FROM MOBILITY TO ACCESSIBILITY PLANNING

THE ROLE OF EVALUATION TOOLS

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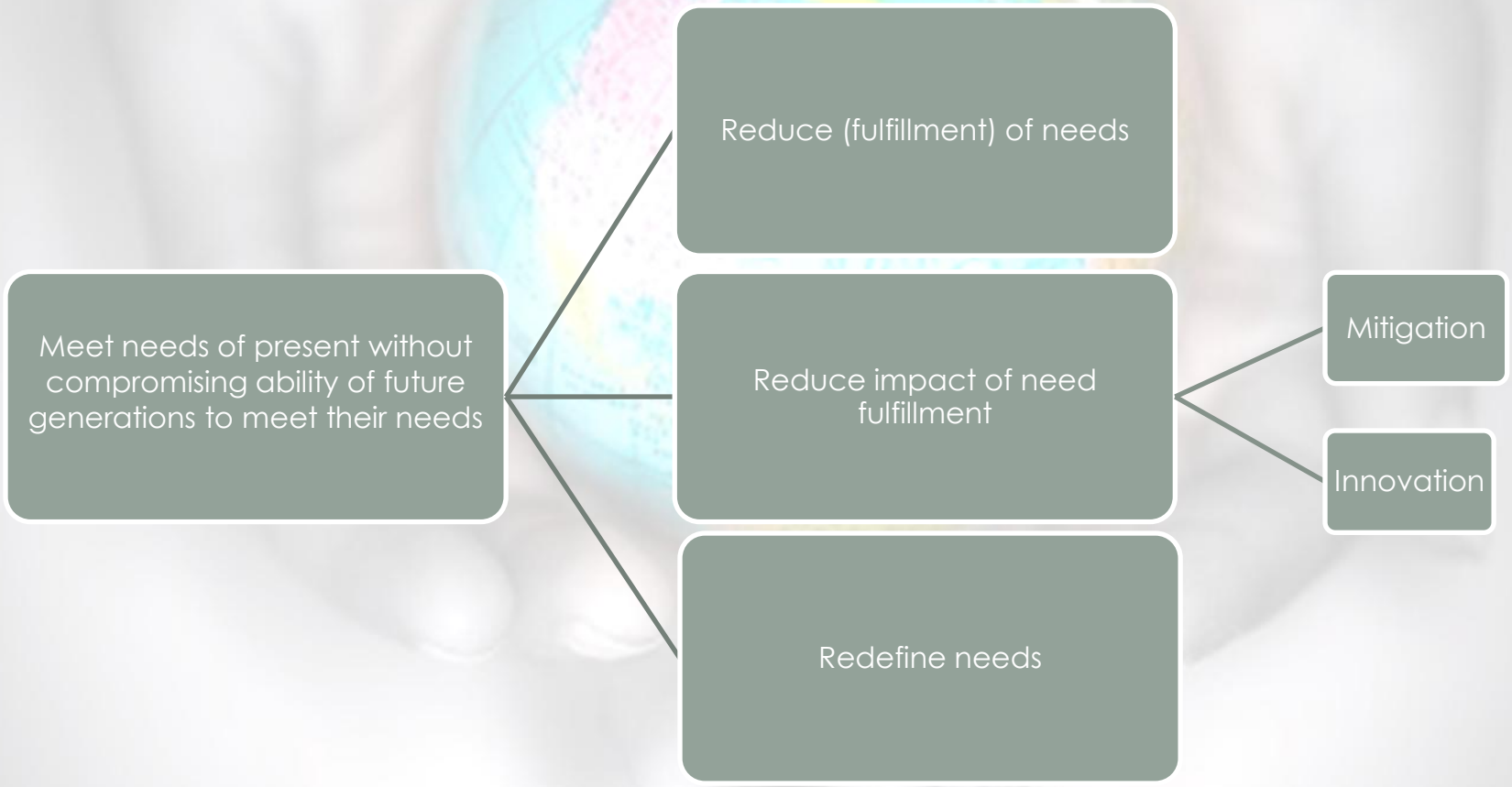
ACCESSIBILITY AND SUSTAINABILITY




NORTH BAY
75%
13%
8%
4%
EAST BAY
50%
45%
4%
1%
SAN FRANCISCO
39%
30%
27%
5%
2%
11%
60%
27%
SOUTH BAY
AUTOMOBILE
RAIL
(BART, Caltrain, Muni Metro)
BUS
(Muni, AC Transit, SamTrans)
FERRY
(GG Ferries)
WALK / BIKE

