May 4th, 12:00 PM - 2:00 PM

Comparing Mode Shares for Non-residential Destinations in Urban and Suburban Environments

Tasnia Subrin
Portland State University

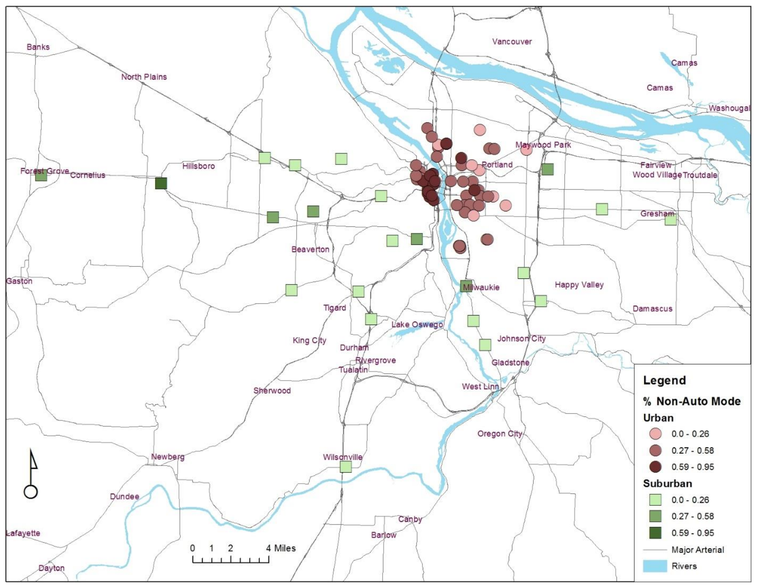
Comparing Mode Shares for Non-residential Destinations in Urban and Suburban Environments

Tasnia Subrin, Faculty Advisor: Kelly J Clifton, Portland State University

ABSTRACT

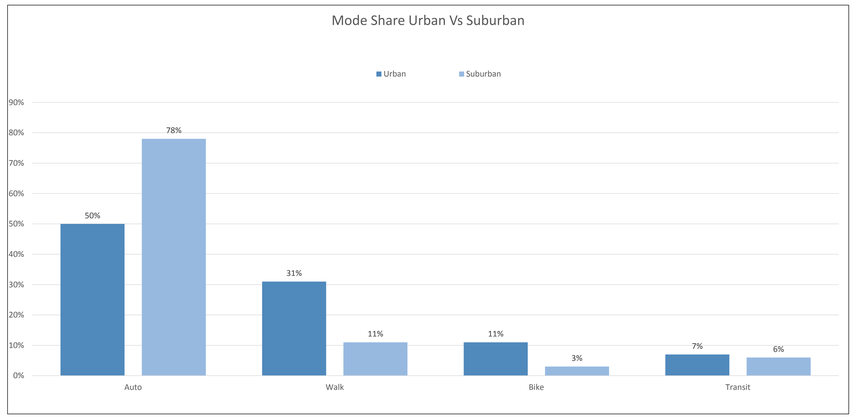
To ensure facility for multimodal transportation is one of the most important concerns in today's transportation sector, with initiatives being taken to make multimodal transportation popular. The built environment variables have a strong relationship with transportation mode choice, but whether that relationship holds true in urban and suburban neighborhoods in the same manner has not been considered. Using data for three non-residential land uses, this research explores whether the built environment variables in suburban areas influences mode share like it does in urban areas. We used survey data conducted at the establishments regarding respondents' travel characteristics from a previous study, as well as the built environment characteristics of the location around the establishments. Using mode choice and built environment data we ran multiple regression models with a dummy variable for suburban places. The results of our regression modeling showed the differing impacts of urban and suburban environments on the mode share. This could be an important consideration for future researchers in estimating travel behavior within different environments. Our study does not define the difference in the relationship but it shows that consideration regarding this matter should be taken into account. It would be vital for investigators to understand any unexpected travel behavior to an establishment in a suburban environment.

