

Urban Geography: Waterfront Development

Mark Davidson, Clark University, Worcester MA USA

Glossary

- brownfield** A piece of previously used land that requires some remediation of contaminants, pollutants, debris or hazardous substances in order for it to be reused and redeveloped.
- containerization** A shipping method which uses standardized containers to store and transport goods and materials.
- gentrification** A complex process whereby a group of middle class people move into a previously working class community, causing substantial neighborhood reinvestment and the displacement of existing working class residents.
- place marketing** Marketing activities which seek to influence a target audiences perceptions about a particular place in a positive way.
- post-industrial city** A city that has undergone industrial decline and now has an employment profile that is characterized by the tertiary service sector.
- urban development corporation** A quasi-public authority that is established by government in order to generate and direct urban development.
- waterfront** A space where water (i.e.: river, lake, sea, ocean) meets with urbanized land, creating a unique spatial interface.

The unique qualities of the water/urban spatial interface regularly make waterfront development a distinct form of urban development. Historically, the resources provided by waterfronts, things such as waste disposal, energy and transit, have resulted in it being useful to distinguish between urban waterfronts and cities more generally. However, over recent decades, previously industrial – and subsequently derelict – waterfront spaces have been redeveloped into urban spaces which are emblematic of more general forms of post-industrial urbanism. The resources offered by the water/urban space interface appear to have mutated and waterfront development has broken from traditional patterns.

Key words: waterfront, port, urban development, decline, post-industrial, entrepreneurial, public space, gentrification

Introduction: An Historical Perspective

The earliest forms of waterfront development occurred as societies began to utilize waterborne transit. Up until 60 years ago, waterfront urban development was largely dominated by harborage and shelter functions. For example, the Roman settlement of Londinium – later to become London, UK – was established in 50 A.D. at the last bridgeable point on the River Thames. Many more urban settlements would later become established along favorable waterfront areas, such as Falmouth, UK, Bahia, Brazil, and Mumbai, India. A consistent pattern of development occurred where particular sections of riverside and coastline provided ports and natural harbors suitable for maritime activities.

As international trade developed from the 14th century onwards, waterfront cities witnessed significant growth with mercantile activities producing large urban economies. As the capital of the first imperial trading nation, Amsterdam, Netherlands, developed from a 12th century fishing into to a commercial city of 200,000 people in 1700. Other major waterfront trading cities established during this period included the Mediterranean cities of Naples, Venice and Marseille.

As European nations developed imperial trading routes, many other colonial port cities developed. The British Empire's growth saw major ports established in Mumbai, India; Cape Town, South Africa; and Sydney, Australia. As the central point within this globalized trading network, London's port facilities grew to stretch some 11 miles along the River Thames.

Waterfront space was also developed during this period for military and strategic reasons. Port cities were centers of economic and political power and therefore required protection. For example, to the east of London from the 16th century onwards, a large stretch of the Thames riverside housed naval dockyards and munitions storage facilities. Originally built to protect the capital from invasion via the Thames estuary, the facility, which became 'Royal Arsenal', eventually grew to a five square kilometer site, employing 72,000 people during the early twentieth century.

Industrial Waterfronts

Although imperial trade and military expansion lie at the origins of much urban waterfront development, it is the industrial development which took place in waterfront areas during the 19th and 20th centuries that has left the greatest legacy for contemporary urbanism. As industrialization brought with it increased demand for raw materials and new streams of export products, port facilities had to be expanded. This was striking in London, UK, where dock construction continued throughout the 19th and early 20th century so that most of the eastern section of the metropolitan Thames was devoted to shipping. Starting with the construction of West India dock in 1802, and followed by London (1805), East India (1805), Surrey (1807), St Katherine (1828), West India South (1829), Royal Victoria (1855), Millwall (1868), Royal Albert (1880) and King George V (1921) docks, the scale of development was vast and played a central role in enabling London's economy to become prosperous and diverse.

Industrial production methods were also used in port and shipyard construction. Building larger ships meant building larger dry docks. In Britain, the rivers Thames (London), Mersey (Liverpool), Tyne (Newcastle), Wear (Sunderland) and Clyde (Glasgow) were all utilized to build large, ocean-going ships. In Belfast, Northern Ireland, the Harland and Wolff shipyard was established in 1861 when Edward James Harland and Hamburg-born Gustav Wilhelm Wolff founded a small shipyard on Queen's Island. As Belfast developed into a large industrial center, the Harland and Wolff shipyard built larger and larger ships, including the Titanic between 1909 and 1911. At this time the Harland and Wolff shipyard employed 15,000 people, most working 49-hour weeks. Harland and Wolff also built the world's largest dry dock in Glasgow, Scotland, a facility which measured 256 meter long by 73 meter wide.

