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TAIWAN RAILWAYS

ANNUAL REPORT

2022

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TAIWAN RAILWAYS

ANNUAL REPORT

2022

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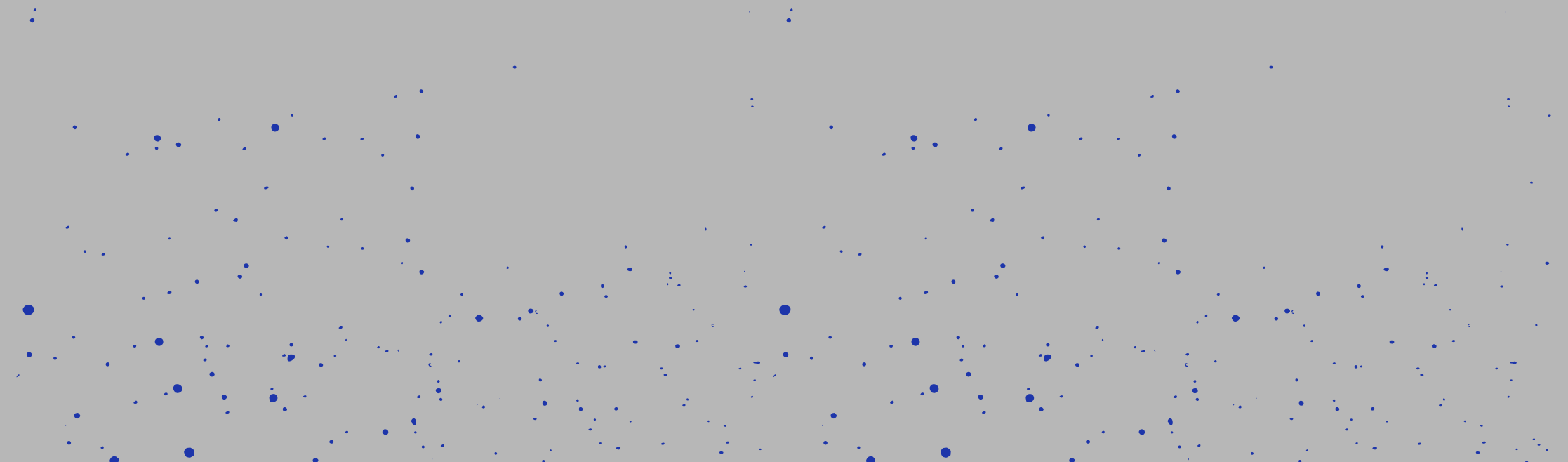
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Introduction Introduction



Introduction

As the coronavirus pandemic gradually subsides, the demand for transportation has normalized and the public has begun traveling again for business and tourism. In 2022, TRA strengthened the island-wide transportation network to prevent further viral transmission, protect the safety of travelers, and provide comprehensive transportation services.

Safety reform has always been the top priority of TRA. TRA classifies the construction risks for all TRA construction projects and has created a security management system to enhance construction safety. Additionally, TRA implemented the Vehicle Intrusion Prevention Facilities and Warning System Installation project and experimentally installed electric-assisted sentinel systems to improve the safety of engineering operations conducted in close proximity to railways. Regarding electrical engineering projects, TRA completed the Second Circular Deployment of 96-Fiber Cable project and the Island-Wide Optical Fiber Transmission Network System Update project to improve the reliability of the communications network and passenger rail system. The Taipei Electrical Engineering Conductive Tunnel Rail Installation project won the Honorable Mention at the 22nd Public Construction Commission Golden Quality Awards under the Facilities category. TRA continues to purchase and replace trains. By controlling risks, and improving construction and transmission efficiency, TRA aims for a safe and steady railway network for Taiwan.

TRA is responsible for providing daily commutes, intercity transportation, and passenger transportation during major holidays. The new EMU 900 commuter trains and EMU 3000 intercity trains have begun operations to increase our transportation capacity. New automated and computerized ticket machines are being installed across Taiwan and support nine mobile payment platforms to allow travelers to purchase tickets with ease. Additionally, TRA continues to build accessible lifts and optimize public toilets in stations across Taiwan to respond to the needs of the older population and provide passenger-friendly transportation services. TRA renovated Chiayi Station and recreated the historical building so that Chiayi Station could be both a beautiful and accessible cultural landmark.

To develop subsidiary businesses, the Tengyun Class of the EMU 3000 trains provide a luxury experience to travelers. The Future class, the tourist train, went even further in its effort to provide an exquisite railway tourism experience by adding an all-new dining car, The Moving Kitchen,

to serve Michelin-quality food. Additionally, TR Bento continues to incorporate local ingredients across Taiwan and offer special bento to spice up railway tourism. To promote local development, we are revitalizing the land in front of Yilan Station and undergoing an urban renewal project around Pingtung Station. The recently opened Chaozhou Railway Park allows the public to experience railway culture and infrastructure to boost local tourism. TRA continues to develop the railway for everyone.

TRA raised the salary of some employees to boost company morale and actively promoted public care facilities by establishing the Taipei Main Station Workplace Cooperative Education and Care Service Center and Yilan Workplace Cooperative Education and Care Service Center. Such facilities help to create a friendly workplace and allow employees to balance work and family.

On May 27, 2022, the Act for Establishment of State-owned Taiwan Railway Co., Ltd passed the third reading in the Legislative Yuan, and TRA will become the Taiwan Railway Co., Ltd in 2024. This change will improve the flexibility of our organizational operation, improve efficiency, enhance competitiveness, and continue to protect the rights of our employees. The road ahead is full of challenges, but TRA is united to reform bravely to reach new heights!



Director General Victor Tu

Chapter.1 Chapter.1

- 1 ● Vision
- 2 ● Strategic goals
- 3 ● Operating policies



1 VISION

1. Vision

TRA's vision is to complete corporatization by 2024 and reemerge as the state-owned Taiwan Railway Co., Ltd to develop an excellent public transportation system that embodies safety, convenience, and first-rate service. Taiwan Railway Co., Ltd will operate transportation businesses and subsidiary businesses to create a safety-first railway company that meets social expectations. Our goal is to operate sustainably, ensure customer satisfaction, and become a railway trusted by the public.

2. Strategic goals

1. Sustainable and happy company (financial sustainability and happy employees)
2. Technological and safe railway (technologically and systematically safe)
3. Smart and innovative railway (digitizing infrastructure and creating new applications)
4. Adaptive and cultural railway (developing assets and promoting cultural preservation)

3. Operating policies

(1) Smart railway and improved safety

1. Establishment of special departments: Taiwan Railway Co., Ltd will flexibly adjust the organizational structure and establish a Safety Committee under the board of directors to increase safety oversight. Additionally, the General Manager will directly supervise the Operational Safety Office and the Occupational Safety and Health Office to improve operational efficiency.
2. Upgrades to railway facilities: Taiwan Railway Co., Ltd will continue to purchase new trains to replace old ones, improve software and hardware, and introduce safety detection systems and management technology, such as smart slope safety and smart level crossing, to enhance the reliability, stability, and efficiency of systems.
3. Development of smart railway: This includes smart system management, establishment of smart platforms by incorporating the Internet of Things, and introduction of information technology to monitor, diagnose, and analyze railways.
4. Risk control and management: The Train Dispatch Department will be established to coordinate dispatches and contingencies. Additionally, the Regional Operations Department will be established and authorized for train operations, passenger and freight services, and emergency response within the region. These measures can strengthen horizontal integration and reduce the chain of command and administrative processes.



5. Formation of technological groups: A Technological Research and Development Department will be established, and the Information Center will be upgraded to the Digital Development Department to expedite advanced communications technology and improve the operational and management capacity for the safety and maintenance of railway transportation.

(2) Organizational reform and corporate sustainability

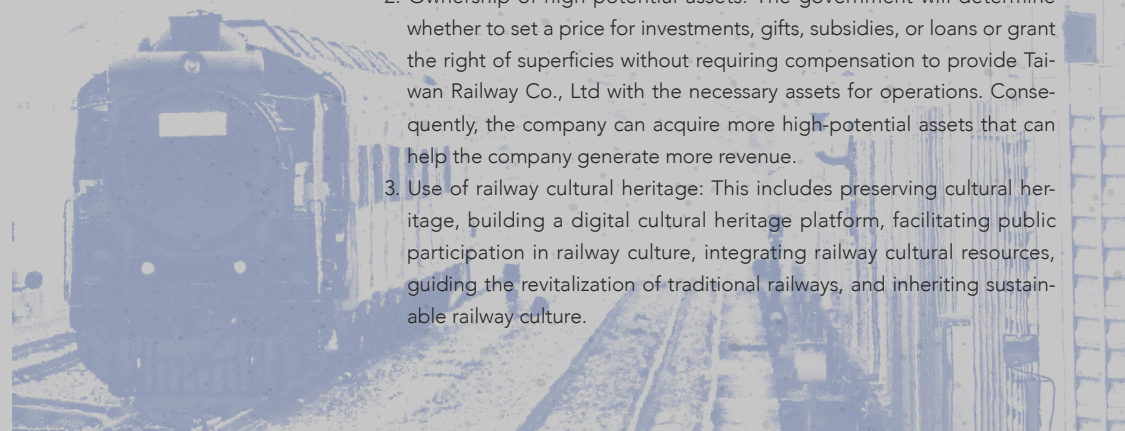
1. Organizational reform: The organization will consolidate advisors and units and revise the number of key positions. The optimized organizational structure will be fully integrated to facilitate corporate operations after corporatization.
2. Robust finance: The MOTC will establish a foundation to handle current short-term debts by eliminating existing short-term debts owed to financial institutions and injecting sufficient assets to repay the debts. The government will subsidize the operational losses incurred by Taiwan Railway Co., Ltd when following governmental policies, so that Taiwan Railway Co., Ltd can operate while fulfilling its social responsibilities.
3. Sustainable operation: Taiwan Railway Co., Ltd will focus on expanding transportation capacity and railway tourism to establish a stable customer base and generate revenue. The subsidiary businesses will revitalize assets and develop land along the railway for added value. Taiwan Railway Co., Ltd will also expand the franchise of TR Bento and develop diverse railway merchandise.
4. Talent retention: Taiwan Railway Co., Ltd will promote talent retention projects, improve talent exchanges, and encourage and implement inter-unit or interinstitutional transfer of employees to train interdisciplinary talent. Taiwan Railway Co., Ltd will also strengthen cooperation with vocational schools to train railway professionals, such as maintenance workers, to sustainably pass down professional railway techniques.
5. Corporate identity: Corporate identity will be formed by reshaping employee values, encouraging innovative thoughts, building solidarity, and increasing pride among employees.
6. Improvement of working environment: A safe, healthy, and comfortable workplace will be provided, and benefits will be adjusted accordingly. The company will focus on the physical and mental health of employees and safeguarding their rights.

(3) Digital transformation and innovative service

1. Information digitization: Taiwan Railway Co., Ltd will develop standard, digital, and consistent common data and build a smart railway information integration platform. Moreover, Taiwan Railway Co., Ltd will create digital infrastructure and gradually transmit real-time data to the platform. Access to the platform's resources will be shared to conduct big data analyses and support decision-making.
2. Smart transformation: Taiwan Railway Co., Ltd will follow the smart railway terminal, network, and cloud frameworks to ensure secure, open, and scalable information. This also includes building a consensus for digital transformation across the company, cooperating with organizational changes, and establishing a Digital Development Department to promote the digitization of various infrastructure.
3. Upgrades to service and equipment: This includes having smart, intuitive, universal, user-friendly, and informative operating equipment to improve the reliability and punctuality of passenger transportation services and the capacity of trains. Such changes ultimately create a friendly and successful transport environment.

(4) Asset revitalization and cultural preservation

1. Relax laws to expedite revitalization: This consists of following the amendments to the Railway Act and the Act for Establishment of State-owned Taiwan Railway Co., Ltd, which relax regulations for tourism and land development and remove restrictions in the National Property Act and the Land Act. Taiwan Railway Co., Ltd will turn deficits into profits and facilitate regional development and prosperity by increasing land development and improving public facilities.
2. Ownership of high potential assets: The government will determine whether to set a price for investments, gifts, subsidies, or loans or grant the right of superficies without requiring compensation to provide Taiwan Railway Co., Ltd with the necessary assets for operations. Consequently, the company can acquire more high-potential assets that can help the company generate more revenue.
3. Use of railway cultural heritage: This includes preserving cultural heritage, building a digital cultural heritage platform, facilitating public participation in railway culture, integrating railway cultural resources, guiding the revitalization of traditional railways, and inheriting sustainable railway culture.



Chapter.2 Chapter.2



- 1 ● Organization and human resources
- 2 ● Operating status

2

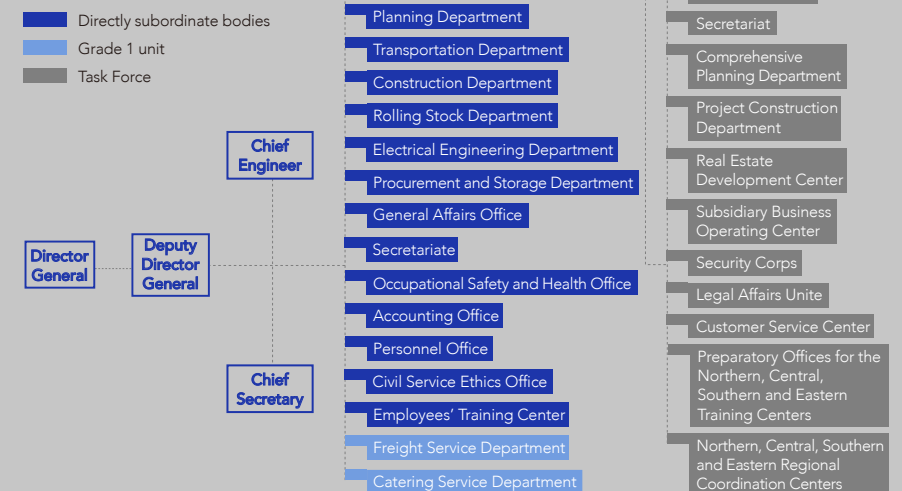
ORGANIZATION AND OPERATION

1. Organization and human resources

After the Second World War, the central government requested the Taiwan Provincial Government to temporarily assume operation and management of Taiwan's railways. In 1945, the Taiwan Railway Management Committee was formed, and in 1948, the TRA was formed. The TRA was placed under the jurisdiction of the MOTC on July 1, 1999. The TRA has 13 units under the Director General, Deputy Director Generals, Chief Engineer, and Chief Secretary: the Planning Department, Transportation Department, Construction Department, Rolling Stock Department, Electrical Engineering Department, Procurement and Storage Department, General Affairs Department, Secretariat, Occupational Safety and Health Office, Accounting Office, Personnel Office, Civil Service Ethics Office, and Training Center. Additionally, TRA has 17 mission-oriented organizations: the Operation Safety Office; Secretariat; General Planning Department; Project Construction Department; Asset Development Center; Subsidiary Business Operation Center; Special Security Corps; Legal Affairs Unit; Customer Service Center; Northern, Central, Southern, and Eastern Training Center Preparation Departments; and Northern, Central, Southern, and Eastern Coordination Centers. TRA has two directly subordinate bodies, namely the Freight Service Department and Catering Service Department, and 43 indirect bodies, such as workshops, branches, centers, offices, and corps.

The budgeted number of TRA personnel for 2022 was 17,361. TRA had 15,681 employees at the end of 2022.

TRA Organizational Structure





2. Operating status

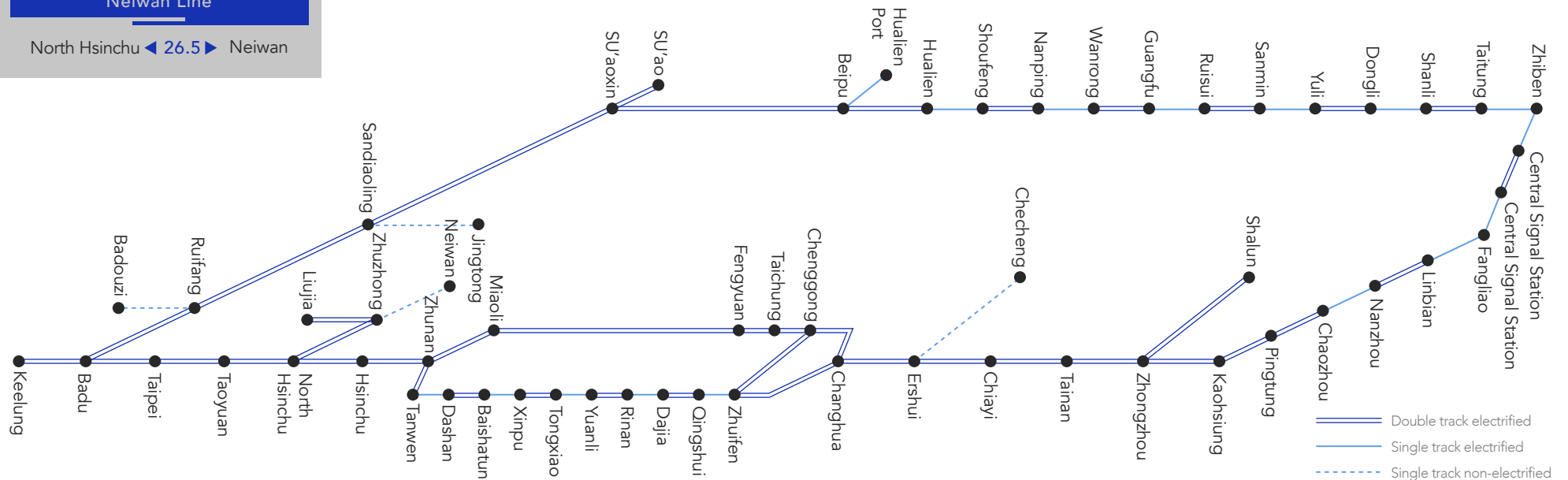
(1) Operating distance

1. The total operating distance is 1,065 kilometers. The length of the electrified double track, the electrified single track, and the nonelectrified single track is 742.1, 255.6, and 67.3 km, respectively.
2. Stations: TRA has 241 stations, consisting of 4 special grade stations, 28 grade one stations, 25 grade two stations, 72 grade three stations, 66 basic stations, and 46 staffless stations.

3. Level crossings: TRA has 418 level crossings, consisting of 3 type-one crossings, 18 type-two crossing, 397 type-three crossings, 28 semiclosed crossings, 11 manually controlled crossings, and 6 special-use crossings.
4. TRA has 1,618 bridges and 125 tunnels.

Unit: Kilometer

West Coast Line	Taichung Line	Pingtung Line	Pingxi Line	North-link Line
Keelung ◀ 125.4 ▶ Zhunan	Zhunan ◀ 85.5 ▶ Changhua (mountain line)	Kaohsiung ◀ 61.3 ▶ Fangliao	Sandiaoling ◀ 12.9 ▶ Jingtong	Su'aoxin ◀ 79.2 ▶ Hualien
Zhunan ◀ 90.2 ▶ Changhua (coastal line)				
Changhua ◀ 188.9 ▶ Kaohsiung	Chenggong ◀ 2.2 ▶ Zhuifen			
Liujia Line	Jiji Line	Shalun Line	Taitung Line	South-link Line
Zhuzhong ◀ 3.1 ▶ Liujia	Ershui ◀ 29.7 ▶ Checheng	Zhongzhou ◀ 5.3 ▶ Shalun	Hualien ◀ 150.9 ▶ Taitung	Fangliao ◀ 98.2 ▶ Taitung
Neiwan Line				
North Hsinchu ◀ 26.5 ▶ Neiwan				





(2) Total number of rolling stock and operating efficiency

Operational efficiency

In 2022, the availability of power cars was 91.50%; 93.58% of electric locomotives, 95.05% of push-pull electric locomotives, 88.42% of diesel-electric locomotives, 98.38% of diesel-hydraulic locomotives, 91.44% of EMUs, 97.60% of tilting EMUs, and 88.07% of diesel passenger cars were available for operation.