ACCESSIBILITY VS. MOBILITY

MOBILITY-ACCESSIBILITY DISTINCTION

- **Mobility improvement**: Reduction in the time-plus-money cost of travel per kilometer
- **Accessibility improvement**: Reduction in the time-plus-money cost of travel per destination

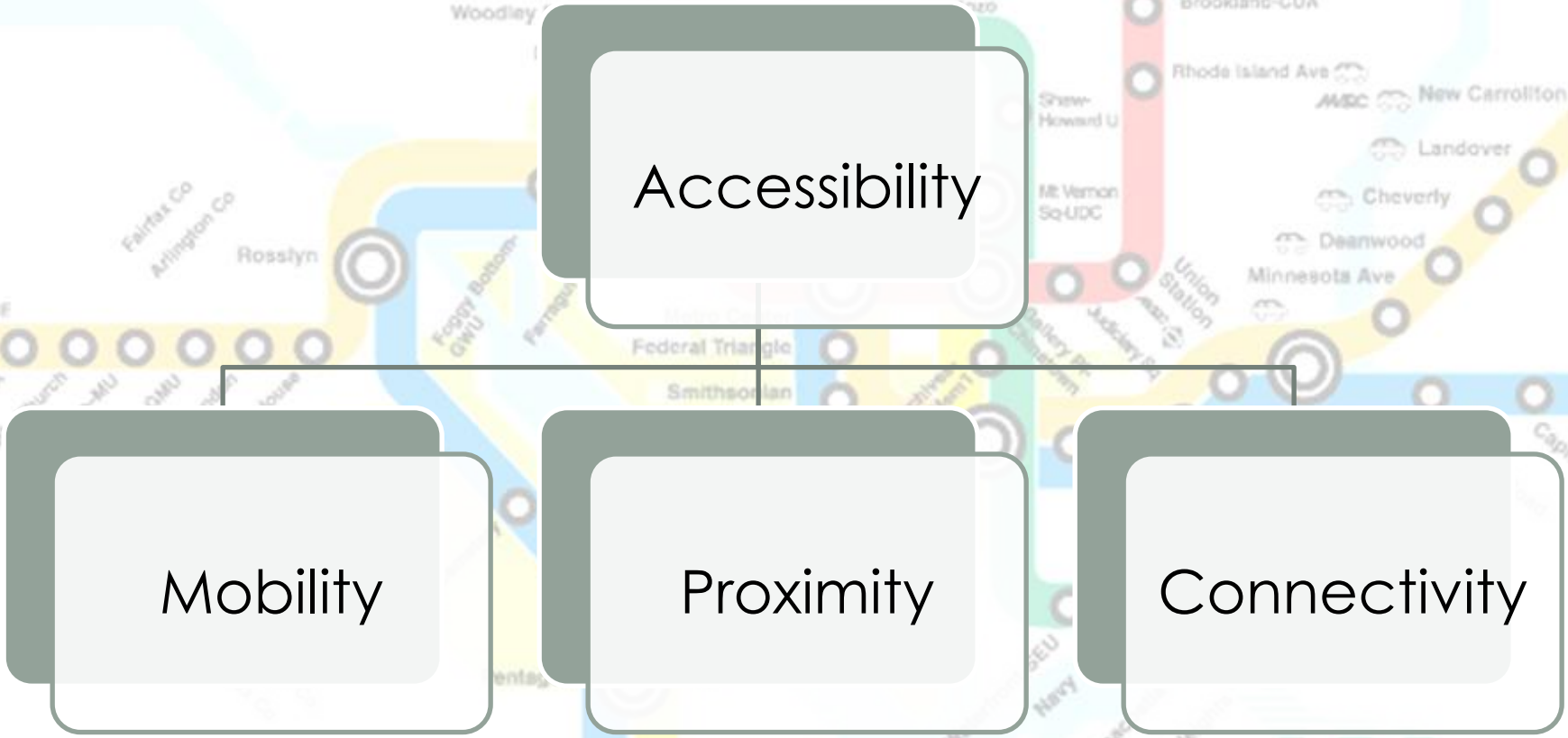
MOBILITY-ACCESSIBILITY DISTINCTION

- **Mobility improvement**: Reduction in the time-plus-money cost of travel per kilometer
- **Accessibility improvement**: Reduction in the time-plus-money cost of travel per unit value of destination

