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**Rust Never Sleeps:
Infrastructural Urbanism and Planning for Change**

by

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Abstract

The research project explores the potential that exists when infrastructure is used to plan for cities that are experiencing economic restructuring. The North American Rust Belt is used as an example to better understand the process of economic restructuring, the possible consequences of this for municipalities, and for examples of how infrastructure can be used to repurpose, reconfigure and regenerate these places. Planning literature looking at decline and regional disparity informs this. The emerging theory of landscape urbanism and its understandings of infrastructure are used as a potential way of planning infrastructure for places that are experiencing change. Examples of planning initiatives that use infrastructure to plan in innovative ways are presented and analyzed, and a conceptual planning response is developed for Oshawa, Ontario which synthesizes this research.

Keywords: infrastructure, planning, economic restructuring, Rust Belt, decline, landscape urbanism, Oshawa, Ontario

Introduction

“New conditions necessitate new forms of practice.” (Reed, 2006, 270)

“...the projection of new possibilities for future urbanisms must derive less from an understanding of form and more from an understanding of process – how things work in space and time.” (David Harvey, quoted in Comer, 2006, 29)

With increasing change and mobility within the North American economy and population, it is clear that planning needs to be done in a more strategic, holistic and adaptive way than ever before. As the spatial configuration of employment across North America evolves, so too does the population distribution. It has certainly been the case in North America in the last four decades that employer closure or relocation, and the more general process of economic restructuring, can have devastating consequences for cities, such as depopulation, high unemployment, and inner city blight. Because of this, planning in such a way that is appropriate to the realities of rapid growth and expansion in some places, and decline and retraction in other places, in the present and future, is required to ensure that restructuring occurs in a way that allows some degree of resiliency and adaptability to communities. This is particularly important for places experiencing slow growth or decline, in order to avoid blight and to ensure that these communities remain healthy and viable places.

This research project explores how infrastructure can be used to plan for municipalities that are experiencing economic restructuring. This research falls into a gap identified in the planning literature where infrastructure is generally regarded as outside the purview of urban planning, despite the huge implications that infrastructure has for urban form, land use and development. I am using the example of deindustrialization in the Rust Belt region to better understand the process of economic restructuring, the possible consequences of this for municipalities, and for examples of how infrastructure can be used to repurpose, reconfigure and regenerate these places.

Linked to any discussion of economic restructuring and deindustrialization is the issue of decline. Of particular interest for this project is the conflation of decline and slow growth, as identified by Leo and Brown (2000). Because slow growth and decline are realities facing places undergoing economic restructuring, and because these call for a different planning approach than places undergoing rapid growth, this will inform this research project. In addition, a more general look at the issue of regional disparity and decline will also be of interest for this project.

To inform the discussion of planning for change and infrastructure, I will draw on the emerging theory of landscape urbanism and its understandings of infrastructure. The principles of flexibility, adaptability, dynamism and process that characterize landscape urbanism can potentially offer a new and useful lens for thinking about planning for changing urban areas using infrastructure. In addition, the examples of landscape urbanist projects have commonly occurred in industrial sites that have been contaminated, abandoned or rendered obsolete, which further suggests that landscape urbanism is an appropriate and valuable way of thinking about planning for places undergoing economic transition.

Enhancing this research, I will present a set of examples of innovative and interesting planning strategies to address the new realities of economic restructuring – whether that means population decline, abandoned industrial sites or infrastructure, or a significant shift in the economic structure. Specifically, I will be looking at the Chattanooga waterfront revitalization, the Youngstown 2010 Plan in Ohio, the High Line in New York City, the Syracuse Connective Corridor, the Beltline initiative in Atlanta, the Route Verte cycling trail in Quebec, the recent economic transition in Elliot Lake, Ontario, and the Flexible Workplace Initiative in Houston, Texas.

Finally, to illustrate this analysis, I will synthesize these theories, ideas and planning strategies to develop a conceptual planning response for the struggling downtown of Oshawa, Ontario. Oshawa is an example of a city that is still experiencing growth – largely due to growth in its health, education, and other service sectors – but is also undergoing significant economic restructuring, with decline and uncertainty within its manufacturing sector, which had been the city's economic engine for decades. Learning from the experience of other Rust Belt cities as well as the literature on decline and infrastructure, this response will use infrastructure to plan for the realities of slow growth and economic restructuring in Oshawa.

Method

This research project crafts a discussion of planning for economic restructuring based on secondary research. The first section of the report uses academic literature from the fields of planning, architecture, economic history, geography and landscape urbanism to bring together issues around infrastructure, planning for places that have experienced economic restructuring, and broader issues surrounding growth and decline. After this, a set of eight examples of planning initiatives are presented, which have been researched through academic literature, municipal planning documents, local media reports and websites for these initiatives. These examples were selected as a sampling of what possibilities exist for reusing and rethinking infrastructure, and show a range of scales and approaches. The final section of this research project develops a speculative planning response for Oshawa, Ontario, which draws on the secondary research mentioned above, as well as background research on the city from Statistics Canada and the Conference Board of Canada, the city's Official Plan, and from site observation and analysis.

Planning Infrastructure

Before getting into a discussion of planning and infrastructure, it is important to be clear about what infrastructure is. Infrastructure comprises the networks, facilities and systems that allow society to function. A traditional view of infrastructure would likely stop at transportation infrastructure, water and sewer systems, and energy. However, it may be more useful to use a broader definition because it allows for a better understanding of how important and integral infrastructure is with functions and uses in cities, as well as acknowledging the important functions of ecological systems in addition to constructed ones. For the purposes of this research project, I am adopting the definition of infrastructure used by Michael Neuman (2009):

...infrastructure refers to built facilities and networks, which are above or below ground, and non-built, yet planned and managed landscapes that provide human and nature services. This broad take includes publicly, privately, and jointly owned and operated systems such as:

<i>Utilities:</i>	gas and electricity, water supply and sewerage, waste collection and disposal.
<i>Public works:</i>	roads and bridges, dams and canals, ports and airports, metros and rails.
<i>Community facilities:</i>	schools, parks, hospitals, libraries, prisons, police, fire, EMS.
<i>Telecommunications:</i>	telephone, fax, internet, television, radio, print, cable, broadband.
<i>Green infrastructures:</i>	parks, river and open space corridors, watersheds, wetlands, rivers and lakes, forests, and habitats. (p. 205)

In addition, it seems appropriate to add governance infrastructure to this list, as policy and government are certainly a system that is integral to the functioning of society.

Infrastructure such as utilities and public works are largely considered to be a concern for civil engineering rather than planning, and green infrastructure is left to ecologists. The current context of planners, architects and engineers, and other professionals, working largely independently of one another means that the potential synergies that could come out of more collaboration are not realized. Each of these professions has a unique set of skills that can inform urban projects. With the case of infrastructure, while civil engineers and ecologists have very important technical skills that are imperative to the construction of reliable and safe infrastructure, planners also have specific skills and knowledge

about urban form and dynamics that can also contribute to the success and viability of infrastructural projects (Graham & Marvin, 2001; Dodson, 2009).

It is the absence of the planners' input that has led Stephen Graham and Simon Marvin (2001) to develop their splintering urbanism critique. They posit that when infrastructure is planned without the input of planners or consideration as to spatial implications, the result can be to impact connections and flows in cities in undesirable ways – think, for example, of the notion of there being a 'wrong side of the tracks.' Iago Dodson (2009) summarizes Graham and Marvin's thesis very effectively: "All too frequently, they charge, analyses of urbanization have tended to downplay the often intimate, complex and intense relationships between urban patterns and constituent infrastructure" (111). Dodson goes as far as to say that the critique put forth by Graham and Marvin doesn't show much hope for this issue to be rectified, and for planners to once again have the role of "urban coordination" (111). He begs to differ, noting an "infrastructural turn" in the last decade in Australia, which he feels is beginning to spread elsewhere in the world (Dodson, 2009). However, Dodson also thinks there is a need to identify the risks and benefits of planning through an infrastructural frame, and whether infrastructure on its own can fulfill the broader goals of planning.

Stan Allen (1999) approaches this discussion of infrastructure planning from a different angle, but his ideas corroborate the idea that infrastructure is not only the purview of technical experts. He writes about the traditional role of the architect in planning infrastructure, and the move away from this as architecture became more expressive and symbolic with the shift from modernism to post-modernism. According to Allen, in the past architecture was more concerned with 'material practices' that were concerned with performance, rather than this new focus on expression that is more concerned with signs and symbols – a shift from "models of formal organization and meaning that work with transparency and depth" to "shallow surfaces in which meaning resides in graphic information lying on the surface" (Allen, 1999, 49). Allen calls on architects to refocus on infrastructure so that the discipline can have a more meaningful part in shaping landscapes, since infrastructure "creates the conditions for future events" (Allen, 1999, 55). Whether or not there has been a similar shift in planning as Allen identifies in architecture is less clear, but his argument for increased attention to infrastructure is a compelling one for architects and planners alike.

A common observation in the literature on infrastructure is the relationship it has with urban form, acting as a kind of skeleton for cities and regions (Allen, 1999; Graham & Marvin, 2001; Neuman, 2009; Schilling & Logan, 2008; Vojnovic, 2006, among others). Similar to Allen, who writes that "infrastructure's medium is geography" (1999, 55), Neuman (2009) observes that infrastructure presents a new way for planners to shape the urban form, and that this has largely been neglected by the discipline. He states "infrastructure systems are always planned... who plans infrastructure is a question of vital importance with significant consequences" (Neuman 2009, 204). Neuman goes on to suggest:

- (1) infrastructure provision has suffered by not being more completely in the hands of city planners,
- (2) city planning has suffered by not having infrastructure as part of its purview, and
- (3) planning can address today's most pressing problems more effectively using infrastructure (Neuman 2009, 205).

For example, when planners are working towards the goal of ecological sustainability and tackling challenges such as sprawl, car-dependency, over consumption of water and energy, and threats to environmentally sensitive lands, infrastructure planning can be used as a way of managing and directing development, logistics and consumption in urban areas. Thinking about equity issues, the siting of infrastructure such as community facilities or amenities could be used to ensure a fair distribution of these throughout urban areas, rather than favouring certain socioeconomic groups. In fact, it may be that making a concerted effort to locate this infrastructure in higher need communities is an appropriate strategy. Also, the siting of infrastructure ought to be done in such a way that doesn't segregate or negatively impact certain groups or neighbourhoods, recalling Graham and Marvin's (2001) work.

A third example, using infrastructure to address economic challenges and goals in urban areas is the area of focus for this research project. Kennedy et al. (2009) note that:

Beyond its impacts on productivity, infrastructure has a deeper, more fundamental role in shaping economies. The whole ecology of a regional economy – the amounts of consumption, the demand for imports, and the types and number of certain jobs – can be linked to long-term infrastructure investments. Through its association with land use and urban form, infrastructure fundamentally influences consumption within an economy (15).

