Lecture 4

How to think about Cities

4.2 Time Geography and Time Invariants in Mobility

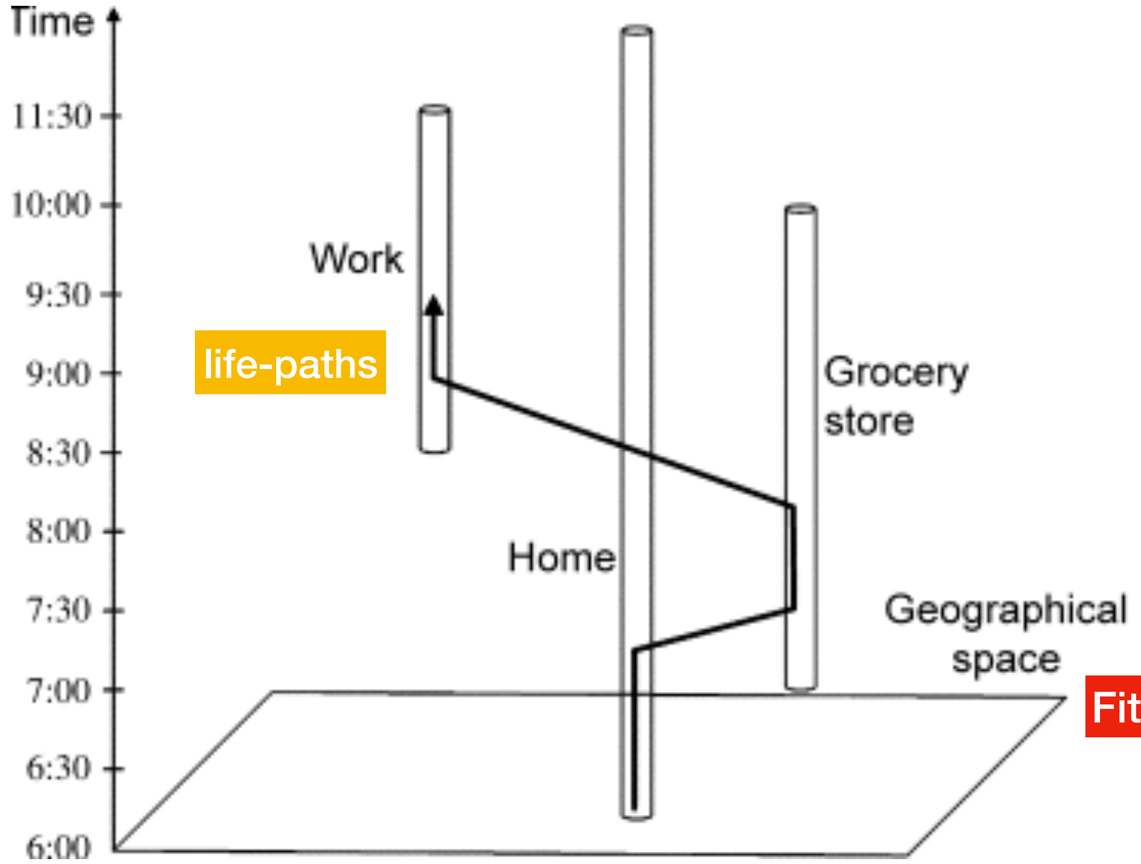
IUS 2.3

Time Geography

IUS 2.3.2

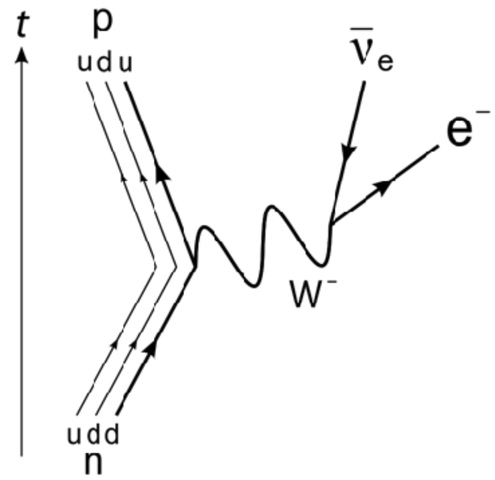
Time has a critical importance when it comes to fitting people and things together for functioning in socio-economic systems, whether these undergo long-term changes, or rest in something which could be defined as a steady state.

