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STADIUMS AND SMART GROWTH

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ABSTRACT: *Decentralization caused by the suburban explosion in the second half of the Twentieth Century caused many American city centers to endure a decrease in population, an increase in vacant lots and abandoned buildings, and loss of retail activity. As the 1900's drew to a close, urban planners sought ways to curb suburbanization and revitalize ailing urban cores. As a result, Smart Growth emerged as a predominant influence on city planning policy designed to achieve those goals. Concurrent to that shift in planning ideology, many cities began building new sports facilities in city downtowns. The idea was that having an attraction like a stadium or an arena would draw people back into downtown, spur urban growth, boost the local economy, and, most of all, become a driving force and central figure in achieving the goals set forth by the city's Smart Growth-influenced master plan. The relationship between sports facilities and economics has been vigorously investigated, however, there is a paucity of research that analyzes the relationship between sports facilities and planning goals. Is the use of sports facilities as a tool for Smart Growth implementation a successful strategy? Results from three case studies will confirm that stadium districts achieve success in drawing population back to the core and in rebuilding and reusing existing structures and lots. However, these districts still have not encouraged automobile independence.*

Keywords: *stadiums, smart growth, sports, revitalization, downtowns*

INTRODUCTION

The economic impact of sports on cities has been thoroughly analyzed, however, little research has been conducted on the physical and demographic changes a city goes through as the result of the introduction of a stadium or arena to one of its districts, specifically with respect to the Smart Growth principles cities employ in revitalization districts. Therefore, economics will play not be the focus of this paper, but rather it will concentrate on particular Smart Growth ideals within a district that is built around a sports facility and more specifically to determine whether those changes differ from other revitalization districts within the city and the city as a whole.

An extensive review of sports and the economy was performed by Baade (1994) who analyzed 48 cities over 30 years that added either a new sports facility or a new sports team to determine exactly what economic impacts there were. Baade's (1994) results overwhelmingly indicated that there was no statistically significant relationship between a stadium and/or a sports team and "per capita personal income growth." In most cases, researchers almost unilaterally agree that stadiums' contribution to the economy is greatly exaggerated. It is from these results that researchers moved into asking why, then, if stadiums are such a bad investment, do cities continue to build them?

Baade and Dye (1990) made this very observation by recognizing that while most of the research suggested that economic benefits were minimal at best, cities were still motivated to build new stadiums. It was their belief that it was because of the *indirect benefits* that stadiums provide that give cities the impetus to build them – indirect benefits being economic activity outside of the stadium "as a result of stadium events."

Expanding on the idea of indirect benefits, Chapin (2004) claimed that studies which analyze only stadiums' economic impact "miss the mark" considering cities no longer build stadiums for purely economic reasons. As such, Chapin shifted the focus away from analysis based purely on economics and moved towards analyzing other impacts a sports facility might have on its surrounding area, particularly to the built environment. Cities, Chapin argued, continued to build sports stadiums into and beyond the 1990's despite mixed economic returns because stadiums and arenas can help drive "district redevelopment," that is, the physical redevelopment of downtown districts. This idea of district redevelopment was identified by Robertson (1995) as having three objectives: 1-to generate "spillover" spending into adjacent districts, 2-to generate new construction in the district, and 3-to rejuvenate blighted areas. From those objectives, Chapin (2004) identified three measurable indicators of district redevelopment: 1-the reuse of existing buildings or spaces, 2-new construction within the district, and 3-the emergence of a new "entertainment or sports district." Chapin believed that when the three previous indicators have been identified, then proof of district redevelopment by way of investment in a sports facility exists.

To demonstrate the trend in sports facility location, Newsome and Comer (2000) analyzed the pattern of new facilities compared to old facilities, that is, where did a team move to in relation to where they moved from – or in the case of expansion teams, where did they go? They found that the trend was inward, towards city downtowns, away from suburbs. For stadiums, Newsome and Comer (2000) found that there were twelve downtown National Football League and Major League Baseball stadiums in 1965, and twenty-three in 1997, with an additional four more being planned. For arenas, Newsome and Comer (2000) found that there were twelve downtown National Hockey League and National Basketball Association arenas in 1965, and thirty-five in 1997. Overall, this shows that there were twenty-four major league sports facilities in urban downtowns in 1965, compared to fifty-five in 1997, a 146% increase, with the number expected to grow.

Why did this trend occur? While the first half of the Twentieth Century saw city centers as the dominant metropolitan entity, as they were the home of the population majority, retail, and manufacturing, the second half saw a reversal of that trend and suburbanization was a force that could not be contained. As of 2008, 52% of all Americans live in suburbs (Palen, 2008, pp. 142). The suburbs have also consumed the workforce and account for 90% of metropolitan area jobs and workspace (Palen, 2008, pp. 95). The offset to this suburban explosion was the decline of central cities. The jobs and population departure led to vacancy of buildings and city lots, and less tax revenue to improve and maintain infrastructure (Palen, 2008, pp. 237).

As suburbs began to sprawl, consume open space, drain infrastructure, and burden transportation networks, the planning focus shifted back towards city centers. By doing this, metropolitan areas could use existing buildings and infrastructure to absorb growth rather than continue to build further and further outward. In an attempt to revitalize downtowns, cities and planners began to employ public projects to transform blighted city districts. They hoped this would in turn attract private investment in the area and thus turn it into a desirable location for people to live, work, and play. Adult entertainment complexes, particularly sports stadiums and arenas, became popular city projects that were to be the hub of district redevelopment.