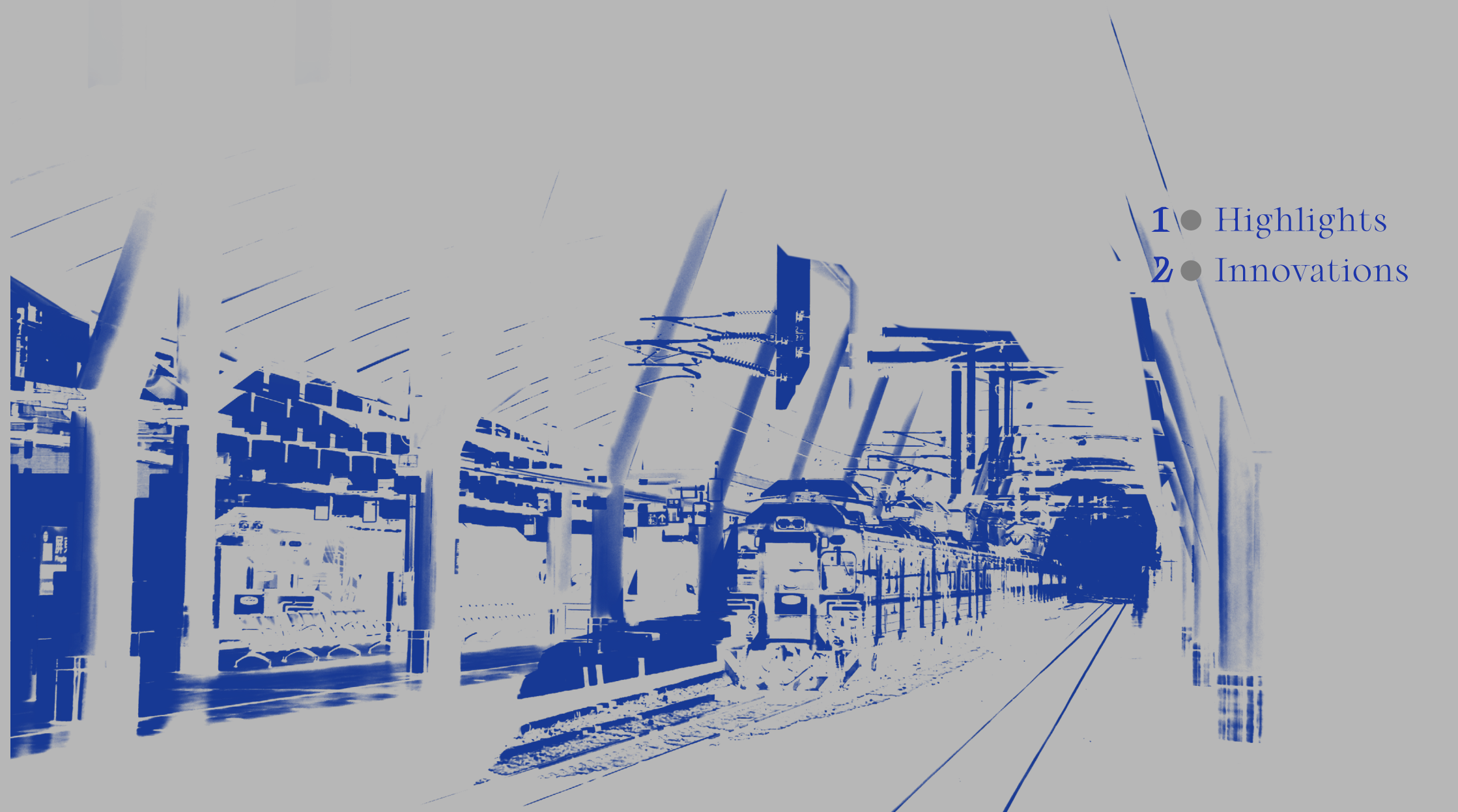
Number of locomotives, passenger cars, and freight wagons

locomotives	247
electric locomotives	84
push-pull electric locomotives	62
diesel-electric locomotives	85
diesel-hydraulic locomotives	16
passenger cars	2,766
Tze-Chiang EMUs	565
push-pull Tze-Chiang passenger cars	381
commuter EMUs	1,330
Tze-Chiang DMUs	162
diesel passenger cars	46
air-conditioned passenger cars	230
ordinary passenger cars	19
other cars	33
freight wagons	1,527



Chapter.3 Chapter.3

- 1 ● Highlights
- 2 ● Innovations



B

HIGHLIGHTS AND BUSINESS INNOVATIONS

1. Highlights

(1) TRA brand image transformation: Winning the 2022 Good Design Award

On October 7, 2022, Good Design announced that TRA's brand image transformation projects such as the Chiayi Station Spatial Microtransformation project and TR Bento Store project, which were completed in cooperation with the Taiwan Design Research Institute, won the 2022 Good Design Award. This marked the first time that TRA won an award for brand design.

1. TR Bento Store

To optimize the corporate identity and services of TR Bento stores, TRA began the TR Bento Store Research, Investigation, and Brand Design and Integration project in June 2020. The project created a brand identity and implemented excellent user-friendly services to achieve four goals, namely consistent brand and visual identities, user-friendly service models, standardized spatial modules, and brand awareness. These goals can direct consumers' attention to brand image and develop value and memories of the brand. Consequently, TR Bento can enhance its brand identity and improve the brand loyalty of customers.

The brand image was updated by collecting TRA documents and studying domestic and international trends. The I-shaped rail logo, which has been familiar to travelers for over a century, was incorporated into the TR Bento brand logo to refresh memories of the taste of TR Bento that has been passed down for generations and connect with a new generation of consumers. Additionally, the standard colors of TRA were used to represent the connection between TR Bento and TRA and symbolize the railway culture and spirit. The I-shaped rail was integrated into the contour of the font to create soft lines that represent the softness of food. The overall design pursued minimalism for versatility and cooperation with other industries and brands.

The Hsinchu TR Bento concept store presented the new aesthetics of TR Bento to the public at the Taiwan Design Expo 2020. The TR Bento catering trolley was shown at the Taiwan Design Expo 2021 in Chiayi the following year, and the visual changes in the TR Bento logo was introduced to the Chiayi TR Bento store.

TRA will gradually upgrade the TR Bento stores nationwide and apply standardized and uniform designs to reinforce brand identity and increase brand equity and revenue.



TRA also strives to reduce its carbon footprint by offering local, seasonal food. TRA uses fresh, natural ingredients across Taiwan to prepare bento, support local agriculture, and implement environmental, social, and corporate governance. Travel with TR Bento and take your taste buds on a journey, too!



The new TR Bento stores

2. Chiayi Station Spatial Microtransformation

The Chiayi Station Aesthetics of Subtraction presentation was held on July 29, 2022. In consideration of the historical building and the elevation of Chiayi Station, TRA microtransformed the historical building before its renovation by enhancing the available space and optimizing its services and facilities. TRA also applied aesthetics of subtraction to retain the characteristics of the historical building but add a contemporary twist. The appearance of the historical building, the indicator systems, the ticket hall, the waiting hall, and the first platform were all renewed. The project won the 2022 Good Design Award and was nominated as one of the Shopping Design 2022 Taiwan Design Best 100.



Chiayi Station Aesthetics of Subtraction Presentation

(2) EMU 3000 won the German iF Design Award: Debut of the EMU 3000 Special Edition

The EMU 3000, an intercity electric multiple unit of TRA, was designed under the theme of Silent Flow. The EMU 3000 won the prestigious Japanese award Good Design Best 100 in 2021, the German iF Design Award (also known as the Oscars of design), and the Taiwanese Golden Pin Design Award in 2022.

The EMU 3000 was launched on December 29, 2021, and featured the Tengyun, the first-time business passenger car offered by TRA to provide travelers with high-quality services. The first EMU 3000 Special Edition arrived at the Port of Hualien on November 6, 2022, and disembarked on November 7, 2022. Unlike the other EMU 3000s, the EMU 3000 Special Edition has its sixth business passenger car converted into a general passenger car featuring a bar that serves food and beverages. Additionally, the EMU 3000 Special Edition is decorated with a border in four colors, namely red, blue, green and yellow, unlike other EMU 3000s that are decorated with only red or green borders. The four colors represent the four characteristics of Taiwan as interpreted by the Japanese designer: red represents passion, blue is intellectuality, green is tranquility, and yellow is fertility.

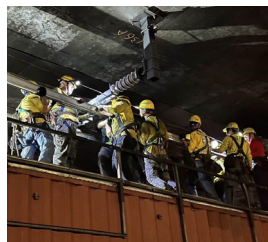
The EMU 3000 Special Edition train, conducting name registration measures, transported passengers returning to their hometowns on December 30, 2022, therefore passengers' need for travel on consecutive holidays could be satisfied.



EMU 3000 Special Edition



EMU 3000 winning the Golden Pin Design Award



Construction



Completion of project

(3) The conductor rail installation project won the 22nd Public Construction Commission Golden Quality Award

The project began from the ramp of the tunnel between Xike Station and Nangang Station (at approximately 15K+800) and ended at the ramp of the tunnel between Banqiao Station and Fuzhou Station (at approximately 37K+403). The project replaced the original catenary system that had two contact wires with the conductor rail system, which has a simpler structure, a longer service life, lower maintenance cost, and higher reliability. The total length of the conductor rail system installed was 51.8 km, and the system improved the quality and stability of the power supply.

This TRA project covers a railway section that has the highest traffic density and the highest number of commuters; thus, it is the most crucial transportation section of TRA. Taipei Main Station is the most difficult section for construction works nationwide because maintaining train operations and ensuring transportation safety while construction works are being conducted is more challenging than anywhere else. The design stage of the project won the first conductor rail system safety certificate in Taiwan, and the construction stage of the project applied a new method in Taiwan. The new, pre-planned method used temporary hooks to gradually replace the conductor rail system, which used a suspending double contact wire, with a system that uses a single contact wire. Although only 3.5 hours at night time were available for construction works each day, adequate plans for construction methods and equipment and material preparation enabled the construction to be completed ahead of schedule. The installation of the conductor rail system was completed on December 9, 2022.

The actual benefits of the conductor rail system include reducing the number of annual maintenance worker from 3240 to 639 and reducing the annual maintenance cost from NT\$95.83 to NT\$23.95 million. Additionally, the service life of the contact wire and the conductor rail system has been extended from 20 to 30 years, which greatly improves the reliability of the system and the safety of train operations.

During each stage of the project, the project implemented a safety management system by using the concept of the full life cycle to overcome on-site construction and maintenance difficulties. The project competed for the 22nd Public Construction Commission Golden Quality Award and won Honorable Mention in the Facilities category. Each member of the construction

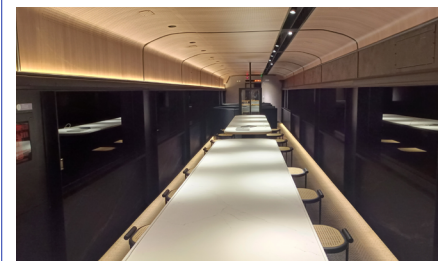
team played a major role in the project's success, which is encapsulated in travelers' trust in TRA's safety.

(4) The Moving Kitchen

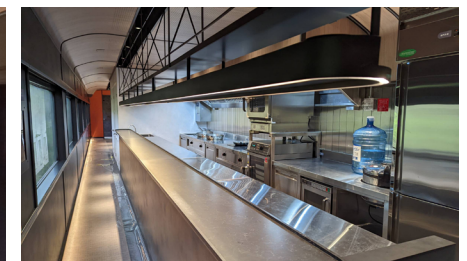
To provide a diverse range of excellent railway tourism services to travelers, TRA has continued to improve the facilities and equipment within passenger cars. Additionally, TRA cooperated with Lion Travel and Regent Taipei to source local ingredients to serve Michelin quality food and provide travelers with beautiful scenery, delicious cuisine, and high-quality wine. The press conference for The Moving Kitchen, our new dining carriage, was held on March 2, 2022 and has made 54 online and media appearances. The Moving Kitchen began operations on March 30, 2022, and served 7,867 travelers in 2022. The dining cars for The Moving Kitchen have served 1,748 travelers.



The Moving Kitchen press conference



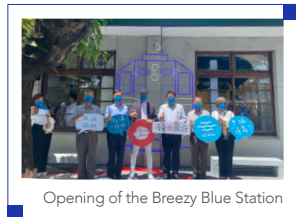
Dining car for The Moving Kitchen



Kitchen car for The Moving Kitchen

(5) Breezy Blue Station

The press conference for the opening of Fangliao Breezy Blue Station was held on July 19, 2022, and distinguished guests such as the Deputy Director General of TRA Chu Lai-shun, the then Magistrate of Pingtung County Pan Men-an, and Chairman of Lion Travel Wang Wen-chieh attended the ceremony. The event was reported in 16 news articles. The



Opening of the Breezy Blue Station

Breezy Blue trainline began operation on October 23, 2022, and has served over 60,000 travelers as of December 2022.

(6) Bicycle Train

In cooperation with the Bicycle Route Upgrade and Integration Project of the Executive Yuan and MOTC, TRA renovated the Chu-Kuang Express passenger cars for cyclists to travel with their bicycle. The project integrates bicycle and train tourism and allows travelers to seamlessly transfer between the two modes of transportation. After the renovation, TRA cooperated with Lion Travel and offered a new tourism package featuring the Bicycle Train. The package provides leisure tours around the island that promote fitness and green transportation and is suitable for families and people of all ages. The press conference for the Bicycle Train was held on November 14, 2022, at Nangang Station, and guests such as Taiwan Railways Tourism Association, Lion Travel, and Fullon Hotels joined the press conference to unveil a new chapter of railway tourism in Taiwan.



Bicycle Train press conference

(7) Ticket service

1. Multiple electronic ticket service

TRA has installed 239 electronic ticket services across the island. The TRA cooperated with the Directorate General of Highways to

provide discounts to travelers who transfer to or from buses at 32 stations along the east and west lines to conserve energy and reduce carbon emissions.

In 2022, the number of travelers who used electronic tickets was 116.1 million, with a daily average of 318 thousand travelers. The revenue from electronic tickets was NT\$3.979 billion.

2. Convenient ticket booking and pick-up service

(1) Booking and picking up tickets at convenience stores and the post office

In 2022, an average of 11,435 travelers per day used convenience stores or the post office to pick up their tickets. The post office, 7-Eleven, Family Mart, Hi-Life, and OK Mart accounted for 0.36%, 69.30%, 26.23%, 3.03%, and 1.08% of these travelers, respectively.

(2) 24-h online booking service and voice booking service In 2022, 13.38 million tickets were picked up after they were booked.

(3) New functions on the Taiwan Railway e-booking service app

The Taiwan Railway e-booking service app added Google Pay on November 10, 2022, and optimized other services such as meal booking for Tengyun Class passengers and ticket booking for the Bicycle Train. The app also allows members to use their membership rewards to redeem TRA Dream Factory products or use the concierge room and enjoy excellent services during their travels.

3. Membership service

TRA had 1,772,005 members (1,751,399 natural persons and 20,606 legal persons) as of 2022 and has matched 202,496 tickets for members in 2022, a success rate of 41.7%.

4. Installation of automated ticket machines

TRA has continued to install and upgrade automated ticket machines to improve service quality and ticket management.

	Computerized ticket vending terminal (set)	Automated ticket vending machines for Express Trains (set)	Automated ticket vending machine (set)	Automated ticket barrier (set)	Ticket inspection pole (set)	Portable fare adjustment machine (set)
Number of stations	191	75	60	68	239	8 (Train staff team)
Number	436	288	84	384	770	800



(8) Railway tourism service

1. Celebration of centennial operation of the coastal railway

To celebrate the centennial operation of the coastal railway, TRA operated a DT 668 steam locomotive followed by six Chu-Kuang train cars equipped with automatic doors on October 11, 2022, from Changhua Station to Baishatun Station and back. TRA also cohosted a series of celebratory activities with local governments at stations such as Dajia Station and Tongxiao Station.

2. 2022 Taiwan Railway of Popular Science

The National Science and Technology Council rented two EMU 500 trains consisting of eight train cars each from TRA to host the 2022 Taiwan Railway of Popular Science from October 24 to October 28, 2022. The trains connected both cities and small towns across Taiwan. This event integrated trains and technology for popular science education. Students explored subjects such as artificial satellites and space and had opportunities to apply their newfound knowledge. This event broadened scientific education in Taiwan, exposed students to science, and ultimately enhanced scientific research in the country.

3. Operation of environmentally friendly and bicycle-friendly trains

In compliance with energy conservation and carbon reduction policies and to promote leisure activities to the public, TRA offers environmentally friendly and bicycle-friendly trains and the specialized Bicycle Train to attract travelers. The bicycle-friendly trains carried 212,923 travelers in 2022.

4. Inclusion of the family carriage on the push-pull Tze-Chiang Limited Express

The timetable of the family carriage was adjusted on June 29, 2022, and 104 trains with the family carriage operated each week. These trains carried 49,603 travelers in 2022.

5. Continuation of specialized charter trains

TRA continued to promote railway tourism and provide comfortable and convenient transportation services to domestic and international travelers. TRA served 283 groups and 83,958 travelers in 2022 and generated revenue worth NT\$25,313,024.

6. Continuation of the TR-PASS

TRA continued to issue the TR-PASS (both the general TR-PASS and student TR-PASS) to attract domestic and international tourists. The revenue of the TR-PASS in 2022 was as follows:

	General TR-PASS	Student TR-PASS
Number of TR-PASS issued	15,362	2,145
Revenue (NT\$)	30,326,264	1,403,181

7. Issuance of the JOINT-PASS with THSR

For foreign travelers undertaking business activities or traveling, TRA continued to issue the JOINT-PASS for the THSR and issued 211 JOINT-PASS in 2022.

8. Day pass for branch lines

TRA continued to promote tourism along the branch lines. The revenue of the day passes for the branch lines in 2022 was as follows:

	Northeast	Pingxi Line and Shenao Line	Neiwan Line	Jiji Line
Number of day passes	425	17,365	996	Discontinued
Revenue (NT\$)	47,705	1,271,160	83,820	Discontinued



Taiwanese and Japanese guests in front of the sister train station wall at Wanhua Station



Taiwanese and Japanese guests in front of the sister train station wall at Jiaoxi Station

(9) International railway partnership

1. 2-year anniversary of sister train station partnership between Wanhua Station and Taga Taisha-mae Station of Ohmi Railway in Japan

Wanhua Station and Taga Taisha-mae Station of the Ohmi Railway celebrated their 2-year anniversary as sister train stations on the morning of November 4, 2022. Representatives such as the General Manager of the Taipei Branch of the Seibu Prince Hotels Yasuda Natsuki, Taipei Transportation Branch Mater Liang Yu-yu, and Wanhua Station Master Tsai I-kuan attended the anniversary event. The event included historical videos, road sign deliveries, and ticket punching to commemorate the joy of travel and long-lasting friendship between Taiwan and Japan. An orizuru was made to represent the continued peace and happiness of the people.