- Thorsten Hägerstrand



life-paths

credit: Harvey J. Miller



Feynman diagram (particle physics)

Fitting people and things together

WHAT ABOUT PEOPLE IN REGIONAL SCIENCE?

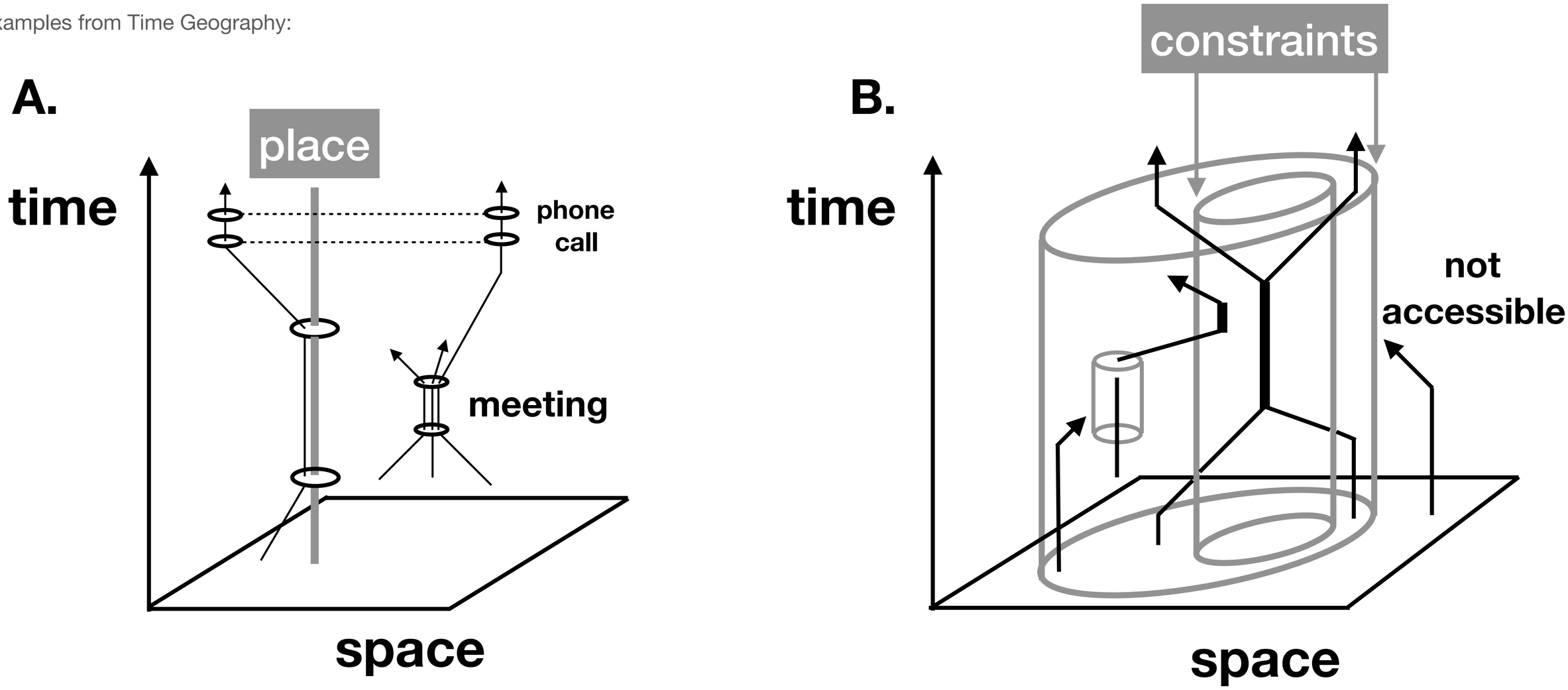
by Torsten Hägerstrand*

Reading materials

Since this occasion is the first time in the annals of the Regional Science Association that the presidential address is being delivered at a congress in Europe, it seems appropriate to explore the past to see whether there has been a difference in emphasis or tone between the European and the North American meetings. I think there has been a difference although I am not prepared to show statistical evidence. When looking over the proceedings of the sixties, one gets the impression that participants in this part of the world have preferred to remain closer to issues of application rather than to issues of pure theory. We in Europe seem to have been looking at Regional Science primarily as one of the possible instruments with which to guide policy and planning. I have chosen to proceed along this line by suggesting that regional scientists take a closer look at a problem which is coming more and more to the forefront in discussions among planners, politicians, and street demonstrators, namely, the fate of the individual human being in an increasingly complicated environment or, if one prefers, questions as to the quality of life. The problem is a practical one and, therefore, for the builder of theoretical models, a 'hard nut to crack.'

