

An Exegesis Exploration of Retrofitting and Urbanisation as Tools for Reversing Urban Sprawl

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ABSTRACT: Research interest into urban sprawl and its detrimental effects on the quality of life and urban environment has been prompted by the growing number of decaying urban spaces in the outer fringes of cities. It is imperative that additional research into reversing urban sprawl is conducted to ensure that affordable housing is available without disturbing the natural environment and quality of urban spaces. It is recommended that more support is needed to bring solutions to urban sprawl into mainstream use. This paper expands on existing literature by asking, *how can retrofitting, urbanisation and re-greening counteract and reverse urban sprawl?* To answer this research question, an investigation of how urban sprawl can be reversed will be undertaken with an emphasis on how retrofitting, urbanisation and re-greening can combat this built environment phenomena. The chosen study area for this paper is the current urban climate of the Hoppers Crossing Railway Station precinct in Western Melbourne. Additionally, this exegesis will present conceptual design ideas and guidelines based around the study area that challenges the current understanding of urban sprawl. New urban design practices that are more sensitive to keeping the harmonious balance between natural habitats and green spaces and the built environment are recommended. This paper also proposes that built environment professionals need to overcome problems of affordable and attractive housing without resorting to urban sprawl.

Keywords: Urban sprawl, Retrofitting, Infill development, Urbanisation, Exegesis

1. INTRODUCTION

1.1. Research Question

How can retrofitting, urbanisation and re-greening counteract and reverse urban sprawl?

1.2. Research Diagram

This exegesis will answer the research question through a written and a design component. It will also take into account the following:

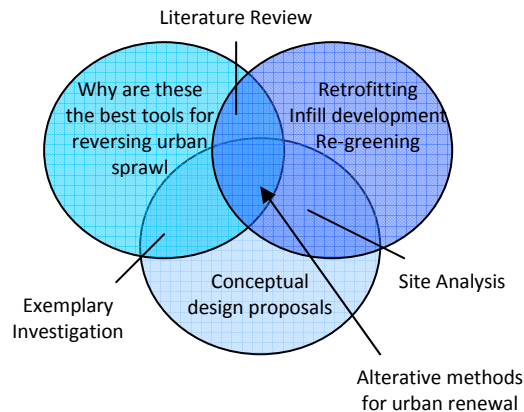


Figure 1: Research diagram

What – Urban sprawl areas and how they can be reinvented to become more attractive places through the reversal of this phenomena.

How – By implementing the existing solutions found in retrofitting, urbanisation and re-greening as well as adding to them through independent research.

Where – The large precinct just North of the Hoppers Crossing Railway Station containing a retail centre, commercial areas and a strip shopping area.

2. LITERATURE REVIEW

The aim of this section is to examine the existing literature on the tools for reversing urban sprawl.

2.1. Urban Sprawl

Williams (2000) asserts that Americans in particular are moving to the outer suburbs on the fringes of their cities (Williams, 2000, p.1) and this sprawl pattern of urbanisation has been occurring with little slowing down in growth for at least 20 years (Williams, 2000, p.1). Williams (2000) highlights the long daily commutes for the residents of what he dubs as 'exurbs' (Williams, 2000, p.11) and pushed motor vehicle use in the US from one to two trillion miles on average per year between 1970 and 1990 (Williams, 2000, p.11). From this we can see that the more people move to these 'exurbs', the greater the dependency on personal vehicular transportation becomes.

According to Williams (2000) many "exurban" residents complain about the decline of their quality of life that initially drew them to purchase a home in such a location. Each additional housing and commercial development brings more traffic, turning connector roads and local highway systems into overcrowded bottlenecks. Residents also become dismayed as their once pristine open spaces are gradually filled with yet more sprawl. The quality of life for these suburban residents is also deeply affected by the design features of the subdivisions that they inhabit. In the pursuit of privacy, single family units usually become introspective. (Williams, 2000, p.15) The perceived reduction in quality of life can be attributed partly to the 'unprecedented loss of "open space", productive crop and pasture lands, along with forest woodlands, fragile wetlands, and other natural wildlife habitats' (Williams, 2000, p.1). Additionally Beall, Guha-Khasnobis & Kanbur (2010) suggest that urban sprawl shares a major characteristic of slums in that socioeconomic problems are prolific.