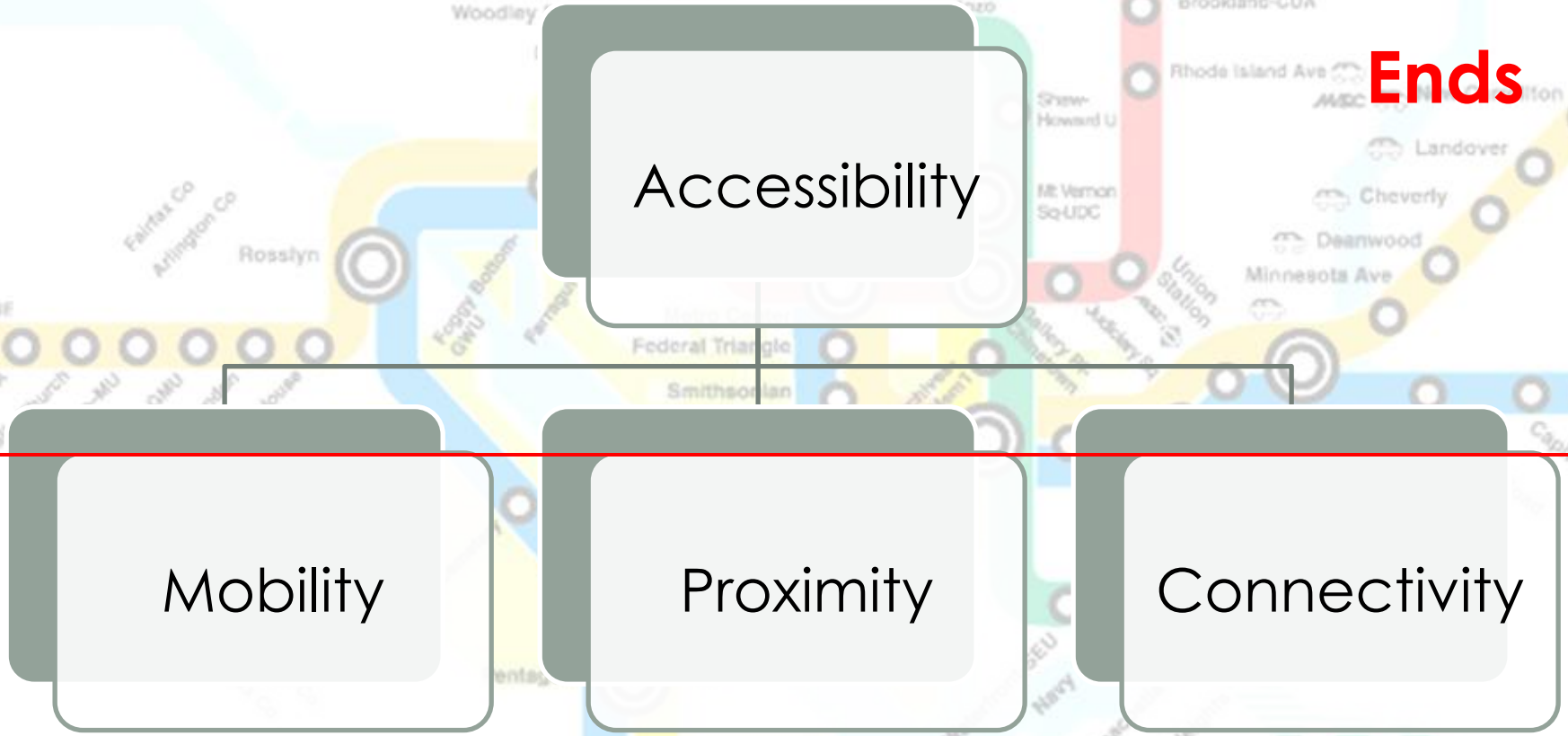
MOBILITY-ACCESSIBILITY DISTINCTION

- **Mobility improvement**: Reduction in the time-plus-money cost of travel per kilometer
- **Accessibility improvement**: Reduction in the time-plus-money cost of interaction ~~travel~~ per unit value of destination

