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TAIWAN RAILWAYS
ANNUAL REPORT

110年 臺灣鐵路年鑑

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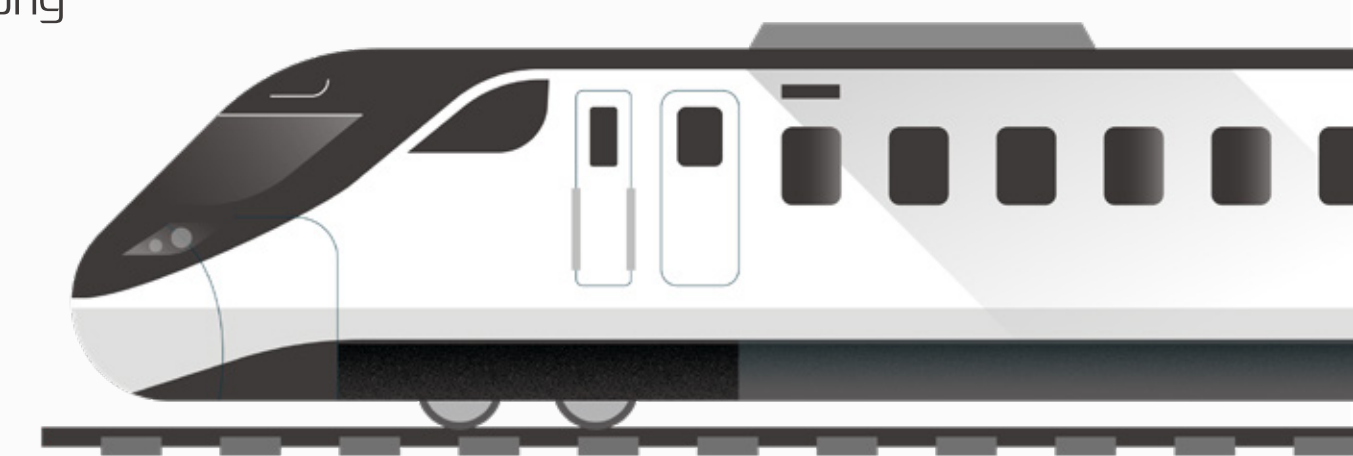
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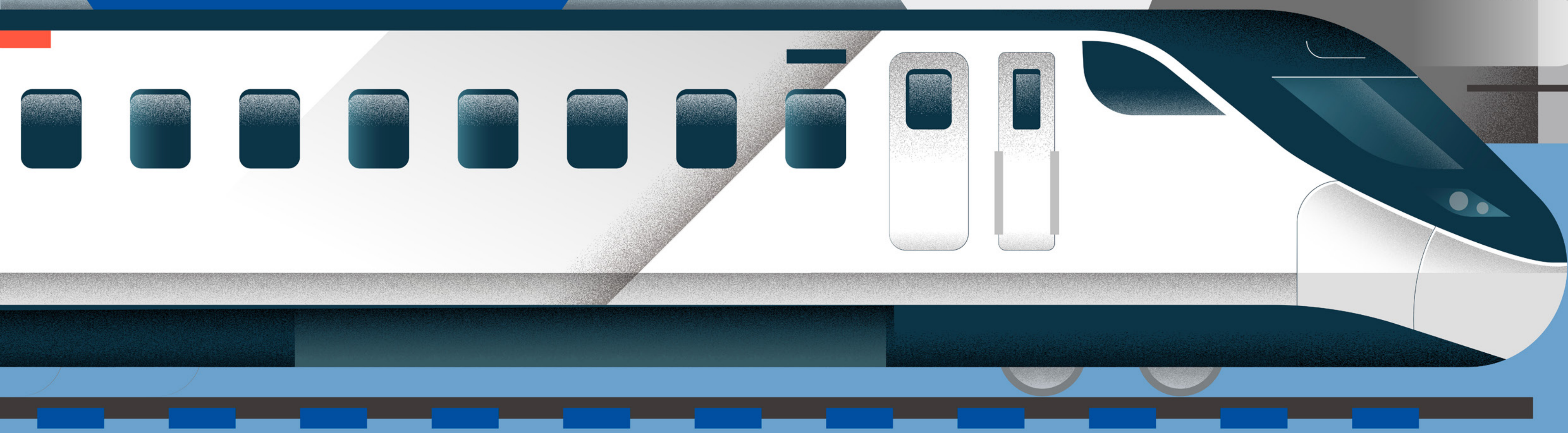
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Major Events in 2021



↓ 月台
Platform

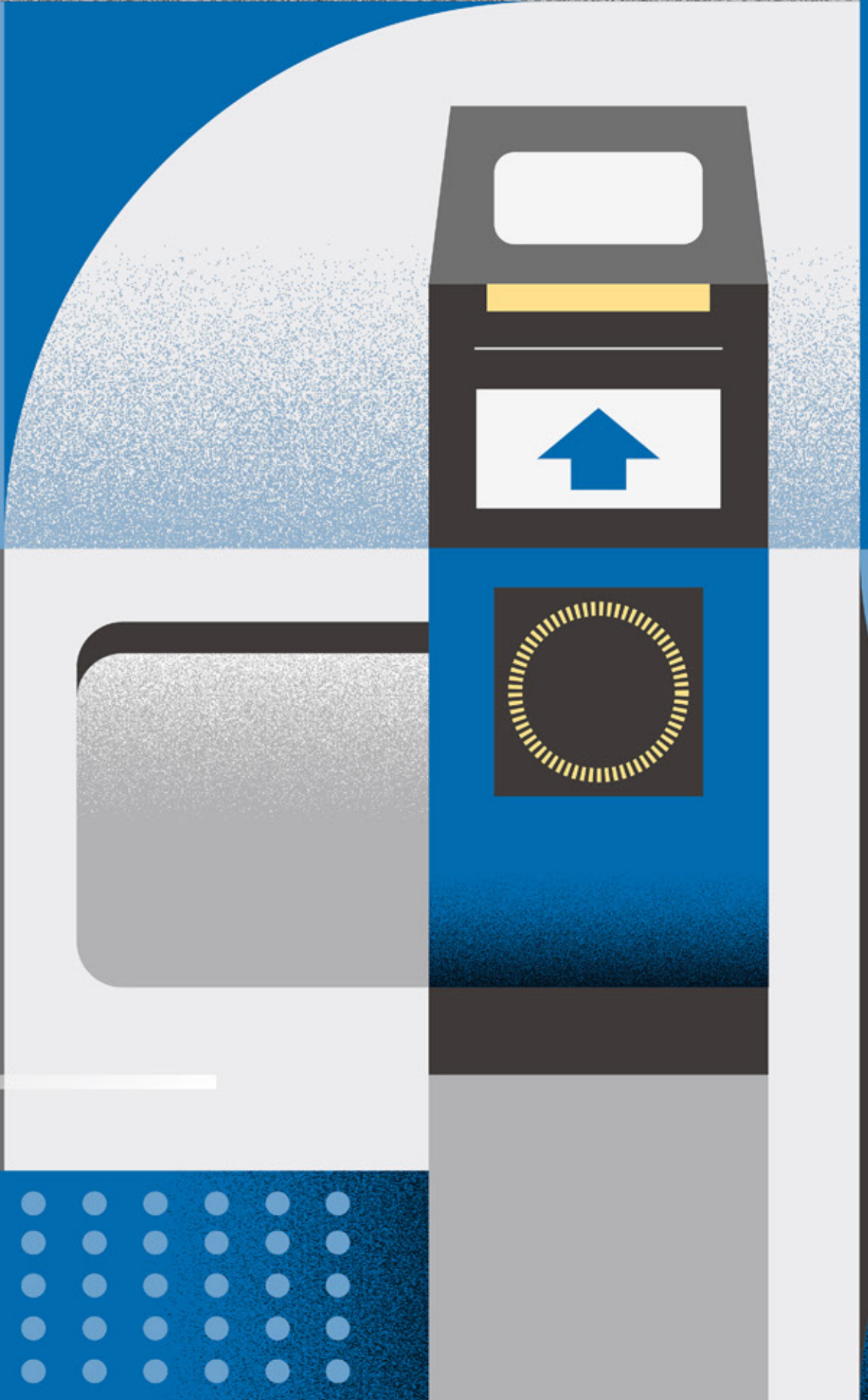
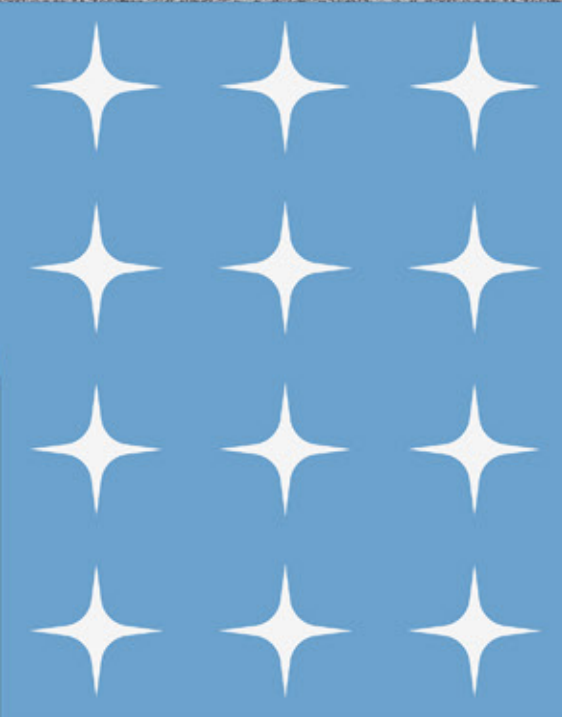
INTRODUCTION /



06:18 區間車 準點
06:23 區間車 準點



07:12 準點 北
07:37 準點 上
06:26 準點 南
06:30 準點 下



0-1 Introduction

2021 has been a challenging year, while also marking the beginning of an all-around reform. Taiwan Railways Administration (TRA) has made concerted efforts to achieve sustainable development through the implementation of safety, stability, and transformation.