Some of the growing dissatisfaction about urban sprawl comes from rising tax rates. As more and more residential housing is constructed in the remaining open space, local governments find it necessary to raise the property tax on existing home owners and businesses to accommodate the need for more schools, roads, water and sewage lines, electrical utilities, and an expansion of public safety services like police, fire, and emergency medical care (Williams, 2000, p. 15).

Dunham-Jones & Williamson (2011) state that the 'goal of urbanizing suburbs calls into question many long-standing cultural stereotypes' (Dunham-Jones & Williamson, 2011, p. 2). They suggest that cities are conventionally understood as old places with new buildings, while these new urban sprawl areas are new places with replicas of old buildings. They propose that urban design has three vastly different scales starting on a small scale with instant architecture moving to the grander scale of instant cities and finally the more conceptual incremental metropolitanism (Dunham-Jones & Williamson, 2011, p. 2). Additionally the world's greatest cities exemplify the use of incremental urbanism, sensitive interventions and the evolution of cultures over time (Dunham-Jones & Williamson, 2011, p. 3).

Dunham-Jones & Williamson (2011) coin some very interesting terms for urban sprawl and similar phenomena, "Instant Cities" or "Faux Downtowns" simply meaning, large, new and inauthentic urbanist projects (Dunham-Jones & Williamson, 2011, p. 3). Indeed, Berrigan, Tatalovich, Pickle, Ewing & Ballard-Barbash (2014) report a negative association between urban sprawl, health and environmental consequences (Berrigan, Tatalovich, Pickle, Ewing & Ballard-Barbash, 2014, p. 19). In addition, Lv, Dai & Sun (2012) suggest that urban expansion will continue to cause one of the biggest human effects on land in history (Lv, Dai & Sun, 2012, p. 6437-6448). Clearly, there is justification in attempting to reverse the detrimental effects associated with urban sprawl. The author's propose that the driving factors to the creation of urban sprawl are based in socioeconomics. Similarly, Bruegmann (2005) supports this view, particularly the desire of residents to escape the congestion and pollution of the cities and to enjoy the economic advantages of land that is cheaper further from the cities. Bruegmann (2005) also alludes to the fact that the increase in density in the urban fringes has only recently been flattened and expanded to lower the density gradient (Bruegmann, 2005, p. 220). There is a need to understand the changes in the spatial configurations of urban areas over time to quantifying the effects of urban sprawl (Lv, Dai & Sun, 2012, p. 6437-6448).

Designing and building healthy places is not a new concept and it is necessary for the survival of urban spaces (Frumkin, Frank & Jackson, 2004). One of the challenges in changing the expectation of urban sprawl is that it is currently seen as a medicine that treats a multitude of diseases, in this case economic problems (Frumkin, Frank & Jackson, 2004, p. 222). Beall, Guha-Khasnobis & Kanbur (2010) have found that 'urban centers offer economies of scale in terms of productive enterprise and public investment' (Beall, Guha-Khasnobis & Kanbur, 2010, p. 6), but Frumkin, Frank & Jackson (2004) also suggest that major selling points of urban sprawl and what it offers is often too good to be true.

2.2. Urbanisation

Wilson & Rushing (2010) propose that the global phenomenon of urban sprawl is inevitable and a natural progression of a city's evolution. The authors contend that American and by implication Australian cities are much younger and less densely populated than European and Asian cities (Wilson & Rushing, 2010, p. 5). Therefore, urbanisation and infill development is still possible and could ultimately counteract urban sprawl.

