

# Sponge Cities in China

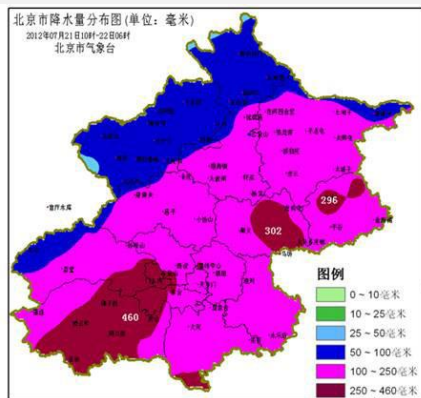
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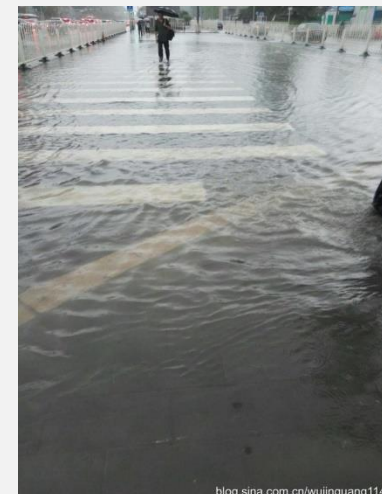
# Two rainstorms in Beijing

- **A heavy Rainstorm hit Beijing on July 21, 2012**
  - About 2 million people were impacted and 79 died
  - 95 roads were inundated and many buses and cars were immersed
  - Many flights, trains, and subways were stopped
  - Economic lost was up to 10 billion Yuan



# Two rainstorm in Beijing

- **A similar Rainstorm occurred on July 20, 2016**
  - No serious flooding and disaster
  - 1,178 rainwater utilization projects in place, retaining 8.76 million m<sup>3</sup> water totally
  - The West Gravel Pit put in use and retained 3.7 million m<sup>3</sup> water and effectively cut the flood peak from the West Mountain to the city center
  - After the rainstorm, groundwater increased 0.79 m and soil water content increased 20%.



# Concept of Sponge Cities

Grassland Lake Forest Wet land Eco-park Garden with Rainwater Green roof Permeable pavement

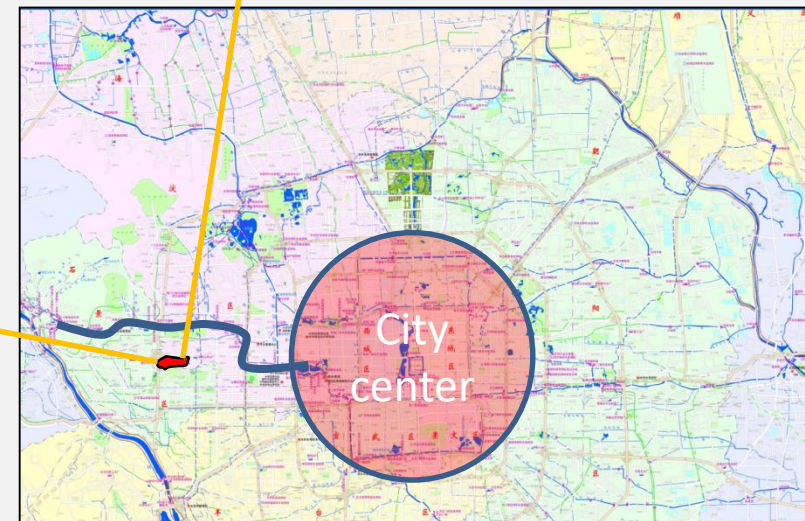
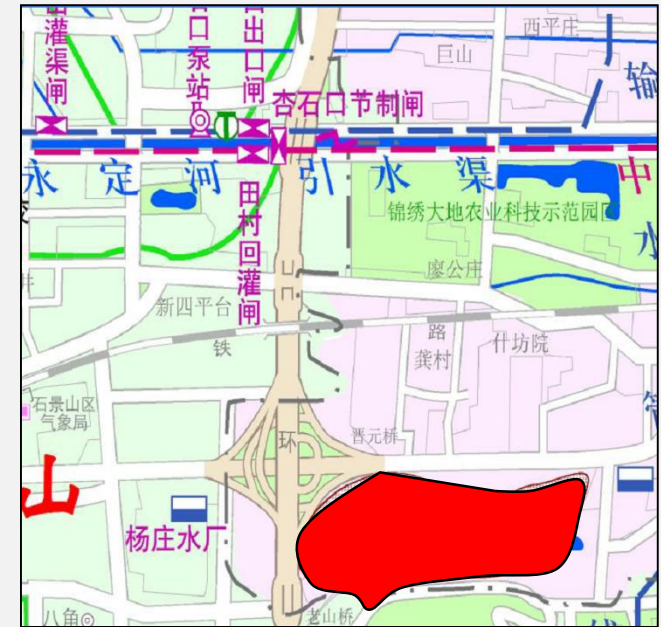
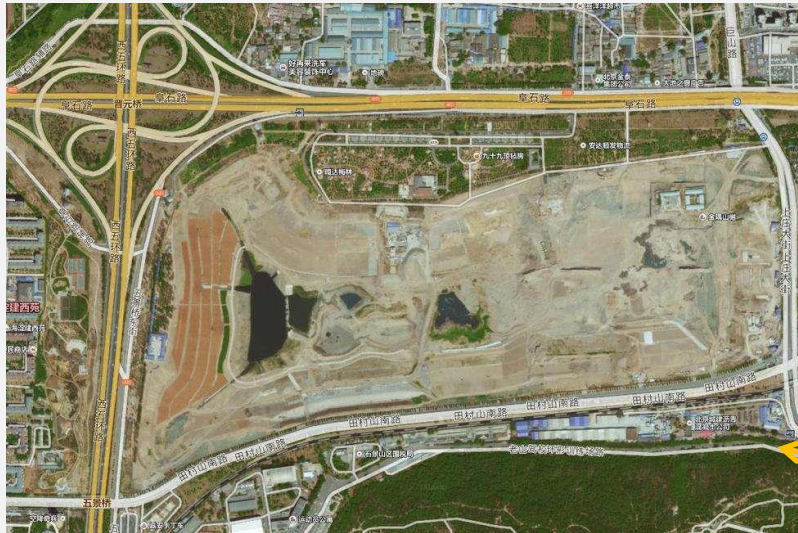


