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The Future of the Metropolis: Tools and Models

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Comparative Land Use and Transportation Planning
MIT Course 11.953
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- Looking at Transport
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A new way of looking: Systemic Thinking

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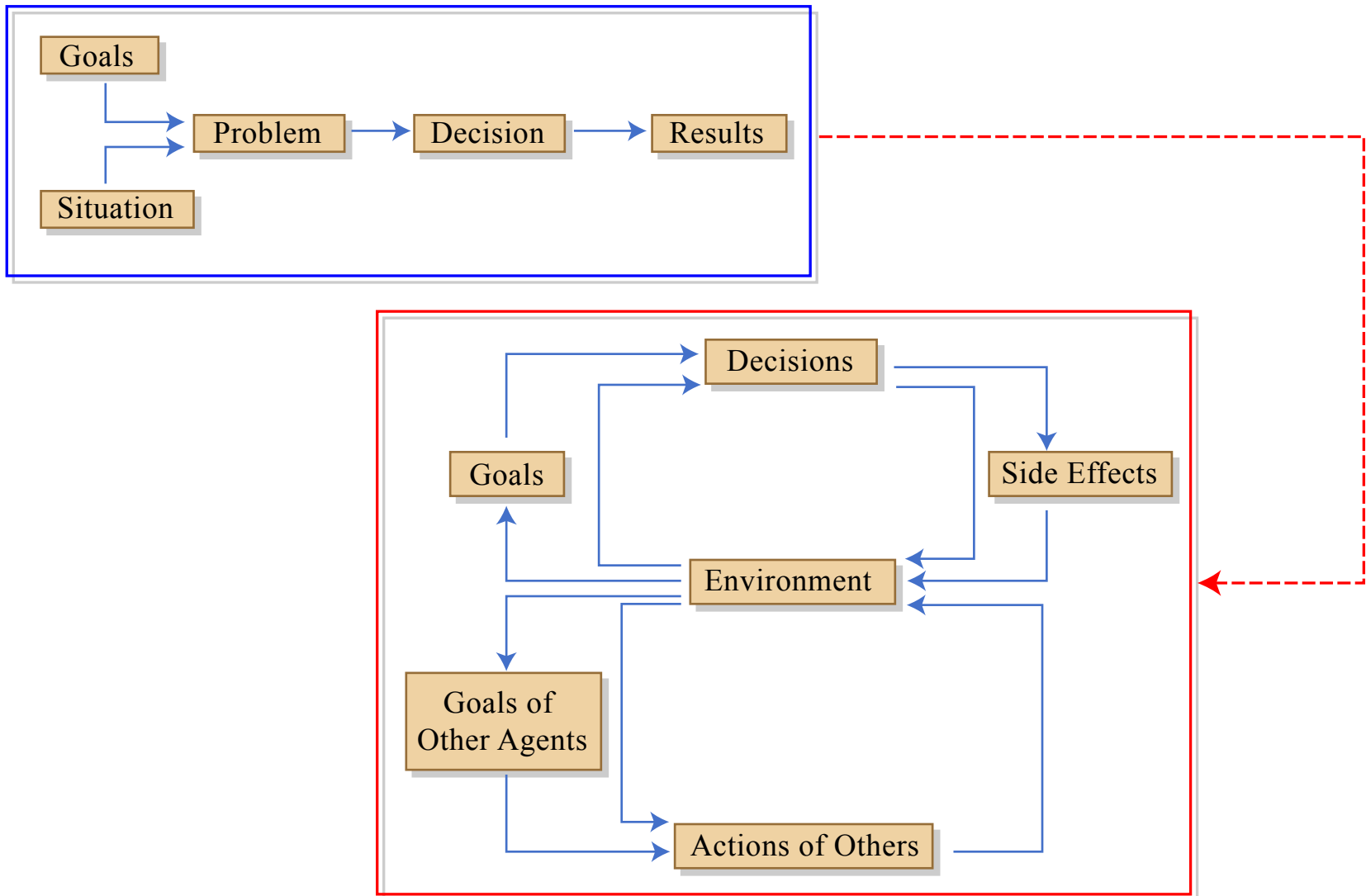


Figure by MIT OCW.