Baltimore is one example of this strategy. An area within the city's downtown adjacent to their central business district had been filled with empty rail yards, vacant buildings, and crumbling warehouses, and the city built two new stadiums with the hopes that they would be the catalyst for a district turnaround (Chapin, 2004).

Many other cities built stadiums with the same intentions. Cleveland once had a bustling market district that eventually became a sea of empty buildings and open lots (Chapin, 2004). The city believed moving their sports teams into brand new facilities in this district would give the area the jump start it needed (Chapin, 2004).

The boom continued well into the Twenty-first Century, and wasn't limited to major cities. Wichita, Kansas began building an arena in 2007 in their downtown which they intend to use as the hub of a brand new entertainment district that the city hopes will "draw visitors to the city" and "assist with redevelopment of the core," (Brewer, 2009). In conjunction with this arena, the city implemented their 2007 Arena Neighborhood Redevelopment Plan which will create districts around the arena that promote mixed-use zoning, streetscape and placemaking, and serve as a jumping point to the city's other districts and attractions (Brewer, 2009).

METHODOLOGY

Census data will be used to analyze the success of stadium and arena districts in various categories. The categories reflect particular Smart Growth principles, and the change will represent a period of time before and after the construction of a stadium or arena. The data for the district will then be compared to another city Smart Growth district, and the city as a whole to determine whether or not any changes differ, that is, are changes in stadium/arena districts any different from changes elsewhere in the city. To do this, decennial Census data for 1990 and 2000, as well as American Community Survey data for 2005-2009 was used to determine the change in certain categories. The time period will vary depending on the city to allow a reasonable amount of time for the district to be impacted by the stadium and for that impact to be reflected in census data.

For this research, only major league sports cities were considered. The city must have a stadium or arena in its downtown that was not built where a previous sports facility existed. Cities that have their stadiums outside of downtown, such as Philadelphia, and cities that built new stadiums at the same site as their predecessors, such as St. Louis and Cincinnati, were eliminated. After filtering out those facilities that meet these criterion, three were chosen as case studies.

One of the basic principles of Smart Growth is building a community where people live, work, and play in a single district. The point is to attract people to the area to live instead of continued growth outward away from the core, as well as improve quality of life by reducing commute time by not traveling far for work or for recreation. The analysis in this area will include population and commute time. Population data will be used to indicate

whether or not the district attracted new residents. Commute time will be used as an indicator of work and quality of life with commute times less than fifteen minutes indicating a close proximity of home and work.

Smart Growth seeks to ease the strain sprawl places on infrastructure. To do this, high-density housing, infill development, and re-use of existing structures is encouraged. Data on the number of housing units will be an indicator of infill development, that is, is the available housing in stadium districts outpacing the construction of new housing elsewhere. The number of housing units in each structure will be used to analyze density. High-density housing is a more efficient use of land than less dense single housing units. Those structures with over fifty housing units will be an indicator of high-density, with single units an indicator of low density. An analysis of the year housing structures were built will be used as an indicator of the re-use of existing buildings. An increase in the number of housing units in buildings constructed prior to 1940 will signify conversion of old warehouses, factories, and other abandoned industrial properties into lofts, condominiums, and other living space.

Smart Growth encourages automobile independence. Auto dependency leads to pollution, traffic and congestion, and strains tax dollars with road construction and maintenance. An analysis of the method of commute will be used to indicate whether or not foot, bicycle, and public transit commutes are more frequent in stadium districts. Method of commute will be broken down into three categories: auto, public transit, and foot/bike.

CASE STUDY: COORS FIELD, LOWER DOWNTOWN – DENVER, CO

Analysis

Denver's Lower Downtown (LoDo) had turned into a skid row by the 1980's; it was pedestrian unfriendly, offered no after-work entertainment options, and had vacant warehouses and office buildings caused by an oil recession (Sneider, 1997). In the late 1980's, Denver began to overhaul their downtown and transform it into vibrant mixed-use neighborhoods. The goal was to encourage people to come back to downtown and to develop districts where people can live, work, and play (Sneider, 1997). A series of projects were put in motion to accomplish this, but perhaps the biggest was Coors Field – a stadium for the city's Colorado Rockies baseball team. Coors Field was built on abandoned rail yards at the edge of LoDo and was intended to help speed up the city's plan to transform the surrounding blocks (Merritt, 2007).

With Coors Field opening in 1995, the analysis of Denver will consist of a comparison of data from 1990 and 2000 for Lower Downtown and two other geographical areas: Capitol Hill and the city of Denver. Capitol Hill is another section of downtown Denver which sought to implement Smart Growth principles during the 1990's (Denver Infill, 2004).

The population of LoDo increased by 56.26% from 1990 to 2000 from 2707 residents to 4230 (Figure 1). By comparison, Capitol Hill's population increased by 16.50%, and the entire city of Denver increased by 18.61%.

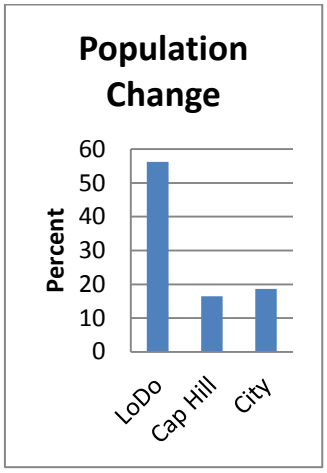

Figure 1. Denver: The change in population from 1990 to 2000.

For quality of life and working near home, the number of LoDo residents who commute less than fifteen minutes to work increased by 56.54%, with an overall rate of 45.82% of district residents experiencing a low commute time Capitol Hill's number of low commutes went up 26.1% and had 31.49% of its residents commute less than fifteen minutes, and Denver's rate went up 3.08% and had 23.72% of residents experiencing low commute time.