collect rainwater

use rainwater

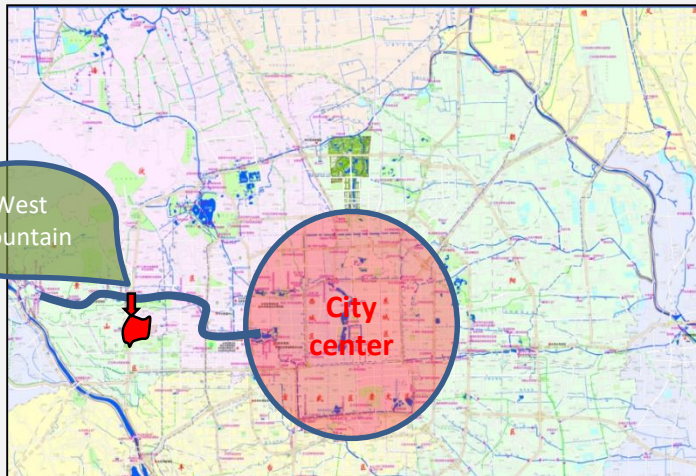
# Case 1: West gravel pit

- In the Past:
  - A abandoned quarry with 32 hm<sup>2</sup>
  - Located at the West Mountain foot
  - Underground infiltration funnel



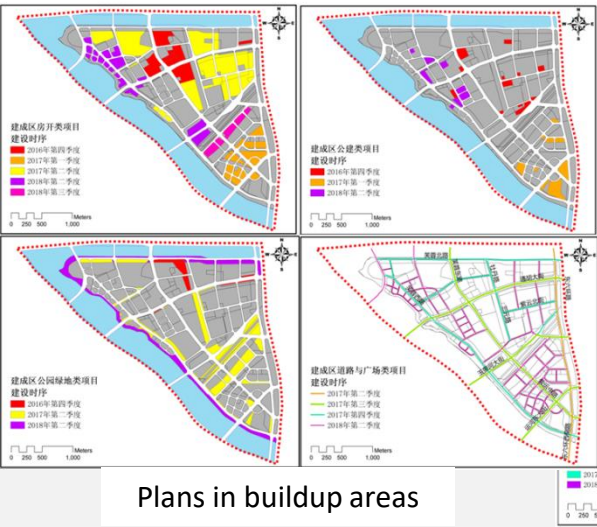
# Case 1: West gravel pit

- Start restoration in 2014, and Put in use in 2016
  - It can catch the flood from the West Mountain with a volume: 6.8 million m<sup>3</sup>
  - It also can recharge groundwater 80 thousand m<sup>3</sup> per day
  - It is a very beautiful city park