2. 2-year anniversary of sister train station partnership between Jiaoxi Station and Izu-Nagaoka Station of Izuhakone Railway in Japan

Jiaoxi Station and Izu-Nagaoka Station of Izuhakone Railway celebrated their 2-year anniversary as sister train stations on the afternoon of November 4, 2022. Representatives such as the General Manager of the Taipei Branch of Seibu Prince Hotels Yasuda Natsuki, Yilan Transportation Branch Deputy Branch Master Huang Tsung-hsien, and Jiaoxi Station Master Chang Li-chang attended the anniversary event. Jiaoxi Station



held the Taiwan Railway Landscape Photography Exhibition to commemorate the anniversary and used the photography exhibition to present local railway landscapes across Taiwan. The attendees were fascinated by the photographs and look forward to more frequent exchanges between Taiwanese and Japanese travelers after border restrictions are relaxed.

(10) Introduction of innovative bento flavors

1. TRA and Shinano Railway introduce the Scrumptious Bento

TRA and Shinano Railway in Nagano, Japan celebrated the 4-year anniversary of the sister train station partnership between Tianzhong Station and Tanaka Station (which are written the same in both languages) by requesting the Taichung Railway Restaurant to offer the Taiwanese-Japanese Nagano Miso Chicken Drumstick Makunouchi for a limited time. The bento was sold from March 18 to March 27, 2022, at Taichung TR Bento store. The special promotion sold 246 makunouchi and generated a revenue worth NT\$61,254.



Scrumptious Bento



Scrumptious Bento: Commemorative Tanaka Badge

2. Promoting sustainable seafood through the Heart of the Sea Mackerel Bento

TRA Taichung Railway Restaurant joined the sustainable seafood movement of Taiwan to reduce carbon emissions, source local produce, and love the ocean. Thus, the Taichung Railway Restaurant offered a mackerel bento that won the Heart of the Sea Ecological Label. The bento is both delicious and sustainable. Taichung Railway Restaurant became the first ocean-friendly restaurant to offer sustainable seafood in the Taiwanese transportation industry. The bento was sold from April 15 to June 15, 2022, at four TR Bento stores at Hsinchu Station, Taichung Station, Taichung HSR Station, and Changhua Station. The special promotion sold 8,655 bentos and generated a revenue worth NT\$489,304.



Mackerel Bento

3. Harbor City Curry Porkchop Bento at Keelung City Expo

In association with the Keelung City Expo and in cooperation with the Keelung City Government, TRA offered the Harbor City Curry Porkchop Bento at the Keelung TR Bento from June 10 to June 19, 2022. A total of 980 bentos were sold, which generated NT\$117,456 in revenue.

4. New Taste of Grouper TR Bento in Pingtung County

In cooperation with Pingtung County, TRA offered five types of bento at the New Taste of Grouper TR Bento in northern, central, and southern Taiwan. The bentos embodied our carbon footprint reduction by offering local, seasonal food and supporting Taiwanese fishermen. The first wave of the promotion was from June 27 to July 17, 2022; the second wave was from July 20 to July 31, 2022 (an expanded promotion); and the third wave was from August 1 to September 30, 2022 (at the original price). The bentos were sold at Songshan Dream Factory and Nangang Dream Factory; Taipei Main Station TR Bento Stores 1 and 2; and the TR Bento stores at Banqiao Station, Taichung Station, Taichung HSR Station, Xinzuoing Station, Kaohsiung Station, and Pingtung Station. A total of 33,028 bentos were sold, generating revenue worth NT\$4,510,910.



New Taste of Grouper TR Bento

5. Special Braised Pork TR Bento for the centennial celebration of the Changhua Railway Roundhouse

TRA, Changhua City Office, and Tri-mountain National Scenic Area cohosted the 2022 Centennial Celebration of the Changhua Railway Roundhouse on July 18, 2022. TRA hosted the event, "A Century of the Changhua Railway Roundhouse, Celebrations Across Generations," on December 4, 2022, to promote the preservation, revitalization, and



inheritance of cultural heritage and offer the special Braised Pork TR Bento that incorporates local delicacies. TRA offered the special bento during the centennial celebration of the Changhua Railway Roundhouse, and each bento was sold for NT\$100. This special bento is still sold at the TR Bento stores at Changhua Station, Taichung Station, and Taichung THSR Station.

6. TRA and Chiayi Station Aesthetics of Subtraction Presentation and Fisheries Agency offer the Blessed Kabayaki Sea Bream Bento

In cooperation with the 2022 Creative Expo Taiwan in Kaohsiung and the opening of the Chiayi Station Aesthetics of Subtraction Presentation, TRA offered the Blessed Kabayaki Sea Bream Bento, which included lightly-cooked sea bream and local ingredients from Chiayi. Under the theme of "Welcome to Chiayi: Taste Authentic Home Cuisine," the bento was sold at the Chiayi TR Bento store and the TR Bento catering trolley at the Kaohsiung Music Center from July 29 to August 14, 2022. The special promotion sold 1,969 bentos and generated NT\$192,120 in revenue.

7. TRA and the Fisheries Agency offer the Mahi-mahi Bento

TRA and the Fisheries Agency continued their cooperation and offered a special mahi-mahi bento. The chefs from the restaurants in Hualien and Taitung creatively prepared the bento to promote fisheries and revitalize TR Bento's brand image. The bento was sold from August 26 to September 30, 2022, at Hualien and Taitung. A total of 4,609 bentos were sold, generating NT\$828,170 in revenue.

8. TRA and Kintetsu Group offer the Taiwanese-Japanese Train-Shaped Bento

TRA partnered with Kintetsu Group to offer a special bento in celebration of the 5-year anniversary of the friendship between TRA and Kintetsu Group. This event improved the international reputation of TRA to attract Japanese travelers to visit Taiwan once the border restrictions are relaxed. The bento was sold at Kaohsiung TR Bento store from September 16 to September 25, 2022. A total of 600 bentos were sold, generating NT\$236,600 in revenue.

9. TRA and Taiwan Design Research Institute offer the Timeless Hidden Flavor bento

The design expo promoted urban aesthetics and sold only bentos, which boosted TR Bento's sales. A limited number of special bentos was sold each day from October 7 to October 23, 2022, at the TR Bento stores at Kaohsiung Station and Zuoying HSR Station. A total of 1,783 bentos were sold, generating NT\$194,249 in revenue.



Blessed Kabayaki Sea Bream Bento



Train-Shaped Bento



Timeless Hidden Flavor Bento



Countryside Special Bento

10. TRA and the Miaoli County Government offer the Countryside Special Bento to commemorate the centennial of the coastal railway

To celebrate the centennial of the coastal railway, TRA and Miaoli County Government offered a special bento that featured local ingredients sourced along the coastal railway on October 11, 2022. TRA cooperated with local governments to market TR Bento and promote local tourism. A total of 726 bentos were sold, generating NT\$87,120 in revenue.

11. TRA offers special bento to commemorate the opening of the Chaozhou Coach Yard (Chaozhou Railway Park)

TRA developed the Taste of Pingtung Bento by sourcing local, seasonal food to reduce our carbon footprint and support local agriculture. The bento features Wanluan pork knuckle, a Pingtung delicacy, and incorporates local ingredients from Pingtung. The bento was sold for 1 day on December 18, 2022 at the Chaozhou Coach Yard (Chaozhou Railway Park) and from December 18 to December 25, 2022 at the Pingtung TR Bento store. A total of 836 bentos were sold, generating NT\$107,718 in revenue.

(11) Seventh Formosa Railroad Bento Festival

The seventh Formosa Railroad Bento Festival was celebrated from November 11 to November 14, 2022 on the ground floor lobby of Taipei Main Station under the theme of "Wonderland on the move." A record number of 39 domestic and international catering businesses participated in the festival. The number of participating vendors this year is the highest in history. Additionally, local governments from Changhua County, Hsinchu County, Pingtung County, and Tainan City attended the festival for the first time. The festival presented special bentos and showcased local railway culture, tourism, and cultural merchandise, and activities were held to promote tourism and life along the railway.

The activities of the festival included the Influencer Dream-Come-True Bento, online essay contests, singing and dancing for children, business promotion integrating bento and tourism, the EMU 3000 Ceramic Bento Championship hosted by four TRA railway restaurants, and interactive technology for creating personalized virtual bento. Such activities created a "wonderland on the move" for participants.

The festival exhibited over 60 special domestic and international bentos for 4 days. Some of the highlights of the festival were The Moving Kitchen, which partnered with Regent Taipei to prepare special meals; the Bicycle Train, which used virtual reality technology to allow users to ex-



perience 16 cycling paths; and Lion Travel, which offered several tourism packages for visitors.

The benefits of the Formosa Railroad Bento Festival were as follows: The total revenue from the festival was NT\$6,538,539, which was an 11.6% increase compared with the previous festival. The revenue from TR Bento was NT\$1,663,547, which was a 55.5% increase. The revenue from the TRA Dream Factory was NT\$924,083, which was an 86.8% increase.



(12) TR Bento discounts to promote electronic payment

1. Taiwan Pay, traveling by taste: Enjoy a 10% discount at TR Bento

To encourage contactless payments and reduce viral spread, TRA offered the Taiwan Pay scan-and-pay method (through debit card or bank transfer) that provided travelers with a 10% discount at TR Bento. The discount was offered from May 5 to July 31, 2022. The total number of transactions during the discount period was 15,970, the total amount transacted was NT\$1,886,740, and the total amount discounted was NT\$208,230.

2. Taiwan Pay Full-Belly Sunday: Enjoy a 15% discount at TR Bento

To encourage contactless payment and reduce viral spread, TRA offered the promotion "Taiwan Pay to Save Every Day: Full-Belly Sunday." Users who used Taiwan Pay to purchase bentos received a 15% discount. The discount was offered from September 1 to December 2, 2022. The total number of transactions was 4,170, the total amount transacted was NT\$575,775, and the total amount discounted was NT\$100,275.



Advertisement for electronic payment discount

(13) Highlights of cultural merchandise

1. TRA partnered with iPASS to co-develop the three-dimensional TR Bento iPASS for the Railway Festival. The TR Bento iPASS was sold for NT\$390 each at selected TRA stores and the TRA Dream Factory online store. The iPASS was sold out on the first day of sales (June 9, 2022). A total of 8,607 TR Bento iPASS were sold, generating NT\$3,288,501 in revenue.
2. TRA cooperated with the Tourism Bureau to develop the Bear Bento Bag for the centennial celebration of the coastal railway. The bag features the TR Bento Bear and the Oh Bear of the Tourism Bureau, and the design caught the attention of fans of both mascots. The bag increased revenue and improved brand recognition. A total of 306 bags were sold, generating NT\$60,734 in revenue.
3. For the 2023 TRA Train Stories Calendar, TRA dispatched both retired and new trains at the Qidu Marshalling Yard for photos. The calendar was offered on November 18, 2022, at selected TRA stores and the TRA Dream Factory online store. Calendars sold for NT\$250 each. Calendars on the online store sold out in a record 2 minutes and 50 seconds and sold out in physical stores in 3 days. A total of 800 copies were sold, generating NT\$183,112 in revenue.
4. TRA entered into a partnership agreement with Lion Travel to develop merchandise for The Future class of trains from 2021 to 2026. Lion Travel owns the license for designing the paint scheme of The Future. As of November 2022, Lion Travel has developed 15 pieces of merchandise. The authorization fee was NT\$23,201.
5. TRA continued to develop merchandise for the Star Fleet (e.g., the EMU 3000 and the Breezy Blue). Star Fleet products, such as train-shaped alcohol bottles, vacuum flasks, and small bags, have sold well and have been well-received. TRA continues manufacturing such merchandise to increase revenue.
6. TRA offers simple stainless steel straw cups to reduce plastic waste. The central government has banned single-use plastic cups from 2024 onward, and the Department of Environmental Protection of Taipei City Government has led the initiative by banning single-use plastic cups on December 1, 2022 at beverage shops in Taipei City. To support this policy, TRA began offering simple stainless steel straw cups on November 25, 2022, in two different colors to reduce plastic and protect the environment. By the end of 2022, TRA sold 183 sets of cups and generated NT\$118,922 in revenue.



Merchandise for The Future developed by Lion Travel



(14) TRA Smart Railway Information Integration Platform

1. The vision for the development of railway technological and industrial policies in the 2020 Transportation Technological and Industrial Policy White Paper is that "software will integrate advanced technology such as Internet of Things, big data, cloud computing, and artificial intelligence to improve passenger service, train control, maintenance, real-time control of safety, and information feedback applications. Therefore, Taiwan must promote the framework and strategies for the development of smart railways and build the smart railway Internet of Things platform to use terminals, networks, and the cloud to develop framework specifications, establish interface standards, and connect railway and information and communications businesses to drive the development of the smart railway industry." TRA hopes to standardize and digitize each unit of TRA, compile information of each system, and improve decision support by establishing the Consistent Data Interface Regulations and the TRA Smart Railway Information Integration Platform.
2. The Smart Railway Information Integration Platform Planning, Supervision, and Verification Service Project was awarded to CECI Engineering Consultants on April 14, 2022. During June and July, the company interviewed each TRA unit to understand their demands and evaluate the systems of each unit. The company also compiled suggestions from each TRA unit for system improvements, interdisciplinary application services, and data exchange. The company proposed five application services, namely safety management, train operation environment, preventative maintenance, passenger service, and decision support.
3. TRA established the Smart Railway Promotion Team on August 4, 2022, which incorporated seven aspects, namely safety management, passenger service, train operation control, electrical engineering, construction, rolling stock, and administrative support. The team also included personnel involved in organizational adjustment, educational training, labor safety management, and digitization. The Director General and the Deputy Director General of TRA were the chairperson and the vice chairperson of the team, respectively. The team assisted each TRA with identifying their business needs and researched and investigated smart management and development goals for the smart railway.

4. On August 31, 2022, TRA held a seminar featuring experts and scholars in railway engineering, railway automation, electromechanical integration, and railway institutions to exchange opinions on the preliminary plan. The seminar collected and compiled opinions and suggestions from the attendees and incorporated them into the short-term, mid-term, and long-term development plans of the smart railway.
5. In October 2022, the Smart Railway Information Integration Platform Planning, Supervision, and Verification Service Project reached its mid-term stage. Four Digital Transformation Education Training courses were held in November and December to help personnel from each TRA unit further understand the framework and layout of corporate digitization.

(15) Promotion of the information security management system

TRA promoted the information security management system and verified the central train control system, information center, and ticketing system. On November 18, 2022, TRA passed the second verification, and the ISO 27001 certificate was again validated. TRA continues to work on its strategies, management, and technology to ensure the safe use of information.

(16) Opening of TRA Workplace Cooperative Education and Care Service Center

To care for the children of TRA employees and create a friendly workplace, TRA established the Taipei Main Station Workplace Cooperative Education and Care Service Center and Yilan Workplace Cooperative Education and Care Service Center. Children and grandchildren of TRA employees or children and grandchildren of employees who worked at institutions that signed a joint childcare agreement with TRA were prioritized to assist employees with balancing their work and family life. The remaining vacancies in the centers were open to the public.

The inauguration ceremony of the Taipei Main Station Workplace Cooperative Education and Care Service Center was held on August 31, 2022, and cohosted by MOTC Minister Wang Kwo-tsai and TRA Director General Tu Wei. The inauguration ceremony of the Yilan Workplace Cooperative Education and Care Service Center was held on October



13, 2022, and cohosted by MOTC Head of the Department of Personnel Tsai Ying-liang and TRA Chief Secretary Chen Yu-mou.



MOTC minister presenting souvenirs to children of the education and care center



Inauguration ceremony guests and children of the education and care center



Presenting souvenirs to children of the education and care center



Completion of the inauguration ceremony

2. Innovations

(1) Ticket purchasing service through nine mobile payment operators

To improve the convenience of purchasing tickets, TRA added nine mobile payment services that use QR codes, namely JKOPay, iPASS Money, O'Pay, Pi Wallet, LINE Pay, EasyWallet, Gama Pay, icash Pay, and PX Pay Plus, for use at computerized ticket vending machines across Taiwan. Travelers can link mobile payments to their credit card, debit card, or their bank account and use a QR code payment method to purchase tickets.

(2) A feasibility study on applying remote control technology in whistle post rotation to reduce the risk of accidents

When TRA workers are working on a specific section of the railway, they erect stable working whistle posts at 800–1000 m ahead of both ends of the section. However, for sections that may affect sound transmission, the distance may be shortened to no less than 500 m. During nighttime construction, contract workers rather than TRA workers walk along the railway and remove or conceal the whistle posts, which increases the risk of accidents and can greatly affect train operation safety. Therefore, removing and concealing whistle posts requires engineering solutions and cannot be resolved by management.

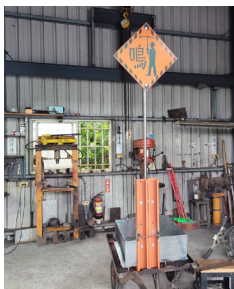
The Yilan Construction Branch applied value engineering and innovation to brainstorm three solutions: light-emitting diode whistle posts, liftable whistle posts, and rotatable whistle posts. The team members evaluated the proposals and concluded that the third proposal was the most feasible project and met the conditions of the signals. Additionally, the third proposal could conserve energy and was easy to operate. After ordering material, welding, and assembling the parts (Photos 1–4), the team tested the whistle post and remote control at K32+300 along the Yilan Line on June 11 and June 13, 2022 (Photos 5 and 6). A total of 22 trains passed during the tests; 20 trains saw the whistle posts and sounded their whistle, whereas the other two trains did not whistle because the whistle post was rotated after the workers tested its concealment. The maximum distance that the remote control could operate was 90 m. After preliminary tests, a whistle post was provided to the contract workers at the K32 earth anchor and slope improvement project. Contract workers could approach the whistle post from Fulong Street, Dongxing Street, and Guishougu Street and activate it without having to enter the railway (Fig. 1).

During the hazard identification and risk evaluation process, unacceptable risks should be resolved sequentially through measures such as

removal, replacement, engineering control, management control, and personal protective equipment. Control measures that can effectively lower risks should be used, and factors such as current technology and available resources should be considered. This project combined current materials for researching and developing equipment suitable for railway construction. Such equipment allows TRA to undertake risk-free construction work at locations that require whistle posts.



Assembly



Completion



Transportation



Positioning



Section personnel controlling a whistle post from outside the railway



Section personnel controlling a whistle post from outside the railway



Fig. 1: Diagram of installation of remote-controlled whistle post at K32+300

Chapter.4 Chapter.4



- 1 ● Profit and loss analysis
- 2 ● Passenger and freight transportation status
- 3 ● Earnings from affiliated businesses

4

2022 OPERATING
PERFORMANCE

1. Profit and loss analysis

Comparison of profit and loss ■ for 2021 and 2022

Unit: thousand NT\$

Item	2022	2021	Difference(%)
Total revenue	29,069,707	21,350,307	36.16
Passenger transportation revenue	12,800,771	11,181,025	14.49
Freight transportation revenue	558,413	534,158	4.54
Other revenue	13,108,868	7,860,774	66.76
Nonoperating revenue	2,601,655	1,774,350	46.63
Total expenditure	40,178,222	33,293,151	20.68
Operating costs	34,526,104	28,539,522	20.98
Operating expenses	1,525,471	1,405,638	8.53
Nonoperating expenses	4,126,646	3,347,992	23.26
Profit/loss	-11,108,515	-11,942,844	Loss decreased by 6.99

Note: The 2021 data are approved final accounts, whereas the 2022 data are preliminary final accounts.

