

# 永續臺北 海綿城市

Taipei, Living in Harmony with Water



近年來隨著都市高度開發及全球氣候變遷影響，世界各大都會區都面臨著不同種類、不同程度的水環境風險與挑戰，像是洪水、熱浪、暴雨、乾旱等水太多或水太少的困境，這些極端氣候不僅對民眾生命財產造成重大威脅，也將影響一個城市的永續發展，而在全球氣候變遷的挑戰下，臺北市當然也面臨相當艱鉅的考驗。

Thinking Globally, Action Locally！面對全球氣候變遷與區域性的極端氣候，臺北市長期致力於防洪排水建設及河川整治工作，目的就是提供民眾安全宜居的水岸都市。然而面對未來艱鉅的極端氣候挑戰與水資源的競爭，現階段臺北市更以「海綿城市」理念做為水環境政策的核心，以「韌性水調適」、「永續水利用」、「友善水環境」為三大願景，一步步打造臺北市成為一個安全、永續、親水、生態的水岸城市。

臺北市是一個蛻變中的城市，臺北市的水環境建設正朝向嶄新的階段邁進，期待民眾一起加入雨水回收再利用以及居住環境綠化的行列，共同打造屬於我們的永續臺北海綿城市。

柯文哲



## Taipei Mayor:

*Taipei, Living in Harmony with Water*

Due to urban expansion and global climate change in recent years, the world's major metropolis face various types of challenges and different levels of risk connected with their water environments. Such as floods, heat waves, torrential rains, and droughts, etc. When there is too much or too little water, cities face the challenges of unstable water resources. These extreme events not only pose major threats to life and property, but will also affect cities' sustainable development. In the face of global climate change, of course Taipei also confronts great challenges.

Thinking Globally, Action Locally ! Facing global climate change and regional extreme events, Taipei has striven for the development of flood prevention and drainage infrastructure, and river remediation work, with a goal of providing the public with a safe, livable waterfront metropolis. Nevertheless, in the face of future challenges of extreme events and competition for water resources, Taipei adopts the Sponge City concept as the core of its water environment policy. With the three visions of resilience and adaptation, sustainable water usage, and vibrant water environment, we will gradually transform Taipei into a safe, sustainable, water-friendly, ecological waterfront city.

Taipei is a city in transformation, and the development of its aquatic environment is moving to a brand-new stage. We are looking forward to the public joining us in rainwater recycling and reuse, and the creation of a greener living environment. In our quest to make Taipei a sustainable Sponge City.

*Wen-Je Ko*



世界各大都會區面臨著不同程度的水環境風險與挑戰。

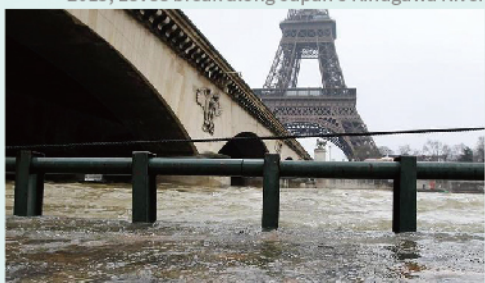
The world's major urban areas face various degrees of risks and challenges connected with their water environments.



2015 日本鬼怒川潰堤  
2015, Levee break along Japan's Kinugawa River



2016 印度熱浪 2016, Heat wave in India



2017 巴黎暴雨 2017, Torrential rain in Paris



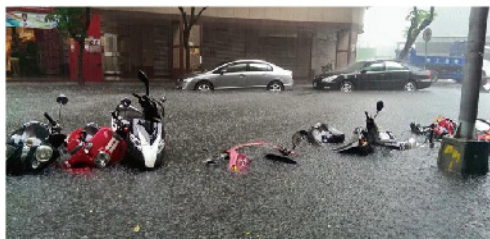
美國加州連續四年乾旱 Four-year drought in California

例如，路面積淹水、水庫缺水、廢水污染的問題。

Urban challenges such as flooded roads, low reservoir storage levels, and wastewater pollutions.



