Geo Factsheet

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RESTORATION OF THE CHEONG GYE CHEON STREAM

– an example of urban redevelopment in South Korea

Introduction

By the end of the 1950s, the Cheong Gye Cheon stream was a symbol of poverty and pollution, being filled up with trash and wastes. During the 1960s and 1970s, the area around Cheong Gye Cheong was transformed as an example of successful industrialisation and modernisation. However, by the 1980s and 1990s, it came to be regarded as a source of intense traffic, health and environmental issues. In the 2000s it is seen as a model for successful river restoration, urban development and national identity and pride. It is far more than just the restoration of a 6km stretch of river in a downtown urban environment. It has witnessed the restoration of history, culture and nature as well as being the focus of urban development in Seoul.

Cheong Gye Cheon – a long history of river engineering

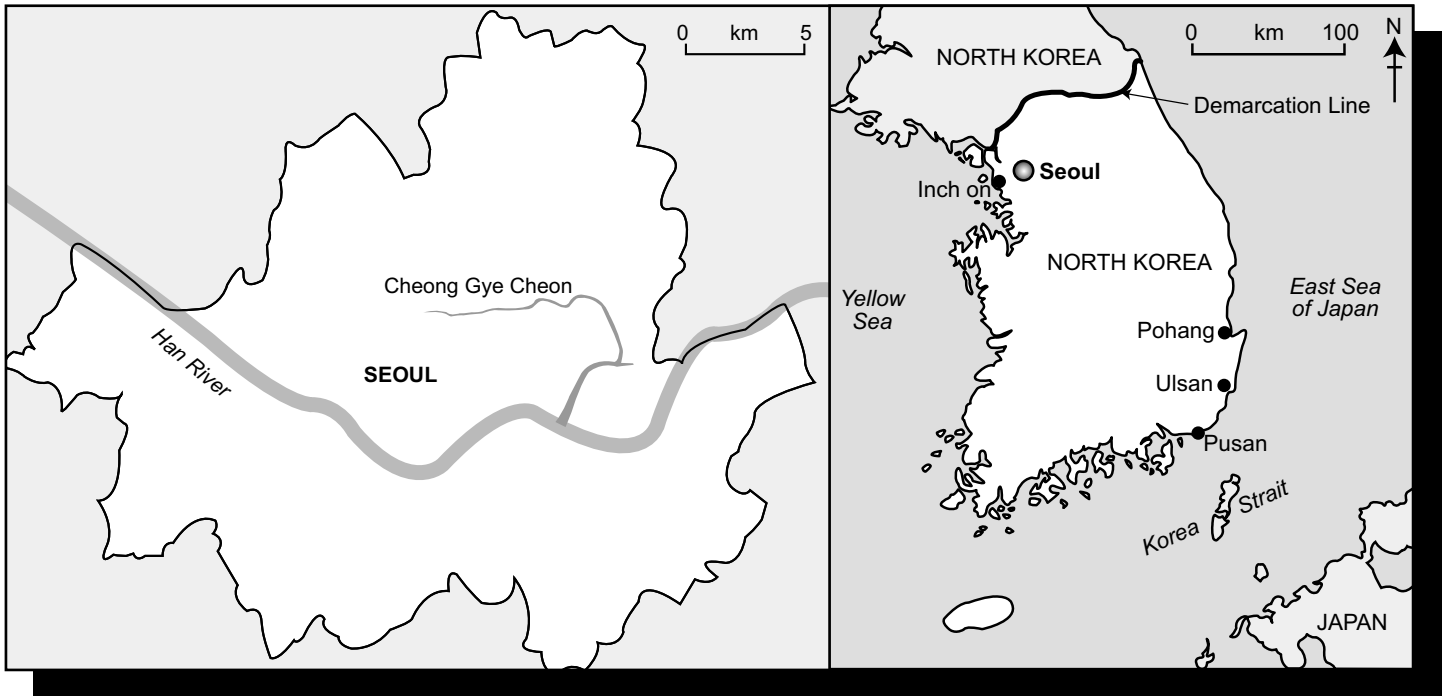
The name Cheong Gye Cheon means "Clean Stream". The Cheong Gye Cheon was a natural river flowing west to east through the centre of Seoul *(Fig. 1)*. Seoul became the capital of Korea in 1392. The stream overflowed and flooded during the rainy season and yet experienced low flows for much of the year, resulting in it being heavily polluted. There is evidence that the river has been altered as far back as 1406, included dredging and bolstering the banks on both sides of the river to combat flooding.