As Boone & Fragkias (2010) suggest, insensitive urbanisation can be a slippery slope as there is an underlying human tendency to want to conquer the environment (Boone & Fragkias, 2010, p. 95). However, there is a growing movement of 'farm-to-school' (Vallianatos, Gottlieb & Haase, 2004, p. 414) as a systematic approach to combating urban sprawl by helping preserve farmland as well as establishing a centralised and localised food system (Vallianatos, Gottlieb & Haase, 2004, p. 414). Under this concept, residents maintain their own vegetable gardens. An extension of this is to conduct a thorough analysis of vegetation, possible urbanisation, total population, number of households, average people per household and income ranges (Boone & Fragkias, 2010, p. 97).

Additionally, Mihaila & Banica (2014) contend that cities should not be a place for industry but a source of its workforce. They suggest that urban sprawl should be reversed or mirrored where the majority of the population lives within the city centre rather than on its fringes, which should consequently be reserved for industry (Mihaila & Banica, 2014, p. 35). Finally, Lv, Dai & Sun's (2012) contend that socioeconomics are the driving factor to urban sprawl and that urban sprawl areas have links to slums. However, there is a positive side as sensitive urbanisation may have the power to relieve socioeconomic problems and to potentially reduce the effects on residents living in these first world slums (Beall, Guha-Khasnobis & Kanbur, 2010, p. 144-145).

2.3. Retrofitting

According to Dixon, Eames, Hunt & Lannon (2014) the existing urban infrastructure should be retrofitted to improve the quality of life within urban sprawl areas (Dixon, Eames, Hunt & Lannon, 2014, p. 49). The author's suggest three major approaches for retrofitting which include (Dixon, Eames, Hunt & Lannon, 2014, p. 269-273):

1. Smart-networked city

The city centralised as a hub within a highly mobile and competitive globally networked society. This approach is an open, outward looking society in which the mobility of people, goods and services remains high.

2. Compact city.

The city as the site of intensive and efficient urban living, where urban land use, buildings, services and infrastructure provision are optimised and centralised in order to create a dense urban settlement that encourages the reduction of energy and resource usage. Concentration of density in urban centres reduces pressures on its fringes. Significant efficiencies are obtained through systematic integration and re-design.

3. Self-reliant green city

The city as a self-reliant bio-region in which the population lives in harmony with nature and uses self-replenishment and circular metabolism to service its needs. In this case, where resources are local, demand is constrained and the inputs and outputs of the city are centralised. In many ways this is an inward facing society, but one conscious of its global responsibility to 'living within its limits'.

Source: Dixon, Eames, Hunt & Lannon, 2014, p. 269-273

Of these three approaches, the compact city is selected for an in-depth exploration in the design component of this study paper as it is the most viable in the current economic climate of the site.

Additionally, Talen (2011) suggests a method to retrofit urban sprawl affected areas by taking into account the unsustainable urban forms and strengths and weaknesses. By examining accessibility, density, diversity and connectivity including nodes such as light rail stops, areas of possible retrofit are revealed (Talen, 2011, p. 952-978).

2.4. Re-greening

Re-greening has been in practice since the mid 1930s. It was pioneered by Albert Morris (Jones, 2011, p. 181), in the small Australian mining town of Broken Hill. According to Jones (2011), Morris worked with arid zone re-vegetation techniques and established a series of reserves around Broken Hill to reduce the environmental impacts of the mining landscape. He coined the terms "Regeneration Reserves" and "Green Belts" (Jones, 2011, p. 181). We can take from Morris the idea of re-greening as a workable concept.

More recently, the City of Melbourne developed a concise guide to greening laneways in the CBD (Jones, 2011). Recommendations to offset traditional gardens with planter boxes, wall creepers and green roofs suggests a positive commitment to re-greening spaces and demonstrates ways in which to make cities more habitable. This complements Mihaila & Banica's (2014) proposal to encourage inner city living and draw people away from the fringes.