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As globalization and industrialization drove waterfront industrial growth and dock construction, the supporting physical infrastructure also had to be expanded. Dockland regions gradually became larger and larger as vast railway terminals were constructed on waterfronts to transport incoming ship freight. In addition, huge warehouses were built to store the vast amounts of goods that flowed into port cities. This resulted in many cities losing their waterfront public spaces. Waterfronts became the domain of heavy industry, rarely seen by city residents. In Toronto, Canada, port infrastructure dislocated the city from the Lake Ontario shorefront. When the Toronto waterfront was targeted for redevelopment during the 1960s by the city's government, increasing accessibility quickly became a priority.

Industrial urban waterfronts required large labor forces. Residential communities reliant upon dock-related employment grew up in areas adjacent to waterfront industries. These communities often developed distinctive political and social cultures due to the demands and practices of port-

related labor. For example, the casual work practices of dockers created distinctive social networks and political practices. Quayside workers in cities such as London operated under a complex and informal employment system where workers were recruited on a needs-basis every morning. Such an employment system meant dockers often faced periodic hardship as recessions, tides and weather combined to create fluctuating labor demand. This insecurity also affected social practices and networks. It was imperative that dockers should personally know dock foreman to ensure they picked up employment opportunities. Such an unmediated relationship between labor and capital also contributed to dock communities being places of radical political ferment. Port communities in London, UK, Liverpool, UK, New York, US, Boston, US, and Brisbane, Australia, all became sites of political radicalism and trade union power.

19th and early 20th century waterfronts were also appropriated by industries which relied upon water. These industries included textiles, dyes, cable making, breweries, various milling industries, steel, and energy. Many cities also developed coal fired power stations along waterfront areas because the water provided an efficient means to transport the bulk materials required to generate power. Many of these power stations have left, and continue to leave, indelible marks on the urban landscape, both in terms of built structures and contaminated land. Although some of the early 20th century power stations continue to operate using updated energy production technologies, others have been converted. Examples of conversion include the Bankside and Battersea Power Stations in London, both designed by architect Sir Giles Gilbert Scott. The Bankside building is now the Tate Modern art gallery, whilst Battersea Power Station is undergoing redevelopment for conversion into residential and commercial usage.

Industrial Decline

As industrialized economies experienced decline in the second half of the 20th century, many urban waterfronts fell into dereliction. The massive industrial and trading complexes that once dominated urban waterfronts became derelict, abandoned and under-used. As capital fled from urban waterfronts, the communities left behind often faced high unemployment, economic stagnation, and growing social problems.

Many of the ports built in the 19th and early 20th century became unprofitable and redundant in the late 20th century as the shipping industry began to use containers to transport goods. Container shipping, a method developed by Malcolm McLean of the Pan-Atlantic Steamship Corporation, US, greatly reduced the costs of handling goods at ports and simplified the logistics of shipping, drastically cutting the labor and time involved compared to the previously used bulk break method of shipping. The economic and social effects of the transition to container-based shipping were dramatic. Container shipping required large areas of land to store and organize shipping containers, large docks to hold container ships, and different labor practices. Many waterfront industries developed during the previous decades were made unprofitable and obsolete by these new shipping technologies. This transition created a host of complex problems for waterfront cities, many of which are still felt today.

As many dock facilities and surrounding communities declined, city and national governments formulated renewal efforts. Initially, many governments attempted to reform port industries to make them more competitive. In London, the national government unified the city's docks and wharves under a single jurisdiction – the Port of London Authority (PLA) – in an attempt to remove internal wrangling and simplify complex operations. Faced with an archaic labor system and restrictive legislation, the PLA ultimately abandoned its attempts to regenerate London's docks and, in 1969, it instigated the movement of operations east to a new container port in

Tilbury, Essex. This failed attempt to regenerate urban docks was repeated elsewhere. In Toronto during the 1950s and 1960s, the city government responded to increased competition and changing shipping practices with a plan to expand port facilities, create a new outer harbor, and redevelop established ports. Such initial reactions to waterfront decline were therefore often focused upon restructuring existing industries and maintaining these waterfront spaces as sites of industry.

