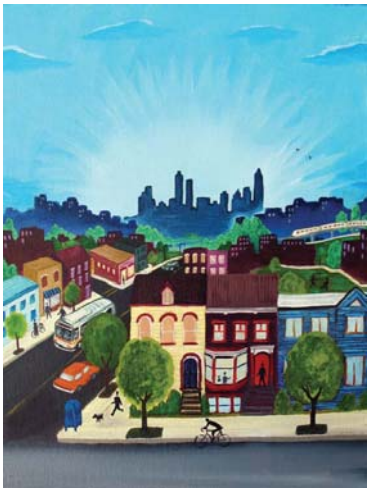
SMARTRAQ: New Data for a New Era



Executive Summary

What is SMARTRAQ?

Begun in 1998, SMARTRAQ (Strategies for the Metro Atlanta Region's Transportation and Air Quality) is of one of the largest, most comprehensive planning studies yet undertaken for a large metropolitan area. It was an ambitious attempt to understand how the layout of our neighborhoods, cities and region is associated with how we travel, and how that in turn affects our personal, economic and environmental health. The project began when the region's transportation plan was forecast to violate emissions standards under the federal Clean Air Act. Barred from using federal road money until a complying plan could be approved, the region needed a broader understanding of land use, transportation and air quality relationships.

SMARTRAQ was a multidisciplinary collaboration including federal and state transportation, environmental and health agencies, a local foundation, other non-profit organizations, and Georgia Tech and University of British Columbia researchers. Its funders included the Georgia Department of Transportation, Georgia Regional Transportation Authority, Federal Highway Administration, Centers for Disease Control and Prevention, Atlanta Regional Commission, Environmental Protection Agency, Turner Foundation, and others. Collectively, its budget exceeded $4.5 million.

Components of the SMARTRAQ research program

The SMARTRAQ research program consisted of the following five major components:

- A regional 13 county land use database;
- A 2001/2002 travel survey of more than 8,000 households;
- A sub-survey of physical activity and social capital of 1,000 people in different households;
- A community preference survey of 1,500 people in different households;
- An outreach program focused on local government officials, lenders, and developers.

The Highlights: What We Found

While the research is complex, the basic findings are clear. The research suggests that there is a pent-up demand for more walkable environments in the Atlanta region, and those walkable neighborhoods are associated with less driving, more walking and more transit use. These findings can mean significant benefits for residents who live in areas that are more compact, with shopping and/or jobs close to homes, and with a well-connected street network. People in those areas drive fewer miles and spend less time driving, generate less air pollution and greenhouse gas emissions, and are more physically active and less likely to be obese. Additionally, the study is the first to document that, even after taking people's preferences for neighborhood type into account, the environment in which people live is associated with how much they drive and how often they walk and use public transit. These results suggest that whether or not you prefer a walkable neighborhood, living in such an environment will very likely still translate into more walking and less driving.

How Atlantans Travel

Atlantans drive almost 35 miles a day on average, more than most other regions of the nation. This already large average distance driven grows steadily as counties get farther from the urban core. Residents in the central counties (Clayton, Cobb, DeKalb, Fulton, Gwinnett, Douglas) drive an average of 32.7 miles/59 minutes daily per person, while those in the outlying counties drive an average of almost 44 miles/72 minutes daily.

Daily commutes are often the longest trips people make. The average commute distance in the region is 16.5 miles. Commuters in outlying counties drive far more than that. The average commute trip in Paulding County is 31.6 miles, almost twice the regional average.

People spend nearly as much time in their cars on weekends as on weekdays. The average distance driven on the weekend is just 6 percent lower than on the weekdays.

Most trips in the region are made by private vehicle. Just five counties, Forsyth, Clayton, Douglas, DeKalb, and Fulton, had more than ten percent of trips via public transit, bicycling, walking and carpooling combined. Across the region, fewer than five percent of all trips were made on foot; just over two percent were made by bus or train. Transit trips make up more than five percent of total trips only in the two counties that have rail transit, Fulton and DeKalb.

Neighborhood Walkability and Driving

People in walkable neighborhoods drive less. SMARTRAQ found that people who live in neighborhoods with the lowest walkability drive an average of 39 miles per person each weekday, about 30 percent more than those who live in the most walkable areas, who drive 30 miles per person. The difference for weekend travel was even greater – about 40 percent fewer miles for those in the most walkable neighborhoods.