“The Future of Operations Research (OR) is Past” by Russell Ackoff 1979

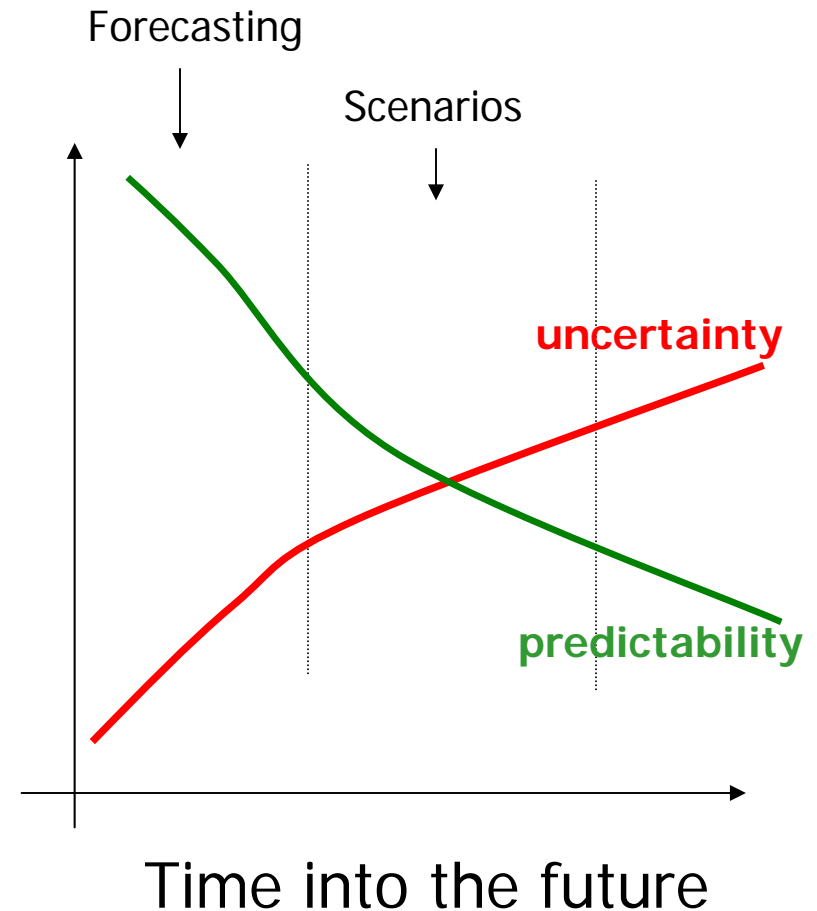
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1. First, there is a greater need for decision-making systems that can **learn and adapt** effectively than there is for optimizing systems that cannot.
2. Second, in decision making, account should be taken of aesthetic values-stylistic preferences and progress towards ideals because they are relevant to **quality of life**.
3. Third, problems are abstracted from systems of problems, messes. Messes require **holistic treatment**. They cannot be treated effectively by decomposing them analytically into separate problems to which optimal solutions are sought.
4. Fourth, OR's analytic problem-solving paradigm, "predict and prepare," involves internal contradictions and should be replaced by a synthesizing planning paradigm such as "**design a desirable future and invent ways of bringing it about**".
5. Fifth, effective treatment of messes requires **interaction of a wide variety of disciplines**, a requirement that OR no longer meets.
6. Sixth and last, all those who can be **affected by the output of decision** making should either be involved in it so they can bring their interests to bear on it, or their interests **should be well represented** by researchers who serve as their advocates.

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- Forecasting:
 - Short term extrapolation: The future on the basis of the past
 - Applicable to slow incremental change
- People believe that *today's status quo* will remain
- Scenarios, to accept pattern breaks, and to improve our decisions!



Number crunching may keep you busy and non-thinking

Example of Scenario Planning

TENTATIVE FUTURE SCENARIOS			
Element	1: BAU	2: Increased pressure	3: Modal Shift and environmental improvement
Socioeconomic (population)	Immigration and aging acc. to BAU-population scenario of Basque country	Increased aging and immigration leads to higher population increase and aging	Like 2. evtl. Other Basque scenario
Economic (jobs and income)	Trend development of income	Increased economic development	Like 2
Spatial development	Slight trend to bigger agglomeration	Like BAU	High development towards bigger agglomeration
Motorization	Trend development	Increased growth rate	Decreased growth rate
Technology: Vehicle efficiency	Improvement acc. to TRENDS	Improvement acc. to TRENDS	Increased vehicle efficiency (private and public road transport, rail)
Transport policy	Slight change towards private cars and trucks (passenger and freight transport) Moderate infrastructure improvement	Increased change towards private cars and trucks (passenger and freight transport) increased road infrastructure improvement	Increased share of public transport, non motorized transport and rail (freight) increased rail infrastructure improvement

Just a current example

Backcasting and Forecasting

- We learn only from the past!
- Look at American and European cities with subways...
 - When were those systems built?
 - Have they shaped those cities?
 - How should we then evaluate their contribution???

