

The **Dragon** Gallops
Underground

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Changing Memories of the Taipei Railway

1983 - 2011

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General's Foreword

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A subway version site map imitated from the famous painting "Along the River during the Qingming Festival"



To Draw Forth *Perfect Ending* for the Taipei Metropolitan Area Railway Reconstruction Projects

Railway is always the most effective transportation system in urban area. In accordance with energy-saving policy and municipal development, the Ministry has put emphasis on promoting modern public infrastructures and accelerating metropolitan transportation improvement, so as to enhance economic activities and improve citizen's livelihood at the same time. The Railway Reconstruction Bureau, MOTC was assigned the major duty on the Taipei railway main station rehabilitation task in July 1979, and construction works started in 1983. Since then, Taipei main station project was completed and started operation in 1989; afterwards Songshan project, Wanhua-Banqiao project and Nangang project are all completed on schedule successfully.

Total mileage of Taipei Metropolitan Railway Reconstruction Projects is accumulated to 35 kilometers, with construction cost 180.8 billion NT dollars. Handovers consist of underground railway tunnels, stations and buildings, elevated bridges, tracks, service yards and workshops, and various power and communication facilities. Since all construction activities are done adjacent

electrified railroad in operation, working condition is tremendously tough, difficult and dangerous. We are very delighted to complete finally the Nangang project on August 31, 2011. After 28 endurable years of hard working, the RRB colleague has drawn forth perfect ending of this admirable project.

Sincerely edited herewith in this commemorative album, the RRB has collected remarkable construction highlights of this project, all benefits and conveniences induced from this project are also stated, for readers' acknowledgement and reference. We hereby wish to pay cordial respect and gratitude to thousands of honorable railway reconstruction participants, they devoted their valuable youthfulness without regrets and complaints, boosted all their ability and professional skills, and responsibly fulfilled their duties. They are truly heroes of this country and this project.

Furthermore, we should pay extreme respects to our former Director Generals: Mr. Dong, Ping; Mr. Chiang, Hsin-ru; Dr. Shieh, Chao-i; and Mr. Cheng, Tzu-jung. Follow their brilliant

leadership, just like a string of indispensable pearls are gathered to form this perfect outcome. The bureau motto: "Active in action leads to success; endeavor in marching reaches to destination" is always pursued, to keep up with our performance goals: "Safety, Guiltless, Efficiency, Solidarity," which forms a powerful strength to support us, for a more farsighted future: "New Era of Taiwan Railroad."

Hsu, Chun yat

Director General
Railway Reconstruction Bureau,
Ministry of Transportation and
Communications



Poignant *Memories* Extend along Railway Tracks

The Taipei Railway Underground Project was always a hot topic for classroom discussions while I was a college student. The various possibilities—elevated tracks, underground tracks, and rerouted roads—all had their own adherents, who would wax eloquently on their respective advantages. Though it seems just yesterday, 28 summers and winters have passed since the approval was made by the Executive Yuan and the look of modern Taipei gradually emerged along with the railway reconstruction proceeded stage by stage.

As this year is 10th anniversary of the Railway Reconstruction Bureau, and also the “Engineering Office of the Taipei Railway Underground Project” was established 28 years ago, Director-General Hsu charged me with leading a task force to compile an album that would document valuable history of the railway construction projects in Taipei. As sorting through several thousand photos, we discovered that the overwhelming majority of them were neither taken by professionals nor well preserved. Although the photos demonstrate the hard work put in by our predecessors, they aren’t particularly adept at conveying the many moving stories associated with railway reconstruction. For instance, the most advanced international engineering techniques were used for the Taipei Main Station, but buoyancy issues forced our own engineers to find unique solutions. Team leaders took the initiative to determine that the slab tracks used for the eastern ramp needed to be pulled out and redone, thus helping to make preparation works for future extensions.

Carrying out maintenance work on a trunk line while it is in operation is a lot like altering clothes while you’re wearing them. There are countless issues requiring negotiations and communications, as well as safety procedures to implement, issues demanding urgent handling, and emergency responses.

When Typhoon Nari caused flooding in and around Hulin Street in Taipei, it proved that we were right to have the special flood prevention design by raising structures at a high level. The test

posed by the 921 earthquake in 1999, which further demonstrated the quality of the railway reconstruction. Also as the traditional railway toilets depended on sun-drying and rain-washing for sanitation, the unsuitability of “direct deposit” style train toilets for the underground Taipei Main Station wasn’t discovered until the year before this section opened.

The compilers were eventually able to overcome the various challenges they confronted. Starting with “Rising to the Challenge” and “Bringing into Practice,” the volume proceeds with photos documenting the four stages of engineering efforts. It discusses railway culture and social economics, and then proceeds to juxtapose modern and historical railways and stations, in order to outline some of the salient features of government policies over the years.

Looking back now, at a time when the final touches are being applied to the projects putting Taipei’s tracks underground, I feel very grateful for the leadership shown by the series of director generals who have headed RRB. In particular, the inspiring and down-to-earth leadership of former director-general Tong Ping has left its imprint on this collection. First of all, in leading the railway engineering teams, he insisted that the members of the teams constantly outdo themselves and furthermore find ways of adapting to challenges and overcoming bottlenecks. Secondly, he stressed that the construction teams must cooperate with the operating institutions in order to meet travelers’ needs via high-quality reconstruction. Thirdly, he stressed putting the public welfare first and behaving in a principled and honest manner. From 1983 until 2011, one group of railway heroes after another passed along the torch of railway reconstruction. Their efforts have borne fruit, earned kudos and created a legacy to be treasured by future generations.

In conclusion, let me quote from the Turkish poet Cahit Sitki Taranci in the essay:

*Where to... at this moment of night,
Beautiful train, solitary train?
Bitter was the sound of your whistle,
Bringing so many things to my memory.*

*Why shouldn't I wave my scarf?
Passengers are more or less kin to me.
Go, wish you a safe journey home,
Bridges are rigid, tunnels are bright.*

Joe Y. Chow

Editor-in-chief & Deputy Director General
Railway Reconstruction Bureau, Ministry of
Transportation and Communications





第

一

天

字

Pioneer Stage

History of the Taiwan Railway

蓄勢

The story of the Taiwan Railway began in 1887.

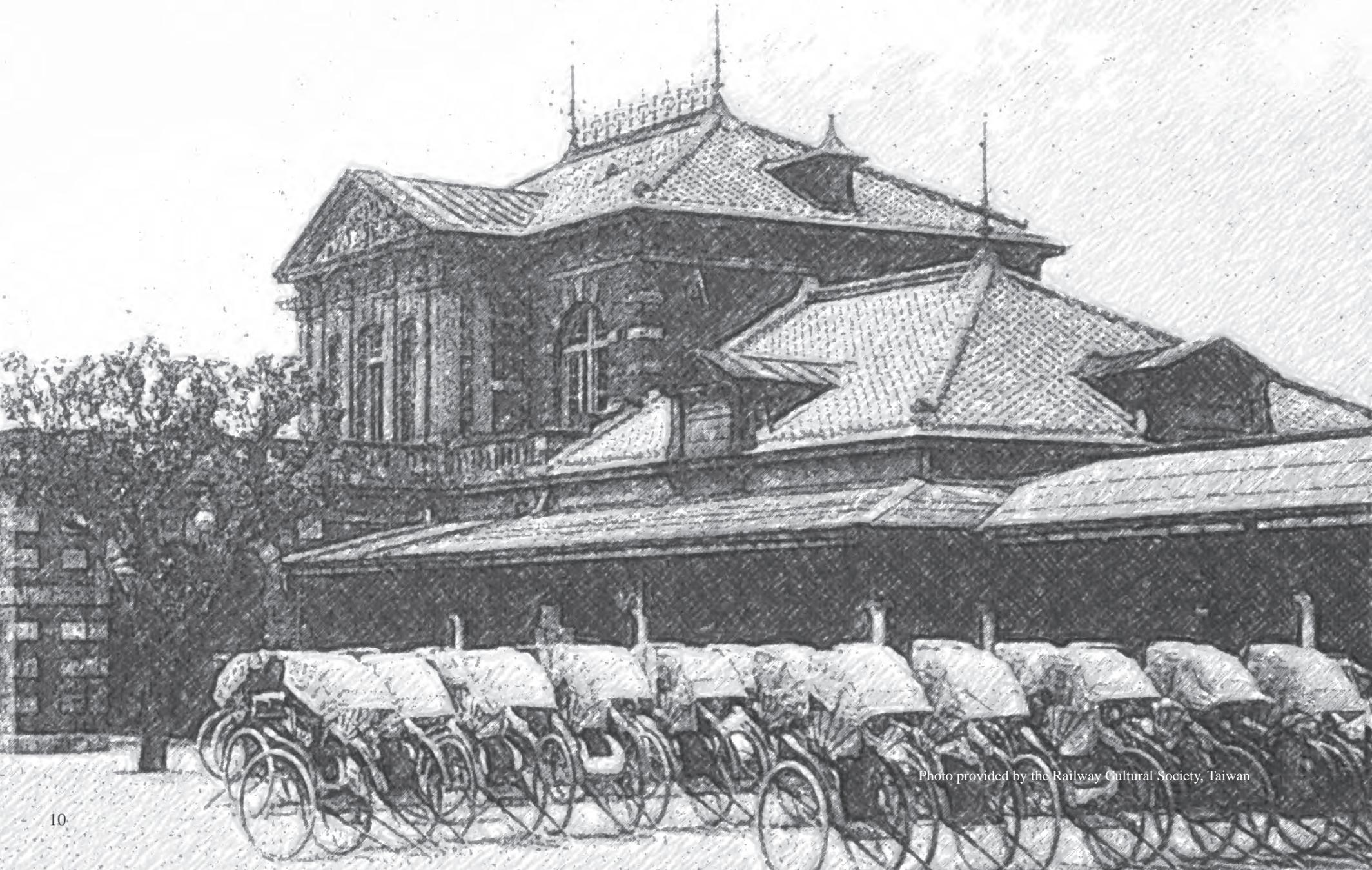


Photo provided by the Railway Cultural Society, Taiwan

1887

Taiwan is administratively upgraded to a province under the Qing government. The first governor Liu Ming-chuan began the construction of railway between Keelung and Taipei in July this year.

1888

The railway is built to Xikou (now Songshan) in January. It is announced that work will begin on plans to build a rail line linking Taipei and Hsinchu.

1889

The railway is built to Shuifanjiao (now Xizhi). It is convenient to transport local tea, coal, timber, and other products.

1891

Shao You-lien succeeds Liu Ming-chuan as governor of Taiwan. The 28.6-kilometer-long Keelung-Taipei Railway is completed in October of the same year.

1893

The Keelung-Hsinchu Railway begins in service. It is 106.7 kilometers long, has 16 stations, and crosses 74 bridges and 568 irrigation canals, marking the birth of Taiwan's railway system.



