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The influence of infill development on travel behavior

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ABSTRACT

While the evidence that the built environment can influence travel behavior to date is fairly robust, the influence of specific, identifiable policy actions is limited. One policy action that can potentially change travel behavior is increasing infill development, particularly if that development is located near the center of a major metropolitan region. This study examines the influence of a large-scale, infill development, Atlantic Station, which opened in 2005 just west of Midtown Atlanta. The study uses propensity scores and differences-in-differences research designs to identify how travel patterns changed for new residents and for existing residents of the area around Atlantic Station, respectively. Atlantic Station reduced vehicle miles traveled and increased alternative mode share for its new residents, but it did not reduce the vehicle miles traveled or increase alternative mode share for the existing residents of the area around Atlantic Station.

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1. Introduction

The goal of reducing vehicular dependence through a supportive built environment continues to be a primary objective of urban policy and planning. Continued greenhouse gas emissions, stressed transportation infrastructure, and the need to promote physically active travel are each important motivations for fostering reduced vehicular dependence and promoting alternative modes of travel.

Although planners now know that a built environment with more density, more diversity, better design, and higher destination accessibility can reduce vehicular dependence, the impact of specific planning actions – i.e. approving specific developments, increasing densities in particular locations, or increasing the mix of uses within particular activity centers – has rarely been studied. Before and after studies of such planning actions are informative because they are able to identify the impacts that specified land use changes have on travel behavior. Since the built environment of cities changes slowly and incrementally, understanding the impact of specific land use changes on travel behavior is of pivotal interest for urban planners.

In this study I examine the impact of the Atlantic Station infill development on the travel behavior of new residents to the area as well as for existing residents of the surrounding area. The Atlantic

Station development is a large-scale, mixed-use, infill development that occurred on a former brownfield site close to the center of the Atlanta metropolitan region. The development was originally approved in 2001 and opened its doors in 2005. Although the Atlantic Station site was a former steel mill and surrounded by industrial uses to its west, it enjoys a prime location immediately west of the booming Midtown Atlanta area and just a short distance north of the Georgia Institute of Technology. Using travel survey data from 2001 to 2011, I examine how travel behavior in the area changed as a result of the Atlantic Station development. In addition, I compare the travel behavior of Atlantic Station area residents in 2011 with residents of similar demographic makeup from outside the area. Analyzing the impacts of Atlantic Station on travel behavior in this way yield insights into the transportation-related benefits of large-scale, mixed-use infill developments.

The results suggest that the Atlantic Station development did substantially reduce vehicular travel for its new residents by placing them in a high accessibility area close to the center of the metropolitan region. However, for those residents already living in this area, the new destinations introduced by the Atlantic Station development did not reduce their daily vehicular travel or increase their use of alternatives modes.

For planning practitioners, this study indicates that residential infill development in central parts of metropolitan areas can have a substantial influence on reducing vehicle dependence and on promoting alternative modes. The commercial portion of mixed-

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use infill development may reduce vehicle dependence through internal trip capture, but these effects appear to be small relative to the importance of locating additional residential units in central, high-accessibility areas well served by public transit. For planning scholars, this study is one of a few examples of before-and-after research designs of land use interventions, and the research designs presented here can be replicated to examine the transportation impact of other specific developments or area plans. By examining travel behavior before the area plan, and then again after the area plan is completed, planners can evaluate if the area plans shifted travel behavior in a meaningful way. In particular the difference-in-differences method is well suited to identifying causal effects of area plans on travel behavior.

1.1. Background on Atlantic Station

With 136 acres of redevelopment adjacent to Midtown Atlanta, Atlantic Station is one of the largest mixed-use, urban infill developments to be completed in the US in recent years (Chamberlin, 2006; Miller, 2006). As Fig. 1 indicates, the location of Atlantic Station is close to the center of the Atlanta metropolitan region, located about 3 miles to the north of Atlanta's historic downtown core. It is also located close to an existing MARTA Station (Atlanta's heavy rail system), the Arts Center Station, which is accessible by a lengthy walk or via the Atlantic Station shuttle. The development includes a shopping and entertainment district with a movie theatre, bars, and restaurants as well as a Target, a department store and other shopping; a multifamily residential district on its west side; an office tower district along the main east-west corridor of 17th Avenue; and townhomes serving as a transition from the denser core of Atlantic Station to the single family residential areas to its south. In addition, the Atlanta region's only Ikea store is located on the western edge of the Atlantic Station development. From the development program described above, it is apparent that the development contains a wide range of residential and commercial uses, mostly at medium to high intensities, typically with

3–4 stories of building height, but with much greater densities along the 17th Street spine.