SpaceTime Graphs: **life paths** or **world lines**

Examples from Time Geography:



Fitting people and things together

Types of Lifepath Constraints

Capability Constraints

The physical scape available to an agent due to their mobility possibilities

Coupling Constraints

Refer to obstacles in realizing social and economic interactions

Authority Constraints

Mediated by institutions: firms, universities, public spaces: shaping where and when and by whom spaces can be used

Combine to shape, regulate and coordinate collective socioeconomic behavior

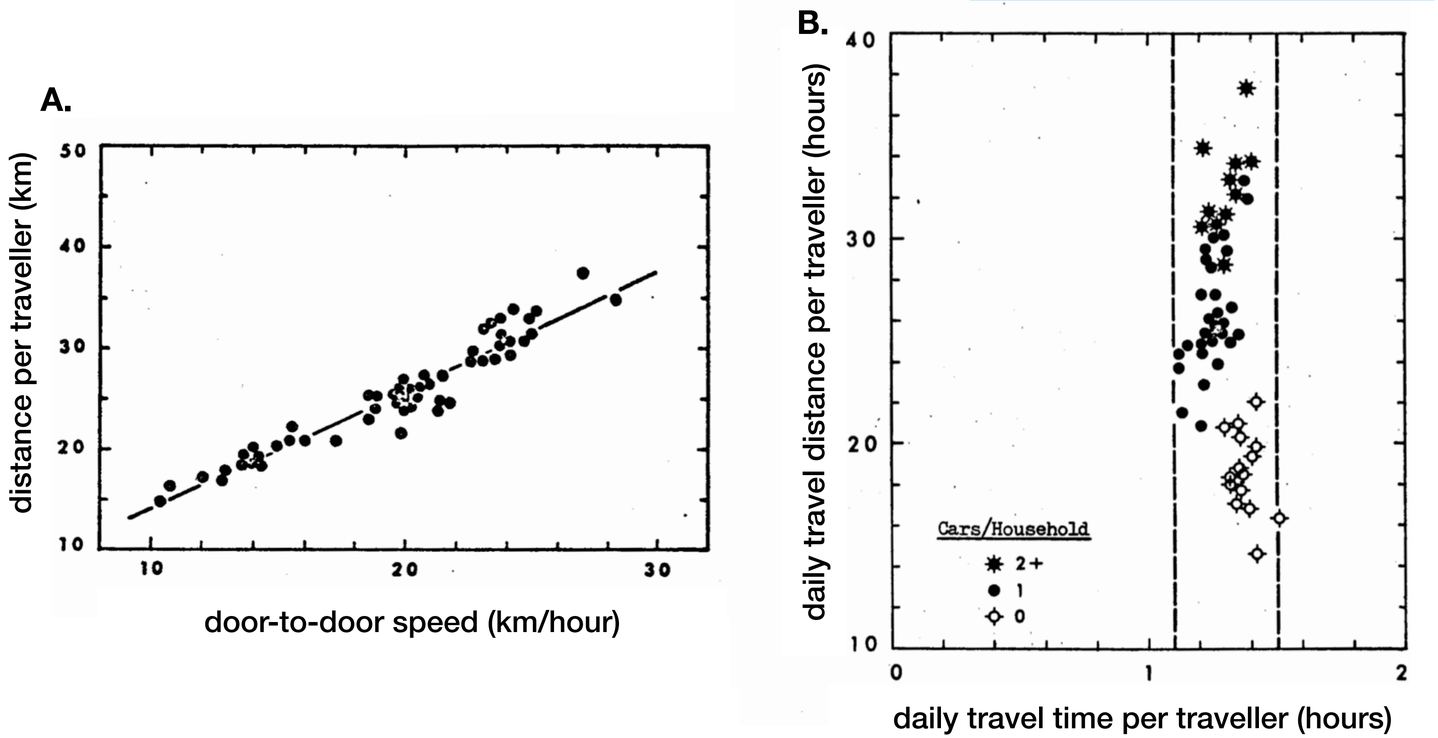
Time Invariances in Urban Mobility

Is the size of a city set by space or by time?