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Backcasting

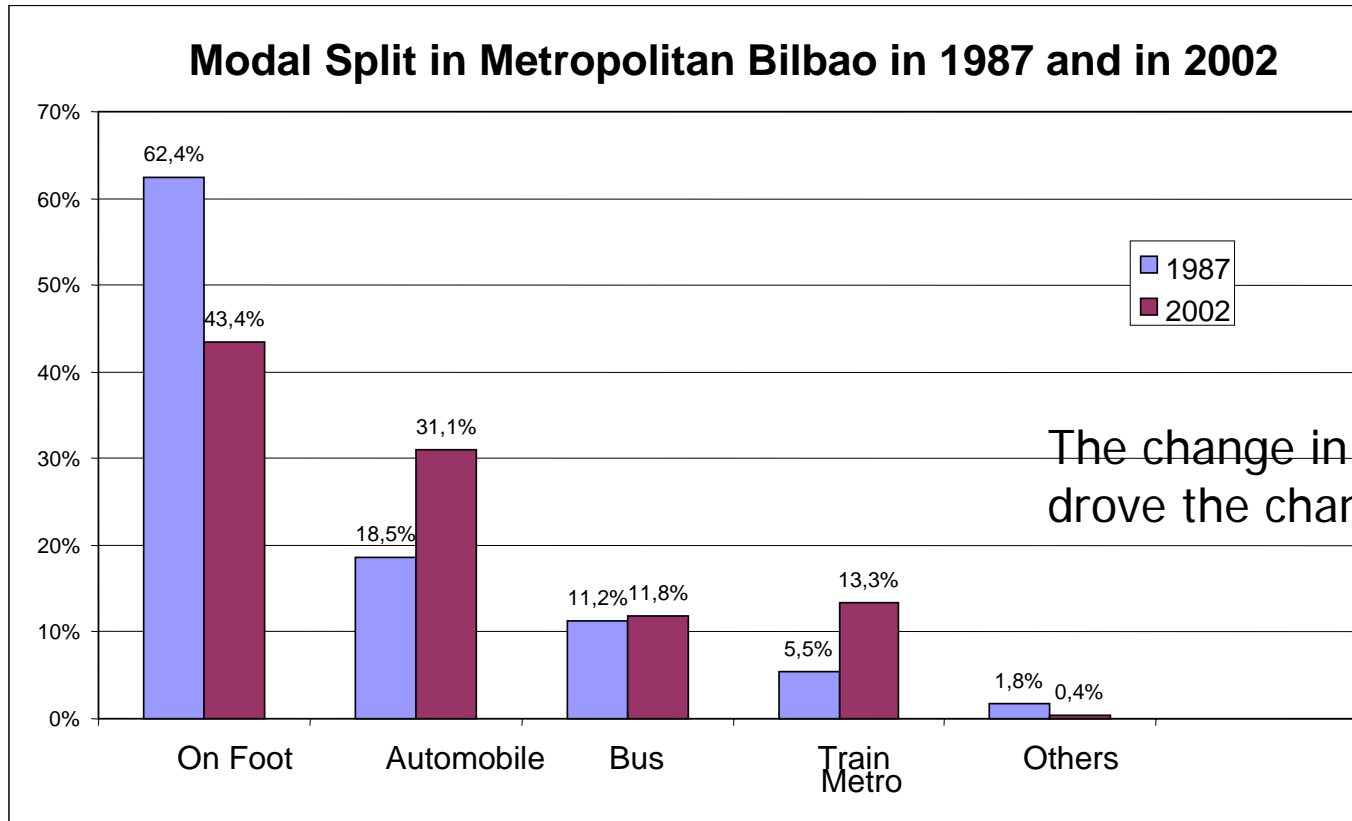
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The reality modeled for 1985 and 2004 in Bilbao shows similar congestion levels but with higher flows

MIT Backcasting

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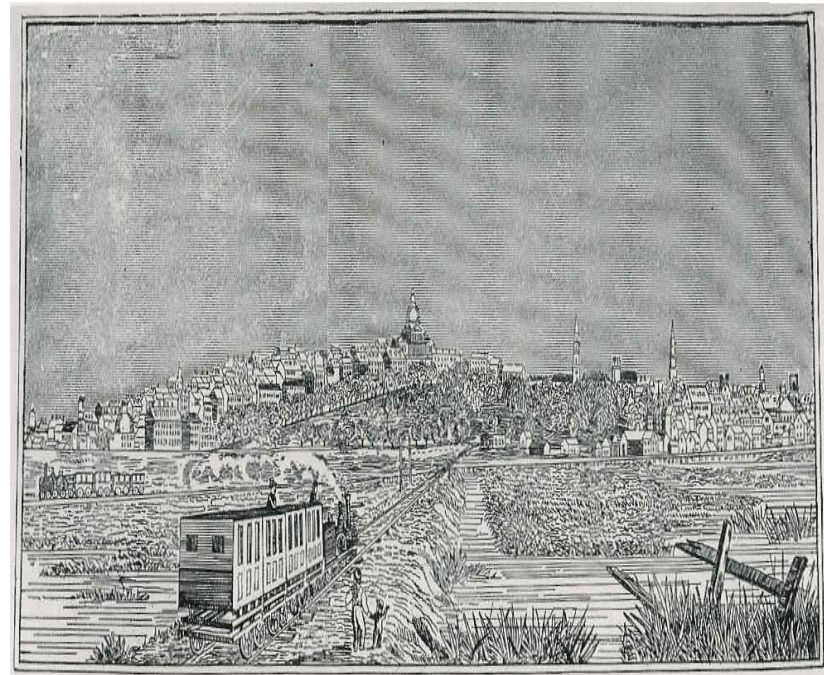
The home surveys from 1987 and 2002 describe a clear unsustainable trend ... WHAT ARE THE REASONS BEHIND THIS ???