Cause analysis

1. Total revenue for 2022 reached NT\$29.07 billion, an increase of NT\$7.719 billion (+36.16%) compared with 2021; passenger transportation revenue increased by NT\$1.62 billion. During the height of the pandemic in 2021, not all seats for reservation-only trains were available for passengers, and passengers were prohibited from boarding reservation-only trains using commuter tickets or electronic passes. In addition, the public cooperated with government COVID-19 prevention measures to reduce travel. As a result, passenger volume in 2022 increased compared with that of 2021. Other operating revenue increased by NT\$5.248 billion; this includes an increase in government subsi-



dy revenue of NT\$4.868 billion. This increase is due to compliance with IAS20, which resulted in an increase in deferred revenue recognized for the year from the adoption of the straight-line depreciation method for government subsidies of assets that undergo frequent maintenance by the TRA to ensure consistent performance; these assets were previously not applicable for depreciation. Rental revenue increased by NT\$228 million, and dining and travel service income increased by NT\$129 million. Nonoperating revenue increased by NT\$827 million; of this increase, government donation revenue increased by NT\$631 million.

2. Total expenditures for 2022 amounted to NT\$40.178 billion, an increase of NT\$6.885 billion (+20.68%) compared with 2021, of which personnel cost increased by NT\$455 million because of the 4% raise in salary for military, government, and public school personnel effective from January 1, 2022. Service expenses increased by NT\$552 million due to the increase in electricity prices effective from July 1, 2022, the end of the relief and exemption measures for electricity charges of 2021, and the increase in outsourcing costs in 2022 compared with 2021. Rental and interest expense increased by NT\$912 million because the actual mean interest rate was higher than last year, which led to an increase in debt interest; depreciation and amortization increased by NT\$4.946 billion, which was due to the aforementioned adoption of the straight-line method of depreciation for assets that undergo frequent maintenance for consistent performance which were previously not applicable for depreciation.

2. Passenger and freight transportation status

Status of passenger and freight transportation ■ since 2018

Year	Passenger volume (in thousands of people)	Passenger transportation revenue (in thousands of NT\$)	Freight transportation volume (in thousands of tons)	Freight transportation revenue (in thousands of NT\$)
2018	231,268	17,853,724	7,720	645,008
2019	236,151	17,770,071	7,313	638,062
2020	203,521	14,941,480	7,255	601,405
2021	154,927	11,181,025	6,609	534,158
2022	170,254	12,800,771	6,805	558,413

3. Earnings from affiliated businesses

(1) Asset development and revitalization

In recent years, the TRA has actively promoted land development to increase the operating performance of related businesses through promotion of private participation in infrastructure (PPI) projects, urban renewal, and the creation of superfacies. In addition, to increase revenue and improve its financial status, the TRA has continued to engage in asset revitalization, such as engaging in routine operations and leasing housing, land, space for telecommunications stations, commercial spaces, parking, advertising, and photography or filming locations. In 2022, the operating revenue of the asset development center reached NT\$4.324 billion.





2022 Operating revenue ■ of the asset development center

Unit: thousand NT\$

Item	Content	Earnings (before tax)
Conventional operations	Cement, limestone, and sand	1,899
Fixed asset investments	Taipei Main Station District Parcel No. T9	59,172
Royalty	PPI projects, commercial spaces, housing, superficies	771,718
Leasing operations	Housing, land, space for telecommunications stations, commercial spaces, passenger service spaces, machinery, parking, advertising, and photography/filming	2,375,188
Sale of assets	Sale of fixed assets	1,055,501
Others	Interest and miscellaneous revenue	60,552
Total		4,324,030

(2) Affiliated operations

1. Cultivate the TRA bento (boxed meal) market

The TRA has actively collaborated with local county and city governments, and Taiwanese and Japanese companies as well as companies from other industries to develop and launch TRA specialty bentos. By using local fresh and natural ingredients, the TRA supports local farmers and fisheries.

The TRA sold 6,465,584 bentos in 2022, averaging 17,714 bentos per day for a total revenue reached NT\$400,735,942.

2. Royalty revenue from TRA trademark and image authorization and revenue from agency sales of TRA products

The Taiwan Railway Shop is committed to brand management and optimizing its product sales channels, e-commerce marketing, trademark and image authorization, agency sales, and cross-industry collaboration to achieve high revenue growth.

Regarding TRA trademark authorizations, a total of 315 products were authorized for an authorization income of more than NT\$3.56 million.

The total revenue from TRA-related products (including train duty department and all restaurants) amounted to NT\$32.37 million in 2022.

Merchandise sales royalties from the tourist spaces associated with the Future Excursion and JieYou Excursion trains in 2022 reached NT\$120,000.

3. Continuing to develop railway travel tourism

The TRA continues to develop the planning and execution of collaboration operations for railway travel tourism to concurrently develop new, diversified, innovative, and sustainable local railway tourism.

Operating revenue for the Center of Affiliated Businesses amounted to NT\$609.3 million in 2022.

Revenue type	Amount (before tax; in NT\$)
TRA catering department (Trade royalty and royalty from the Future and JieYou Excursion trains)	3,537,749
Train duty department (including the Hualien division and Taichung dining service division) (sales revenue)	5,959,519
Taipei, Taichung, and Kaohsiung restaurants (sales revenue)	1,961,584
TRA catering service department (railway travel tourism, including space-rental revenue for the Future Excursion train, JieYou Excursion train, cruise-style trains, and Formosa Express)	95,156,886
TRA catering service department (trademark royalties from Taiwan FamilyMart, Formosa Railroad Bento Festival space rental, and profit sharing of revenue from Formosa Railroad Bento Festival sales)	719,667
Train duty department (including Hualien division and Taichung dining service division) (bento revenue)	123,254,675
Taipei, Taichung, and Kaohsiung restaurants (bento revenue)	349,751,267
Commission revenue from agency sales	23,491,794
Miscellaneous	5,471,831
Total	609,304,972

Chapter.5 Chapter.5

Special Report, Taiwan Railways

Administration 2022 Railway Anniversary

Celebration Ceremony (135th Anniversary
of Taiwan Railways)

- 1 ● Passenger and Freight Transportation
- 2 ● Asset Development and Revitalization
- 3 ● Materials and Procurement
- 4 ● Personnel Management
- 5 ● Professional Training
- 6 ● Occupational Safety
- 7 ● Operation Safety
- 8 ● Disaster prevention
- 9 ● Ethics
- 10 ● Cultural Assets



5

OPERATIONAL PERFORMANCE

Special Report, Taiwan Railways Administration 2022 Railway Anniversary Celebration Ceremony (135th Anniversary of Taiwan Railways)



Key Visual Design of the Celebration Conference

Marking the 135th anniversary of Taiwan Railways, the Taiwan Railways Administration (TRA) held the 2022 Railway Anniversary Celebration Conference—135th Anniversary of Taiwan Railways on June 9, 2022, in the auditorium of the TRA Building. Minister Wang Kuo-tsai of the Ministry of Transportation and Communications (MOTC) handed out several awards for volunteer excellence, years of service, and TRA allieship. He paid tribute to the TRA staff for their unrelenting hard work in providing high-quality transportation services at the frontline for the Taiwanese public and affirmed their dedication and preemptive actions for safeguarding passenger health during the pandemic. The Minister stated that the passing of amendments to the Railway Act and the Act for Establishment of State-owned Taiwan Railway Co., Ltd on May 27, 2022 marked a major step for TRA in entering into a new era following nearly 20 years of discussion on the corporatization of TRA.

TRA Director-General Tu Wei stated that safety reform has always been the TRA's top priority. During the past year, TRA staff have reinforced the implementation of on-track operation safety measures, established a foreign object detection and rockfall warning system, planned a project for establishing road vehicle incursion prevention mechanisms and warning systems, installed speed restriction backup systems for rolling stocks, built a safety management system to improve infrastructure, such as tracks and electrical services, and increased track maintenance capacity. The concerted effort of the TRA staff has been instrumental to the success of each of these tasks.



Taiwan's railways are a crucial segment of public transportation in Taiwan; hence, the TRA has a duty to improve safety, operations, and services to meet the public's expectations. Currently, the active promotion of the corporatization of TRA is the most critical and effective method for transformation and reform and relies on the support of all staff. The award recipients at the celebration conference represent the epitome of the TRA's progress; although the transformation is complex, successful reform is possible with the concerted effort of all staff to overcome difficulties. Accordingly, the TRA can strive to achieve sustainable development and provide the best travel services for the public.

1. Passenger and Freight Transportation

(1) Passenger transportation

1. Minor time table changes from June 29, 2022 onwards

- (1) The EMU3000 series trains replaced four Shulin–Taitung Puyuma Express trains, two Taichung–Taitung Tze-Chiang Limited Express trains, and two Tainan–Hualien Tze-Chiang Limited Express trains. This increased transportation capacity by 13.8% for the Tze-Chiang Limited Express eastern lines.
- (2) The Tze-Chiang Limited Express trains for Xinzuoing–Hualien Train Nos. 306, 308, 317, and 323 as well as Taichung–Taitung Train Nos. 372 and 373 were replaced with Puyuma Express trains to reduce travel time.
- (3) The Chu-Kuang Express trains for Chaozhou–Hualien Train Nos. 561 and 562 and for Qidu–Chaozhou Train Nos. 506, 507, 522, and 513 were retired. In response to the travel demand for popular route sections, six EMU900 series trains will be used. This marks the retirement of all Chu-Kuang Express trains that featured folding doors, which were replaced to improve operational safety.
- (4) The number of diesel-powered Tze-Chiang Limited Express trains in the Kaohsiung underground railway section was reduced from 14 to 4 trains per day to improve air quality.

2. Provide safe and accurate transportation services

The punctuality rate of TRA passenger trains in 2022 reached 94.98%, an increase of 2.17% from 92.81% in 2011. The main causes of train delays were faulty equipment (49.7%), natural disasters (27.2%), low speed (7.9%), invasion by foreign objects (7.8%) and level crossing accidents and accidents with casualties (6.6%). TRA will continue to actively renew and replace operating equipment and acquire new locomotives, review and improve equipment maintenance processes, and improve the profes-

sional training of its staff. The number of equipment failures in 2022 was markedly reduced by 9.42% compared with the same period in 2011. In the future, TRA will continue to improve the equipment inspection and maintenance, accelerate the replacement of old equipment, strengthen the safety management mechanisms for work areas along railway tracks, and continue to provide safe and timely services.

3. Conduct joint railway–bus operations for Taipei–Luodong–Hualien

The TRA performed joint operations with intercity bus operators (Capital Bus, Kamalan Bus, Metropolitan Transportation Corporation, and Kuo-Kuang Motor Transportation Company). Joint operations provided services for 71,528 passengers in 2022, averaging 196 passengers per day.

4. All public restrooms managed by the TRA rated as excellent or higher

In 2022, the TRA was responsible for 741 public restrooms throughout Taiwan, all of which were rated excellent or higher. Among them, 738 received the highest rating, an increase of 1.2% compared with 99.6% in 2021. The TRA will continue to maintain high restroom standards in the future.

(2) Freight transportation

1. In accordance with the amendment to Article 4 of the Regulations for Train Driver Qualification, License Issuance and Management of Public and Private Railways on the types of public railway train driver licenses, a car type for shunter drivers was included (amendment to Article 3). As of late 2022, 99 drivers of existing shunters have obtained appropriate licenses (92 for internal employees and 7 for external employees).
2. Due to the earthquake in Chishang Township in Taitung, a 3-month freight train and labor deployment measure was planned in conjunction with the repairs for the Fenglin–Yuli segment.
3. To strengthen national defense and security, the TRA cooperated with the Army Logistics Command for the deployment of flat cars and transportation equipment for the Army's Land Service Department.
4. The TRA also upgraded weighbridge equipment to ensure driving safety. To prevent the overloading of freight vehicles, the TRA set up weighbridges at Qidu, Yilan, and Xincheng stations for performing random inspections on freight vehicles. The weighbridge equipment and peripheral facilities at Yilan station were upgraded by August 2022 to facilitate accurate random inspection of freight vehicles to avoid overloading and maintain operation safety.



2. Asset Development and Revitalization

(1) Asset development

In response to environmental changes, the TRA has been actively combining transportation construction with asset development to maximize the construction benefits of public infrastructure. Through mechanisms such as asset development and other business operations, the TRA has conducted various development projects in accordance with relevant laws and regulations, such as the Act for Promotion of Private Participation in Infrastructure Projects, Urban Renewal Act, and National Property Act, as well as in collaboration with government railway construction projects, the Urban Regeneration Acceleration Scheme of the Executive Yuan, and the urban development projects of local governments.

The TRA has achieved good performance in land development by adopting methods such as promoting private participation in infrastructure projects, urban renewal, and the creation of superficieses. Earnings from relevant land development projects in 2022 reached NT\$474.65 million. The following table lists details of these earnings.



Foundation-laying ceremony for the Nangang BOT project

Unit: thousand NT\$

Land development method	Project	Earnings for 2022 (before tax)	
		Land rental	Royalty
Promotion of private participation in infrastructure projects	Land development of Taipei Main Station District Parcel No. T9	59,172	-
	Nangang Station BOT	59,555	100,300
	Songshan Station BOT	47,323	58,225
	Wanhua Station (eastern and western sections) BOT	42,618	2,962
	Taichung Station Railway Cultural Park BOT	3,139	13,556
Creation of superficieses	Banqiao Station special district (Type II special district zone) BOT for international tourism hotel	9,014	9,412
	Jingxiu Road, Yuanlin Township, Chuanghua County	289	715
	Lot 28, Qiaobei section of Yongkang District, Tainan City	116	242
	Fuhe section of Zhongzheng District, Taipei City	1,319	3,341
	Baoqing section of Songshan District, Taipei City	1,759	24,200
	Chenggong section of Zhongzheng District, Taipei city (126 and 127)	2,686	10,419
	Chenggong section of Zhongzheng District, Taipei city (125 and 129)	1,959	8,277
	Yucheng section of Nangang District, Taipei City	2,958	11,100
	Subtotal	231,907	242,749
	Total	474,656	



In addition, to revitalize land assets, the urban planning committee of the Pingtung County government reviewed and approved the Pingtung Station and adjacent area urban renewal development and investment planning project on February 24, 2022 and publicly disclosed the project's investment promotion and selection documents between April 26 and May 9, 2022. A local briefing was held on June 24, and an announcement was made on July 25th. Subsequently, A initial invitation to tender was held from September 21 to December 19, 2022. A qualification document review was held on December 20, 2022. Estimated future earnings from the project are expected to reach NT\$1.429 billion.

Furthermore, the TRA Chaozhou Railway Park opened on December 17, 2022. The park includes an indoor railway cultural museum, eating areas, and outdoor recreation areas. In the future, the TRA plans to hold hands-on activities on railway technologies and culture, display 15 historical locomotives, and plan 10 cultural and creative carriages for the public to participate in hands-on activities. Annual rental earnings from this project are expected to reach NT\$940,000.



Opening ceremony of the Chaozhou Railway Park

In 2022, 6 on-going government-planned urban renewal projects and one superficieses creation project were active (a total of 7 cases). The details are shown in the table below.

Urban renewal projects (government-planned)		
Project name	Lot size	
Nangang Marshalling Yard Urban Renewal	54,405m ²	
Yucheng section of Nangang District, Taipei City Urban Renewal	3,392.19m ²	
Urban Regeneration Project of Taichung Taiwan Railways Station Surrounding Area (Kuo-Kuang Motor Transport Temporary Station)	6,400m ²	
Yuanlin Station Surrounding Area Urban Renewal Plan	27,033.69m ²	
Urban Renewal Plan of Kaohsiung Station East-side Old Dormitory	27,744.52m ²	
Urban Renewal Development and Investment Plan of the Land Surrounding Pingtung Station Project	8,850m ²	
Creation of superficieses		
Project name	Lot size	Duration of special approval
Superficieses of Shulin Dormitory, New Taipei City and Construction Project	10,127m ²	50 years

(2) Asset revitalization

1. Station commercial spaces and passenger service spaces

In accordance with relevant provisions of the Act for Promotion of Private Participation in Infrastructure Projects for revitalizing assets, the TRA plans to invite investment and creativity from the private sector and transform train stations into regional commercial centers that provide comprehensive travel services and serve as locations for art, culture, and business. As of late 2022, total royalties from such commercial spaces in the four stations of Nangang, Taipei, Banqiao, and Xinzuoing amounted to NT\$315.98 million.



In addition, an invitation for the multiobjective land lease tender for a lot related to the platform elevation project of Yuanlin Station (four sections for parking lots and three sections for commercial purposes) was announced on March 10, 2022. The winning tender list was evaluated and selected on June 2, and the contract was signed and notarized on September 16, 2022. Operations are expected to commence from 2023, and the TRA estimates to receive annual earnings amounting to approximately NT\$14.25 million.

2. Transforming warehouses and cultural assets into cultural and creative spaces for tourism

To develop and revitalize TRA assets, the TRA is leasing its existing warehouses. Furthermore, to effectively maintain and use TRA cultural assets (heritage sites, historical buildings, and antique houses), we collaborated with local governments to renovate them into exhibition spaces for artistic creations and as new art and cultural landmarks for the public to visit. In 2022, 33 properties were rented out for a total rental income of NT\$36.44 million.

3. Land and property rentals

Through diversified management and development of unused land, dormitories, offices, land, and parking lots along railway tracks, the TRA leased a total of 805 properties and 126 parking lots as of late 2022 for a total rental income of NT\$870.93 million. For the revitalization project of Lot Nos. 61 and No. 62 on Hemu Road of the Yilan Station (Yilan Train Station Front Plaza) for commercial development, we announced invitations for tender and selected reputable local companies to create the URBAN Shopping Plaza—a community-based shopping mall covering an area of nearly 10,000 m² that focuses on food trends and lifestyles. The plaza officially opened on January 1, 2023. The shopping plaza features renowned domestic and foreign cuisine, lifestyle brands, and integrates local specialties. Together with its vast parking lots, the plaza serves as a convenient and comfortable shopping location for the public.

4. Leasing advertising spaces

The TRA has continued to promote the use of station spaces for advertising through tenders with consideration of the aesthetics of its train stations. For advertisements inside trains, we offer poster advertisements using frames and LCD screens as well as wrap advertising. For advertisements inside and outside the station, we offer 2D, lightbox, and multimedia advertising. The unit of an advertisements is a station, and both single or multistation advertisement tenders are held. The awarded tenderer can unleash their creativity and plan the overall advertisement, including its position, size and media form. The overall advertising rental income for 2022 amounted to NT\$44.84 million.



