, we will all be 10 yrs older*

- Demographics, not only predictable, but inevitable. *The most powerful, yet underutilized tool, to understand the past and foretell the future*

- Age is a good predictor of behavior... and therefore, a good forecasting tool

Scenarios ...and Demographics

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- **Is age a good predictor for:**
  - Real estate?
  - Transit use?
  - Use of hard drugs?
- **If age is a good predictor, then:**
  - Establish number of people in each age group
  - Define probability for each age group, of participation in a given behavior or activity

Average Daily Trips Per Person, Greater Toronto Area

A 19 yr old has little money and plenty of time to wait in the bus stop

Some important sources

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- Transport Research Board
- Institute of Transportation Engineers
- Urban Land Institute
- American Society of Civil Engineers
- The Eno Foundation
- The Economist
- www.gbn.org/bookclub/ (book selection by Steward Brand)
- The Executive Summaries

Models

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- ## How many types??
  - 4-step demand models
  - Land-Use Transportation models
  - G.I.S.?
  - Traffic models
  - Operation models
  - Air pollution levels
  - Noise impact models
  - …………………

Day 4.5

Geographic Information Systems (G.I.S.)

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- GIS.
  - Digital mapping: *links with attributes*
  - Data management: *how many park-meters?*
  - Data analysis: *aggregate or disaggregate*
  - Data presentation: *graphical pie charts*

- Some commercial packages:
  - ArcInfo
  - ArcView
  - MapInfo
  - TransCad – GIS-T
  - ....

Day 4.5

Geographic Information Systems (G.I.S.)

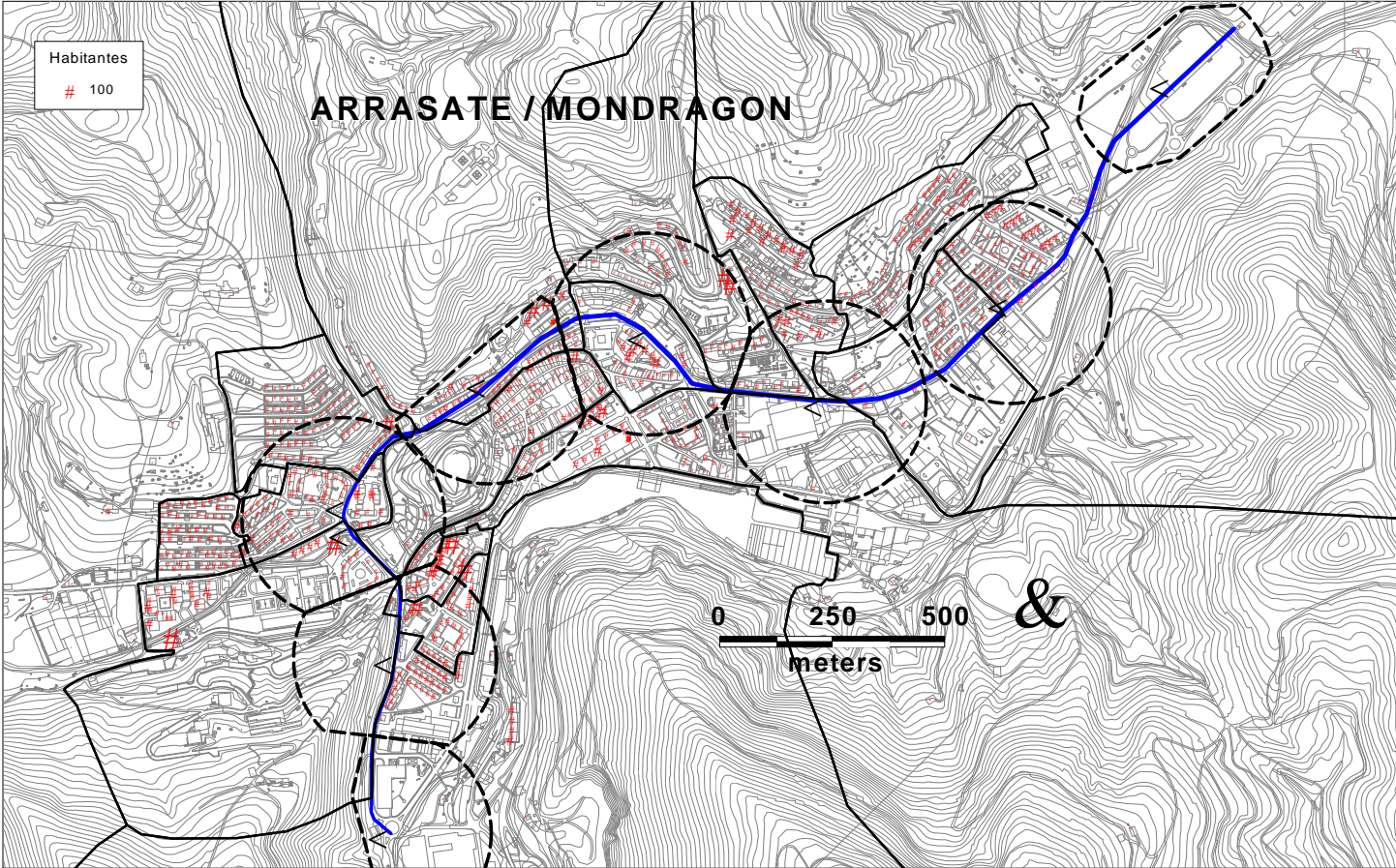**Massachusetts Institute of Technology**