In terms of safety reform, we have taken a number of measures for improvement, such as strengthening construction site management, improving risky railway sections, revamping infrastructures such as tracks and electric service, conducting evaluation of slope stability, setting up the warning system for foreign objects and falling rocks and intelligent track inspection, and enhancing the maintenance capabilities for construction and electrical engineering departments. In addition, to increase the response efficiency, the TRA horizontal communication team and regional coordination centers were set up to shorten the chain of command and strengthen supervision and inspection. In terms of rolling stock, the onboard speed limit backup systems were installed, assessment of drivers was strengthened, vehicle purchase and replacement plan continued to be implemented, and 1933 hotline was activated to provide additional protection for railway safety. Furthermore, the establishment of a safety management system was accelerated, whereby vehicle safety and efficiency could be improved through risk management.

For transportation services, the round-the-island railway network commuter and intercity transportation was arranged to meet the needs of passengers, a diversified payment and ticketing mechanism was established, the Taiwan Railways E-Booking application was continuously optimized, and new automated ticket vending machines were set up, so as to continuously provide high-quality travel services to passengers. The operation of newly purchased EMU900 passenger trains and EMU3000 intercity express trains have effectively increased the capacity of commuter trains in western Taiwan and the tourist and home-returning trains in eastern Taiwan. Moreover, the

new trains are designed aesthetically with greater emphasis on practicality and details, and EMU3000 intercity express trains have won the global design award of 2021 Good Design Best 100. We have set up the “Tengyun Cabin” business class in EMU3000 train, with aviation-level service and provision of an honorable traveling experience.

In terms of the development of subsidiary business, cruise trains have been upgraded and set sail, and the “people-oriented high-end service experience” tourist train Future Express and the “strong nostalgia and retro style” Breezy Blue Train have been launched to explore diversified railway tourism. The new trademark “TR Bento” of TRA Bento was unveiled. Through the unified visual design and standardized space modules, the overall brand image of TRA Bento Shops was enhanced, and cross-industry cooperation with foreign sister railways was carried out to jointly promote the use of Taiwan local ingredients in dishes and release a variety of special bentos. In addition, we have also actively developed the railway products of the star train fleet to increase commodity exposure and revenue. We continue to focus on asset development and promote mutual benefit and common prosperity between railway transportation and local business districts by urban renewal, setting superficies for state-owned land, and private participation in public construction, so as to increase revenue and continuously create win-win oriented rail economic development.

In terms of job stability, we continue to promote the improvement of employees’ accommodation facilities and the environment of railway maintenance squad to improve the quality of employees’ working environment, and sign industry-academia vocational collaboration contracts with regional senior and vocational high schools to actively cultivate diversified grassroots technical talent and implement the inheritance of railway technology. We have won the approval of the Executive Yuan for welfare improvement measures, and timely subsidizing employees’

weddings, funerals, maternity, and children’s education; it stabilizes colleagues’ lives and create a happy workplace.

The TRA shoulders the public’s expectations for rail transportation, and all employees have full confidence and will always stand in the front line to provide all kinds of high-quality services for passengers.



Director General *Victor Tu*

CHAPTER 01 /





Vision of TRA

- 1-1 Vision and strategic objectives
- 1-2 Operational policy

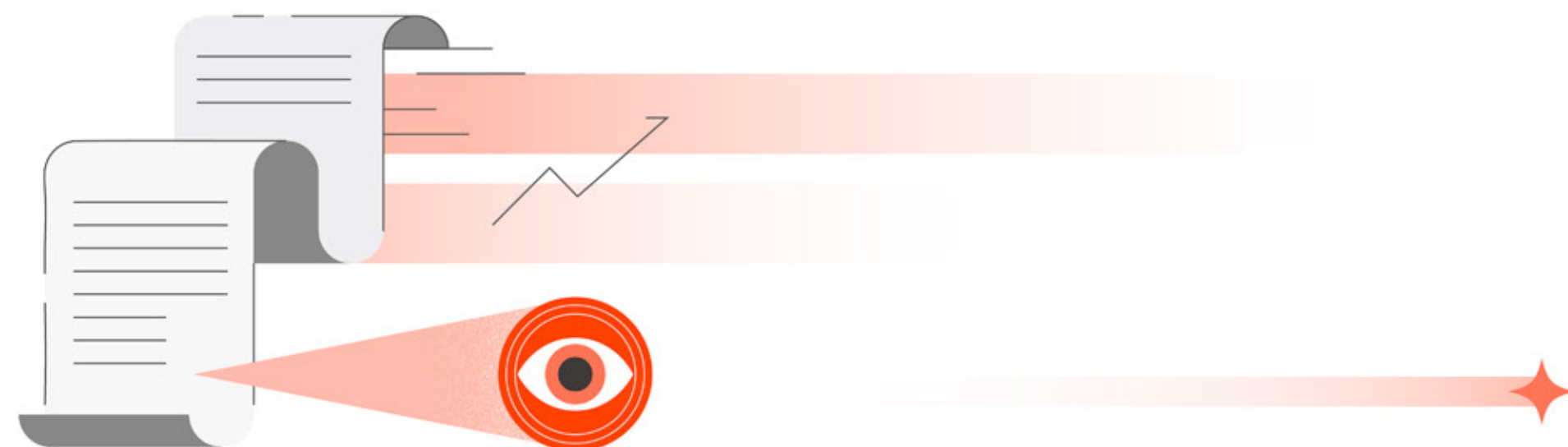
1-1 Vision and strategic objectives

1 Vision

Build a customer satisfaction-oriented high-quality public transportation system, operate the dual-core business of main transportation business and subsidiary business, and become the railway trusted by people.

2 Strategic objectives

1. Ensuring railway safety: building a safe, accurate, convenient, comfortable, and green transportation environment.
2. Improving the culture of TRA: remodeling employees' values, encouraging innovative thinking, establishing unity consciousness, and enhancing colleagues' sense of honor.
3. Improving the service quality: Ensuring that the operating equipment are intelligent, humanized, universal, friendly, and informative.
4. Improving the operating environment: providing a safe, hygienic, and comfortable working space, simplifying the operation procedure, strengthening the talent retention and cultivation, paying attention to both physical and mental health of employees, and protecting the rights and the interests of employees.
5. Upgrading vehicles and railroad facilities: improving the software and hardware facilities, simplifying the operation interface, and introducing intelligent detection and management technology to improve the system availability, stability and functional efficiency.
6. Promoting business operation: improving the operational constitution, enhancing the financial structure, developing subsidiary businesses, enforcing assets revitalization, promoting rail development and activating railway revenue, creating peripheral benefits and added value along the route, and promoting international cooperation and exchange.



1-2 Operational policy

1 Implementation of government policies

In line with the policy guidelines of the Executive Yuan in 2021, the following measures have been executed:

1. Accelerating the promotion of public construction plans and driving the private investment- six investment projects are scheduled for this year, totaling TWD 21,927,637,000.
2. Establishing and improving barrier-free living environment- the provision of establishment and maintenance cost of barrier-free facilities is TWD 680,136,000.
3. Ensuring the safety and health of workers, and reducing occupational accidents - the provision of labor health examination fees, labor safety equipment, and education funds is TWD 79,889,000.
4. Conducting pollution prevention measures in line with the government's environmental protection policy- the provision of wastewater treatment, waste removal and transport, air pollution prevention, and other environmental protection expenditures is TWD 457,701,000.
5. Assisting the development and unity of trade union and implement the self-management of trade union- donating TWD 2,382,000 to Taiwan Railway Labor Union.