水庫缺水 Shortages of water in reservoirs



路面積淹水 Accumulation of water on roads



廢水污染 River pollution from wastewater





# 海綿城市

Sponge City



臺北市以「韌性水調適」、「永續水利用」、「友善水環境」等三大願景，勾勒出安全、永續、親水、生態的臺北市水環境藍圖，並以「健全都市水循環」、「提升防洪容受度」、「多元活絡水利用」、「穩定供水有效用水」、「生態多樣水棲地」、「豐富魅力水遊憩」為六大推動目標，透過各種工程及管理手段，進一步落實道路廣場鋪面透水化、提高城市綠覆率、推廣建築綠屋頂、增加都市貯留滯洪能力、推動污水處理再升級、再生水多元利用、復育保護水環境棲地、營造親水遊憩環境等，使臺北市具備入滲保水的能力，可蒸散調節都市微氣候，面對極端降雨具備足夠災害容受度與回復力，打造一個具韌性、水冷散熱並可因應未來挑戰不斷調適的永續臺北海綿城市。

With the three visions of “Resilience and Adaptation”, “Sustainable Water Usage”, and “Vibrant Water Environment”, Taipei has developed a safe, sustainable, water-friendly, and ecological blueprint for its Water Environment. It has also established six goals, which are “Restoring Urban Water Cycle”, “Increasing Flood-Resisting Capacity”, “Diverse Water Reuse Sources”, “Stable and Efficient Water Supply”, “Livable Natural Habitat” and “Promoting Waterfront Activities”. Through various engineering and management approaches, Taipei has devoted its self on constructing permeable pavements for roads and squares, increasing the ratio of green cover, promoting the idea of green roofs, improving water holdup and retention capacity, upgrading sewage treatment, diversify the reclaimed water

utilization, restoring water habitat, and creating waterfront recreational environment. By doing so, Taipei will have the ability of water infiltration and retention which allows transpiration and regulation of the urban microclimate. Thus, it will have sufficient carrying capacity and resilience while facing extreme rainfall. By this to create a resilient Taipei sponge city which can respond to the future challenges.



臺北海綿城市願景  
The vision of sponge city Taipei



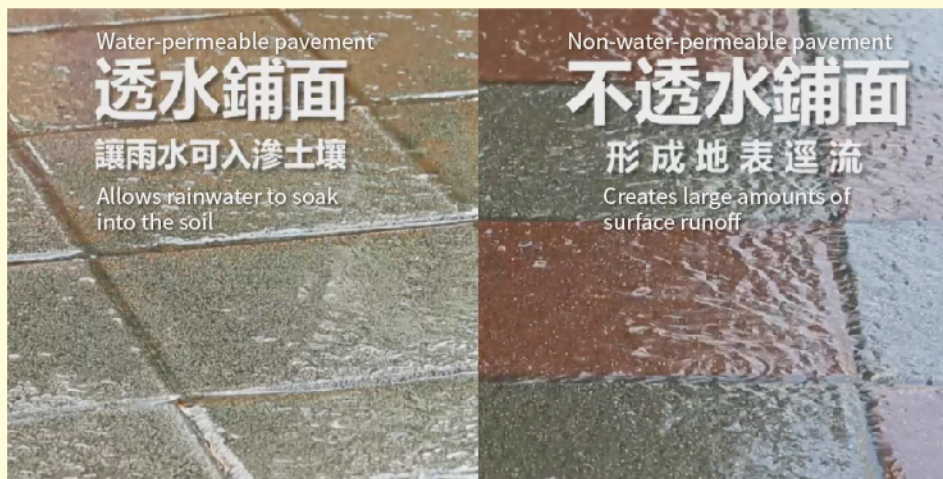
# 韌性水調適

## Resilience and Adaptation

「韌性水調適」代表我們這座海綿城市無論是面對水災、旱災或是熱島效應等極端的事件，都具備足夠的災害容受度以及恢復力，也就是「韌性」；另外更強調長期、未來10年、20年，都會區如何與水共存，以前瞻性的調適策略，確保都市面對未來極端氣候的韌性。

Taipei's resilience and adaptation means sufficient carrying capacity, recovery ability, and toughness to withstand extreme events, such as floods, drought, and heat island effects. Furthermore, we put major emphasis on forward-looking adaptation strategies letting urban areas coexist with water during the coming ten to twenty years, and to ensure the city's resilience in the face of future extreme events.