The number of available housing units in LoDo increased 51.19% from 2469 units in 1990 to 3733 units in 2000. By comparison, Capitol Hill housing increased by 0.44% and Denver's went up 4.92%. For density, LoDo's high-density housing went up 27.49% from 2150 units in structures with over 50 units to 2741, with such units representing 73.43% of all housing units in the district (Figure 2). Capitol Hill's high-density housing went up 17.17% with 26.88% of all units in high-density buildings. The city's high-density housing went up 13.93% with 12.51% of all units in high-density structures.

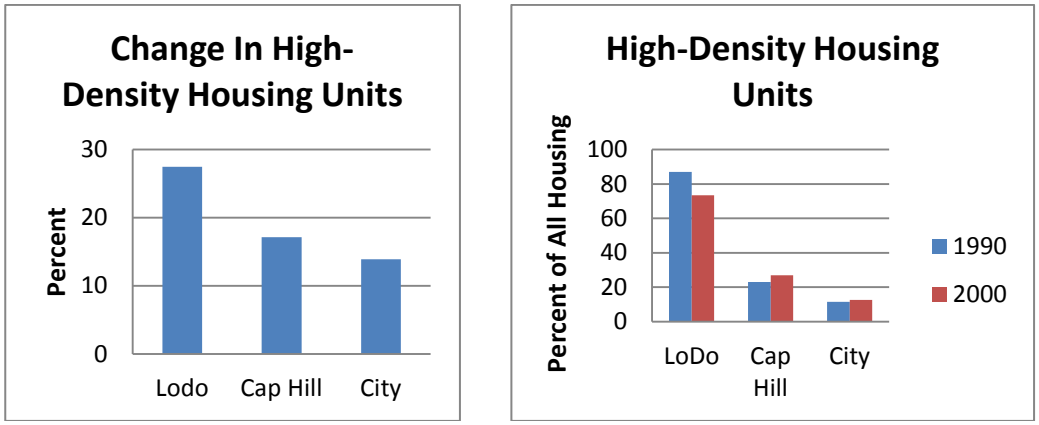

Figure 2. Denver: The change in the number of high-density housing units from 1990 to 2000 (left) and the change in the percentage of high-density housing units (right).

LoDo's single housing unit structures increased 1346.67% from 15 to 217, but accounted for only 5.81% of all housing units in the district. Single unit housing went up 43.47% in Capitol Hill, accounting for 5.35% of all district housing. For Denver, single units increased 6.81% but accounted for 54.96% of all city housing.

For use of existing structures, in 2000 LoDo had 1133 units of housing in buildings built prior to 1940 as compared to 151 such units in 1990. This represents an increase of 650.33%, and accounts for 30.35% of all district housing units. In Capitol Hill, the number of units in older buildings decreased 8.31% but still had 40.9% of all units in old buildings.

Due to LoDo's population increase, the number of commuters of all types increased across the board with auto use increasing 78.35%, public transit use increasing 54.84%, and foot/bike use increasing 60.46%. However, as percentages of all commuters, auto use went up 2.23% with 41.70% of commuters driving to work, public transit use went down 0.89% with 9.88% of commuters taking mass transit to work, and foot/bike commutes went down 2.08% to 40.1% (Figure 3). Capitol Hill showed similar change, with auto use increasing by 44.93% and the percentage increasing 6.49% to 62.95% of commuters driving to work. Public transit use increased 22.68% and foot/bike commutes increased 4.57%, although the percentage decreased 4.31% to 17.74% of commuters walking/biking to work. For Denver city, auto use increased 20.62%, public transit use increased 27.04%, and foot/bike use increased 3.06%. In all cases for the city, the rate of use changed by less than 1%, with auto commutes accounting for 81.92% of all commutes, mass transit 8.28%, and foot/bike 5.30%.

Summary

The increase of all commuting statistics is expected given that population increased in all three geographical areas of study. The increase in LoDo's population was much higher than the other two areas, and so the higher rates of increase in transportation patterns is also expected. Overall, though the numbers increased, the patterns in use did not. That is, the rate of each use saw minimal change. LoDo had the lowest percent of automobile commuters in 1990 and the lowest in 2000. Similarly, LoDo had the highest percent of foot/bike commuters in 1990 and the highest in 2000. So, while there were more public transit and foot/bike commuters, there

were also more auto commuters. Therefore, with regards to transportation, the stadium district did attract more people to it, but did not have an effect on method of commute patterns.