2 Operational management

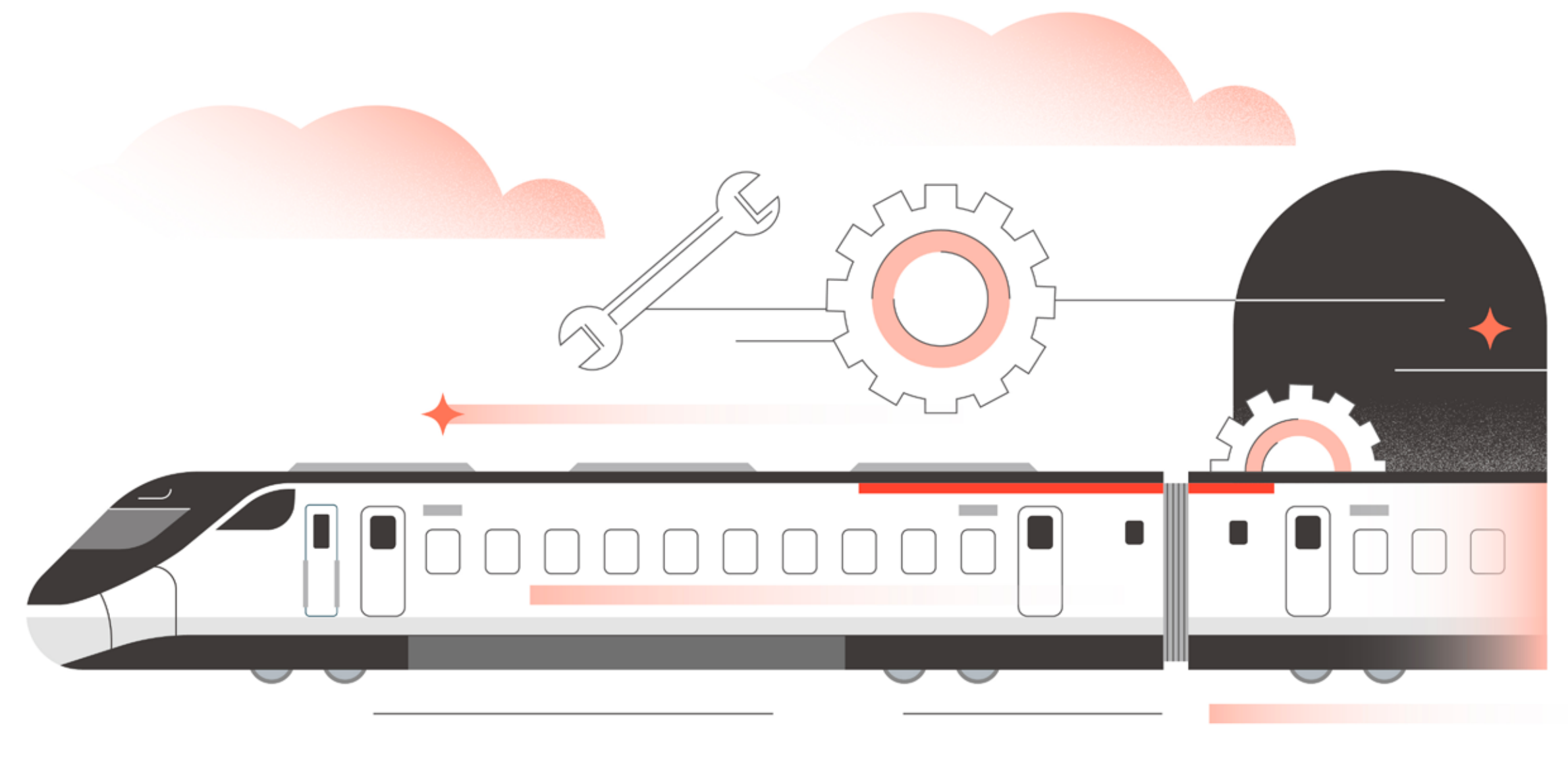
1. Clarifying the positioning of the transport market and strengthening the long-distance intercity transport (Taipei - Taitung and Taipei - Kaohsiung) and cross-line transport (Taichung - Hualien) in the east-west trunk line; strengthening the commuter transport in the western trunk line area.
2. Promoting seamless transport, integrating ticket, timetables, stations, and operations with intercity bus, city bus, MRT and high-speed rail, and building diversified, convenient and high-quality transportation services.
3. Implementing universal design, building barrier-free space continuously, and shaping a modern and friendly transport environment.
4. Combining railway assets and culture, conducting a cross-industry alliance, researching and developing distinctive commodities, developing railway tourism, strengthening marketing strategies, and exploring new customer groups.

5. Implementing the environmental awareness of sustainable development and the people-oriented design concept; making effective use of existing assets to develop travel-related business; loosening the law and regulations, creating the Transit Oriented Development benefits of combining transportation construction with land development, and making the Taiwan Railways the “link to a better life.”
6. Making every effort to promote the revitalization of assets and selecting key assets to be activated and developed in priority by public-private-partnership, urban renewal, and setting up superficies, so as to create financial resources.
7. Strengthening the on-the-job training and assessment such as employee risk management and crisis management, strengthening the disaster prevention and terrorism prevention mechanism, and improving the emergency response ability to maintain railway safety.
8. Strengthening vertical communication and horizontal coordination within the enterprise, establishing harmonious labor-capital relations and learning organization, and improving organizational efficiency.
9. Discussing the reasonable fare adjustment, service route and station loss subsidy mechanism, and striving to improve quality and cost saving, so as to implement enterprise-oriented operation and sustainable development of business.

4. Handling the relocation plan of Kaohsiung Workshop, improving vehicle maintenance technology and quality, and ensuring railway safety; in addition, promoting the development and the operation of original workshop site, preservation and the utilization of railway culture, expanding affiliated businesses, and driving regional development.
5. Handling the connection plan between THSR Changhua Station and Taiwan Railways, so as to strengthen the transfer and connection between the two railways, expanding the scope of transfer service between THSR Changhua Station and Taiwan Railways, and improving the service quality of the station’s connected traffic and transportation system.
6. Improving the infrastructure of Jiji branch line and improving the hardware construction, track alignment, and slope stability detection of stations along the Jiji line, so as to improve the overall service level of the branch line and strengthen the convenience, safety, and tourism quality of passengers.
7. Handling the safety enhancement of track structure, completely replacing the wood sleepers and turnouts, which are easy to corrode with PC sleepers and turnouts to integrate the turnout types of the whole line, reducing the maintenance cost, and improving the strength of track structure for ensuring railway safety.

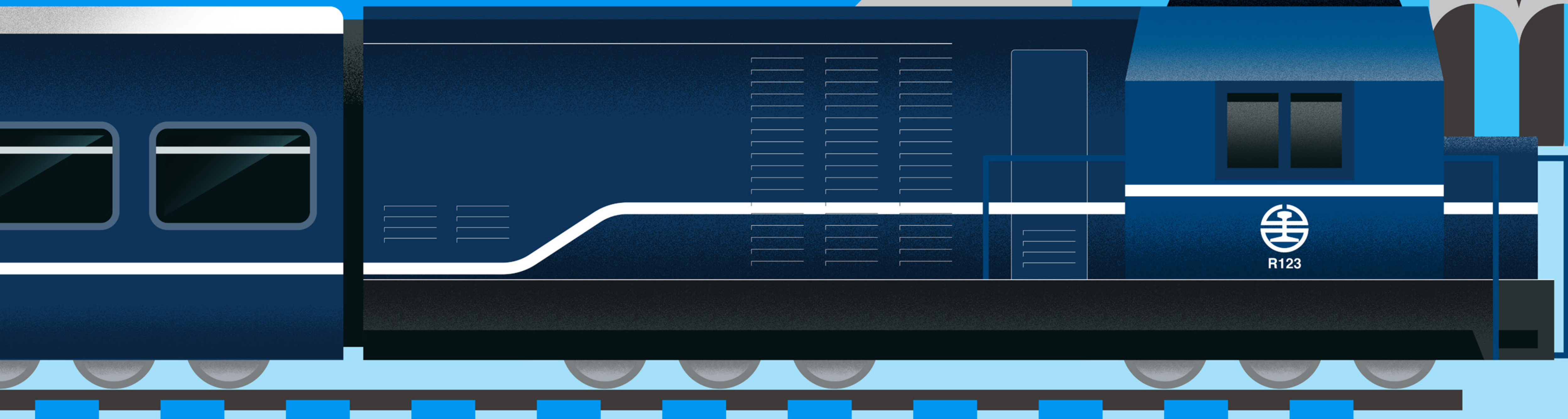
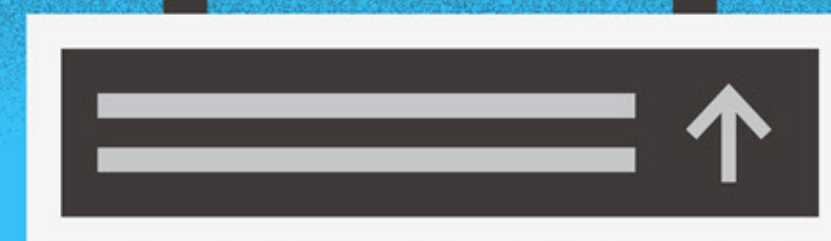
3 Improvements of software and hardware

1. Handling the railway operational safety improvement plan, strengthening the joint inspection of construction and electric engineering and disaster prevention and protection measures, and strengthening the infrastructure to improve the operational efficiency, so as to improve operational safety and service quality.
2. Handling the smartification upgrade project of Taiwan Railways’ electric engineering, by means of upgrading the software and hardware, supplemented by technology and intelligence, and strengthening the transport efficiency, so as to expand the service scope, improve the service quality, and increase the convenience of passengers.
3. Continuing to purchase and replace the operation vehicles, simplifying vehicle types, improving service quality, and punctuality rate.