The stream was an integral part of life for many of Seoul's population. It acted as Seoul's sewage system, a laundry for women and a recreation ground for children. As the city developed the river carried the household waste waters from around 100,000 people. By 1669 the population had risen to 190,000 and the amount of waste waters increased hugely. The situation worsened as many new migrants to Seoul cultivated vegetables on every single space on both sides of the stream, causing major drainage issues. Illegally built houses on the banks of the Cheong Gye Cheon increased the pressures on the stream. As the urban population increased so too did levels of pollution. They were also using a lot of trees from the mountains as the main source of fuel so the Cheong Gye Cheon was filled with debris swept from the mountains. The king established an office in charge of dredging streams and it started work in 1760, dividing the main stream and its tributaries into a total of eight zones and fixing the damaged bridges. In 1773, higher retaining walls were made on both sides of the Cheong Gye Cheon, and curved courses were straightened.

During the Japanese colonial occupation in the 1930s, the stream came to act as the border between Jongno, regarded as the street for Koreans and Honmachi, a Japanese town. The Japanese announced plans to cover up the stream on several occasions, including one announced in 1926 to form a 4ha housing site, one announced in 1935 to build up a road and an elevated railroad and one announced in 1940 to build up a tramway.

However, with the exception of one section, which had been covered up in 1937, the stream remained open due to the lack of financial resources although several bridges were rebuilt or strengthened.

Fig. 1 Location of Seoul and Cheong Gye Cheon



After the 1950s

By 1945, when Korea was liberated from the Japanese colonial rule, the Cheong Gye Cheon was filled up with trash and sand swept from the bare mountains. It became severely contaminated with wastes from shabby makeshift houses built alongside. After the Korean War (1950-53), more people swarmed into Seoul and settled down along the stream in an illegal shanty town *(Fig. 2)*. Those living in houses near the stream suffered a lot due to the stench caused by the large amount of wastes flowing into the stream. Thus, the image of Seoul had also been severely affected.

Fig. 2 Shanty town development on the Cheong Gye Cheon in the 1950s.

In 1958 work began to cover the stream with concrete. In addition, a 5.6km-long, 16m-wide elevated highway extending from was completed over the stream in 1971. Under the Cheongye Road a 2-5m wide and 11km long sewer was built, along with over 32km of pipes, 13km of sewage pipes 4km of electricity power ducts, 9km of telecommunications cabling and 330m of gas lines. All makeshift houses along the stream were demolished, freeing the place for some modern commercial buildings.

The Cheong Gye Cheon Expressway was a symbol of economic growth in Korea. It was a 6km elevated highway forming the main east-west route in Seoul reaching right into the city centre. The area was transformed. A multitude of large and small tool, lighting, shoes, clothes and second-hand book stores were opened along the concrete-covered stream. Every day there were thousands of vehicles over the stream and the elevated highway. The area eventually became the busiest and noisiest sector in Seoul. Before the highway was dismantled it was carrying almost 170,000 vehicles each day.

Problems

Whereas the focus of Korea's development in the 1960s and 70s was economic expansion, new values have arisen. The highway, which was the symbol of progress in the 1970s and 1980s, was increasingly seen as an environmental nightmare. Not only were there notorious traffic jams, the highway itself gradually fell into disrepair and became unsafe. Moreover, with the rise in environmental awareness, there was growing anger at the poor air quality associated with urban development in Seoul.

Structural surveys in 1991 had shown that the concrete on the highway was in good condition but more than 20% of the steel beams were corroded or damaged. Between 1994 and 1999 a 2km section had to be completely repaired. Repair work had been almost continuous between 1992 and 2001.