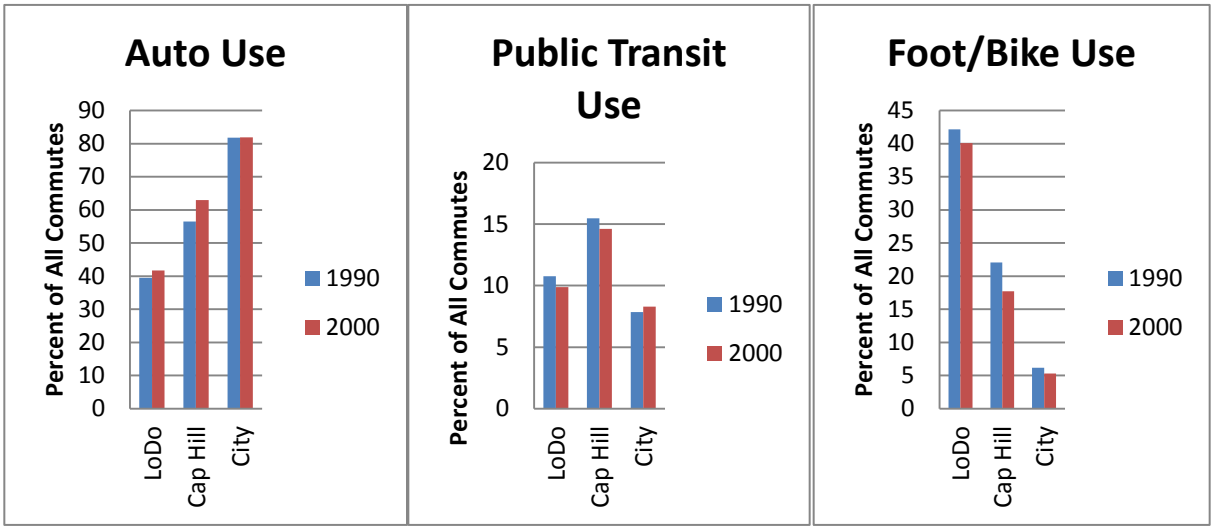

Figure 3. Denver: The change in the percentage of all commutes via auto (left), the change in the percentage of all commutes via public transit (center), and the change in percentage of all commutes via foot or bicycle (right).

Similar to population and transportation, LoDo showed infrastructure increases across the board. To accommodate the increase in population, new housing was constructed at a much higher rate than the other two areas. As such, housing of all density types increased. LoDo had the highest density in 1990 and remained the highest in 2000 despite the decrease in percentage of all housing units that were high-density.

Where LoDo made the most progress was in the re-use of existing structures with a 650.33% increase in the number of housing units in buildings built prior to 1940. Units of this type accounted for 77.7% of all new housing built and went from 6.12% of all housing in 1990 to 30.35% in 2000. Capitol Hill saw a decrease in the number of older housing units, and the city as a whole had only 1% of its new housing units in old buildings.

Overall, the city of Denver experienced growth during the 1990's, but LoDo outpaced it. Population and housing increased, as did all of the sub-categories they influence. Public transit use, high-density housing, and short commute times increased, but so did auto use and low-density housing. Whether or not the city's growth would have impacted LoDo without the stadium is a worthwhile question, but there is no question that the stadium district far exceeded the city's growth in all areas. So, while the stadium district's revitalization happened at a faster rate, the ability to impact Smart Growth factors is mixed. In sum, LoDo did not experience a shift in pre-Coors Field patterns, but rather adapted to them in higher numbers.

CASE STUDY: VERIZON CENTER, PENN QUARTER - WASHINGTON, D.C.

Analysis

North of Pennsylvania Avenue between the White House and the Capitol, Penn Quarter was riddled with drug dealers and prostitutes for the majority of the second half of the Twentieth Century (Faiola and Evans, 1996). The area, which has a stop on the city's subway, tried to make a comeback in the early 1990's, and was finding moderate, but slow success, but in general was still an undesirable area with only one department store and many abandoned buildings (Anders, 1999). One of the heads of a district development firm said of the area that as recently as 1995, "It was real bad…You only came here if you were in the drug trade," (Anders, 1999). It wasn't until the Verizon Center (MCI Center at the time of construction) was built in 1997 that the area began to boom (Anders, 1999). The construction of the arena, which brought the NHL's Capitals and the NBA's Wizards out of their then-current suburban Maryland arena, served as the centerpiece of a comprehensive plan for the district that called for mixed-uses and high-density housing in the streets immediately surrounding the new arena (Anders, 1999).

With Verizon Center opening in 1997, the analysis of Washington, D.C. will consist of a comparison of data from 1990 and 2009 for Penn Quarter and two other geographical areas: Columbia Heights and the city of Washington, D.C. Columbia Heights is a section of downtown Washington centered on a subway stop that employed Smart Growth principles during the late 1990's, specifically transit-oriented development (Menard, 2009).

The population of Penn Quarter increased by 201.95% from 1990 to 2009 from 718 residents to 2168 (Figure 4). By comparison, Columbia Heights' population decreased by 1.5% and the entire city of Washington decreased by 3.04%.

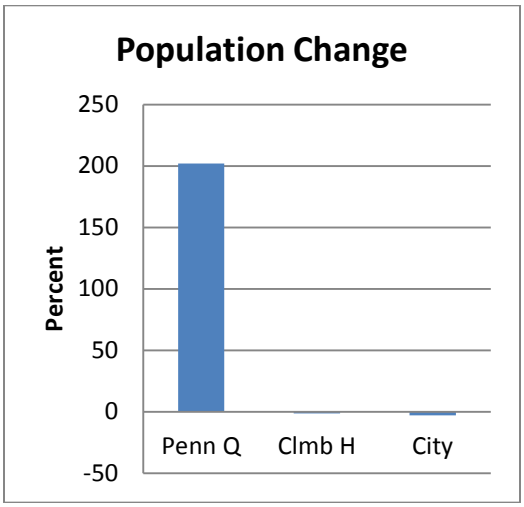

Figure 4. Washington, D.C.: The change in population from 1990 to 2009.

For quality of life and working near home, the number of Penn Quarter residents who commute less than fifteen minutes to work increased by 561.84%, with an overall rate of 30.97% of district residents experiencing a low commute time. Columbia Heights' rate of low commute time decreased 6.28% and had 10.11% of its residents commute less than fifteen minutes, and Washington's rate decreased 20.76% and had 13.79% of residents experiencing low commute time.

