Churn and change along commercial strips: Spatial analysis of patterns in remodelling activity and landscapes of local business

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Abstract
Commercial strips are common within metropolitan regions throughout the world and particularly within Canada and the USA. Planners have identified these linear clusters of commercial land use as a form of auto-oriented sprawl on the one hand, and as fertile ground for local independent businesses on the other. Despite the rapid churn of businesses in a number of gentrifying central cities, few studies have examined the distribution or cumulative impacts of commercial remodelling or its relationship to larger scale urban transformations. In this research, we demonstrate methods used to identify spatial patterns in central city remodelling activity. Getis Ord Gi*, also known as hot spot analysis, is used to identify clusters of reinvestment activity associated with locally owned restaurant and retail businesses. Associations with differences in urban form are observed, including clustering of independently owned restaurant and retail businesses along areas of commercial strips with smaller lots. Theories on the location of clusters in older buildings are also tested, with mixed results. In addition, we use a Redevelopment Impact Index to capture the degree of external modification to commercial buildings and the nature of changes in building usage. Point density analysis is used to identify areas where commercial remodels are likely to add up to entertainment and leisure zones. The results of statistical tests show some association between proximity to the restaurant and retail clusters and new, mixed use development. Thus, we illustrate methods of examining emerging landscapes of local restaurant and retail business and their relationship to larger scales of redevelopment. This methodology has applications in the study of incubation and retention of local businesses, land use planning and redevelopment along commercial strips, and gentrification studies.

Keywords
commercial strips, existing buildings, gentrification, local business, retail corridors

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Introduction

Commercial strips are common elements in cities throughout the world and they are particularly ubiquitous within the USA and Canada (Ebrahimpour-Masoumi, 2012). Also known as linear or ribbon commercial development (Davies and Baxter, 1997), these corridors consist of adjacent commercial properties developed a single lot deep and oriented toward main streets, arterials and older highways.

Commercial strips can exhibit a variety of urban forms, from one- and two-storey commercial buildings once oriented toward early-20th century streetcar lines, to more recent development patterns that include multi-tenant strip malls and large freestanding big boxes developed to serve customers arriving by car (Liebs, 1995; Longstreth, 1997). While the composition of businesses and characteristics of their urban form may differ according to the era when originally developed and their later evolution, commercial strips share the predominance of lower density, commercial land uses in linear form along transport infrastructure. Policy makers and urban planners often view commercial strips as in need of reform, particularly where they originally developed with an orientation to the automobile, have concentrations of off-street parking and a lack of pedestrian infrastructure, and are missing vibrant public spaces. In contrast, some commercial strips are notable for their orientation to sidewalks, especially where they were developed to serve early streetcar traffic. In multiple forms, commercial strips have been recognised as fertile ground for the incubation and sustenance of local, independent businesses (Davis, 1997; Herbert and Semple, 2001; Jackson, 1970; Linovski, 2012; Loukaitou-Sideris, 1997, 2000, 2002; Minner, 2013; Rankin, 2008). Both can play an important role in providing goods and services to surrounding neighbourhoods, as well as serving larger regional market areas.

During the 1980s and 1990s, many central city commercial strips showed patterns of disinvestment (Loukaitou-Sideris, 1997). In response, Loukaitou-Sideris (1997) called for a coordinated effort among local governments, merchants and community groups to address the decline of inner-city commercial
strips in the USA. She proposed a framework for community economic development, calling for local governments to incentivise merchants in the commercial rehabilitation of exterior façades, rezone strips to allow and encourage mixed use development, among other actions. Local merchants had a role to play in mutual support and joint improvement of public spaces along the commercial strip.

Since the 1990s, there has been significant reinvestment in many central cities and some local governments have embraced policies and plans that are supportive of local businesses. Business improvement districts and other forms of merchants’ organisations have been organised. Some commercial strips are experiencing an increase in property values and investment. In a few places, reinvestment has taken the form of demolition and new mixed use development at higher densities in accordance with public-sector policies oriented toward Smart Growth, New Urbanism and Transit-oriented Development that seeks to retrofit low density areas that developed in a commercial land use pattern that lacks other uses (Dunham-Jones and Williamson, 2009). However, more common than large-scale mixed use redevelopment is the adaptation of existing building stock in the form of remodelling, a process that takes less upfront investment and often enjoys an expedited local government approval process (Minner, 2013).

Along some rapidly changing commercial strips, property and business owners actively adapt properties in response to their immediate economic and social context. Investments are made in response to the commercial parcels around them, the surrounding neighbourhood, and larger forces of social and economic change. Small-scale transformations represent the outwardly visible manifestation of the churn of new businesses along strips and adaptations to draw customers (Davis, 1997; Jakle and Mattson, 1981). Property owners and commercial tenants incrementally modify commercial buildings inwardly and outwardly in ongoing processes of adaptation. On their own, or with the aid of professional architects, landscape architects and other designers, business and property owners redesign landscapes at a site scale. Commercial remodels can add up to highly visible modifications to the urban landscape, potentially producing districts of compatible businesses that are attractive to residents and tourists. We hypothesise in this research that they can create microclimates of investment conducive to larger scales of redevelopment. Planning research often overlooks these small-scale transformations along commercial strips, focusing instead on larger-scale redevelopment in the form of new construction.

The research described in this article tests methods to examine patterns of commercial remodelling activity and their relationship to recent higher density, mixed use development along case study commercial strips in Austin, Texas. Austin is a rapidly growing metropolitan area within the US Sunbelt that has experienced substantial reinvestment within the downtown and surrounding central city neighbourhoods. Along Austin’s central city commercial strips, signs of urban transition and gentrification are quite obvious, taking the form of new upscale, mixed use developments, as well as the much more common adaptation of individual commercial buildings and lots along the strip. In these areas, clusters of remodelling activity appear to be substantially changing segments along commercial strips into newly popular entertainment and leisure zones. Restaurants with celebrity chefs have co-located along boutique retail, thrift shops and locally owned hamburger joints. Older auto service stations with shaded porte-cocheres have been converted into outdoor
bars. New music venues have appeared next to older, established bars that were integral to the development of Austin’s self-proclaimed status as the ‘Live Music Capital of the World’. Meanwhile new mixed use developments are relocating higher income residents along commercial strips, in some cases resulting in the demolition of multi-family apartments that housed working-class residents (Mueller, 2010; Mueller and Stiphany, 2012). The result is a new landscape along Austin’s commercial strips representing substantial socio-economic shifts. These dynamics of reinvestment and gentrification are at once specific to Austin, and also bear resemblance to the dynamics within other cities internationally that are undergoing a similar revalorisation of the central city. Austin’s knowledge and information based economy is part of a larger global network of cities experiencing distinct patterns of reinvestment (Castells, 2010; Tretter, 2015).