As governments attempted to reverse waterfront decline, political conflicts arose. The containerization of shipping demanded that dock labor practices change. Working hours, employment contracts, places of work, and labor requirements were all targeted for restructuring, bringing dockers' unions into conflict with managers and political representatives. In New York City during the 1960s, the New York Shipping Association introduced a computer-based hiring system, developed by IBM, to reorganize dock labor. This system had the effect of rationalizing labor recruitment and changing the organization of work units. The latter caused discontent within dockers' unions as it threatened to reduce labor demand and increase the risk of workplace accidents. This type of conflict was repeated in other cities, such as Liverpool, UK. However, the reform of older dock operations did little to stem decline and many of the facilities were eventually abandoned.

Economic decline and abandonment plunged those waterfront communities which relied upon dock-related employment into severe distress. In London between 1971 and 1981, the population in the docklands area fell from 48,352 to 39,429. By 1981, the unemployment rate in the area was running at 17.8%. However, even after a decade of decline, between 1978 and 1983, a further quarter of all jobs in the area (13,000) were lost and another 5,100 acres of land fell into dereliction. The same types of decline occurred in other port cities, with similar consequences for working class waterfront communities. In New York City, the piers of Manhattan and Brooklyn were abandoned for container ports in neighboring New Jersey. In Dublin, Ireland, all city center port activities were transferred one mile down the River Liffey to a container shipping facility at Alexander Quay.

As industries abandoned urban waterfronts, land fell into dereliction. Due to the character of many waterfront industries, such as gas depots, chemical plants and oil refining, large swathes of waterfront land were left highly contaminated. For example, the Union Carbide chemical plant on Rhodes Peninsula, Sydney, Australia, dumped dioxins and other chemical by-products into surrounding wetlands up until 1970. When renewal efforts began on this previously industrial waterfront land, there was significant environmental remediation required.

Contemporary Waterfront Development

Redevelopment Trends

Since the 1970s, urban waterfronts around the globe have experienced redevelopment. Older port facilities have been replaced by new ones in an intense race between port cities to remain connected into flows of global trade. Centrally-located waterfront brownfields have been governed by quasi-public redevelopment agencies invested with significant planning powers to transform waterfront urban spaces in new centers of commerce and luxury residences. And yet, despite this rapid redevelopment of urban waterfronts, many are increasingly threatened by storm surges and the uncertainties of global warming-related sea level change.

The race for global trade

Although port facilities do not dominate urban waterfronts as they did in the mid-20th century, some of the world's largest cities are still home to important port facilities. The same transformative processes that changed waterfronts in London and Liverpool during the mid-20th century have continued apace, and as cities look to incorporate new shipping technologies and dock facilities, port cities continue to evolve. The world's busiest ports now reside in Asia: Shanghai (by container), Ningbo-Zhoushan (by tonnage) and Singapore (by transshipment). Each of these cities are engaged in an intense inter-urban competition to maintain their lucrative shipping businesses. None more so than Singapore, whose city-state economy is reliant on it remaining a hub of shipping and commerce.

In 2012, Singapore's transport minister, Lui Tuck Lew, announced plans to build a new mega port facility in the city's Tuas peninsula. Shipping accounts for approximately 7% of Singapore's Gross Domestic Product. With the growth of Chinese port facilities, and the Chinese government's ambitious plans to dominate logistics and shipping in Asia, Singapore has set out to construct a mega-port. The plan is intended to maintain Singapore's already-world leading port facility as the preferred choice for transshipment in the region. Planned for completion in 2040, the Tuas port will be mainly built using land reclamation, with 222 10-storey tall concrete caissons being partially submerged to create the new dock facilities. When Tuas is finally completed, the new port will replace all of Singapore's five existing shipping facilities. This consolidation will create a highly automated mega-shipping terminal capable of handling millions of shipping containers and the berthing the world's largest container ships.

Singapore's investment in the Tuas facility represents the government's response to an intensifying competition among port cities for the growing, but changing, shipping industry. Transformations within shipping itself include the advent of larger container ships, new shipping alliances and changing goods distribution models. Singapore is also responding to new competition and changes in global logistics. Most significantly, the Tuas port is responding to the competition created by China's Belt and Road initiative by making Singapore's shipping operation more efficient and cost effective. Singapore's port initiative is also responding to the prospect of Arctic shipping routes becoming accessible in coming decades. This climate-change related change in shipping routes would dramatically impact Singapore's current locational advantage.