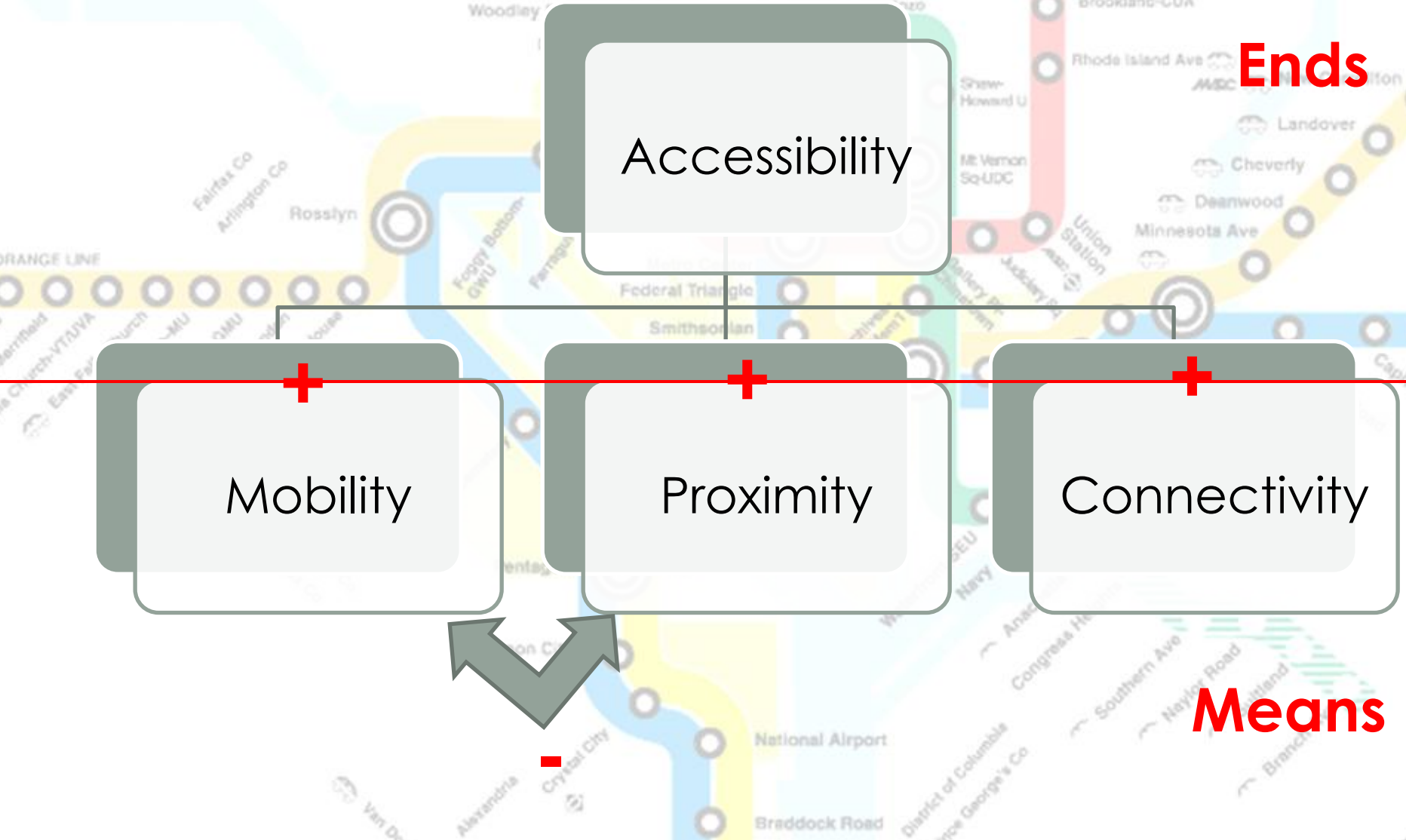
THREE ROUTES TO ACCESSIBILITY



THREE ROUTES TO ACCESSIBILITY

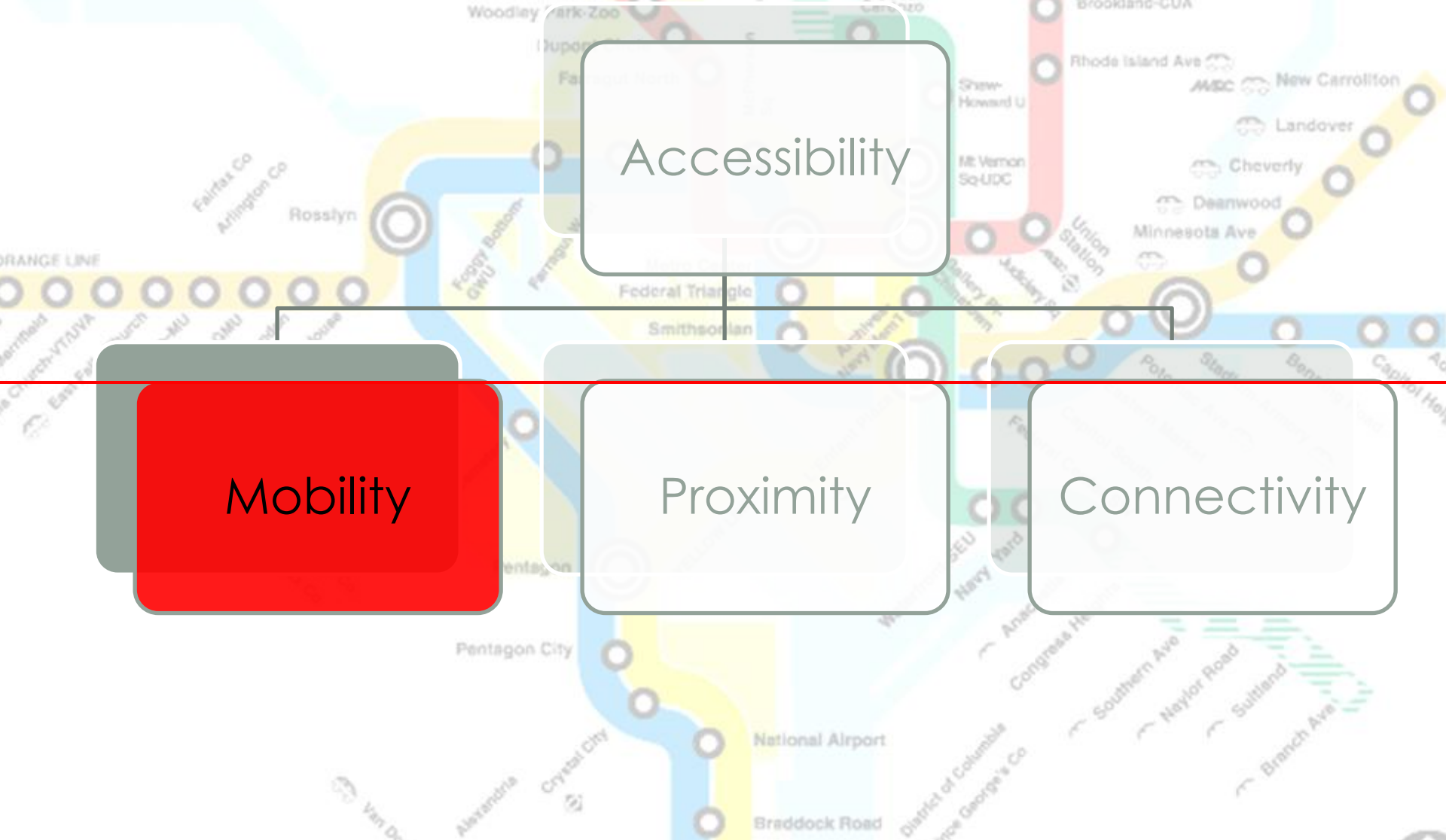


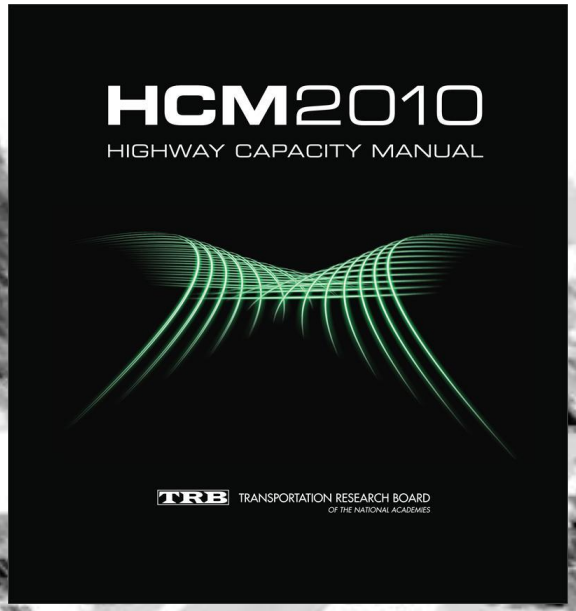
THREE ROUTES TO ACCESSIBILITY

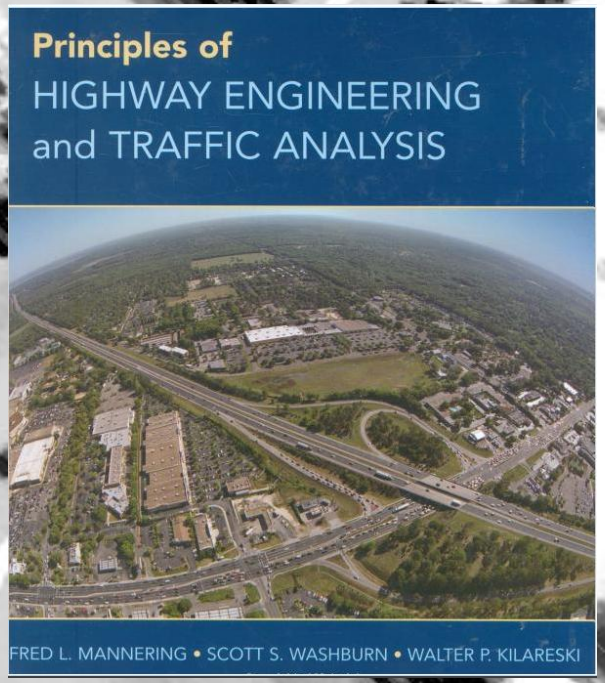


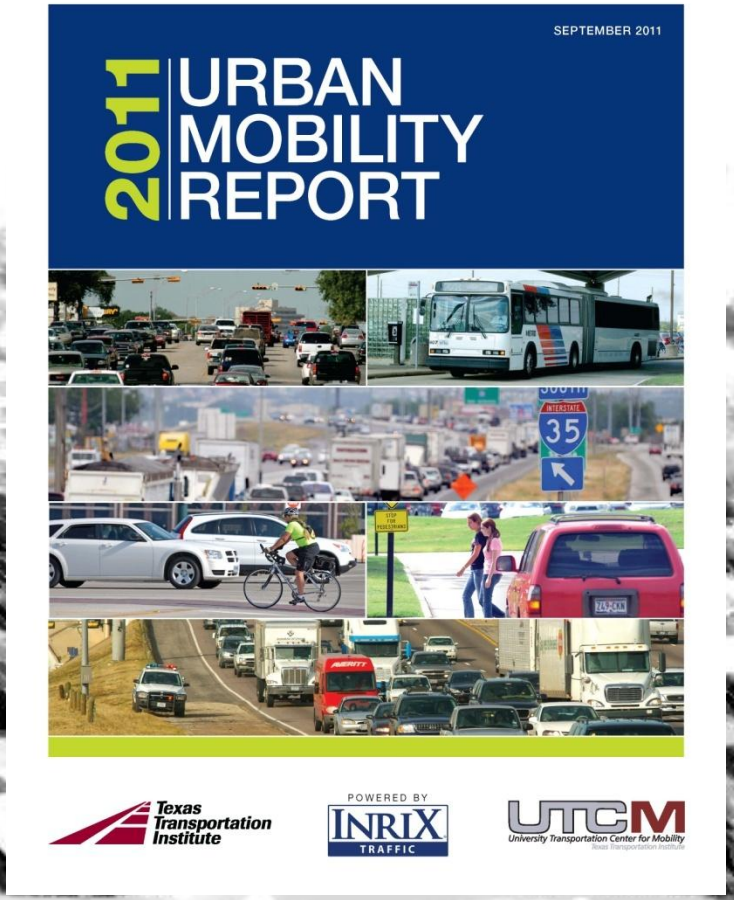
MOBILITY-BASED PLANNING

SUSTAINABILITY, CONSISTENCY, AND MOBILITY-CENTERED PLANNING




HCM2010
HIGHWAY CAPACITY MANUAL
TRB
TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES


Principles of
HIGHWAY ENGINEERING
and TRAFFIC ANALYSIS
FRED L. MANNERING • SCOTT S. WASHBURN • WALTER P. KILARESKI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2011 URBAN MOBILITY REPORT
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Texas Transportation Institute
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University Transportation Center for Mobility

FROM ACCESSIBILITY INSTRUMENTS TO ACCESSIBILITY-BASED PLANNING

WALTER G. HANSEN

How Accessibility Shapes Land Use

An empirical examination of the residential development patterns illustrates that accessibility and the availability of vacant developable land can be used as the basis of a residential land use model. The author presents an operational definition and suggests a method for determining accessibility patterns within metropolitan areas. This is a process of distributing forecasted metropolitan population to small areas within the metropolitan region. Although the model presented is not yet sufficiently well refined for estimating purposes, the concept and the approach may be potentially useful tools for metropolitan planning purposes.

AUTHOR'S NOTE: This article is a preliminary presentation of certain concepts and findings developed while the author was attending the Massachusetts Institute of Technology under Public Law 85–507, which permits employees of the federal government to extend their education in areas closely allied to their work.

This study is part of a broader research project of the Bureau of Public Roads, designed to explore empirical relationships between land use and highway traffic with a view to coordinating and improving urban planning and highway planning.

CITY PLANNERS have continually emphasized the far-reaching effects that accessibility has on the development of land. The more accessible an area is to the various activities in a community, the greater its growth potential.