This article develops spatial analysis methods to identify clusters of local restaurant, bar and retail clusters in Austin to test the hypothesis that the emergence of entertainment and leisure zones that attract a mix of tourists and local residents, spurs broader impacts along commercial strips. Initially, we hypothesised that reinvestment undertaken by local businesses was adding up to new landscapes integral to larger scale processes of redevelopment and commercial real estate. We sought to understand where this clustering was occurring and to what extent it appears to precede and relate to a larger scale of redevelopment.

In the next section we provide an overview of prior literature related to commercial strips, focusing on calls for reform, observations of strips as incubators for local businesses, and discourses of the creative class and gentrification. A third section describes case study commercial strips in Austin. A fourth section details a classification system for associating building permits according to business type. The next section describes the methods used to identify clusters of local restaurant and retail businesses and their distribution along commercial strips. The following section describes the construction of a reinvestment impact index used to test the hypothesis that a concentration of certain types of remodeling activities occur prior to larger scale mixed use development. The final section concludes with a discussion of the test of this the spatial analysis methodology and its relevance to scholars, policymakers and planning practitioners who wish to understand the distribution of local businesses and of mixed use development, the association of retail corridors with commercial real estate and development activity, and the dynamics of gentrifying commercial strips.

Varied perspectives on the commercial strip

In the 1960s, Blake (1964) wrote of the visual and environmental pollution associated with the cluttered and commercialised landscape of the strip. Likewise, in an article originally published in 1974, Lynch and Southworth (1996) pointed out many of its flaws:

The commercial strip has many deficiencies – its noise, its confusion, its harsh climate, its monotony, its inhospitality to man on foot, its overwhelming ugliness. Strips are among the most ‘polluted’ man-made environment we have. They affect the quality of entire regions because of their extensiveness ... They epitomize the irresponsible use of the public environment for private gain. These endless, formless, eventless, cluttered avenues saturate the urban experience. (Lynch and Southworth, 1996: 579)

This focus on the flaws of the commercial strip are carried through in contemporary urban planning literature focusing on Smart Growth and New Urbanist solutions to
reforming land use and transportation patterns. Common prescriptions for improving areas along commercial strips involve the assembly of parcels, demolition and redevelopment with new compact mixed use development (Dunham-Jones and Williamson, 2009; Tachieva, 2010).\textsuperscript{2} Dunham-Jones and Williamson propose improving commercial corridors to make them perform as better multimodal environments and both large-scale redevelopment and some smaller-scale incremental property improvements to common commercial strip forms such as strip malls. They express a preference for redevelopment over smaller, incremental change. Likewise, Shoup encourages local governments to adopt ‘graduated density zoning’, which would encourage the assembly of smaller parcels for redevelopment at higher density (Shoup, 2008). Other authors propose ‘pulsing’ redevelopment at primary corner intersections along commercial strips to encourage further infill development in between these areas (IFC International and Freedman Tung and Sasaki, 2011; Tachieva, 2010). Other movements in urban planning and design, such as Everyday Urbanism and Tactical Urbanism, focus on smaller interventions aimed at more incremental forms of change (Chase et al., 2008; Lydon et al., 2011) Tactical urbanism, in particular aims to restructure space away from ‘automobility and toward more sociability’ and to reclaim the public realm through walkable urbanism and a mix of land uses that promote interaction and outdoor use of spaces (de Souza e Silva and Frith, 2012: 32).

In between large-scale redevelopment associated with Smart Growth and New Urbanism and temporary, tactical interventions is the everyday turnover of businesses within existing commercial properties and the remodels undertaken to adapt existing buildings and their immediate landscapes. These ‘meso-level’ interventions along commercial strips are often overlooked in the literature of reform. One exception is Tachieva’s (2010) illustrated proposals of the potential for building and parcel-scale retrofits, such as adding corner stores to gas stations and wrapping affordable housing around fast food restaurants.\textsuperscript{3} In addition, there has long been a focus on façade improvement in Main Street programmes within the USA (Robertson, 2004); however, these preservation-oriented programmes are more commonly to downtown areas than along commercial strips.

In contrast to planning literature focused on reform and redevelopment, there is also literature that appreciates commercial strip landscapes as valuable places. This perspective was articulated by JB Jackson, a cultural geographer who counted among strips’ virtues the concentrations of small businesses and spirit of entrepreneurialism. In the 1950s, he aired concerns about the proposed reforms and beautification efforts of planners and policymakers, who he feared might curb the vivacious and entrepreneurial landscape of the strip (Jackson, 1970). Jackson’s writings inspired Learning from Las Vegas, perhaps the most well-known book about commercial strips (Venturi et al., 1977). The book praised the architecture of the Las Vegas Strip, finding that its architectural patterns provided lessons for both architects and the academy. Venturi et al. admonished the design community to look deeper at the strip for inspiration and contrasted the exuberance of the commercial strip with the sterility of high modernism. Focusing on everyday architecture, Davis (1997) observed the constant change along the strip or ‘churn’ of businesses. This happens as both new businesses inhabit the strip and existing businesses remain – both can precipitate commercial remodelling, although it is the influx of new businesses and uses that yields more intensive remodelling. Davis conjured JB Jackson’s values of ‘informality, adaptability, and impermanence, and relative
freedom’ (Davis, 1997: 103) also invoking the *Death and the Life of Great American Cities* (Jacobs, 1961) in calling these commercial strips places of opportunity, diversity and vitality.