The number of available housing units in Penn Quarter increased 561.84% from 284 units in 1990 to 1894 units in 2009. By comparison, Columbia Heights housing increased by 4.76% and Washington's went up 1.83%.

For density, Penn Quarter's high-density housing went up 692.82% from 195 units in structures with over 50 units to 1546, with such units representing 81.63% of all housing units in the district (Figure 5). Columbia

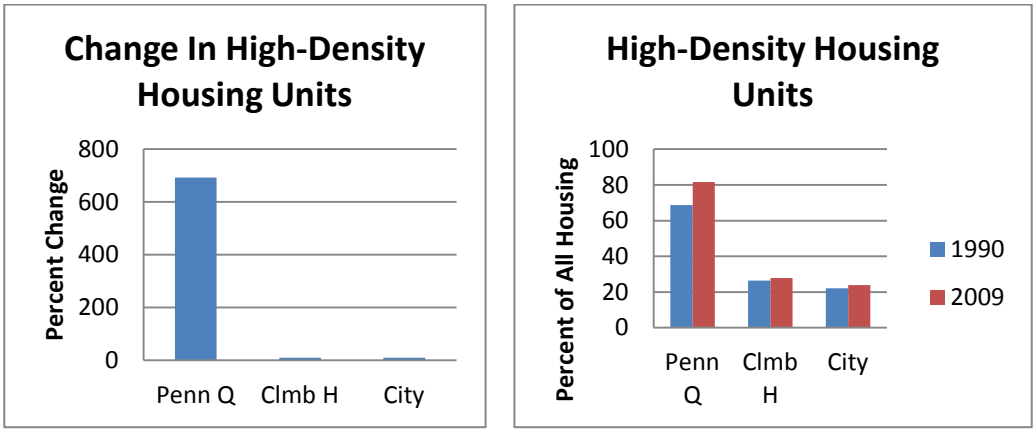

Figure 5. Washington, D.C.: The change in the number of high-density housing units from 1990 to 2009 (left) and the change in the percentage of high-density housing units (right).

Heights' high-density housing went up 10.37% with 27.77% of all units in high-density buildings. The city's high-density housing went up 9.88% with 23.84% of all units in high-density structures. This indicates that Penn Quarter increased its high-density housing at a higher rate and also has a much higher percentage of high-density housing. Penn Quarter's single housing unit structures increased 65.38% from 26 to 43, but accounted for only 2.27% of all housing units in the district. Single unit housing went up 18.77% in Columbia Heights, accounting for 28.94% of all district housing. For Washington, single units increased 5.74% and accounted for 39.48% of all city housing.

For use of existing structures, in 2009 Penn Quarter had 192 units of housing in buildings built prior to 1940 as compared to 56 such units in 1990. This reflects an increase of 242.86%, and accounts for 10.14% of all district housing units. In Columbia Heights, the number of units in older buildings decreased 16.35% but still had 42.08% of all units in old buildings. For Washington, the decrease was 2.9% with 35.91% of all housing units in buildings built before 1940. These numbers indicate that Penn Quarter has less housing in older buildings than the other areas, however the number of old buildings in the district is not available. It should be noted that as of 2009, 72.65% of all housing in Penn Quarter are in buildings built after 1990, a potential indication that vacant lots were utilized.

Due to Penn Quarter's population increase, the number of commuters of all types increased across the board with auto use increasing 1610%, public transit use increasing 295.38%, and foot/bike use increasing 501.1%. However, as percentages of all commuters, auto use went up 14.3% with 21.06% of commuters driving to work, public transit use went down 16.33% with 42.12% of commuters taking mass transit to work, and foot/bike commutes increasing 2.97% to 34.05% (Figure 6). Columbia Heights' population decreased, and so did auto use by 4.47% and public transit use by 2.79%. The auto use rate decreased 4.13% to 31.99% of commuters driving to work and the public transit rate decreased 5.28% with 48.21% of commuters taking mass transit to work. Foot/bike commutes increased 130.04%, and the rate went up 7.10% to 13.37%. Washington also saw a decrease in population and that mostly impacted auto use. Commutes by auto dropped 13.38%, while the other types both dropped by less than 2%.

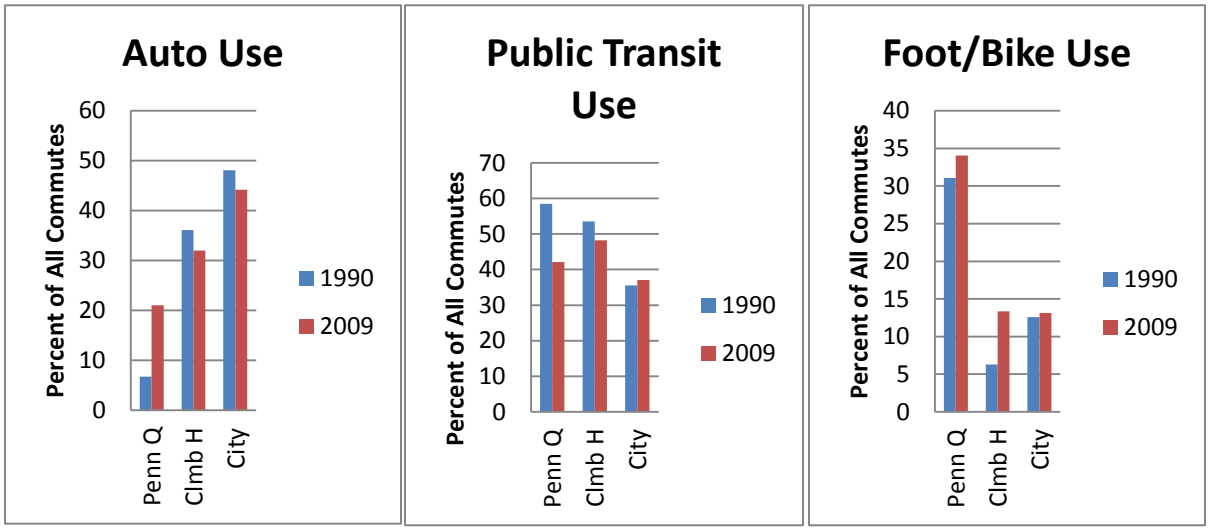

Figure 6. Washington, D.C.: The change in the percentage of all commutes via auto (left), the change in the percentage of all commutes via public transit (center), and the change in percentage of all commutes via foot or bicycle (right).