URBAN Shopping Plaza

5. Leasing photography or filming locations and facilities

In collaboration with relevant policies to promote the cultural industry, enhance the image of the TRA, and revitalize relevant TRA assets, the TRA handled 33 projects for photography/filming purposes, such as dramas, movies, documentaries, and advertisements in 2022, for a total rental income of NT\$1.06 million.

6. Leasing spaces for base stations

To facilitate travel and improve communication quality without affecting driver safety, the TRA has actively built base stations along its railway tracks and offered to rent its stations, properties, and real estate to telecommunication operators to set up mobile phone base stations. In 2022, this rental income amounted to NT\$37.43 million.

7. Leasing plans for solar photovoltaic equipment

To implement the policy goal of the Executive Yuan of achieving renewable power generation composing 20% of total power generation by 2025, the rooftops of public buildings have been leased out for the installation of solar photovoltaic power generation equipment. In addition to awarded tender projects, the TRA has successively awarded two tenders including 20-year leases for the installation of solar photovoltaic power generation equipment on the south-side rooftops of Taitung Station, the surrounding buildings and lands, and the TRA Central Region Supply Workshop. Estimated annual rental income from these two tenders is expected to reach NT\$25 million following the installation of equipment and connection to the main power grid.



Solar photovoltaic power generation equipment installed on the rooftops of Taitung Station and its surrounding buildings, parking lot roof, and covered walkways



8. Relief measures for vendors affected by the pandemic: extending rent payment deadlines to assist vendors to overcome challenges

To ease pressure on lessees, the TRA permitted an extension of payment deadlines for lessees who had signed a lease or contract based on the Act for Promotion of Private Participation in Infrastructure Projects with the TRA or its subordinate units. For applicable parties that applied in writing to defer rent and fixed fee payments for June–August 2022, the payment deadlines were extended to late September 2022. No late payment fees were charged during the extension period, and any such fees already collected were reimbursed without interest. Accordingly, a total of 167 vendors applied to defer the rent and fixed fee for June–August 2022.

9. Amended the draft resolution for the Railway Act in collaboration with the MOTC to revitalize the operations and development of relevant agencies

The TRA, in collaboration with the MOTC, amended the draft resolutions of the Railway Act for relevant articles concerning sustainable development to establish a mechanism for developing and managing the real estate assets of state-owned railway institutions. This amendment enables the TRA to promote the transformation and revitalization of railway institutions, inject financial resources into their core operations, and comply with the Transit-Oriented Development (TOD) concept of integrating transportation construction with land revitalization and urban development. The goal is to establish a mechanism for state-owned railway institutions to develop and dispose real estate assets and to promote tourism railways.

3. Materials and Procurement

(1) Statistics on procurement projects

In 2022, the TRA handled a total of 695 procurement projects, including 230 engineering service procurement cases, 323 labor service procurement cases, and 142 property procurement cases, for a total sum of NT\$14.82 billion. The projects were as follows: The procurement of 60 energy-efficient and environmentally friendly passenger cars for branch lines; car equipment renewal and remodeling of TRA Hai-feng and Shan-lan excursion trains; repairs, equipment, and materials for the EMU858 train (4 cars) that encountered an accident; the TRA electrical engineering smartification upgrade project (level crossing closed circuit television system, centralized crossing monitoring equipment and transmission/receiver system, and the host machine of level crossing obstruction detector upgrade project); Fu Gang Training Center project (survey, soil investigation, design

and supervision service), TRA rail track structural safety enhancement project (Yilan Construction Branch PC sleeper turnout upgrade project and track replacement projects); four-year maintenance and operation management of train dispatch wireless systems; planning, design, and supervision service for the phase-2 construction of the Kaohsiung Railway Workshop Chaozhou site; four-year maintenance plan for the air-conditioning system equipment at Taiwan Railway Administration Building, Wanhua Station, and Banqiao Station (2022–2026); and intelligent railway information integration platform commissioned planning, supervision and inspection service project.

(2) Revised operation rules in accordance with relevant regulations and to improve procurement and material management performance

1. Revised the TRA Procurement Project Responsibility Division and Internal Control Mechanism Table

To improve the efficiency of handling of procurement disputes, the TRA revised the TRA Procurement Project Responsibility Division and Internal Control Mechanism Table on June 21, 2022 in accordance with the latest version of the Table of Responsibilities for the MOTC and Affiliated Organizations (Concurrent Affairs).

2. Revised relevant instructions for tenderers and contract regulations in accordance with relevant regulations of the Public Works Committee of the Executive Yuan to satisfy actual needs

- (1) On January 4, 2022, revised the construction procurement contract, turnkey contract/design–build contract for construction procurement, service procurement contract, technical service procurement contract for public works, project management procurement contract for public works, and information service procurement contracts.
- (2) On January 22, 2022, revised the construction procurement contract and turnkey contract/design–build contract for construction procurement.
- (3) On February 15, 2022, revised the “Instructions to Tenderers” and instructions for tenderers concerning references for the most advantageous bid of procurement projects of a value not reaching the threshold for publication but not less than one tenth of this threshold.
- (4) On February 16, 2022, revised the service procurement contract.
- (5) On May 11, 2022, revised the construction procurement contract, turnkey contract/design–build contract for construction procurement, service procurement contract, technical service procurement



contract for public works, project management procurement contract for public works, and information service procurement contracts as well as the Instructions to Tenderers and instructions for tenderers concerning references for the most advantageous bid of procurement projects of a value not reaching the threshold for publication but not less than one tenth of this threshold.

- (6) In accordance with the notice from the Public Construction Commission dated April 29, 2022 (Gong Cheng Qi Zi No. 1110100327) regarding the property procurement contract sample and the notice dated May 2, 2022 (Gong Cheng Qi Zi No. 1110002191), the TRA revised some of the regulations concerning property procurement contracts as well as the model statement of tenderers of the Instructions to Tenderers. Subsequently, the TRA model instructions to tenderers and contract regulations for property procurement contracts (June 2022 version) were announced on June 2, 2022.
- (7) On June 23, 2022, revised the construction procurement contract.
- (8) On August 9, 2022, revised the technical service procurement contract for public works and project management procurement contract for public works.
- (9) In accordance with the policy of the Public Construction Commission, the TRA provided online payment services for bid bonds of procurement cases with bid bond amounts of NT\$2 million (inclusive) or lower. Subsequently, the TRA model instructions to tenderers and contract regulations for property procurement contracts were revised on August 17, 2022.
- (10) Starting from August 22, 2022, the TRA began offering online payment services for bid bonds for new procurement projects.
- (11) On August 22, 2022, the TRA revised the Instructions to Tenderers and instructions for tenderers concerning references for the most advantageous bid of procurement projects of a value not reaching the threshold for publication but not less than one tenth of this threshold.

(3) Organized benchmarking, on-the-job training, and operation inspections

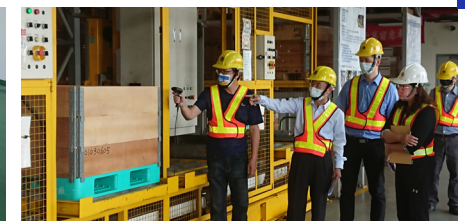
1. Between April and September 2022, the Northern, Central, and Southern Region Supply Workshops conducted material audits and audits pertaining to ten major risk factors and their prevention measures as well as on small-amount procurements. The audits for the various risk factors were organized on the basis of the specific operation characteristics of each workshop, and were performed to supervise the implementation of relevant

operating regulations by each workshop to ensure the quality of the procured materials and safe warehouse management. In response to the low storage space of the workshops identified during the audits, on-site inspections were conducted, and improvement plans were proposed.

2. In July and August 2022, the TRA held basic training for all procurement personnel to learn procurement laws and regulations as well as related operating regulations to enhance their professional knowledge and skills. A total of 141 personnel received this training.
3. In August 2022, the TRA held a seminar on the TRA operational procedures for reviewing models and conditions for establishing qualification stipulation working groups to increase procurement quality and reduce bidding and performance disputes.
4. In October 2022, the TRA held an educational training course on the Public Construction Cost Estimating System (PCCES) to increase the knowledge of TRA personnel in the use of the PCCES and its item code applications when handling construction procurement projects.
5. Between October and November 2022, we conducted inspections on newly added control and management mechanisms for bid evaluation operations and held experience-sharing conventions to improve the quality of procurement operations and promote the standardization of operations across units all tendering departments or units.



Specific areas for materials awaiting inspection and storage



Material management inspection conducted by the Northern Region Supply Workshop



Inspecting the control and management mechanisms for bid evaluation operations of procurement projects



On-site inspection of the construction of the future Hualien Supply Workshop



4. Personnel Management

(1) Employee Assistance Program (EAP) seminars

1. April 19, 2022: Briefing on personal coach consultation—Personal Coaching Consultation System: Awakening Your Leadership Traits
2. May 11, 2022: EAP finance seminar (online video course)—Learn about Retirement Life Planning
3. May 20, 2022: In-depth training for care workers (online video course)—Into the World of Patients with Mental Illness: Breaking Myths and Understanding Mental Illness and Catching You at the Precipice: Living with People with Mental Illness
4. May 31, 2022: Training for awareness on employee assistance and caring (online video course)—How to start a conversation to express concern: interpersonal sensitivity training
5. June 1, 2022: EAP job seminar (online video course)—Excellence in Communication: Effective Communication and Efficient Work
6. June 22, 2022: Themed growth group session I (online video course)—Music for Relieving Stress and Enhancing Breathing
7. June 24, 2022: EAP law seminar (online video course)—Knowing the Law and Working Assuredly in the Office
8. July 26, 2022: Professional knowledge training and seminar (online video course)—Preventing and Providing Concern toward Illegal Infringements at the Workplace
9. September 7, 2022: EAP health seminar—Why Engage in Running?
10. September 22, 2022: Themed growth group session II—Workplace Conflict and Stress Management
11. September 26, 2022: Professional knowledge training—Dialogue with an Iceberg
12. October 5, 2022: Personal coach consultation workshop—What Does a Coach Do? Identifying DISC Behavioral Style and Engaging in Communication
13. November 9, 2022: Professional knowledge training—Eliminating Generation Gaps in Communication
14. November 18, 2022: Professional knowledge training—Resource Integration, Utilization, and Referral.
15. December 21, 2022: EAP "Memories Engraved in My Heart" Image and Text Competition Award Ceremony and Seminar—Touching Moments and Memories for a Lifetime.

(2) Management training and development for mid- and high-level managerial personnel

The TRA held five workshops between September and November 2022 to improve the management skills of five groups of TRA mid- and high-level managerial personnel by improving communication, execution, and problem-solving skills to in turn increase management efficiency.



Speech delivered by the Director-General



Lecture delivered by Mr. Lin Chin-ti during the Corporate Leadership Management—Reform and Adaptation session

(3) 2022 Model Civil Servant Award Ceremony

The 2022 MOTC Model Civil Servant Award Ceremony was held on September 5, 2022 (Monday) in the fifth-floor auditorium of the ministry building. The ceremony was hosted by MOTC Minister Wang Kuo-tsai, who commended the 35 recipients of the award. Five personnel from the TRA received the award at the ceremony, namely, Senior Executive Officer Lin Jing-shan; Assistant Engineer Hsu Ling-wen, Director Liu Chien-liang, Deputy Director and Engineer Cheng Kuo-hsi, and Chief and Engineer Chen Chen-yuan, in that order.



Minister Wang Kuo-tsai with the TRA recipients of the Model Civil Servant Award

(4) The 2022 President Cup Slow Pitch Softball Championship

The TRA slow-pitch softball team, consisting of elite players from the transportation, construction, rolling stock, and electrical engineering departments, represented the TRA in the 2022 President Cup Slow Pitch Softball Championship. Director-General Tu Wei presented the flag in a ceremony to boost the morale of the TRA team and encouraged the staff to regularly engage in physical activity to maintain their health and psychological well-being and enhance their work motivation and performance.



Director-General Tu Wei with the TRA team

5. Professional Training

(1) Current situation of the TRA Training Center

The employee training center is a unit responsible for providing training for TRA personnel. Since its relocation to Beitou over 50 years ago in 1971, its facilities have aged and the seismic resistance of its building no longer



Classroom



Community center

satisfy current standards. Thus, the center will be relocated following the completion of the new Fu Gang Training Center. Employee training is a key focus of the TRA. To ensure uninterrupted training before the completion of the new center, training was temporarily moved to the Shulin Marshalling Yard on October 17, 2022.

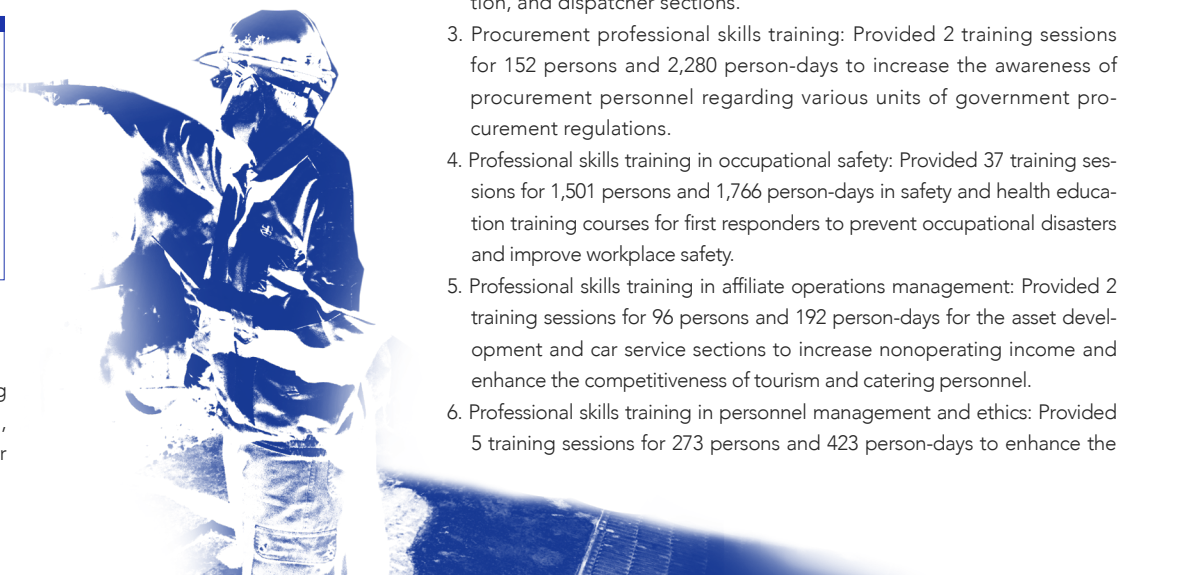
The present Training Center has four classrooms, a community center, a gym, and dormitories for learners.

In 2022, in addition to promoting the six goals of employee training, namely, safety, precision, service, innovation, unity, and honor, the center aims at cultivating various professional talents to provide high-quality railway transportation services for the public and enable diverse TRA operations to ensure the sustainable development of the TRA.

(2) Training provided in 2022

The TRA Training Center has arranged 162 training sessions for 6,211 persons, for a total of 52,239 person-days in 2022 as follows.

1. Pre-employment training for new recruits: provided 48 orientation training sessions for 2,128 persons and 16,707 person-days in on-site operation training (machine inspection branch training) for new employees recruited through the railway transportation personnel examination.
2. Track professional skills training: provided 58 training sessions for 1,782 persons and 30,091 person-days for the transportation, operation, and dispatcher sections.
3. Procurement professional skills training: Provided 2 training sessions for 152 persons and 2,280 person-days to increase the awareness of procurement personnel regarding various units of government procurement regulations.
4. Professional skills training in occupational safety: Provided 37 training sessions for 1,501 persons and 1,766 person-days in safety and health education training courses for first responders to prevent occupational disasters and improve workplace safety.
5. Professional skills training in affiliate operations management: Provided 2 training sessions for 96 persons and 192 person-days for the asset development and car service sections to increase nonoperating income and enhance the competitiveness of tourism and catering personnel.
6. Professional skills training in personnel management and ethics: Provided 5 training sessions for 273 persons and 423 person-days to enhance the





professional skills of the personnel and ethics departments; the TRA organized relevant training sessions such as those for human resources personnel and ethics work review meetings and consensus camps.

7. Lecturer skills training: provided 6 training sessions, including periodical re-training, for 169 persons and 418 person-days to promote the certification of lecturers and increase teaching quality; an external professional institution was appointed to provide teaching skills training for the certification of internal lecturers.
8. Other training: Provided 4 training sessions for 110 persons and 362 person-days. The substituting for the Railway Bureau in providing training for their railway construction route blockade section and TMS educational training management system practical operation course were included.



Lecturers



The 49th Driver Training Batch



EMU3000 Car Service Staff Training Batch

6. Occupational Safety

(1) Improve the occupational safety culture of TRA

In light of the major accident that occurred at Yilan Station this year, specific safety inspections of crew operations were performed by visiting

various stations with similar operations to understand the environment in which drivers need to cross tracks during shift changeovers and the preventive measures adopted by the various rolling stock sections. Both management and equipment were improved, and reviews were implemented to ensure that preventive measures are effective, avoid similar accidents in the future, and ensure a safe working environment.

(2) Promote the physical and mental health of employees

1. On-site occupational safety and health consultation services were provided every month for 3 hours for a total of 12 sessions in 2022.
2. To promote health in the workplace, the TRA planned four lectures on workplace health and safety promotion, education, and training by inviting registered nurses from Country Hospital to give talks on prevention of illegal actions during work, prevention of musculoskeletal injuries, education and training regarding overwork, and maternal health protection and management.

(3) Continue to promote occupational health and safety management systems (OHSAS 18001 & ISO 45001)

The TRA continued to perform system audit verifications and cultivate system auditors to effectively control hazards at various facilities and environments through system management. Although this training was suspended in 2021 due to the pandemic, the TRA completed the 2021 follow-up audit and verification for all 36 sections of the TRA organization by March 17, 2022. Although the TRA failed twice to open the tender for management system verification in Q3 due to uncertainties related to the pandemic, follow-up verification for 2022 is planned to be held in 2023.

Regarding system auditor training, the TRA held trainings for 20 people each for its central and southern offices, for a total of 40 people in 2022.

(4) Improving construction safety and health standards

The TRA does not provide advance notice to construction supervisors when conducting nighttime inspections. Inspections are performed by an inspection team comprising the director of occupational safety, the branch organization directors of labor safety, and occupational safety and health personnel from the occupational safety office. Inspections of on-going



projects in 2022 that were performed without prior notice included the cut-and-cover tunnel construction on the Jiji Line, construction of the new signal relay room in Hukou Station and the Disanshuangshi and Xinshe bridges of the six-year railway operation safety projects, restoration of the Former Hualien Railway Hospital, and the platform elevation projects in Dahu and Luzhu Station under the jurisdiction of the Kaohsiung Construction Branch.



Chiayi Construction Branch cut-and-cover tunnel construction on the Jiji Line

(5) Actions for improving occupational safety

1. After an accident, the relevant unit uploads information concerning the incident to the TRA occupational safety and health group; horizontal communication across branch organizations then occurs to promote awareness.

2. Gather feedback to improve the occupational safety management system after occupational accidents

In accordance with the type of the accident, visits to similar workplaces are arranged to understand their environments, determine the preventive actions of each unit, and implement improvements to management and equipment:

(1) During August 18–30, 2022, the TRA held an operational safety visit and improvement seminar for train crew by inviting the transportation, construction, rolling stock, and electrical engineering sections of the various branch organizations to perform on-site surveys of management and equipment and requiring the various units to undergo case education training and implement equipment improvements.