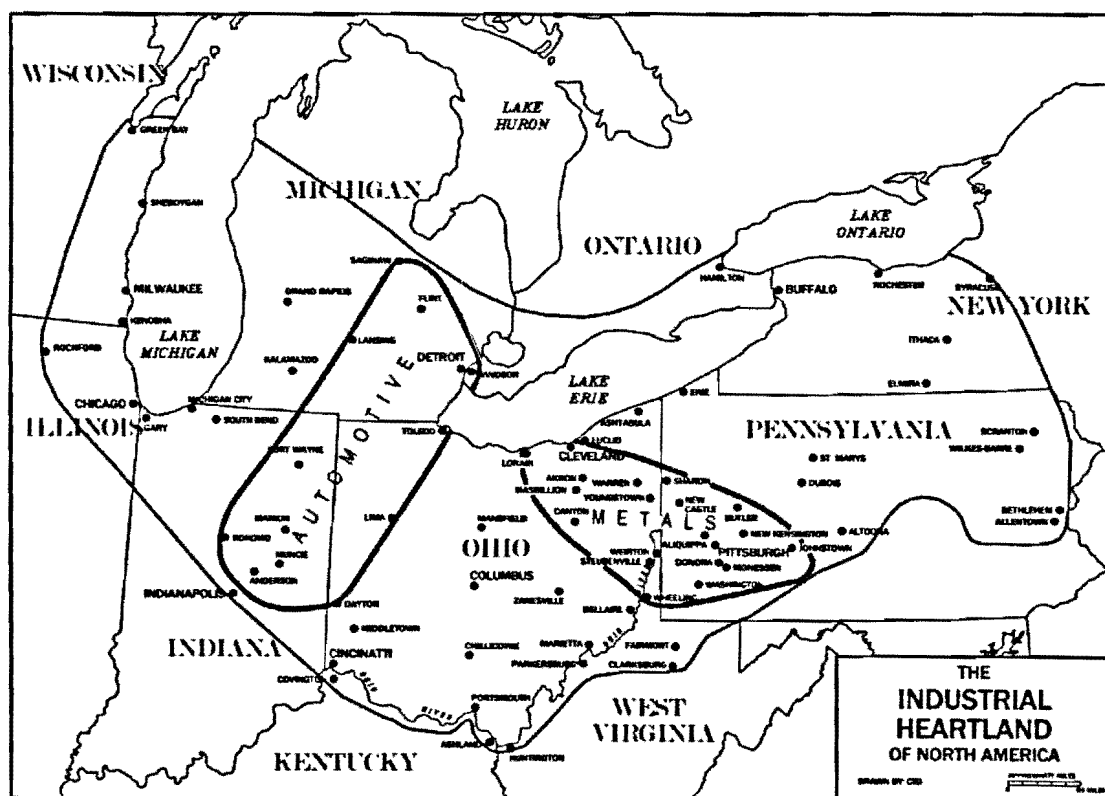
They go on to emphasize the close relationship between infrastructure and economic activity. Considering the dominant growth-oriented paradigm that pervades the planning of cities and their infrastructure, it is clear that the way in which infrastructure has been planned is to encourage and support growth as much as possible.

At this point, I will turn to one particular economic challenge facing urban areas – economic restructuring and deindustrialization – before returning to this discussion of infrastructure. To synthesize this proposed planning approach with the challenges associated with economic restructuring, I will then offer a set of examples of planning initiatives that use infrastructure in innovative ways, and develop a response for Oshawa that draws on the common themes from the literature and from these examples.

Economic Restructuring in the Rust Belt

The North American economy has experienced a marked structural shift since the postwar period. This economic shift, in turn has had spatial implications and profound impacts on the North American urban system. Following the second World War, with the rise of Fordist production methods and correlated consumer demand, manufacturing in the United States and Canada became a dominant economic sector, especially for weapons production, chemical processing and auto manufacturing (Belanger, 2009). Postwar factories provided stable, well-paying jobs for millions of North Americans, and became the economic backbone of many cities, states and provinces. During this time, cities in the northeastern United States and southern Ontario and Quebec were hubs for manufacturing and heavy industry, as shown in Figure 1. This was largely due to their proximity to resources, waterways and railroads.

Figure 1: The North American Rust Belt



By the 1970's, the manufacturing sector entered a period of instability, after decades of growth. Weaknesses in the global economy impacted demand, both domestically and in foreign markets (Wilson & Wouters, 2003). In addition, relaxed trade regulations and newly industrialized countries abroad made it easier and more attractive for manufacturers to relocate where labour costs were cheaper and environmental regulations were less rigorous (Barnes, et al, 2000; Donald, 2002; High & Lewis, 2007). Over the next few decades, there was a rise

of plant closures, or employee layoffs whereby some positions were made redundant by machinery and more efficient production methods (Wilson & Wouters, 2003). In turn, cities that had developed as centres for manufacturing and chemical processing were left “victims of decaying oversized infrastructure, contaminated vacant land, and heavy tax burdens” (Belanger, 2009a, 83).

In Canada, there has been a marked decline in manufacturing in the last 4 decades, shown in the following table, which shows a break down the percentage of total Canadian employment by sector for 1971 and 2009:

Table 1: Employment Structure, Canada: 1971 and 2009

	1971	2009
Goods-Producing Sector		
<i>Manufacturing</i>	22%	11%
<i>Resource Extraction, Utilities, Construction</i>	13%	11%
Service Sector	65%	78%
Total Employment	100%	100%

(Coffey & Shearmur, 2006, 249; Statistics Canada, 2010)

Considering that the majority of Canadian manufacturing has taken place in Ontario and Quebec (even in 2001, three-quarters of manufacturing jobs were located in these two provinces, mainly in the Windsor-Quebec City corridor) (England & Mercer, 2006, 33), it is clear that the huge decline in manufacturing employment as the economy shifted to service employment would have profound impacts on cities and towns in the Canadian Rust Belt.

Similarly in the United States, there was a shift from manufacturing to service sector employment between 1970 and 2008, even more dramatic than that experienced in Canada:

Table 2: Employment Structure, United States: 1970 and 2008

	1970	2008
Goods-Producing Sector		
<i>Manufacturing</i>	26%	10%
<i>Resource Extraction, Utilities, Construction</i>	12%	7%
Service Sector	62%	83%
Total Employment	100%	100%

(US Census Bureau, 2009; US Census Bureau, 2010a).

For many cities whose economies were based on manufacturing and industry, these changes were devastating. The concentration of cities impacted by the decline of manufacturing sector and the population and economic decline that resulted is often referred to as the Rust Belt. Lorraine Hoyt and André Leroux (2007) have developed the notion of “forgotten cities” which are characterized by an industrial past, a population of less than 150,000 in 2000 (indicating significant population decline) and a low median household income (indicating significant economic decline); one hundred and fifty cities in the American Rust Belt meet

these criteria. In contrast, Canada's experience of deindustrialization has been somewhat different. A study done by Serge Coulombe and Kathleen M. Day (1999) found that Canadian Rust Belt cities were less likely to experience population decline, even if there is significant economic decline. Coulombe and Day, as well as others (England & Mercer, 2006; Jacobs, 2009) have hypothesized that this is largely due to government policies in Canada, such as social welfare and health care benefits. As well, Canadian Rust Belt cities tended to have a somewhat diversified economies than those of the United States which also added to their relative resiliency (Donald, 2002; England & Mercer, 2006). Diversified economies have been shown to make a significant impact on how cities experience economic restructuring (Detrick, 1999).

Pittsburgh is an example of a city that was a typical centre for steel production, but, despite layoffs and depopulation, was able to pull through the transition relatively well. There are a few key factors that contributed to this. First, there was a somewhat diversified economy to help weather the storm: as Detrick (1999) points out, although manufacturing employment in Pittsburgh decreased by 43%, or 115,000 jobs, overall employment only decreased by 7%, indicating that there was employment growth in other sectors (5). Second, in the decades before the collapse of steel in the 1980s, the municipality made significant investment in infrastructure that was valuable during difficult times – suggesting the importance for cities to invest in long-term needs, especially when the economy is stable or growing. This investment continues with a new sales tax increase of 0.5% that is earmarked for economic development and infrastructure projects. A third important factor for Pittsburgh's relative resilience has been the public-partnerships that exist between private businesses, public institutions, non-profit groups and the government, which have bolstered revitalization efforts. In particular, the partnerships between the two universities in Pittsburgh, the city and private research labs have resulted in job creation and economic activity (Singh & Allen, 2006). While Pittsburgh is not without its challenges and issues, the relative success of its transition from a steel economy to a more knowledge-based one shows the importance of a diversified economy, investment in infrastructure and partnerships.

It is important to understand the decline of manufacturing in Canada and the United States as one aspect of a fundamental shift in the North American economy whereby jobs that are largely physical and repetitive in nature are being replaced by jobs that require more analytical skills and creativity (MPI, 2009). The Martin Prosperity Institute makes a distinction between 'routine-oriented occupations,' which include physical-labour jobs as well as repetitive service jobs, and 'creativity-oriented occupations' that require more analysis and creativity. Their working paper "Ontario in the creative age" shows that in Ontario, while creativity-oriented occupations make up roughly one-quarter of Ontario's employment, they are increasing as "routine-oriented" occupations are declining, which they describe as a transition that has been underway since World War II "from an industrial economy based on physical labour to a creative economy based on human creativity" (MPI, 2009, 8).

The Martin Prosperity Institute, as well as Cowie and Heathcott (2003) observe that this type of transition simply marks a natural next step for a successful industrialized nation, where there is sufficient wealth and training to support a knowledge-based economy. That said, there are issues of equity and exclusion that follow from this shift. 'Creative,' knowledge-based jobs favour those who are well-educated, and tend to be found in larger urban areas (MPI, 2009). They point to the need to create better infrastructural linkages within the urban system to increase and enhance the relationships that smaller towns and cities have with the largest urban centres, so they too can benefit from the new economy. As well, investment in education is important to foster a skilled labour force.

A recurring observation in the literature is that, despite the deindustrialization that occurred in the Rust Belt, it is important to remember that the importance and need for manufacturing hasn't changed, but its geography has (Cowie & Heathcott, 2003; High & Lewis, 2007, among others). In this vein, David Wilson and Jared Wouters (2003) bring spatial discourse into their interpretation of restructuring in the American Rust Belt. They note the way in which new technological and economic strategies impacted the spatial dimension of manufacturing:

Space's traditional holding effect on business was no longer effective. The globe was now constituted by coordinated parts, easily moving capital and equipment across international space. Once, space locked plants, investments and jobs in cities, a fact that ensured economic stability. But now urban space has become dramatically tamed and mastered, according to the growth rhetoric. in the service of business and corporate profits with profound repercussions for cities. (Wilson & Wouters, 2003, 130)

Charles Waldheim and Alan Berger (2008) add an interesting idea to this line of thought in their discussion of economic restructuring and infrastructure. They trace the same shifts in the economy that Wilson and Wouters have, but emphasize the primacy of infrastructure in this evolution. For example, they discuss how the rise of 'Just-In-Time' delivery in manufacturing and distribution systems has greatly reduced the need for warehousing, because materials and products are kept on public infrastructure while in transit, thus making the spatially-rooted function of storage less necessary (Waldheim & Berger, 2008). Another example that Waldheim and Berger give is how corporations are more often regarding physical infrastructure, such as buildings and properties, as "semidisposable" which can be "written off or abandoned at any moment", considering buildings as annual operating costs, rather than capital assets (Waldheim & Berger, 2008, 229). The tendency of large-format retailers such as Wal-Mart or Home Depot to invest little in the design elements of their buildings and properties, and the not uncommon abandonment of big box stores is evidence of this (Waldheim & Berger, 2008).

