Accessibility and Sustainability in Transportation

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Promote Sustainability: *Meet needs of present without compromising ability of future generations to meet their needs*
Accessibility

MEANS

Mobility
Proximity
Connectivity

ENDS
Illustration of Accessibility Concept

Baltimore Travel Analysis Zones (TAZ)

The height of each TAZ block shows the job density (i.e. Jobs/Acre) of that TAZ zone.

Legend
- TAZ #688

Travel Time from TAZ #688 (in Minutes)
- 2 - 10
- 11 - 20
- 21 - 30
- 31 - 50
- 51 - 70
Job Accessibility by Car
Baltimore and Phoenix

Accessibility Scores by Census Block Group
Baltimore, MD

Legend
- Interstates
- Water Area
- County Boundaries

Accessibility Indicators
- 0 - 10,000
- 10,001 - 50,000
- 50,001 - 100,000
- 100,001 - 150,000
- 150,001 - 300,000
- 300,001 - 555,832
Accessibility by Population Percentile, Baltimore and Phoenix (Year 2000)

Population Percentile

Accessibility (Gravity Model, Beta = 0.14)
“…local governments shall adopt land use and subdivision regulations to reduce reliance on the automobile which … allow transit-oriented developments (TODs) on lands along transit routes…"
The railroads collapsed because they thought they were in the railroad business, when really they were in the transportation business.

Extras
Population Distribution by Accessibility Indicator, Baltimore, and Phoenix

[Bar chart showing the distribution of population in different accessibility indicators for Baltimore and Phoenix.]

- Less than 10,000: Baltimore (0%), Phoenix (0%)
- 10,001 - 50,000: Baltimore (10%), Phoenix (10%)
- 50,001 - 100,000: Baltimore (20%), Phoenix (30%)
- 100,001 - 150,000: Baltimore (30%), Phoenix (20%)
- 150,000 - 300,000: Baltimore (50%), Phoenix (10%)
Hansen Accessibility Measure

\[ A_i = \sum_j O_j f(C_{ij}) \]

Where,
- \( C_{ij} \) refers to travel impedance (e.g. travel time between zone \( i \) and \( j \));
- \( F(C_{ij}) = \exp(-\beta \cdot C_{ij}) \), an exponential function of \( C_{ij} \); \( \beta \) is the parameter;
- \( O_j \) refers to all opportunities \( O \) (numbers of Jobs in this study) at zone \( j \);
- \( A_i \) is a measure of accessibility at zone \( i \) to all opportunities \( O \) at zone \( j \);