

Mixed Uses and Walkability a national perspective

A Study of Land Use, Transportation, Air Quality, and Health (LUTAQH) in King County, WA Executive Summary, Lawrence Frank and Company, Inc., 2005. Several key findings include:

- Whether the goal is to increase transportation efficiency, reduce automobile dependence, or reduce ozone and improve regional air quality and health, the study shows that compact development, a wide variety of land uses close to home and work, and a connected street network with pedestrian facilities can help achieve all of these goals.
- Residents walk more in neighborhoods that provide a wide variety of retail services and where connections to such services are facilitated through a connected street network.
- Increased residential density, street connectivity, and land use mix near home and work are associated with significantly lower per capita vehicle emissions; in particular, fewer oxides of nitrogen (NO_x) and volatile organic compounds (VOCs).

They also found that transportation efficiency is best served by helping people travel shorter distances, with more opportunities to ride public transit, walk, or bicycle. The study found that mixed use –the commingling of homes with offices, shops, schools, parks, and other destinations – matters most when it comes to transportation efficiency. While residential density is needed to sustain commercial use and to make transit viable, providing retail destinations and activities near where people live and work also is critical.

The research found that residents walk more in mixed-use neighborhoods with good street connections. The land uses most strongly linked to the percentage of household trips made on foot proved to be educational facilities, commercial office buildings, restaurants and taverns, parks, and neighborhood-scale retail establishments, with civic uses and grocery stores following closely. Having establishments such as these within a kilometer of one’s home allows people to meet recommended physical activity needs by walking. Data showed the odds of walking increased by 20 percent for each additional park and 21 percent for each additional educational facility within a kilometer distance from where King County residents live. It is anticipated that this relationship is “non-linear” and that smaller increases in walking will likely result as demand for parks and schools is approached and met.

The actual number of recreational, educational, retail, entertainment, and other commercial attractions near one’s home may be more important than the size of the attraction itself in making the decision to walk. This is an important finding suggesting that more small uses interwoven in residential areas is the best way to encourage walking for errands and other non-work purposes. For example, a big box store does not affect walking as much as several smaller shops with the same total square footage. The likelihood of walking increases the most when a number of these factors are combined:

- a variety of destinations close to home
- greater street connectivity
- greater residential density

Increased transit ridership was observed in the same locations where walking was more prevalent. LUTAQH discovered a synergistic relationship between transit use and neighborhood walkability. Neighborhoods with a greater mix of land uses, better street connectivity, and higher density supported both transit use for regional mobility and walking for nearby destinations. Whereas the number of non-residential destinations did the most to influence walking rates, the

greatest relationship with transit use came from the total square footage of commercial destinations in the neighborhood.

Not surprisingly, the land uses most closely associated with the greater percentage of work trips on transit are also those associated with typical downtown areas: more commercial office floor space and retail floor space and a greater number of large retail attractions and office buildings. Areas that included predominantly fast food outlets, high tech companies, office parks and vacant land were found to be associated with lower transit ridership.

Additional effectiveness data

- Frank in *A Study of Land Use, Transportation, Air Quality, and Health (LUTAQH) in King County, WA* found that when controlling for demographics, for each quartile increase in the number of retail establishments, there was a corresponding 19 percent increase in the odds of walking for non-work travel.
- Burden and Wallwork in *Handbook for Walkable Communities*, found that walking distance increases as the quality of the pedestrian environment improves. Having an interesting view, retail frontage, and high pedestrian activity have all been linked to increases in walking distance. Pedestrians are likely to walk up to one mile (20 minutes) for a commute trip under favorable conditions.
- Hess et al., in *Neighborhood Site Design and Pedestrian Travel*, found that schools, multi-family housing and grocery stores were specifically found to generate pedestrian traffic.
- EPA, in the 2003 article *Travel and Environmental Implications of School Siting*, cites a study by Tracy McMillan (“The Influence of Urban Form on a Child’s Trip to School,” presented at the Association of Collegiate Schools of Planning Annual Conference, Baltimore, 2002) indicating walking or bicycling to school is more likely when homes are within a mile of school. This study concludes that locating schools close to residents increases the viability of walking and biking to school by as much as 13 percent, reducing the total number of vehicular trips. In addition, the total number of vehicular miles traveled is reduced, further reducing auto emissions by at least 15 percent.
- Kikuchi et al. report in *Micro-Level Transit Accessibility Study* that the amount of nearby trip generators encouraged greater transit ridership.
- The article *Transit Oriented Development: Using Public Transit to Create More Accessible and Livable Neighborhoods* (Victoria Transport Policy Institute) documents a series of predictions based on available data regarding the successfulness of various types of development as outlined in the table below.

Table: Travel Impacts of Land Use Design Features (Dagang 1995)

Design Feature	Reduced Vehicle Travel
Residential development around transit centers	10 percent
Commercial development around transit centers	15 percent
Residential development along transit corridor	5 percent
Commercial development along transit corridor	7 percent
Residential mixed-use development around transit centers	15 percent
Commercial mixed-use development around transit centers	20 percent
Residential mixed-use development along transit corridors	7 percent
Commercial mixed-use development along transit corridors	10 percent
Residential mixed-use development	5 percent
Commercial mixed-use development	7 percent

Summary of National Recommendations regarding Mixed Uses:

- Have a blend of single- and multi-family housing.
- Create clear boundaries/borders.
- Locate schools close to homes. Maximize the number of homes within one mile of a school.
- Small uses interwoven in residential areas/ neighborhoods that include a wide variety of retail services. Specific uses recommended close to residential and employment:
 - educational facilities
 - commercial office buildings
 - restaurants and taverns, coffee shops
 - parks
 - neighborhood-scale retail establishments, news stands, dry cleaners
 - civic uses
 - grocery stores
 - child care
- Encourage a wide variety of land uses close to employment.
- Transit Supportive: Provide more commercial office floor space and retail floor space and a greater number of large retail attractions and office buildings.
- Transit Supportive: the greatest relationship with transit use came from the total square footage of commercial destinations in the neighborhood.

Key Recommendations from local studies

- Allow vertical and horizontal mixing of land uses. Require a variety of housing types including both single and multi-family.
 - 1) Allow neighborhood commercial uses in or near residential districts as a conditional use.
 - 2) Allow all types of residential uses within the commercial district, including apartments over stores and offices.
 - 3) Allow retail uses within the office/employment zones.
 - 4) Allow incidental service and retail uses (maximum ten percent of building area) within the Manufacturing/ Industrial district.
 - 5) Require a variety of housing types in Neighborhoods, including both single and multifamily housing. The Neighborhood should consist of seventy to eighty-five percent residential uses, at least ten percent open space, with zero to five percent as civic and institutional uses.
- Communities and neighborhoods, whether villages, hamlets, towns or transit arterial districts require a variety of land uses and a variety of housing types.
- Locate and design public facilities such as schools to maximize pedestrian, bicycle and transit access, in addition to access by school buses.
- Site design of commercial and employment buildings should include pedestrian oriented public spaces.