Specific problems included:

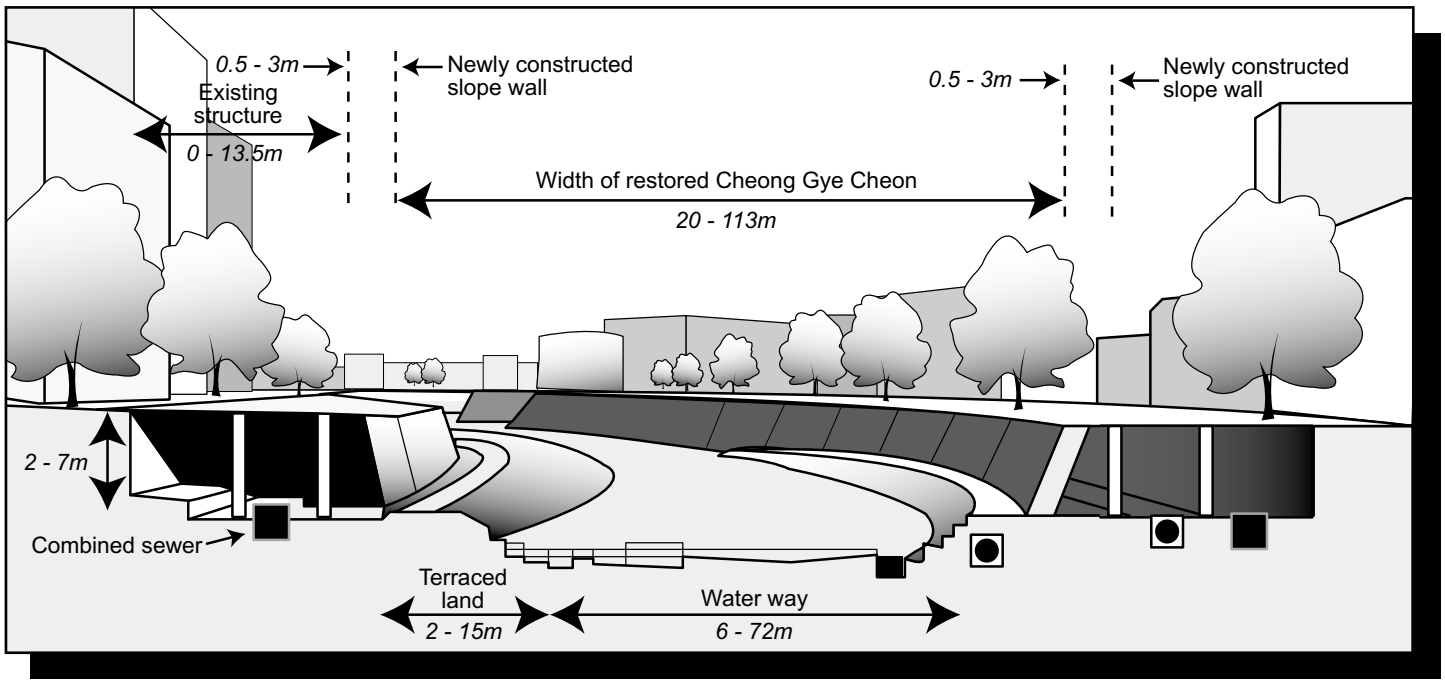
- Some of the steel beams had weathered
- Local residents were afraid the expressway might collapse
- Underground it was worse – a concentration of sewer gas, pollution, chemicals, and sewerage made air and water quality very poor. The bed of Cheong Gye Cheon was polluted with heavy metals such as lead, chromium and manganese. The corrosion of structures was accelerated by carbon monoxide, methane and other gases underground.

Restoration in the 21st Century

Restoration took place between July 2003 and September 2005. A 5.84km section was restored at a cost of 386,739 million won (£200 million). The Cheong Gye Cheon Restoration Project included plans to dismantle the elevated highway and the road covering the Cheong Gye Cheon stream, move existing facilities to other places, and rebuild facilities in order to restore the Cheong Gye Cheon stream. These included a sewage system, roads, bridges, landscaping and lighting.

Demolition of the highway took place between July and August 2003. Given that the Cheong Gye Cheon Restoration Project was carried out within the centre of the city, in an area of densely packed home, businesses and offices, the Seoul authorities wanted to minimise disruption due to noise, dust and other pollution, and the movement of large vehicles to and from the site. A total of 680,000 tons of waste were generated during the demolition work. Of this, 100% of the scrap iron and steel was recycled, and 640,000 tons or 95% of the waste concrete and asphalt was reused.