Consistent with this general concept of a relationship between accessibility and land development, a land use model, based on a realistic measurement of accessibility, can be developed. Such a model would relate the accessibility of an area to the rate and intensity of the land development in that area.

This paper explains the development of a residential land use model—a process of distributing total metropolitan population growth to small areas within the metropolitan region. Similar models, though more complex, are being investigated for commercial and industrial development.

Walter G. Hansen is Highway Research Engineer, Bureau of Public Roads, Division of Highway Planning. He has been studying city and regional planning at the Massachusetts Institute of Technology.

Because a majority (80 per cent) of total personal travel is for work, shopping, and social purposes, this study has limited its investigations to the examination of the relationships between residential development and accessibility to commercial, industrial, and residential locations. These relationships coupled with the availability of space for development form the basis of the proposed residential land use model.

Measurement of Accessibility

As used in this paper, accessibility is defined as the *potential* of opportunities for interaction. This definition differs from the usual one in that it is a measure of the *intensity of the possibility of interaction* rather than just a measure of the ease of interaction. Defined in this manner, accessibility is a generalization of the population-over-distance relationship or "population potential" concept developed by Stewart.[1]

In general terms, accessibility is a measurement of the spatial distribution of activities about a point, adjusted for the ability and the desire of people or firms to overcome spatial separation. More specifically, the formulation states that the accessibility at point 1 to a particular type of activity at area 2 (say employment) is directly proportional to the size of the activity at area 2 (number of jobs) and inversely proportional to some function of the distance separating point 1 from area 2. The total accessibility to employment at point 1 is the summation of the accessibility to each of the indi-

[1] J. Q. Stewart, "Demographic Gravitation: Evidence and Applications," *Sociometry* 11:1-2 (2/5/48), 31-58.

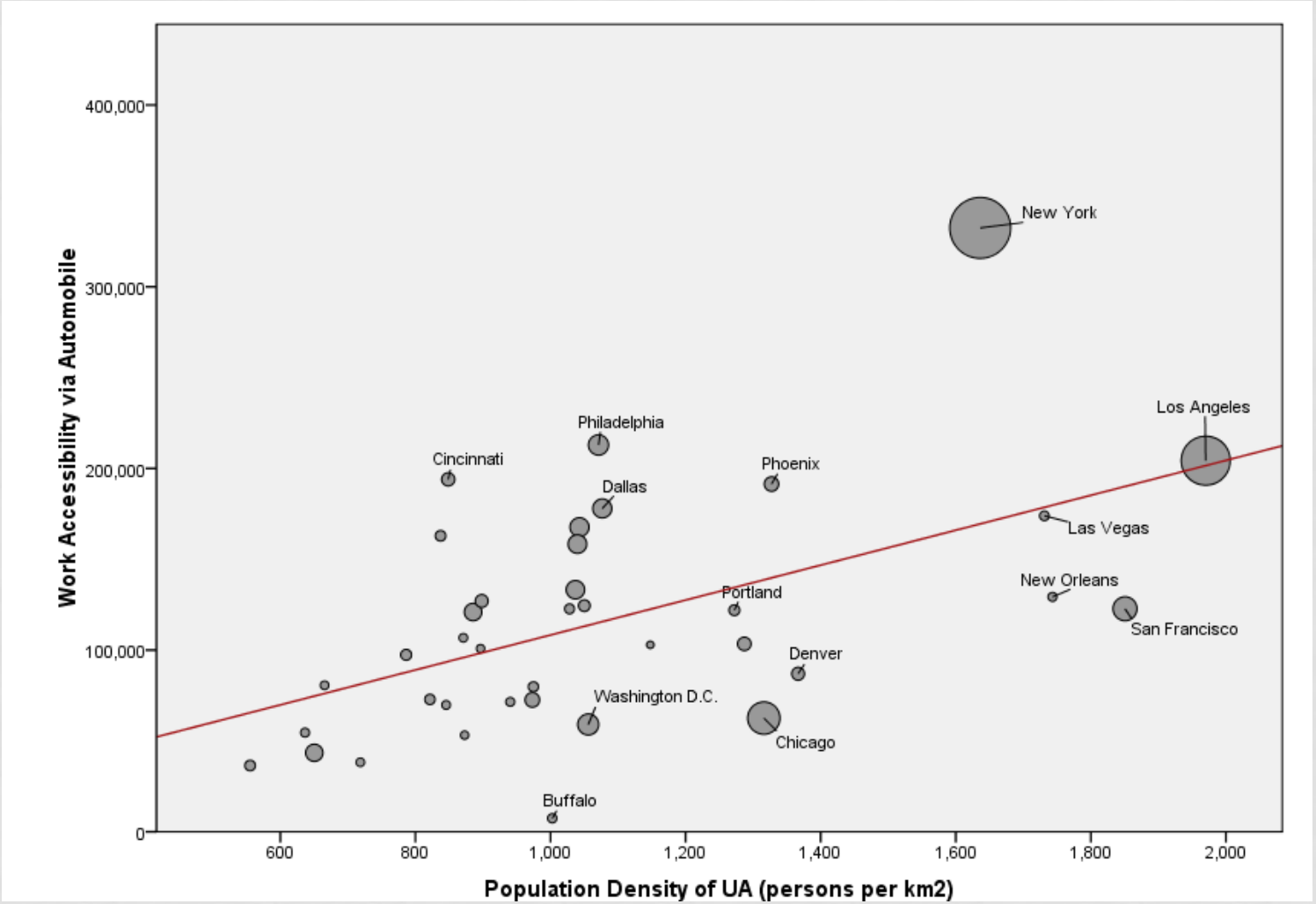
WHICH METRIC IS MOST USEFUL?