Photos provided by the Railway Cultural Society, Taiwan

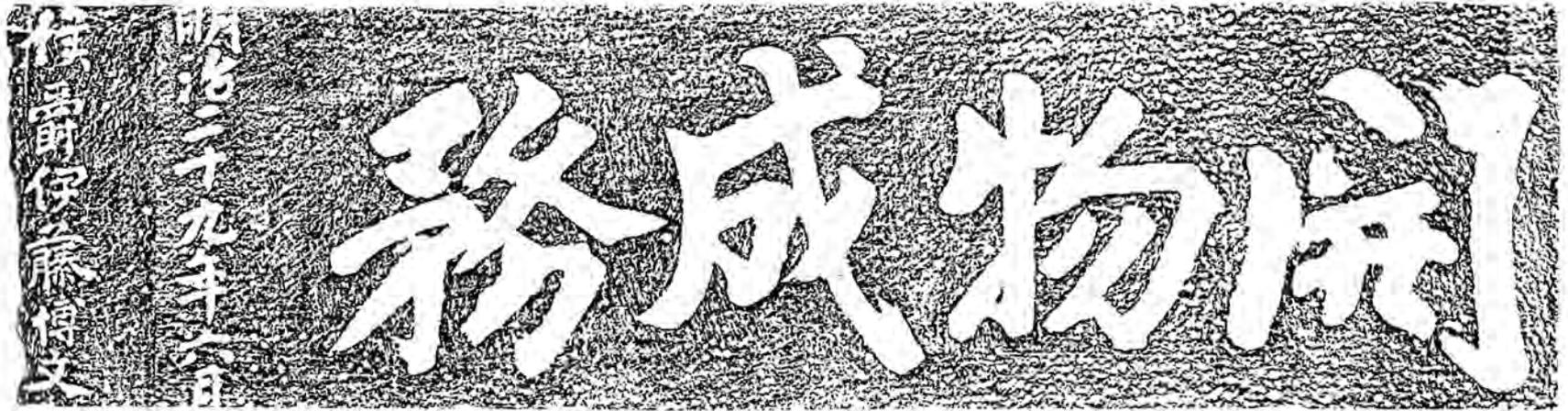


Photo provided by the Railway Cultural Society, Taiwan

This stone plaque (150 cm x 40 cm) is inscribed with the saying, “Unlock the Knowledge of Creation to Accomplish the Undertakings of Mankind.” It was inlaid in the brickwork above the entrance to the Nangang Tunnel of the Taiwan Railway in 1896. That year, Japanese Prime Minister Ito Hirobumi made an inspection tour of Taiwan by train. He encouraged the construction of Taiwan’s first north-south rail line and had a stone tablet inscribed in commemoration.

1895 Taiwan comes under Japanese rule. Railway development expands to develop the island's resources. The north-south line linking Keelung and Kaohsiung is completed in 1908.

1945 Taiwan's retrocession after World War II; repairing the railway infrastructure bombed by the allied forces during World War II becomes a priority task.

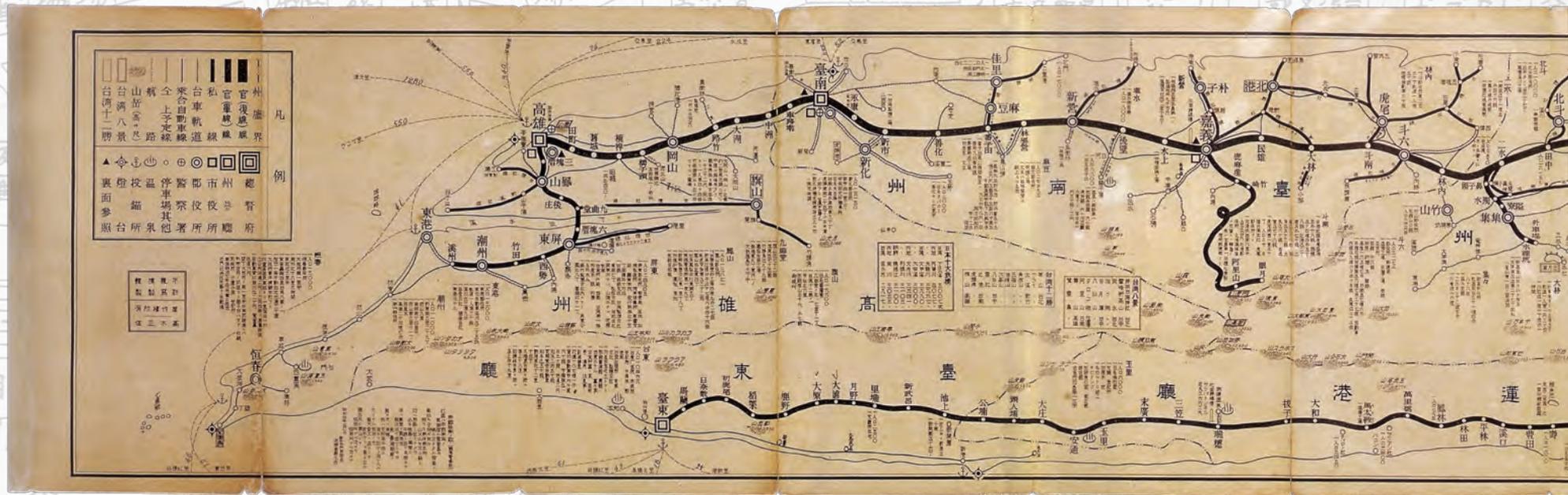
1949 The government of the Republic of China is relocated to Taiwan. Railway trains and rail lines were continuously improved with aid from the United States.

1971 In order to meet growing passenger and cargo demand, plans are drafted to electrify the Western Line and construct the North Link Railway. The project was completed in 1979, ushering into a new era of electrified Taiwan railway.

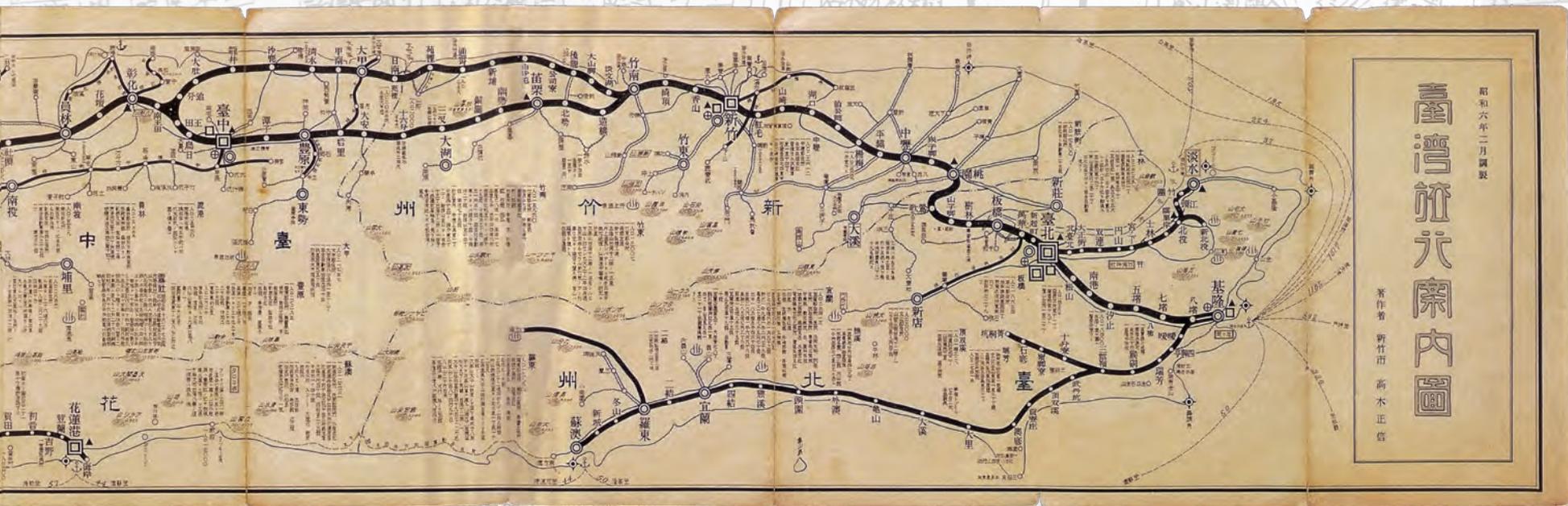
1991 The South Link Line is in service, which officially complete Taiwan's island-wide railway system. And finally Taiwan round-island railway is accomplished as today.



Photos provided by the Railway Cultural Society, Taiwan and the National Central Library



An enlarged map of Taiwan Railway printed in February 1931 (Photo provided by the Railway Cultural Society, Taiwan)





Lead Roles

The Taipei Railway Underground Project

By 1968, the proliferation of railway crossings in Taipei could no longer be ignored. Eliminating the crossings along Zhonghua Road became an especially urgent task in the government's efforts to improve transportation in the city.

On July 1, 1983, the Engineering Office of the Taipei Railway Underground Project (today the Railway Reconstruction Bureau, Ministry of Transportation and Communications) was established: a date that also marks the birth of the Taipei Railway Underground Project.

Twenty-eight years later, on August 31, 2011, the Taipei Railway Underground Project was finally completed at a cost of more than NT\$180.8 billion: 35 kilometers of track were laid, nine stations were renovated, three new stations were built, two marshalling yards and one freight yard were constructed, and 40 crossings were eliminated. This accomplishment pioneered new ground and presented a blueprint for the development of MRT systems for TRA in metropolitan areas across Taiwan.



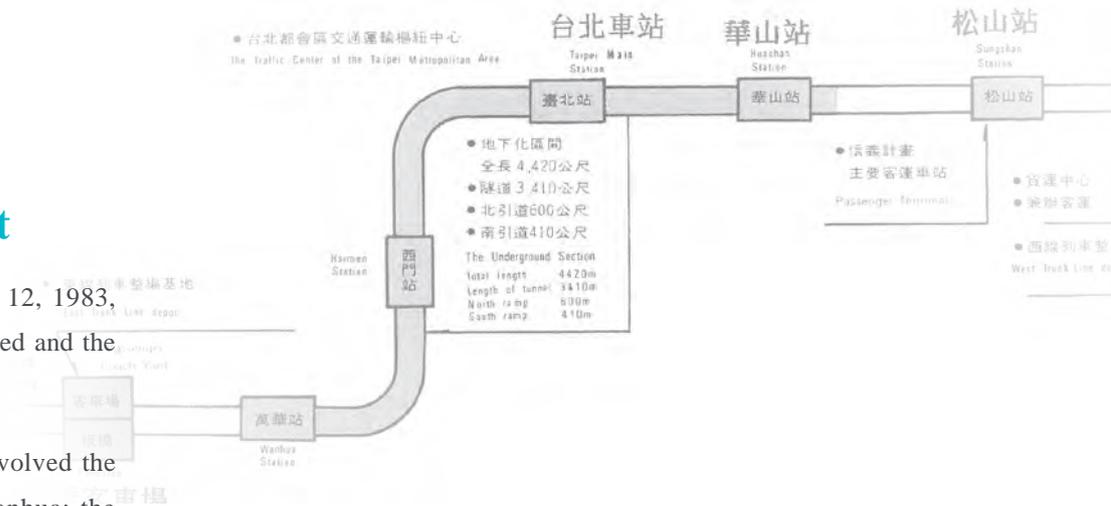
臺北車站地下化

Taipei Main Station Underground Project

Phase one of the Taipei Railway Underground Project began on July 12, 1983, with the “Taipei Main Station Underground Project.” Work was completed and the station re-opened for service on September 1, 1989.