The reasons for plant relocations and closures, and layoffs are plain enough from the perspective of corporate, profit-driven decision-making. However, the

economic decisions that led to the deindustrialization of the Rust Belt had very complex and multidimensional consequences. For the cities and workers that experienced this restructuring firsthand, this was not merely an economic shift – it was a shift in their way of life. Drawing on ideas of spatiality, while a factory may be relatively footloose and able to relocate with ease in order to maximize profit margins, municipalities are entirely tied to space and, in the case of Rust Belt cities, they are left to deal with the aftermath of plant closures and the social, demographic and economic implications of this.

Here, a fundamental difference in the perspectives of manufacturing and industrial employers on one hand, and the cities and employees they left behind in the Rust Belt on the other, is evident. It highlights a fundamental difference between the needs of corporations and the needs of communities and is expressed compellingly by Jefferson Cowie and Joseph Heathcott in their essay on the meanings of deindustrialization:

...the solidity of factories and tenements and steeples masked a fundamental impermanence; it obscures the forces that both created this world through investment and broke it apart by withdrawing investment. Working people saw in the decline of this industrial order the dissolution of their society, culture, and way of life, and the betrayal of their trust by those whose decisions shaped their fate. But owners, investors, and corporate officers did not perceive the world in quite the same terms. (2003, 5)

I would go further, and suggest that not only workers and their families, but many cities felt betrayed by plant closures and layoffs, especially considering the infrastructural investments that were made to accommodate manufacturing and industry, to say nothing of possible incentives that were given to attract these employers. In addition, the depopulation that characterizes Rust Belt cities further compounds the issues that result from deindustrialization, because of the resultant loss of tax revenues, labour and social capital. According to Hoyt and Leroux, “a city’s collective mindset often deteriorates in tandem with the dramatic exodus of industries and residents, which not only depletes civic capacity, but also traumatizes local officials and creates a shared memory of failure” (2007, 15).

It has been noted that there is a great deal of shame and stigma associated with many Rust Belt cities – think of the common connotations attached to cities such as Detroit or Buffalo – and this often colours the way in which the city perceives itself (Cowie & Heathcott, 2003; Hoyt & Leroux, 2007). As this discussion moves on to the broader issues associated with places experiencing decline or slow growth, this is an important point to keep in mind.

Planning for Slow Growth or Decline

The decline or slower growth that resulted from deindustrialization in the Rust Belt raises an important question – specifically, how exactly does one plan for these places? It seems that, by and large, planning is typically motivated by growth – whether it is to attract investment, increase population or grow the economy. As Leo and Brown (2000) point out, places experiencing rapid growth and places experiencing slow growth or decline have different contexts and require different approaches to planning. They go on to assert that it is a uniquely North American tendency to conflate slow growth and decline, since neither is rapid growth, and to assume that it is always a negative thing when places are not experiencing rapid growth. However, this is not necessarily the case.

Slow growth may indicate stability within a community and the consequences of either slow growth or decline is highly dependent on the specific context of the community and the circumstances that have led to that dynamic. Using the example of Winnipeg, a city that is experiencing slow growth, Christopher Leo and Kathryn Anderson make the case that the conflation of slow growth with decline, and the resulting insecurity that a community collectively feels about this can lead to “an exaggerated sense of powerlessness” (2006, 406). This, in turn, can result in city councils being afraid of restricting or refusing the demands of developers for fear of turning away investment and opportunities. Leo and Anderson use Winnipeg’s recent approval of a massive Greenfield residential development to illustrate this:

A good share of this [deteriorated downtown infrastructure] stems from the willingness, indeed the determination, to spread the city thinly as to deplete the resources available for the maintenance of existing infrastructure and services. Winnipeg’s problem is not slow growth, but mismanagement of growth. The visible deterioration, in turn, eats away at the self-confidence that would be needed to enforce some sensible measures for better management of growth. (2006, 403)

Leo and Anderson go on to discuss how this lack of confidence in the city’s future wellbeing creates a vicious cycle: it leads city council to make harmful, desperate planning decisions, which in turn further impact the city in a negative way, when really it is because of a misjudgment of reality. This is likely the case for other cities in a similar situation. Because of this, it is important to realize that growth is not the answer for every challenge that faces a city (Leo & Anderson, 2006).

Larry Bourne (2006) echoes this sentiment that slow growth or decline are not in and of themselves negative, but he qualifies this by noting that decline in population is often associated with communities having limited job opportunities and commercial businesses, reduced public services, and lower housing values (452). He goes on to say, that these characteristics can snowball and further

decline over time, making it difficult for these municipalities to maintain previous levels of services and infrastructure. Bourne comes to the observation that growth tends to beget growth, and similarly, decline begets decline. Because of this, he asks whether this represents a new 'fault line' within the Canadian urban system.

This idea is developed by Bourne in a 2003 essay written with Jim Simmons. Bourne and Simmons note that at the time of writing, five mega-regions in Canada (namely the greater Toronto region, greater Montreal, Ottawa-Gatineau, Vancouver-Victoria and the lower mainland, and the central Alberta urban corridor) experienced over 83% of national population growth between 1991 and 2001 (2003, 28). In contrast, a handful of smaller cities were experiencing slow growth, while the rest of country experienced no population growth, or population decline (Bourne & Simmons, 2003, 28).

Because of Canada's low fertility rate, and the fact that most of the country's population growth comes from immigration, Bourne and Simmons point out that this means that only a handful of areas are receiving most new Canadians which has huge implications: "One set of places is growing relatively rapidly, while simultaneously becoming more socially and culturally diverse. The other set of places is growing slowly, or not at all, and most of these cities (and their hinterland regions) remain socially homogeneous, with a rapidly aging population" (2003, 32). Further, Bourne and Simmons even assert "our urban future is becoming more obvious: a permanent set of place-based winners and losers" (2003, 40). They conclude that growth-decline may represent a new national fault line, similar to historic fault lines such as rural-urban, east-west, or French-English (Bourne & Simmons, 2003). Relating this back to the issue of deindustrialization, Bourne and Simmons note that this division they identify will be exacerbated by economic factors: "Economic restructuring, an expanded services sector, new technologies, and the representation of trade flows to continental destinations, have added an overlay of pressures that are reorganizing the nation's economy and weakening the ties that bind the urban system together" (2003, 42).

Accepting Leo and Anderson's argument that planning for places experiencing slow growth and decline calls for an appropriate, context-specific approach, the next question would be what exactly this looks like. In their handbook on planning for "forgotten cities" in the American Rust Belt, Hoyt and Leroux emphasize how important confidence and hope is for success. They note that in these cities, there is often a lack of civic engagement, and a chronically negative collective mindset (Hoyt & Leroux, 2007). This is largely due to the shock and trauma the community experienced or is experiencing as a result of economic uncertainty, the decline of public services, and the feeling of shame that the community has because it has declined (Hoyt & Leroux, 2007).

One strategy for empowering the community is to focus on existing assets that can be the foundation for future success – as Hoyt and Leroux observe, most of the "forgotten cities" had assets such as a good and accessible location, a

walkable scale and layout, existing infrastructure, heritage buildings, cultural assets, and affordable property values (Hoyt & Leroux, 2007). Another strategy when working with these communities is to focus on something small to start in order to empower residents and stakeholders. This should be done in tandem with identifying the goals of the community, and having stakeholders take ownership over the planning process.

As well, because of the fact that planning typically embodies the view described by Leo and Anderson that rapid growth is the measure of success, there is a need for a paradigm shift. As shown, this view is simply not serving the needs or realities of many communities and can lead to inappropriate planning decisions. Considering the implicit economic motive in this paradigm, it is not hard to see why this paradigm is so pervasive – in a market economy, money is used as an organizing mechanism and a goal. It is beyond the scope of this project to offer alternative paradigms that can shape the planning process, but accepting a new form of success, such as sustainability, can be a way of avoiding the constant drive for growth.

Having touched on planning for places that are experiencing economic restructuring, and decline or slow growth as a result, at this point I will turn to infrastructure planning as a way of regenerating, reconfiguring or repurposing these places, depending on the goals of the specific community. This can benefit from the perspective of landscape urbanism – its focus on process and change seems appropriate for these changing and transitioning areas.

Infrastructural Urbanism

Landscape urbanism is an emerging body of theory that embraces the complexity, functionality and dynamism of spaces. It attempts to work with and harness their functions and processes rather than ignoring or eradicating them. Landscape urbanism defines landscapes in terms of their systems (such as weather, hydrology, seasonality, wildlife, etc.) and the interactions between these systems over time, and, in turn, uses these landscapes as an ordering mechanism to define areas and regions. There is an emphasis on the depth and complexity of the site and the idea of sites as a foundation for performance. By regarding the surface of a site as the basis for systems and uses that may change and evolve, landscape urbanism is focused on process and dynamism rather than purely designed form.

When this theory is applied to infrastructure, it means focusing on functionality and performance – as Stan Allen (1999) writes about this new perspective on infrastructure, “form matters, but more for what it can do than for what it looks like” (57). Infrastructure, then, is conceived of as functioning systems, rather than as merely physical objects. Understanding infrastructure as a system allows for more dynamism, since systems can accommodate and adjust to change. Allen’s analogy between infrastructural systems and ecological systems is an illustrative one, both because it highlights its dynamic quality, but also the idea that the form and characteristics of both infrastructural systems and ecological systems provide direction and structure for flows of energy and resources (Allen, 1999). This is echoed in James Corner’s (2006) discussion of the staging of surfaces for performance:

This understanding of surface highlights the trajectories of shifting populations, demographics, and interest groups upon the urban surface; traces of people provisionally stage a site in different ways at different times for various programmatic events, while connecting a variety of such events temporally around the larger territory. This attempts to create an environment that is not so much an object that has been “designed” as it is an ecology of various systems and elements that set in a motion a diverse network of interaction. (31)

For Corner, surfaces are understood as infrastructure as they provide the basis for function – this view is echoed throughout the literature on infrastructure, which acknowledges its function as a skeleton for urban form.

Inherent in these understandings of infrastructure are ideas of adaptability and resilience. A closer look at these concepts provides a more nuanced understanding of infrastructural urbanism. Drawn from the discipline of ecology, these concepts point to the ability of a system to withstand, allow for and thrive in a context of change and uncertainty. Similar to the way in which any ecological system always adjusts to change, it is possible to design infrastructure in such a

way that it is dynamic and flexible enough to allow for change, rather than ceasing to function if conditions transition (Lister, 2009). Nina-Marie Lister (2009) points out an interesting characteristic of designing this type of infrastructure – that they necessarily evolve over time to fit their changing context, and that “these spaces will unfold and be used and interpreted in ways unforeseeable by the designer.”

To add an economic element to this discussion of infrastructural urbanism, the work of Chris Reed (2006), Charles Waldheim and Alan Berger (2008), and Pierre Belanger (2009a, 2009b) are particularly apt. Chris Reed traces an evolution in American public works projects to show a progression from bottom-up, collaborative public works initiatives to larger-scale, centralized projects, and later to more decentralized projects, and notes that this reflects changing economic contexts (2006). Reed sees this progression as a shift to planning infrastructure in the context of “contemporary cultural conditions of dispersal, decentralization, deregulation, privatization, mobility and flexibility” (2006, 269). He notes that this is seen both in the form that these projects take, as well as in the process by which they are planned and implemented. Because of this, he talks about how the role of planner in this sort of project is “re-cast as [that of an] urbanistic system-builder, whose interests now encompass research, framing, design and implementation of expansive new public works and civic infrastructure” (Reed, 2006, 283).