More recently, Long (2009, 2010) uses Austin’s burgeoning landscape of restaurant and retail investment, which is primarily within the downtown and central city commercial strips, as a testbed for Richard Florida’s theories of the creative class (2004). Long (2009) quotes Florida extensively on the value of ‘street-level culture’:

> The culture is ‘street-level’ because it tends to cluster along certain streets lined with a multitude of small venues. These may include coffee shops, restaurants and bars, some of which offer performance or exhibits along with the food and drink; art galleries; bookstores and other stores; small to mid-sized theaters for film or live performance or both … The scene may spill out onto the sidewalks, with dining tables, musicians, vendors, panhandlers, performers, and plenty of passersby at all hours of the day and night. (Florida, 2004: 183)

He also relates this to the concept of the ‘experience economy’, a theory that focuses on the role of authentic experiences as a niche product (Pine and Gilmore, 1999). Long (2009) is also critical of theories of the creative economy and the production of urban experiences, which he describes as having spurred negative externalities that include threats to the survival of small businesses in the face of rising property values and redevelopment pressure.

He describes concern among local residents that Austin’s creative reputation and appealing landscapes of entertainment and leisure threaten to ‘commercialise’ and ‘homogenise’ the city through both new development and national retail chains. This suggests gentrification as both outcome of clusters of restaurant and retail businesses along commercial strips, and also a threat to some of the same local businesses.

In a related vein, Loukaitou-Sideris (2000, 2002), Linovski (2012), Davis (1997) and Rankin (2008) have argued of the value of commercial strips as areas of immigrant entrepreneurial activity, pointing also to the vulnerability of local business to pressures of gentrification and displacement. Rankin and McLean (2015) find commercial streets to be important to making the city ‘accessible to vulnerable and marginalized groups’ (p. 216). They located threats to these commercial streets in planning and real estate agendas, including visions of new condominiums and ‘green’ and ‘creative’ developments. Hackworth and Rekers (2005) describe how the promotion of ethnic businesses and identity along commercial strips have been used to fuel the residential real estate market in surrounding neighbourhoods. Other scholars have written more generally of commercial gentrification, where clusters of successful local businesses have been displaced by rising costs, new development and chain stores (Carr and Servon, 2009; Long, 2009, 2010). Zukin et al. (2009) describe the process of ‘boutiquing’ or the rise of retail outlets and restaurants catering to an upscale clientele. Longstanding businesses may be directly displaced as older buildings in which they have long relied are demolished and new mixed use developments build higher rent commercial spaces in gentrifying neighbourhoods. Older businesses may also find their customer base dwindling as a neighbourhood changes and as the orientation of surrounding businesses changes to a new demographic group; vulnerable racial, ethnic and working-class groups may feel alienated from a once comfortable and cherished business districts. This process is conceptually related to Davidson and Lees (2005) research on ‘new build gentrification’ as well as the aforementioned work more specific to commercial gentrification. ‘New build gentrification’ involves ‘middle-class resettlement of the central city, the
production of a gentrified landscape, and lower income displacement in the adjacent residential communities’ (Davidson and Lees, 2005: 1169). Later in the article, we expand on this definition, expanding it to include the local businesses in leased spaces that could be displaced because of higher rent mixed use development.

A few other studies have used statistical and spatial analysis methods to explore the relationship between the location of local businesses and urban fabric. The Preservation Green lab, the National Trust for Historic Preservation’s research wing, studied neighbourhoods in Seattle, San Francisco and Washington, DC, identifying clusters of smaller and older buildings that house concentrations of local businesses (National Trust for Historic Preservation, 2014; Powe et al., 2016). Results indicated that a mix of old and new buildings have greater population density and more small business per square foot than areas with newer, larger buildings. Civic Economics (2011) used credit card data to identify local businesses at both county and neighbourhood level in 15 American cities. The research set out to show how clusters of independent businesses contribute economically to cities. Additionally, Sung et al. (2015) tested Jane Jacobs’s (1961) theories of building age and walkability, and found evidence that older, smaller buildings make them more likely to be ‘a good fit for small enterprises (Sung et al., 2015: 128)’ and also increased the probability that people will walk rather than drive. The implication of each of these studies is that synergistic, small business districts can lead to important outcomes associated with vitality and urban employment and they thrive within certain areas of the city with smaller, older buildings.

Despite these promising areas of scholarship, we found no other studies that use spatial analysis methods to study the cumulative impact of remodelling activity associated with concentrations of local businesses. This research builds from aforementioned themes in the literature, as well as prior research that examines how local businesses incrementally adapt existing buildings and urban fabric (Minner, 2013). This research takes these studies a step further, by examining the scale of reinvestment in existing buildings with redevelopment, as well as testing new spatial analysis methods to identify aforementioned clusters of small businesses and how their individual remodelling actions may add up over time. Austin is a particularly valuable case study, given its rapid social and economic change and public policies related both to redeveloping commercial strips with new development and fostering small business.

**Overview of selected case study commercial strips**

The development of Austin’s commercial strips beyond downtown began with the extension of street car lines that connected the downtown with newly constructed residential neighbourhoods. These commercial strips grew and flourished, serving both populations travelling by automobile through the area and the residents of large residential tracts of housing constructed at the urban fringe during the mid-20th century. Although growth along commercial corridors has continued to sprawl at a rapid pace, this study is concentrated on central city commercial corridors located outside of Austin’s central business district, but within the central beltway highway.4

Case study commercial strips were selected running north and south (Figure 1) that had been identified as ‘major transit corridors’ in the City of Austin’s Imagine Austin comprehensive plan (City of Austin, 2012). Revised plan maps described these corridors as areas for ‘high capacity transit’ (City of Austin, 2016). Along these corridors
the City of Austin planned to prioritise transit improvements and adopt higher density and mixed use zoning that is supportive of transit. Barton Springs Road, which runs east–west was included, because it was also designated a major transit corridor and had

Figure 1. Case study corridors and location of commercial and mixed use land use.
both reinvestment in existing buildings and new, mixed use development. Each case study commercial strip had somewhat unique physical attributes, business mix and social context. For instance, South Congress Avenue had some of the oldest commercial buildings associated with an early streetcar line. South First Street had a greater number of residential buildings mixed in with commercial buildings and smaller lots, while commercial development along Airport Boulevard, Burnet Road and South Lamar began later and contained much larger lots. All of the strips that run north–south followed the pattern of smaller parcels closer to downtown with increasing average size as one moves further away from the central business district.