CHAPTER 02 /

車站
Station





Organization and Operation

2-1 Organization and manpower

2-2 Overview of operating facilities

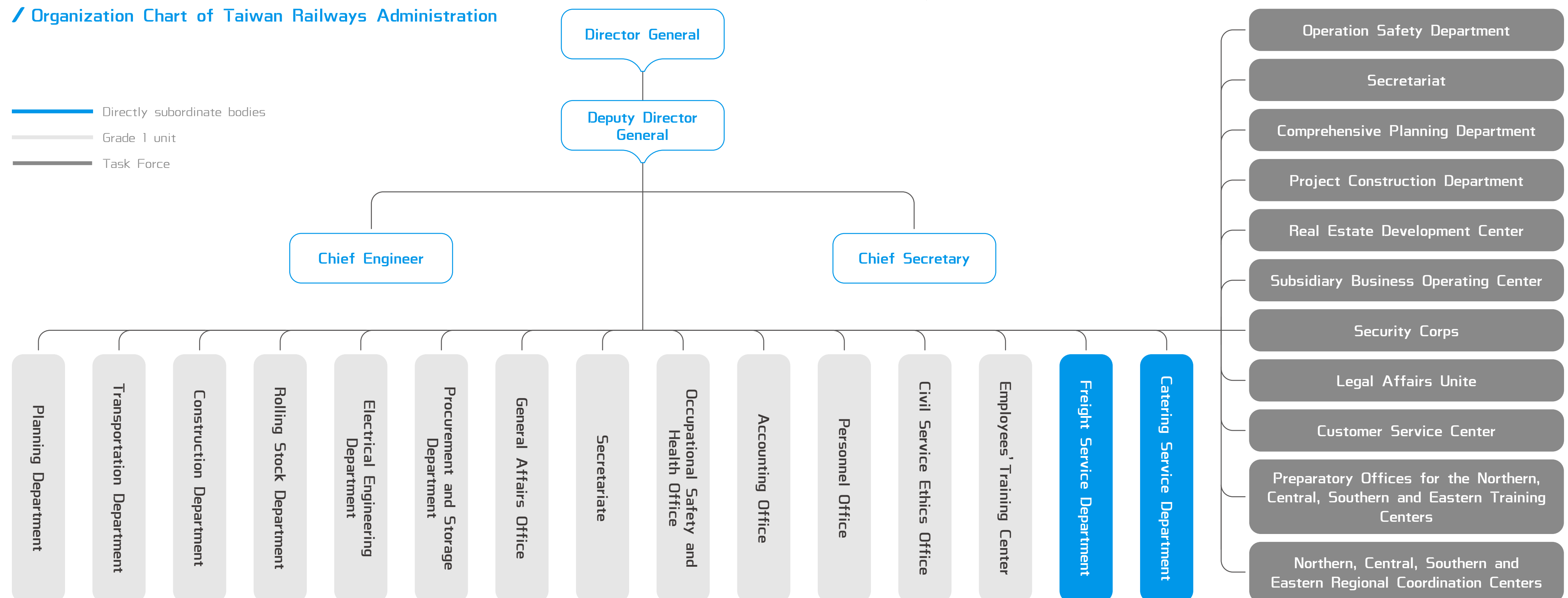
2-1 Organization and manpower

In the early days of Taiwan’s restoration, the operation and the management of Taiwan Railways was entrusted by the central government to the Taiwan Provincial Government. In 1945, the Taiwan Railways Administration Committee was established, and in 1948, TRA was established. Since July 1, 1999, it has been under the Ministry of Transportation and Communications. TRA sets 13 departments under the Director General, Deputy Director General, Chief Engineer and Chief Secretary, including 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 Employees’ Training

Center; 17 task forces, including Operation Safety Department, Secretariat, Comprehensive Planning Department, Project Construction Department, Real Estate Development Center, Subsidiary Business Operating Center, Security Corps, Legal Affairs Unit, Customer Service Center, Preparatory Offices for the Northern, Central, Southern and Eastern Training Centers and Northern, Central, Southern and Eastern Regional Coordination Centers; in addition, there are two directly affiliated institutions, namely, the Freight Service Department and Catering Service Department; and there are 43 branches under the Taiwan Railways Administration, including workshops, sub-branches, centers, offices, and teams.

In 2021, the budgeted complement of TRA was 17,361, and the existing staff number at the end of 2021 was 15,881.

/ Organization Chart of Taiwan Railways Administration



2-2 Overview of operating facilities

1 Operating mileage

- The operating mileage is 1,065 km, among which the double-track electrified railway is 742.1 km, the single-track electrified railway is 255.6 km, and single-track non-electrified railway is 67.3 km.
- Stations: There are 241 stations in total, including 4 special class stations, 28 first-class stations, 25 second-class stations, 72 third-class stations, 66 simple stations, and 46

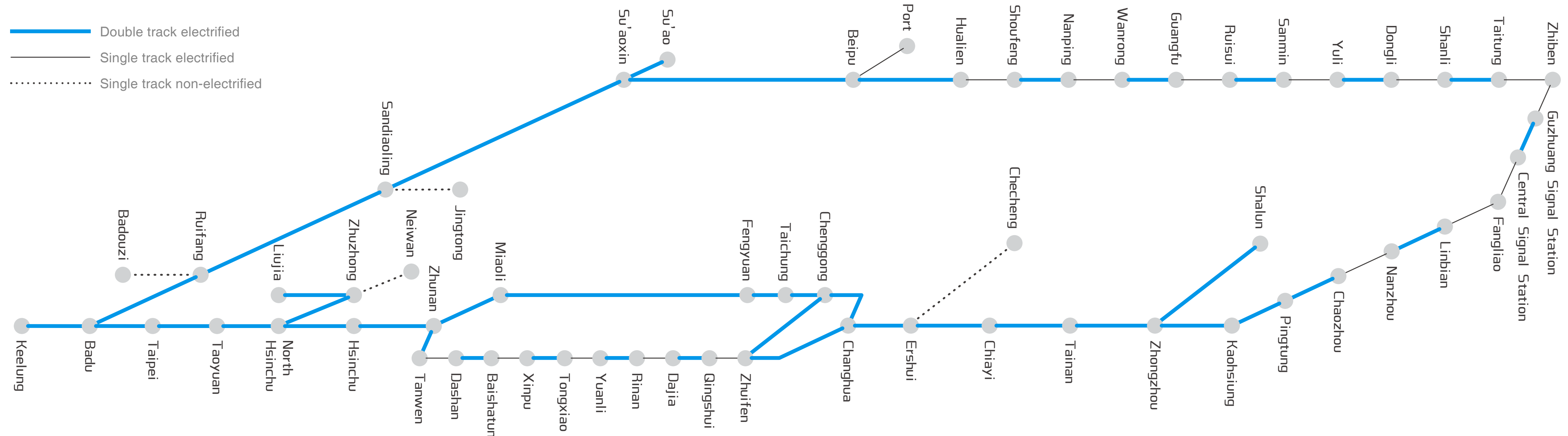
staffless stations.

- Level crossings: 419 in total, 3 for the first type, 1 for the second type, 370 for the third type, 28 for semi-enclosed type, 11 for manual controlled type, and 6 for special use.

- There are 1,616 bridges and 125 tunnels.