According to the US Census Bureau as shown in Table 1, Atlantic Station had 2313 residents in 1784 households as of 2010. In comparison with the City of Atlanta, Atlantic Station had more racial diversity – an almost even balance between blacks, whites, and other races, smaller household sizes (1.30 vs. 2.11), a lower home ownership rate (35.7% vs. 44.9%), and a younger median age (28.7 vs. 32.9). All of these characteristics are consistent with newer and denser, and perhaps more gentrified, urban development brought about by Atlantic Station.

Table 2 lists 23 large-scale mixed-use redevelopment sites identified via a media article search, each with estimated total project value of over \$1.0 billion dollars. Comparing project size between different redevelopment proposals is difficult because there is no uniform standard for reporting a project's size – some projects report total building square feet, while others report residential units and commercial square feet separately. Also since the proposed developments are massive in scale, often times only the size of the latest phase of development under construction are

Table 1 Demographics of Atlantic Station in 2010.

	Atlantic Station	City of Atlanta
Population	2313	420,003
Housing Units	2356	224,573
Households	1784	185,142
Avg. HH Size	1.30	2.11
Median Age	28.7	32.9
Home Ownership	35.7%	44.9%
% Black	37.7%	54.0%
% Other Non-White Race	23.3%	7.6%

(2010). Source: U.S. Census Bureau, Census 2010 Summary File 1, Tables P5, P6, P8, P12, P13, P17, P19, P20, P25, P29, P31, P34, P37, P43, PCT5, PCT8, PCT11, PCT12, PCT19, PCT23, PCT24, H3, H4, H5, H11, H12, and H16.

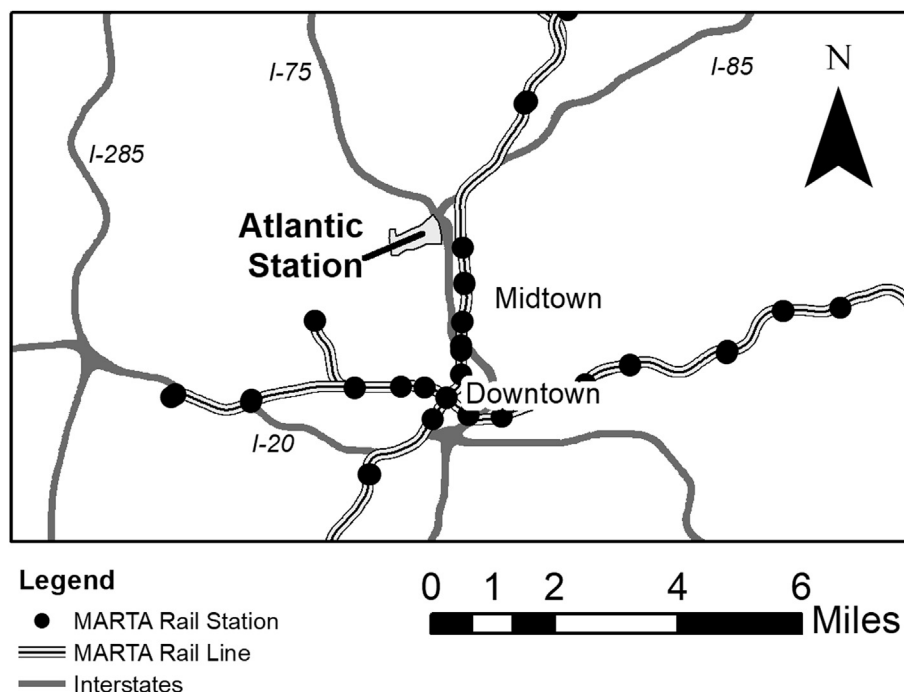


Fig. 1. Atlantic Station context map. Map illustrates the location of Atlantic Station relative to Downtown and Midtown, as well as relative to major heavy rail stations and corridors.

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