Fig. 3 A typical cross-section of the Cheong Gye Cheon restoration scheme.



During restoration, efforts were made not to affect the activity of local stores. This was done by dividing the 6km site into three sections. On each side of the stream, two lanes were left open, and some protective screens were installed to separate the restoration work from surrounding stores.

The area restored included over 6,000 buildings of which 49% were commercial, 29% offices, 13% residential and 9% miscellaneous. Over 500 street traders operated in the area. The neighbourhood around Cheong Gye Cheon was mainly of poor quality buildings, mainly 40-50 years old. The area had been losing population and turning into a slum, and thereby losing its appeal as a residential or commercial area.

As part of the restoration project there were plans to improve the transport system of the area. The traffic flow system in the centre of Seoul was improved:

- A number of streets became one-way streets.
- Bus lanes and free shuttle buses were introduced and the public were encouraged to use the subway and bus network.
- There was also a crackdown on illegal parking in bus lanes.
- Downtown parking fees were raised.
- At Cheong Gye Cheon two lanes on each side of the stream were opened to freight vehicles and road space for loading and unloading was designated.

To help street traders who were unable to do business due to restoration, the Seoul authorities provided a new site at Dongdaemun Stadium and created a new market there.

Under natural conditions the Cheong Gye Cheon is an intermittent stream. It is normally dry and requires additional flow to maintain a certain depth. The water for the Cheong Gye Cheon comes from the Han River, the main river to flow through Seoul. The average water depth of the Cheong Gye Cheon is 40cm, and 120,000 tons of water flows through it every day.

Historic heritage and new cultural importance

The Cheong Gye Cheon Restoration project divides up the scheme into three sections (*(Fig. 4)*:

- history and tradition
- culture and modernity
- nature and future

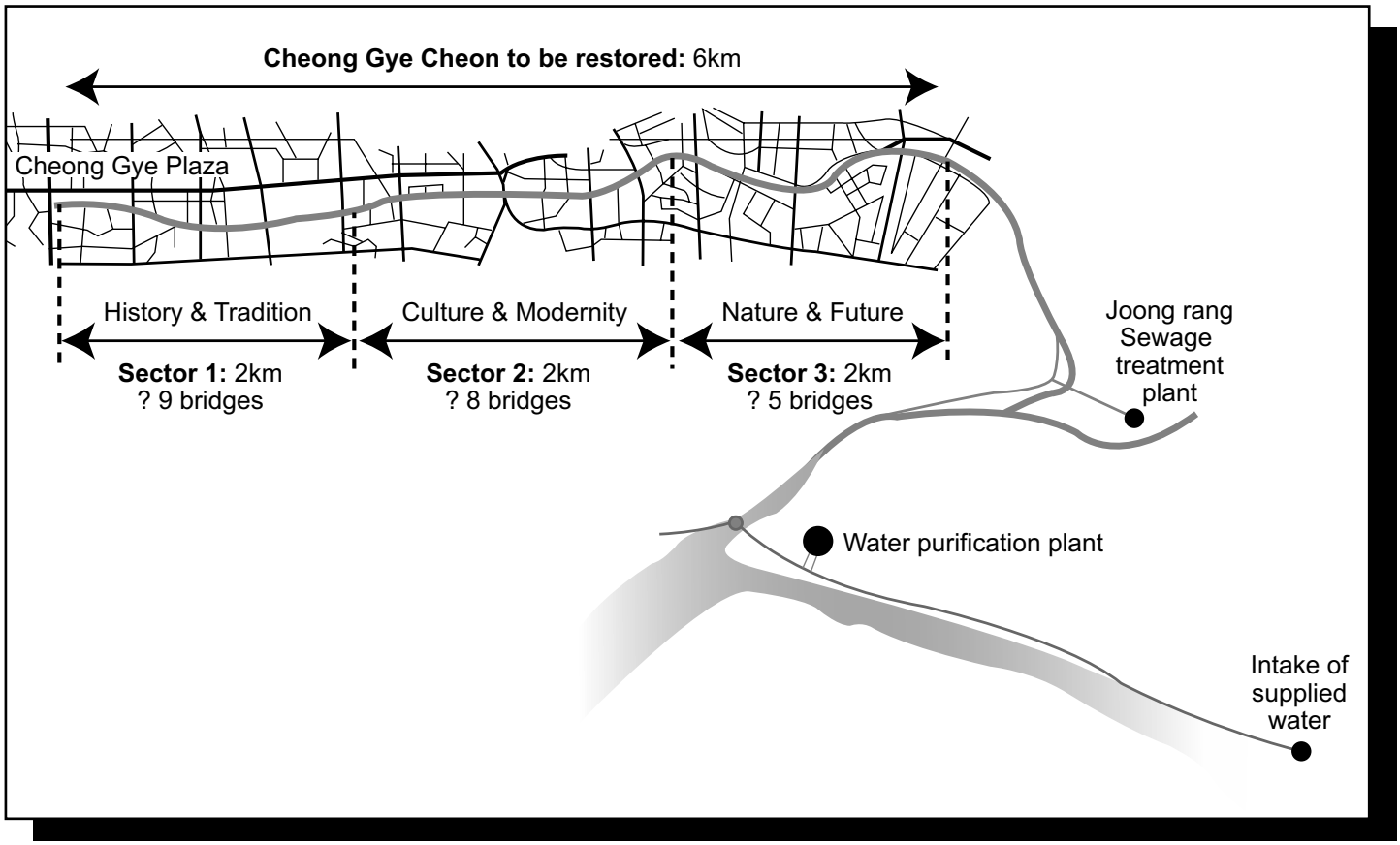
According to an 18th Century map, there were over 190 bridges in Seoul. In 1760, there were nine bridges over the main stream of the Cheong Gye Cheon. Bridges were not only a means of passage over a river, but part of the everyday life for people. Located in downtown Seoul, bridges over the Cheong Gye Cheon were mostly larger than those located elsewhere in Seoul. The Cheong Gye Cheon restoration attempted to restore the central social position of selected bridges in Seoul.