Unit : km

West Coast Line Keelung ← 125.4 → Zhunan Zhunan ← 90.2 → Changhua (coastal line) Changhua ← 188.9 → Kaohsiung	Taichung Line Zhunan ← 85.5 → Changhua (mountain line) Chenggong ← 2.2 → Zhuifen	Pingtung Line Kaohsiung ← 61.3 → Fangliao	Pingxi Line Sandiaoling ← 12.9 → Jingtong	North-link Line Su'aoxin ← 79.2 → Hualien	Taitung Line Hualien ← 150.9 → Taitung
Liujia Line Zhuzhong ← 3.1 → Liujia	Jiji Line Ershui ← 29.7 → Checheng	Shen'ao Line Ruifang ← 4.7 → Badouzi	Yilan Line Badu ← 93.6 → Su'ao	Hualien Port Line Beipu ← 7.4 → Hualien Port	South-link Line Fangliao ← 98.2 → Taitung
Neiwan Line North Hsinchu ← 26.5 → Neiwan	Shalun Line Zhongzhou ← 5.3 → Shalun				



2 Number of rolling stock and utilization efficiency

/ Number of locomotives, passenger cars, and freight cars

Locomotives	Number	Passenger Cars	Number
Electric locomotives	85	Tze-Chiang EMUs	354
Push-pull electric locomotives	63	Push-pull Tze-Chiang passenger cars	381
Diesel-electric locomotives	86	Commuter EMUs	1,090
Diesel-hydraulic locomotives	16	Tze-Chiang diesel-multiple units	162
250 locomotives		Diesel passenger cars	46
		Air-conditioned passenger cars	359
		Ordinary passenger cars	26
		Other cars	39
		2,457 passenger cars	

Freight Cars	Number
1,556 freight cars	

Utilization efficiency

The availability of locomotives reached 90.16% this year. Among them, the available electric locomotives account for 94.89% of all locomotives of this type, 87.98% for push-pull electric locomotives, 87.92% for diesel locomotives, 95.25% for diesel-hydraulic locomotives, 91.31% for EMUs, 99.37% for tilting EMUs, and 84.38% for diesel passenger cars.



CHAPTER 03 /





Achievements and Business Innovations

3-1 Achievements

3-2 Business Innovations

3-1 Achievements

1 EMU3000 intercity express trains

The first delivery of EMU3000 intercity express trains with 12 cars arrived at the Port of Hualien on July 30, 2021. The Minister of Transportation and Communications, Wang Kwo-tsai, personally supervised the unloading process at Wharf No. 8. These cars are designed with safety as the top priority. In addition to a significant functional improvement in the train control and management system, closed-circuit television (CCTV) surveillance and fire detection systems are installed for vehicle monitoring, and an emergency intercom system is deployed for direct communication with the conductor. Further, a three-in-one emergency button is set up next to the driver console to simultaneously sound sirens, apply emergency brakes, and lower pantographs in case of an emergency, thereby ensuring railway safety. The exterior of the train is designed around the concept of “silent flow,” showcasing a sleek, minimalist style in black and white, like an elegant curve crossing a sheet of white paper. EMU3000 has won the award of Good Design Best 100 in Japan. It was the first time that business-class carriages were included in a Taiwan Railways train. The train made its maiden trip from Taitung to Shulin on December 26, 2021, and had been officially put into operation for Shulin-Taitung Section since December 29, 2021.

Characteristics of passenger facilities in EMU3000 intercity express trains:

1. Air-conditioning and ventilation off button: the air-conditioning and ventilation of the whole train can be turned off in areas with poor air quality to prevent dirty air from accessing the carriage.
2. A new business class with Wi-Fi is provided.
3. Each carriage is provided with a large luggage storage area.
4. CCTV system is installed in each carriage to maintain the safety of the travel.
5. Each seat is provided with a charging socket for electronic devices.
6. The accessible carriage is provided with a stroller storage area for parents traveling with children.
7. Direct communication with the conductor can be carried out by radio via the emergency button, which improves the efficiency.
8. Car 7 is equipped with an automated external defibrillator (AED) for emergency.



Unloading of Trains Supervised by the Minister



Delivery Test

2 Brand establishment of “Tengyun Cabin” of EMU3000 intercity express trains

The EMU3000 intercity express trains, launched by the TRA at the end of 2021, are not only upgraded with comprehensively improved train safety control and management systems but also equipped with CCTV and AED devices, with greater attention devoted to the comfort and passengers’ traveling environment. To improve the quality of service, each train includes a business-class car named “Tengyun Cabin” with 30 more spacious exclusive seats, thus becoming a new milestone of the TRA.

1. Attendants of Tengyun Cabin

To improve the service, the TRA has recruited new staff and commissioned China Airlines to provide the business-class service training, focusing on “new service and new travel”, providing five-star business-class service around the concept of starting from the heart, learning the service of flight attendant level on dress & appearance, service attitude, passenger guidance, communication skills, etc., and carrying forward the spirit of airliner cabin service to the service of TRA’s new trains. In the future, two attendants will serve passengers in Tengyun Cabin on each EMU300 intercity express train.



Training

2. Meals and beverages for Tengyun Cabin

In terms of catering service, Tengyun Cabin passengers are provided with domestic and foreign quality snacks and beverages with unified visual design, showcasing the concept of “light travel” and sharp product design. By inheriting the design spirit of “silent flow”, the image of EMU3000 intercity express trains is printed on related catering supplies and special drinks to create an honorable dining experience.



Passengers can pre-select meals and beverages when booking tickets through the TRA application or the official website (before 17:00 the previous day). Passengers who purchase tickets for Tengyun Cabin on the day of travel will enjoy the meals and beverages actually provided on the train. Passengers can select a meal out of five options, including the limited TRA bento for Tengyun Cabin (only available in Tengyun Cabin, not sold in other trains and stations), Haagen-Dazs ice cream, SunnyHills cake (pineapple & apple cake), Fu Yi Shan spicy crackers or lemon crackers. Passengers can also select a beverage out of four options, including Starbucks Pike place & roast black coffee, espresso latte, limited TRA X AQUAGEN carbonated water, and bottled water with the logo of EMU 3000. After passengers are seated in Tengyun Cabin, meals and beverages will be delivered to them by a special attendant.





Starbucks Pike Place & Roast Black Coffee



Starbucks Espresso Latte



Bottled Water with the Logo of UNI EMU3000



Limited TRA X AQUAGEN Carbonated Water



Haagen-Dazs Ice Cream



SunnyHills Pineapple & Apple Cake



Fu Yi Shan Spicy Crackers or Lemon Crackers



Limited TRA Bento for Tengyun Cabin



EMU3000 Intercity Express Train

3 TRA Aesthetics 2.0

On July 1, 2021, the TRA set up the 2nd generation aesthetic group, with new members, including Monica Kuo, the director and head of the Landscape Department of Chinese Culture University, Shenan Chuang, the co-founder of Ogilvy Taiwan, and Jun-Liang Chen, the founder of Freeimage Design, to continue the implementation of aesthetic revival and give the TRA a completely new look in aesthetic reform.

On July 30, 2021, the first batch of EMU3000 intercity express trains purchased by the TRA arrived at the Port of Hualien, which started the journey of silent flow. On the other hand, the retro train “Breezy Blue”, which was transformed on the basis of the blue local train, also returned to South Link Line on October 23, 2021, showing the original retro style.

For Aesthetic Revival 2.0, short-term goals included station subtraction aesthetics, TRA bento shops, and DreamWorks demonstration shops; medium and long-term goals will focus on the transformation of tourism branch line such as Jiji, Neiwan, and Pingxi, and launch Shanlan, Haifeng, Future Express Michelin dining cars, and EMU3000 special cars, so as to build a brand-new tourist train fleet and create TRA’s brand products in combination with various models.



Interior Decoration of EMU3000 Intercity Express Train

4 Breezy Blue tourist train

On October 18, 2021, the press conference for the “Breezy Blue” Tourist Train was held at Fangliao Station in Pingtung, announcing the maiden trip of the train. On October 23, the maiden trip was conducted. Premier Su Tseng-chang inspected the operation of the trip (Fangliao-Fangshan), and he appreciated as well as promoted this trip, which had been vigorously publicized and reported by about 60 print and electronic media outlets. The tourist train runs back and forth on the South Link Line (Fangliao-Taitung) once per day, with 208 passengers on the first trip, and 12,577 passengers had enjoyed the sightseeing trip by the end of 2021.



Breezy Blue Train

5 Start of Future Express tourist trains

Future Express tourist trains started the maiden trip at midnight of December 31, 2020 - a 2-day and 2-night trip of “Trip of sunrise - dawning in Taimali”. Two Future Express tourist trains departed from Nangang Station and Xinwuri Station respectively, and met in Taimali to greet the first dawn of Taiwan on New Year’s Day in 2021. A total of 173 passengers were included in the first tour group, and a total of 58 groups, 4,637 passengers, participated in the trip in 2021.



Trip of Sunrise - Milestone of Two Future Express Trains Met at Taimali Station



Passengers in Welcoming Event at the Square of Taimali Station

6 Upgrade of cruise trains

A press conference on the maiden trip of the upgraded cruise trains was held at Nangang Station on September 3, 2021. Passengers enjoy a new experience through four feature activities - theme painting, limited bento, exclusive train tickets, and interesting itinerary selection. There were 13 tour groups with 1,526 passengers from the maiden trip to the end of 2021.



“Press Conference on the Maiden Trip of the Upgraded Cruise Trains” Held at Nangang Station on September 3, 2021

7 Ticketing service

1. Electronic Stored Value Cards

The TRA has completed the electronic stored value card system of 239 stations in the round-the-island railway network, and provided preferential measures for passenger transfer or buses at 32 stations on the east and west lines combined with the Directorate General of Highways, so as to achieve energy conservation and carbon reduction. We are now planning to combine periodical tickets with the cards so that passengers can travel all over Taiwan with only one card.