Summary

The two basest indicators of growth, population and housing, show tremendous growth for Penn Quarter despite small declines for the other two geographical areas of study. As with Denver, though, this growth led to increases across the board in both Smart Growth friendly and unfriendly categories. For example, while public transit and foot/bike commutes increased, so did commutes by auto. In fact, of the overall percentages of use type, Penn Quarter saw an increase in the rate of auto use and a decrease in the other two categories. So, while the numbers went up, the pattern of use shifted away from Smart Growth principles and more towards auto use. When

compared to the other two areas of study, auto use declined and the other two commute categories saw rate increases. So with regard to transportation, the stadium district did attract more people to it, but did not have the desired effect on method of commute patterns.

Similar to population and transportation, Penn Quarter showed infrastructure increases across the board. To accommodate the increase in population, new housing was constructed at a much higher rate than the other two areas. The major success in this area is in density, where Penn Quarter saw a 13% increase the rate of high-density housing. Of all new housing constructed, 84% were in buildings with over 50 units and 99% were in buildings with over 10 units. This took Penn Quarter's rate of high density from 68.6% in 1990 to 81.6% in 2009, and low density from 9.15% in 1990 to 2.27% in 2009. While Penn Quarter had the highest rate of high density in both years, these figures indicate that the trend towards high-density housing is higher in the arena district than the other two areas.

In terms of the housing structures themselves, use of older buildings was, in general, down across all areas. In Penn Quarter, all housing increased, but rather than reusing old buildings, the majority of all housing in 2009 had been built after 1990. This isn't necessarily a negative impact, as new construction is a sign of positive growth for a district and could also mean either the use of previously vacant lots and/or the demolition of derelict older buildings.

In a nearly two-decade span that saw no growth for the entire city, Penn Quarter bucked the trend. Population and housing increased, as did the sub-categories they influence. In sum, the growth reflects positively on the arena district's ability to revitalize during a period of neutrality, if not slight decline, for the city as a whole. While the growth is positive, the Smart Growth results are mixed as density increased, yet so did auto use.

CASE STUDY: PETCO PARK, EAST VILLAGE - SAND DIEGO, CA

Analysis

Unlike other city districts, East Village in San Diego did not suffer because of suburbanization. That is because it was a section of town that was never fully populated or used, but rather was an area for the city's less desirables, such as industry, low income housing, and the homeless (Kayzar, 2008). As such, the area attracted the likes of transients, drug dealers, prostitutes, and petty criminals, as well as industrial noise and truck noise at all hours of the day (Hirsh, 2010). In the late 1990's, the adjacent Gaslamp Quarter had gone through a makeover and was thriving, and developers moved on to look for the next real estate opportunity. At the same time, baseball's San Diego Padres were threatening to leave the city if they didn't get a new stadium (Erie et al, 2010). These two forces led to the construction of a baseball stadium, Petco Park, in East Village as the centerpiece of district redevelopment.

With Petco Park opening in 2004, the analysis of San Diego will consist of a comparison of data from 2000 and 2009 for the East Village and two other geographical areas: Uptown and the city of San Diego. Uptown is a section of downtown San Diego that used to be a retail hub before decentralization, and is trying to revitalize by increasing density and mixing uses (US EPA, 2010).

The population of The East Village increased 60.52% from 2000 to 2009 from 3288 residents to 5278 (Figure 7). By comparison, Uptown's increase was 8.76% and the entire city of San Diego increased by 6.07%.

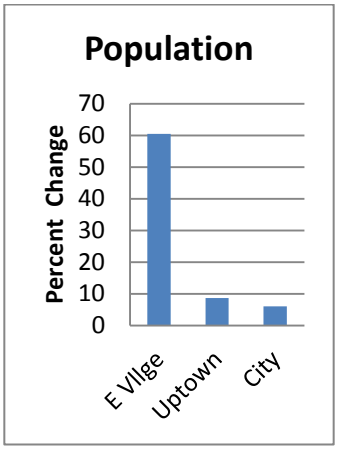

Figure 7. San Diego: The change in population from 2000 to 2009.

For quality of life and working near home, the number of East Village residents who commute less than fifteen minutes to work increased by 368.38% from 117 to 548, with an overall rate of 30.97% of district residents experiencing a low commute time. Despite Uptown's population increasing, in 2009 32.09% of its residents had commutes less than fifteen minutes, the same as in 2000. San Diego's rate increased 6.51% and had 23.48% of residents experiencing low commute time. The East Village saw an increase in the number of short commutes, which is expected given its population growth, but also saw a 9.04% rise in the rate of all commutes shorter than fifteen minutes.

The number of available housing units in the East Village increased 203.9% from 794 units in 2000 to 2413 units in 2009. By comparison, Uptown housing increased by 6.01% and San Diego's went up 6.37%.