(2) From December 27, 2022 to January 7, 2023, the TRA held a second operational safety visit and improvement seminar to teach train crew

how to perform inspections based on the findings of the previous seminar.

3. The TRA held year-end evaluation and benchmarking training concerning management, command, and supervision and occupational health and safety for operations managers at various levels with the goals of improving occupational health and safety at the branch organizations and evaluating the established occupational health and safety management system. In addition, the TRA held a year-end evaluation and demonstration of outstanding units (4 sessions in the northern, central, southern, and eastern regions for 4 hours each).
4. From June 29 to July 21, 2022, the TRA held occupational safety education and training for telecom operators by inviting the managerial personnel of relevant construction and electrical engineering units and occupational safety unit managers to give lectures on topics such as on-track safety and the correct use of radios. These training sessions aimed to improve the safety and health awareness of telecommunication staff and mitigate occupational hazards.



Train crew operation safety training



Occupational safety education and training for telecom operators



7. Operation Safety

To improve TRA operational safety and station inspections, the TRA operational safety department carried out the 76th TRA Safety Week activities on November 1–7, 2022, publicized level crossing safety, and held relevant inspections.



Operational safety department personnel inspecting the TRA Chaozhou Depot Safety Week work tasks



Operational safety department personnel inspecting Qidu Station Safety Week work tasks



Operational safety department personnel inspecting the Yilan Construction Branch Safety Week operations



Operational safety department personnel inspecting Yingge Station Safety Week operations

8. Disaster prevention

In light of the increasingly severe effects of climate change and occurrence of events such as earthquakes, typhoons, heavy rains, landslides, and the COVID-19 pandemic, all units are now required to conduct pre-emptive evaluations and analyses of various disaster scenarios and adopt corresponding disaster prevention measures and countermeasures. The objective is to minimize damage through regular drills and contingency planning and to restore normal railway operations as quickly as possible when such events occur.

(1) Hold rail safety mobilization, disaster prevention, and counterterrorism drills

In 2022, the TRA held five comprehensive large-scale live drills with five TRA joint mobilization offices for 836 employees on the emergency response and rescue (recovery) efforts for various railway disasters. On August 23, 2022, the Construction Maintenance Headquarters conducted the TRA Building Disaster Prevention Drill, a live evacuation and disaster prevention drill for practicing operations at the second floor or higher building levels. The drill had 357 participants. In total, including external support units, 4,178 individuals were mobilized to participate in the drills. Through these drills, the TRA aims to enhance the evacuation, emergency response, casualty care, rescue, and recovery capabilities of various teams and of the Construction Maintenance Headquarters when responding to disasters.

No	Unit	Date	Drill location
1	Headquarter Corps	111.8.23	TRA building
2	Taipei Joint Mobilization Office	111.7.14	Banqiao Station
3	Taichung Joint Mobilization Office	111.4.26-27	Taian Tunnel
4	Kaohsiung Joint Mobilization Office	111.5.26	Dounan Station
5	Yilan Joint Mobilization Office	111.6.15	Dongshan Station
6	Hualien Joint Mobilization Office	111.3.29	Linrong Shin Kong Station



Drills held in the various regions



Flood prevention drill

(2) Flood preparedness

Beginning from the flood season in March, the TRA held disaster prevention awareness education with various emergency response teams and thoroughly verified all equipment in accordance with a flood inspection checklist. Flood prevention drills were conducted in accordance with the established flood prevention plan. In April, the various regional emergency response teams formed a spot-check task force to supervise the flood prevention preparedness of the units within their jurisdiction. Furthermore, the TRA Headquarters also formed a joint supervision task force comprising personnel from the transportation, construction, rolling stock, electrical engineering, and special defense groups to supervise and assess the flood preparedness of all emergency response teams.

The TRA has completed the customization of the Quantitative Precipitation Estimation and Segregation Using Multiple Sensor (QPESUMS) system and has promoted its use to all response centers of the TRA organization. Using this system, the Central Weather Bureau (CWB) can provide the TRA with real-time precipitation monitoring data for key sections, bridges, and construction sections that is updated every 10 minutes. This serves as a reference for alerts regarding or responding to water level and precipitation volume warnings from the monitoring points. The Construction Maintenance Division compiles the information submitted by the individual construction branches regarding the warning, alert, and action values for key sections and bridges and submits the compiled data to the CWB to make ad-hoc corrections.

(3) Auxiliary Military Service Corps training

To enhance the response skills of the military service corps for emergency railroad repair during wartime, the TRA organized training for the Auxiliary Military Service Corps based on the Guidelines for the Assembly and Training of Annual Auxiliary Military Service Corps in collaboration with the Ministry of Defense. In total, two independent regional corps (a total of 65 individuals) participated in two trainings; specifically, 30 individuals participated in the Taitung Construction Branch training session held on July 29, 2022, and 35 individuals participated in the Chiayi Construction Branch training session held on August 5, 2022.

(4) Routine training for civilian vigilance

Routine training for civilian vigilance is intended increase the civil defense knowledge, cultivate the civil defense awareness, and improve the capabilities of civil defense teams to build preparedness for disaster prevention and rescue, counterterrorism, self-defense, and self-rescue, and all-out defense in peacetime to effectively support military services and ensure national security. In total, six routine trainings for civilian vigilance for 282 individuals were conducted in 2022. Lecturers from civil defense, fire, and health departments were invited to conduct comprehensive training regarding organizing civil defense groups and to increase participant knowledge of disaster prevention, rescue, and emergency medical treatment for injuries.

9. Ethics

(1) Integrity platforms

Together with the supervision of external institutions such as the Agency Against Corruption of the Ministry of Justice and the Department of Civil Service Ethics of the MOTC, the TRA established the Integrity Platform for Vehicle Procurement and the Integrity Platform for Electrical Engineering Smartification. Through various preventive measures such as holding regular cross-departmental meetings, building a webpage on government transparency, promoting integrity awareness, and strengthening social participation, the TRA aims to eliminate improper external interference to ensure smooth completion of procurements through the platform and create an efficient and incorruptible administration. At the 21st cross-departmental meeting of the Integrity Platform for Vehicle Procurement held on May 13, 2022, consensus on six items was reached; similarly, at the eighth cross-departmental meeting of the Integrity Platform for Electrical Engineering Smartification held on October 26, 2022, consensus on four items was reached.

(2) Anticorruption activities

1. Advocating anticorruption awareness

Targeting TRA employees, the TRA promoted integrity education to strengthen staff understanding of relevant laws and regulations. In 2022, the TRA ethics unit organized three awareness training sessions



Live images of on-track construction sites

on project-related laws, and collaborated in organizing sixteen legal knowledge training sessions, conducted two prize quizzes, and published six bulletins on integrity to enhance the legal literacy of its staff.

2. Social participation

The TRA used various methods to enhance the understanding and support for anticorruption policies of nonpublic sector individuals and groups. In 2022, the TRA held a promotional campaign in the form of an online prize quiz game for the Safe and Happy 135th Anniversary of Taiwan Railways festival. The webpage received over 40,000 views during the event period. In addition, the TRA ethics unit used the opportunities afforded by local festivals and campus promotion events to hold on-site promotion activities and interacted with approximately 500 individuals to effectively increase public attention on anticorruption issues.

3. Transparent administration

To enhance public trust in the quality of procurement projects and TRA operations, we set up a transparent administration section on our official website, which includes three major project operations, namely the Integrity Platform (including vehicle procurement cases and electrical engineering smartification), real-time imaging of on-track construction sites for administrative transparency, and major asset revitalization projects. By publicly disclosing and enabling public access to this information, clarifying doubts, reducing corruption risks, and improving transparency and credibility, the TRA aims to establish a clean and efficient administration.



On-site audit

(3) Project audit

In 2022, the TRA conducted a project audit on track construction quality and safety by inviting external experts and scholars to form an audit team to review TRA compliance with relevant laws and regulations regarding construction work at its stations, side slopes, and electrical-engineering-smartification-related track construction projects. On the basis of the audit results, suggestions for changes were proposed concerning legal, systemic, and execution aspects of the projects, and the units with the best performance were recognized for their outstanding service. The goal was to encourage all execution units to be accountable to their responsibilities, prevent hazards, reduce corruption risks, improve operational regulations, and enhance public interest and operational safety.



Anticorruption meetings

(4) Anticorruption meetings

On September 28, 2022, the TRA held an anticorruption meeting chaired by Director-General Tu Wei to plan special reports and discuss proposal contents related to major or high-risk TRA projects. Additionally, external committee members were appointed to share their views on citizen participation and transparent administration. Relevant resolutions and instructions from the Chair were then forwarded to all units to follow and implement. Furthermore, to maintain close cross-regional communication, affiliated units of the TRA held a total of eight regional anticorruption meetings to improve the quality of anticorruption projects and achieve employee consensus on anticorruption capacities.

(5) Audit on information use management

In 2022, the TRA performed an audit on the information management of the 4th generation ticketing system. The audit was conducted between April and September 2022 in accordance with an audit schedule and focused on 10 major aspects: the system query log, unusual system access, unusual system access notifications, the implementation of the Information Security Management System (ISMS), the responsibilities and training of information security personnel, outsourced information security management, personal data protection and encryption mechanism management, access authorization and personnel management, information asset management, and the reporting, response, and processing of information security events. Two units within the administration and 48 affiliated stations were randomly selected for the audit to determine whether they were in compliance with relevant laws and regulations, such as the Personal Data Protection Act and the Cyber Security Management Act, and to ensure the effectiveness of information security management systems for ticketing operations. By effectively preventing the leakage and inappropriate use of confidential government and personal data, such audits can ensure the security of ticketing data, systems, equipment, and networks.

(6) Organization security and maintenance meeting

To ensure organizational security and reduce maintenance risks, the TRA held an organization security and maintenance meeting on November 14, 2022, chaired by Deputy Director-General Chu Lai-shun. The meeting included presentations by the accounting office and occupational safety and health offices, which effectively improved awareness of security and



maintenance. The ethics office also provided two constructive discussions regarding the information security of ticketing systems and railway operation safety, both of which were commended by the chair. This meeting was conducive to maintaining the security of the TRA organization as well as confidential government information and for building a comprehensive security protection mechanism.

10. Cultural Assets

(1) Benchmarking

On August 3, 2021, the TRA established a specialized Cultural Heritage Information Section of the Comprehensive Planning Department to promote the preservation of railway history, advance railway culture, and create added value. To develop a long-term plan for the development of railway culture, short, medium, and long-term cultural preservation and utilization projects are to be planned, which requires drawing on the experience of other organizations. Accordingly, three benchmarking events were held to encourage and inspire the staff.

On February 24, 2022, Director Kuo Kuan-hung led a team from the Cultural Heritage Information Section to visit the Taiwan High Speed Rail Museum for benchmarking. On March 4, another trip to the Taiwan Power Company was made to learn about cultural preservation and for benchmarking. They also visited the Postal Museum on March 10.



Benchmarking—Postal Museum

(2) Lectures

To ensure effective railway culture preservation and cultural promotion, the TRA holds regular education and training for increasing the cultural literacy and professionalism of its employees.

On September 16, 2022, the TRA Cultural Relics Inventory and Management Project seminar was held. Dr. Hwang Ti-Chang, Associate Professor of the Department of Transportation of Kainan University, gave a lecture on action guidelines for inventorying cultural relics of the TRA cultural heritage protection network based on the experience of inventorying the cultural relics of Taipei Rapid Transit Corporation Metro Service.

On December 12, 2022, the TRA participated in the Undertaking the Path for Electric Power Culture results presentation hosted by Taiwan Power Company, with Dr. Lin Hsiao-wei, Associate Professor of the Department of Architecture of Chung Yuan Christian University giving a talk on achievements of the Taiwan Electric Power Culture Path Planning.

(3) Digitalization of cultural assets

On May 20th, 2022, the TRA handed over 13 boxes of the Hualien Management Office Reports to the Preparatory Office of National Railway Museum for joint digitalization. On September 12, 94 copies of the Taiwan Railway Business Communication and 19 copies of the Station Station Survey were also handed over for joint digitalization.



Handing over artifacts to the Preparatory Office of National Railway Museum for joint digitalization

Chapter.6 Chapter.6

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- An aerial photograph of a railway bridge spanning a river. The bridge has a complex steel truss structure. The river is dark blue, and the surrounding land is green. The image is partially obscured by the text on the right.
- 1** ● Safety improvements
 - 2** ● Train operation safety improvement project
 - 3** ● Prospective projects
 - 4** ● Project to improve the structural safety of railway tracks
 - 5** ● Research on feasibility of making improvements to area between Guishan Station and Wai'ao Station along Yilan Line
 - 6** ● TRA Train Procurement and Replacement Program (2015–2024)
 - 7** ● Project to move TRA Kaohsiung Workshop to Chaozhou and formulate development plans for former workshop site
 - 8** ● Two-stage construction of Kaohsiung Workshop and Chaozhou Workshop
 - 9** ● Train control 4.0 system
 - 10** ● Railway maintenance construction project
 - 11** ● Train speed limit backup system

6

MAJOR CONSTRUCTION AND INVESTMENT PROJECTS

1. Safety improvements

Under the supervision of the Executive Yuan and the Ministry of Transportation and Communication (MOTC), Taiwan Railway Administration (TRA) accelerated its comprehensive inspection of items for improvement and enhanced overall safety. After the dimensions of personnel, vehicles, and tracks were evaluated, safety improvement measures were implemented under six strategies (34 solutions in total), namely implementing comprehensive construction site management, preventing foreign objects from entering the railway perimeter, strengthening the structural safety of tracks, increasing vehicle availability, ensuring the operation safety of vehicles, and establishing a safety management system (SMS). Additionally, professional technological services were introduced for internalizing task guidance across all task levels to enhance the safety culture of TRA.

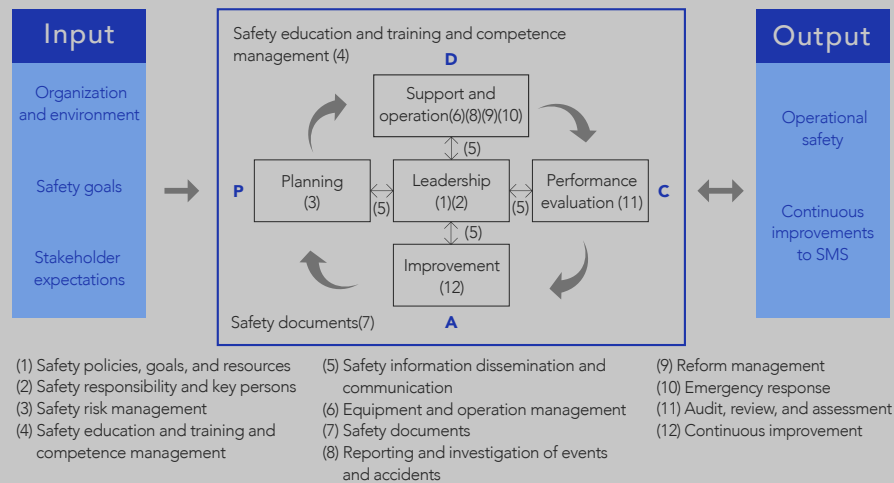
In 2022, TRA held safety reform seminars in Taipei, Hualien, and Taitung on February 26, June 18, and October 15, respectively. Subsequent seminars were held routinely at these locations every 3 months. TRA continues to promote safety reforms and focuses its efforts on two main mechanisms of management, namely the TRA Railway Safety Review and the Safety Management Committee. The TRA Railway Safety Review is monitored by the Executive Yuan, which supervises the promotion of safety reforms by TRA. The Safety Management Committee is convened regularly by TRA to review proposed vehicle safety measures and to formulate safety management policies.

Four dimensions of safety management system (SMS)





12-item framework of SMS



The train operation safety improvement project was approved by the Executive Yuan in 2014, and it received a total funding of NT\$27.522 billion. The project started on January 1, 2015, and concluded on December 31, 2020. A second amendment to the project was approved by the Executive Yuan (Yuan Tai Jiao No. 1110028568) on September 28, 2022; the funding of the project remained unchanged, but its duration was extended to December 31, 2024.

(1) Construction projects

1. Main content

- (1) Erection of fencing and acoustic barriers at high-risk railway sections: Construction work was performed to erect fencing barriers and acoustic barriers spanning 180 km.
- (2) Bridge reconstruction and reinforcement to ensure adherence to current regulations: Construction work was performed to rebuild 16 bridges, including the Wen Cuo Bu Creek Bridge.
- (3) Establishment of slope sliding, landslide, and strong wind warning systems: Construction work was performed to improve slope, subgrade, and drainage facilities of high-risk sections of the TRA railway and to establish slope disaster warning systems.
- (4) Improvement to train station equipment to ensure adherence to current regulations: Construction work was performed to increase the

platform height of all TRA station platforms, and improve the quality of safety equipment of men's and women's restrooms and accessible facilities.

- (5) Upgrading of railway equipment: Along railway lines, 250 km of 50-kg/m steel rails, 60 km of 50-kg/m head-hardened steel rails, and 600 sets of 50-kg PC sleepers for turnouts were replaced, and railway improvements were made at the Xinma curve.

2. Implementation results

- (1) In 2022, construction work to increase the height of platforms at 54 stations, including Keelung station, was completed. In total, TRA increased the height of 126 platforms.
- (2) In 2022, the construction of accessible elevators at four stations, including Zaoqiao Station, was completed. In total, TRA constructed accessible elevators at 177 stations.
- (3) In 2022, improvements to men's and women's public restrooms at 14 stations were completed. In total, TRA has made improvements to men's and women's restrooms at 58 stations.
- (4) The first stage of the construction work was performed to construct the cross-station station building at Dounan Station, which commenced to use on September 5, 2020. The second stage of the construction work was performed to construct an escalator, an accessible elevator, and a public art installation at the Dounan Station bus stop, all of which commenced to use in October 2022.
- (5) For slope life-cycle maintenance management (turn-key project for the construction of a warning and management system), the construction of a warning system for rock falling from slopes was completed at 11 sites in 2021. In 2022, warning systems were installed at 26 railway sites. By 2023, TRA expects to achieve the full online monitoring of slopes along railway lines prior to the flood season.

2. Train operation safety improvement project



Increased platform height at Houli Station

Increased platform height at Keelung station



New accessible elevator at Zaoqiao Station



New accessible elevator at Wuri Station



Improvements to public restrooms at Neili Station

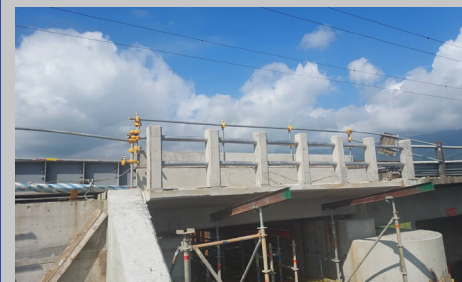


Improvements to public restrooms at Neili Station

(2) Improvements to Xiaqijie bridge, Qiwlanchuan bridge, Erjie drainage box and Sijie bridge

Xiaqijie Bridge was constructed in 1983, and the structure of the 40-year-old bridge does not meet current seismic restraint design regulations for railway bridges. In accordance with the Project for Regulating Flood-prone Areas, improvement plans for the Dezihkou river mouth comprised performing river renovation, widening the river bed, and lowering the loading of the bridge platform and pier. The bridge had to be rebuilt with a four-hole span of 20 m and by using prestressed concrete or steel to maintain train safety. After the reconstruction work was completed, the bridge was extended to increase the river cross-section area and enhance the flood drainage properties of the river, thereby achieving the goal of preventing flood disasters, enhancing the bridge's structure, ensuring compliance with current anti-seismic and flood-resilience regulations, and increasing and ensuring the operational safety of TRA. The reconstruction of Xiaqijie Bridge, Qiwlanchuan Bridge, Erjie drainage box culvert, and Sijie Bridge was contracted

in May 2020. The reconstruction of Xiaqijie Bridge and Qiwlanchuan Bridge is scheduled for completion in 2023, and the reconstruction of Erjie drainage box culvert is scheduled for completion in 2024. Notably, the reconstruction of Sijie Bridge is expected to be completed in 2025 because of difficulties in acquiring land access.



