Identifying Potential Sport Clusters: Gis Analysis of Spatial Patterns of Bicycling Participants, Non-Profits and Businesses and Facilities

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Cities and regions often market themselves based on the type of industry or activities common to the geographic area. For example, Indianapolis markets itself as the racing capital of the world; Austin markets itself as the live music capital of the world; Florida markets itself as the fishing capital of the world. For the most part, these monikers are merely part of the positioning efforts of city marketers. However, scholars such as Porter (1990) have shown that geographic clustering of industry elements can lead to competitive advantage. Although there has yet to be any strong empirical evidence for sport participation clusters, the concept is an appealing one.

Intuitively, one would expect that geographic regions or cities could produce a large number of participants in a sport, and even that a region can become known for producing numerous elite performers in a particular sport. Successful growth in sport participation requires a density of sport participants, providers, supporters, facilities, and other support services. One would expect that cities with a denser network of these elements would also have more participants at both recreational and elite levels. Just as the city marketers position cities for tourism and business, cities become known for their sport prowess. Hence we have monikers such as the hockey town, the soccer city, the ski village, and the surfing neighborhood. However, it is not clear whether successfully developed clusters share similar spatial patterns. Nor is it clear what elements may be necessary or at what density they are sufficient. Therefore, the objective of this study is to determine if spatial analysis can be used to predict key location factors for sport clusters. Spatial analysis, which requires attributes and locations, examines patterns, trends and anomalies otherwise missed (Longley et al., 2011).

This research used spatial analysis of bicycling clusters in the City of Austin, Texas, to examine patterns and trends that may represent a bicycling sport cluster. Austin is a city known for its outdoor lifestyle and the hometown of Lance Armstrong, the seven-time Tour de France champion. The city is considered as a top 3 bicycle racing city in the United States: several hundred racers participate in each weekly bicycle race at Driveway; and 30 racing clubs are registered with the Texas Bicycle Racing Association. Road racers are prominent on many streets, mountain bikers on bike trails in local parks, enthusiastic youngsters on BMX parks are observed every day. On Thursdays, a weekly social mass ride attracts several hundred bikers representing a mix of socio-economic backgrounds and bicycling segments. In addition, environmental and health benefits have been increasing bicycling for transportation purposes. Thirty-seven specialty bike shops actively serve local bicyclists. Lance Armstrong Bikeway, a dedicated bikeway named after the champion ushers many bicyclists through downtown. Austin was ranked 11th in the top 50 "Bike Friendly Cities: America's Best Bike Cities (populations of 100,000 or more)" published by Bicycling Magazine in 2010. The magazine evaluated combined factors: segregated bike lanes, municipal bike racks; the ear of local government; support to a diverse bike culture; smart savvy bike shops. In short, Austin seems to have the infrastructure to capture the potential competitive advantage for cycling of being a sport cluster.

The concept of cluster has been studied from perspectives of competitive advantage of industry, regional network, and urban downtown regeneration strategy. Porter (1990) examined competitive advantages of geographic concentration of the same industries in particular cities and regions. Strategic Leisure Limited (2004) applied the industry cluster for a strategic plan with Sport England to increase local sport participation. The plan included two sub-clusters: professional sport and sport participation. Stern et al.'s (2010) study conducted spatial analysis using geographic information system (GIS) to examine the clusters of artists and cultural activities in four dimensions: cultural providers (both non-profit and commercial), resident artists, and cultural participants. The study is used as a reference for analyzing sport clusters because the types of elements included in the four dimensions of artist and cultural activities are similar to the potential elements of a sport cluster.

In this study, Geographic Information System (GIS) software was used for spatial analysis of bicycling cultural clusters in Austin. The density, key subsets of sport and other types of bicycling, and spatial patterns at
neighborhood level were examined. Four dimensions of Stern et al., (2008) were customized to fit with bicycle activities by the researcher: 1) individual bicyclists; 2) non-profit bicycling activities (e.g., school programs, association and club events); 3) bicycling related businesses; and 4) bicycle-relevant aspects of the built environment (e.g., bicycle paths, routes, parks). This study determines patterns of bicycling elements that exist in areas of the city. The location data (i.e., street addresses of various elements of four dimensions) necessary for spatial analysis of bicycle clusters were: (i) provided by the local institutions such as City of Austin, Austin Cycling Association, Texas Bicycle Racing Association, League of Bicycling Voters, Austin Independent School District, Capital Area Metropolitan Planning Organization; (ii) collected by researchers from local bicycling related websites. Then, the data were geocoded and measured by neighborhood level (e.g., census tract level). Overlay analysis of the four dimensions examined the spatial patterns, density and correlations of various bicycle activities and resources. Four dimensions of spatial data were also linked with the census data downloaded from the website of U.S. Census Bureau for further analysis.

Four key outcomes resulted from the GIS analysis. (1) There are different spatial patterns depending on the type of bicyclists examined. (2) Preliminary analysis by census tracts using sample elements (e.g., bicyclists, businesses, etc.) identified six potential bicycling clusters. Two alternative GIS analysis methods (i.e., buffer zone analysis and network analysis) were used to verify census tract analysis and identified additional bicycling clusters. (3) Bicycling clusters were identified both in the central city and the outskirts of the city. The type of bicycling cluster was associated with neighborhood types such as residential, commercial, mixed land-use neighborhoods. Some of them were located close to the activity locations of bicyclists (e.g., bicycling trails, veloways, bicycle-friendly-businesses). (4) Different routes and boundaries were preferred by different types of bicyclists (e.g., social mass cycling, racing, pedi-cab). These results suggest that spatial analysis is a useful method for a study involving location factors such as sport clusters.