For density, the East Village's high-density housing went up 378.11% from 402 units in structures with over 50 units to 1922, with such units representing 79.65% of all housing units in the district (Figure 8). Uptown's high-density housing decreased 7.32% with 12.86% of all units in high-density buildings. The city's high-density housing went up 23.3% with 10.68% of all units in high-density structures.

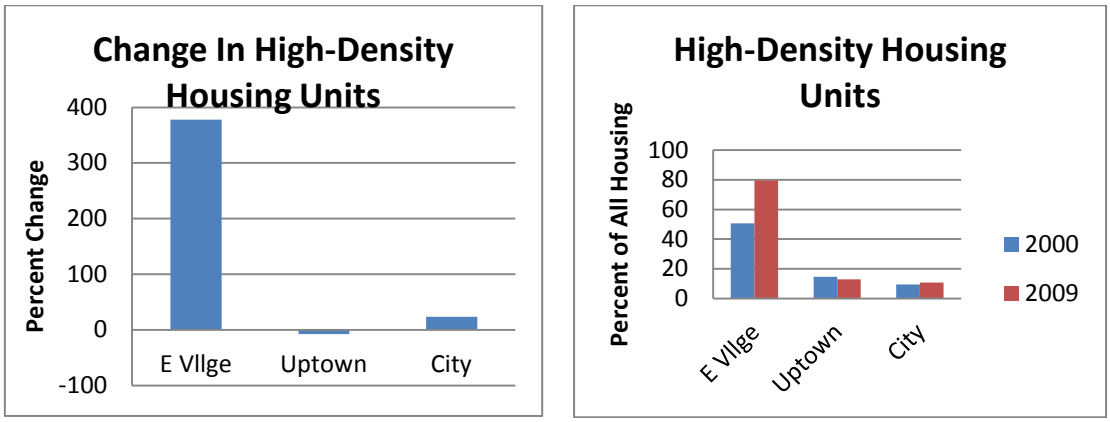

Figure 8. San Diego: The change in the number of high-density housing units from 2000 to 2009 (left) and the change in the percentage of high-density housing units (right).

The East Village's single housing unit structures decreased 12.96% from 162 to 141, and accounted for 4.72% of all housing units in the district. Single unit housing went up 18.47% in Uptown, accounting for 22.83% of all district housing. For San Diego, single units increased 8.69% and accounted for 55.74% of all city housing. The East Village was able to reduce its low density housing despite adding over 1600 new residential units – 93.9% of which were high-density.

For use of existing structures, the East Village saw a decrease in the number of housing units in buildings built before 1940. The East Village had 63 such units in 2009 compared to 161 in 2000, a decrease of 60.87%. Uptown and the city both saw small changes in the number of units in older buildings. These numbers indicate that the East Village has less housing in older buildings than the other areas, however the number of old buildings in the district is not available. It should be noted that as of 2009, 73.27% of all housing in The East Village are in buildings built after 2000, a potential indication that vacant lots were built on.

Due to the East Village's population increase, the number of commuters of all types increased across the board: with auto use increasing 481.37%, public transit use increasing 16.9%, and foot/bike use increasing 37.84%. However, as percentages of all commuters, auto use went up 31.51% with 63.88% of commuters driving to work, public transit use went down 28.07% with 18.46% of commuters taking mass transit to work, and foot/bike commutes decreasing 10.32% to 9.07% (Figure 9). Uptown's population decreased, and so did auto use by 2.68% and public transit use by 12.04%. The auto use rate decreased 1.72% to 79.45% of commuters driving to work and the public transit rate increased 0.34% with 5.35% of commuters taking mass transit to work. Foot/bike commutes increased 1.88%, and the rate went down 0.20% to 6.81%. San Diego city also saw an increase in population. Commutes by auto increased 8%, but the rate stayed the same. The public transit rate went up 4.55% and foot/bike use went down 5.87, with both seeing minor changes in the rate of use. Uptown, and the city as a whole, both saw less than 2% shifts in population patterns – an indicator that the new population fell in line with existing patterns. The East Village, however, saw a sharp increase in auto use and a decrease in the other two commute types.

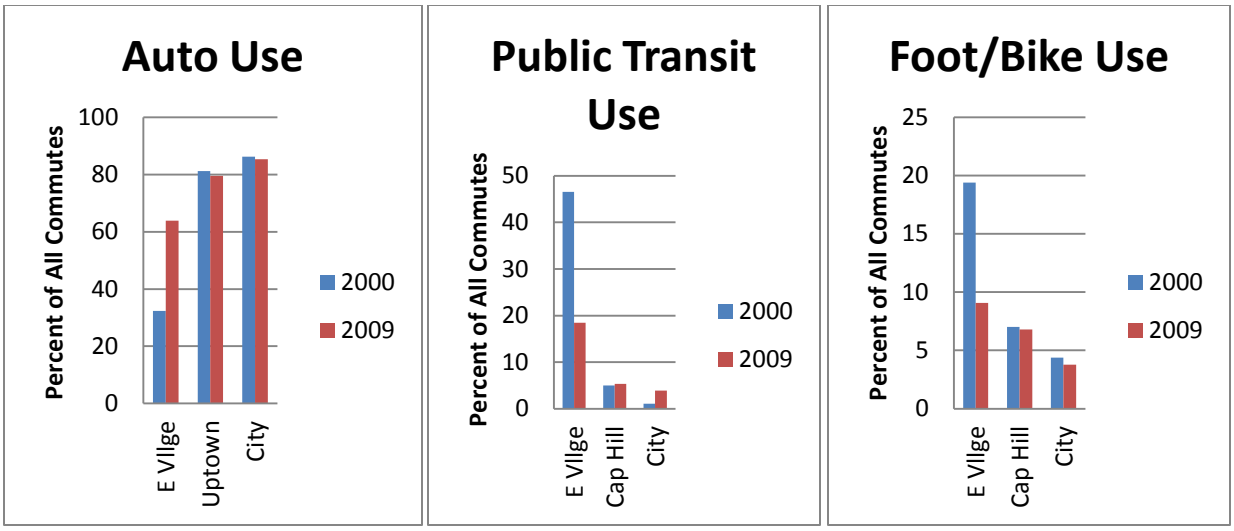

Figure 9. San Diego: The change in the percentage of all commutes via auto (left), the change in the percentage of all commutes via public transit (center), and the change in percentage of all commutes via foot or bicycle (right).