- **Integration of 3 technologies:**
  - A graphical user interface (GUI)
  - A database management system (DBMS)
  - Spatial modeling tools

- **Example: From road maps to Points of Interest (POI):**
  - Up to 100 attributes per street
  - New "smart" roadmaps
  - www.teleatlas.com   www.navtech.com
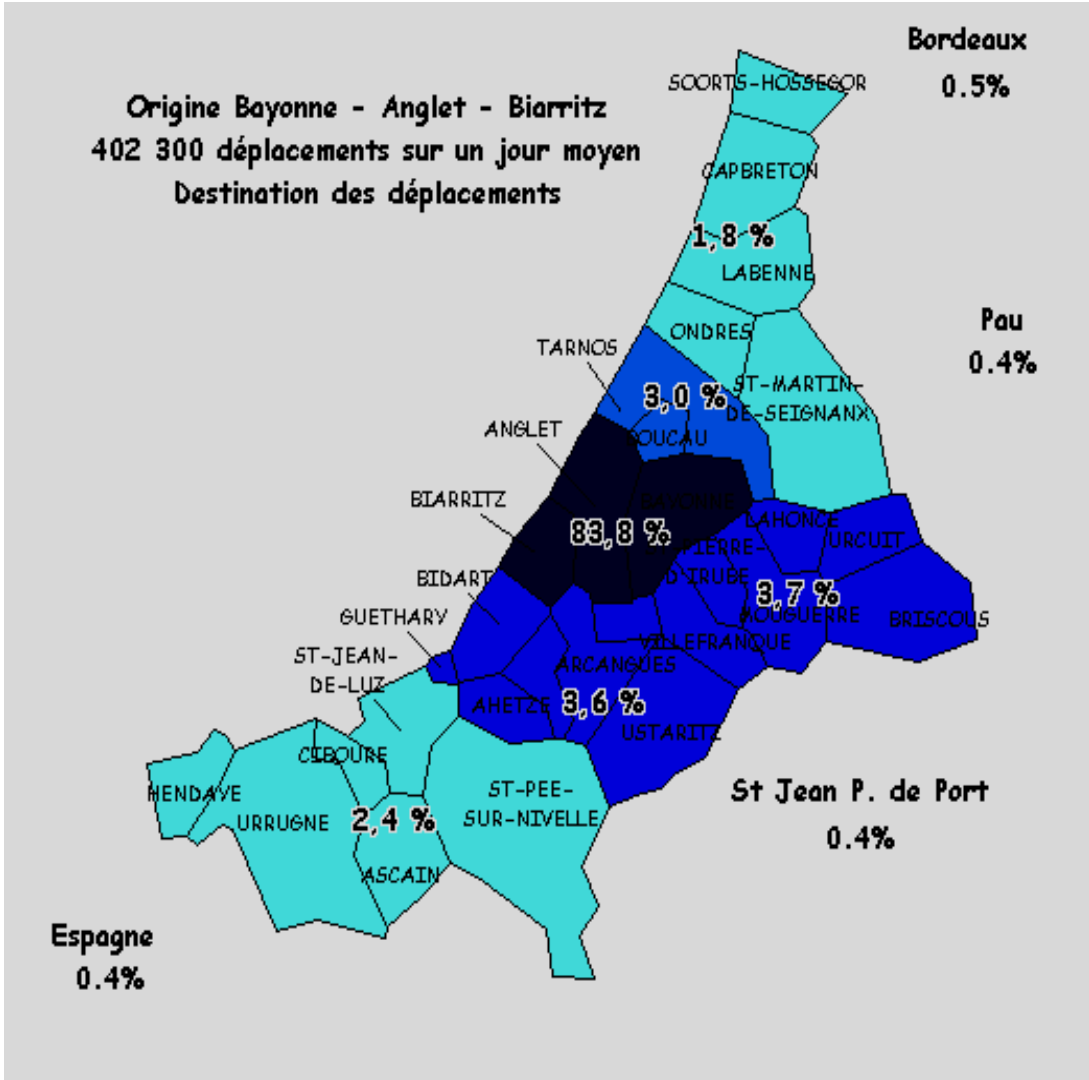
Geographic Information Systems (G.I.S.)