The change in the economy, drove the changes in mobility

Backcasting... *the best learning method!*

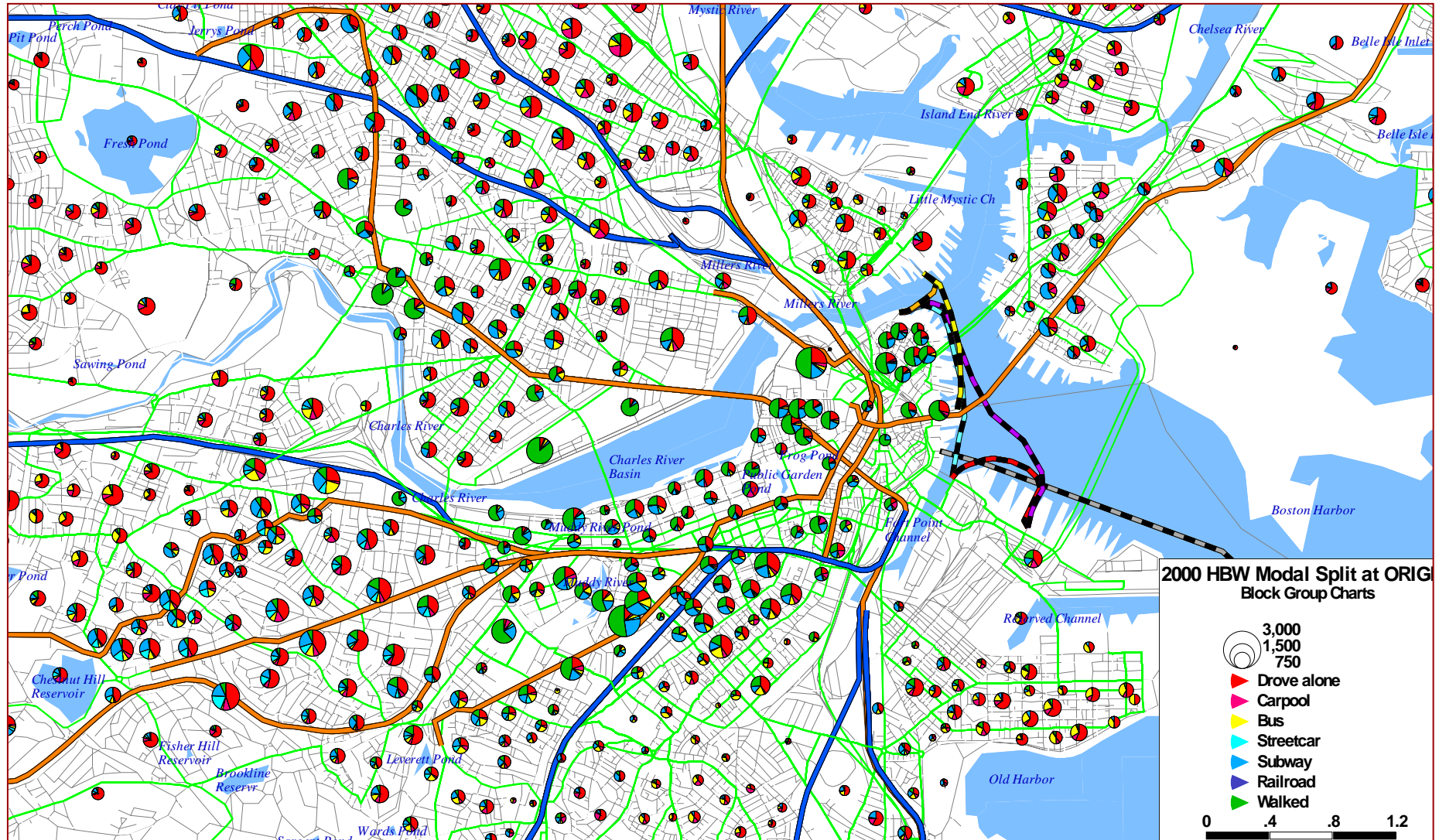
See how Innovate Boston is
Searching for lessons in the past!