For those cities that remain ports, such as Singapore, a host of economic, political and environmental changes are creating yet another round of competition and related restructuring. Pressure to create cost efficiencies remains high, and the growth of Chinese economic and political influence continues to impact port cities that organize global trade. As cities like Singapore redevelop their ports to remain competitive, this again begins another round of waterfront redevelopment. The moving of port operations in Singapore to the westerly Tuas facility will open around 1000 hectares of waterfront district for new uses. Singapore is already using quasi-public urban development agencies to direct this critically important and geographically extensive waterfront renewal effort.

Urban development agendas and waterfronts

Waterfront redevelopment schemes have often come to define post-industrial urban renewal. Examples include Baltimore's Inner Harbor, London Docklands and Battery Park City, New York City. With post-industrial urban policy agendas focused upon consumption and the attraction of capital, waterside redevelopment schemes have tended to follow similar patterns. Waterside office-based redevelopment programs have aimed to attract a global clientele of transnational corporations. The development of waterside leisure spaces has catered to the consumption desires of tourists and the professional middle classes. Finally, waterside residential

development has focused upon providing residencies for the post-industrial metropolis' burgeoning ranks of professionals. Although there have been exceptions to this trend, notably in Vancouver's False Creek South neighborhood (Ley, 1980), the redevelopment of deindustrialized waterfronts has overwhelmingly reflected the neoliberal reinvention of urban policy, with all the related issues of inequity and questionable political representation.

Case Study: Battery Park City, New York City

The redevelopment project which transformed Lower Manhattan's Hudson River waterfront from a collection of derelict piers into a center of global capital has become a symbol of post-industrial urban renewal. The redevelopment of this 92-acre slice of Manhattan began in 1968 when New York State established the Battery Park City Authority. The initial plans proposed by the New York City Department of Marine and Aviation had wanted to redevelop the port facilities along this stretch of waterfront, creating an updated dock and warehouse facility. However, under New York State Governor Nelson Rockefeller, a series of master plans were developed which envisaged the waterfront becoming a pedestrianized park space, interspersed with both private and subsidized futuristic housing. The plan received a warm reception in the city with architecture critic Ada Louise Huxtable commenting in the New York Times: "Is this any way to plan a city? You bet it is."

New York City's 1976 fiscal crisis led to the plans of Nelson Rockefeller's government being abandoned and a more private capital orientated strategy being adopted. This change would become part of a much broader conservative reorientation in urban policy. David Harvey traces the emergence of the ascendancy of the New Right over urban (re)development, and more generally social policy, to New York City's financial crisis. Harvey argues that during the fiscal crisis, global financial actors, such as Citibank chairman Walter Wriston, realized significant leverage and influence over urban and social policy. This resulted in them forcing a vast scaling back of the Keynesian welfare state apparatus. As the major urban development project in North America at this time, Battery Park City's subsequent reorientation was therefore to become symbolic of the more global shift in urban redevelopment practice.

The final 1979 master plan for Battery Park City, designed by Alexander Cooper and Stanton Eckstut, dropped the ambitious and socially inclusive plans of the early 1970s and adopted what the Battery Park City development corporation was to call "a hard nosed, realistic approach". This approach was physical redevelopment-led, involved little local community participation, provided no affordable housing, and focused upon private market imperatives. In 1980, construction on the site began and continued throughout the next decade. Eventually, the development included the World Financial Centre office complex and a series of private residential towers. Although the area was heavily affected by the attacks of September 11th 2001, redevelopment in the area continues with new luxury hotels and apartment complexes being built on the reclaimed land.



Figure 1 An image showing the continued development of Battery Park, New York City, 2006 (Source: Author)

Urban waterfronts and climate change

In October 2012, Hurricane Sandy swept into New York City, generating \$50bn of damage and claiming the lives of 44 New Yorkers, some of whom drowned in their own homes. Low-lying neighborhoods, such as Battery Park City, experienced severe flooding and would continue to deal with the storm damage for years to come. Sandy's 2.8 meter high storm-surge engulfed much of lower Manhattan's infrastructure, flooding subways, tunnels and streets and damaging subterranean cabling and sewers. The storm left 800,000 city residents without power and 700,000 tons of debris had to be cleared from the city.