2.5. Literature review summary

Urban sprawl creates a large dependency on personal vehicular transport. The growing number of dwellings encroaches on natural habitats, disrupts migratory corridors and creates habitat fragmentation. Urban sprawl has a lasting effect on the quality of life of its residents, which lends itself to a growing level of dissatisfaction with modern sprawl patterns. This dissatisfaction also stems from the design of subdivisions where the pursuit of privacy by single family units encourages introspection, anti-social tendencies and detrimental health affects.

Socioeconomic factors are attributed to the creation of urban sprawl along with a tendency to want to conquer the natural environment. It is possible however, to counteract the detrimental affects of urban sprawl through sensitive urbanisation and infill-development. To do so, it is important to use detailed

analysis before developing an urbanisation strategy. There are three major urbanisation visions of which the compact city, where the urban fabric is minimised is of most interest in to this study.

Re-greening is a concept that attempts to counteract the effects of climate change by adding large amounts of vegetation in cities. There are many guidelines that take into account the re-greening process and the harmonious balance between urban spaces and the natural environment. An example of this is the farm-to-school initiative that promotes the minimalist urbanism of close to home farming. Finally, urban sprawl is a relatively new concept and it is capable of being reversed by increasing inner city populations and moving industry to the urban fringes.

3. METHODOLOGY

The methodology for the written component of this exegesis aims to develop ideas for future urban design to reverse urban sprawl. This component will take exemplary works that have implemented retrofitting, urbanisation and re-greening to combat urban sprawl and explore how these approaches can be applied to the study area. The exemplary developments will be analysed on the basis of the following factors; landform, vegetation, water, colour, adjacent Scenery, scarcity, cultural modification and architectural quality.

After analysing these exemplary works, the design component will introduce design concepts that will consist of the following:

- Mapping: Critical analysis of the design context.
- Visualisation: The use of data and discrete elements to create an overarching design projection.
- Design: The conceptual implementation of retrofitting, urbanisation and re-greening within the study area.
- Application: Applying the critiqued design outputs into a realistic and plausible design concept as well as proposing major design guidelines that can be applied to the study area and other locations prone to urban sprawl.

4. EXPECTED OUTCOMES

The expected outcomes for this exegesis are as follows:

- Analysis: Identify elements in exemplary developments that attempt to reverse urban sprawl and consider their applicability to the Hoppers Crossing Railway Station precinct.
- Design output: incorporate ideas for reversing urban sprawl into the Hoppers Crossing Railway Station precinct and represent them visually.
- Guidelines: make recommendations on ways to reverse urban sprawl, thus contributing to the wider knowledge of urban design.

5. INVESTIGATION

This section of the research paper identifies aspects of urbanisation, retrofitting and re-greening by examining existing developments. These developments are taken from all parts of the world in some of the most densely urbanised locations. They represent various sizes and levels of complexity. These aspects provide some guidance on ways to counteract, and potentially reverse the detrimental effects of urban sprawl.

This section also acts as a precedence study to the design component of this study by exploring various types of urban renewal projects which can assist in developing a more concise and positive design outcome. The six projects explore the pre-implementation and post-implementation stages of each project focuses of landform, vegetation, water, colour, adjacent scenery, scarcity, cultural modification and architectural quality. Internet links for each project are provided at the end of the reference list.

5.1. Example 1: Cheonggyecheon Restoration Project, Seoul, South Korea

This urban renewal development in Seoul takes the existing four lane elevated highway which sits over the Cheonggyecheon River and, after growing dissatisfaction with the expressway, was redeveloped into a pedestrian park and a reclaimed river precinct. It decreased the amount of cars and increased the use of public transport.