Backcasting: Boston's Commuter Trip at Residence End

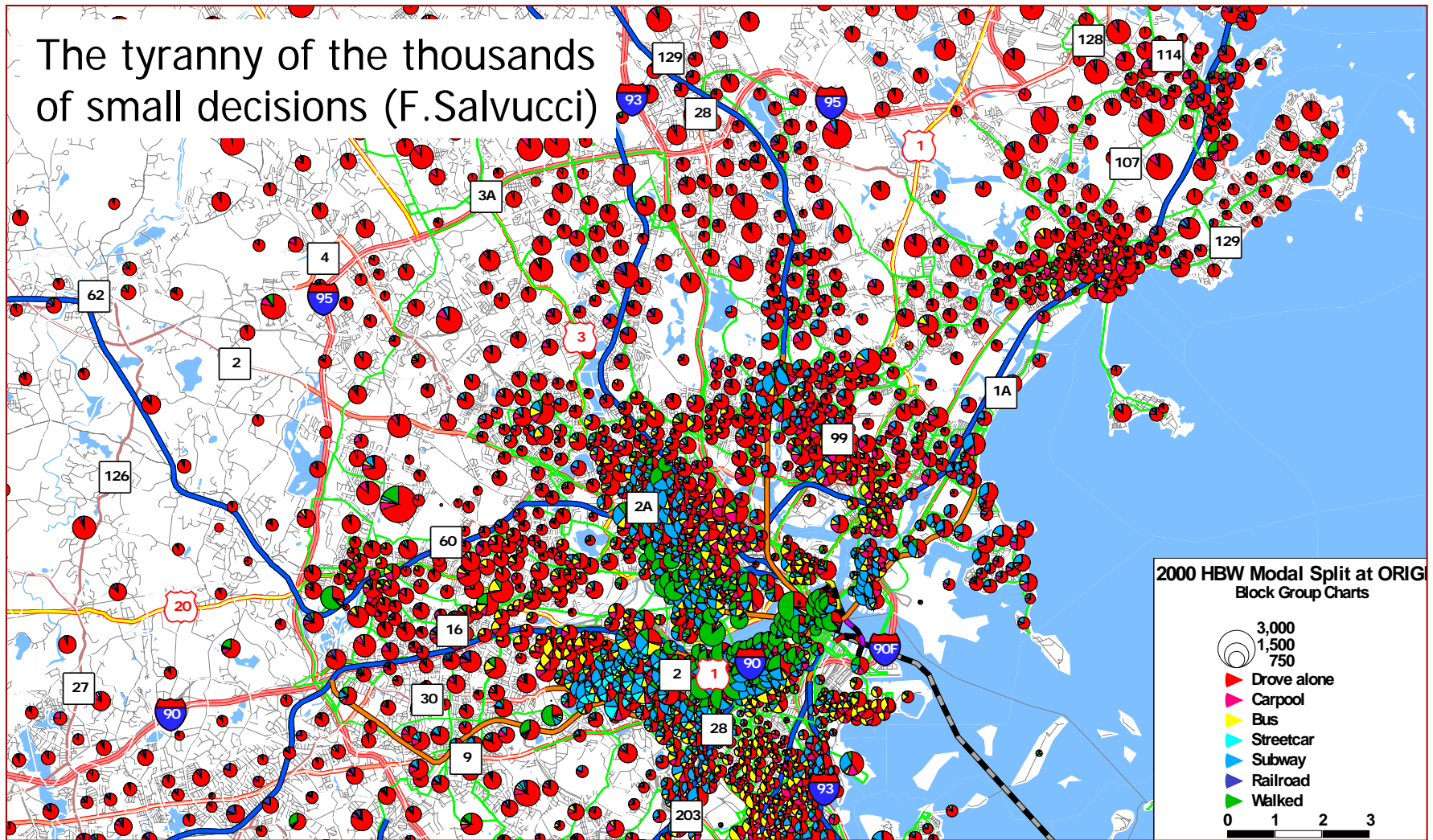
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Backcasting: Boston's Commuter Trip at Residence End