The damage Sandy inflicted on New York City has been interpreted as an event that will likely be repeated in an era of sea level rise and climate change. Hurricane Sandy exposed the various ways in which waterfront cities are becoming vulnerable to extreme weather events. Much of New York City's critical infrastructure was unprotected from Sandy's storm surge. Battery Park City's storm surge experienced a high-water level 1.8 meter above the mean high level. This left the city's existing protections wholly inadequate. With global sea level around 20 centimeters higher than in 1900, and much of the land along the mid-Atlantic sinking, the extreme weather events associated with climate change now pose existential threats to waterfront cities.

For example, many waterfront cities are also home to large coastal airports. In cities such as New York, Hong Kong, Singapore and Sydney, large airport runways are located just a few meters above sea level. If, as predicted, sea levels rise by between around two meters by 2100, many large coastal airports will likely experience highly disruptive flood events. In 2009, a report

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by the Eurocontrol agency estimated that over 30 major European airports are at risk due to sea level change. To avoid airports becoming unviable, some cities have responded with significant infrastructure enhancements. For example, the construction of Hong Kong's new \$18bn third runway features a sea wall that stands 6.4 meters above the current waterline. The sea wall is designed to withstand one-in-one-hundred-year severe storms. Such infrastructure investments are costly but justified by governments like Hong Kong's as they promise to help maintain the city's lucrative role as an international transit hub.

Back in New York City, the city's entire infrastructure planning has been impacted by the effects of Hurricane Sandy. The city's various infrastructure actors, utility companies like ConEdison, infrastructure agencies like Port Authority of New York and New Jersey, and the New York City Housing Authority, have instituted short-term and long-term programs to deal with a future of Sandy-like storm surges. Protective walls have been built to fortify key pieces of infrastructure like power stations and subway lines. The New York City Housing Authority has used federal disaster relief to install power generation capabilities in exposed public housing developments. Longer term projects now include outer harbor tidal barriers designed to protect New York City from potentially devastating flooding. This technology would replicate, albeit on a larger scale, that used to protect cities such as London (Thames Barrier) and low-lying countries like the Netherlands (Delta Works).

Why is post-industrial waterfront redevelopment still distinctive?

The interface of water and urban space shapes post-industrial urban development, just as it did in pre-industrial and industrial periods. However, waterfront development is not disconnected from general urban policy directions. The same themes of private sector-led development, urban development corporations, circumvention of planning protocol and lack of public accountability that characterizes neoliberal urban redevelopment also characterize most waterside redevelopment schemes. With waterside redevelopment schemes reflecting general post-industrial urban redevelopment themes, it is therefore appropriate to ask why post-industrial waterside redevelopment should be considered a distinctive form of urban development. Three answers stand out, and they all relate to how the urban-water interface continues to make these spaces significant.

Political Significance

Waterfront sites which had previously been used for port and industrial activities were often in central city locations. Therefore, after experiencing de-industrialization many cities found themselves with large areas of devalORIZED land in prime central city locations. These waterfronts were also often close to the central business district and were able to be panoramically gazed upon from opposing riverbanks and adjacent foreshores. This combination of proximity and propinquity has meant that waterfront sites have become important spaces within the context of place marketing redevelopment agendas and consumption-based urban economies. In order to be successful in today's urban system, urban governments have needed to redevelop their declining urban waterfronts.

Place marketing has become a key tenet of local economic development in an era where cities are constantly hierarchically ranked by external agents. Cities must actively pursue and construct positive imaginative geographies to ensure that they become and remain 'hot spots'. A negative place image can discourage investment, since negative imagery can indicate a city's economic decline through falling consumption. The redevelopment of highly visible urban waterside sites has become a key mechanism by which positive place images are constructed. For example, in

Singapore the waterside was chosen for redevelopment specifically with the purpose of demonstrating and displaying the city-state's global city ambitions. The redevelopment of waterside spaces for place marketing purposes has often resulted in city planning authorities and development corporations overriding democratic planning procedures and local interests to pursue city-wide economic benefit.

Economic Value

Brownfield waterside sites are also distinctive urban spaces because of their potential economic value. Beyond the basic logistical advantages of waterfronts for port and transit activities, waterside development can offer substantial premiums to developers, landowners and local governments. The potential returns on investment can be as much as 40-60 percent higher for waterside residential units compared to equivalent units without waterfront views. Releasing and redeveloping derelict waterside land can therefore offer hefty windfall profits.