IUS 2.3.2

Anthropological Invariants in Transportation: Space & time intertwined

city extent= ~1.5 h/day

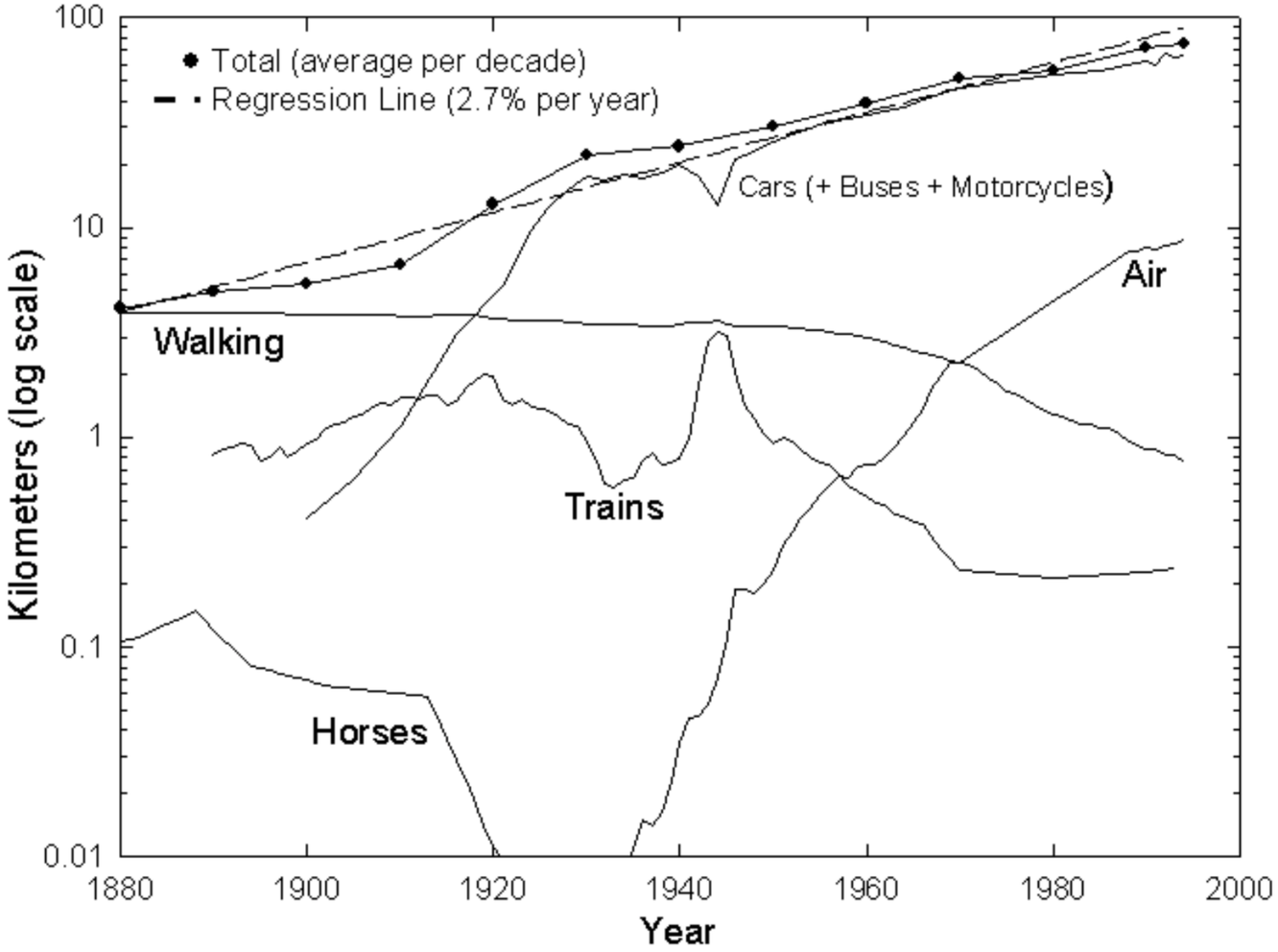


Zahavi's concept of a constant travel-time budget

Imagine planning transit systems for time, rather than space…

Anthropological Invariants in Transportation: Space & time intertwined

Marchetti's Constant

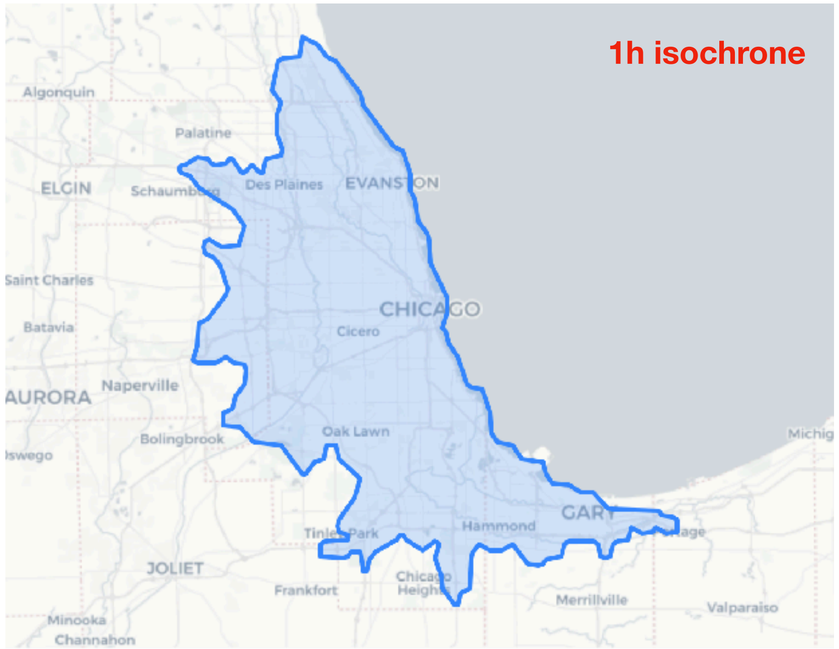