The project created Taiwan’s first underground train station, which involved the undergrounding of 4.4 kilometers of track between Huashan and Wanhua; the Banqiao Coach Yard was repurposed as a marshalling yard for Eastern Trunk Line trains; and the Nangang Freight Station was constructed to replace the Huashan Coach Yard.

Integration of the MRT and railway networks at Taipei Main Station laid the foundation for development of Taipei’s MRT system. It linked Chongqing north and south roads with Gongyuan Road and significantly improved transportation movement in western Taipei. The branch line between the Huashan Coach Yard and the Taipei Winery was eliminated and the reclaimed land was revitalized with the construction of the "Huashan Creative Park," providing a new base for the promotion of Taiwan’s cultural and creative industries.



1	2	3
4		

1. Traffic congestion at the Zhonghua Road grade crossing before the underground railway project
2. Traffic at a grade crossing near Taipei’s North Gate before the underground railway project
3. Traffic on Zhonghua Road before the underground railway project
4. The old Taipei Main Station just before demolition



南港
板橋
桃園
基隆
台北
新竹
嘉義
高雄
屏東
台東
花蓮
澎湖
金門
馬祖





1	4	7	8
2	5		9
3	6		10

1. Traffic on Zhonghua Road before the underground railway project
2. Congestion on Zhonghua Road before the underground railway project
3. Zhonghua Road was a traffic bottleneck before the undergrounding work.
4. Traffic at a grade crossing before the underground railway project
5. Traffic congestion before the undergrounding work
6. Grade crossings posed danger for vehicles before the underground railway project.
7. Trains pass the east side of Taipei Main Station before the undergrounding work.
8. Taipei Main Station was moved to a temporary facility during the undergrounding work.
9. The old Nangang Station and freight marshalling yard
10. Construction on the west side of Taipei Main Station





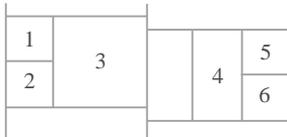
1	2	4	5
			6
	3	7	8
			9

1. Construction of the underground Taipei Main Station
2. Bird's-eye view of the work at Taipei Main Station (east side)
3. The upper beam of a roof skylight at Taipei Main Station
4. Work on an exterior wall of Taipei Main Station
5. Installation of roof panels at Taipei Main Station
6. Bird's-eye view of roof construction at Taipei Main Station
7. Bird's-eye view of the completed roof of Taipei Main Station
8. Inauguration of train service at the underground Taipei Main Station
9. Bird's-eye view of the completed roof of Taipei Main Station

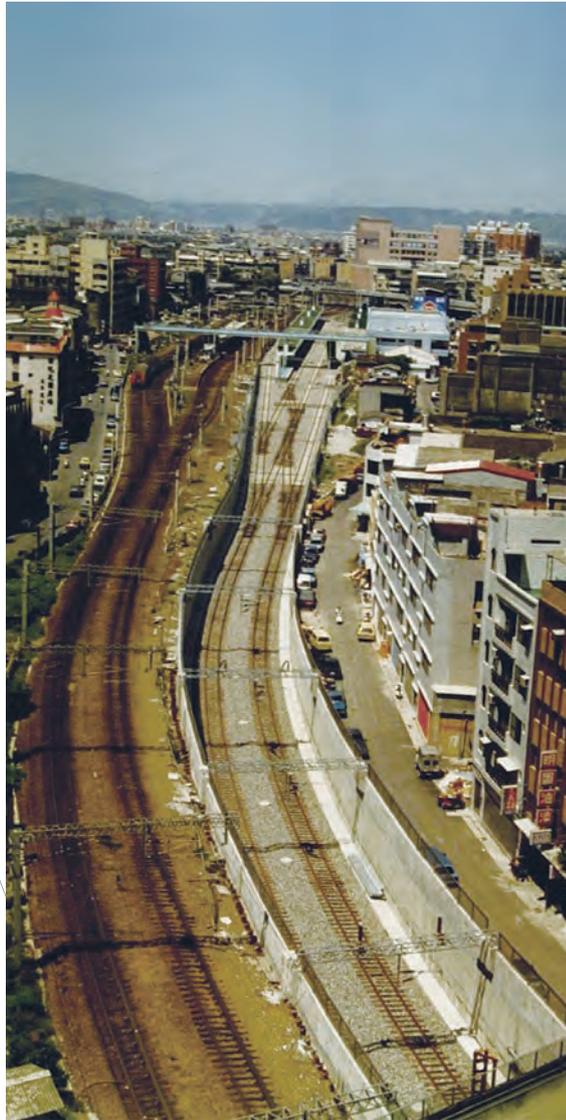








1. The wooden rear building of Taipei Main Station before the undergrounding work
2. The tracks and catenary system for the ground station before dismantling, after the underground station opened
3. Wanhua South Ramp
4. The old Wanhua Station is readied for demolition after the completion of the first-phase underground station.
5. A section of the underground tunnel
6. First phase construction of the train platform and tracks beneath Chengdu Road in Taipei

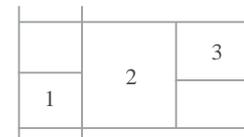
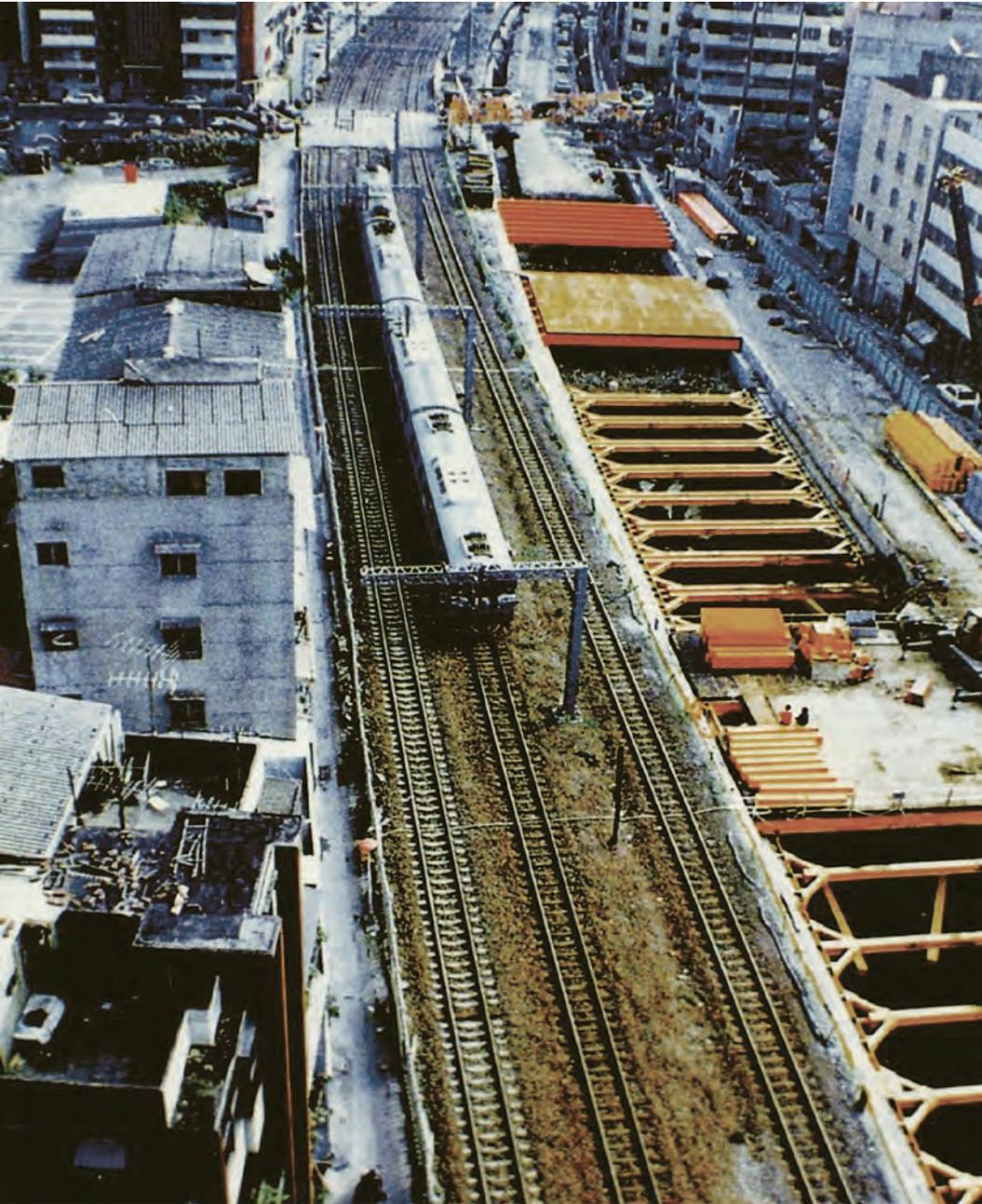


松山專案

Taipei Railway Underground Project Songshan Extension Project (Songshan Project)

Upon completion of the undergrounding work at Taipei Main Station, the Railway Underground Project continued with the Phase 2 "Songshan Project." This phase involved extension of the underground railway eastward to Songshan, covering 5.3 kilometers of track from Huashan Station east to the grade crossing at Hulin Street in Songshan. Work began on October 20, 1989, the south tunnel was completed on August 3, 1992, and the north tunnel opened on June 18, 1994. Using advanced engineering techniques, an elevated viaduct expressway was built above the underground tunnels to maximize use of space. The first east-west expressway in Taipei, this elevated viaduct was named Civic Boulevard. It opened to traffic on September 7, 1997, and has greatly relieved east-west traffic congestion in the city.