ESTABLISHMENT LOCATIONS



METHODOLOGY

- Classification of the data into urban and suburban areas
- Correlational analysis for variables within different environment
- Linear regression between the non-auto mode share for each establishment and BE variables surrounding them
  - I. Stepwise regression (Model 1) for individual area to find the most significant BE variable
  - II. Multiple Regression (Model 2) with one BE variable at a time for the pooled model
  - III. Multiple Regression (Model 3) with significant BE variables from Model 2 for urban, suburban.



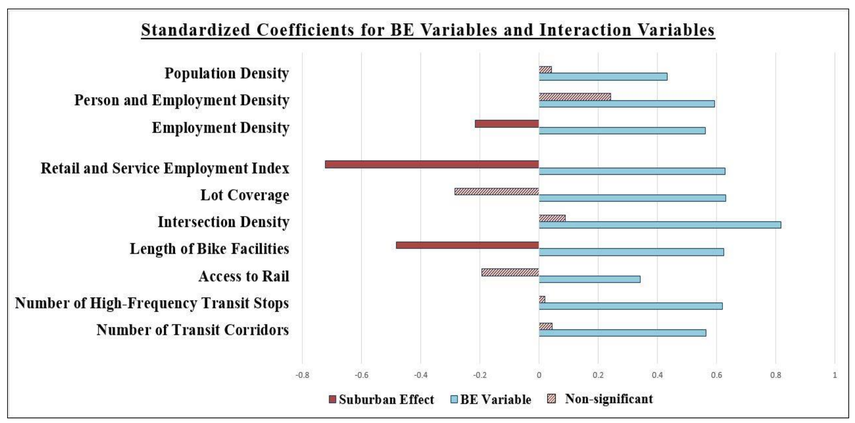
RESULTS FROM ANALYSIS

- From bivariate correlational analysis for urban and suburban area
  - BE variables are highly correlated for pooled model and urban model at significant level
  - Correlation is low in magnitude and significance level for suburban area.

From Stepwise Regression (Model 1)

Environment	Significant BE Variable	Adjusted R^2
Urban	Person and Employment Density	0.5
Suburban	Intersection Density	0.2

From Multiple Regression (Model 2)



From Multiple Regression (Model 3)

- Three variable has different impact on non-auto mode in suburban areas
- May be not significant for small sample size
- Difficult to draw solid conclusion
- Indicate policy threshold for planners
- Also indicate synergy between BE variables

LITERATURE REVIEW

- Built Environment (BE) is the part of the physical environment which is constructed by human activity such as Land use patterns, Transportation system and Urban design (Saelens & Handy, 2008)
- BE variables were broadly classified into three categories such as Density, Diversity, and Design (Cervero & Kockelman, 1997)
- Earlier literature also found significant relationship between BE variables and travel behavior considering the BE impact would be same over all environments

CONCLUSION

- The BE variables are correlated differently in two kind of urban environments
- Found different influence for some variables over urban and suburban areas
- Important for researchers to understand unexpected travel behavior of the suburban residents
- Crucial issue for the planners, policy makers or the establishment owners to predict expected travel behavior

LIMITATIONS

- Limited types of land uses and relatively small sample size
- BE variables tend to be correlated, limiting ability to estimate models with more independent variables
- Data was collected for another study, no data regarding self-selection

FUTURE RECOMMENDATION

- Study a larger data set with more types of land uses
- More observation from suburban places
- Incorporating socio demographic variables into the model
- Study about the person-level characteristics
- Including the question of self-selection in the survey

REFERENCES

- Saelens, B. E., & Handy, S. L. (2008). Built Environment Correlates of Walking: A Review. Medicine & Science in Sports & Exercise, 40(S), S550-S567
- Cervero, R., & Kockelman, K. (1997). Travel Demand and the 3Ds :Density, Diversity and Design. Transportation Research - D, 2(3), 199-219

Portland State UNIVERSITY