People in closer-in, high-walkability neighborhoods take more trips by walking or transit. Transit trips also generally involve a significant amount of walking - 75 percent of all trips to or from MARTA stations are on foot. DeKalb and Fulton counties account for almost 70 percent of the walking trips reported in the entire region, despite being home to only 40 percent of the sampled population.

Less driving also reduces a household's expenses. SMARTRAQ estimates show that households in the least walkable areas of the region consume an average of 1,048 gallons of gas and spend $2,600 per year (assuming two cars per household and $2.50/gallon). Those living in the most walkable areas of the region save substantial amounts of gas and money. On average, two person households in walkable neighborhoods save an estimated 262 gallons of gas a year and spend $640 less. According to a recent report by the Surface Transportion Policy Project and the Center for Neighborhood Technology, Atlanta region households spend an average of 19 percent of their yearly income on all transportation expenses.

What is Walkability?

SMARTRAQ defined a walkable neighborhood as one that has...

COMPACT RESIDENTIAL DEVELOPMENT – with single family houses on small lots, townhomes, duplexes or apartments.

A MIX OF LAND USES – living, working, and shopping activities all within walking distance.

A WELL-CONNECTED STREET NETWORK – typically a "grid" of streets with small blocks.

This basic pattern is found in the older town centers and the central areas of the region.

Neighborhood Walkability and the Environment

Neighborhood walkability is linked to fewer per capita air pollutants. The SMARTRAQ air quality analysis found that each step up a five-part walkability scale results in a 6 percent reduction in Nitrous Oxides and a 3.7 percent reduction in Volatile Organic Compounds, which combine to form ozone. Ozone can cause permanent lung damage and is a serious health threat and a significant air quality problem for Atlanta.

Neighborhood walkability is linked to lower per capita greenhouse gas emissions. Carbon dioxide (CO_2) is the primary contributor to greenhouse gases and global warming. Travel patterns of residents in the region's least walkable neighborhoods generated about 20 percent higher CO_2 emissions than travel by those who live in the most walkable neighborhoods – about 2,000 extra grams of CO_2 per person each weekday.

Neighborhood Walkability, Obesity and Physical Activity

Neighborhood walkability is linked with being more physically active. Residents of the most walkable areas of the Atlanta region are 2.4 times more likely to get the daily 30 minutes of moderate physical activity recommended by the US Surgeon General. Thirty-seven percent of

people in high-walkability neighborhoods met these recommendations, compared to just 18 percent of residents living in the region's least walkable neighborhoods.

Time spent driving is linked to obesity. Every additional hour spent in a car each day is associated with a 6 percent increase in the odds of being obese. In metro Atlanta, 31 percent of SMARTRAQ travel survey participants spend more than an hour and a half a day sedentary in a car.

Neighborhood Walkability and Youth

Open space and neighborhood walkability are linked to youth physical activity and walking. The amount youth walk is strongly linked to the design of their neighborhood. The presence of at least one recreational space within a kilometer of where youth live was consistently associated with walking in youth of all age groups (between ages 5 and 20). The relationship between walking and neighborhood design was found to increase in strength as youth approach driving age, and then decline once driving is an option. Young teens (ages 12 to 15) were 2.5 times more likely to report they walk if there was recreational open space within one kilometer of home, and 2.6 times more likely to the report that they walked if there was a commercial destination within a kilometer of their home. Youth from households with two cars were 1.4 times more likely to report they walked compared with youth from households with 3 or more cars. Those from one-car household were 2.6 times more likely to walk.

The Market for Walkable Neighborhoods

Most neighborhoods in the region are not walkable. About 60 percent of survey respondents said they are unable to walk to nearby shops and services. We estimate that only about one in 20 homes in metro Atlanta are in compact and walkable neighborhoods.

There is an unmet demand for more walkable neighborhoods in the region. A comparison between respondents' neighborhood preferences and their actual neighborhood choices reveals that there is an undersupply of walkable development in the region. About a third of metro Atlantans living in conventional suburban development would prefer to be in a more walkable environment.

A substantial minority of Atlanta residents have strong preferences for features of walkable neighborhoods. Many different neighborhood characteristics were evaluated in the survey, and depending on which characteristics people preferred, between 20 and 40 percent of survey participants had a *very strong* preference for the most compact and walkable neighborhoods. Forty-nine percent of survey respondents said they would prefer a neighborhood where residents can walk to nearby shopping. Fifty-five percent of respondents would prefer to live in a community that affords shorter travel distances to work, *even if it meant* smaller residential lots.