The Cheong Gye Cheon Restoration Project is of historical significance and it has allowed Seoul to rediscover its historical roots and regain some of its original look. Five ancient bridges have been partly excavated and some of the stones used in the construction of the new embankments. The Gwanggyo Bridge has been restored and traditional cultural activities such as the lantern festival and bridge stepping at Supyogyo Bridge have been re-established.

Criticisms

Critics say that it has been gentrification on a massive scale, that it has forced thousands of people away from the area and that it threatens the livelihoods and homes of people nearby. Others say the city is really only masking its problems. The water for the river is now pumped from deep below the city and collected from the nearby Han river. There have been accusations of profiteering, and the rich moving in to appropriate the views and the better quality environment.

Fig. 4 The three sections of the Cheong Gye Cheon restoration



Going forward

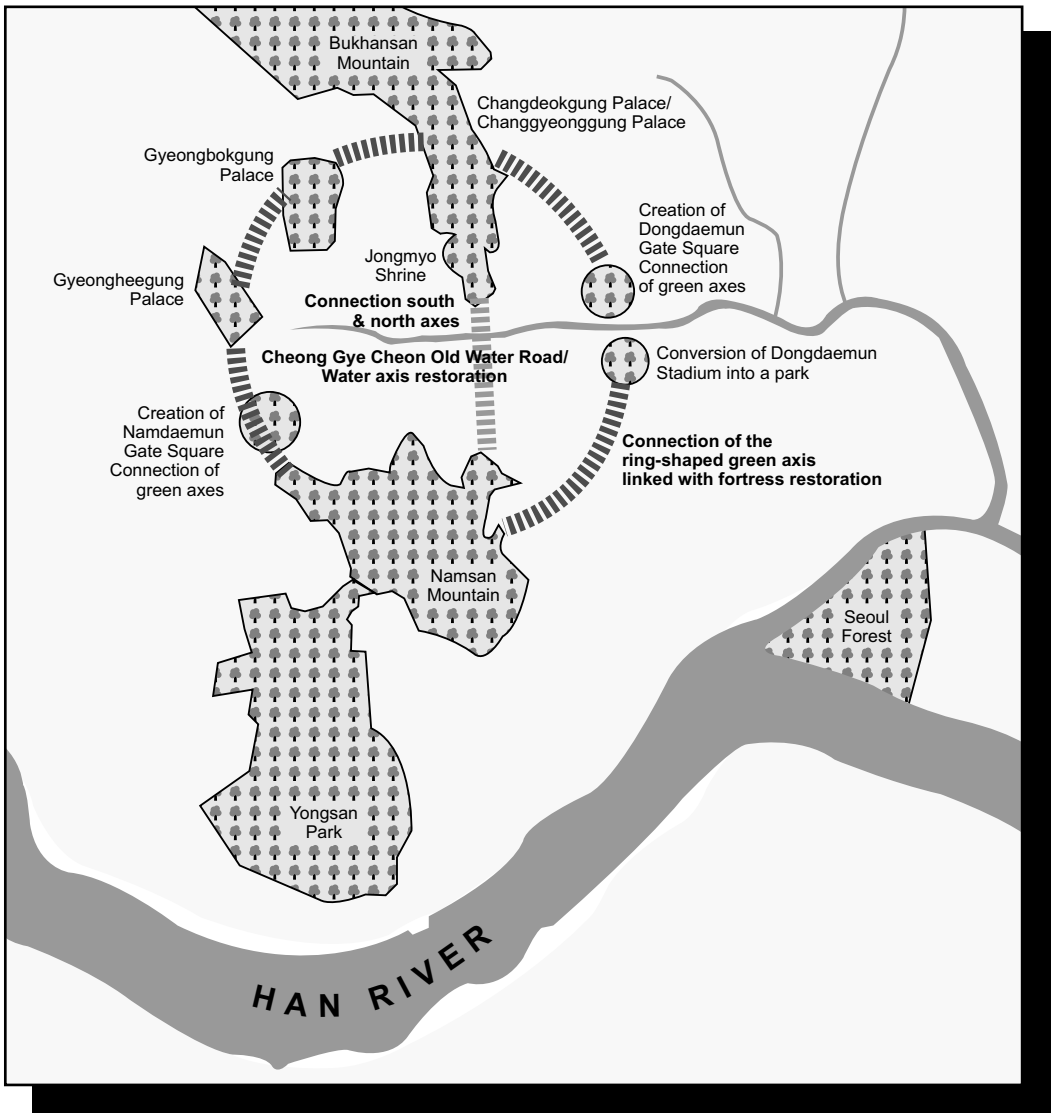
The Cheong Gye Cheon Restoration Project is just one stage in the plans for the redevelopment of central Seoul. Now that the stream has been restored there are plans to broaden the area that is to be redeveloped to include areas away from the stream itself. At the same time the area around Cheong Gye Cheon will need to be maintained so that the benefits of restoration continue for decades to come.

There are plans to develop a number of green axes within Seoul *(Fig. 5)*. These include some areas of steep land, such as Namsan Mountain and Bukhansan Mountain, as well as the areas around historic sites, such as Gyeongheegung Palace and Changgyeonggung Palace.

There are also plans to create a new area of woodland, Seoul Forest, and to convert part of the Dongdaemun Stadium into a park.