Waldheim and Berger trace the increasingly mobile nature of logistical networks used in the production, distribution, consumption and disposal systems in the United States in the twentieth century to the point where the infrastructure that facilitates these functions is best understood in terms of landscapes, rather than as just physical infrastructure, urban form or architecture (Waldheim & Berger, 2008). Although the logistics landscape is not entirely physical, Waldheim and Berger note that it is highly engineered and planned. They also imply that the reason these systems are so efficient is because profit is at stake, so there is strong impetus for this infrastructure to be as adaptive and functional as possible.

Belanger (2009a, 2009b) makes an interesting link between economic considerations and ecological infrastructure. Specifically, Belanger notes how industrial development in North America since the nineteenth century has ignored and subverted ecological systems through civil engineering and rational planning, but that ecological systems offer a powerful way of developing more flexible and resilient infrastructure, recalling the work of Allen, Corner, and Waldheim and Berger. He notes that in the wake of North American deindustrialization, “this moment in history demands a reconsideration of the conventional, centralized, and technocratic practice of infrastructure and the discipline of civil engineering that have overshadowed the landscape of bio-physical systems – as a decentralized infrastructure” (Belanger, 2009a, 80). Providing examples of industrial contamination, in Love Canal, New York, and an infrastructure of waste disposal that has resulted in a functioning habitat in the Leslie Street Spit in Toronto, Belanger shows both the risks of ignoring ecology and the benefits of planning with it (2009a, 2009b).

It is important to acknowledge the tension that results from encouraging a flexible and adaptive form of infrastructure in light of the increasingly mobile nature of the global economy and the clear impacts this lack of stability has on communities. Arguably, much of the change that occurs in cities is due to economic forces, whether directly or indirectly (through demographic shifts that occur as a result of economic shifts, for example). That so, it seems that this is, really, a recommendation for communities to accept that industry and employers are increasingly footloose, and that this needs to be accommodated, even if this subverts the needs of the community for long-term investment and employment. However, it is not necessarily the case that the public interest needs to be compromised in light of increasingly mobile investment.

First, as employment becomes increasingly knowledge-intensive, employers locate where there is a suitable labour pool and clusters that offer potential synergies. Because the labour pool is rooted in a given community or region, it is likely that knowledge-based employers will also be more tied to space. Similarly, if a cluster exists in a given area, this will attract other employers to the area, making it increasingly less attractive for individual employers to relocate as the cluster grows. In addition, communities have the ability to require that employers take their needs into account – for example, environmental regulations, requiring the provision of public goods, and requiring employers to develop along existing infrastructure are all possible strategies for this. Cities can set their own terms for investment, and this can benefit these communities as well as employers.

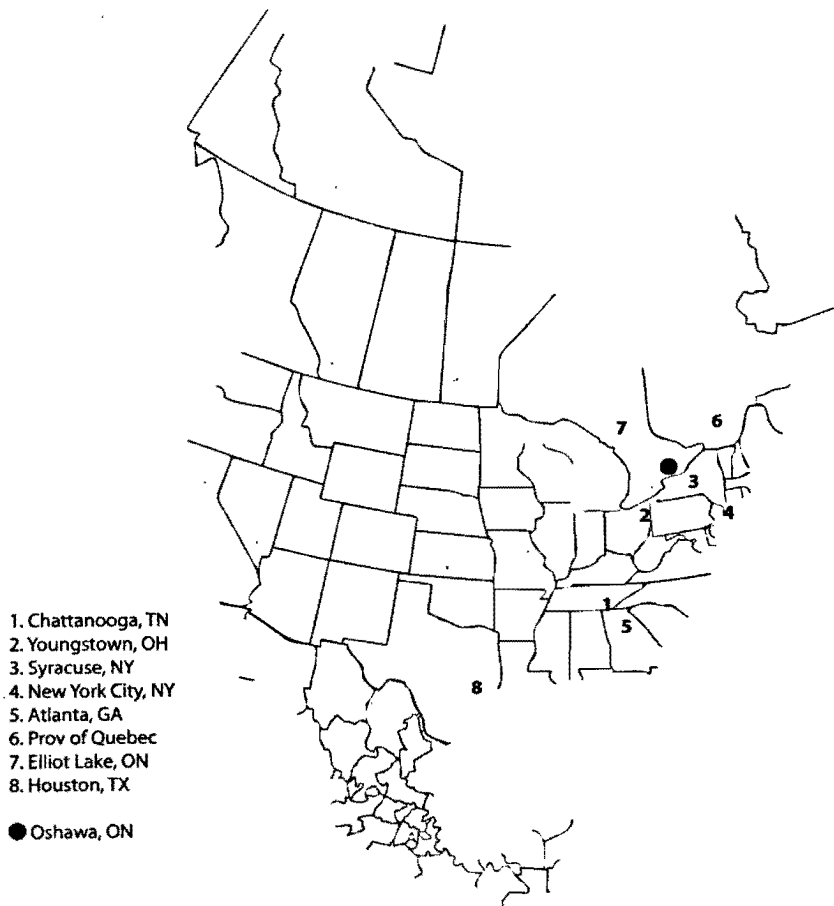
That said, there is always going to be some degree of transition in communities as the economic context changes and employers move in and out – transition is the sign of a healthy economy, because it demonstrates adaptation and resilience. As such, a key lesson that can come from the Rust Belt, as well as many resource-based towns, is the importance of diversity within an urban economy. This makes it easier to weather decline in specific industries, and will make cities less susceptible to the devastation that can result from the collapse of a single industry. A diversified economy will also give the residents of a community more options if faced with layoffs and unemployment, so they would not necessarily need to relocate. Of course, economic diversification is depends on a number of market forces beyond the control of planners, but this should be a goal for municipalities.

Related to this, it is important to accept that as a result of transition there will be abandoned and vacant sites – what Alan Berger (2006) refers to as drosscape. Berger, acknowledging the necessity of drosscape in order for communities to adapt to economic change notes that “the challenge for designers is thus not to achieve drossless urbanization but to integrate inevitable dross into more flexible aesthetic and design strategies,” (Berger, 2006, 203) whether this is occurring as a result of growth, stability, or decline. It is hoped that the examples discussed in the following section will illustrate some of the possibilities that can come out of a new perspective for working with abandoned or underutilized infrastructure, and planning infrastructure more generally.

Rethinking and Reusing Infrastructure: Examples

The following eight examples of planning initiatives and projects show innovative ways of using and reusing infrastructure to reimagine communities and the way they work. examples also represent a range of goals that were identified in these respective communities. In Youngstown, Ohio, for example, infrastructure was used to right-size the community without trying to foster growth. In contrast, the cases of Chattanooga, Tennessee and Elliot Lake, Ontario still have economic development and growth as one of their goals. At this point, I will present the examples, after which I will highlight some common themes and lessons that can be taken from these initiatives. Figure 2 represents the spatial locations of each of these examples:

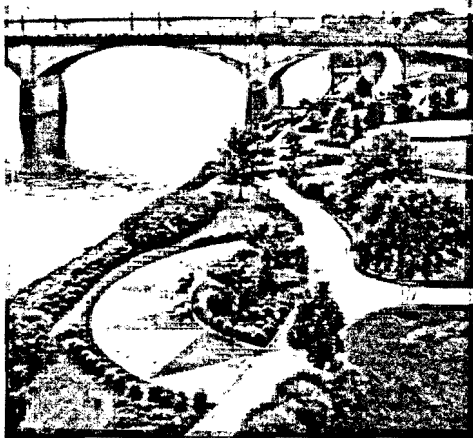
Figure 2: Locations of Examples



Waterfront Revitalization in Chattanooga, Tennessee

In 1969, the United States government labeled Chattanooga, Tennessee as the “dirtiest city” in America (Koerner, 1998, 31). The city was known for the air pollution from its factories and steel foundries, to the extent that “cars were forced to use headlights at midday so they didn’t get lost in the smog” (Koerner, 1998, 31). Chattanooga had a typical Rust Belt city experience of deindustrialization and population loss. The city employed a handful of strategies for cleaning up and revitalizing the city. One such strategy involved empowering the local Air Pollution Control Board to closely monitor air pollution levels to eventual become a national leader in air standards.

Figure 3



A second strategy involved the Vision 2000 planning exercise in 1984, in which a series of community meetings were held over twenty weeks to gain citizen input into the direction of future planning in Chattanooga. A key result of this was “getting back in touch with the river,” (Koerner, 1998, 31) as Chattanooga is a waterfront city, although until recently the waterfront was the location of abandoned industrial sites and waste. The city formed a partnership with private stakeholders, who provided the vast majority of the funds to revitalize the downtown and

waterfront. There are now improved roads and sewers, a promenade and parkland along the water, and a fleet of heavily used electric buses. There have also been large developments such as a stadium, aquarium, children’s museum and convention centre in the last two decades. The city core is now attractive, vibrant and clean and has a diversified economy. Chattanooga’s population has grown and stabilized to 170,880 in 2008 since it hit a low of 119,082 in 1970 (US Census Bureau, 2010b; Koerner, 1998, 32).

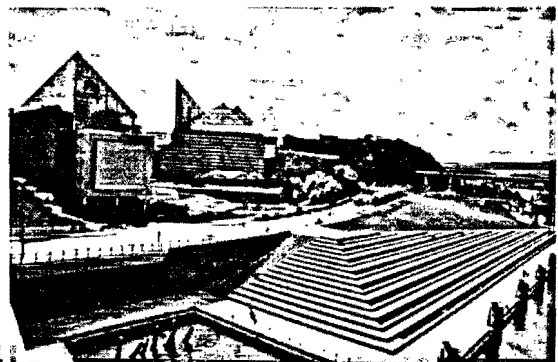


Figure 4

The Youngstown 2010 Plan in Youngstown, Ohio

Youngstown, Ohio has become the go-to example of a Rust Belt city that has adopted a new paradigm for planning, which relies heavily on the planning of infrastructure. The city developed as a center for the production of steel throughout much of the twentieth century, and this constituted the key component of Youngstown's economy. Planning in Youngstown during this time was predicated on expansion and growth. Despite the collapse of the steel industry in the 1970s and subsequent decline in population and employment in the city, the city continued to use its comprehensive plan from 1951 (which had been updated in 1974) until the turn of the century (Hoyt & Leroux, 2007; Youngstown 2010, 2005). Youngstown lost over half of its population of 170,000 within a couple of decades, and approximately 12,000 commercial and residential properties were left vacant (Belanger, 2009a). According to the city, "Youngstown lacked direction through its decline, and without vision languished for the next twenty-five years" (Youngstown 2010, 2005, 14).

When Youngstown's planning department visited Chattanooga a decade ago to see the waterfront revitalization there, they returned with a "collective will to move forward" and plan for the current context of Youngstown, rather than using an outdated approach (Finnerty Jr., 2003, 18). Out of this came the Youngstown 2010 initiative. The first stage of the initiative was an extensive public visioning process in 2002 to identify the goals and values of the community. This process resulted in a framework with which to create a new plan, with a key element being the recognition and acceptance that Youngstown is a smaller city than it once was, making protracted shrinkage an appropriate strategy (Youngstown 2010, 2005; Belanger, 2009a).