Table 1 provides an overview of some of the key attributes of each of the case study commercial strips, including length, width, and lanes associated with roadways, the size of the lots along them, the average age of primary commercial structures and the number of remodel permits along them for the time period studied. These data provide a sense of the differences between the commercial strips and the variability in building age.

### Building permits as reinvestments associated with business types

Building permits were selected that are associated with remodelling activity in existing buildings within 500 feet (152.4 m) of case study corridors. This buffer area is large enough to include buildings that are substantially set back from the street, but small enough to capture remodelling activity primarily located along the commercial corridors. Only permits associated with commercial uses were analysed. Instances of reinvestment in existing buildings were coded several ways for the years 2003–2014. Codes and descriptions of businesses and land uses in the building permit shapefiles were used in conjunction with Google Streetview; ReferenceUSA, a database of business information; and Loopnet, an online real estate database in next steps. An important caveat in relying on building permits is that many incremental changes either do not require building permits or occur illegally, without obtaining a permit. This research relies on the assumption that building permits are reasonably representative of the types and spatial extent of remodelling activities.

In a first step in the coding process, building permits were coded into four Business Types associated with the type of business that would inhabit the remodelled space. The business types were: Group 1: Tourist-oriented Hotels and Motels; Group 2: Locally owned Restaurant, Retail and Leisure; Group 3: Local/Regionally oriented Services and Institutions; Group 4: Other Businesses: National Chains, Auto Sales and Services, Pawn and Loan (see Table 2).

The categories were created to capture observations in both scholarly and popular literature about the appeal of locally owned businesses in Austin, especially restaurants and bars, which are identified as contributing to an ‘authentic, sense of place’ integral to the characteristics many local residents and tourists value about Austin (Alexander, n.d.; Long, 2010). Two of the categories were based on the degree to which they serve a tourist population (Group 1: Tourist-oriented Hotels and Motels) versus serving a local population (Group 3: Local and Regionally Oriented Services and Institutions.) Two additional categories have mixed tourist and resident serving markets – Groups 2 and 4.

Group 2 consists of restaurant, retail, bar and other leisure businesses that are locally owned and appeared to have a mixed tourist and resident customer base. Music venues, which are associated with an internationally known festivals South-by-Southwest and the
Table 1. Comparison of case study commercial strips.

<table>
<thead>
<tr>
<th></th>
<th>Airport Boulevard</th>
<th>Barton Springs Road</th>
<th>Burnet Road</th>
<th>Guadalupe Street</th>
<th>North Lamar</th>
<th>South Congress</th>
<th>South First</th>
<th>South Lamar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of study area (mile)</td>
<td>2.69 Major Arterial</td>
<td>1.27 Minor to Major Arterial</td>
<td>2.96 Major Arterial</td>
<td>1.26 Major Arterial</td>
<td>3.15 Major Arterial</td>
<td>2.69 Major Arterial</td>
<td>2.57 Minor Arterial</td>
<td>3.18 Major Arterial</td>
</tr>
<tr>
<td>Road classification</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Street width (feet)</td>
<td>100 6 lanes</td>
<td>66 4 lanes to 6 lanes</td>
<td>53 4 lanes with two-way centre turning lane</td>
<td>60 4 lanes with two-way centre turning lane</td>
<td>53 4 lanes with two-way centre turning lane</td>
<td>60 6 lanes to 4 lanes with two-way centre turning lane</td>
<td>40 4 lanes with two-way centre turning lane</td>
<td>60 6 lanes to 4 lanes with two-way centre turning lane</td>
</tr>
<tr>
<td>Number of lanes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On street parking</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Back angle parking and parallel parking along limited number of segments to the north (closer to downtown)</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Number of lots within 500 feet</td>
<td>580</td>
<td>178</td>
<td>748</td>
<td>423</td>
<td>489</td>
<td>525</td>
<td>699</td>
<td>563</td>
</tr>
<tr>
<td>Average lot size along corridor (sq. ft)</td>
<td>24,946.6</td>
<td>47,945.7</td>
<td>24,975.7</td>
<td>26,397.1</td>
<td>50,915.9</td>
<td>35,969.6</td>
<td>23,462.6</td>
<td>33,769.7</td>
</tr>
<tr>
<td>Average lot size along corridor (acre)</td>
<td>0.5727</td>
<td>1.1007</td>
<td>0.5734</td>
<td>0.6060</td>
<td>1.1689</td>
<td>0.8257</td>
<td>0.5386</td>
<td>0.7752</td>
</tr>
<tr>
<td>Minimum lot size along corridor (sqft)</td>
<td>1021.6</td>
<td>1296.6</td>
<td>796.3</td>
<td>561.8</td>
<td>1208.7</td>
<td>376.8</td>
<td>46.8</td>
<td>35.8</td>
</tr>
<tr>
<td>Minimum lot size along corridor (acre)</td>
<td>0.0235</td>
<td>0.0298</td>
<td>0.0183</td>
<td>0.0129</td>
<td>0.0277</td>
<td>0.0087</td>
<td>0.0011</td>
<td>0.0008</td>
</tr>
<tr>
<td>Maximum lot size along corridor (sq. ft)</td>
<td>994,006.3</td>
<td>1,195,517.3</td>
<td>1,861,593.5</td>
<td>3,089,925.0</td>
<td>3,089,925.0</td>
<td>2,726,429.8</td>
<td>2,726,429.8</td>
<td>814,800.6</td>
</tr>
<tr>
<td>Maximum lot size along corridor (acre)</td>
<td>22.8192</td>
<td>27.4453</td>
<td>42.7363</td>
<td>70.9349</td>
<td>70.9349</td>
<td>62.5902</td>
<td>62.5902</td>
<td>18.7052</td>
</tr>
<tr>
<td>Average age of commercial properties along corridor (years)</td>
<td>60</td>
<td>52</td>
<td>59</td>
<td>73</td>
<td>53</td>
<td>62</td>
<td>57</td>
<td>58</td>
</tr>
<tr>
<td>Number of remodels</td>
<td>188</td>
<td>322</td>
<td>383</td>
<td>202</td>
<td>463</td>
<td>606</td>
<td>395</td>
<td>527</td>
</tr>
</tbody>
</table>
Austin City Limits Music Festival and attract tourists as well as local residents, are included in this group. Not coincidentally, many of the businesses in this group are likely to be associated with the tastes of middle- to upper-income residents and tourists, as suggested in recent literature (see Rankin and McLean, 2015). However, this is not exclusively the case. Group 3 consists of banks, offices, catering, recording studios, non-profit/educational, and other personal services. Group 4 consists of gas stations, auto sales and service, corporate drive-through fast food restaurants, and general merchandise and discount stores. Reinvestment associated with Group 4 is more likely to reinforce the role of the commercial strip as a landscape of national chains and franchises, which we hypothesise as being less conducive to generating experiences perceived as ‘authentic’ and specific to the region. In this study we specifically focus on the power of locally owned restaurant and retail businesses to draw larger scales of reinvestment.