1. A sectional drawing of the functions of the Songshan Project tunnel
2. A cut-and-cover method was used for railway undergrounding during the Songshan Project.
3. An interior view of the completed tunnel of the Songshan Project





1	2	4
	3	

1. Completion of the rail-laying in the underground tunnel
2. The completed main structure of the underground tunnel
3. The completed main structure of the underground tunnel
4. Fuxing Emergency Platform (Songshan Project)
5. The tunnel and elevated Civic Boulevard Expressway were jointly constructed during the Songshan Project.
6. Completion of the Songshan Project tunnel



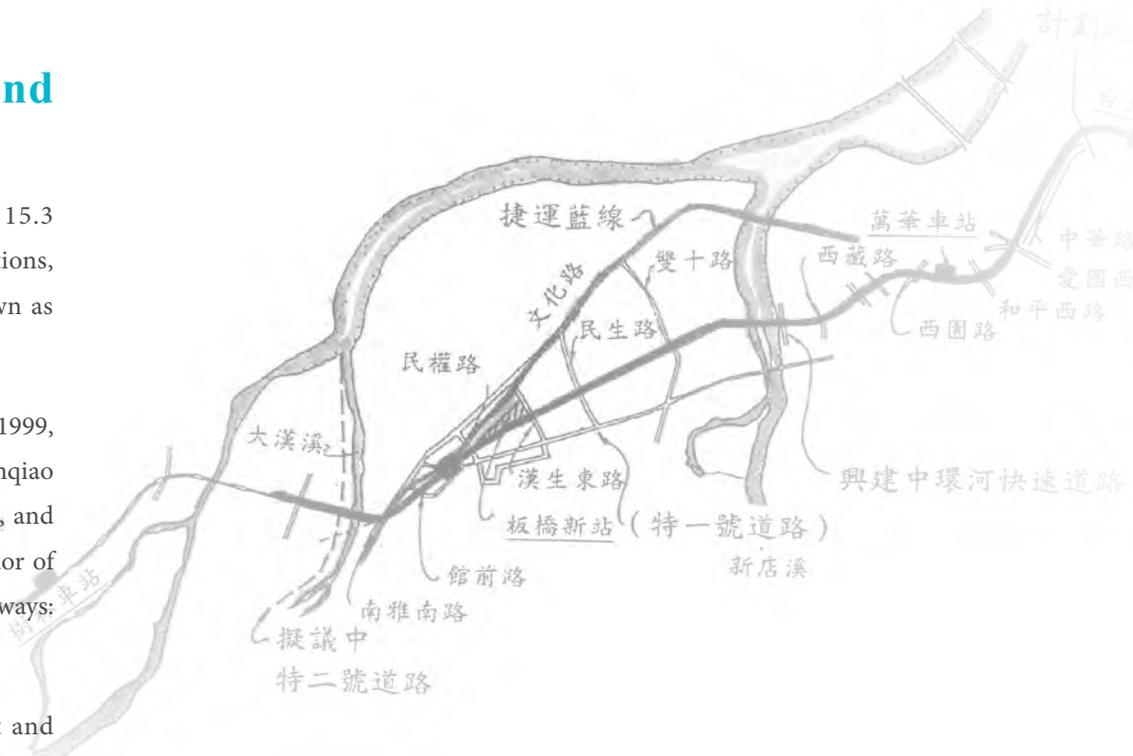
萬板專案

Wanhua-Banqiao Railway Underground Project (Wanhua-Banqiao Project)

In September 1992, the Executive Yuan approved the project of 15.3 kilometers of underground railway between Wanhua and Banqiao stations, it is the third phase of the Taipei Railway Underground Project, known as "Wanhua-Banqiao Project."

The north and south tunnels of the project were completed on July 21, 1999, and October 31, 2002, respectively. Construction of Wanhua Station, Banqiao Station, Xindian River subfluvial tunnel, Huacui Bridge, Shulin Station, and new Shulin Marshalling Yard was completed simultaneously. The corridor of space reclaimed from the original railway was converted into two expressways: Mengjia Boulevard and Xianmin Boulevard.

The Wanhua-Banqiao Project improved access to Wanhua District and alleviated congestion on Banqiao's Wenhua Road. Integration of the railway, MRT, High Speed Rail, and short-, medium- and long-range passenger bus services at the Banqiao Station, along with the inauguration of the New Taipei City Hall underpinned the creation of the New Banqiao Special District. As the center of transportation, commerce and culture in New Taipei City, the zone has revitalized the area and promoted the transformation and growth of the city.



1	3
2	

1. Bird's-eye view of work on the Xindian River cross-river tunnel (the railway now runs across a new concrete bridge)
2. Work on the Wanhua Station underpass
3. The original ground-level Wanhua Station







1	3	4	6	7	8
2		5	9	10	11

1. Construction of the cofferdam for the tunnel under the Xindian River
2. The original railway bridge over the Xindian River
3. Construction of the steel structure for Banqiao Station
4. Construction of a curtain wall at Banqiao Station
5. Beam-laying ceremony for the Banqiao Station building
6. The old Shulin Station
7. The new Shulin Station
8. Entrance to the new Shulin Station
9. Site preparation for construction of Shulin Coach Yard
10. Ground beam laying at Shulin Coach Yard
11. Shulin Marshalling Yard



南港專案

Taipei Urban District Underground Railway Nangang Extension Project (Nangang Project)

The "Nangang Project" was approved by the Executive Yuan in November 1998. It involved undergrounding the last section of grade-level railway in eastern Taipei, extending the subterranean route east from the Keelung Street intersection in Taipei to Qidu District in Keelung. In addition to the 19.5-kilometer line, the project included construction of the new Qidu Marshalling Yard. Completed on August 3, 2005, the yard was the first of its kind in Southeast Asia. Taiwan's first metropolitan elevated railway stations, Xizhi and Wudu, opened on April 9, 2006; the new Qidu Station became the starting point of downward trains since January 21, 2007; and the Nangang and Songshan underground stations began operations on September 21, 2008. On October 23, 2011, the east-west expressway Civic Boulevard reopened above the tunnel corridor, promoting reutilization of land along the line and stimulating city development and renewal.

The underground Songshan Station links Songshan Road with Zhongpo North Road and has become a new gateway for tourism and recreation in east-Taipei. The three-in-one Nangang Station, bringing together the TRA, HSR and MRT rail systems, is both the nation's largest railway station and a terminal station on the HSR line. It also sets the stage for a bright future in east Taipei.

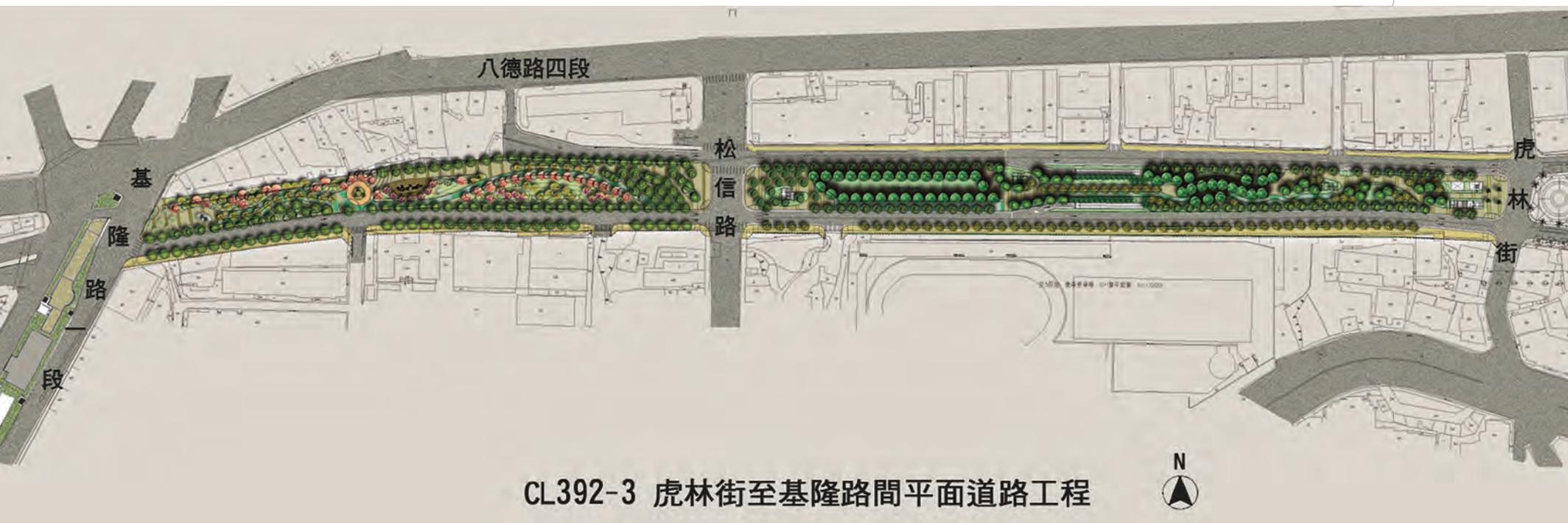




1	2	3	
		4	5

1. Congestion at a grade crossing on Taipei City's Xiangyang Road before the railway undergrounding
2. The old Nangang Coach Yard
3. The old Nangang Coach Yard
4. Undergrounding work for the Nangang Project was complicated by the need to maintain the original line in operation.
5. Elevation work during the Nangang Project also proceeded in tandem with ongoing line operations.





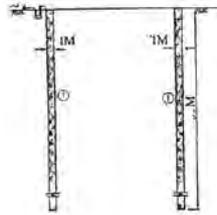
CL392-3 虎林街至基隆路間平面道路工程

1	2
1	2

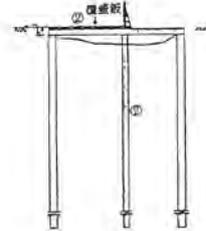
1. Nangang at-grade road layout (rail line corridor plan)
2. Completion of the at-grade arterial under the Nangang Project (originally a rail line corridor)



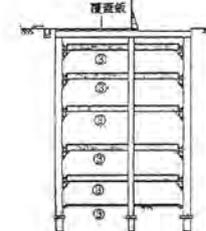




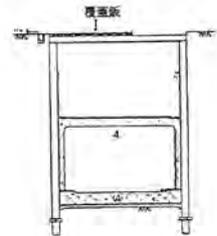
Step 1:
Diaphragm wall construction



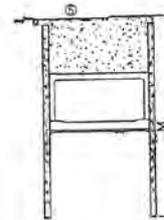
Step 2:
Intermediate column and cover plate construction



Step 3:
Stratified excavation and support placement



Step 4:
Construction of main structure

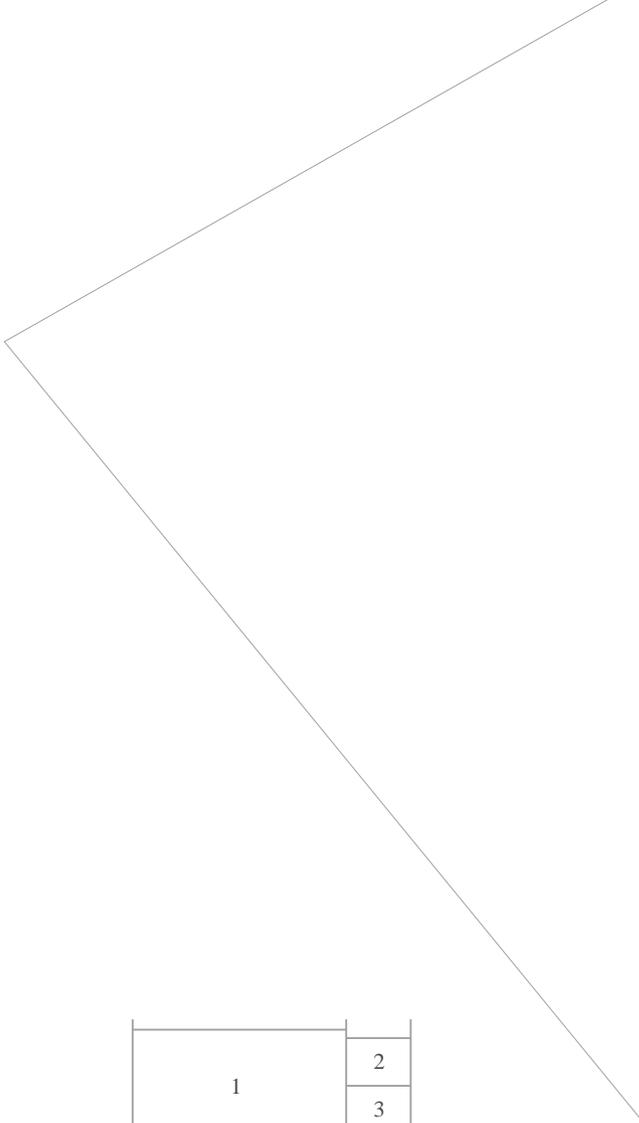


Step 5:
Backfill and restoration

1	3	4
2		

1. Diaphragm wall construction: Excavation
2. Diaphragm wall construction: Crane placement of the reinforcement cages
3. Work on the underground Nangang Station
4. Cut and cover tunnel construction sequencing





- 1. Bird's-eye view of work on Nangang Station
- 2. Work on Nangang Station
- 3. Construction work during operation of the temporary Nangang Station



七堵調車場

Qidu Marshalling Yard (Northern Base of the Taiwan Railway System)

A railway marshalling (classification) yard is a space for organizing freight trains and dispatching passenger trains. It is the heart of a rail system and plays a crucial role in railway transportation.