Summary

While Uptown experienced growth in population and housing similar to that of the city, the East Village far exceeded them. As with Denver and Washington, though, this growth led to increases across the board in both Smart Growth friendly and unfriendly categories. For example, while public transit and foot/bike commutes increased, so did commutes by auto. In fact, of the overall percentages of use type, the East Village saw an increase in the rate of auto use and a decrease in the other two categories. So, while the numbers went up, the pattern of use shifted away from Smart Growth principles and more towards auto use. Therefore, with regard to both population and transportation, the stadium district did attract more people to it, but did not have the desired effect on method of commute patterns.

Similar to population and transportation, the East Village showed infrastructure increases across the board. To accommodate the increase in population, new housing was constructed at a much higher rate than the other two areas. The major success in this area is in density, where the East Village saw a 29.02% increase in the percentage of high-density housing and saw a decrease in both the amount and percentage of low-density housing. Of all new housing constructed, 93.9% of the units were in buildings with over 50 units. This took the East Village's rate of high density from 50.63% in 2000 to 79.65% in 2009, and low density from 20.4% in 2000 to 5.84% in 2009. While the East Village had the highest rate of high-density units in both years, these figures indicate that the trend towards high-density housing is greater in the stadium district than the other two areas.

In terms of the housing structures themselves, the trend of negligible change in Uptown and the city, and noticeable change in the East Village continues. In the East Village, all housing increased, but rather than reusing old buildings, the majority of all housing in 2009 had been built after 2000. This isn't necessarily a negative impact, as new construction is a sign of positive growth for a district and could also mean either the use of previously vacant lots and/or the demolition of derelict older buildings.

Overall, the city of San Diego experienced growth during the 2000's, but the East Village outpaced it. Population and housing increased, as did all of the sub-categories they influence. Whether or not the city's growth would have impacted the East Village without the stadium is a worthwhile question, but there is no question that the stadium district exceeded the city's growth in all areas. In sum, while the stadium district's revitalization happened at a faster rate, the ability to impact Smart Growth factors is mixed. Population, housing, density, and new construction increased, but so did auto use.

CONCLUSION

The three case studies indicate that stadium districts can grow and revitalize quicker than other districts. All three stadium districts showed growth greater than that of the comparison district and their city as a whole.

Population and housing both grew at a higher rate in the stadium districts whereas the other district saw change similar to that of the city.

In terms of Smart Growth implementation, the results are mixed. The best results came from indicators of the built environment such as density and housing construction. In all three cases, high-density housing increased, and in two cases, Penn Quarter and the East Village, the percentage of all housing that is high-density increased and the percentage of all housing that is low-density decreased. While this demonstrates the ability of stadium districts to make better use of land, further research should investigate density from a per area perspective, that is, how many housing units per square mile are in a district? This would improve analysis of housing density because although units per building are a good indicator, building size may vary and influence the results.

In housing construction, all three districts saw positive results in different ways. One of the principles of Smart Growth is to make better use of the existing physical features of a city. In LoDo, the success in this area was the conversion of older buildings into living space. In Penn Quarter and the East Village, the success was in new construction altogether, which is not only a sign of growth, but is also a good use of existing power, sewer, and other infrastructure. Constructing new buildings where those things already exist helps to prevent spending money on new infrastructure in sprawling areas where none exists. Furthermore, new construction might also be a sign that previously vacant city lots are being put to use. This not only reduces the blight of a district but is also a more efficient use of space. To that end, statistics measuring a city's vacant lots should be made available and used as a way of determining whether or not a city has reduced its blight and made a better use of space.

Where stadium districts missed the mark is the ability to create neighborhoods where residents can be free from auto-dependence. In all three districts, the rate of auto use increased and the rate of public transit use decreased. One hypothesis for this trend is that new downtown living space becomes desirable and expensive and those with a higher income might be less inclined to take public transit. That would be a topic for further research. Also, New Jersey Transit (1994) stated that people are generally willing to walk up to 15 minutes to metro stops and suggested a radius of a half-mile around metro stops for development. Therefore, further research should consider how much access to public transit a district offers to determine if that influences ridership patterns.

In addition to the above suggestions, there are other areas of Smart Growth that could be investigated if official data were made available. To enhance the idea of Live/Work/Play, data on work location relative to residence would be a helpful statistic in determining proximity of home and work. Also, statistics on "play" options such as restaurants, bars, theaters, and shopping would help indicate the ability of a district to keep its residents from having to go elsewhere for such activities.

Also, a major Smart Growth principle is mixing land uses. Mixed-use zoning is developed so that auto dependency is diminished by making Live/Work/Play within a single district a possibility. Statistics on the percentage of space per use within a district (such as how much office space, retail space, etc) would assist further research in assessing the district's success in creating a mixed-use environment.

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