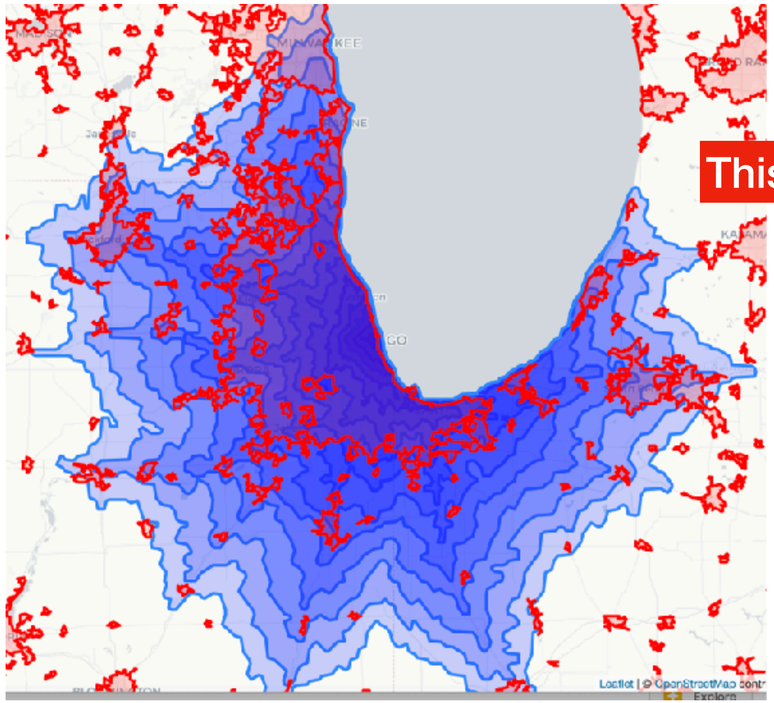
This has come to suggest that

1. Cities are limited in extent by a fixed **time** budget ~ 1-2 h.

2. A constant time budget corresponds to **exponentially growing spatial extent**, because of infrastructure and technology improvements

(Predictable) Urban Expansion





This can be done worldwide

Go use it:
https://github.com/mansueto-institute/urban-isolines/