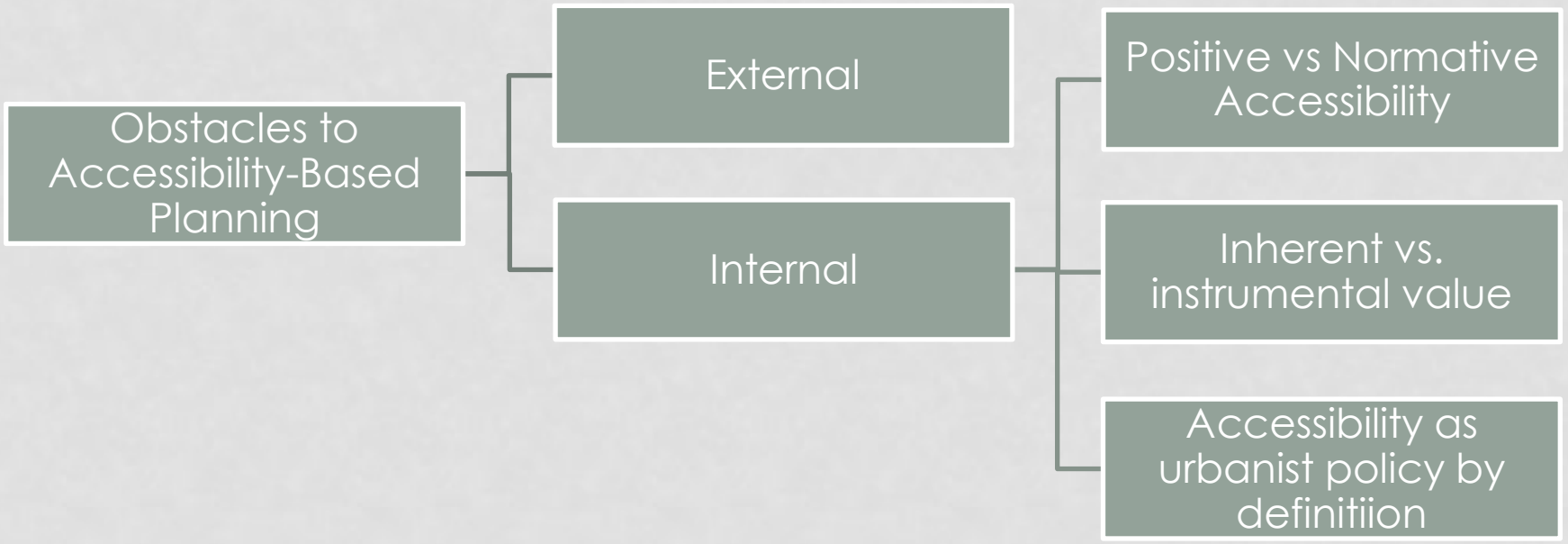
	Cumulative Opportunity-Based	Gravity-Based	Utility (Logsum)-Based
Person-Based			X
Place-Based	X	X	

INGREDIENTS FOR ACCESSIBILITY-BASED EVALUATION

	Land-Use Change	Transportation-System Change
Small-scale	Proposed land-use change + transportation impacts	Proposed transportation change, as part of a larger plan + forecast land-use impacts
Large-Scale		Proposed transportation change + forecast land-use impacts

ACCESSIBILITY AND METROPOLITAN COMPACTNESS




Obstacles to Accessibility-Based Planning
External
Internal
Positive vs Normative Accessibility
Inherent vs. instrumental value
Accessibility as urbanist policy by definitiion