The return of capital to waterfront locations has therefore often involved a movement of people back to the waterfront. Urban waterfronts which were once undesirable brownfields have now become some of the most desired pieces of real estate around the globe. Examples include waterfront areas of Sydney, Australia, Baltimore, US, and Prague, Czech Republic. One consequence of this process has been the widespread gentrification of many urban waterfront spaces.

Case Study: London Riverside

From almost any vista in London, the signs of the Thames' post-industrial transformation are obvious. A gaze towards East London encounters a dynamic landscape of continually growing skyscrapers huddling around the towers of Canary Wharf. In Central London, the new London government has established its Foster and Partners designed egg-shaped offices on the banks of Thames, and the Tate Modern art gallery has attracted four million tourists to the Southbank each year since opening in 2000. In addition, all along London's waterfront a vast swath of residential development has taken place since 2000, making the riverside one of the most desired residential spaces in the city.

Since its reestablishment the Greater London Authority has embraced the waterfront redevelopment. First, under Ken Livingstone, the city developed a strategic planning vision for the waterfront: 'The Blue Ribbon Network'. This planning policy intended to stimulate the redevelopment along the riverside and better utilize the space for industrial, residential and transit uses. The policy did little to address the city's social problems – housing stress, social segregation, poverty- but rather pursued property-led growth as a trickle-down policy. In London's booming housing market, corporate residential property developers answered the calls of the metropolitan government. Developers have been met by substantial demand for their products as London's professional elites have proven eager to become riverside residents. The collection of political promotion, large-scale corporate development, and burgeoning demand for 'riverside living' led to a widespread gentrification of the waterfront. Many previously working class riverside neighborhoods in London are now populated by the middle-classes, changing the composition, politics and services of these neighborhoods.

However, there are signs that the insatiable demand of riverside living is coming to an end. Slow economic growth, tax increases and the uncertainties generated by Britain's withdrawal from the European Union have slowed London's housing boom. Riverside districts have been particularly hit. On London's Southbank new-to-market riverside apartments are selling at 20% below expected rates. Prices in surrounding neighborhoods

have been less impacted, with overall house price growth stagnating. Real estate commentators suggest that international real estate investors have shifted away from London's riverside, moving to safer economies like Singapore – where waterfront development is still rolling.

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Figure 2 An image of ongoing residential waterfront development in West London, 2005
(Source: Author)

Socio-cultural Value

Although only implicitly referred to in accounts of urban waterside redevelopment, much of the political and economic significance of these spaces is related to the socio-cultural value placed on them. Waterside spaces are often part of the city's valued collection of open spaces, comparable to the parks and gardens which are valued for their sensory and physical qualities. Debates which surround issues of public access to redeveloped waterfronts bear witness to this communal value of urban waterside space.

In an era of neoliberal urban development, the spatial and sensory qualities of waterfront areas have been utilized to generate consumption. In Melbourne, Australia, the city's waterfront Southbank region has been extensively redeveloped into a space of (middle-class) consumption. Carefully curated urban design techniques and omni-present policing controls manage this waterfront space filled with manufactured spectacles. The same commodification of waterfront space can be witnessed in other cities, such as Copenhagen, Denmark, Sydney, Australia, and Boston, USA. In these cities parks and promenades have been built alongside expensive hotels and retail stores to produce an attractive and consumption-efficient urban space. Even in today's

commodified form, the continued socio-cultural importance of waterfronts is therefore attested to by the fact that people still want to live and play near and next to the water.

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**Mark Davidson, Graduate School of Geography, Clark University, 950 Main St,
Worcester MA 01610**
mdavidson@clarku.edu

Bio (150)

Mark Davidson is an Associate Professor in the Graduate School of Geography at Clark University, Worcester, Massachusetts. He is an urban geographer whose research examines the relationship between cities and politics, and the drivers of contemporary urban change. Mark has an international reputation for his research on gentrification, critical urban theory and urban sustainability. He has published in high-impact human geography journals, such as *Transactions of the Institute of British Geographers* and *Progress in Human Geography*. He has also published edited collections with SUNY Press and Sage. He has received research funding from the National Science Foundation and the International Olympic Committee. Prior to joining Clark University, Mark held fellowships at the Nelson A. Rockefeller Centre for Public Policy and Social Science, Dartmouth College, and the Urban Research Centre, University of Western Sydney. He holds a BA (Hons) and PhD in Geography from King's College London.