From January to December of 2021, 105,302,387 passengers travelled with electronic stored value cards, with a daily average of 288,500 passengers and TWD 3,523,300,000 revenue.

2. Convenient ticket booking

(1) Booking (collecting) tickets from convenience stores or post offices

In 2021, 11,900 passengers collected their tickets from convenience stores, of which the post office, 7-Eleven, FamilyMart, Hi-Life, and OK accounted for 0.37%, 68.85%, 26.43%, 3.21%, and 1.15%, respectively.

(2) 24-hour online and voice ticket booking

From July 1, 2021, passengers can book tickets for trains at least 30 minutes before departure on the day of travel and complete payment and ticket collection at the latest 20 minutes before departure, and tickets are available for purchase all day because of the convenient service. Approximately 11,700,000 tickets were booked and collected in 2021.

(3) Periodical tickets can be booked with credit cards

Since October 8, 2021, passengers could book periodical tickets with credit cards.

(4) Taiwan Railways E-Booking App

The TRA has continuously optimized the “Taiwan Railways E-Booking” application, which supports multiple ticket collection, and added operation options such as “Forgetting the booking code” and “Re-downloading the ticket” to the mobile ticket page, keeping the user interface more intuitive and humanized. In line with the new trains and cabins released by the TRA, passengers can book tickets for designated cabins with more options.

3. Upgrade of the membership service system

Since the introduction of the member reward points and matching booking mechanism in 2011, the number of members reached 1,419,365 by 2021 (including 1,399,515 natural persons and 19,850 legal persons), and the number of successful matches was 171,683, with a success rate of 35.38%.

4. Diversification of noncash payment

In line with the launch of the new ticketing system on April 23, 2019, passengers could pay for tickets with Apple Pay, Samsung Pay and Google Pay at ticketing windows, and mobile ticket payment services are established according to passengers’ needs. On March 25, 2021, Taiwan Pay mobile payment (bar code payment) has been added at ticketing windows: on September 7, 2021, Apple Pay mobile payment has been added to the mobile App “Taiwan Railways E-Booking”, which greatly improved the convenience of passengers’ ticket booking and payment. Noncash payment can be applied in different fields, including station and online (official website and mobile App), and the number and the amount of transactions are counted each year, as shown in the following table:

Transaction	Year	Station	Online (official website and app)	Station mobile payment	Mobile payment app
Number of the transaction (nos.)	2019	2.69 million	4.75 million	27 thousand	—
	2020	2.97 million	7.09 million	70 thousand	—
	2021	1.86 million	3.14 million	170 thousand	630 thousand
Amount (TWD)	2019	1.198 billion	3.338 billion	9.36 million	—
	2020	1.25826 billion	2.9834 billion	22.19 million	—
	2021	965.03 million	2.48536 billion	38.42 million	196.71million

5. Construction of automated ticketing equipment

To improve the service quality and ticket management, we have continuously constructed and updated the automated ticketing equipment.

	Computer ticketing terminal (nos.)	Reserved seat ticket vending machine (set)	Ticket vending machine (set)	Automatic ticket gate (nos.)	Ticket inspection pole (set)	On-board portable fare adjustment device (set)
Number of stations	191	38	117	68	239	8 (train team)
Quantity	436	144	215	384	770	800

8 Railway tourism

1. 2021 Taiwan Popular Science Train

The “2021 Taiwan Popular Science Train” originally scheduled to run from October 26 to October 29, 2021 was changed to an online exhibition of popular science train due to the COVID-19 pandemic. This is an example of digital transformation in response to the COVID-19 pandemic and network development, and it completed the journey around the island on January 25, 2022.

2. 2021 Summer Formosa Train

On October 30, November 13 and November 27, 2021, the Summer Formosa Train was released. It was pulled by a DT668 steam locomotive and attached with six Tze-Chiang DMU3100 cars. It started from Yuli to Taitung Station and operated as a cruise train (stopping at Fuli, Chishang, Guanshan, Shanli, etc. along the way), and the return trip was arranged by the contractors of the Subsidiary Business Operating Center as a package, which took passengers on a journey through the vintage atmosphere of the steam train and the breathtaking views of the Hualien-Taitung Valley.

3. Environmental friendly vehicles (trains + bicycles)

In line with the policy of energy conservation and carbon reduction and the promotion of citizens’ leisure activities, the TRA has introduced measures such as environmental friendly trains and charter trains to attract passengers to take “trains and bicycles” railway trips. A total of 162,510 passengers have experienced such trips in 2021.

4. Push-pull Tze-Chiang Train with parent-child cars

Parent-child cars were first introduced on August 6, 2017, and are now been operated in 103 trains every week after schedule adjustment on December 29, 2021, with a total 42,146 passenger in 2021.

5. Charter trains for tourist groups

The TRA promotes railway tourism and provides comfortable and convenient trips for domestic and foreign tourists. In 2021, the TRA served 248 tourist groups, totaling 74,418 person-times and a revenue of TWD 20,348,604.

6. Continuous issuance of TR-PASS

To attract domestic and foreign tourists to the railway tourism, the TR-PASS of general and student edition are continuously issued. The revenue data for 2021 are as follows:

	General edition	Student edition
Quantity	6,380	1,065
Revenue (TWD)	12,967,915	690,668

7. Issuance of JOINT-PASS with Taiwan High Speed Rail (THSR)

To facilitate foreign tourists to engage in business activities or sightseeing in Taiwan, we have continuously cooperated with THSR to issue JOINT-PASS. In 2021, we issued six passes, earning a revenue of TWD 4,220.

8. One-day pass for branch lines

The TRA has continued to promote branch line tourism, and the revenue data of one-day pass of each branch line in 2021 are as follows:

	Northeast Coast	Pingxi – Shen'ao	Neiwan	Jiji
Quantity	245	15,168	1,519	2,945
Revenue (TWD)	27,894	1,108,280	125,810	221,940

9 Connection with international railways

1. The first anniversary commemoration of sister stations concluded between Wanhua Station of TRA and Taga Taisha-mae Station of Ohmi Railway Co., Ltd.

November 4, 2021 marked the first anniversary of sister stations concluded between Wanhua Station of TRA and Taga Taisha-mae Station of Ohmi Railway Co., Ltd., and both parties held the first anniversary commemoration of the sister station at Wanhua Station. Natsuki Yasuda, the general manager of the Taipei Branch of Prince Hotels, Inc., presented the lunch box of Ohmi Railway to Cai Yikuan, the stationmaster of Wanhua Station. Although the COVID-19 pandemic prevented visitors from Taiwan and Japan to visit the other country, the first anniversary commemoration has deepened the friendship between both parties.

2. Sister station concluded between Jiaoxi Station of TRA and Izu Nagaoka Station of Izuhakone Railway

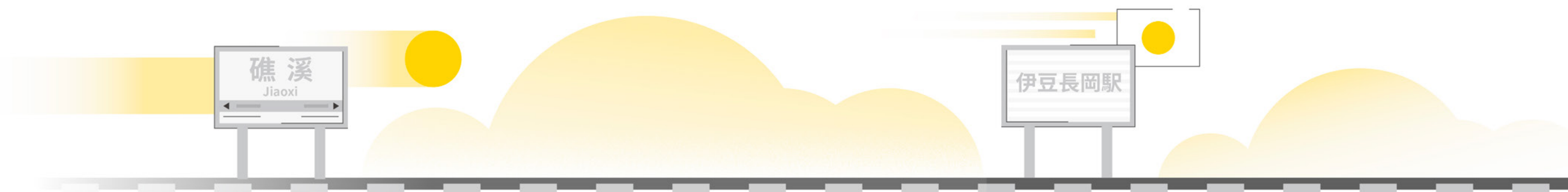
November 4, 2021 marked the first anniversary of the establishment of sister stations concluded between Jiaoxi Station of TRA and Izu Nagaoka Station of Izuhakone Railway. On the afternoon of that day, the first anniversary celebration was attended by Natsuki Yasuda, the general manager of Taipei Branch of Prince Hotels, Inc. Both parties exchanged gifts with each other, adding warmth to both stations adjacent to hot springs, and hoping that the warmth will last until the end of the epidemics, so that travelers from both Taiwan and Japan can visit both stations again.



First Anniversary Commemoration Between Wanhua Station of TRA and Taga Taisha-mae Station of Ohmi Railway Co., Ltd.



First Anniversary Commemoration of Sister Station Concluded Between Jiaoxi Station of TRA and Izu Nagaoka Station of Izuhakone Railway



10 Continuous launch of innovative TRA bento

1. In line with the promotion plan of pineapple in public transport stations and service areas released by the Ministry of Transportation and Communications, the TRA has successively launched a series of “TR Bento X pineapple” bentos in six catering centers across Taiwan since March 5, 2021, which not only expanded domestic demand for pineapples but also helped farmers and increased the brand visibility of TRA Bento. By March 28, 14,343 kg of pineapples were purchased and 213,489 bento boxes were sold.