How many residents, how many jobs, how many shops within the catchment area of a station?

Geographic Information Systems (G.I.S.)
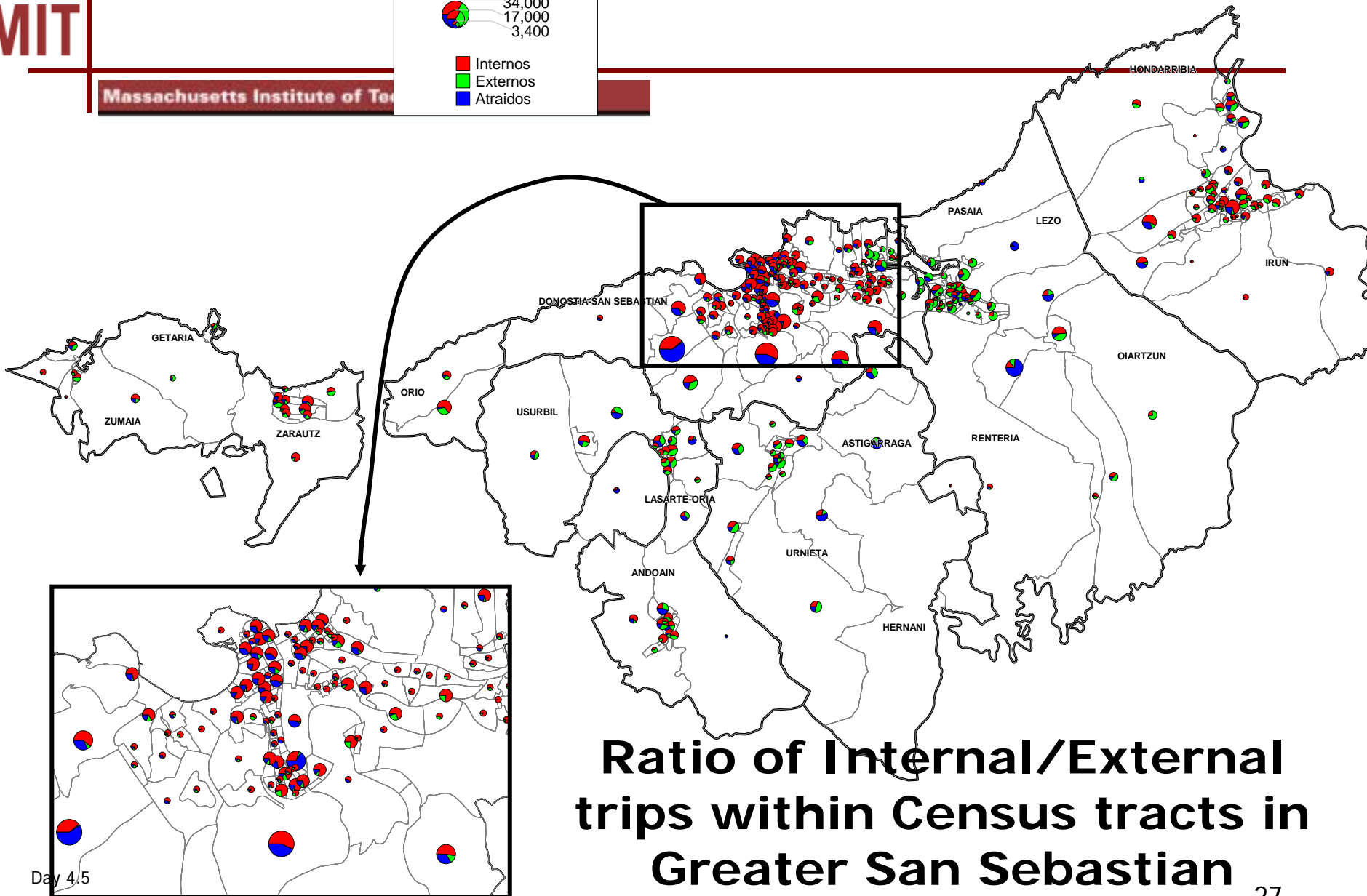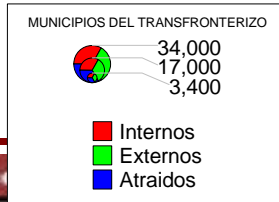
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Origine Bayonne - Anglet - Biarritz
402 300 déplacements sur un jour moyen
Destination des déplacements

Bordeaux
0.5%

SOORTS-HOSSEGOR

CAPBRETON

1,8 %
LABENNE

Pau
0.4%

ONDRES

TARNOS

3,0 %
ST-MARTIN-
DE-SEIGNANX

ANGLET
BOUCAU

BIARRITZ
BAYONNE
LAHONCE
URCUIT
83,8 %
MOUGUERRE
BRISCOUS
3,7 %

BIDART
D'IRUBE

GUETHARY
VILLEFRANQUE

ST-JEAN-
DE-LUZ
ARCANGUES
AHETZE 3,6 %
USTARITZ

CIBOURE

HENDAYE
ST-PEE-
SUR-NIVELLE
St Jean P. de Port
0.4%

URRUGNE 2,4 %

ASCAIN

Espagne
0.4%

Destination of the trips generated in Bayonne-Biarritz

Day 4.5

26

MUNICIPIOS DEL TRANSFRONTERIZO
- 34,000
- 17,000
- 3,400

- Internos
- Externos
- Atraidos

Ratio of Internal/External trips within Census tracts in Greater San Sebastian

Day 4.5

27

Geographic Information Systems (G.I.S.)

