Service Area Analysis of Portland's METRO Bus System

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Report: 98 Percent Of U.S. Commuters Favor Public Transportation For Others

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WASHINGTON, DC—A study released Monday by the American Public Transportation Association reveals that 98 percent of Americans support the use of mass transit by others.

"With traffic congestion, pollution, and oil shortages all getting worse, now is the time to shift to affordable, efficient public transportation," AFTA director Howard Collier said. "Fortunately, as this report shows, Americans have finally recognized the need for everyone
METRO Background

• 8 routes serving Portland, South Portland, Falmouth and Westbrook

• 100,000+ passengers/month, +11% 1997-2005 (GPCOG/METRO, 2006)

• Miles covered daily: almost 3,000 (GPCOG, 2006)

• Total number of stops: 489 in Portland alone (City of Portland)
Project Specifications

• Determine the areas of the city served within ¼ mile (roughly five minutes' walk) of each bus stop along with some corresponding demographics

• Identify potential new areas for service
Data

• Building footprints, parcels, Census block geometry (City of Portland)

• METRO stops and routes (GPCOG)

• E911 roads, Additional Census data (MEGIS, US Census Bureau CTPP)
Building the Network Dataset
Service Area Analysis of Portland's METRO Bus System

Solving the Service Area

Layer Properties window with options for line generation, accumulation, and network locations. The window includes settings for impedance, default breaks, direction, and allow U-turns. The polygon generation section allows for generating polygons, specifying polygon type (generalized, detailed), trim polygons, and multiple facilities options. Excluded sources and overlap type options are also visible.
Network Service Area

Service Area Analysis of Portland's METRO Bus System
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Select by Location

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Coverage of METRO 1/4 mi Service Area

Mainland Area: 50.0% (Completely Within), 50.0% (Centroid Within)
Population: 62.7% (Completely Within), 75.0% (Centroid Within)
Buildings: 72.9% (Completely Within), 73.8% (Centroid Within)
Parcels: 62.1% (Completely Within), 64.9% (Centroid Within)
Need Index (Yao, 2007)

\[ NI(i) = 0.085x_1 + 0.087x_2 + 0.465x_3 + 0.038x_4 - 0.066x_5 + 0.046x_6 \]

*Figures from metro Atlanta*

(i) = traffic analysis zone (TAZ)

X1 = % of workers below poverty line

X2 = % of workers from 100 – 150% of poverty line

X3 = % of workers with 0 vehicles available

X4 = % of workers with 1 vehicle available

X5 = employment rate

X6 = population density
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Traffic Analysis Zones

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Need Index
Need Index
Need Index

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Enhancements

• Look beyond city borders

• Refine Need Index/calculate NI coefficients for Portland

• Examine impact of island populations

• Exclude areas where people don't walk (water, 295)

• Improve footpath/parking lot coverage
References


References


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