The Shulin Marshalling Yard was constructed in conjunction with the undergrounding of Banqiao Station during the Wanhua-Banqiao Project. It began operations in 1997 and replaced the Banqiao Marshalling Yard as the organizational base for Eastern Line trains bound for Suao, Hualien, and Taitung. When it opened in 1972, the Qidu Marshalling Yard was the first such facility in Taiwan and the first flat-shunted marshalling yard in Southeast Asia. It also served as an important marshalling point for northbound freight trains. The yard was rebuilt during the Nangang Project and reopened in 2005 as a marshalling yard for passenger trains. It also replaced the Nangang Marshalling Yard as the organizational base for the express trains on the Western Line.





1	4	5
2		6
3		7

1. Track work at the old Qidu Marshalling Yard
2. The old Qidu Marshalling Yard (Taiwan's only hump shunting yard)
3. The operation control center at the old Qidu Marshalling Yard (the center is functionally similar to an airport control tower)
4. Bird's-eye view of Qidu Marshalling Yard (Photo provided by Chen Ming)
5. The new Qidu Marshalling Yard
6. New automated train washing facilities at Qidu Marshalling Yard
7. The central control traffic control (CTC) system at Qidu Marshalling Yard

鐵路工程技術

Innovations in Railway Engineering Techniques

The Taipei Railway Underground Project set a precedent in Taiwan's railway engineering world. Due to the urban location and extensive length of the project, a cut-and-cover method was the main method for constructing the underground tunnels. Underpinning techniques were needed to maintain the functionality and safety of some existing structures.

Technical advances made during the project have had a ripple effect on development of domestic industries. Many pioneering materials and techniques were used during the construction. For example, self-compacting concrete was used in the construction of Nangang Station. When poured, the concrete completely fills in the spaces among the steel reinforcement bars and formwork without vibrating or tamping. Aside from the environmental benefits of greatly decreasing the amount of cement used, the material substantially improves structural durability. Another innovation was use of an elastic, non-ballasted sleeper direct-coupling tracks. Apart from reducing maintenance costs, this track system is earthquake resistant and offers increased travel stability and comfort.

In addition, the underground ventilation system underwent full-scale hot smoke testing to thoroughly verify the functionality of the system in emergencies and ensure operational safety. The techniques used in this process are on the cutting edge internationally.

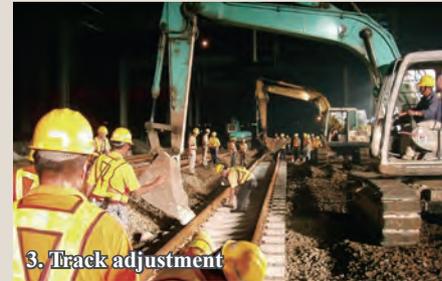




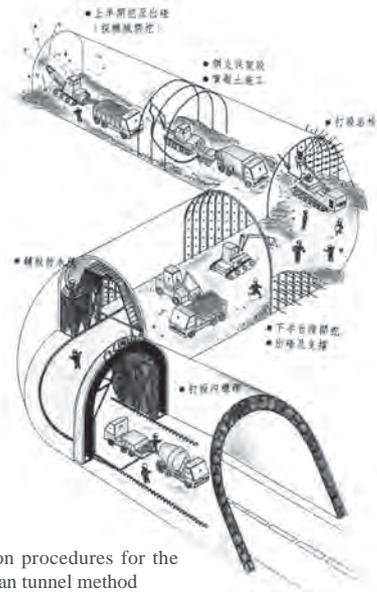
1	5	9
2	6	
3	7	10
4	8	

1. Slump flow testing (1)
2. Steel bar gap passes U-shaped trough testing
3. Slump flow testing (2)
4. Production of test specimens
5. Steel bar tying along the trackbed
6. Track sleeper laying
7. Laying of the Non-ballasted PC sleepers and installation and adjustment of the vertical and horizontal supports for the track skeleton
8. Track skeleton and mold forming along the non-ballasted track section
9. The completed non-ballasted track with sound-dampening stone
10. A track measuring car checks the track alignment.

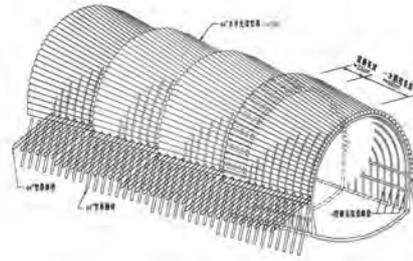
Track Switchover



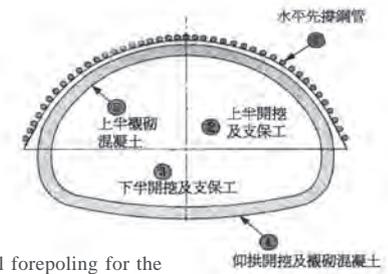
Mountain Tunnel Construction



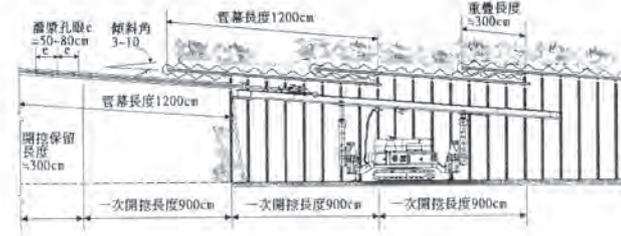
Construction procedures for the New Austrian tunnel method



3-D rendering of the tunnel steel pipe-roof method



Horizontal forepoling for the steel pipe-roof tunnel method



Steps in the pipe-roof tunneling work



1. Preparing to bore



2. Excavating



3. Mucking



4. Erecting the steel tunnel supports



5. Installing the rock bolts



6. Laying the waterproofing membrane



7. Forming rebar for the interior tunnel lining



8. Forming steel molds for the interior tunnel lining



9. Breakthrough ceremony





Sentiments of the Past

Cultural Reflections in an Evolving Railway

Train after train whistles past, powering across the mountains and rivers. To big cities and small towns alike, they carry passengers, goods, and the memories of years past.

Rail was once the dominant mode of transportation in Taiwan, a fact owing to their ability to transport huge volumes of freight and provide a stable and comfortable journey. The Taiwan Railway Administration (TRA) rail system consists of main trunk lines for passenger transport and an intricate network of branch lines that were once used to exploit natural resources in the forestry, sugar, salt and mining industries. These lines served as the arteries driving the rise of Taiwan's economy in earlier times.

Today, railways compete with other modes of transportation in Taiwan. Yet they are an irreplaceable and precious part of the memory, shared by many on the island, of leaving home to work and study in the city. The stations, trains, and facilities, the villages and industries that sprang up because of the railway, and even the delicious railway boxed lunches, are all part of Taiwan's railway heritage and sources of endless fond memories.

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華山創意文化園區

Evolution of Huashan Creative Park

Huashan is located in Taipei's Zhongzheng District. During the Japanese colonial period it was called Kabayamach. The Huashan Railway Station was established during that time as part of the Western Line. After Taiwan's retrocession, the station was renamed as Huashan Freight Station and remained in service until its decommissioning during the Railway Underground Project.

Huashan Station is located by the historic Taipei Winery, founded in 1914. A branch line once linked the winery to Huashan Station. After the railway was relocated underground, the reclaimed land was revitalized and transformed into Huashan Culture Park. This space brings together a green park space with design workshops and a creative product exhibition center, providing the art world and cultural-creative industries with an excellent platform for exchanges and displays. The space also served as one of the venues in the 2011 Taipei World Design Expo.



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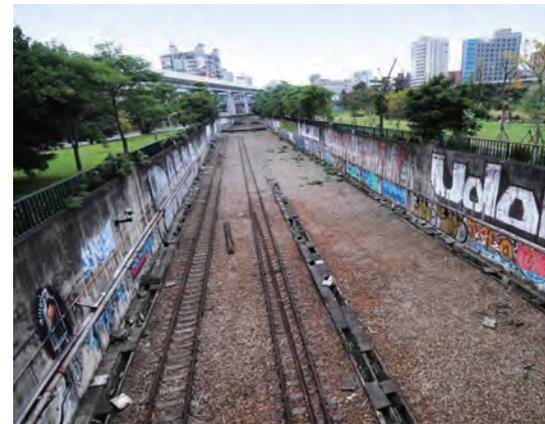
1. Huashan in earlier years

2. Crawling vines are a distinguishing feature of the TRA Taipei Freight Depot today.

3. The renovated Taipei Winery of the Taiwan Governor-General's Office

4. The repurposed old space brims with a nostalgic air.

5. The old rail line



國父史蹟紀念館

Relocation of the Dr. Sun Yat-sen Memorial Hall (Yixian Park)

The Dr. Sun Yat-sen Memorial Hall occupies a rectangular building in Yixian Park, near Taipei Main Station. Constructed as an inn in 1900, the building is also known as the “Plum House” due to the plum trees planted here. During a stay at the inn 1913, Sun Yat-sen created a work of calligraphy reading, “Universal Love,” and presented it to the inn owner as a keepsake.

After World War II, the Plum House was renamed as Dr. Sun Yat-sen Memorial Hall. Its original Japanese-style grounds were re-landscaped in a southern Chinese garden style. The facility, now open to the public, displays rare historical materials and works of calligraphy made by Sun Yat-sen during his three trips to Taiwan.

In 1983, Dr. Sun Yat-sen Memorial Hall was relocated 50 meters to the north to accommodate the Taipei Main Station underground project. The building was faithfully rebuilt to its original form and reopened to the public in 1987.