There are plans that downtown Seoul around Sewoon will be converted into a large business area, one that is competitive on the international scene. The plans attempt to balance development with conservation, and to prevent any unplanned growth. Historical, cultural will be recovered and restored and utilised as tourism resources.

Fig. 5 The development of green axes within Seoul.



Similar schemes

Cheong Gye Cheon Restoration Project is a flagship planning scheme. Shanghai is thought to be considering a similar, though smaller, scheme. Tokyo has an elevated road above an ancient bridge and is investigating the possibility of removing it, and other cities in East Asia are taking an interest in what has been a bold and dramatic urban regeneration project. In the UK, Coventry is considering a similar scheme.

Conclusion

The basic concept of the Cheong Gye Cheon Restoration Project was to re-establish an uninterrupted tract of green land, some 5.8km long, replacing a stream which had been covered for the previous 40 years. Moreover, it solved the safety problems associated with the elevated highway and the covered stream. It is a form of restoration that links in with urban management, sustainability, history and culture. It has also linked northern and southern parts of the city which had formerly been separated by the Cheong Gye Cheon Expressway.

The restoration of the Cheong Gye Cheon is not just about the restoration of a stream or even part of a larger plan for urban development. It is part of a symbolic project to revive part of Korea's historic, cultural and natural heritage. It may well prove to be the paradigm for future redevelopment schemes elsewhere.

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Acknowledgements

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