Applying the Research: The Livable Centers Initiative

Through the Atlanta Regional Commission's Livable Centers Initiative (LCI), the results of the SMARTRAQ analysis were applied to actual policy decisions. With the LCI program, a qualified entity can compete for money to create innovative plans for a variety of projects, such as redeveloping a town center, road corridor or strip shopping corridor; focusing development around transit stations; or converting commercial-only areas into live-work-play districts. Winning jurisdictions with successful plans are then in line to receive implementation money from the region's transportation funds.

SMARTRAQ data and analytical results were used to evaluate LCI plans for three case study sites – the city of Marietta in Cobb County, the Perimeter Center area in DeKalb and Fulton Counties, and the West End neighborhood in Atlanta. The case studies were chosen based on their regional location and development type (suburban town center, inner-ring "edge city" and center-city neighborhood), as well as on the availability of data. The team predicted the differences between the LCI plans and 'status quo' scenarios for outcomes such as miles of driving, air pollution, transit ridership and other factors. In all three cases, based on the SMARTRAQ outcomes, the LCI plan could reduce the miles of driving per person, increase use of transit, improve walking conditions and reduce vehicle emissions over the projection of status-quo trends.

What We Learned from SMARTRAQ

The SMARTRAQ data and research offers detailed, quantitative answers on how decisions on transportation and development can help create healthy cities in the Atlanta region and elsewhere in the nation.

In Atlanta, the SMARTRAQ travel survey provided a much-needed update to the last travel survey done in 1991. These data were incorporated into the regional travel model, greatly expanding its capacity to evaluate potential transportation and land use investment decisions. SMARTRAQ also developed a series of indicators and benchmarks to assist the Georgia Regional Transportation Authority (GRTA) in tracking performance in quality of life, economic opportunity, housing options, environmental health and other areas. Lastly, the assessment of the three LCI plans made SMARTRAQ relevant to policy decisions in the region by evaluating the program's prospects of success and developing a framework through which other related decisions on growth, transportation and land use could be made.

For planners, public health officials, and decision makers outside the Atlanta area, the SMARTRAQ results can be important evidence-based guidance on how transportation investments and development may impact transportation, air quality and public health. More importantly, SMARTRAQ serves as a model for cross-disciplinary, collaborative, and policy-relevant research and data collection.

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SELECTED JOURNAL ARTICLES FEATURING SMARTRAQ RESEARCH

Article	Topic	Publication Information
Obesity Relationships With Community Design, Physical Activity, & Time Spent in Cars. Frank, L, Andresen, M, Schmid T.	Urban Form and Obesity	*American Journal of Preventive Medicine* Vol 27. No 2, 2004.
Linking Objectively Measured Physical Activity with Objectively Measured Urban Form. Frank, L, Schmid, T, Sallis, J, Chapman, J, Saelens, B.	Urban Form and Physical Activity	*American Journal of Preventive Medicine*. Volume 28, No. 2S. 2005.
Urban Form Relationships with Walk Trip Frequency and Distance among Youth. Frank, L, Kerr, J, Chapman, J, Sallis, J.	Urban Form and Youth Walk Trips	*American Journal of Health Promotion. 2007.*
Spatial Distribution of Food Outlet Type and Quality around Schools in Differing Built Environment and Demographic Contexts. Frank, L. Glanz K, McCarron, M, Sallis, J, Saelens, B, Chapman, J.	Urban Form and Healthy Food	*Berkeley Planning Journal. 2007*
Stepping Towards Causation: Do Built Environments or Individual Preferences Explain Walking, Driving, and Obesity? Frank, L.D., Saelens, B., Powell, KE., Chapman, J.	Urban Form and Obesity/Physical Activity	*Social Science and Medicine. Forthcoming*
"Transportation and Land-Use Preferences and Residents' Neighborhood Choices: The Sufficiency of Compact Development in the Atlanta Region." Levine, J, Frank L. D.	The Market for Walkable Development	*Transportation. 2007.*
Urban form correlates of pedestrian travel in youth: Differences by gender, race-ethnicity and household attributes.Kerr, J., Frank, L. Sallis, J, Chapman, J.	Urban Form and Physical Activity in Youth	*Transportation Research Part D. Forthcoming*