After analyzing the land use designations in Youngstown that had been in place for decades, the planning department decided there was too much land devoted to commercial, industrial and residential uses in light of Youngstown's population of 82,000 (Youngstown 2010, 2005). Land use designations were adjusted so that they were appropriate for a smaller city, by keeping the urban form relatively centralized, and not designating land in a way that anticipates growth. In tandem with this was the decommissioning of infrastructure to certain parts of the city that was unnecessary, in order to mitigate sprawl and reduce servicing and maintenance costs – what Pierre Belanger compellingly refers to as "dismantling" the city (2009b). Another interesting strategy for downsizing Youngstown was the "grey to green" transformation (Youngstown 2010, 2005, 45), of allowing developed areas within the city to take on ecological functions – banking vacant land to expand the network of green spaces and trails, or allowing vacant properties to take on stormwater management functions, for example (Belanger, 2009a). Youngstown is a powerful example of planning for the realities of decline, and in doing so, embracing a new paradigm where decline is not seen as a negative thing (Belanger, 2009a).

Figure 5: Existing Land Use Designations, Youngstown, OH

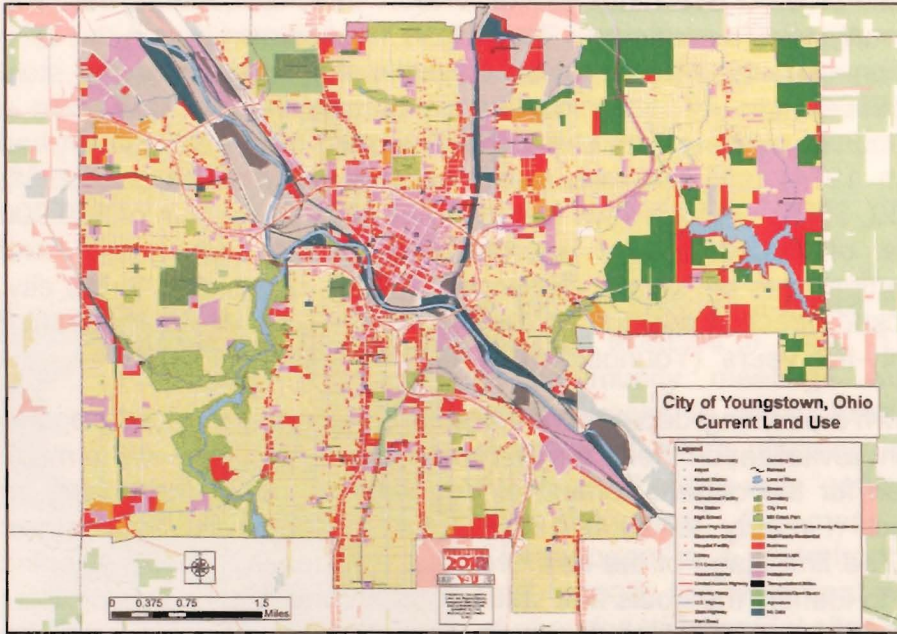
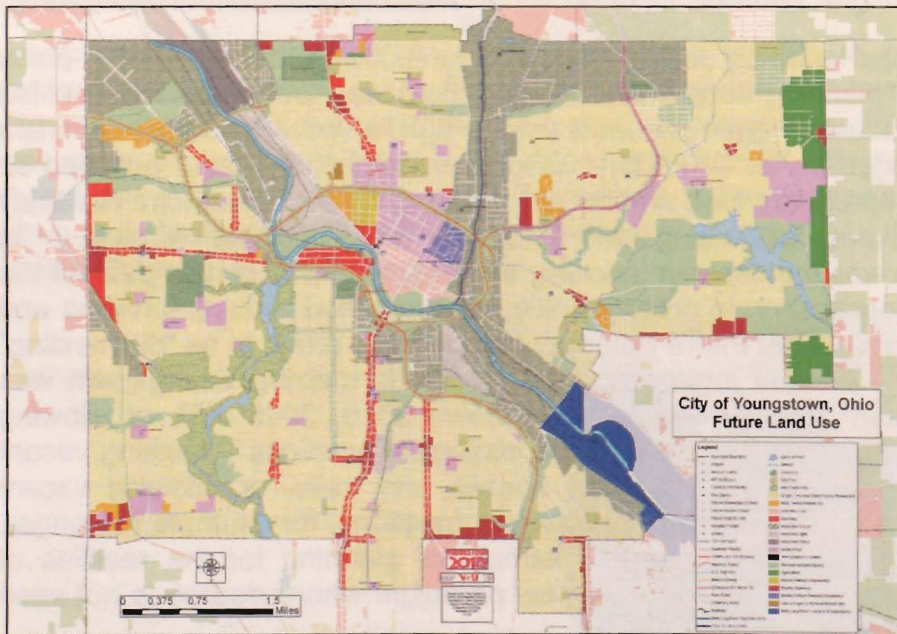


Figure 6: Future Land Use Designations, Youngstown, OH



The Connective Corridor in Syracuse, New York

Syracuse, New York would fit within Hoyt and Leroux's (2007) definition of a 'forgotten city', as it has experienced population and income decline as its manufacturing sector has declined. A revitalization project in Syracuse, whose partners include the city, Syracuse University, the regional public transit authority, National Grid, and private firms, has been established in the downtown core. The Connective Corridor initiative runs 1.5 kilometres through a central corridor, connecting Syracuse University with the downtown using public transit and bicycle and pedestrian paths. It is also meant to connect historic landmarks and arts and cultural venues, and encourage more development and intensification in the downtown through the development of better transportation options and celebration of Syracuse's cultural amenities (Office of Community Engagement and Economic Development, Syracuse University). There is an attempt to "unify the city's islands of vitality" (Thompson, 2009), by connecting neighbourhoods with varying characteristics as part of this project. In addition, Julia Czerniak (2009), an urban design consultant for this project, emphasizes the fresh image and identity for Syracuse that will emerge from this project, which can be important for cities that have experienced decline, since a new image of the community can foster enthusiasm and pride.

Figure 7: Concept Art of Syracuse Connective Corridor



While this initiative is quite forward-thinking and inspiring, it is not without its challenges. There is some concern from local residents that this project has focused solely on design and economic development, and perhaps not enough on the maintenance and engineering requirements of the Corridor (Thompson, 2009). There have also been issues around the implementation of the project after its preliminary design competition, working with multiple stakeholders, and funding cutbacks from government (Czerniak, 2009). Luckily, one of the partners

of this project -- Syracuse University -- is moving the project along and will help it come to fruition. This points to the benefit of having partners in this sort of project that have a longer-term interest, such as educational or cultural institutions and community groups, to mitigate the challenges of losing the support of a private firm or government.

Figure 8: Concept Art of Syracuse Connective Corridor



Figure 9: Concept Art of Syracuse Connective Corridor



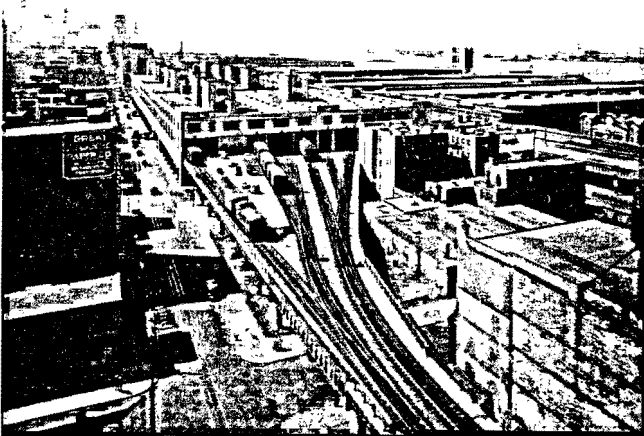
An important element of this project is its strategic nature, as it has limited financial resources (Czerniak, 2009). The Connective Corridor focuses on a small segment of the city, and is an attempt to lay the foundation for the

“thickening up” of the city (Czerniak, 2009). Here, the design interventions are quite simple, such as interesting forms of lighting, and a common colour running throughout the corridor on the ground surface of bike and pedestrian paths, in street furniture and light posts. In addition, there is a free bus running along the corridor. Not only are these interventions fairly minimal, they’re also entirely functional, which suggests that they could be used in many cities that may not have large budgets for urban design. As well, the strategic nature of these interventions are meant to be triggers for much larger changes that would happen organically as a result, including greater synergies within the arts and cultural sector, increased transit use and a draw for more mixed-use and intensification in the downtown core.

The High Line in New York City, New York

New York City is far from experiencing economic or demographic decline, but it has experienced economic restructuring in the last century as manufacturing has been replaced with more knowledge-based and service employment. The High Line is an example of repurposing transportation infrastructure that was utilized for shipping goods for processing and distribution. This elevated railway was created in the 1930s as a way of creating more efficient lines for freight trains to run through west Manhattan, without having to compete with cars and pedestrians (Chamberlain, 2006). These freight trains served the meatpacking district, shipped agricultural goods to factories and warehouse and brought mail to the Post Office (Friends of the High Line, 2010).

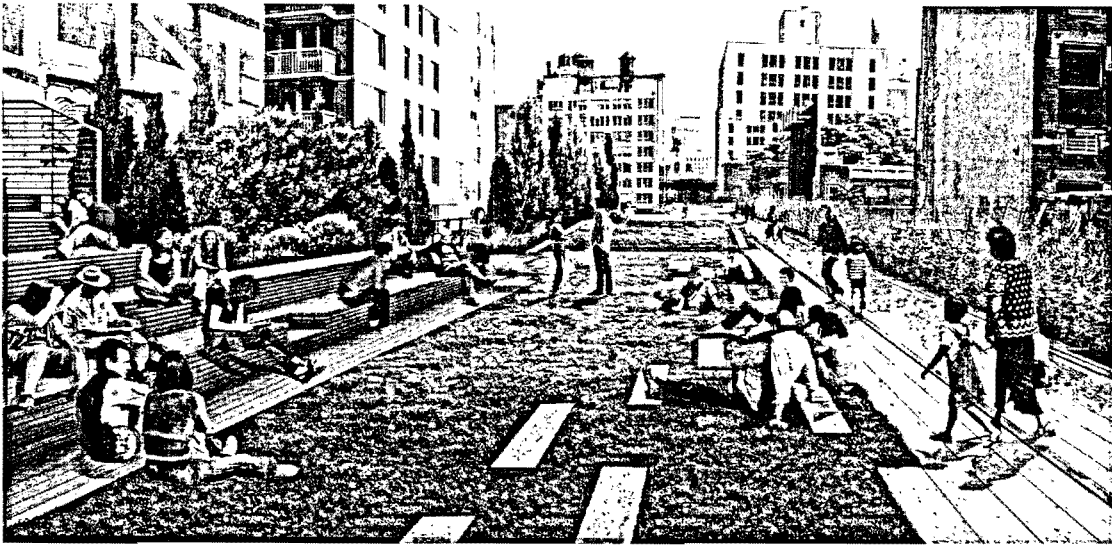
Figure 10: The High Line in use as a Freight Railway Line



By the 1980s, the High Line was no longer used for freight trains, and in the late 1990s the structure was grown over with wildflowers and was slated for demolition (Friends of the High Line, 2010). Recognizing the potential for reuse and the historic importance of the High Line, a community group called Friends of the High Line formed in 1999 to push forward the conversion of this structure into a public park. Although met

with resistance by local property owners and city officials, eventually a partnership between this group and the City was formed. By rezoning the area around the Highline to allow for development, the City was able to win the approval of those who owned property beneath the High Line (Chamberlain, 2006). A design competition for the park was held in 2004, and the winning design was by James Corner's Field Operations landscape architecture firm and Diller Scofidio + Renfro architects. The winning design incorporated paths, seating areas, viewing platforms and gardens. Construction of the two and a half kilometre park began in 2006, and the partnership between Friends of the High Line and the NYC Parks and Recreation department still exists to maintain and program the park, as well as to financially support it – currently Friends of the High Line provides over 70% of the park's operating budget (Friends of the High Line, 2010).

