

Innovative Measures and Improvements

5 Metro Lines & Numerous Transfer Options

1. Raising the Capacity of the Taipei MRT

Planning of the Taipei MRT system began in 1977. Initial plans, drafted by the Committee of Transportation Planning, MOTC (now the Institute of Transportation, MOTC), were delivered to the Council for Economic Planning and Development (CEPD, now the National Development Council), which then commissioned the Taipei Transit Council (TTC), a consultancy, to conduct further network planning. After gathering widespread feedback, in 1986 the CEPD approved TTC's initial network. On May 1, 1993, the MOTC approved for future reference network plans for the Taipei MRT follow-up development. Since 1996, when the Muzha line began operations, the Tamsui, Zhonghe, Xindian, Bannan, Neihu, Luzhou, Xinzhuang, Xinyi and Songshan lines opened. In 2014, when the last section of the original planned network opened, all lines were organized on the basis of color.

Over 18 years of operation, expedient operational modes were adjusted in accordance with construction progress. In 1998, when the Zhonghe line opened, it was linked to the Tamsui line. When the Xindian line was also linked to the Tamsui line upon opening in 1999, its trains alternated with those servicing the Zhonghe line. Opening of Dongmen Station in 2012 finally allowed for orange line trains servicing Zhonghe, Xinzhuang and Luzhou to connect. In 2013, when the Xinyi line opened, the Tamsui and Xindian lines temporarily remained connected. On November 15, 2014, when the last piece of the Taipei MRT puzzle, the green Songshan line, opened, it was connected to the green Xindian line, in accordance with plans originally approved by the Executive Yuan. Expedient operational modes were no longer necessary.

The Taipei MRT network was planned to satisfy transportation needs within and between downtown Taipei (main core) and surrounding satellite cities (sub-core). For optimal transit use, the network consists of a series of L-shaped lines in downtown Taipei that connect in a grid pattern. The L-shape, chosen to maximize service scope and transfer stations, paved the way for 12 transfers stations in the grid: Taipei Main Station, Zhongshan, Minquan West Rd., Chiang Kai-Shek Memorial Hall, Ximen, Zhongxiao Xincheng, Zhongxiao Fuxing, Guting, Dongmen, Daan, Songjiang Nanjing and Nanjing Fuxing. Once passengers enter downtown, they have several options to choose from as they plan the best route to reach their destination.

The downtown L-shaped corridors each connect two points that experience heavy passenger traffic during peak hours. The points then radiate outward. In the future, the Circular line will link these outer areas and the satellite cities that compose them. Passengers will need fewer transfers to navigate this dense, convenient, fast, comfortable and high-volume MRT network.

The Taipei metropolitan area MRT network was built to accommodate regional development. The original planned network consisted of the Wenhua line (the brown

line, Taipei Zoo Station to Taipei Nangang Exhibition Center Station), the Tamsui-Xinyi line (the red line, Tamsui Station to Xiangshan Station), the Songshan-Xindian line (the green line, Xindian Station to Songshan Station), the Zhonghe-Xinlu line (the orange line, Nanshijiao Station to Huilong Station and Nanshijiao Station to Luzhou Station), and the Bannan line (the blue line, Taipei Nangang Exhibition Center Station to Yongning Station). On this network, which was built incrementally, a single exclusive color for each line makes it easy to switch trains.

Opening of the Songshan line basically signaled the completion of the downtown Taipei MRT network. For reasons of safety, service quality, permitted line capacity, feasibility, and overall network efficiency, past expedient operational modes, adjusted as more sections of the MRT were completed, ended. The network adopted its original design of five lines and numerous transfer options. For convenient line identification and transfers, lines were distinguished by color. To further assist foreign passengers, TRTC adopted a numbering system similar to those used on MRT networks in other major cities. The colors that people have grown familiar with were assigned exclusive numbers: brown (1), red (2), green (3), orange (4) and blue (5). Independent operation of each line maximized network operational effectiveness while avoiding interference that can result when lines intersect. It resulted in a safer, more stable system that is faster, more convenient and closer to completion.

2. Benefits of the Songshan Line

- (1) Estimated Project Benefits in the Target Year 2021:
 - a. Passengers' time-savings will equal a gain of NT\$6.52007 billion.
 - b. Bus operation costs will be reduced by NT\$974 million.
 - c. Costs owing to bus accidents will be reduced by NT\$54 million.
 - d. Daily travel time in the Taipei Metropolitan area will be reduced by 2.9 million minutes and yearly travel time will be reduced by 939 million minutes.
 - e. Travel between Songshan and Ximen stations will only take 15 minutes.
- (2) User Benefits:
 - a. Since the MRT uses exclusive traffic lanes, it does not interfere with other traffic. It provides faster, safer, punctual, convenient, and reliable service.
 - b. Higher environmental control standards in MRT stations and trains provides for more comfortable transit.
- (3) Social Benefits:
 - a. Save road space, reduce road congestion and traffic accidents
 - b. Stimulate development
 - c. Reduce air pollution
 - d. With large traffic volume and high efficiency, the MRT system saves more energy than other transport modes.
- (4) National Benefits:
 - a. By joining the ranks of countries with a modern urban transit system, Taiwan can enhance its international profile.
 - b. High economic returns include direct benefits of increased employment opportunities

and indirect benefits of improved infrastructure and facilities.

- c. New knowledge and experiences in the areas of transportation construction and operational management.
- d. Improved quality of urban life and image together with enhanced global image.
- e. Demonstrates Taiwan's emphasis on technological development and its confidence in future economic growth.