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1. Dr. Sun Yat-sen Memorial Hall
2. The house is located in Taipei’s bustling commercial district.
3. The house was originally a Japanese-style inn called “Ume-yashiki” (Plum Mansion)
4. An aerial view of the Dr. Sun Yat-sen Memorial Hall





水返腳崛起

Arise of Shuifanjiao (Xizhi)

When Taiwan entered the railway age in 1891, Xizhi, now a district of New Taipei, was one of the stations on the Keelung-Taipei Line.

Xizhi was originally known as Shuifanjiao (literally, “the foot of returning water”) since the tides of the Keelung River would ebb after reaching the area. This area occupied a key position in the transportation network between Keelung and Taipei. It was also an important distribution center for tea and coal produced in the nearby mountains, as well as for the import of daily necessities.

Work on the elevated Xizhi Station commenced on July 17, 2003, as part of the Nangang Project. During excavation for the pier foundations at the Xizhi Station tunnel, long, neat rows of foundation stones were discovered. Scholars and experts confirmed that the stones formed the historical foundation of the railway bridge constructed during the administration of Liu Ming-chuan in the Qing period. A section of the foundation was transported to Xiufeng Junior High School in Xizhi for preservation and the remainder was protected by backfilling the original excavation. On June 15, 2004, the ruins were designated as the “Xizhi Jiadongjiao Taiwan Railway Historical Site,” adding another chapter to the dialogue between railway construction and the historical sites of Taiwan.

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1. Xizhi is frequently hit by typhoon-related flooding (Typhoon Nari)
2. Aerial view of work on the Xizhi Viaduct
3. Remains of a railway bridge foundation built during Liu Ming-chuan’s administration
4. Cataloging the historic site
5. Relocating the historic site





公共藝術

Public Art

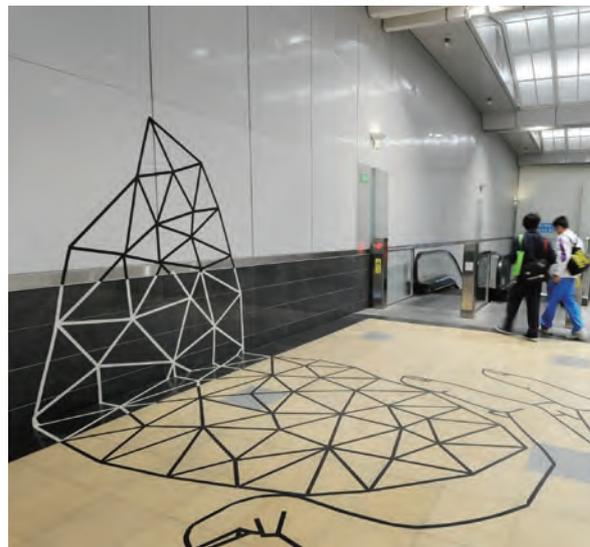
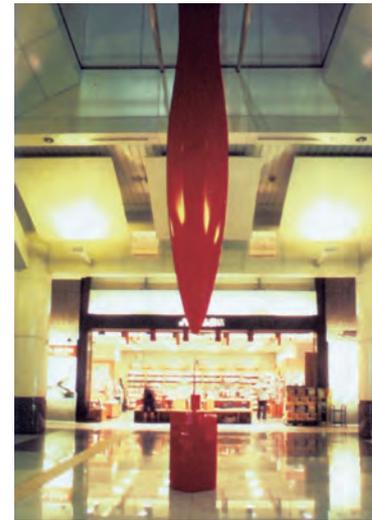
The Railway Underground Project defined a 28-year journey that transformed the face of Taipei in lasting ways.

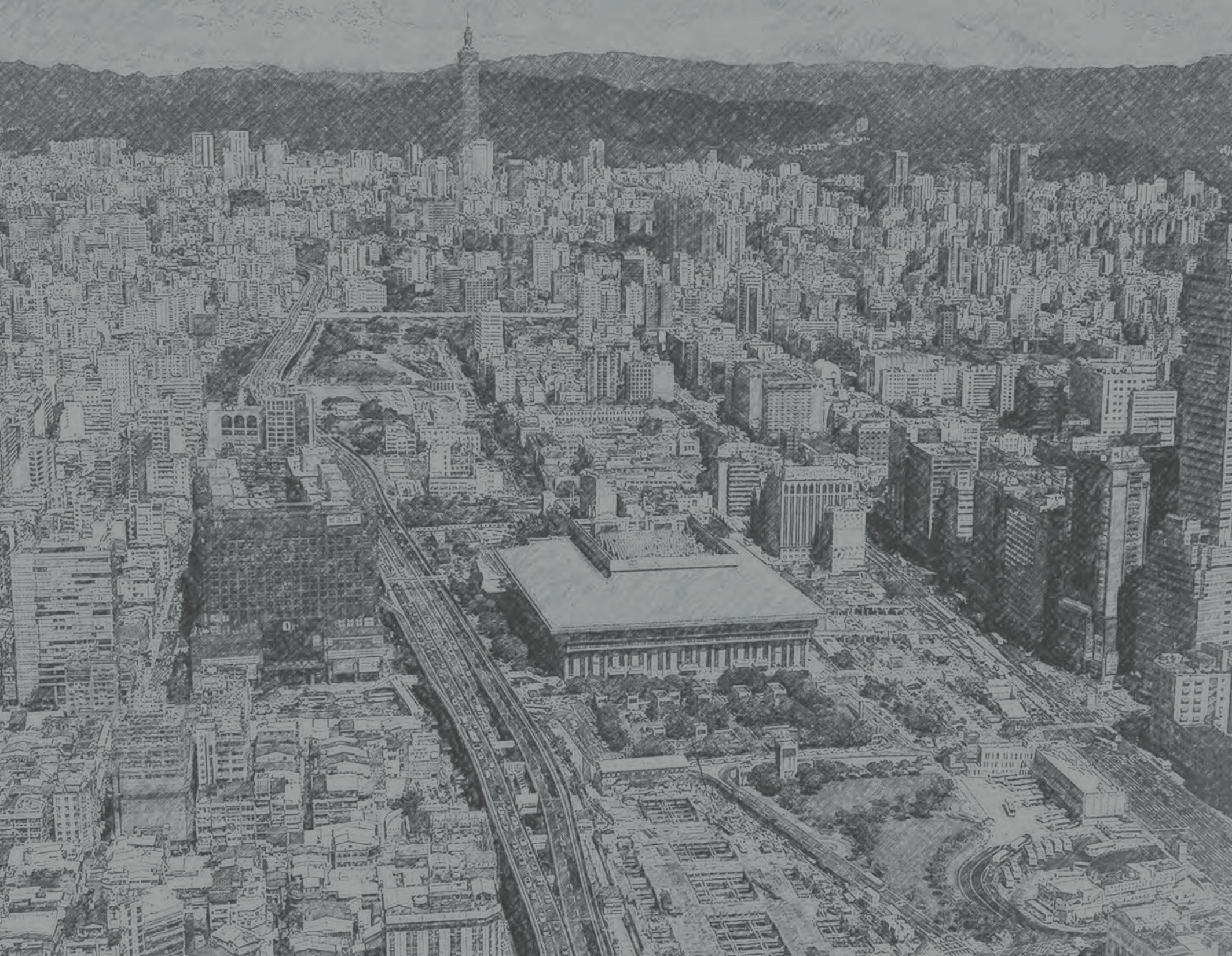
The stations created during the project today serve as venues for public art, presenting an arresting visual feast and bringing art close to daily life. Convenient transportation has stimulated industrial and commercial prosperity and added substantially to public service functions, revitalizing Taipei and enhancing the happiness of its residents.



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1. Public art at Qidu Station
2. Public art at Wanhua Station: Dancing Sun Gate
3. Public art at Wanhua Station: Festival
4. Public art at Songshan Station
5. Public art at Banqiao Station: Eight Elements
Passing Through Time and Space
6. Public art at Banqiao Station: Tracks of Time
7. Public art in front of Nangang Station
8. Public art in Nangang Station







Powering Forward

Undergrounding Tracks to Create a Better Life

Railways have symbolized the advance of civilization since the Industrial Revolution in the eighteenth-century. Steam engines not only powered trains rapidly forward, but also broadened humanity's vision and dreams.

Railways also redefined our sense of space, shortening the temporal distance between cities and the countryside and setting the stage for rapid industrial development. But as the cities swelled with people and transportation developed, the coexistence of roads and rail created traffic bottlenecks and hampered urban growth.

This was especially true in Taiwan's capital city of Taipei. Railway grade crossings caused traffic problems and accidents. They also severed districts, hindering more comprehensive city planning and development. Undergrounding the city's rail lines was clearly the best way forward for both mass transportation and city planning.

優
勢

經濟效益

Economic Benefits

In order to eliminate the impact of railroad crossings on urban transportation and development, the government implemented an improvement project based on “grade separation” development. The undergrounding of the railway system in the Taipei metro area was the first step in this direction: one that would set a high benchmark of success.

In addition to creating a more barrier-free city, railway undergrounding has freed up land along rail corridors for new uses. It also has promoted balanced urban development, increased land values along the rail line, and contributed to tax revenues.

The underground railway project has also elevated the level of construction technology in Taiwan and spurred development of related industries, creating jobs and lifting Taiwan’s GNP.



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1. The perspective of Nangang Station BOT
2. Bird’s-eye view of Banqiao Station
3. Traffic by Taipei Main Station after the undergrounding work



生活便捷

Convenience of Life

The most noticeable difference of underground railway is the absence of surface crossings. This translates into an improved urban landscape, increased public safety, and better quality of life in the city. As previously severed roads are reconnected, and tunnels and freeways built, railways and highways have become more vertically integrated, creating a more expansive and convenient urban transportation network. At the heart of this development are the city's train stations, which have emerged as new urban landmarks combining commerce, culture, and tourism.

With the completion of underground railway, centrally-located stations have been reconfigured to jointly serve as stations for the Taiwan High Speed Rail (HSR), Mass Rapid Transit (MRT), and other public transportation systems, enabling more comprehensive planning of movement routes and increasing the convenience of intra-city and inter-city travel.



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1. Stores and restaurants abound at Taipei Main Station.
2. Ticket counter at the lobby of Taipei Main Station
3. Pedestrian traffic bustles outside Taipei Main Station.
4. Banqiao Station offers the convenience of seamless integration.
5. Banqiao Station and New Taipei City Hall Square are alive with night activity.
6. A Christmas Tree in the front plaza of Banqiao Station





Changing Faces

Stations on the Tracks of Time

Taiwan's railway system dates back to the Qing dynasty. Construction reached a new height during the Japanese colonial period, spurred on by the commercial development of goods and resources island-wide. Further development came after Taiwan's retrocession in 1949. The government improved rail facilities, widened the narrow-gauge tracks, and electrified rail lines to create a convenient island-wide rail system. More recently, the rail system is moving forward again with the development of underground railways and MRT systems.

The evolution of the railway system in Taiwan can be seen in the different types of trains used over the years. But the passage of time is perhaps best captured in the railway stations.

Through the years, stations have been constructed of wood, brick, cement and steel, and today's more advanced materials. They have been built in styles ranging from Baroque elegance to Gothic, Renaissance, and modern Chinese. The only thing that has remained the same has been their dedication to service and reliability, as well as the sense of nostalgia they impart.