[Side Dish]
Fried Fungus With Pineapple



Alianthus Prickly Ash Bento with
Pineapple, and Chicken Leg



Pineapple Pork Chop
Bento



Hawaiian Fried Rice



Golden Pork Chop
Special Bento

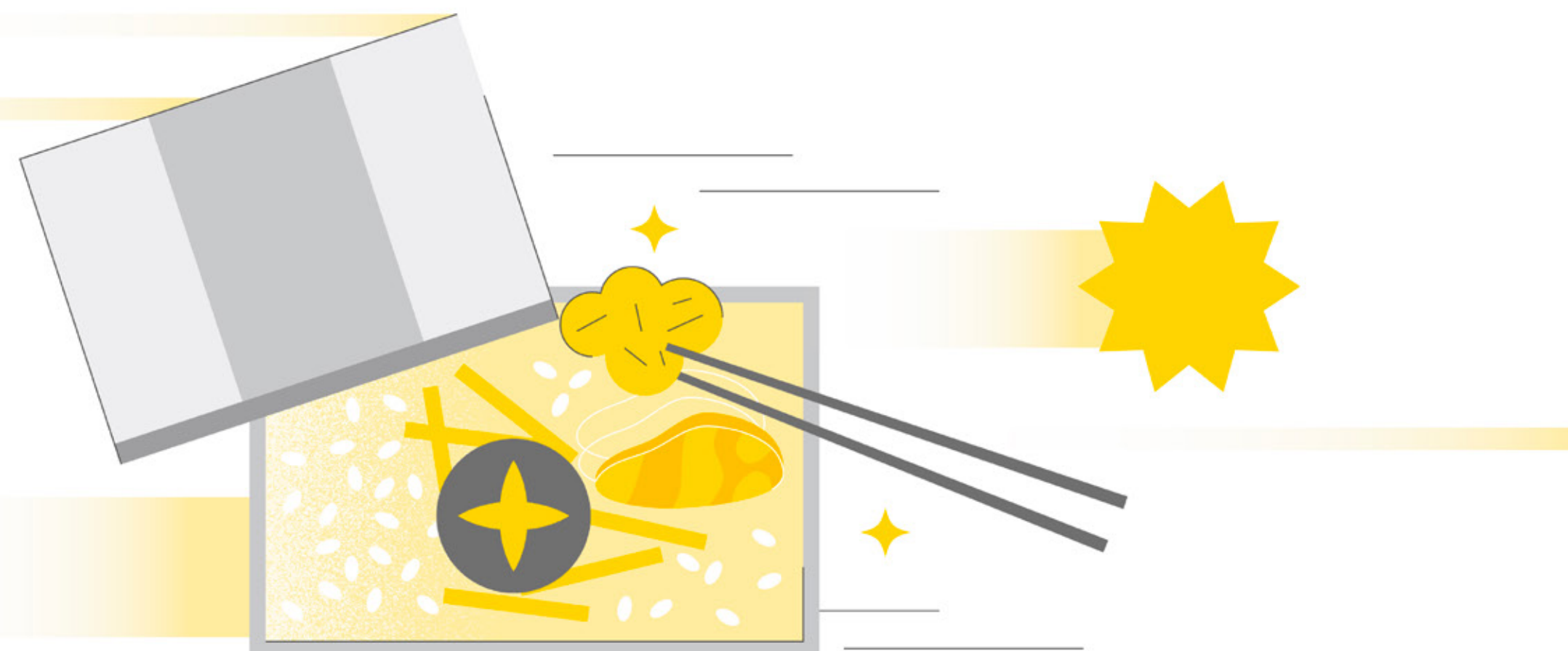


Stir-fried Turmeric Pork
Rice Burger



Red Quinoa Shirred Egg
Rice Burger

2. From June 1 to the end of July, the TRA launched the “TRA Warm-hearted Bento 2.0 Tribute Project”, by which medical professionals, firefighters and police officers could enjoy a 10% discount when they purchased the bento in any “TR bento” shops with identification cards, and they could also enjoy a 10% discount and free delivery when ordering more than 10 bento boxes within 3 km of Taipei Main Station. TRA had sold 1,735 warm-hearted bento boxes to medical professionals, firefighters and police officers, earning a revenue of TWD 115,894.



3. Affected by the COVID-19 pandemic, the number of eels exported to Japan has been greatly reduced this year. The TRA and the Fisheries Bureau jointly planned and carefully developed the “Grilled Eel Bento” by the chef of Taipei Railway Restaurant of TRA to promote domestic eels to citizens and help fishermen. In this case, the grilled eel exported to Japan recommended by Changhua Fisheries Association is cooked with delicious and high-quality eel as the main dish, and the side dishes integrated Taiwan and Japanese flavors. A total of 1,957 bento boxes were sold from September 16 to September 26, with a revenue of TWD 345,587, which was greatly appreciated by the passengers and helped the fishermen.



Grilled Eel Bento

As the TRA eel bento had been praised by the public, the TRA cooperated with the Fisheries Bureau again to launch “Hearty Eel Bento” by Kaohsiung Railway Restaurant on November 19 and the end of November, which was enthusiastically sold in Southern Taiwan. Eels exported to Japan were cooked with rich side dishes, which caused passengers to snap up, selling 1,003 bento boxes in total with a revenue of TWD 177,845.

4. TRA × Seibu Group co-launched “Travel Bento” as the epidemic command center lessen the restrictions of epidemic control measures and resumed onboard dining from November 2. To revitalize the economy, TRA also took the opportunity to jointly launch three special bento (one vegetarian and two non-vegetarian), which were first sold on November 4, and sold out within 15 minutes as people enthusiastically bought them. As of November 14, a total of 1,921 bento boxes were sold, with a revenue of TWD 317,160.



5. TRA × TOBU Group co-launched “Fun Bento” - Taichung Restaurant launched limited Taiwan and Japan co-branded “Fun Bento” for the 6th anniversary of TOBU Railway Taipei Branch’s conclusion since December 18, 2015, with the popular “SL Taiju” steam locomotive box used as the bento container, which was filled with the local foods of Taiwan. Any customer of the co-branded bento would be provided with TOKYO SKYTREE Sorakara-chan stickers. The bento boxes were sold in the TR Bento shops in “Taichung Station of TRA” and “Taichung Station of THSR” from December 10 to December 19, and a total of 436 bento boxes were sold, with a revenue of TWD 152,164.



Note: Including bubble milk tea cake and pineapple cake, one each, excluding the rail base



©TOKYO SKYTREE Sorakara Stickers (Gift)



Golden “Steam Locomotive SL Taiju”Box (10 limited lucky draw prizes)

Note: Rail base and decorations are not included.

6. TRA, Chiayi City Government and Taiwan Design Research Institute (TDRI) jointly planned and launched the “Wine and Tea” TR bento, representing the classic taste of Chiayi food. The bento was sold in “TR bento mobile diner” at Chiayi Railway Station with a limited amount from December 23, 2021 to January 2, 2022. To promote TR bento and increase brand visibility, Huang Ming-Hui, the mayor of Chiayi City, and Chang Chi-Yi, the president of TDRI, were specially invited to attend the press conference of “Limited Bento for TR bento Chiayi Mobile Diner and Taiwan Design Expo” held by TRA. With the theme of local ingredients in Chiayi, the “elegance” was added, which represented the delicate and the pure spiritual heritage of Chiayi. They made turkey sauce with sorghum distillers grains of Chiayi Winery and local plum extract, and designed this limited “Wine and Tea” bento box for Taiwan Design Expo with local vegetables, which led to a 50% increase in the purchase of the classic TRA pork chop bento. During the event, 2,679 bento boxes were sold, with a revenue of TWD 269,642.