Construction of new Xiaqijie Bridge



Construction of new Qiwlanchuan Bridge

(3) Rolling Stock Branch

1. Step gap elimination of railway cars

To improve walking safety for passengers, the Rolling Stock Branch is planning to eliminate the height gap between the floor of the passenger car and the station platform. By 2021, the branch had renovated 1,208 passenger cars. In September 2022, the Rolling Stock Branch commenced project work to increase the platform height of all TRA station platforms and implement Stage two of the step gap elimination plan for Taroko Express. This plan is scheduled for completion in April 2023.

2. Power system and static inverter updates for 252 EMU500 trains

Shihlin Electric & Engineering Corporation was awarded the contract for this project. The upgrading of a total of 57 sets (228 vehicles) were completed by the end of 2022, and the update process is scheduled for completion by March 2023.

3. Improving train video-recording and information displaying equipment

This project aimed to improve the train CCTV system (used as an information display equipment) in EMU600 trains and to install this system in 560 in-service EMU trains (EMU600, EMU700, and EMU800) in multiple stages. Additionally, the project also included the installation of new CCTVs on the trains and the updating of the passenger information display system of EMU600 trains. By 2022, 556 trains had been updated under the project.



On-site inspection of EMU500 updating process



(4) Electrical Engineering Branch

1. Construction of obstacle detection system for railway crossings

- (1) In recent years, TRA has made various improvements to its railway crossing safety equipment and integrated various technological applications and smart equipment, including safety equipment, data storage, preventative data analysis, and big data databases established through self-learning, to apply smart technology to the management of railway crossing information.
- (2) The point-by-point scanning technique used in the new obstacle detection system differs from that used in current infrared laser systems. The new system combines thermal and laser detection to achieve a detection range of 30–300 cm, which is an improvement from the 75–150-cm detection range of the current system. The system can detect and identify obstacles in the clearance area of railway crossings and issue the relevant warnings. When the system detects an obstacle intrusion along a railway crossing, the train conductor receives a real-time alert through a wireless railway safety system, thereby preventing railway crossing accidents and reducing accident rates.
- (3) In addition to an automatic obstacle detection system, manual emergency buttons were set up near railway crossings to increase the overall safety level of railway crossings and ensure the safety of drivers and motorcyclists, train passengers, and TRA employees. After both the automatic obstacle detection system and manual emergency buttons were installed in 2021, an analysis of general accidents and railway crossing accidents revealed that the rate of railway crossing accidents decreased annually by 8%–9%.
- (4) The new-generation automatic obstacle detection system for railway crossings won the 2022 Smart Transportation Application Award for intelligent transportation systems. The TRA has continued to invest in the development of smart transportation equipment to establish smart railway crossings and prevent railway crossing accidents.



Position of installed radar sensor and detection zone

3. Prospective projects

(1) Transfer and shuttle bus project for TRA and THSR Changhua Station

1. Project content

This project aimed to improve transportation transfers between THSR Changhua Station and TRA routes through the joint operation of the Jiji Line while also facilitating tourism services. The project received NT\$2.955 billion in funding and was planned to be completed in approximately 7 years. The project primarily involves the establishment of a single-track railroad layout that connects TRA Tianzhong Station and THSR Chuanghua Station. Known as the Tianzhong branch line, the railroad measures approximately 3.135 km in length and comprises approximately 1,475 m of elevated railroad, 1,500 m of embankment railroad, and 160 m of elevated train stations. The branch line is operated jointly with the Jiji Line, with which it intersects.

2. Implementation results

The final research report by the MOTC on the feasibility of the transfer and shuttle bus project for the TRA and THSR Changhua Station was submitted to the Executive Yuan on August 29, 2019. The project was approved by the Executive Yuan on September 27, 2019, and the overall planning of the operations was approved on October 28, 2022. Subsequently, the Railway Bureau was tasked with commissioning the planning, design, and construction supervision of the project. On December 2, 2022, the construction commission was officially signed.



Directional fishbone antenna
(before optimization)



Directional panel antenna
(after optimization)

(2) Smart electrical systems upgrading plan

1. Optimization of wireless phone system for train dispatching

By 2022, the project had optimized and improved 54 sections of a wireless phone system for train dispatching. Rebroadcasting stations, repeaters, and antennas were optimized and improved to increase the coverage rate of the system's wireless electric field, thereby increasing the reception rate of wireless signals up to 100%.

2. Second installation of 96-core optical fiber cable across Taiwan

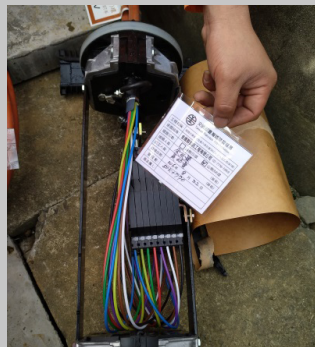
The installation project was completed on August 12, 2022. A total of 613 km of optical fiber cable was laid out to upgrade the existing safety mechanism into a double-loop optical fiber cable mechanism, thereby improving the transmission reliability of TRA's communication network and its other communication systems (e.g., travel and transportation systems).

3. Upgrading optical fiber network system across Taiwan

The installation of IP/MPLS (Multiprotocol Label Switching), the new generation backbone communication network, has upgraded the backbone bandwidth from 2.5G to 100G and is able to realize IP-based communication network system in future. The internet routers were installed in 193 stations and yards across Taiwan and the installations were completed on November 23, 2022.



96-core optical fiber cable control room



96-core optical fiber cable connector



Testing of connections at optical fiber
cable control room



Improvement construction of
Zhuifen station



(3) Chenggong Station–Zhuifen Station Double-Track Railway Construction Project

To overcome the operating limitations of the single-track railway between Chenggong Station and Zhuifen Station, TRA constructed a double-track railway between the two stations to provide passengers in Taichung with an accessible, rapid, comfortable, and efficient railway transportation service. In 2016, the Executive Yuan approved NT\$1.5405 billion in funding for the project. The project primarily involved increasing the railway capacity, reducing the headway between trains, meeting the transportation demand of commuters, and alleviating the traffic bottleneck in the Taichung region.

The project involved the construction of subgrade, civil works, railway track, traffic signs, communication systems, and electrical engineering works. The design and construction phases of the project started in 2017. The construction of a double-track railway was completed in December 2019, and the track was open to traffic on January 3, 2020. On December 31, 2022, improvements were made to the transportation facilities of Zhuifen Station to complement the main construction project.



Clearance and measurement for
turn-key project regarding improving
tunnels and slopes



Improvements to Jiji Line and
nearby railway crossings

(4) Project for improving basic facilities of Jiji Line

This project involves improvements to the station hardware, track alignment, and slope stability testing protocol for the Jiji Line, which serve to improve the overall service quality of branch lines, enhance passenger convenience and safety, and increase tourism quality. The project was approved by the Executive Yuan on August 23, 2019, and received NT\$2.363 billion in project funding. The project commenced on August 23, 2019, and concludes on July 31, 2026.

The project primarily involves increasing the platform height and length of each station, improving the exterior of train stations and transportation facilities, improving railway fencing and drainage facilities, implementing slope stabilization and remote monitoring, implementing tunnel realignment, improving track alignment, strengthening track configuration functions, and relocating a railway crossing.

Track construction works included continuous track ballast replacement and rail guard renewal. The improvements to a railway crossing was completed on August 30, 2022. The review of the basic designs for a turn-key construction work was completed on November 18, 2022; subsequently, in-depth design tasks will be performed.



4. Project to improve the structural safety of railway tracks

(1) Project content

This project was approved by the Executive Yuan (Yuan Tai Jiao No. 1080199278) on January 21, 2020, and received NT\$9.9003 billion in funding. The project was scheduled to be conducted between 2020 and 2025.

The project primarily involves replacing all 1,946 wooden sleepers for turnouts with PC sleepers, replacing 250 km of steel rails, and upgrading railway maintenance equipment by procuring 74 sets of railway maintenance machinery.

(2) Implementation results

1. Turnout materials: By 2022, 697 turnout components have been procured, and further deliveries are planned.
2. Steel rail materials: By 2022, steel rail materials for replacing 250 km of steel rails have been inspected and accepted, and further deliveries are planned.
3. Forty-one large- and medium-sized ballast tamping machines, regulators, and stabilizers (contract budget: NT\$3.17 billion): A tender was opened on December 27, 2022, and the bid review process is currently in progress.
4. Twenty-five construction maintenance vehicles (NT\$350 million): A tender was opened on December 28, 2022, but it was unsuccessful. The tender was reopened on January 18, 2023.
5. Seven railway transportation machines (NT\$496 million): A tender was opened on December 28, 2022, and manufacturers have been invited to submit additional explanatory documents.

5. Research on feasibility of making improvements to area between Guishan Station and Wai'ao Station along Yilan Line

The project mainly involves constructing a railway tunnel that connects to the exit of Guishan Station and has a curvature of more than 1,000 m; the tunnel was designed to evade disaster hot spots and relocate the tunnel exit such that it is not facing private housing. The project railway will be connected to the existing railway route at a section north of Wai'ao Station without changing Wai'ao Station itself and the curvature of the railway to the north of Wai'ao Station. The project has received NT\$2.334 billion in funding, and it is scheduled to be completed within 6 years following its approval.

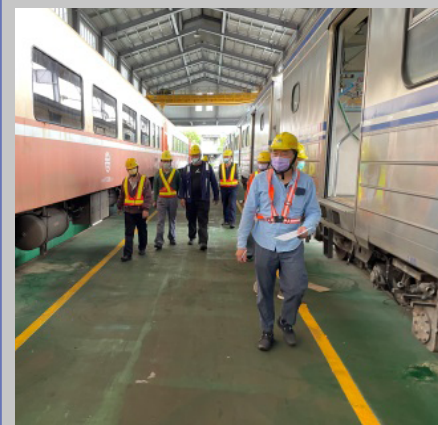
The project was launched on October 19, 2020. On November 24, 2022, a set of reports on the project was submitted to the MOTC for review. Subsequently, an environmental impact assessment review was performed by the MOTC, and suggestions based on the review were sent to TRA. On October 14, 2022, TRA held a meeting to respond to the review suggestions and

6. TRA Train Procurement and Replacement Program (2015–2024)

to coordinate project affairs with the MOTC, and it invited the construction manufacturer to assist in making the necessary adjustments and acting on the aforementioned suggestions. The meeting report was submitted to the MOTC for review in January 2023.

This project has a planned total budget of NT\$99.73 billion and involves the planned procurement of 1,307 trains. The procurement items are as follows:

- (1) 600 intercity EMUs: On July 30, 2021, one trainset was delivered (12 EMUs). By the end of 2022, a total of 25 trainsets had been delivered (300 EMUs).
- (2) 520 commute EMUs: On October 24, 2020, two trainsets were delivered (20 EMUs). By the end of 2022, a total of 39 trainsets had been delivered (390 EMUs).
- (3) 127 locomotives (initial procurement of 102 locomotives and subsequent procurement of remaining locomotives): On November 21, 2019, 68 Type A electric locomotives were procured from Toshiba/Infrastructure Service Co. of Japan; the delivery of the procured locomotives are scheduled to begin in 2023. On November 1, 2019, 34 Type B diesel-electric locomotives were procured from Stadler Rail AG of Switzerland; the delivery of the procured locomotives are scheduled to begin in 2023.
- (4) 60 branch line passenger cars: On August 25, 2022, the tender was awarded to Taiwan Rolling Stock Co., Ltd.; the delivery of the procured cars are scheduled to begin in 2025.



On-site inspection of trains to be replaced and decommissioned



Unloading of new trains



7. Project to move TRA Kaohsiung Workshop to Chaozhou and formulate development plans for former workshop site

To maintain the smooth supply of components and materials for repairing passenger and cargo trains, ensure the proper and safe operation of passenger and cargo trains, and meet the maintenance needs of TRA trains, the newly constructed Chaozhou Workshop was designated as TRA's train maintenance center in Southern Taiwan. The project involves moving the Kaohsiung Workshop to Chaozhou, moving supplier factories in Southern Taiwan to Chaozhou, constructing a maintenance factory for push-pull passenger trains, and implementing urban development plans for the former workshop site. The first amendment of the project was approved by the Executive Yuan in 2017, and the funding for this project was adjusted to NT\$13.4818 billion. Construction commenced on August 13, 2013, and concluded on December 31, 2021.

The information management system for train repair logistics was launched on February 9, 2022. The system stores data on 25 types of trains and includes a backup data center. TRA will continue to optimize the interface and functions of the system. The opening ceremony of the Chaozhou Workshop was held on June 18, 2022.



Aerial photograph of the Chaozhou Workshop



Opening ceremony of Chaozhou Workshop

8. Two-stage construction of Kaohsiung Workshop and Chaozhou Workshop

In accordance with the TRA Train Procurement and Replacement Program (2015–2024), the replacement of existing EMUs with newly procured long EMUs started in 2020. After 3 years of operation, every new train must undergo level 3 and 4 maintenance operations. Because both the Taipei Workshop and Hualien Workshop are already at full maintenance capacity, TRA is establishing a maintenance workshop for intercity EMUs on the land formerly occupied by a workshop and procuring maintenance devices to ensure that its maintenance depot is equipped with sufficient maintenance tools for ensuring vehicle operation safety.

The project was approved by the Executive Yuan and received NT\$12.1477 billion in project funding. The project started on September 27, 2021, and is scheduled to conclude on September 30, 2025.

This project is an emerging project that mainly involves constructing a maintenance workshop for intercity EMUs and supply warehouses and procuring maintenance equipment. The tenders for construction design and supervision services were awarded on April 7, 2022, and the contract came into effect on May 20, 2022. At present, the implementation plan for the planned design of the workshop has been completed, and the supplementary measurement results of the project have been approved.



Two-stage construction of Chaozhou Workshop(blue)

9. Train control 4.0 system

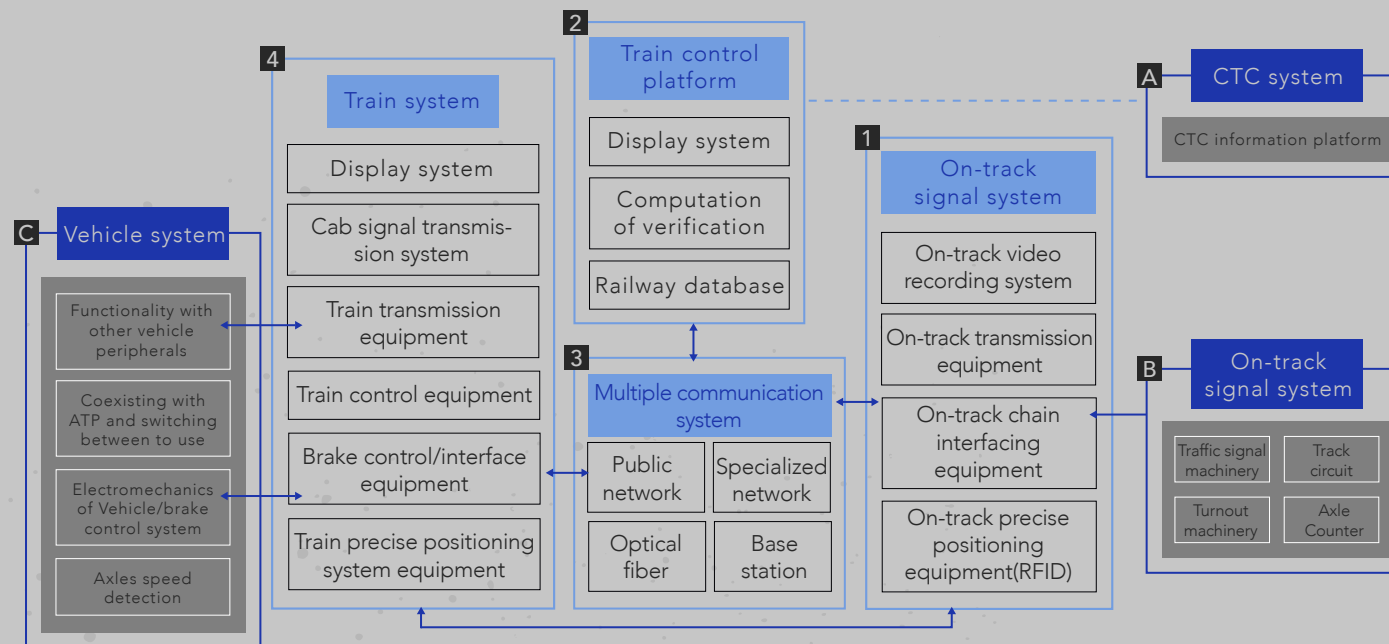
(1) TRA strives to improve railway safety. On the basis of its research and analysis results, TRA determined that the functions of its conventional control system for railway and trains were restricted to the passive control of train status, thereby preventing it from implementing the safety and control functions that are achieved through the remote, continuous, and real-time monitoring of train status. To effectively ensure train operation safety, TRA thoroughly reviewed its software and hardware frameworks, held numerous internal meetings and external seminars involving discussions with experts and scholars, and concluded that its conventional system was inadequate. Additionally, TRA conducted a comparative analysis of the development functions of its conventional system with those of overseas railway and train control systems (e.g., Japan's EJTC, the EU's ETCS, and the US's PTC), and planned a research and development project for developing its train control 4.0 system.



This project was not limited to any specific system framework. Most train control systems comprise diverse communication networks, and the international community has yet to establish unified regulatory standards for train control systems. In consideration of development costs, technology autonomy, and the development of Taiwan's railway industry ecosystem, TRA must establish a train control system that meets the railway transportation demand of Taiwan, reflects the development of the railway industry, and aligns with international standards. Accordingly, TRA proposed the research and development project for creating the train control 4.0 system.

Framework of train control 4.0 system

New system equipment(1+2+3+4), communication equipment and interface equipment were newly added to properly connect the existing system equipment which are to achieve optimization of the train control 4.0 system. Thus, the protection for train safety can be enhanced without a significant upgrade of the existing system equipment.



(2) The project has applied for the subsidy program operated by the Executive Yuan National Science and Technology Development Fund, and plans were implemented for six branch lines. The project kick-off meeting was held on November 19, 2021. The real-time communication equipment, balises, and a train control platform that were procured were delivered on January 5, 2022. Construction work for installing the system started on January 19 of the same year; the midterm report of the construction was submitted on February 24, and the construction was completed on June 27. On July 19, 2022, the National Science and Technology Development Council the final review meeting. The inspection and acceptance of the construction was completed on December 28, 2022.