臺北車站

Taipei Main Station

Taipei Main Station occupies the center of Taiwan's bustling capital and is the largest-capacity railway station in the country. Standing six stories above-ground and four below, it is home to Taiwan Railway, HSR, and MRT stations. An MRT line to Taoyuan International Airport is also in the works.

The first incarnation of Taipei Main Station dates back 1891. The facility at that time was known as Dadaocheng Station and it was built with a western canopy-style design. The station was used until 1901 and dismantled in 1908.

The second version of the station opened on August 25, 1901, and was relocated in 1908. In 1923, a rear station building was added as a terminus for the Danshui Line. This portion of the station fell into disuse with the decommissioning of the Danshui Line in 1988.

The third generation of Taipei Main Station was constructed in 1941. This new facility was flanked by the city's long-haul bus terminals, making it the main transportation hub in the greater Taipei area. In conjunction with the Taipei Railway Underground Project, this station was dismantled on February 24, 1986, and a temporary underground station was established—the fourth incarnation.

The fifth Taipei Main Station was built during the underground railway project. It commenced operation on September 5, 1989, making it the first underground train station in Taiwan.

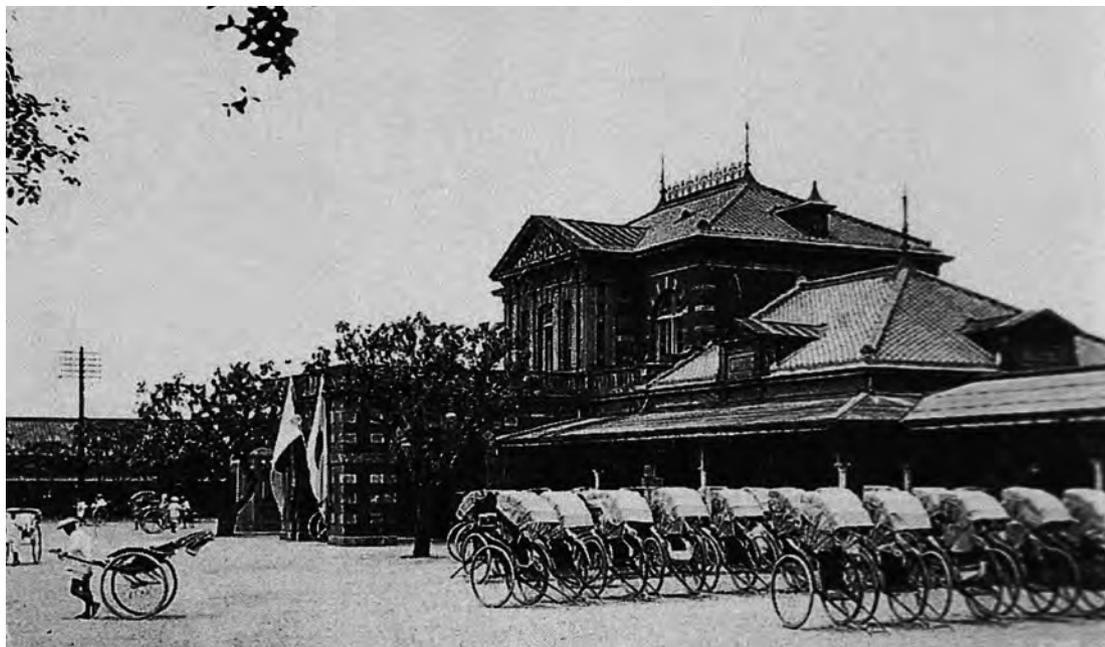


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- 1. The Qing era Taipei Railway Ticket Office
- 2. Taipei Main Station during the Japanese colonial period
- 3. Taipei Main Station during the Japanese colonial period

- 4. Rickshaws in front of Taipei Main Station during the Japanese colonial period
- 5. The overpass at Taipei Main Station during the Japanese colonial period

- 6. Taipei Main Station during the Japanese colonial period
- 7. A bronze stature of Japanese engineer Hasegawa Kinsuke in front of Taipei Main Station during the Japanese colonial period (Photos provided by the Railway Cultural Society, Taiwan)





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1. The old Taipei Main Station just before demolition
2. Taipei Main Station bustling with holiday travelers in earlier times.
3. An automated ticketing system at Taipei Main Station in earlier times
4. Passengers thronged Taipei Main Station in former days.
5. Bird's-eye view of the old Taipei Main Station
6. A fan-shaped train depot occupied the east side of Taipei Main Station before the undergrounding project.
7. Travelers on the platform at Taipei Main Station.
8. A bird's-eye view of Taipei Main Station after the underground railway project (Photo provided by the Bureau of High Speed Rail)



萬華車站

Wanhua Station

Formerly known as “Bangka,” Taipei’s Wanhua District was the commercial center for Chinese merchants arriving in Danshui Harbor during the Qing dynasty.

The “Bangka Parking Station” opened on August 25, 1901, to meet the commercial needs of the area. In 1918, the station was moved to its current location and rebuilt with a wooden station house in an East-West fusion style. Renamed as “Wanhua Station” in 1920, it served as the terminal station of the Xindian Line between Wanhua and Gongguan from 1921 to 1965.

As part of the Wanhua Project, the front and rear sections of Wanhua Station were reconstructed in 1988 and 1991, respectively. The Wanhua-Banqiao Project was launched in 1992, linking Wanda Road and Kangding Road. The modern version of Wanhua Station known today opened on July 21, 1999.

Today, Wanhua Station’s east and west buildings sit on either side of Kanding Road. The buildings have two aboveground stories and two underground levels. The basement levels are slated to be redeveloped as the foundations for a 20-story mixed commercial-office-use building that is expected to spur new development in this historic district.



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1. The old Wanhua Station
2. The area near Wanhua Station in earlier times
3. The ground-level Wanhua Station during phase one of the underground railway project
4. The ground-level station building after the undergrounding of Wanhua Station



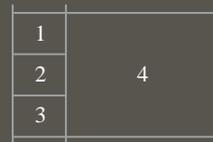
板橋車站

Banqiao Station

Banqiao Station was built in 1901 as “Fangqiao Station” and gained its current name in 1920. Its second incarnation was a wooden building constructed in 1922. The station was rebuilt in brick in April 1951 and further expanded in 1986.

In conjunction with the Wanhua-Banqiao Railway Underground Project, construction on the new underground station and station building commenced in 1995 at the site of the former Banqiao Coach Yard and Banqiao Distillery. A temporary station was put into use from 1996 to the completion of the third-generation station on July 21, 1999.

Today, Banqiao Station towers 25 stories above ground and five below, making it the tallest train station in the country. The facility serves the Taiwan Railway, HSR, and the MRT Banqiao and Circular lines. It sits adjacent to the New Taipei City Hall at the center of the city's transportation, commercial, cultural, and administrative functions, making it a stunning example of the success of New Banqiao Special District.



1. The old Banqiao Station
2. The construction site for Banqiao Station
3. Banqiao Station
4. Diagram of the five lines served by the station





松山車站

Songshan Station

The history of Songshan Station dates back to the first years of the Taiwan railway system. It began life in 1887 as a simple ticket booth. The facility was renamed as Songshan Station in 1920 and the station building was rebuilt in wood in 1940.

With the exception of shipments for Taiwan Cement Corp. (TCC), the station stopped serving cargo traffic in 1985. The following year, a new station building was erected. In 1987, the station became a terminal for southbound passenger service on the TRA's Main Line to meet rapidly growing demand. All cargo services at the station ceased in 1991, after which time TCC moved its bulk concrete operations to Nangang. On July 28, 2003, the overpass-style station was demolished and a temporary station was built in its place. The current station sits two stories above and below ground and will be expanded into a 15-story building. With tracks underground, the station no longer obstructs traffic. It also links the Taiwan Railway Main Line and Taipei MRT Songshan Line. The station serves an additional function as a new portal for the tourism attractions in east Taipei, including the Songshan commercial area joining Raohe Street Night Market, Wufenpu Garment Wholesale Area, and Ciyou Temple.

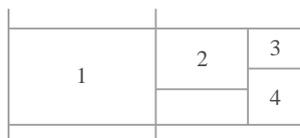
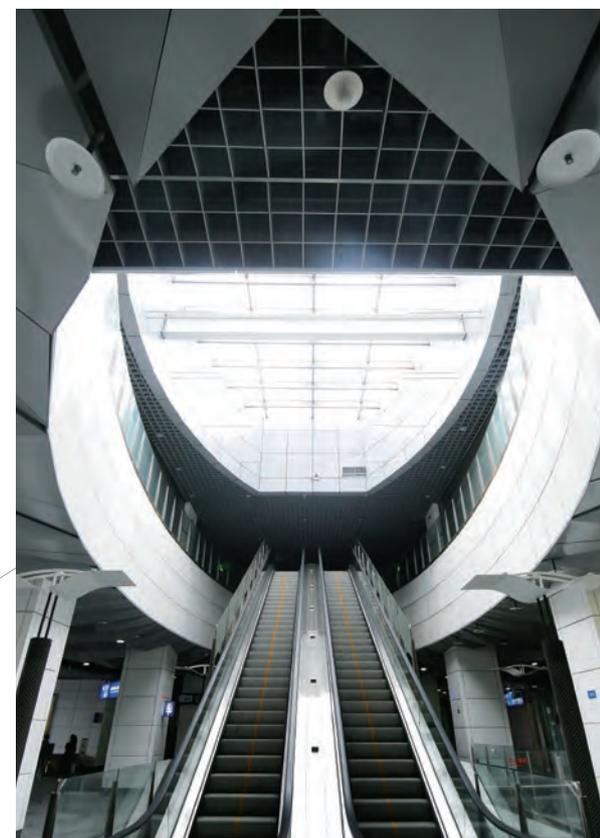
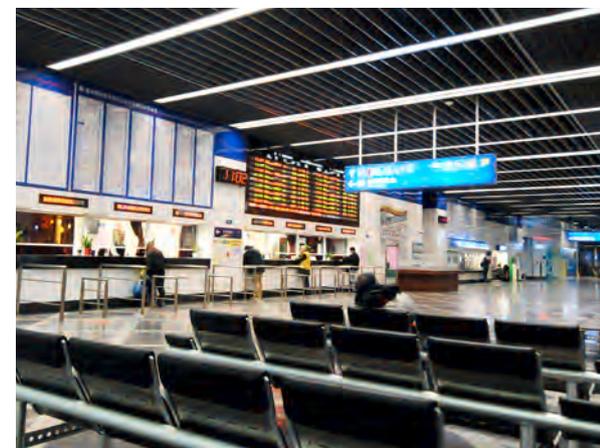


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1. Old Songshan Station
2. Bird's-eye view of the temporary Songshan Station
3. Songshan Station







1. Passengers wait at the underground platform of Songshan Station
2. A taxi line outside Songshan Station
3. A ticketing area at Songshan Station
4. Modern escalators at Songshan Station

南港車站

Nangang Station

Nangang once marked the eastern border of Taipei City. A simple station was built here in 1899. In 1905, it was reconstructed in wood in Japanese style.