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4.913

53.375

External

7.766

70.344

4.290

211.911

421.862
Internal

114.873

91.483

2.805

7.223

Attracted

90.470

39.822

168.218

30.703
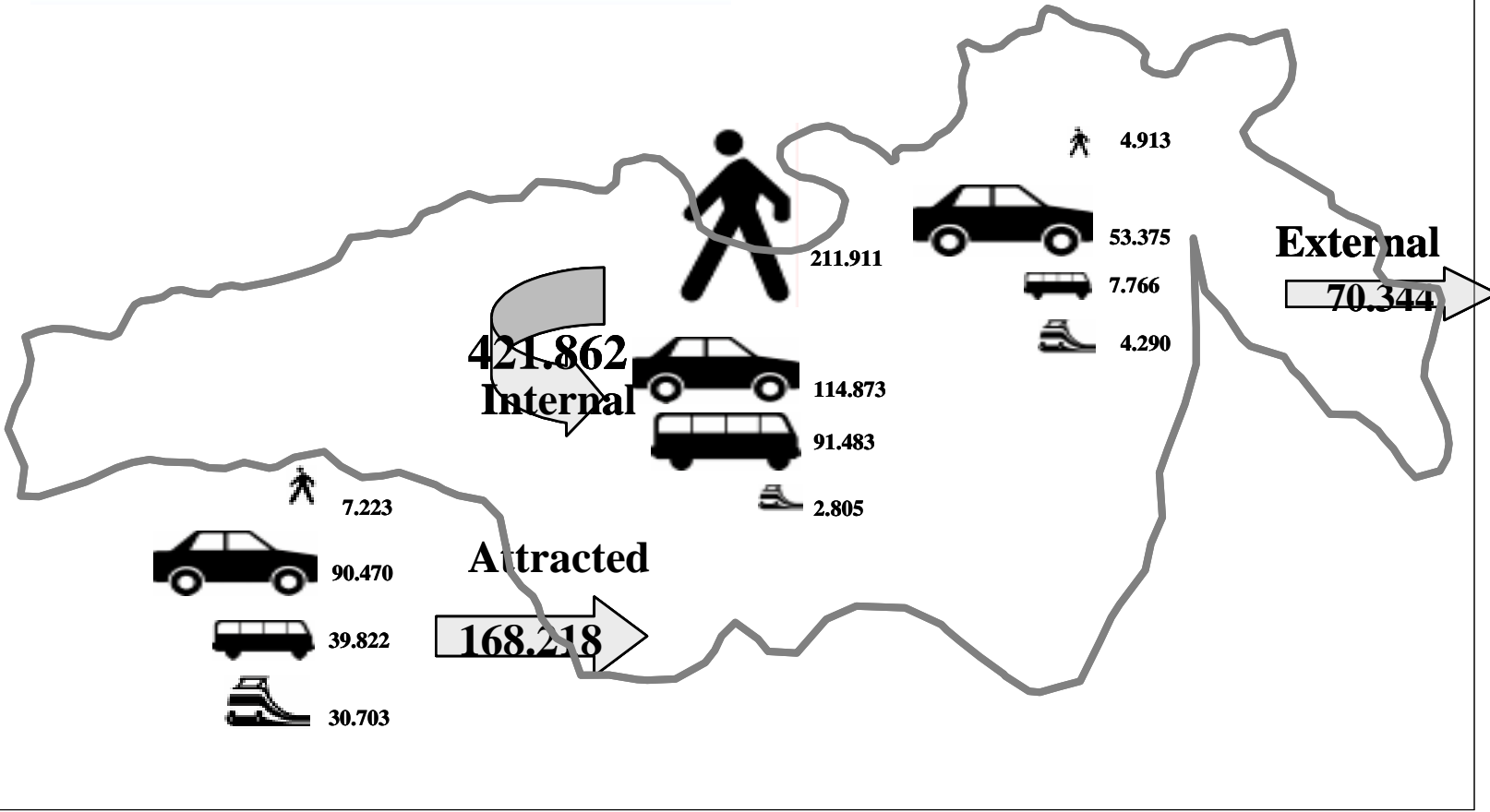
Modal share in San Sebastian for
internal, external and attracted trips

Geographic Information Systems (G.I.S.)

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- Graphical databases to:
    - Analyze spatially available data (ie automobile ownership ratios, family sizes...)
    - Integrate data needed for transport modeling
    - Manage and process information
    - Post-process or to visualize results

A tour throughout the US

- Which is the modal split in…

  - San Francisco?
  - San Diego?
  - ………???

- But, can we explain that??