Figure 11: Concept Art of High Line public park



The High Line opened to the public in June 2009, and has been met with huge interest – it has received over two million visits in its first year (Friends of the High Line, 2010). It is already inspiring similar projects in Chicago, Pittsburgh and Tennessee (Kolb, 2009). Jaffer Kolb (2009) writes that the High Line represents a precedent of what the possibilities of civic participation and new ways of thinking about public space are. This is an important aspect of the High Line project than can serve as inspiration for initiatives in cities that may not have the financial or staff resources to develop projects such as this, because the High Line has been a community initiative in its conception, construction and maintenance. It demonstrates the possibilities that exist when a community has a strong vision, and is able to form partnerships. Kolb also notes that this initiative shows other cities that they should “evaluate existing landscape and infrastructure and see them as opportunities rather than burdens” (29).

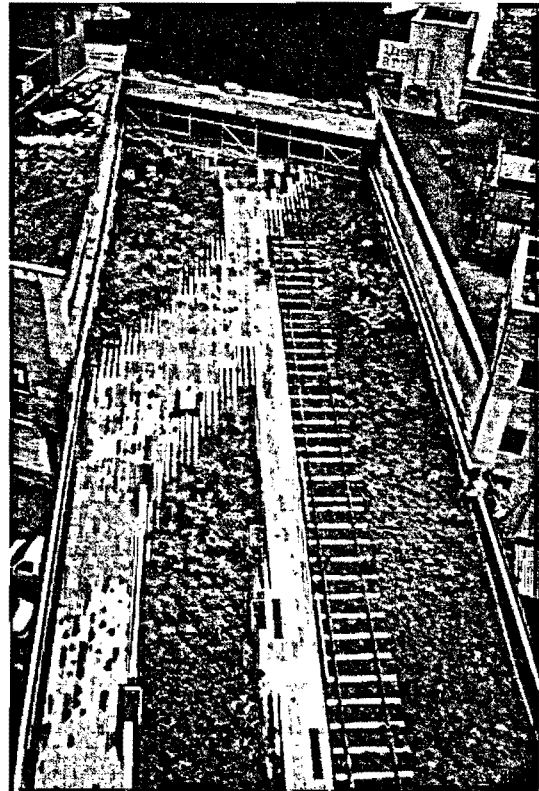


Figure 12

The Atlanta BeltLine Initiative in Atlanta, Georgia

Although Atlanta, Georgia is not a Rust Belt city and the city's economy is growing, a new undertaking there that is repurposing abandoned transportation infrastructure is a compelling one to consider. Atlanta's BeltLine Initiative is a plan to create a 35 kilometre network of light rail transit, trails, and parks and open space that encircle the downtown core of the city. This massive project will develop along abandoned industrial railway lines, taking advantage of their capacity for connecting different parts of the city, as well as reusing and repurposing this valuable infrastructure to give it a new function. It is expected that over 50 kilometres of trails and 1200 acres of new green space will result from the BeltLine project (Atlanta BeltLine, 2010). In addition, there will be significant economic development from this project, from the creation of construction jobs and through the mixed-use development that will occur along the network.

Figures 13 and 14: Concept Art of Atlanta BeltLine



This initiative will be carried out by Atlanta BeltLine, Inc. which is an affiliate of the Atlanta Planning Authority, and is working in conjunction with Atlanta's planning department. The project will be funded through government at the local, state and federal levels, as well as private philanthropic donations (Atlanta BeltLine, 2010). The project will be funded, in part, through the use of tax increment financing (TIF), which is a tool that can be used to create jobs and revitalize underdeveloped areas, by freezing taxable property values at pre-development levels (Immergluck, 2009).

The BeltLine organization, makes it very clear that this is an economic development initiative, but there is also a strong emphasis on public involvement, curtailing sprawl and connecting different parts of Atlanta, as seen in this rationale for the project on the BeltLine website:

Over the past 20 years, metro Atlanta's growth has occurred in widely spread and disconnected pockets of development which have strained the region's quality of life and economic growth. By attracting and organizing some of the region's future growth around parks, transit

Figure 15: Concept Map of Atlanta BeltLine



A TIF area has been established around the BeltLine to attract mixed-use development. The BeltLine website states that a new land use framework is being developed to ensure that “new development is transit supportive and enhances livability and quality of life” (Atlanta BeltLine, 2010). While this is still preliminary and speculative, the focus on transit and parks on the part of the BeltLine, rather than on merely attracting development, suggests the commitment to the public benefits of this project.

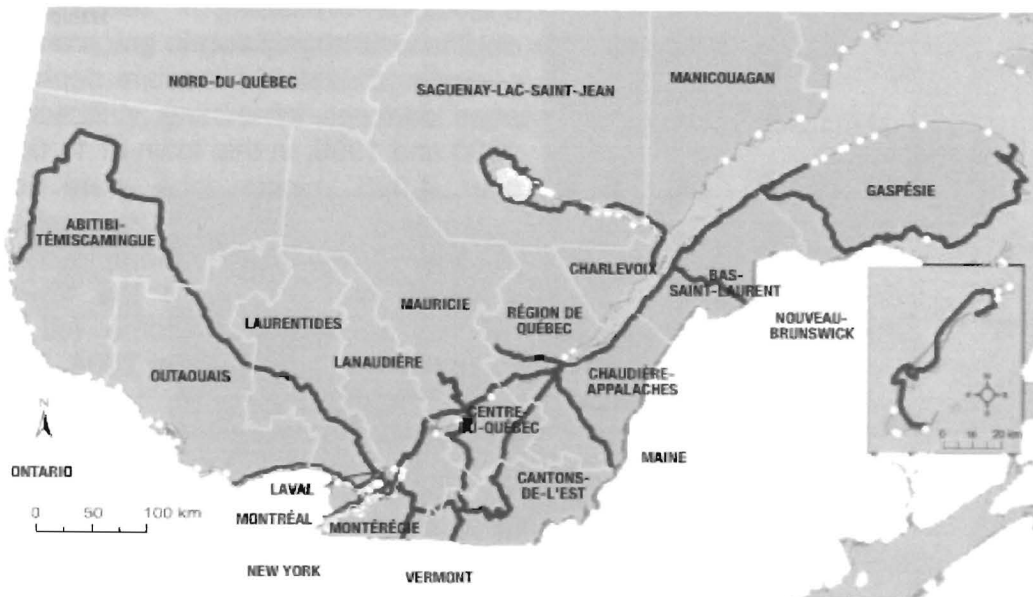
Only five years after the announcement of this project, residential properties in close proximity to the BeltLine have already experienced a rise in property value, when compared with similar properties elsewhere in Atlanta, which raises issues around gentrification and displacement (Immergluck, 2009). Because of this, special attention will need to be given to equity as the project unfolds. There is a commitment to provision of affordable housing as part of the goals of this project and the BeltLine organization speaks of an “unprecedented citizen participation process and engagement campaign” (Atlanta BeltLine, 2010), which will help to mitigate these negative effects. The community engagement process is impressive, with public information sessions occurring monthly, as well as study groups, volunteering opportunities, and ten public steering/planning committees for different sections of the BeltLine.

The president of the Atlanta BeltLine organization, Brian Leary, says that the BeltLine initiative is meant to address a multitude of urban issues, such as mobility, housing and public health, as well as to provide a way of bringing together different areas and populations within the city around a common, forward-thinking project (Morrell, 2009). He goes on to state that “in some areas, [the BeltLine] will enhance the embedded strengths of existing neighbourhoods and, in others, it will bring under-utilized, abandoned and contaminated former industrial areas to life with new residents, jobs, parks and transportation options” (Morrell, 2009). This has clear parallels with the general lessons for planning for cities experiencing economic restructuring, as written about by Hoyt and Leroux (2007), by recognizing existing assets and reimagining areas that are abandoned or underutilized. Similar to the High Line, the BeltLine shows the potential that exists when unused infrastructure is seen with a new perspective.

La Route Verte in the Province of Quebec

Similar to the Atlanta BeltLine, the Route Verte in Quebec has used abandoned railways for a new function, but at a much larger scale. It is a network of over 4,000 kilometres of cycling and hiking trails that runs throughout the province. This initiative is funded by both the provincial transportation agency, and local and regional agencies. The Route runs through more than 300 communities, showing the impressive connective potential that rail infrastructure can have.

Figure 16: Location of Route Verte Trail



The Route was designed for tourism and is considered a world-class bikeway, but it is also used a great deal by local residents (Velo Quebec Association, 2007). There are issues around maintenance and planning for the Route, since it must be kept up on a daily basis to prevent deterioration, and since the planning of network infrastructure involves many stakeholders (Route Verte, 2008). Because of the sheer number of communities involved, there has been an effort to create several coordinating bodies to ensure collaboration and representation (Velo Quebec Association, 2007). The Route Verte organization points to economic spinoffs, with a rise in the bicycle industry in Quebec since the opening of the Route, and spending by tourists and other users of the Route in the communities it passes through. This is an example of a large-scale initiative to adapt unused infrastructure to new uses, with economic, environmental, recreational and public health benefits, suggesting the potential that may be going untapped in abandoned or underutilized infrastructure.

Figure 17



Economic Transition in Elliot Lake, Ontario

Although not discussed in depth by this paper, resource-dependent towns are highly susceptible to economic restructuring, since many of these formed because of their resource extraction or processing industries. Because of the lack of diversity within the economies of these towns, booms and busts have an especially strong impact, which is exacerbated by isolated locations and often small populations (Leadbeater, 2004). Elliot Lake, Ontario, once referred to as the “uranium mining capital of the world” experienced a sharp decline in its



uranium mining sector with the last uranium mine closing in 1996. This decline was largely due to low uranium prices, and depleted uranium deposits after decades of mining. Between 1990 and 1996, in this town of 14,000, over 4,000 mining jobs were lost (Leadbeater, 2004, 42) which devastated the town. Unemployment reached over 50%, and the town's median employment income fell by more than half (Leadbeater 2004, 42).

Figure 18: Uranium Mining, Elliot Lake

Elliot Lake had to find a new way of generating economic activity. In the last fifteen years, the town has made the unlikely transition from a uranium mining town to a retirement community by repurposing its housing infrastructure. Former mayor George Farkouh describes the situation in the mid-1990s: “We were looking for people who didn’t need jobs and had their own source of income” (quoted in Taylor, 1996, 104). The town took over empty houses that had been owned by the mining companies, and offered these to seniors from out of town at extremely low prices. The rest of the vacant housing stock was bought by a private firm and this was sold at very low prices – a three-bedroom house, for example, could be sold for \$19,900 (Taylor, 1996, 104). Here, the housing infrastructure was repurposed and reused to serve a new function, and to attract new investment and population to this declining town. In addition, the health care and community facilities that were created for the mining community are now being used by the new elderly population (Coffey & Shearmur, 2006). According to Farkouh, each senior that moved to Elliot Lake created 6/10 of a job for a younger resident of the town, and the 4000 new seniors that had moved to Elliot Lake created 2400 new jobs (at the time of writing) (Taylor, 1996, 104).