Reinvestment in existing buildings from 2003 to 2014 are depicted in Figure 2 for the four business groups. The distribution of Group 1 remodelling along case study commercial strips shows investments in existing hotel and motel buildings close to downtown and along South Congress. Remodelling associated with this business type comprises only 1.4% of the total remodelling activity. Patterns of reinvestment by Group 2, 3 and 4 business types are hard to discern with the naked eye without additional pattern identification tools. These tools are used in the next section. Remodelling in locally and regionally oriented services and institutions (Group 3) comprises the greatest proportion (50.3%) of commercial remodelling activities. The second highest proportion of commercial remodels is in locally owned restaurants, retail and leisure businesses (25.5%). This activity is hypothesised to be associated with clusters of synergistic businesses and to have the potential to play a special role in commercial real estate development in creating a distinct sense of place along a commercial strip and a microclimate conducive to larger scale redevelopment in the form of higher density, mixed use

<table>
<thead>
<tr>
<th>Business group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1: Tourist-oriented Hotels and Motels</td>
<td>Remodelling activity associated with hotels and motels that are oriented toward tourists</td>
</tr>
<tr>
<td>Group 2: Locally owned Restaurant, Retail and Leisure</td>
<td>Remodelling activity associated with locally owned restaurants and bars, clothing stores, art galleries, mini-golf course; locally owned fast food (chains solely in local region or within Texas)</td>
</tr>
<tr>
<td>Group 3: Local/Regionally oriented Services and Institutions</td>
<td>Remodelling activity associated with banks (other than pawn and loan), offices, catering, recording studios, funeral services, non-profit/educational, personal services</td>
</tr>
<tr>
<td>Group 4: Other Businesses: National Chains, Auto Sales and Services, Pawn and Loan</td>
<td>Remodelling activity associated with national chain and franchise retail, restaurants, grocery; pawn and loan; auto repair, gas stations, convenience stores</td>
</tr>
<tr>
<td>Not analysed</td>
<td>Remodelling in existing multi-family apartment and vertical mixed use buildings, and telecommunications equipment upgrades</td>
</tr>
</tbody>
</table>
development. Meanwhile, Group 4 remodels represent 22.8% of all commercial remodels along the case study commercial strips.

Figure 3 illustrates a few types of building remodels along one of the case study commercial strips, focusing on examples of Group 2 remodels. The images are selected from Google Streetview. The first series of panels showing 1193 S Lamar Blvd for the years 2007, 2008, 2011 and 2015 (top row) an empty auto garage building is converted over the years to a building that simulates the conversion of a residential building to a commercial building. The new inhabitant of the building is the Gibson Bar. By 2015, the substantially remodelled building has an addition, an outdoor seating area, new landscaping and a mobile food truck that is a probably a second commercial tenant, renting part of the lot. Both the conversion in building usage and outdoor remodelling affect the surrounding streetscape and are indications of the conversion from auto-serving business to a bar and restaurant that would be more conducive to creating a desirable sense of place along the strip.

The next series of photographs of 1509 S Lamar for years 2011, 2013, 2014 and 2015, show a large L-shaped strip mall with a centre parking lot. All but one building was razed by 2013. The one building that remains is an anchor tenant called the Alamo Drafthouse that is a theatre chain that serves alcohol and food. It was once a local, independent businesses that has since grown into a national chain. The theatre was remodelled for the anchor tenant, but the rest of the strip mall was demolished and redeveloped as a vertical mixed use project. By 2015, one can see an internal road that leads to the Alamo Drafthouse. Commercial tenants are located along this new internal right of way. The tenants that were once housed in the rest of the strip mall have since moved to other locations that have cheaper rent and were replaced with commercial tenants that have the look and feel of local businesses, but in some cases are national chains (e.g. Shake Shack). The third series in Figure 3 shows an old auto service station that is stripped down and converted to another bar. Like 1193 S Lamar, there are modifications to the lot to allow for outdoor seating and a food truck is also located out front. In the fourth set of photos, a small building that is attached to a multi-tenant strip mall is also stripped down for the conversion from a chiropractic clinic to a bar. Parking spaces at the front of the building are removed for outdoor seating.

The conversion of the building in terms of building usage and remodelling activity can be observed along many Group 2 businesses. As noted above, Austin has a reputation for live music and the conversion of general commercial and office uses to bars has been widely noted along the corridors. There are also indications that these remodels and the influx of bars and other related uses has significant ‘proving’ power that attracts developers to scale up to larger development. The next section describes an index created to measure clusters of use and remodelling activity that may add up to both significant shifts in orientation (e.g. synergistic restaurant and retail businesses more conducive to walking and outdoor activities, and distinctive, creative storefronts that contribute to a sense of place) and that have the potential to lead to an increasing level of reinvestment in the form of mixed use development.

**Hot spots of reinvestment associated with locally owned restaurant, retail and leisure businesses**

To more clearly identify and measure cumulative clusters of remodelling activity associated with Group 2 bars, restaurants and retail along the corridors, a Getis Ord Gi* analysis was performed using an ‘optimised hot spot
tool’. The Getis-Ord Gi* is a ‘local’ statistic, in other words, the results can be mapped to show clusters, in contrast to ‘global’ statistics that yield a single result for the entire study area. This spatial analysis tool is most often used to measure clusters of either high values

Figure 2. Building permits displayed by associated Business Group along case study commercial strips.
or clusters of low values in neighbouring polygons, for instance within census tracts and block groups, neighbourhoods or other similar geographic units. In ArcGIS 10.3, modifications to the available spatial analysis tools allowed the use of hot spot analysis to measure areas where there is a higher intensity of spatial features, in this case we used it to examine the intensity of building permits for instances of reinvestment for the years 2003 to 2014. Optimised hot spot analysis identifies areas of both high concentration and low concentration of reinvestment. It indicates whether clustering is statistically significant. The boundary for the analysis was defined as 500 feet area around selected commercial corridors. Since each case study corridor has unique physical attributes and business mix we performed hot spot analysis for each corridor separately and present the result in a composite map (Figure 4).