透水人行道與一般人行道對比圖  
Comparison between the permeable and non-permeable pavement on sidewalk

藉由將路面改成採透水鋪面的設計，讓雨水可以更容易的入滲土壤，增加都市保水、減少路面的積水情況。臺北市透水鋪面及綠資源面積於2016年增加超過12萬平方公尺。

With water-permeable pavement, it allows rainwater to soak into the soil more easily, enhancing the city's water conservation capacity, and reducing puddling on roads. Over 120,000 m<sup>2</sup> of water-permeable pavement and greens were expanded in 2016 in Taipei.



夏季高溫時水份可以蒸發調節都市微氣候，恢復都市的自然水循環系統。根據透水人行道監測地表溫度可降低2.05~3.53°C，並可削減地表雨水逕流達7.3~18.7%。

In this way, we can regulate the urban microclimate in summer by evaporation of the water and restore the city's natural water circulatory system. For water-permeable sidewalk, the surface temperature can be lowered down by 2.05-3.53°C, and surface runoff be reduced by 7.3%-18.7%.



上游保水 Upstream water conservation  
山坡地水土保持 sloeland water and soil conservation

面對短延時強降雨時，透過上游保水、中游減洪、下游防洪的都市流域整體規劃策略，降低臺北市淹水的風險。

When dealing with high-intensity rainfall, we rely on comprehensive urban watershed management involving upstream water conservation, midstream water detention, and downstream flood prevention, to reduce the risk of flooding in Taipei.



中游減洪 Midstream flood detention  
金瑞治水園區 Jinrui flood management park



下游防洪 Downstream flood prevention  
堤防 抽水站 dike and pumping stations

藉由調洪池、滯洪池、排水分流及抽水站等工程，讓都市流域上中下游具備整體性的規劃，有效改善都會區的排水問題。

Comprehensive urban watershed management with measures like flood retention and detention ponds, drainage diversion systems, and pumping stations can enhance the capacity and efficiency of our urban drainage systems.





## 文山防洪排水計畫

Wenshan flood prevention and drainage plan

排洪隧道施工品質檢視 Drainage tunnel construction quality inspection



辛亥路憲兵營區停車場滯洪池

Military police camp flood detention pond



福興路排水分流新建工程

Fuxing Road drainage diversion system



景美抽水站機組增設工程

Installation of new pump units at the Jingmei pumping station



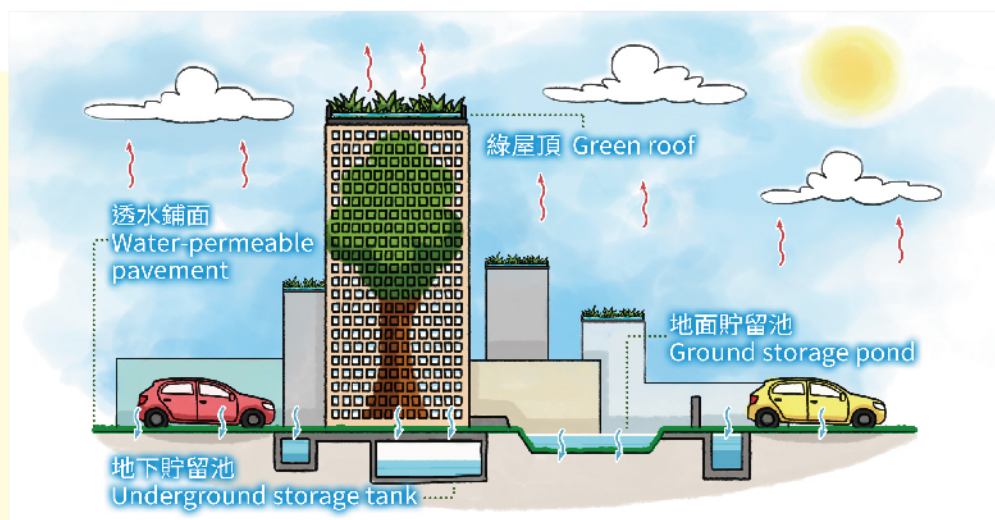
文山運動中心北側用地滯洪池

Wenshan Sports Center flood detention pond



透過推動雨水流出抑制設施及綠屋頂設置，使都市裡的公共及私有建築也能具備雨水入滲保水的能力，讓私有建築物與都市排水系統共同為都市保水及暴雨防災盡一份心力，達到政府、民眾與企業協力共同防災的目的。

We use rainwater outflow suppression facilities and green roofs to enable public and private buildings in Taipei to perform rainwater infiltration and retention. By this, with the urban drainage system, we can achieve the goal of increasing water-conservation and flood-resistance capacity in Taipei through public-private partnerships.