(3) Four main performance indicators pertaining to technology function of the project:

1. Real-time communication: The transmission delay of the system is within 10–100 ms. The transmission delay within the optical fiber cable is within 10 ms. The transmission delay between the railway equipment and transmission equipment mounted on the train is within 100 ms.
2. Continuous train monitoring: The error of train speed detection is within ± 2 km/h. The system enables a train to stop within ± 10 m of the designated stopping point.
3. Precise positioning: At a train speed of 130 km/h, the precision of positional tracking is within 3 m, which corresponds to a 100% accuracy rate. The response frequency of precise positioning is 20 Hz; the sensor sampling frequency is also 20 Hz.
4. Cab signal transmission: The transmission time required to send a cab signal to the station and the train control platform should be within 10 and 100 ms, respectively.

The system uses wireless information transmission to comprehensively monitor operating status of trains, thereby increasing the safety of conventional railway and train control systems, preventing train equipment failure and improper train operation, and reducing the occurrence of major accidents. Through technological innovation and development, the TRA upgraded the functions of the existing train control system to ensure the safety and efficiency of train operations.



(4) On August 22, 2022, TRA held a seminar and meeting on the prospects of the Train Control 4.0 System, and it invited the experts and scholars attending the seminar to take a train to demonstrate TRA's development results. The experts and scholars reached the following consensus: (1) After completing the seminar and taking a train, the participating experts, scholars, and institutions (e.g., Taipei MRT, Taoyuan MRT, THSR, the National Chung-Shan Institute of Science & Technology, the Industrial Technology Research Institute, and the Railway Technology Research and Certification Center) recognized the results of TRA's development and research project, which led to the creation of the Train Control 4.0 System based on diverse communication frameworks. (2) The test results pertaining to the current research and development of the Train Control 4.0 System indicate that this system should be optimized to further increase train operating safety. (3) TRA should collaborate with domestic industrial research agencies, such as the Railway Technology Research and Certification Center, to accelerate the implementation of the system, establish a comprehensive and open system framework, and obtain the proof of service. (4) On the basis of the upgrades to the train control system, the operation processes for the software used and relevant regulations should also be reviewed.

(5) On September 14, 2022, Executive Yuan Official Chang Ching-sen inspected the research and development results pertaining to TRA's Train Control 4.0 System and invited MOTC Deputy Political Minister Hu Hsiang-ling, the Executive Secretary of the Executive Yuan's Office of Science and Technology Yeh Jer-liang, and several representatives of the families of the Taroko train crash victims to participate in the seminar and take the train to test the system. The following resolutions were subsequently proposed: (1) The developed train safety monitoring system achieved excellent test results. The MOTC should continue to promote the implementation of the system and aim to complete the proof-of-service and proof-of-business objectives of the research project within the next 3 years. (2) The MOTC should continue to apply for research funding to conduct subsequent research and development projects assigned by the National Science Council and request assistance from the relevant agencies; and (3) After completing the proof-of-service and proof-of-business objectives of the research project, the TRA should begin construction work to implement the Train Control 4.0 System on the main line on the basis of the general budget.



Group photo of participating inspectors

10. Railway maintenance construction project

The railway maintenance construction project was implemented by the Construction Maintenance Division of TRA in 2022 to improve railway routes. By December 2022, 1,882 wooden sleepers were replaced, 51.676 km of steel rails were replaced, 31,136 m³ of railway ballast was supplemented (accounting for 67.45 km of railway), and 131 turnout sets were replaced.

11. Train speed limit backup system

To increase railway operation safety, TRA and the National Chung Shan Institute of Science and Technology collaborated to develop speed limit backup systems for TRA trains. By 2022, a total of 332 systems had been installed. On December 28, 2022, 52 systems installed on Taroko Express were activated. TRA is scheduled to complete the installation of 400 systems by 2023.



Mr. Wu, the Minister of State, inspected installation of speed limit backup systems

Appendix Appendix

Appendix ● Major events in 2022



Appendix—Major events in 2022

Date	Events
01.03	Successful transportation of passengers during the New Year long weekend To successfully transport passengers during the New Year long weekend, TRA operated an additional 141 trains and 261 railcars between December 30, 2021, and January 3, 2022. During the long weekend, TRA generated a total passenger revenue of NT\$273,805,624, which was equivalent to an average daily passenger revenue of NT\$54,761,125 and 3.66% more than that in the previous year. The total number of passengers transported was 3,055,858, which was equivalent to a daily average of 611,172 passengers and 0.39% more than that in the previous year.
01.06	TRA and Lea Lea Foundation jointly held the Taiwan Railways and Architectural Heritage Exhibition at Banqiao Station.
01.30	President Tsai Ing-wen inspected the Joint Disaster Prevention Center of Taipei Main Station.
02.07	Successful transportation of passengers during the Lunar New Year long weekend. To successfully transport passengers during the Lunar New Year long weekend, TRA operated an additional 423 trains and 669 railcars between January 27 and February 7, 2022. During the long weekend, TRA generated a total passenger revenue of NT\$454,372,729, which was equivalent to an average daily passenger revenue of NT\$37,864,394 and 28.76% less than that in the previous year. The total number of passengers transported was 4,430,624, which was equivalent to a daily average of 369,219 passengers and 32.35% less than that in the previous year.
02.22	TRA held a train driver seminar for the inauguration of new EMU3000 trains.
02.23	The Ministry of Transportation and Communication (MOTC) held the Meeting to Discuss the Act for Establishment of State-owned Taiwan Railway Co., Ltd.
02.23	The ground-breaking ceremony for the construction of a new escalator in Yingge Station was held.
02.26	TRA held the Taiwan Railway Administration Safety Reform Orientation video conference.

Date	Events
02.27	TRA Director-General Tu Wei inspected the awning at Shulin Station and the renovation plans for the plaza located in front of the station.
03.01	Successful transportation of passengers during the 228 Memorial Day long weekend. The 228 Memorial Day long weekend lasted from February 25 to March 1, 2022. During this period, TRA operated an additional 155 trains and 84 railcars. During the long weekend, TRA generated a total passenger revenue of NT\$243,267,044, which was equivalent to an average daily passenger revenue of NT\$48,653,409 and 8.76% less than that in the previous year. The total number of passengers transported was 2,832,977, which was equivalent to a daily average of 566,595 passengers and 11.08% less than that in the previous year.
03.01	The Executive Yuan held the Meeting to Discuss the Act for Establishment of State-owned Taiwan Railway Co., Ltd., which was attended by TRA Director-General Tu Wei and Deputy Director-General Feng Hui-sheng.
03.02	A press conference for The Moving Kitchen within TRA aesthetic tourist trains was held.
03.14	TRA held the Information Security Management Review Meeting.
03.16	The Labor Day commendation ceremony was held.
03.17	Director-General Tu Wei visited two sites (one between Shangyuan Station and Ronghua Station and the other between Fugui Station and Neiwan Station) on the Neiwan Line to perform an on-site inspection of a rock-fall warning system.
03.18	TRA and Japan's Shinano Railway launched cobranded Nagano Miso Chicken Drumstick Makunouchi bento boxes at Taichung Station.
03.18	The MOTC held the TRA Operation Schedule Meeting, which was attended by Director-General Tu Wei and Deputy Director-General Feng Hui-sheng.
03.19	To continue promoting safety reform, TRA supported the Railway Bureau in the implementation of the Chiayi City Elevation Railway Project.



Date	Events
03.19	TRA actively expanded railway tourism on branch lines. Director-General Tu Wei conducted an on-site inspection of the Neiwan Branch Line and developed plans for promoting railway tourism.
03.21	The National Science and Technology Development Fund operated by the Executive Yuan subsidized TRA's project to develop the Train Control 4.0 System, which is based on diverse communication frameworks.
03.24	The Legislative Yuan held a public hearing on TRA reform, which was attended by Director-General Tu Wei.
03.29	The MOTC held a symposium for family members of the victims of the 0402 Taroko No. 408 Taroko Express Train Crash.
04.01	MOTC Deputy Political Minister Hu Hsiang-ling inspected TRA and Taiwan High Speed Rail Taipei Station's preparations for the Qingming Festival long weekend.
04.02	A Commemoration and Memorial Ceremony for the victims of the 0402 Taroko No. 408 Taroko Express Train Crash was held in front of Taipei Main Station.
04.05	MOTC Deputy Political Minister Hu Hsiang-ling inspected Kaohsiung Station and Xinzuoing Station.
04.06	<p>Successful transportation of passengers during the Qingming Festival long weekend.</p> <p>The Qingming Festival long weekend lasted from April 1 to April 6, 2022. During this period, TRA operated an additional 141 trains and 291 railcars. During the long weekend, TRA generated a total passenger revenue of NT\$310,701,509, which was equivalent to an average daily passenger revenue of NT\$51,783,585 and 12.29% less than that in the previous year. The total number of passengers transported was 3,073,918, which was equivalent to a daily average of 512,320 passengers and 20.35% less than that in the previous year.</p>
04.07	The Legislative Yuan reviewed the Act for Establishment of State-owned Taiwan Railway Co., Ltd. (Draft)
04.15	TRA launched the "Heart of the Sea" mackerel bento to express its support for ocean sustainability.

Date	Events
04.15	MOTC Minister Wang Kwo-tsai visited the Taiwan Railway Labor Union.
04.25	MOTC Deputy Minister Chen Yen-po inspected TRA's preparatory drill for Labor Day service halt.
04.25	MOTC Minister Wang Kwo-tsai inspected TRA's preparatory drill for a Labor Day service halt.
04.29	MOTC Deputy Minister Chen Yen-po inspected TRA's preparatory drill for a Labor Day service halt in Hualien and Taitung.
04.30	MOTC Deputy Minister Chen Yen-po inspected TRA's preparatory drill for a Labor Day service halt for the South Link Line.
05.01	MOTC Minister Wang Kwo-tsai inspected all major stations along the Eastern Line.
05.12 05.18 05.20	The Legislative Yuan held the Meeting to Discuss the Act for Establishment of State-owned Taiwan Railway Co., Ltd. (Draft) with the ruling and opposition party.
05.18	The MOTC invited the Taiwan Railway Labor Union to participate in the TRA Reform Communication and Negotiation Meeting.
05.21	Track replacement was performed as a part of the Six-Year Train Operation Safety Improvement Project- of Wen Cuo Bu Creek Bridge.
05.23	MOTC Deputy Political Minister Hu Hsiang-ling inspected the construction work for improving the slope stability between Luye Station and Shanli Station on the Eastern Line.
05.27	The Legislative Yuan passes a three reading of the Act for Establishment of State-owned Taiwan Railway Co., Ltd.
06.06	<p>Successful transportation of passengers during the Dragon Boat Festival long weekend.</p> <p>The Dragon Boat Festival long weekend lasted from June 2 to June 6, 2022. During this period, TRA operated an additional 70 trains and 84 railcars. During the long weekend, TRA generated a total passenger revenue of NT\$149,587,079, which was equivalent to an average daily passenger revenue of NT\$29,917,416 and 403.09% more than that in the</p>



Date	Events
	previous year. At this time in the previous year, Taiwan was under Level 3 COVID restrictions. The total number of passengers transported was 1,612,408, which was equivalent to a daily average of 322,482 passengers and 243.57% more than that in the previous year.
06.07	Exclusive iPass cards shaped like 3D bentos were sold to celebrate the railway anniversary.
06.07	TRA and 2022 City Expo launched cobranded Harbor City Curry Porkchop Bento.
06.09	The Railway Anniversary Celebration Conference—135th Anniversary of Taiwan Railways was held.
06.13	Director-General Tu Wei personally attended the unveiling ceremony for a bronze plate that was carved with the words "To Rebuild Banqiao Station" at Banqiao Station.
06.14	Director-General Tu Wei accompanied MOTC Minister Wang Kwo-tsai and several members of the Legislative Yuan to inspect Xike Station.
06.18	The opening ceremony for the Chaozhou Workshop, which is replacing the Kaohsiung Workshop, was held.
06.22	The Act for Establishment of State-owned Taiwan Railway Co., Ltd was promulgated by President Tsai Ing-Wen on June 22, 2022.
06.25	Director-General Tu Wei inspected the station facilities and travel services of multiple stations in Southern Taiwan, including Tainan and Chiayi Station.
06.27	TRA and Pingtung County Government launched cobranded bento boxes named "New Taste of Grouper TR Bento".
06.28	Taipei Workshop was moved to Fukang Depot and inaugurated as Fukang Workshop.
06.28	Director-General Tu Wei inspected the renovation of the Qidu Rolling Stock Branch.
07.06	The opening ceremony of a new elevator in Mudan Station was held. The elevator was built to improve the quality of train services for passengers.

Date	Events
07.19	The Executive Yuan held a meeting to review the Train Control 4.0 System.
07.19	The opening ceremony of the Breezy Blue Station of Fangliao Station was held and attended by Deputy Director-General of Taiwan Railway Chu Lai-shun.
07.21	Director-General Tu Wei inspected the domestically produced Railway Temporary Speed Restriction System installed in Hualien.
07.27	Quality Assurance Division Director Zhao Gui of Hyundai Rotem Quality Assurance visited TRA.
07.29	TRA had microtransformed Chiayi station and hold the presentation of The Chiayi Station Aesthetics of Subtraction.
07.30	The 2022 Fugang Railway Art Festival was held, and the Little Prince CK124 steam locomotive was operated.
08.20	Director-General Tu Wei reviewed the Hualien Rolling Stock Branch's efforts to strengthen the intercity train team and perform maintenance for electrical multiple units.
08.21	President Tsai Ing-wen and member of the Legislative Yuan Liu Chao-hao inspected the Taitung Rolling Stock Branch.
08.26	Director-General Tu Wei reviewed the preparations of train stations in Northern Taiwan for passenger transportation during the Mid-Autumn Festival long weekend.
09.09	MOTC Minister Wang Kwo-tsai inspected the malfunctioning signs between Yuanlin Station and Huatan Station.
09.10	MOTC Deputy Political Minister Hu Hsiang-ling inspected the emergency maintenance of signs between Yuanlin Station and Huatan Station.
09.12	Successful transportation of passengers during the Mid-Autumn Festival long weekend. The Mid-Autumn Festival long weekend lasted from September 8 to September 12, 2022. During this period, TRA operated an additional 127 trains and 60 railcars. During the long weekend, TRA generated a total passenger revenue of NT\$268,216,702, which was equivalent to an average daily passenger revenue of NT\$53,643,340 and 30.46% more than that in the



Date	Events
	previous year. The total number of passengers transported was 2,624,660, which was equivalent to a daily average of 524,932 passengers and 22.87% more than that in the previous year.
09.14	Nangang Station held a press conference on Bicycle Train.
09.14	Executive Yuan Official Chang Ching-sen and MOTC Deputy Political Minister Hu Hsiang-ling reviewed the proof-of-concept performance of the Train Control 4.0 System.
09.19	Executive Yuan President Su Tseng-chang inspected the earthquake damage sustained by Dongli Station.
09.21	President Tsai Ing-wen personally visited the Hua-tung region to inspect the earthquake damage sustained by Dongli Station.
09.24	Director-General Tu Wei inspected the slope stability alarm and monitoring measures of Pingxi Line.
09.25	Director-General Tu Wei inspected the operation condition of the power and signaling system in the Yuanlin region.
09.30	Director-General Tu Wei inspected the recovery of train services and highway transfer services between Hualien Station and Yuli Station and between Fuli Station and Taitung Station.
10.01	Director-General Tu Wei inspected the earthquake damage sustained by the bridges along the Dongli section.
10.05	Director-General Tu Wei inspected the new site of the Shulin yard crew training center.
10.08	Deputy Director-General Feng Hui-sheng inspected the preparations by the Changhua Rolling Stock Branch and Changhua Station for transporting passengers during the National Day long weekend.
10.11	The 100-year anniversary of the coastal line Line was celebrated.
10.11	Successful transportation of passengers during the National Day long weekend. The National Day long weekend lasted from October 7 to October 11, 2022. During this period, TRA operated an additional 95 trains and 26 railcars. During the long weekend, TRA generated a total passenger revenue of NT\$26,898,735, which was equivalent to an average daily passenger revenue of NT\$53,796,147

Date	Events
	and 14.5% more than that in the previous year. The total number of passengers transported was 2,953,050, which was equivalent to a daily average of 590,610 passengers and 14.9% more than that in the previous year.
10.24	The NSTC Science Train officially started its journey from Taipei Main Station.
10.29	Director-General Tu Wei inspected the progress of the emergency maintenance work aimed at addressing the earthquake damage sustained by the section between Yuli Station and Fuli Station.
11.01	The Six-Year Improvement of Railway Traffic Safety—An accessible elevator was built at Zaoqiao Station.
11.02	TRA held the 23 MOTC Golden Way Awards Ceremony.
11.04	Deputy Director-General Feng Hui-sheng inspected the Taipei Rolling Stock Branch during the maintenance period.
11.07	Executive Yuan Official Wu Ze-cheng inspected the installation and testing of the Railway Temporary Speed Restriction System.
11.08	Deputy Director-General Feng Hui-sheng personally visited TRA's employee training center to give a lecture on the special railway examination program.
11.11	A press conference was held on the 7th Formosa Railroad Bento Festival.
11.17	Taipei Main Station, Tianzhong Station, Zhongzhou Station, and Su'aoxin Station received Public Restroom Awards after demonstrating improvements in their service quality.
11.24	TRA, Breeze Taipei Station operators, and Breezy Charity Foundation jointly held the Shine Like Stars Christmas tree lighting public welfare event.
11.29	The Rail Engineering Society of Taiwan held a seminar themed on "Sharing happiness through the railway network of Taiwan" to discuss new ideas.
11.30	On December 1, TRA expanded its ticket purchasing services to include nine new mobile (barcode) payment operators.
12.04	The "A Century of the Changhua Railway Roundhouse, Celebrations Across Generations" event was held to celebrate the 100-year anniversary of Changhua Railway Roundhouse.



Date	Events
12.07	The results of the first stage of the TRA 5G Train Protection Program were submitted, and the meeting for planning the second stage was held.
12.17	Chaozhou Railway Park was officially opened.
12.18	MOTC Deputy Political Minister Hu Hsiang-ling inspected the restoration of the Siuguluan River Bridge, Lele River Bridge, and Dongli Station.
12.19	TRA convened the Second Committee Meeting of the TRA Aesthetic Design Group in 2022.
12.23	Director-General Tu Wei reviewed the progress of the construction of the double-track railway between Chenggong Station and Zhuifen Station.
12.23	TRA convened the first committee meeting of the TRA Aesthetic Design Group to model the Shan-lan Hao and Hai-feng Hao excursion trains.
12.27	MOTC Minister Wang Kwo-tsai inspected the reconstruction of the earthquake-damaged sections between Yuli Station and Fuli Station and announced that the train service between Yuli Station and Fuli Station will be restored starting December 28.
12.27	TRA held the Localization Promotion Committee Meeting.
12.28	Director-General Tu Wei took the first train on the Eastern Line that passed through the route between Yuli Station and Fuli Station to review the recovery of the train service.
12.29	MOTC Minister Wang Kwo-tsai held a meeting on the results pertaining to the corporatization of TRA.
12.30	MOTC Deputy Political Minister Hu Hsiang-ling inspected TRA's contingency center.

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