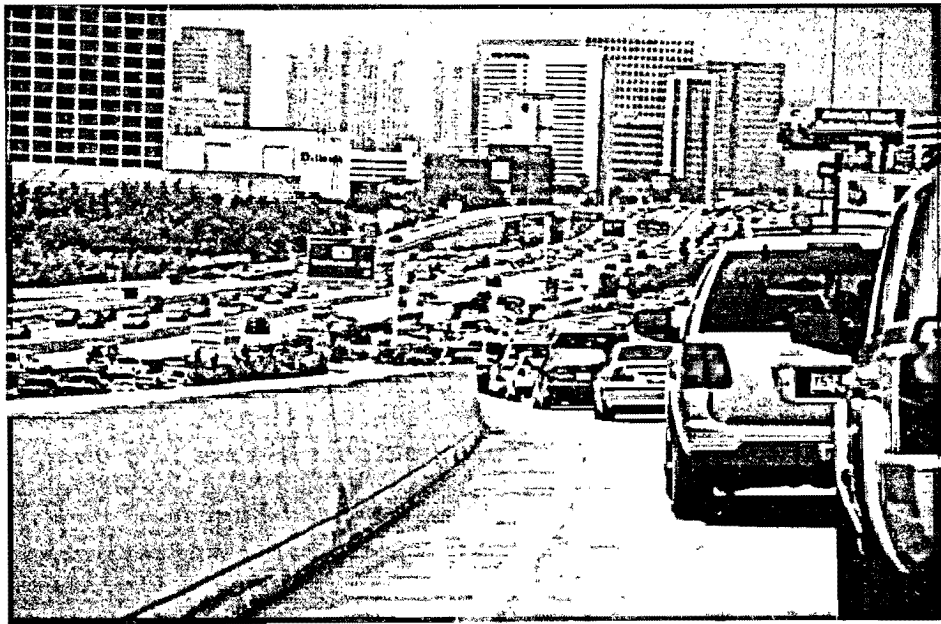


Figure 19

Flexible Workplace Initiative in Houston, Texas

Similar to Atlanta, Houston, Texas is not a Rust Belt city and is enjoying a strong economy, but an initiative there with transportation infrastructure may offer some lessons for cities experiencing slow growth or decline. The Flexible Workplace Initiative in Houston is a program that has been developed by the city's planning department to encourage Houston employers to consider flexible work options, in order to ease traffic congestion during rush hours. The city works with employers to assess what types of flexible work arrangements, if any, are appropriate and beneficial for that organization. The work arrangements can include telework, compressed workweeks, staggered work hours or days, and the city is also encouraging carpooling and transit use with this program (City of Houston, 2010). Employers benefit from recognition for participating in this program, increased productivity, and from the general improvements in mobility in Houston.

Figure 20:
Traffic in
Houston



This strategy for transportation planning takes an interesting approach in light of the above discussion of spatiality, as infrastructure is being used to shape and limit usage patterns. In this example, transportation infrastructure (roads and public transportation) is being inundated at certain times (during rush hour congestion), and by asking employers to help shift usage patterns, Houston is allowing the existing infrastructure to enforce limits rather than just expanding the infrastructure to allow for any amount of usage. This is a powerful idea, since it offers a new approach that cities can take when dealing with developers or investors who may have huge demands for infrastructure provision. Flexibility on the part of employers, as well as cities in their infrastructural planning and provision, can greatly impact the creation of infrastructure that is resilient and adaptive.

Themes and Lessons

There are a number of common themes and lessons that can be taken from these examples which can inform initiatives elsewhere. A key commonality is the recognition of assets and their potential for reuse or reconfiguration. Whether it is unused transportation infrastructure, cultural assets or natural heritage, all communities have some assets and strengths that can serve as a basis for innovation or revitalization. Thus, it is important for planners to look for potential and opportunities, and not just challenges and barriers. Related to this is the importance of community involvement, through visioning, in order to learn what the stakeholders of a community value and see as potential, as well as throughout the implementation and realization of initiatives so that they will be self-sustaining and welcomed by the community.

An interesting theme among some of the examples is the way in which the initiatives serve to increase connectivity between different areas – specifically in New York City, Syracuse, Atlanta, and the bicycle network in Quebec. This is important in any community, but especially so in areas that may be experiencing decline because it helps to avoid the isolation of more depressed areas within the city. The way in which the Youngstown and Atlanta examples are creating networks of public spaces and parks out of unused land is also a form of connectivity. Another commonality in most of these examples is the focus on the downtown and goals of intensification and compact form. While these goals are common throughout North American cities, they are especially important in cities that have experienced decline, to avoid blight in the inner city and sprawl around the periphery as the population and new development occurs at the urban edge. Finally, a powerful lesson that emerges from all these examples is the possibilities that exist when communities are able to look at infrastructure in a new way. The Atlanta example, in particular, shows how giving a new use to infrastructure – transit, trails and parks – has incredible potential for shaping the future form of the city, by effectively bounding the core of the city and setting the stage for intensification. The example in Houston is also very exciting, as it shows the city taking a proactive approach to infrastructure planning by working with employers in an attempt to reduce the burden on transportation infrastructure by changing usage patterns rather than just the infrastructure itself (although this is only one strategy the city is adopting to deal with congestion). These examples and the ideas they embody exhibit a range of possibilities that can be learned from and potentially adapted to other communities where appropriate.

Speculative Planning Response: Oshawa, Ontario

Drawing on the innovative planning initiatives discussed above, at this point I would like to propose a speculative planning response for Oshawa, Ontario that demonstrates an approach for using infrastructure to plan for economic restructuring. While Oshawa is experiencing slow growth, and not decline, the precarious nature of its manufacturing sector has become evident in recent years, suggesting that restructuring is imminent. Because of this, thinking about planning for change is timely, and necessary for a smooth transition. In this section, I will give a brief description of Oshawa's economic context, and then propose a forward-looking planning response for the city.

Located on Lake Ontario, Oshawa became a hub for the manufacturing of automobiles with the founding of General Motors of Canada in the early twentieth century, and the growth of this company's operations and that of many auto parts manufacturers. The population of Oshawa has grown steadily throughout its history, and is still growing at a slow rate:

Table 3: Population Change in Oshawa, Ontario: 1991 to 2006

	Population Change
1991-1996	+ 3.9%
1996-2001	+ 3.5%
2001-2006	+1.8%
2006 Population	141, 590

(Statistics Canada 1996, 2001, 2006)

A report by the Conference Board of Canada on Oshawa's economic trends indicates that Oshawa was hard hit by the recent global recession and saw significant decline in its manufacturing sector for two years – for example, real exports of autos and parts in Ontario dropped by 45% in 2009 (Lefebvre et al., 2009, 4). As a result of this, the third shift was laid off at General Motors and the truck assembly plant was closed. The prospects for Oshawa's auto sector is anticipated to reverse in the next few years, in large part because the increased demand for new cars that resulted from the American "Cash for Clunkers" initiative and the government interventions for helping General Motors pay its loans in Canada and the United States (Lefebvre et al., 2009). However, the precarious nature of the manufacturing sector was very clear in recent years, and with employment shifting toward increasingly knowledge-based and service jobs, it is clear that Oshawa needs to accept that its economic future may not lie entirely in auto manufacturing. The 2006 census shows that manufacturing employment in Oshawa is actually decreasing disproportionately with the rest of the province:

Table 4: Employment Change in Oshawa and Ontario: 2001 to 2006

% Change in Employment Within Sector, 2001-2006	City of Oshawa	Province of Ontario
Manufacturing	- 10%	- 2%
Health & Education Services	+ 14%	+ 16%
Business Services	+ 18%	+ 11%
Other Services	+ 9%	+ 12%

(Statistics Canada, 2006)

Hence, there is already an economic transition happening and further decline in the manufacturing sector is likely considering employment trends at the local and global level. This calls for a planning approach that keeps this context of change in mind.

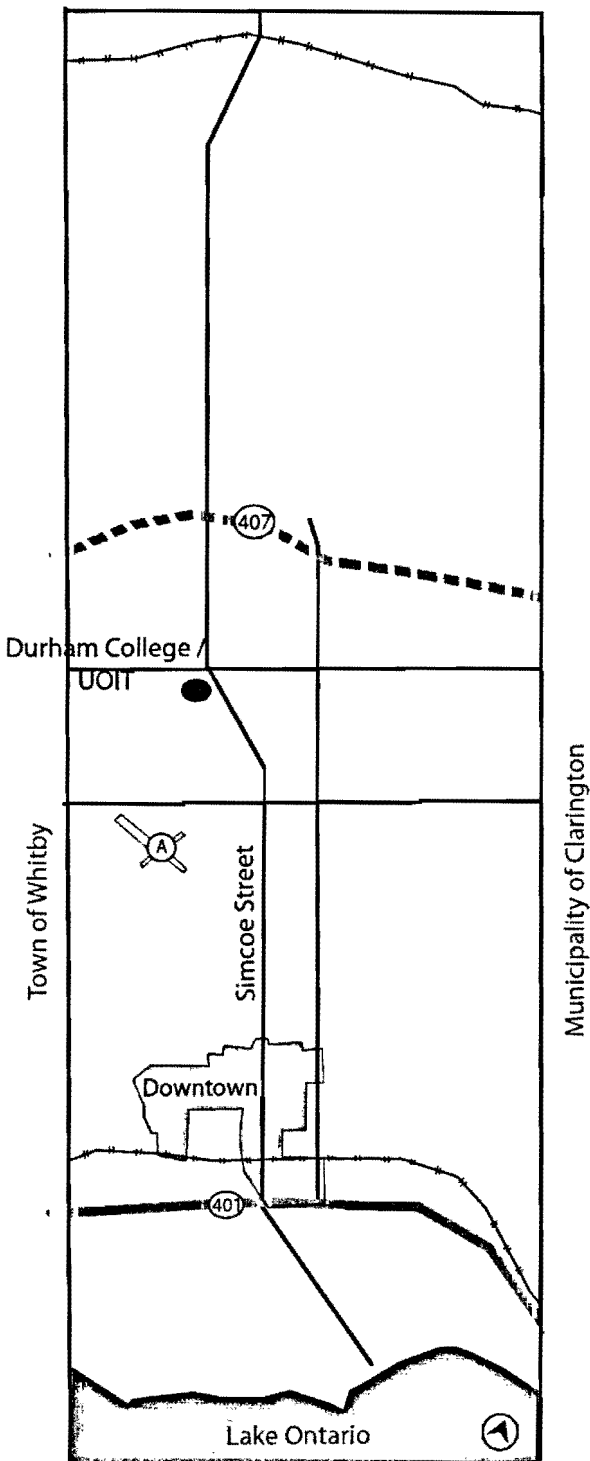
First and foremost, a public visioning process is important to any actual planning initiative that may occur in Oshawa, in order to identify the concerns, values and goals of community members. This is particularly important in a city that will experience economic restructuring (Neuman, 2009), and it will allow residents to shape and take ownership over new initiatives in Oshawa. Therefore, the response given here is entirely speculative and is based on possibilities and assets in the community, but may not be reflective of what residents of Oshawa want to see.

There are two main elements of the planning response for Oshawa that make use of the city's existing infrastructure. These are (a) restricting greenfield development in north Oshawa and focusing on redeveloping the downtown, and (b) making the most of the city's ecological assets and waterfront. I argue that connectivity is the key issue in Oshawa, because the city is fairly car-oriented and the separation of uses. Directing users (both residents and visitors) back into the downtown and the waterfront is the key to revitalizing the city.