田園城市基地總面積超過10萬平方公尺

The Garden City site occupies more than 100,000 m<sup>2</sup>



# 永續水利用

Sustainable Water Usage

「永續水利用」是希望臺北這個海綿城市珍貴的水資源，不僅自來水可以穩定有效的提供民眾來使用，也能透過雨撲滿及再生水的方式循環利用，讓一滴水充份發揮滴水重複利用的效益，讓臺北市的水資源不僅是穩定優質的、更是多元的、永續的。

The sustainable use of water seeks to ensure that the "Sponge City" of Taipei can use its valuable water resources to provide a stable and efficient supply of tap water to the public, and we also hope that we can use rainwater collecting systems and water reclamation systems to recycling water resources. This lets every drop of water be used repeatedly, and enables Taipei to enjoy stable, superior, sustainable water resources.

臺北市擁有全國最大的污水下水道系統，污水處理廠在處理水質和水量的部分也持續提升。

Taipei has Taiwan's largest sewage system. We are continuing to improve wastewater treatment plants' water quality and capacity.



經處理後的再生水，不僅可提供植栽澆灌、道路沖洗，也能夠提供民眾取用。

After treatment, reclaimed water can not only be used to water vegetation and wash roads, but can also be used by the public.





建置在公園和學校的雨撲滿，也可以在雨天保存雨水，有效並多元運用水資源。

Rainwater collecting systems installed in parks and schools can retain rainwater from rainy days and make the most diversified, effective use of water resources.

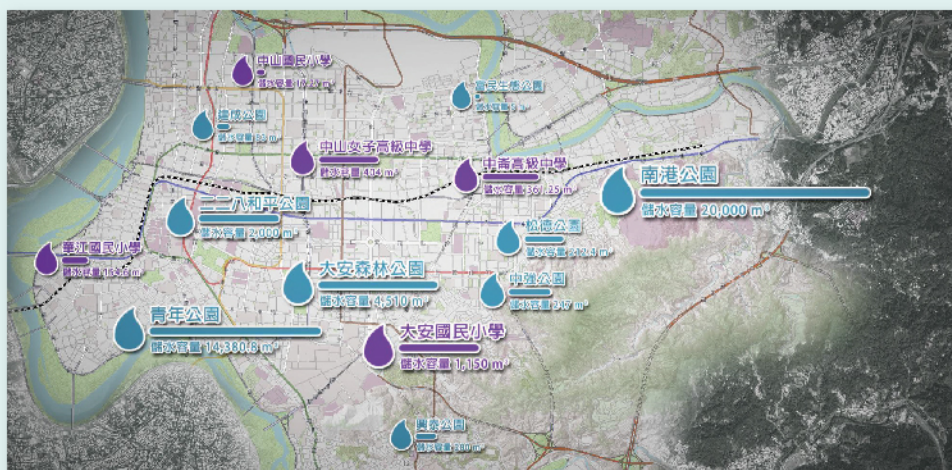


綠地下方設有90公尺長、8公尺寬的雨撲滿  
Rainwater collecting systems under the green measures  
90 meters long and 8 meters wide