Significant clusters were identified along South First St, the northern end of South Congress Ave., near the southern end of Burnet Road and Guadalupe Street. Reinvestment activities along South and North Lamar Blvd are distributed relatively evenly. Since the grid or fishnet is created by calculating the average distance to nearest points, its size is an indicator of the density of permits along each corridor. South Congress Avenue and Guadalupe Street have smaller grids, which means there are more Group 2 reinvestment activities per square foot along these two corridors over the past decade. Though the large size grids along South First Street and Burnet Road indicate a lower density of reinvestment activity, the clusters show that those reinvestments, despite the low average density, were still very concentrated.

There were not enough instances of Group 2 reinvestments along either Barton Springs Road or Airport Boulevard to perform hot spot tests along those strips.

Figure 3. Examples of remodelling associated with locally owned restaurant, retail and leisure businesses along South Lamar Boulevard.
Figure 4. Results of Group 2: Locally owned Restaurant, Retail and Leisure businesses hot spot analysis.
Barton Springs Road is a shorter stretch of road with fewer buildings. This commercial strip is known for its restaurant row that appeals to locals and tourists, but much of the reinvestment and remodelling may have occurred before the window of analysis and undertaken by fewer businesses than along other strips. In contrast, Airport Boulevard is a much longer strip, is farther and more disconnected from Austin’s downtown, and has few tourist-oriented businesses.

Most of the hot spots correspond with the locations of merchant’s associations. These include Independent Business Investment Zones called IBIZ Districts, which were organised by a non-profit organisation called the Austin Independent Business Alliance (AIBA). IBIZ Districts must meet certain criteria intended to reinforce ‘synergy’ among merchants. The districts must contain over 75% locally owned businesses and have active merchant participation. Although these criteria do not require a linear form, all of them have been organised along street frontages, which reflects the geography of local business outside of Austin’s central business district. There is an additional merchants’ association along South Congress Avenue that is comprised primarily of local businesses, but is not affiliated with the AIBA and is not an IBIZ district. Neither the IBIZ districts, nor the South Congress Avenue merchants association provide incentives or specific resources for remodelling of buildings. These districts are more indicative of joint marketing, the organisation of street festivals, and informal forms of mutual support among merchants. There is no formal mechanism or funding source to support the commercial remodelling activities of Group 2 businesses.

Along South Congress Avenue, as well as other case study commercial strips, the further one travels away from the downtown the more recent the vintage of commercial building and the larger the parcel. The hot spot of remodelling associated with Group 2 business mostly occurs in the inner end of the corridors where there is a cluster of small sized parcels. To test the relationship between building age and diversity and the location of the hot spots, we examined the average age and standard deviation for the buildings within hot spots at a 95% confidence level compared with the same statistics for the entire corridor (Figure 5). The standard deviation was used as an indicator of building age and diversity, factors that Jane Jacobs identified as important to the location of small businesses (Jacobs, 1961; National Trust for Historic Preservation, Preservation Green Lab, 2014; Powe et al., 2016; Sung et al., 2015). When examining statistics for all three corridors together, the average age of buildings and their diversity in age is greater within hot spots (Table 3).

However, along individual corridors, we found the average age of buildings in the hot spot on Guadalupe to be lower than the average for the entire corridor and the standard deviation to be lower. Not surprisingly, the appearance of hot spots of remodelling activity among restaurant and retail clusters is not simply a function of building age.

### Impacts of change of use and remodelling type

The next step was to examine not only the distribution of remolds, but differences in the types of remodelling activity. Two typologies were created to capture the degree of change through remodelling – the Change of Building Use and Remodelling Type continuums (Table 4). The Change of Building Use continuum describes the extent to which a change of building usage associated with a building permit impacts the overall mix of businesses along the commercial strip. High impact changes include a change of building usage from single-family residence to a Group 2: restaurant, retail, and leisure business. Medium Impact Change of
Use consists of building usage changes from either a Group 3 or Group 4 business (that we hypothesised was less conducive to creating a specific sense of place), to building usage associated with a Group 2 businesses. A Low Impact Change of Use included changes within multi-tenant strip malls that represented only small variations to established uses. A ‘Change of use toward auto-oriented building usage’ describes changes in use that we thought were likely to require car travel among customers (e.g. change to sale of larger merchandise or a restaurant that changed from full service to take out).

The Remodelling Impact continuum echoes this type of ranking, but specifies the amount of physical change associated with a building permit. High Exterior Impact consisted of remodelling activity such as the addition of an outdoor patio, addition to the building, or façade improvements such as canopies that we hypothesised would add up to a changed streetscape more conducive to outdoor recreational activities such as dining outdoors on sidewalks or patios or more generally strolling between businesses. Medium impact included permitted changes to the interior of buildings. We theorised that for restaurant, bar and retail, these modifications to the interior of ‘third spaces’ (Oldenburg, 1989) might still have an effect on the experience of the public, even if the impacts were associated with interior spaces. Low impact changes consisted of repairs, mostly to roofs and HVAC systems that are associated with routine maintenance or upgrading of building systems. Like the change of use spectrum, a ‘Remodelling toward auto-oriented site configuration’ consisted of changes that were likely to remove aspects of walkability and increase orientation to the automobile, such as the removal of landscaping or patios for additional parking spaces.