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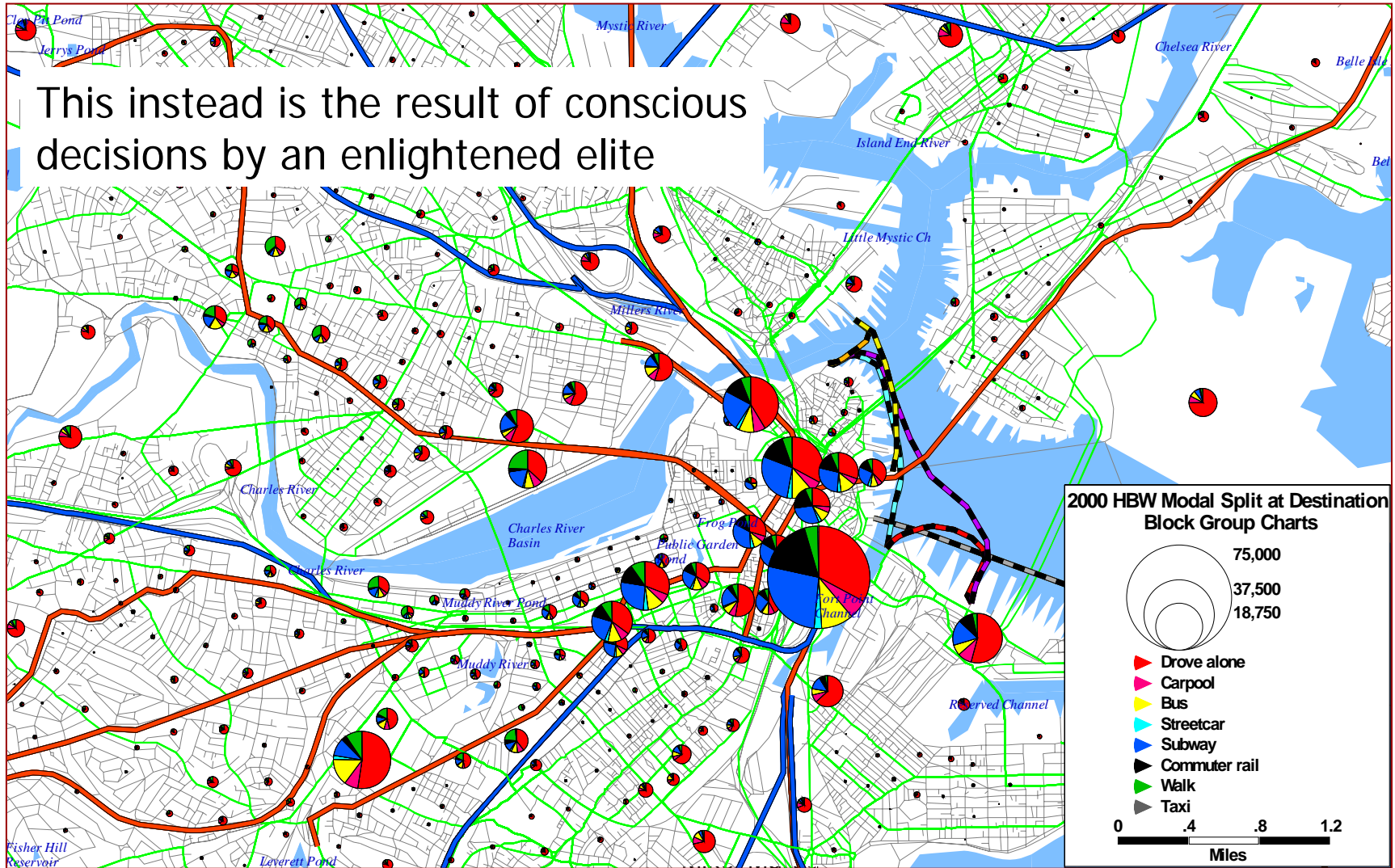


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MIT Backcasting: Boston's Commuter Trip at Destination End