Table 1: Cheonggyecheon Restoration Project, pre-implementation and post-implementation aspects

	Pre-implementation	Post-implementation
Landform	Flat urban landscape with elevated highway.	Open and valley like.
Vegetation	Seemingly none. However there are some token trees along the streetscape.	Large amounts of vegetation running the entire length of the project.
Water	Stormwater drainage into creek.	Open, clean, uncovered and celebrated.
Colour	Drab and grey.	Very green, warm and dark.
Adjacent Scenery	Low rise high density residential apartment blocks.	A man-made valley which hides the harsh urban environment.
Scarcity	Limited exposed or visible earth as most of the area is covered with concrete or paving.	Now it is concrete and pavers that are scarce.
Cultural Modification	Highway and vehicular transport dominate. Not many people spending time in the location.	Area opened up for public use while providing a scenic pedestrian pathway and promenade.
Architectural Quality	Very old out-dated buildings.	Majority of the surrounding architecture is hidden. The adjacent buildings now face and celebrate the water source.

This development highlights the positive effect that re-greening has on the urban landscape. The project was a retrofit where an existing urban environment was drastically changed to open the space up and activate it. There are really no negative aspects in this development as its primary function is executed well.

5.2. Example 2: Promenade Plantée, Paris, France

This urban renewal project is a 4.7 km promenade situated within an extensive retrofitted urban green park built above an obsolete rail yard. It has elevated sections up to 10m above the surrounding area and has zones for retail strips and an arts and crafts market.

Table 2: Promenade Plantée, pre-implementation and post-implementation aspects

	Pre-implementation	Post-implementation
Landform	Flat train yard with an elevated section of train line.	Garden and open spaces with an elevated garden walk.
Vegetation	Weeds and overgrown grasses on the train tracks.	Established and thought out vegetation with well maintained grounds.
Water	Water is not celebrated even though a natural river is present	Water runs through the centre of the promenade for most of its length. It only stops when the environment opens up and allows users attractive viewpoints/visitors.
Colour	Drab and washed out.	Green and floral colours.
Adjacent Scenery	Classical Parisian architecture and townhouses.	Same Parisian landscape, however there are now viewpoints where the trees frame the adjacent scenery.
Scarcity	There is a scarcity of useable space in the area and a large demand for useable public space.	No scarcity of viable public space in the development.
Cultural Modification	The rail bridge seems to cut the areas off from one another.	Now Parisians have a very inviting thoroughfare for walking to and from work or exercising.
Architectural Quality	Outdated and obsolete rail bridge and rail yards.	Celebration of the old rail buildings and the bridge itself through its reactivation.

In this development, the retrofitting of the obsolete rail yard and bridge exemplifies the concept of retrofitting proposed in this paper. Additionally, the use of water has an ongoing positive effect on the surrounding urban environment.

5.3. Example 3: Madrid Rio, Spain

This project, called Madrid Río, is about 9 kilometres long. It transforms a neglected precinct in the middle of Spain's capital. It sits atop a reclaimed highway and also rejuvenates a large stretch of the Manzanares River waterfront. It knits together neighbourhoods that had been disconnected from the city centre by the highway.

Table 3: Madrid Rio, pre-implementation and post-implementation aspects

	Pre-implementation	Post-implementation
Landform	Stark unusable river front, muddy and marsh-like. At a certain point a freeway passes over the river and connects to a complicated 'cloverleaf' overpass.	Step up and step downs and a rejuvenated waterfront. Large open urban park areas. Complicated 'cloverleaf' removed.
Vegetation	A few trees but mainly weeds and grasses.	Large amounts of established trees and open green spaces
Water	Shallow running creek with exposed islands dotted along its length.	The banks of the river have been rejuvenated. After dredging, the water flows much better. There are some ponds and water features along the river front.
Colour	Washed out reds and greens.	Greens and greys in the concrete coupled with reds and blues.
Adjacent Scenery	Juxtaposition between water front and the city of Madrid.	There is now a blurring of the line between the city and waterfront.
Scarcity	Very scarce urban environment.	Scarcity is now balanced with urbanisation.
Cultural Modification	The space is very uninviting. Most users would feel that it is not a place to stay for long. People would avoid it.	There are more public use spaces now such as skate parks and BMX tracks. The area is now used extensively as a well activated space that runs through the centre of Madrid.
Architectural Quality	Outdated bridges as well as the surrounding buildings needing maintenance.	Rejuvenated heritage buildings and bridges with new facilities along the waterfront.