### Table 3. Building age and diversity along corridors compared with areas in hot spots of remodelling activity.

<table>
<thead>
<tr>
<th>Corridors with hot spots</th>
<th>Commercial building age along entire length of corridors</th>
<th>Commercial building age within 95% hot spot</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All three corridors</strong></td>
<td>Average age 50</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Average year of construction 1966</td>
<td>1956</td>
</tr>
<tr>
<td></td>
<td>Range 1887 to 2014</td>
<td>1887 to 2013</td>
</tr>
<tr>
<td></td>
<td>SD 19.9</td>
<td>26.1</td>
</tr>
<tr>
<td><strong>South Congress Avenue</strong></td>
<td>Average age 54</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>Average year of construction 1962</td>
<td>1947</td>
</tr>
<tr>
<td></td>
<td>Range 1887 to 2013</td>
<td>1887 to 2013</td>
</tr>
<tr>
<td></td>
<td>SD 24.3</td>
<td>28.7</td>
</tr>
<tr>
<td><strong>South First Street</strong></td>
<td>Average age 50</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Average year of construction 1966</td>
<td>1973</td>
</tr>
<tr>
<td></td>
<td>Range 1909 to 2012</td>
<td>1944 to 2010</td>
</tr>
<tr>
<td></td>
<td>SD 21.2</td>
<td>19.4</td>
</tr>
<tr>
<td><strong>Guadalupe Street</strong></td>
<td>Average year of construction 62</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>Average 1954</td>
<td>1959</td>
</tr>
<tr>
<td></td>
<td>Range 1909 to 2009</td>
<td>1933 to 1993</td>
</tr>
<tr>
<td></td>
<td>SD 22.3</td>
<td>14.0</td>
</tr>
</tbody>
</table>
Figure 5. Commercial properties by year built date.
These rankings were combined to create a Reinvestment Impact Index that was applied to permits associated with Group 2: Locally owned Restaurant, Retail and Leisure. We mapped the Reinvestment Impact Index by visually representing the impact with point density maps. Point density maps create a raster surface that indicates density and change across a larger area.

In addition to these trends and spatial patterns detailed below, the process of coding building permits helped us to qualitatively identify potential patterns among building permits. For instance, we observed that older, existing businesses often had repairs, such as reroofs, that had a more limited impact than remodelling activities among new businesses. We also observed some newer businesses investing incrementally in improvements over several years. Some new businesses invested in improvements right before they closed. This could be interpreted as either motivation to improve their facilities in order to improve profitability, or it might be that in some cases property owners may have engaged in improvements in anticipation of new businesses.

Figure 6a shows the density of high impact changes of use. Figure 6b shows the remodelling impact scores. The combination

<table>
<thead>
<tr>
<th>Remodeling Impact Continuum</th>
<th>Change of use toward auto-oriented building usage (−1)</th>
<th>No change of use (0)</th>
<th>Low impact change of use (1)</th>
<th>Medium impact change of use (2)</th>
<th>High impact change of use (3)</th>
<th>Sum of permits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remodeling toward auto-oriented configuration (−1)</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>No remodelling (0)</td>
<td>0</td>
<td>17a</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>26</td>
</tr>
<tr>
<td>Low impact/repairs (1)</td>
<td>0</td>
<td>67</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>69</td>
</tr>
<tr>
<td>Interior only (2)</td>
<td>2</td>
<td>141</td>
<td>20</td>
<td>58</td>
<td>25</td>
<td>245</td>
</tr>
<tr>
<td>High exterior impact (3)</td>
<td>0</td>
<td>69</td>
<td>1</td>
<td>8</td>
<td>34</td>
<td>112</td>
</tr>
<tr>
<td>Sum of permits</td>
<td>2</td>
<td>295</td>
<td>22</td>
<td>75</td>
<td>60</td>
<td>454</td>
</tr>
</tbody>
</table>

Note: aSome of the building permits coded as ‘No change of use’ and ‘No remodelling’ are for work completed, but previously unpermitted; reinvestment happened in an unspecified prior year and therefore was not counted in the analysis. It also includes permits for name changes to businesses that have no land use change or physical impact. There are also a few temporary music venue permits that were not counted as they do not constitute permanent land use or physical changes.
of these effects is showed in Figure 6(c). Three panels (6d, e and f) show closer views of major mixed-use projects with the reinvestment impact scores in proximity. These were constructed primarily within areas that have a higher Reinvestment Impact Index scores with a few exceptions. In the next section, we describe additional statistics to test that relationship.

**Remodelling clusters and large-scale redevelopment**

With the hypothesis that small, incremental changes could be integral to large-scale transformations associated with redevelopment, we expected to observe concentrations of Group 2 reinvestments with a higher Reinvestment Impact score occurring prior to and in proximity to the construction of large-scale mixed use development. To test this, we selected building permits associated with new construction of mixed use development developed in the years 2009 (N = 1), 2010 (N = 1), 2011(N = 3), 2012 (N = 4), 2013 (N = 2) and 2014 (N = 5), and compiled all of the Group 2 building permits for remodeling activity in years 2003–2014 (Table 5). We calculated the number of Group 2 reinvestment permits per square feet within 150 feet of new mixed use development for each year. By comparing the Reinvestment Impact Index in proximity to new, mixed use development to the value of the Index along the whole corridors, we tested whether or not a concentration of reinvestments occurred prior to the mixed use development. For example, our hypothesis

![Figure 6. Reinvestment Impact Index analysis: (a) Change of use; (b) remodelling impact; (c) Reinvestment Impact Index; (d) mixed-use development on South First and South Lamar; (e) additional mixed-use development on South Lamar; (f) mixed use development on Burnet Road.](image-url)
would appear to be confirmed if the density of remodelling permits from 2003 to 2013 around new construction projects in 2014 is significantly higher than the density of permits along the entire corridor.

The reinvestment impact scores did appear to be higher within 150 feet of new, mixed use development than along the entire length of corridors. The distance of 150 feet includes reinvestment in immediate proximity to new mixed use development – in most cases it includes the land immediately next to and across the transportation corridor from the new development (depending on the width of the corridor.) Mann Whitney U tests were performed to determine whether this difference was significant (Table 5). The result when comparing all corridors was statistically significant at a level of 90% confidence at \( p = 0.087 \) (\( p < 0.10 \)). The Reinvestment Impact Index produced a result of 0 in the year 2011. Although there were more mixed use developments in 2011, one development was very small in size and two seemed to be located very distant from the mixed tourist and local resident market that are more typical of other developments. When 2011 was treated as an outlier and removed from the test, the result is statistically significant at \( p = 0.030 \) (\( p < 0.05 \)). We concluded that the Reinvestment Impact Index supported the hypothesis, but not perfectly, as the initial test yielded only a 90% confidence level. The Reinvestment Impact Index has value for descriptively mapping of the distribution of remodelling that could add up to a valuable sense of place along the strip. The strength of the statistical relationship between highly visible, valued landscapes of local business and redevelopment at larger scales is not as clear. A much more complex regulatory and environmental context is likely to be at work when developers select sites for new mixed use development that needs to be factored into future tests.