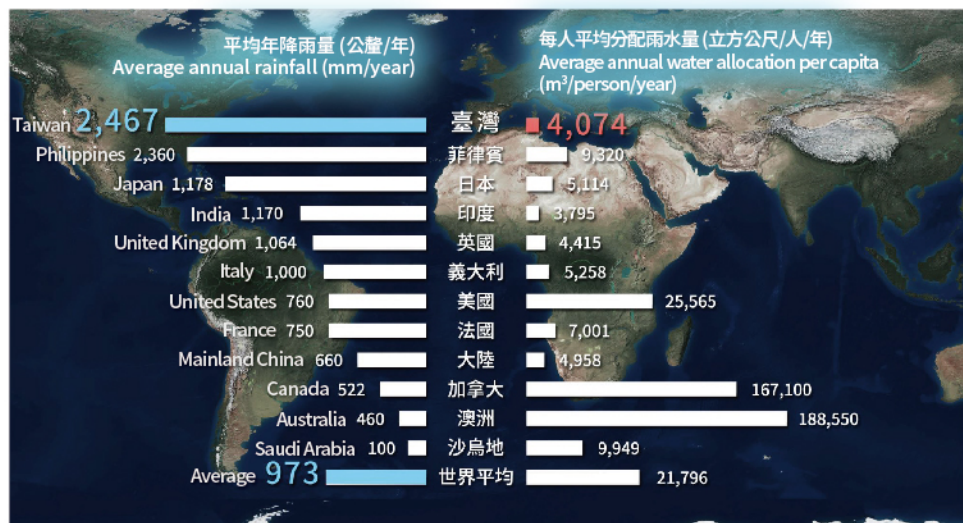


目前臺北市已有多座雨撲滿建設，預計於2017年能再完成1座公園雨撲滿。

Taipei currently has numerous rainwater collecting systems, We expect to complete one more park rainwater collecting system in 2017.



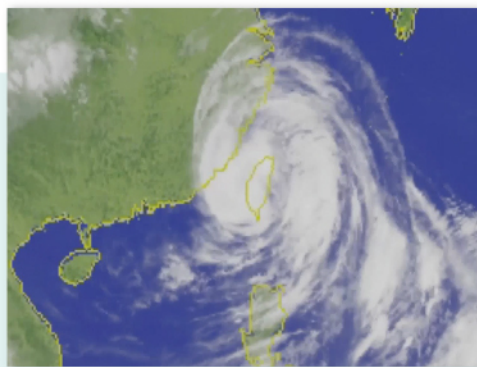
公園及學校雨撲滿合計總貯留量約10,000立方公尺  
Rainwater collecting systems at parks and schools have a total capacity of approximately 10,000 m³



各國降雨量與人均分配雨水量統計 Annual rainfall and water collocation per person in different countries

臺灣年降雨量是世界平均的3倍，卻因地形與氣候變遷成為世界排名第18的缺水國家，因此每一滴水都格外珍貴。

Although Taiwan has three times average global rainfall, its topography and changing climate have made it the world's 18<sup>th</sup> most water-deficient country. As a consequence, every drop of water is especially valuable.



颱風襲台導致河川濁度升高 Increasing river water turbidity when typhoon hitting Taiwan

而位處亞熱帶地區也讓臺灣時常面臨颱風的考驗，在強颱肆虐下往往造成原水濁度升高，使臺北面臨嚴峻的水資源考驗。

Taiwan often suffers from typhoons because located in the subtropical zone. When a strong typhoon hits Taiwan, the turbidity of the water always surges so that Taipei has faced a enormous challenge for water resources.



為了預防颱風造成原水濁度太高而導致的自來水停水，臺北市也透過工程與管理手段，強化了淨水廠的防災應變措施，讓民眾能時時刻刻享有乾淨穩定的自來水供應。

In order to prevent typhoons from causing excessively turbid raw water, which can interfere with the tap water supply, Taipei is also employing engineering and management methods to strengthen water purification plants' disaster prevention and response capabilities. Ensuring that city residents enjoy a stable supply of clean tap water at all times.



墊高耙污設備 確保取水穩定  
Raised bar screen equipment ensures  
a stable water collecting



增設刮泥設備 進行即時排泥  
Installation of sludge scraping equipment  
to perform real-time sludge discharge







兒童新樂園直飲台  
Taipei Children's Amusement Park drinking fountain



仙跡岩直飲台  
Xianji Rock drinking fountain

在臺北市的公共場所、公園、熱門的登山步道，也逐步設置直飲台，全市直飲台至2018年將超過800座，讓民眾隨處可以享受安全便利的飲用水。

We are also gradually installing more drinking fountains in Taipei's public places, like parks, and even along popular hiking trails. There is expected to be more than 800 drinking fountains throughout Taipei till 2018, ensuring that the public can enjoy safe and convenient drinking water.



大佳河濱公園  
Dajia Riverside Park

同時也響應國際減少保特瓶裝水使用的趨勢，讓臺北成為環保節能的友善城市。

Responding to international calls to reduce use of bottled water, making Taipei an environment-friendly, energy-saving city.



