Cheong Gye Cheon Restoration Project
- a revolution in Seoul -

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Before

After
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Introduction

- Seoul and Cheong Gye Cheon
Seoul at a glance

- Capital city of Korea for over 600 years
- Area: 605.6 km²
- Population: 10.3 M
Cheong Gye Cheon

- Catchment area: 61 km²
- Length: 13.7 km
- Width: 20~85 m
Old map of Seoul
Early 20C
Problem: sanitation
Solution: covering
Covering work (1958~1977)
Cheonggye Highway
(1967~1971)
Highway in 1990s
Cheong Gye Cheon 2002
Cheong Gye Cheon Area

- Building: over 6,000
- over 100,000 small shops
- Nation’s biggest commercial area
Cheong Gye Cheon Area
Declining old CBD

- CBD redevelopment stopped where the Cheonggye Expressway started
- Population and employment reduced
  - Population: 40,000
  - Employment: 80,000 in 10 years
- Business headquarters moved to Gangnam (new sub-center)
- Industries in CBD lost competitiveness
Safety problem

✓ Over all ‘C’, partially ‘D’ or ‘E’
Safety problem

- Only small cars were allowed from 1997
- Maintenance cost soared: US$50M (94~99)
The Restoration Project

- Background
- Outline
- Challenges
- Progress
Decision to restore: July 2002
Why restore?

- Paradigm shift of urban management
  - Development → High quality of life
  - Environment-friendly city
- Fundamental solution to safety problem
- Recovery of history and culture
- Revitalisation of downtown area
  - Balanced regional development
The Restoration Project

- Background
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Site location

Total length: 5.84 km

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Demolition

- Covered structure and highway: 5.4 km
  - Waste (concrete+asphalt): 872,400 ton (96% recycled)
River design

- **Design Criteria**
  - Satisfy with the 2nd grade local river standard
  - Secure the stream capacity for 200 years frequency rainfall (118mm/hr)

- **Flood Level:** estimated by numerical model and corrected using hydraulic model test
Water supply

- **Waterway plan**
  - Width: more than 20% of main waterway width
  - Depth: more than 40 cm
  - Flow velocity: 0.24 m/sec
  - Measures to prevent water loss

- **Water supply plan**
  - Water from the Han river: 120,000 ton/day
  - Underground water from subway stations: 22,000 ton/day

- **Water quality: better than the 2nd grade**
  - BOD: 3mg/l or less
  - SS: 25 mg/l or less
  - DO: 5 mg/l or less
  - Total N: 10 mg/l or less
  - Total P: 1 mg/l or less
Sewer system

- Design Criteria
  - Combined sewer system for rainfall and wastewater
  - Capacity: 3 times of estimated wastewater

- Combined Sewer System
Bridge design

- Design Criteria
  - Minimize flow resistance
  - Create as cultural places
    - artistic landmark

- Number of bridges: 22
- International concept design competition
Landscape design

Concepts

- New green belt with waterfront: West to East
- Gradual transformation from urban landscape to natural environment
- Create ecological biotop and environment
- Thematic places: waterfall and fountains
Historic relics restoration

- **Basis**
  - Preserve or restore historic relics
  - Consider current situation: flood, traffic, merchants
  - Involve specialists

- **Site survey: Feb 2003 to June 2004**
  - Restore 600 year old bridge: Gwangtong gyo
  - 150 m upstream from the original site
  - Restore Supyo gyo and Ogansu gyo: future plan
● The Restoration Project

- Background
- Outline
- Challenges
- Progress
Challenge 1: Transport

- Cheonggye road & hwy
  - Urban backbone corridor
  - 170,000 vehicles/day

- Traffic disaster warned
  - Media, interest group
  - Traffic simulation
  - Project delay
Solutions to transport

- Discourage driving cars in the city centre
- Improve traffic system
  - Cheong Gye Cheon area
  - Metropolitan area
- Improve public transport system
  - subway system
  - bus only lane
Challenge 2: Neighboring merchants

- Traffic congestion: access difficulty
- Noise & dust due to construction
  - Business decline
Solutions to merchants

- Detailed survey on the markets and continuous interviews
  - consultation offices at the markets
  - regular meeting on the project

- Minimize inconvenience for business activity
  - state-of-the-art technology
  - provide parking space nearby
Solutions to merchants

- **Stimulate business activity**
  - Reduce parking fee
  - Improve parking system for loading & unloading
  - Promote Cheong Gye Cheon stores

- **Financial support and subsidies**
  - Low-interest loans
  - Grants for the market remodeling

- **Special arrangement for street vendors**

- **Special business centre in a outer area**
The Restoration Project

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Project delivery

- Targets
  - Keeping the schedule
  - Best value for money

- Details of contract: Design-build contract
  - invitation for bid: Feb 2003
  - bidding: June 2003
  - starting work: 1 July 2003
  - three construction sections

- Original project budget (03): US$357M
  - Final adjusted amount (05): US$386M (+8%)

- Original project period:
  - 1 July 03 ~ 30 Sep 05 (27 months)
Construction progress

Started on 1 July 2003
Construction progress

Stage 1: Scaffolding (July 2003)
Construction progress

Construction progress

Stage 3: Covered road demolition (Jan 2004)
Construction progress

Stage 4: Sewer, road & bridge construction (Sep 2004)
Construction progress

Stage 5: Landscaping for the recovered area (May 2005)
First water supply

1 June 2005
Test running & Final touch

June ~ September 2005
Grand opening

1 October 2005
Cheong Gye Cheon 2005
Monitor the changes due to the project
- from Jan 2003~Mar 2006
- before, during and after the project

Monitoring areas
- Land use
- CBD Industry
- Environment
- Ecology
- Traffic
- Real estate
Traffic

- **Speed in CBD**
  - Morning peak: 17~18 km/hr
  - Evening peak: 12 km/hr
  - not very much worsened

- **Car in/out flow**
  - 1.56M ⇒ 1.27M (-18.6%)

- **Subway ridership**
  - Central area: +13.7%
Environment

Air
- $\text{NO}_2$: 69.7 $\Rightarrow$ 46.0 ppb (-34%)
- PM10: 74.0 $\Rightarrow$ 60.0 $\mu$g/m$^3$ (-19%)

Water quality
- BOD: 100~250 $\Rightarrow$ 1~2 ppm

Noise level reduced
Heat island effect relieved
Wind corridor created
Cooling effect

Thermal image
27 July 2005

Average 32.7°C
Cheong Gye Cheon

Average 36.3°C
Nearby street

Changes

-3.6°C

Averages:

28° 36°

37° 36°
Environmental improvement

Public survey (Nov 2005)

- Air
- Water
- Noise
- Odour
- Daylight
- Wind

Changes

0% 25% 50% 75% 100%

V improved
Improved
Unchanged
Ecology: Fishes

- 3 ⇔ 14 species
Ecology: Birds

- 18 species
Ecology: Insects

7 → 41 species
Final Remarks
Most preferred destination

[Images of crowded streets and children playing in water and fields]
Future of Cheong Gye Cheon

- Identity as the 600 yr old Capital
  - Harmony between preservation & development
- Economic vitality
- Pedestrian oriented street system
- International standard business district
Effects of the Project

- Changes in the urban management paradigm
- Historic restoration
- Nature & ecological restoration
- CBD regeneration
- Good example of
  - solving conflicts over a public project
  - successful project management
Virtual Tour
Further information
http://english.seoul.go.kr/cheonggye/
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Thank you for your attention!