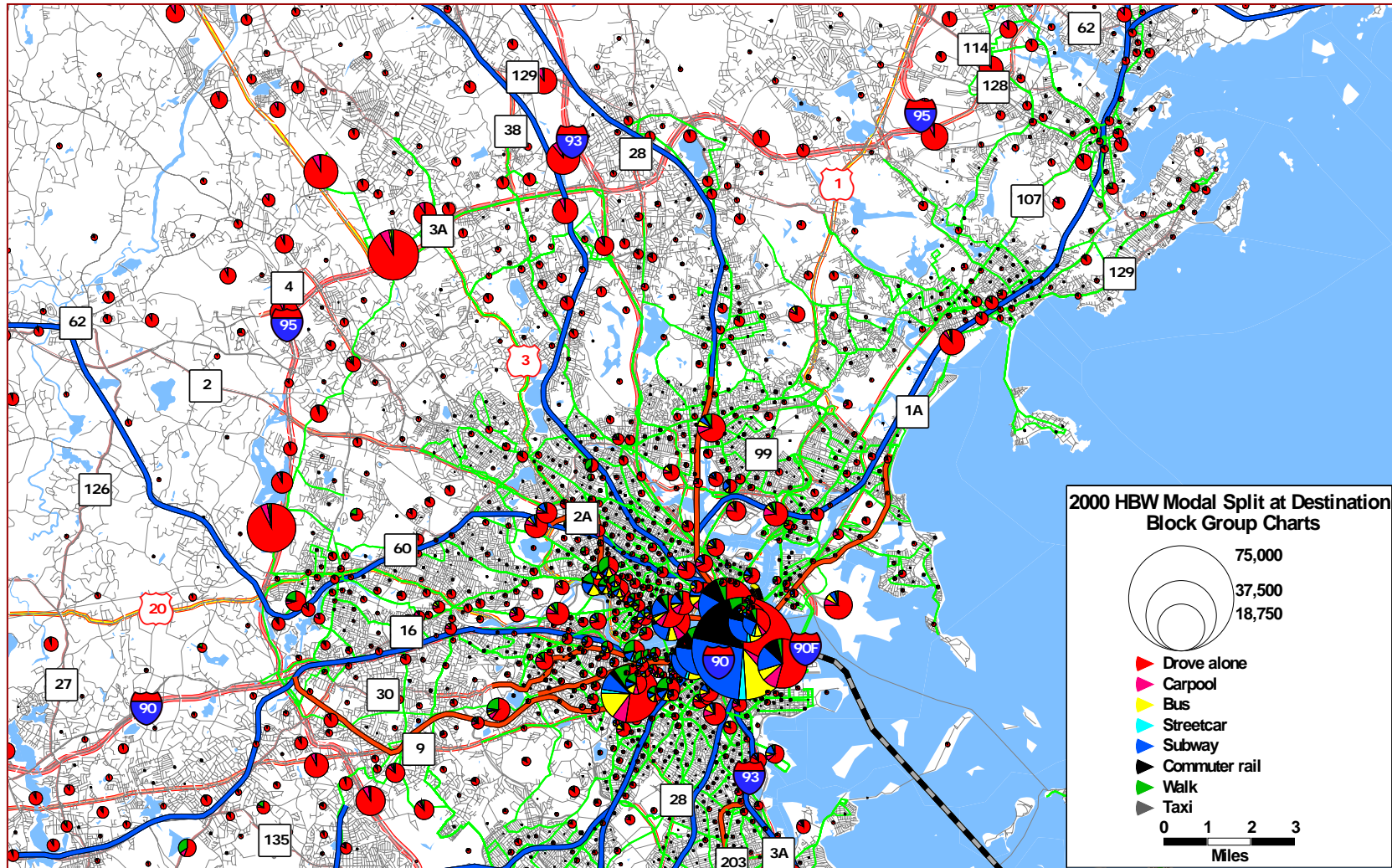
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This instead is the result of conscious decisions by an enlightened elite



MIT Backcasting: Boston's Commuter Trip at Destination End

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- Transit makes high density central city possible
- Even in the US with transit serving only 2% of all person trips, it is critically important in shaping the big cities
- The home to work commute in Boston (and in other American cities like Chicago, New York, San Francisco..) shows the critical role of transit in its downtown
- The downtown job density makes it impossible to rely solely on the automobile

- As a chicken and egg problem, job density and parking restrictions go hand in hand
- But parking restrictions do not impede economic development
- In fact, Boston development has been very impressive, since its EPA led parking freeze in 1973

- Opening the new frontier...
- Who gains with a new expressway?
 - New access opportunities?
 - Faster times for present users?
 - New development opportunities?
 - Induced demand to get back to square one?

Transport Efficiency and Quality of Life?

- Which are the real goals of Transport Policy??
- The *systems* view aligns transportation proposals with higher goals
- You will have to be creative in the use of your tools and approaches
- A Day in the Life of an executive type
a Grandma, a yuppie, a child

Focus on Quality of Life?

- When traffic is tamed, a good walking environment results
- Walkers enjoy a wide range of sensory experiences
- When most people drive, the buildings end up lacking the detail and relief that people need and enjoy
- People attract more people

See Jan Gehl work in Melbourne

Has transit solved Bilbao's problem?

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- In the last decade, the transit network added a state-of-the-art new subway, a new Light Rail and new refurbishment of the RENFE, FEVE and ET rail networks



Transit's contribution beyond transport

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- In parallel to the new infrastructure projects, the quality of the urban space has been improved
- However experience shows that this has not been enough to turn the tide...



Quality of Life: Generic Recommendations

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- Upgrade Squares and Plazas
- Rehabilitate wide streets
- Develop transit
- Reduce through traffic
- Enhance Park Lands
- Create pedestrian and bike networks
- Mixed uses for day and night livability
- Attract residents
- Foster markets, cafes and educational institutions
- Improve ground floor frontage
- Organize public activities and events

- Suburban sprawl and the car:
 - Did we want to segregate society?
 - Downtown vs the Mall, who benefits?
 - Can we change the Public versus private space debate?
 - What about, public poverty versus private wealth?
- Transit and density
- Infill development around stations



If you only fix the transportation ...