# 友善水環境

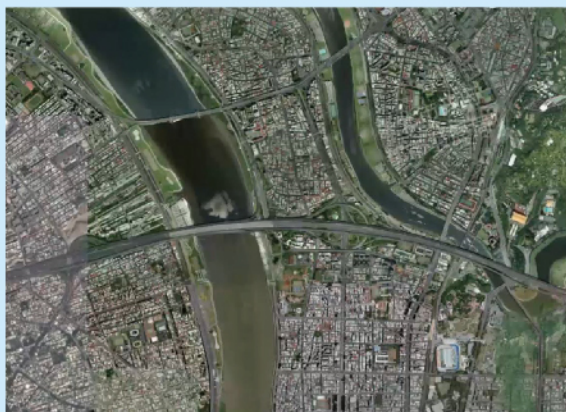
Vibrant Water Environment

「友善水環境」- 臺北市致力於生態環境復育與維護，特別是都會區珍貴的生態濕地，這些濕地的永續經營規劃，目的除了維持生態多樣水棲地外，也是希望能夠進一步建立民眾愛水、親水、生態的環境觀念。

For “Vibrant Water Environment” Taipei is committed to the ecological restoration and maintenance of the valuable ecological wetlands. The sustainable operation of wetlands and promoting the idea of cherishing our valuable water environment to the public is equally necessary.

在高度都市化的狀況下，綠地和水環境逐漸消失，臺北市為民眾規劃了各類水環境教育宣導與生態體驗活動。

Green spaces and aquatic environments have been gradually disappearing. In light of today's high degree of urbanization, Taipei has been planning various types of aquatic environment education and ecological experience activities.



透過環境的復育與維護，逐漸恢復都會區的生物多樣性。

Relying on environmental restoration and maintenance, we gradually recover the biological diversity in highly urbanized area .







內溝溪 Neigou Creek

這些濕地透過NGO結合在地志工居民永續經營，除了復育生態棲地，也讓民眾重新建立與水資源之間的聯結，使民眾重回這個孕育先民及城市發展母親之河的懷抱。

With sustainable management by NGOs and local volunteers, the wetlands ecological habitat will be restored, and the public will be able to reconnect with our precious water resources.





臺北市熱門的河濱公園除了自行車騎乘外，也配合不同季節定期舉辦系列河岸水域活動，已經成為臺北市著名的觀光遊憩盛事。

Apart from cycling, Taipei's extremely popular riverside parks are the scene of regular riverbank and aquatic activities throughout the year, and have become some of Taipei's best-known tourist recreation attractions.



大佳河濱公園路跑活動  
Dajia Riverside Park Road Running Activity



彩虹河濱公園花海  
Sea of flower in Rainbow Riverside Park



大稻埕碼頭  
Dadaocheng Wharf



社子島自行車道  
Shezidao bike lane

臺北市規劃的六大主題河濱公園，歷年來依不同季節陸續舉辦一系列河岸水域活動，已成為臺北市著名的觀光遊憩盛事。藉由這些親水活動，民眾在悠遊河川溪溝濕地的同時，更能重拾城市發展與水密不可分的脈絡與文化與水共存、生生不息。

Taipei has planned six riverside theme parks in which a series of riverside events were held in different season. These events are well-recognized tourism and recreational activities. Through these events, the public can stroll along the river and wetlands while discovering the water culture which is relevant to the urban development.



美堤河濱公園 Meiti Riverside Park



水岸臺北端午嘉年華 Taipei Dragon Boat Festival



臺北河岸童樂會 Taipei Riverside Kids Festival



TLC臺北野餐日 TLC Taipei Picnic Day



臺北河岸音樂季 Taipei Riverside Music Festival



## 給市民的話: *Talk to the public:*

下一代是我們最珍愛的希望種子，他們的笑臉是我們最大的前進動力，要留給下一代什麼樣的臺北，掌握在你我手中，讓我們一起努力，共同為下一代許下一個安全、永續、親水、生態的海綿城市。

The next generation represents our treasured seeds of hope. Their smiles are our biggest motivation. Taipei's future is in everyone's hands. Let us strive together to leave a safe, sustainable, water-friendly, ecological Sponge City for the next generation.







# 永續臺北 海綿城市

## Resilient Sustainable Vibrant

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海綿城市

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