Here, urbanisation is the major key in rejuvenating the spaces around the Madrid riverbank. Urbanising this area allowed more of the public to use it as well as make it a prominent focal point in the city.

5.4. Example 4: Park East Freeway Downtown Milwaukee, WI, USA

After growing dissatisfaction among the local population, downtown Milwaukee's elevated freeway was demolished. After removal of the freeways, the original street grid and streetscape was restored. Additionally, the creation of a new district that contains housing, commercial and entertainment developments has improved the urban environment of the downtown area.

Table 4: Park East Freeway Downtown Milwaukee, pre-implementation and post-implementation aspects

	Pre-implementation	Post-implementation
Landform	Stark urban environment, very built form dominate. Elevated freeway overpass dominating the landscape.	More open spaces with areas of natural forms.
Vegetation	Token nature strips.	Green spaces and urban gardens.
Water	The Milwaukee River runs underneath the elevated freeway.	Celebrated river front with urban green spaces.
Colour	Very grey as it is a concrete dominant environment.	Still very grey however there is now a fair amount of greens.
Adjacent Scenery	More built form.	Now less built form and some aspects of the natural environment are visible.
Scarcity	Scarcity of the natural environment.	It is still quite an urban environment however it is now much more active.
Cultural Modification	This area lacks a sense of the natural environment which can lower the quality of life for residents.	The quality of life in the area is a lot higher than it was previously with the inclusion of the natural environment.
Architectural Quality	General medium rise apartment developments.	More diversity of architecture with new developments.

This development illustrates how retrofitted urbanisation can rejuvenate and activate a space that has been over-urbanised and where an excess of built form can be counteracted with sensitive developments.

5.5. Example 5: Atlanta BeltLine, GA, USA

The Atlanta BeltLine is a joint initiative between local government and community groups to create a lengthy green corridor that surrounds the city centre. This corridor is complete with trails and large open green spaces. It also consists of a light rail network which helps users navigate the expansive area.

Table 5: Atlanta BeltLine, pre-implementation and post-implementation aspects

	Pre-implementation	Post-implementation
Landform	Neglected parklands and light rail network.	Activated parklands and nodal light rail network.
Vegetation	Large amounts of unkempt and overgrown vegetation.	Well maintained and established vegetation.
Water	No obvious presence of water.	Man made lakes coupled with water features dotted around the area.
Colour	Green earthy tones but not so inviting.	Green earthy tones, but now more inviting.

Adjacent Scenery	The Atlanta city skyline.	More open and celebrating the rest of the city.
Scarcity	Inactivated and uninviting space.	Always activated.
Cultural Modification	Local residents would not use this space very often.	Very highly activated space, with many attractions all year round.
Architectural Quality	Building frontages shunning the parklands.	Buildings now face into the park celebrating it while creating a green streetscape.

This is a good example of how urbanisation can create harmony between the natural and the built environment. In this case, it is the addition of sensitive urbanisation that does not attempt to conquer the natural environment but makes a built form statement; thus, creating a balance within the urban environment.

5.6. Example 6: Fishermans Bend, Melbourne, Australia

Australia's largest urban renewal project, Fishermans Bend, attempts to urbanise the South Western industrial area of Melbourne. It boasts the implementation of a 'garden city' which maintains a balance between the natural environment and a high quality built environment. It also consists of new public transport nodes as well as a secondary airport closer to the city.