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- ... A beautification program -- without people as in Troy, NY



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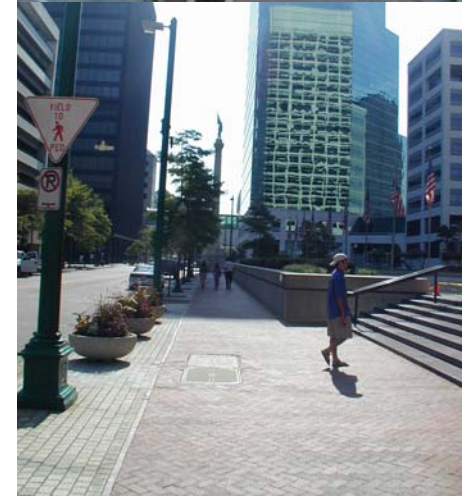
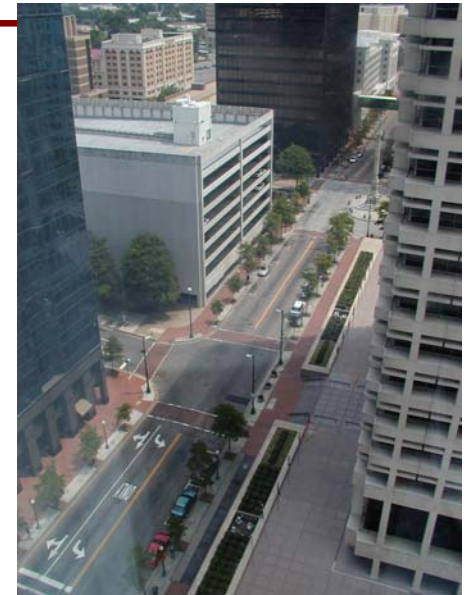


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If you only fix the transportation ...

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A beautification program -- without people as in Norfolk, VA on weekends



Future Trends and Challenges

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- Globalized (or Flattening) World
- Global warming
- Aging of society
- Increasing income gaps
- Physical separation based on income
- Road Congestion

You will have to come up with your own recipes, to provide effective answers to this critical issues!

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Future Trends and Challenges

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We need new sustainable models of development – other than letting the automobile shape the future of our lives

It cannot be based on *do as I tell you*, instead *do as I do*



Transit: an opportunity for rehabilitation

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The power of a LRT project

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Strasbourg

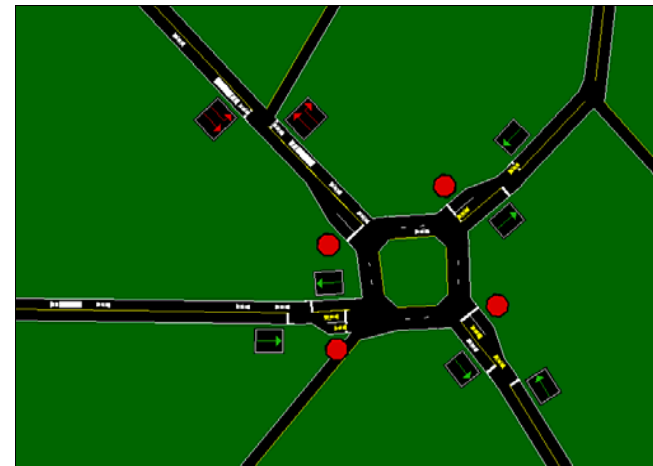
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LRT as an excuse for urban transformation

Modeling provides technical feasibility

... even though vision is what counts!



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Even a small project: *before and after*

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Even a small project: *before and after*

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Even a small project: *before and after*

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Even a small project: *before and after*

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We need new measuring tools to gauge the contribution!

Of all the kinds of work I can imagine the hardest work of all is thinking -- and that's why most people just don't do it."

Henry Ford in his highly original
"My Philosophy of Industry" published in 1929

You will be surprised how often you can make meaningful proposals with a bit of thinking plus some creativity

- The Netherlands ABC location policy:
 - Locations:
 - A: main transit hub – few parking - downtown
 - B: district center or small town bus junction
 - C: Not served by transit
 - Activities:
 - A: People intensive land uses
 - B: Commercial and service activities with low turnout (e.g.: car sales, furniture dealers...)
 - C: Goods intensive uses

Work simultaneously at the macro and strategic level, and at the detail level

- Be on the lookout for all the lessons from the past
- Do measurements and keep those records for future reference, and updates
- Come up with new metrics for the actual contribution of transportation projects
- You can manage only what you measure
- Do challenge the status quo... and dare to be creative!