Refocusing on Downtown Oshawa

Downtown Oshawa has a huge capacity for absorbing additional investment and users. There is a great deal of mixed-use built form in place, with many vacancies and room for additional development. The downtown is well serviced by local and regional public transportation and is in close proximity to a GO transit station and Highway 401. Downtown Oshawa has been designated as an Urban Growth Centre in the *Places to Grow Growth Plan*, which has set a density target of 200 residents and jobs combined per hectare of the downtown by 2031. That said, while the city is mandated to meet this target by provincial legislation, it is expected that more development will occur in north Oshawa as the Highway 407 extension is built, and the University of Ontario Institute of Technology (UOIT) grows expands (Ansari et al., 2010).

Figure 21: Oshawa, Ontario



Here, the it is important to recall Leo and Anderson's (2006) discussion of Winnipeg planning in a way that stretches its infrastructure thin. In a city that should be anticipating economic restructuring in the near future, it seems inappropriate to expand spatially. Even if developers pay for the initial costs of servicing greenfield sites, the city will have to absorb infrastructure costs in the long term. Rather, there should be a strong emphasis on maximizing the existing infrastructure in Oshawa, to reduce maintenance costs as well as to mitigate sprawl.

That said, revitalizing downtown Oshawa is easier said than done. There have been failed attempts at revitalization, with the construction of the GM Centre (a sports and entertainment venue), and efforts to hold classes from the UOIT downtown. It seems that the main challenge here is that many residents of Oshawa simply have no reason to go downtown. Because of this, it seems that the key issues is bringing users to the downtown, so that investment will follow. Stronger partnerships between the municipality and Durham College, UOIT and regional and provincial agencies may facilitate the location of more offices and classes in the downtown core. This can be facilitated by improving bus service along Simcoe Street,

which runs through the entire city and can serve to better connect the north of the city with the downtown.

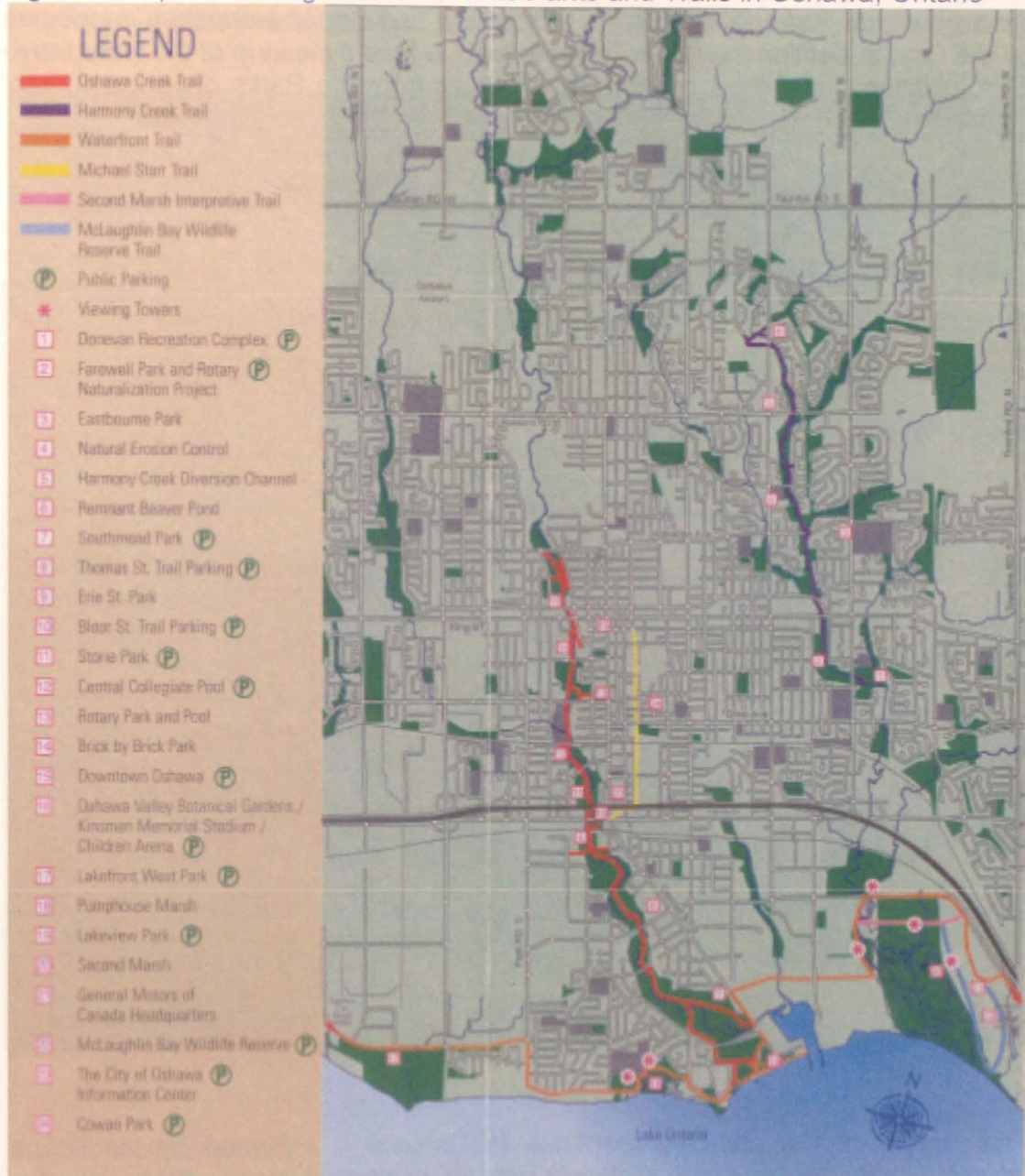
As well, it may be beneficial to subsidize the lease of vacant storefront properties in downtown Oshawa temporarily, to encourage new businesses and entrepreneurship. It is hoped that demand for residential units downtown would happen as a result of increased institutional, commercial and retail uses there. By putting the focus on downtown Oshawa at this point, while the economy is still experiencing growth and manufacturing is experiencing an upswing, the municipality would be proactive in planning to avoid inner city decay and blight that may result from the future decline of the manufacturing industry, or the move away from auto-oriented development as oil prices and environmental concerns increase.

Building on Ecological Assets

A second part of this response for Oshawa is to capitalize on its ecological assets (Schilling & Logan, 2008). There is a network of parks and protected lands around Oshawa's creeks running from the northern boundary of Oshawa down to the waterfront (the spatial configuration of parks and trails is shown in Figure 22). This has the potential to be developed into a network of publicly owned land is an incredible opportunity for the development of walking or cycling trails that can serve to connect different parts of the city, much like the BeltLine project in Atlanta is trying to do. This, in turn, would result in increased opportunities for recreation and use of alternative modes of transportation, and would likely have a positive impact on public health. As well, these trails can be a way to link more residents with the water.

Oshawa is located on Lake Ontario, with public parks and open spaces spanning almost the entirety of its waterfront (which is quite polluted and not suitable for swimming). With two conservation areas and waterfront parks that are already well-used, there is opportunity to build on this and have more community members using this space. Another strategy for increasing connectivity with the water is by considering a subsidy for public transit to the lake. The Simcoe Street bus runs the entire length of the city, from the shared campus of Durham College and UOIT in the north, through the downtown, and down to the water in the south. If local businesses or agencies subsidized bus fares on weekends during the summer months, this could facilitate access to the waterfront at a relatively small cost. In addition, better signage and more parking could also increase the use of this space – I observed on a mild spring weekend an overflow of parking at the waterfront, and that the route to the park is not well marked with signage.

Figure 22: Spatial Configuration of Public Parks and Trails in Oshawa, Ontario



Along with these connective strategies, there is also great potential for partnering with local educational institutions to bring more users to the waterfront parks and conservation areas. By having education students from Durham College or UOIT develop stewardship programs, community educational workshops, or field trip curriculum, this would create more programming at the waterfront at little or no cost, and provide valuable experiences for students, faculty and park users. As well, partnerships between the city and local post-secondary institutions could allow research projects to take place in the conservation area, or around environmental remediation at the beach. Business students from Durham

College or UOIT could also work on promoting events and creating a brand for the waterfront. There is currently a grassroots community campaign, supported by the City, to petition the federal government to fund a cleanup of the waterfront. This initiative, as well as concurrent initiatives from the Parks department, can have a huge impact on the City. These efforts to bring more people into parks, natural heritage areas and conservation areas may also help to foster pride in Oshawa's environment which can sustain this in the long-term.

Figure 23: Oshawa's Waterfront



This aspect of the planning response in Oshawa is informed by landscape urbanism. By reconnecting Oshawa with its ecological assets (trails, creeks, conservation areas and waterfront), it reorients the focus on the landscape, and plans in a way that allows this landscape to perform and function. While it is likely that this will be done on a large scale in Oshawa, because of limited will and resources, the community-led and city supported waterfront revitalization is a great opportunity to apply these ideas. Using precedents such as the 2007 Stoss: Landscape Urbanism conceptual plan for Toronto "River + City + Life" (Lister, 2009) can show planners in Oshawa that it is possible to put landscape at the forefront in ways that enable it to perform important ecological functions as well as provide a space for recreation. This intervention can occur in such a way as to strategically alter or reconfigure parts of the existing ecological

infrastructure so that it can allow for resilience and adaptability to changing conditions and contexts, so that this system is able to be self-sustaining and dynamic.



Figure 24: Conceptual Art for River + City + Life planning response for Toronto

Overall, then, both the focus on the downtown and the recognition of Oshawa's ecological assets serve to connect the residents of the city, connect different areas of the city, lay the foundation for more compact urban form, and promote the protection of parks and natural heritage. All of these will (hopefully) foster community pride, identity and involvement, which will be the most important assets for going through economic restructuring, when it happens.

Conclusion

Igor Vojnovic writes that an important dimension of infrastructure is “its relative permanence in the face of an ever-changing urban dynamic” (2006, 123). Because of this, communities should use infrastructure to its full potential to work toward their goals, whether that means growth, revitalization, stability, transition or contextualized decline. That said, it should be noted that it is misguided to understand the ‘permanence’ of infrastructure as the permanence of its form and physical entity, but of its functional presence. Alan Berger summarizes this idea well: “Cities are not static objects, but active arenas marked by continuous energy flows and transformations of which landscapes and buildings and other hard parts are not permanent structures but transitional manifestations” (2006, 203). Thus, there needs to be some understanding on the part of communities that change is inevitable and that permanence is illusory; but, this does not mean that communities can’t plan for the long term or ask for some degree of loyalty from developers and employers. By using infrastructure in strategic ways that will shape the way in which communities will function over time, planners still have a valuable means for setting the stage for long-term viability and sustainability that accommodates and embraces change.

Returning to Wilson and Wouters discussion of spatiality in the context of deindustrialization, they raise an important point – namely, that although space has typically been regarded as “a passive container for urban processes” it is in fact “humanly made and actively used to give form and character to urban social processes” (2003, 124). Through infrastructure planning, it is possible to form and shape communities so that development and usage patterns will occur in a way that is context appropriate and in a manner that is in line with the values and goals of the community.

By considering economic restructuring in the North American Rust Belt, a set of examples of repurposing or rethinking infrastructure, and the case of Oshawa, it is hoped that the potential of planning for change using infrastructure has been demonstrated. The emerging theory of landscape urbanism, as well as the rise of infrastructure-based projects such as the ones discussed here suggest that planners are increasingly engaging with infrastructure. As this becomes more pervasive in the discipline, planners will be better equipped to respond to the challenges faced by urban areas in the twenty-first century, and to realize the goals and wellbeing of the communities and regions that they serve.

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