Table 6: Fishermans Bend, pre-implementation and post-implementation aspects

	Pre-implementation	Post-implementation
Landform	Flat and marsh like area.	Stable land with ideal building sites.
Vegetation	Some minimal parklands with small number of trees	Large amounts of tree lined streets, urban gardens and parklands.
Water	External from site in the form of the Yarra River and Port Phillip Bay.	Celebrated with urban streams and water features.
Colour	Drab industrial greys.	Various building palates and materials.
Adjacent Scenery	Views of the city from some streets.	Surrounding views of the North, West and Eastern suburbs as well as uninterrupted views of the city centre.
Scarcity	Lack of activity, people, architecture and permeability.	Possible lack of engagement of residents and road networks.
Cultural Modification	Used only for employees of companies who tenant the buildings in the area.	Residents mingling with employees of tenants and tourists visiting the area.
Architectural Quality	Industrial precincts and warehousing close to the mouth of the Yarra River and Port Phillip Bay.	High density apartments and some commercial precincts.

This is an example of urbanisation being used to increase density and to improve quality of life. This will pave the way for retrofitting the existing urban environment as well as re-greening areas that lack vegetation. The implementation of this project will see greater diversification of Melbourne demography and increase its liveability.

5.7. Investigation Summary

This investigation of exemplary projects supports the possibility of reversing urban sprawl in the following ways

Re-greening - has a lasting positive effect on a space and, when maintained, rejuvenates not only the urban space but the natural environment as well.

Urbanisation - is primarily used in activating urban spaces as well as being the catalyst for creating a harmonious balance between the natural and the urban environments.

Retrofitting - can also be used to activate a decaying urban space. However, unlike urbanisation it is a more complex procedure making small changes that result in larger benefits and outcomes.

Water - can be used as another tool for reversing urban sprawl as it has the effect of purifying spaces and creating activation through the presence of fluid movements.

The positive changes found in these projects provide ideas for use in the Hoppers Crossing Station precinct to combat urban sprawl without making major alterations to the overall model.

5.8. Design Guidelines

The growing dissatisfaction with urban sprawl has prompted this study. Literature on the subject of reversing urban sprawl was analysed, particularly ways in which retrofitting, urbanisation and re-greening could help achieve this goal. After additional analysis of exemplary projects, the following design guidelines have been proposed:

- Increase population density
- For new developments, step up/down of 1 storey when near residential dwellings
- All new developments should have provisions for green roofs
- All rail networks are to be move underground
- Air rights above existing commercial buildings are now available for development, without impeding the existing function of the building.
- Where applicable, all large masses of car parking are to be infill developed.
- Pedestrians take priority over vehicular transport.
- Provide provisions for a second level of egress/foot traffic (Concourses/catwalks/pedestrian overpasses)
- Increase the amount of mixed use buildings around transport hubs.
- Free unoccupied space is to be acquisitioned and retrofitted into green spaces.
- Car parking should be limited to one major site, excluding time zoned street parking.
- Increase the amount of large vegetation (Tall Trees)
- Where applicable include and/or celebrate water.
- Use transport corridors as green belts which spread from the node/hub.

New urban design practices that are more sensitive to keeping the harmonious balance between natural habitats and green spaces and the built environment have been recommended. It is important that built environment professionals begin to develop new ways to overcome the issues surrounding urban sprawl as outlined in this study.

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6.1. Internet links for exemplary projects

6.1.1. Cheonggyecheon Restoration Project

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6.1.2. Promenade Plantée

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6.1.3. Madrid Rio

<http://www.lafoundation.org/research/landscape-performance-series/case-studies/case-study/382>, accessed 23rd May, 2014

[6.1.4. Park East Freeway Downtown Milwaukee](#)

<http://www.preservenet.com/freeways/FreewaysParkEast.html>, accessed 24th May, 2014

[6.1.5. Atlanta BeltLine](#)

<http://beltline.org>, accessed 22nd May, 2014

[6.1.6. Fishermans Bend](#)

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