**Conclusion**

As noted in the literature review, commercial strips have both been identified as habitat for local businesses and areas for targeted for redevelopment. In this paper, we set out to find systematic means of mapping the areas that may add up to larger entertainment and leisure zones comprised primarily of local restaurant and retail businesses. We believe that the spatial analysis methods outlined in this article are likely to be generalizable and valuable in searching for patterns of similar activities in other cities, especially those undergoing rapid central city reinvestment. Using spatial analysis, we find evidence that clusters of local businesses seem to thrive in areas along commercial strips closer to the central city on smaller parcels. We also find that areas with older buildings and greater diversity of building age do provide a vital habitat for small businesses, although that was not uniformly the case along all case study commercial strips in Austin. One hot spot for restaurant and retail remodelling activity was located in an area with a younger, less diverse building stock than along the entire commercial strip where it was located.

Prior research on adaptive reuse along the strip (Minner, 2013) indicated that as areas of the commercial strips become entertainment destinations, their value as a location for mixed use development seems to increase, as developers find locations for new development near to restaurants, bars and retail more desirable for redevelopment. Our statistical tests did find an association, although this does not appear to be a linear function with proximity to local business restaurant and retail clusters. While hot spots of remodelling activity among locally owned retail and restaurants may increase the desirability of a commercial strip for redevelopment, it is likely that the size and configuration of redevelopable parcels and
<table>
<thead>
<tr>
<th>Sum of Reinvestment Impact Index within 150 ft new construction</th>
<th>Total area of buffers 150 ft around new construction (sq. ft)</th>
<th>Density of Reinvestment Impact in proximity to new construction</th>
<th>Sum of the Reinvestment Impact Index along entire corridor</th>
<th>Total corridor area (sq. ft)</th>
<th>Density of Reinvestment Impact along corridors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cumulative reinvestments associated with Group 2 from 2003 to 2008</strong> New construction in 2009 (N = 1)</td>
<td><strong>Cumulative reinvestments associated with Group 2 from 2003 to 2009</strong> New construction in 2010 (N = 1)</td>
<td><strong>Cumulative reinvestments associated with Group 2 from 2003 to 2010</strong> New construction in 2011 (N = 3)</td>
<td><strong>Cumulative reinvestments associated with Group 2 from 2003 to 2011</strong> New construction in 2012 (N = 4)</td>
<td><strong>Cumulative reinvestments associated with Group 2 from 2003 to 2012</strong> New construction in 2013 (N = 2)</td>
<td><strong>Cumulative reinvestments associated with Group 2 from 2003 to 2013</strong> New construction in 2014 (N = 5)</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>0</td>
<td>39</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>148,489.1</td>
<td>173,296.8</td>
<td>782,673.3</td>
<td>1,756,977.3</td>
<td>559,153.8</td>
<td>1,494,833.0</td>
</tr>
<tr>
<td>5.388 * $10^{-5}$</td>
<td>5.770 * $10^{-6}$</td>
<td>0</td>
<td>2.220 * $10^{-5}$</td>
<td>1.430 * $10^{-5}$</td>
<td>1.003 * $10^{-5}$</td>
</tr>
<tr>
<td>475</td>
<td>503</td>
<td>611</td>
<td>703</td>
<td>781</td>
<td>842</td>
</tr>
<tr>
<td>106,113,503.9</td>
<td>106,113,503.9</td>
<td>106,113,503.9</td>
<td>106,113,503.9</td>
<td>106,113,503.9</td>
<td>106,113,503.9</td>
</tr>
<tr>
<td>4.48 * $10^{-6}$</td>
<td>4.74 * $10^{-6}$</td>
<td>5.76 * $10^{-6}$</td>
<td>6.62 * $10^{-6}$</td>
<td>7.36 * $10^{-6}$</td>
<td>7.93 * $10^{-6}$</td>
</tr>
</tbody>
</table>
regulatory context (e.g. zoning regulations and incentives) play as great, if not a greater role, than the immediate proximity of retail and restaurant clusters.

A crucial area for further research is the success and longevity of local restaurants and retail businesses clusters over time as commercial strips are redeveloped at higher density, mixed use corridors. Newer and smaller local businesses, as well as older established merchants in leased locations, are likely to be particularly vulnerable to increases in leasing costs and property taxes as properties are redeveloped around them. As commercial strips experience substantial public-sector policy attention, as well as private-sector reinvestment momentum, an important question remains as to the best community economic development policies to help local businesses thrive and survive as commercial strips are restructured and local business are exposed to the threat of ‘new build’ and commercial gentrification.

Acknowledgements

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Notes

1. Meanwhile some longstanding businesses persist and serve as landmarks along the strip; investments in them are often made more frugally and consist of more limited repairs and maintenance.
2. An additional approach is improvement to transportation infrastructure to facilitate non-automobile transportation modes such as walking, biking and taking transit (Boarnet et al., 2011).
3. This proposed design intervention seems problematic, given the potential for pollutant impacts associated with drive through service in fast food restaurants and the impacts on residents of the surrounding housing development.
4. The study area is bounded by Research Boulevard to the north and Ben White Boulevard to the south.
5. The City of Austin makes georeferenced building permit data readily available online. These were permits that were identified according to the City of Austin’s codes as: Remodels, Additions, Remodels and Additions, and Repair.
6. Within the City of Austin’s building permit coding system, multi-family apartments are
included as commercial uses. While important, remodelling and reinvestment in aging multi-family apartments was not the primary focus of this analysis.

7. Includes one theatre chain established and based in Austin called the Alamo Draffthouse. There are now locations across the USA, but the Alamo Draffthouse is largely perceived as a local, independent business and expanded beyond Texas later in the time period analysed in this paper.

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