In 1966, Nangang Station was expanded with the addition of a coal and gravel storage yard and branch lines linking to fertilizer and flour mills. In 1986, the station was rebuilt with a reinforced concrete structure. It also absorbed operations from the shuttered Huashan Station that year, making Nangang a major cargo hub for the greater Taipei area.

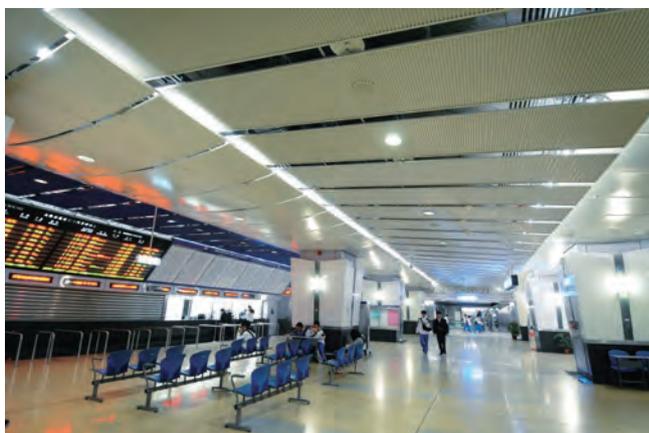
As part of Nangang Project, Nangang Station ceased all cargo operations in 2001. The following year, the station was moved to a temporary facility, which remained in use until the new underground station opened on September 21, 2008.

Following the completion of the Nangang Project, a 25-story building will be erected at Nangang Station on a build-operate-transfer (BOT) basis. The new facility will serve as a hub for short, medium, and long distance transportation as well as link to shopping malls and the Nangang Economic and Trade Park, positioning it to rise as a second city center and landmark.



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1. Old Nangang Station
2. Nangang Station before the railway undergrounding
3. Nangang Station
4. Ticketing area at Nangang Station
5. Nangang Station (serving both the Taiwan Railway and Taiwan High Speed Rail systems)
6. Concept drawing of the BOT shopping area at Nangang Station







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1. A future mall at the east entrance of Nangang Station
2. Nangang Station's modern look
3. Nangang Station Entrance at night
4. Taipei MRT rail corridor to Nangang Station
5. Ceremony for the completion of the Nangang Project and opening of Civic Boulevard



1979.07.19 The 1640th meeting of the Executive Yuan passes a resolution to "relocate a double-track section of the Taiwan Railway Main Line underground according to the 'Tunnel Extension Project' formulated by the Ministry of Transportation and Communications (MOTC)."

1979.10.16 The Preparatory Office of the Taipei Railway Underground Project is established. The Director General of the Taiwan Railway Administration under the Taiwan Provincial Government concurrently serves as the office director.

1983.07.01 The MOTC establishes the Taipei Railway Underground Project Office (TRUPO) and appoints Tung Ping as its first director.

1983.07.12 The Taipei Railway Underground Project groundbreaking ceremony is held.

1985.09.02 Premier Yu Kuo-hwa inspects work on Taipei Main Station.

1985.12.17 The opening ceremony for the temporary Taipei Main Station is held.

1986.08.28 The temporary Nangang Station and temporary Wanhua Station open.

1987.01.20 Minister of Transportation and Communications Lien Chan inspects work at Taipei Main Station.

1987.03.09 A ceremony is held to inaugurate the Dr. Sun Yat-sen Memorial Hall and Yixian Park.

1987.07.20 Premier Yu Kuo-hwa inspects work on the east and west tunnels of the new Taipei Main Station, accompanied by Council for Economic Planning and Development Minister Chao Yao-tung, Minister of Transportation and Communications Lien Chan Kuo Nan-hung, and Taipei Mayor Hsu Shui-teh.



- 1988.06.25 A track laid completion ceremony for the main tunnel of the Taipei Railway Underground Project is held.
- 1988.06.30 The Executive Yuan approves the "Taipei Railway Underground Project Songshan Extension" (Songshan Project).
- 1988.11.11 Senior Advisor to the President Sun Yun-suan visits TRUPO to inspect the work site.
- 1988.12.23 President Lee Teng-hui inspects work on the new Taipei Main Station and Songshan Project.
- 1989.09.01 [An inauguration ceremony is held for the main tunnel and Taipei Main Station under Taipei Railway Underground Project.](#)
- 1989.10.20 A groundbreaking ceremony is held for the Songshan Project.
- 1990.11.13 Minister of Transportation and Communications Clement C.P. Chang inspects work on the Songshan Project.

- 1992.05.19 President Lee Teng-hui inspects work on the Songshan Project.
- 1992.08.03 An opening ceremony is held for the phase one south tunnel work during the Songshan Project
- 1992.09.14 The Executive Yuan approves the "Wanhua-Banqiao Railway Underground Project" (Wanhua-Banqiao Project).
- 1993.04.07 Minister of Transportation and Communications Liu Chao-shiuan inspects work on the Songshan Project.
- 1993.04.10 Work begins on the Xindian River cross-river tunnel (Wanhua-Banqiao Project).
- 1993.12.01 TRUPO Director Tung Ping retires and is succeeded by Deputy Director Chiang Hsin-ju. Minister of Transportation and Communications Liu Chao-shiuan personally presides over the handover ceremony.



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| 1994.06.18 | A ceremony is held for the opening of the phase two north tunnel work and completion of the Songshan Project. | 1999.02.09 | Minister of Transportation and Communications Lin Fong-cheng inspects the Wanhua-Banqiao Project. |
| 1995.09.23 | An opening ceremony is held for Banqiao Station (Wanhua-Banqiao Project). | 1999.02.11 | A beam raising ceremony is held at the new Banqiao Station building (Wanhua-Banqiao Project). |
| 1997.03.14 | The Shulin Marshalling Yard opens. | 1999.04.16 | Premier Vincent Siew inspects the Wanhua-Banqiao Project. |
| 1997.04.24 | President Lee Teng-hui inspects the TRUPO Banqiao work site. | 1999.04.18 | Taipei Mayor Ma Ying-jeou inspects work on Wanhua Station (Wanhua-Banqiao Project). |
| 1997.09.27 | An opening ceremony is held for the new Shulin Station. | 1999.07.20 | An opening ceremony the Wanhua-Banqiao Project is held at the new Banqiao Station. |
| 1998.08.27 | The Executive Yuan approves the Taipei Urban District Underground Railway Nangang Extension Project" (Nangang Project) | 1999.09.21 | A comprehensive inspection was conducted to determine the impact of the 921 Earthquake on the construction work |
| 1998.11.01 | A groundbreaking ceremony is held for the Qidu Marshalling Yard (Nangang Project). | | |



2001.08.16 An opening ceremony was held for phase one of the Wanhua-Banqiao arterial (Bangka Blvd.-Huacui Bridge-Xianmin Boulevard). The arterial was completed on July 27, 2002.

2002.01.01 The MOTC renames TRUPO as the "Railway Reconstruction Bureau, Ministry of Transportation and Communications" to reflect railway construction needs

2003.09.12 Work begins on the Nangang Station Underground Railway Project (Nangang Project).

2004.03.08 Railway Reconstruction Bureau Director-General Chiang Hsin-ju is appointed to the position of counselor to the Ministry of Transportation and Communications (MOTC). He is succeeded by Hsieh Chao-I. The ceremony is presided by Vice Minister of Transportation and Communications Chang Chia-juch.

2004.09.23 Minister of Transportation and Communications Lin Ling-san presides at the breakthrough ceremony for the "Xizhi Section Mountain Tunnel and Ramp Construction" (Nangang Project).

2005.02.02 Work begins on the Songshan railway underground station (Nangang Project).

2005.08.01-03 Preliminary work and track switching begins on the Qidu Marshalling Yard and Qidu Station.

2005.11.14 The RRB arranges the 2005 Taiwan Railway Overall Inspection Operation in conjunction with the MOTC.

2005.11.21 Cheng Tzu-jung succeeds Hsieh Chao-I as director-general of the RRB at a handover ceremony presided by Vice Minister of Transportation and Communications Ho Nuan-hsuan

2006.04.08-09 Switchover and inauguration of the Xizhi Viaduct Section, Xizhi Station and Wudu Station (Nangang Project)

2007.01.21 New Qidu Station phase two permanent track (three tracks) switchover and completion and opening of the phase two new Qidu Station (Nangang Project)



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| 2007.04.16 | Work begins on the Xizhi-Wudu Triple-track Elevated Project. | 2008.07.21 | Newly appointed RRB Director-General Hsu Chun-yi succeeds outgoing acting Director-General Chiang Hsin-ju at a handover ceremony presided by Vice Minister of Transportation and Communications Oliver F.L. Yu. |
| 2007.04.21 | President Chen Shui-bian and Minister of Transportation and Communications Tsai Duei inspect the Nangang Station Underground Railway Project. | 2008.08.18 | Work begins on the "Taiwan High Speed Rail Tunnel Dakeng River Ramp Construction" (Nangang Project). |
| 2007.11.02 | The Nangang Coach Yard tunnel section under the Nangang Project is completed. | 2008.09.17 | President Ma Ying-jeou, Premier Liu Chao-shiuan and Minister of Transportation and Communications Mao Chi-Kuo inspect the Nangang Project. |
| 2007.11.08 | A beam-raising ceremony is held for the Nangang Station Underground Railway Project. | 2008.09.20-21 | Completion of switchover operations for the Songshan-Xizhi section of the phase one underground railway work of the Nangang Project, completing the Taipei underground railway system. |
| 2008.01.25 | RRB Director-General Cheng Tzu-jung is appointed as counselor of the MOTC. He is succeeded by MOTC Counselor and RBB Acting Director-General Chiang Hsin-ju. | 2009.06.06 | The commissioned Bannan Line tunnel of the Nangang Project is handed over to the Taipei City Government |



2009.06.30 The commissioned High Speed Rail tunnel and railway platform of the Nangang Project are handed over to the Bureau of High Speed Rail and then turned over to the Taiwan High Speed Railway Corporation.

2009.11.28 Premier Wu Den-Yih, Taipei Mayor Hau Lung-bin and Minister Mao Chi-Kuo inspect construction of Nangang Station and the High Speed Rail tunnel (Nangang Project)

2010.01.01 Work begins on the south plaza underground car park at Songshan Station and is completed on August 31, 2011 (Nangang Project)

2011.08.23 The Xizhi section of the Xizhi-Wudu Triple-track Elevated Project is completed (Nangang Project).

2011.08.27 The ground-level road construction between Hulin Street and Keelung Road is completed (Nangang Project).

2011.08.31 The Nangang Project is completed.

2011.10.23 A ceremony is held for the completion of the Nangang Project and opening of the ground-level Civic Boulevard, presided by Premier Sean Chen and Minister of Transportation of Transportation and Communications Mao.

2011.11.26 President Ma Ying-jeou inspects the results of the Nangang Project.

The Dragon Gallops Underground



Changing Memories of the Taipei Railway

1983 - 2011

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