(5) Three major passenger benefits resulting from organizing lines by color:

a. Time-saving:

(a) Shorter headway

The Xinyi Line: Reduction of headway from six minutes to three minutes cut waiting times. Passengers transferring at Dongmen Station enjoy a faster, more convenient trip (with benefits for an estimated 70,000 passenger trips daily).

The Xindian Line: Extra runs during peak hours reduced headway from six minutes to between four and five minutes.

(b) Faster trips Between Songshan and Neihu

Passengers traveling between the Tamsui, Songshan and Neihu areas can save time by transferring early at Zhongshan Station, rather than waiting until Taipei Main Station.

Passengers traveling between the Banqiao and Tucheng areas and the Songshan area can transfer early at Ximen Station to save time and avoid crowding at Zhongxiao Fuxing Station.

Passengers traveling between the Xindian area and the Nanjing East Rd. and Songshan areas do not need to transfer, saving time over the previous transit mode of transferring to a bus at Zhongshan Station.

b. Cost-saving

Fare was reduced by NT\$5 for travel between a portion of stations in Xindian, Tamsui, Xinzhuang or Luzhou and Neihu, with benefits for an average of 25,000 passenger trips.

c. Convenience:

(a) Fewer Transfers

Apart from travel from the Orange line (Zhonghe-Xinlu) to the Brown line (Wenhu), only one transfer is needed to go station to station on the MRT network, reducing travel time on an average of 26,000 trips daily.

(b) Independent Route Without Interruption

All lines are organized by color and use designated platforms, helping passengers avoid taking the wrong train.

If service is suspended on one route, passengers can take alternative routes.

(c) Multiple Transfer Points Disperse Crowds

When the Songshan line opened, four transfer stations were added: Ximen Station for the Blue line, Zhongshan Station for the Red line, Songjiang Nanjing Station for the Orange line, and Nanjing Fuxing Station for the Brown line. These stations

dispersed crowds at Taipei Main Station, Zhongxiao Xinsheng Station and Zhongxiao Fuxing Station.

Passengers taking the Orange (Zhonghe-Xinlu) line to travel north of NTU Hospital Station only need one transfer at Dongmen Station, dispersing transfer crowds at Guting Station.

(d) Convenient Transfer to Operating Lines and the Airport Line for Xindian Residents

Adoption of the “Xindian – Songshan” operational mode, which connects the Songshan and Xindian lines, allowed Xindian residents to reach Ximen, Songshan, and Nanjing East and West roads without transfer. Also, transfers can be made at the opposite platform at Guting Station for the Orange line, Chiang Kai-Shek Memorial Hall Station for the Red line, and Ximen Station for the Blue line. Only one transfer is needed for transfer to the Brown line.

- (e) Before the Songshan line opened, during peak hours at Ximen Station passengers took trains operating between Ximen and Taipower Building stations at different level platforms, depending on the guidance of an electronic information display. Opening of the new route allowed passengers to wait for trains at the same platform level.

The Songshan line is the third east-west line in downtown Taipei, after the Bannan and Xinyi lines. Its links to the future airport line and Taiwan Railways are expected to bring economic benefits and landscape changes to surrounding areas. The Songshan line has eight underground stations. There are Taipei Arena and Nanjing Sanmin stations along with several transfer stations: Ximen, Zhongshan, Songjiang Nanjing and Nanjing Fuxing, which connect to the blue, red, orange and brown lines. Songshan and Beimen stations respectively link to Taiwan Railways Songshan Station and the airport line’s Taipei Main Station via underground passageways. Passengers can take advantage of these transfer points to reach their destination quickly and conveniently.

Before the Songshan line opened, at peak travel times trains dispatched from Ximen to Taipower Building Station used top and bottom level platforms. Signs and staff alerted passengers of the correct platform. After the Songshan line opened, these platforms reverted to their original design and passengers simply used the platform that corresponded to their desired destination. Besides added ease and convenience, it was no longer necessary to switch levels to get the correct train.

Record Ridership on the MRT

After the Songshan line opened on November 15, 2014, EasyCard users enjoyed free travel along the line during the first month of service. TRTC estimated that the discount was used for 19.94 million trips. During the first month, the line’s eight stations serviced an average of 260,000 daily trips. At transfer stations during the first month – Ximen and the new transfer stations of Zhongshan, Songjiang Nanjing and Nanjing Fuxing – there were an average of 220,000 daily weekday transfers, showing that more passengers took advantage of multiple transfer points.

Opening of the Songshan line also dispersed passengers from several congested stations. During the first month of service, average daily weekday transfers on the Bannan line fell by 16.7% (from 431,000 to 359,000). This included a 30.4% drop at Taipei Main Station, which saw its daily weekday transfers fall by 48,000 to 110,000.



Nanjing Fuxing Station's addition to the ranks of transfer stations dropped daily weekday transfers at Zhongxiao Fuxing Station, which also services the Wenhua line, by 4,000, or 3.7%, to 104,000.

For New Year's Eve service, joint use of the Songshan-Xindian line, Tamsui-Xinyi line and Bannan line managed to disperse downtown congestion by 2 am on January 1. From 6 am on December 31, 2014, to 6 am on January 1, 2015, there were a record 2.96 million trips on the MRT, an increase of 210,000 compared to the previous year. Ridership was about 400,000 on the Songshan-Xindian line, 880,000 on the Tamsui-Xinyi line and 900,000 on the Bannan line.