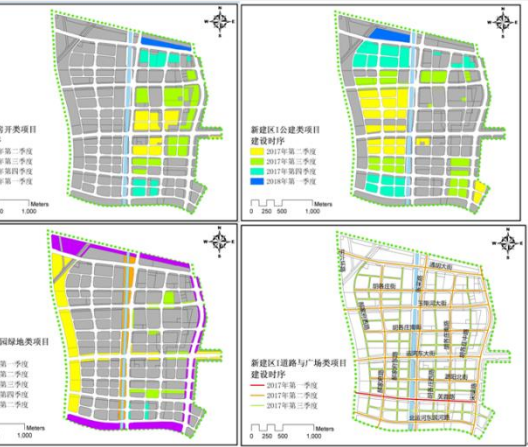


# Case 2: Tongzhou New City

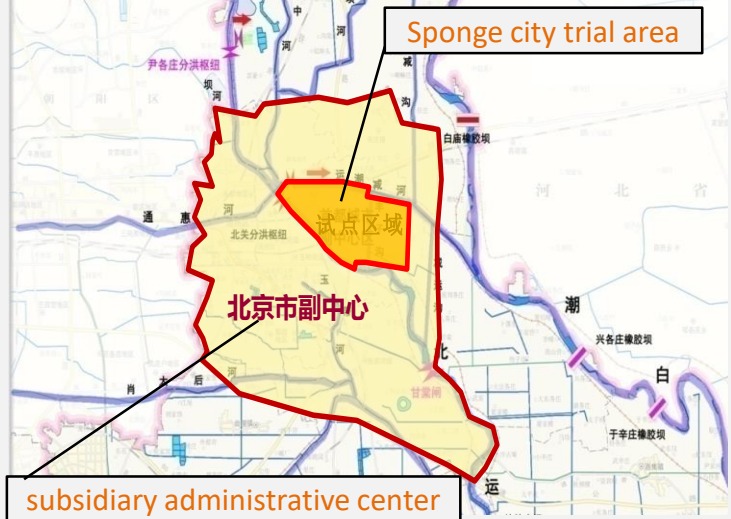
- Subsidiary administrative center
- A trial sponge city in 2016
- 14 sponge projects were finished until 2017
- 40 sponge projects are in process



Plans in buildup areas



Plans in new developing areas



subsidary administrative center

# Case 2: Tongzhou New City

- Zijingyayuan, an old community with 11.61hm<sup>2</sup> and 17 buildings
- Sponge reforms:
  - Permeable paving
  - Sunken greenbelt
  - Rain garden
- Effects
  - Annual runoff volume control rate  $\geq 75\%$ ;
  - Annual rainwater use rate  $\geq 3\%$ ;
  - Annual runoff pollution control rate  $\geq 37.5\%$ .

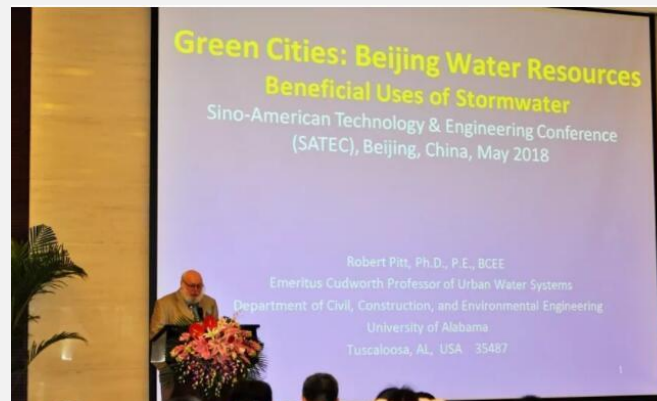




# Case 2: Tongzhou New City

- International Exchange

- April 11-12, 2018, Experts from Germany experts visited Tongzhou New City
- May 14, 2018, a conference on green city between Chinese and American experts was held in Beijing
- June 14, 2018, Experts from Demark visited Tongzhou New City



# Challenges and Lessons



- Serious conflicts between building land and green land, especially during the rapid urbanization in China
- Shortage of personnels and experiences in the sponges city construction



*Thank You for  
your attention*