INFRASTRUCTURE TRANSITION

Historically developed around extractive and manufacturing economies, deindustrialization has left many industrial legacy cities with an urban fabric no longer suitable for the 21st century. Vacant industrial land, idle factory buildings, and derelict railway tracks constitute examples of infrastructure systems in need of re-development. Urban Transitions Alliance cities have come a long way in transforming their outdated infrastructure and brownfields in an effort to re-invent themselves and meet their current and future needs.

KEY MESSAGES

- Many industrial legacy cities have been left with large tracts of unused industrial land and degrading infrastructure systems following their economic slow-down and the resulting downward spiral of job loss, population decline and disinvestment.
- By transforming outdated legacy systems into new assets, many industrial legacy cities have embarked on a path of transition and invested in large-scale redevelopment projects to re-invent themselves and create new visions of their urban future.
- Industrial site redevelopment can serve a variety of public policy objectives. Redevelopment projects can be used to generate public health and social benefits, create economic opportunities, attract investment and protect the environment by reducing urban sprawl.
- Elements of Industrial heritage can be strategically used to support the urban redevelopment process. They can either be incorporated into new developments or retrofitted for adaptive reuse purposes.

THE INFRASTRUCTURE DILEMMA OF INDUSTRIAL LEGACY CITIES

The decline of manufacturing and extractive industries left many formerly booming industrial cities of developed economies with vacant industrial sites and an outdated urban fabric. Quarries, factories and warehouses gradually turned into disused remnants of formerly flourishing economies scattered across the urban landscape. These sites were often neglected and left to degrade because of the costs and risks associated with their cleanup or simply due to a lack of demand or available investment. Railroads, harbors and other transport systems which were developed for industrial purposes were suddenly no longer needed. Other infrastructure systems like residential buildings were negatively impacted by the rising job loss and population decline that followed the economic downturn, turning once-lively neighborhoods into poverty-stricken, desolate areas. Disinvestment further exacerbated the deterioration of the physical landscape.

In order to renew economic growth and overcome the systemic effects of de-industrialization, industrial legacy cities have had to revitalize their post-industrial landscape, fostering a transition into a productive and stimulating place to live and work in that would restore residents' sense of place and attract investment once again. The knowledge and good practice examples created by these cities may be able to provide inspiration for other cities with industrial legacy features or cities following similar industry-driven development paths.

THE POTENTIAL OF RE-INVENTING THE POST-INDUSTRIAL URBAN LANDSCAPE

In an age of rapid global urbanization and urban growth, industrial legacy cities have come to realize the potential of their infrastructure assets. Many have embarked on a path of transition and invested in pivotal redevelopment projects that help to create new visions of their urban future. They have embraced the challenges around disused and under-invested land and infrastructure as unique opportunities to achieve a range of social and environmental objectives while simultaneously creating new economic prospects.

The regeneration of degraded post-industrial land offers a multitude of potential **public health and social benefits**. Remediating contaminated land is crucial to reduce the environmental health and safety risks that adjacent residents may be subjected to. Additionally, brownfield regeneration can serve as an essential neighborhood revitalization intervention, particularly where sites are situated within or next to disadvantaged and impoverished areas which could greatly benefit from a re-valuation of their surrounding public spaces. Such revitalization actions are often strategically used to advance social mix policy objectives such as deconcentrating poverty and enhancing social cohesion. In addition, redevelopment projects help to rebuild communities' sense of place and identity. In Dortmund, for example, a former blast furnace and steel plant site was turned into a 24-hectare lake that now constitutes a landmark of civic pride and local affiliation.

Closely linked to the social benefits is the range of **economic opportunities** associated with brownfield regeneration. Large-scale projects such as the redevelopment of former industrial sites often provide direct job opportunities for the local workforce. To this end, Baltimore's Center for Green Careers offers residents training in brownfield remediation to equip them with the necessarily skills to pursue such opportunities. In addition, many industrial legacy cities strategically have used urban regeneration projects to increase their attractiveness to prospective investors and the private sector. Measures include the adaptive reuse of existing legacy structures such as warehouses and factories to provide space for start-ups, research institutes, restaurants, and galleries, etc to name a few. As the good practice example of Gelsenkirchen demonstrates, brownfield redevelopment can be part of a larger strategy to promote job creation in less resource-intensive sectors that hold better economic prospects.

From an **environmental perspective**, the re-development of existing industrial sites is a key contributor to land conservation. It promotes urban densification and redirects development pressure away from the urban fringes and surrounding natural environment. If sites are contaminated, brownfield remediation is crucial to ensure healthy soils and groundwater. In addition, greening brownfields may directly contribute to urban biodiversity. Examples include the conversion of industrial facilities and their impermeable surfaces into urban parks, allotment gardens or wildlife meadows.

INFRASTRUCTURE TRANSITIONS IN PRACTICE

Urban Transitions Alliance cities have come a long way in re-claiming and repurposing their legacy systems into viable residential, industrial, and recreational sites. The concrete outcomes of these infrastructure transition processes are as diverse as the strategies they have been pursuing as the following examples showcase:

GELSENKIRCHEN'S TRANSITION INTO A SOLAR CITY

Previously known as the "city of 1,000 fires", Gelsenkirchen has reinvented itself into the "city of 1,000 suns". The conversion of a former coal-powered steel plant site into the Science Park Gelsenkirchen in the 1990s presented the starting point for the city's transition into a "Solar City". Equipped with 900 solar panels, the Science Park not only generates about one-third of its own electricity demand but it is also home to businesses and research institutes focusing on the development of clean energy technologies and strategies. Moreover, the Science Park's EnergyLab provides hands-on education opportunities for high school students to inspire the next generation of clean energy practitioners. Since the inauguration of the Science Park, several other post-industrial sites have been transformed into solar housing estates in line with Gelsenkirchen's solar city strategy.

INFRASTRUCTURE TRANSITION

FROM CONCRETE FACTORY TO MIXED-USE AREA IN HUAIROU DISTRICT, BEIJING

Since 2015, Huairou District, Beijing, has redeveloped a disused concrete factory site into a mixed-use area. Once finished, the new site will encompass three zones: A science and technology research and development area, a culture creativity area as well as an exhibition area. Adaptive reuse has played an important role in Huairou District's redevelopment strategy. In the culture creativity area, for example, a former warehouse and silo have been repurposed into a hotel complex. Similarly, the old machine repair shop has been turned into an exhibition hall and the workers' club will be used as an exchange platform for research & development practitioners upon completion. Next to Huairou District's focus on adaptive reuse, it will create a forest park on the former mining site to provide a recreational area for its citizens.

KATOWICE'S CULTURE ZONE

Following the gradual decline of its heavy industry, Katowice has been investing in the creative economy. The transformation of the former coal mine "Katowice" into the Culture Zone showcases the city's commitment to expanding its cultural sector. The zone encompasses the new seat of the National Polish Radio Symphony Orchestra, the Spodek sports and entertainment hall, an international conference center as well as the new Silesian Museum. Situated in the heart of the city, the Culture Zone has become a major attraction for tourists and local residents alike with its multitude of concerts, shows and exhibitions. Moreover, the zone features attractive green spaces and unique architectural designs. The museum's building complex, for example, includes elements of the site's industrial past with its main exhibition area located in the old mine shaft at 14 meters underground.