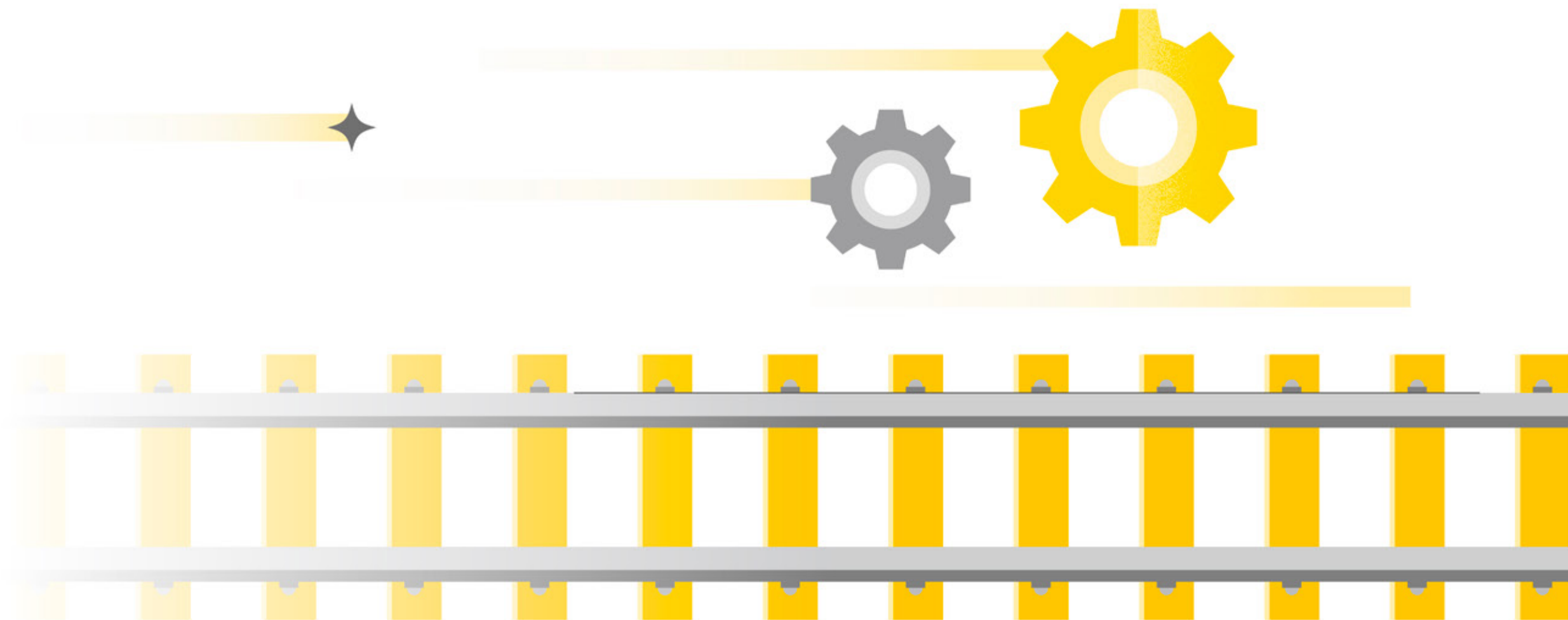
11 TRA intelligent railway information integration platform

1. To accelerate the realization of the concept of “Taiwan Railways Intelligence 4.0”, the TRA plans to establish an intelligent railway information integration platform, and simultaneously expanded each module system. Therefore, the “Taiwan Railways Intelligent Railway Development Advisory Committee” was established, and the “Technology Exchange Workshop on Digital Transformation and Intelligent Railway” was held, experts and scholars were invited to jointly discuss and promote the digital transformation of the TRA.
2. On September 9, 2021, the 1st meeting of the “TRA Intelligent Railway Development Advisory Committee” was held. Experts and scholars in the fields related to intelligent transportation, railway safety, and information innovation in Taiwan, as well as professionals from the Science and Technology Advisor Office of Ministry of Transportation and Communications, Railway Bureau, Institute of Transportation and other units were earnestly invited to serve as members, and a number of suggestions on organizational change, education and training, development strategies, etc. were provided for the planning and conception of intelligent railway development as important references for the follow-up promotion works.
3. On October 20, 2021, the “Technology Exchange Workshop on Digital Transformation and Intelligent Railway” was held, in which experts and scholars, Deutsche Bahn, Science and Technology Advisor Office of Ministry of Transportation and Communications, Railway Bureau, Institute of Transportation and domestic information and rail-related industries were invited, to collect opinions from all parties through exchanges and discussions at home and abroad, so as to further improve the promotion of digital transformation and intelligent railway-related projects in the future.
4. On November 19, 2021, the 2nd meeting of the “TRA Intelligent Railway Development Advisory Committee” was held. In response to the comments provided by the members at the previous meeting, all relevant units of TRA were invited to attend the meeting to discuss the planning of intelligent railway development, reach a consensus on digital transformation, set up an intelligent railway development promotion team after the meeting, and speed up the outsourcing planning of intelligent railway information integration platform.

12 Ensuring the information security: the ISO27001 certificate remains effective upon re-evaluation

The TRA promoted the Information Security Management System, and the original Central Traffic Control and Information Center (including computer room, network and infrastructure management) obtained ISO-27001 certificate respectively. In 2021, the TRA expanded the verification field, merged the aforementioned fields, and passed the verification on May 6, 2021. On November 24, 2021, an impartial third party, SGS Taiwan Limited (SGS), conducted the verification and audit, qualifying the TRA upon re-evaluation; hence, the certificate remains effective.

To strengthen the joint defense of information security, on September 22, 2021, the TRA signed the Memorandum of Cooperation on National Information Security and Information Sharing with the National Center for Cyber Security Technology and the Investigation Bureau of the Ministry of Justice respectively, and the three parties will strengthen cooperation in the future to achieve the goal of information security joint defense and information sharing.



3-2 Business Innovations

1 Establishment of the "1933" 24-hour emergency reporting telephone number

To improve railway safety, the TRA officially put the 1933 emergency reporting telephone into service on December 3, 2021. After being put into service, it provided simple and easy-to-remember reporting telephone number for the public, which is shorter than the original emergency reporting telephone number 0800-800-333, and easy to remember, thus greatly reducing the reporting obstacles and improving the reporting efficiency. This number is hoped to facilitate prompt reporting in case of emergency, thereby enabling the adoption of proper measures to prevent accidents and improve railway safety.



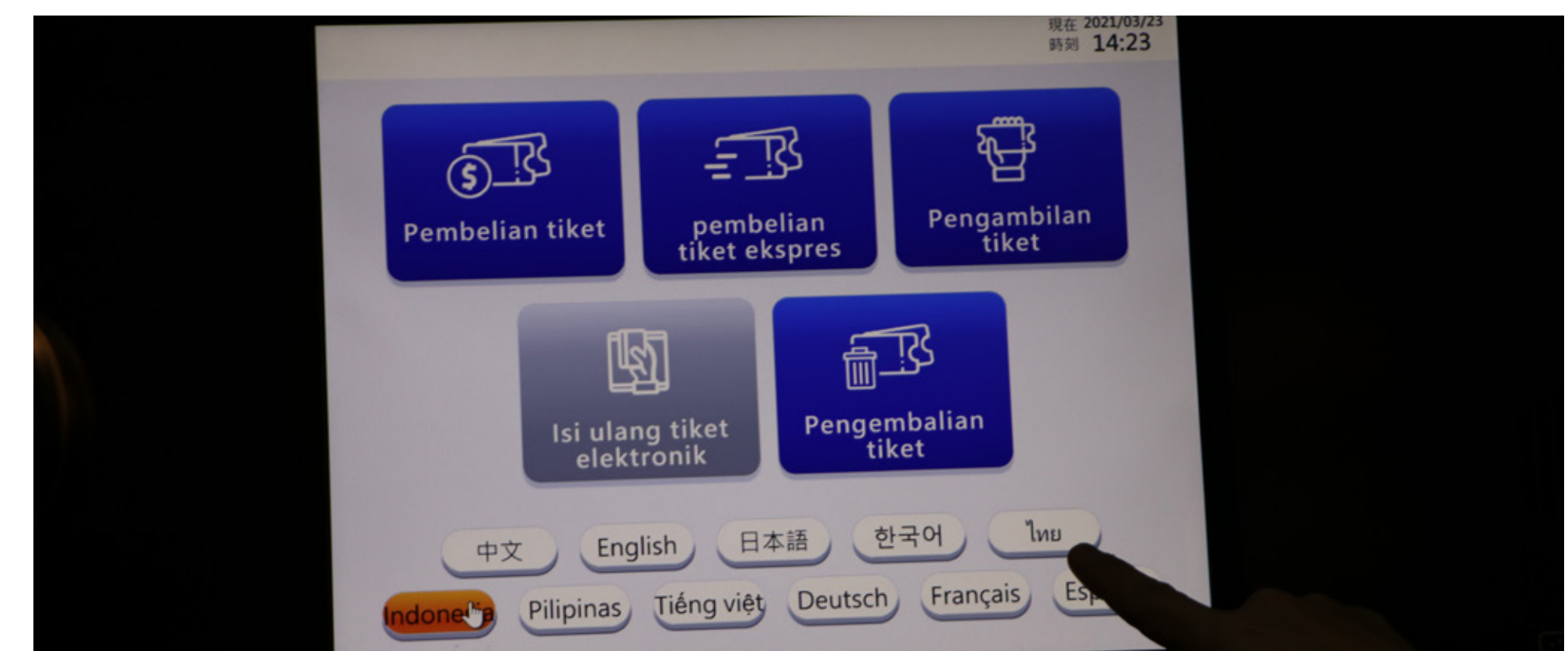
Advocacy Meeting for Invocation

2 Launch of new ticket vending machines

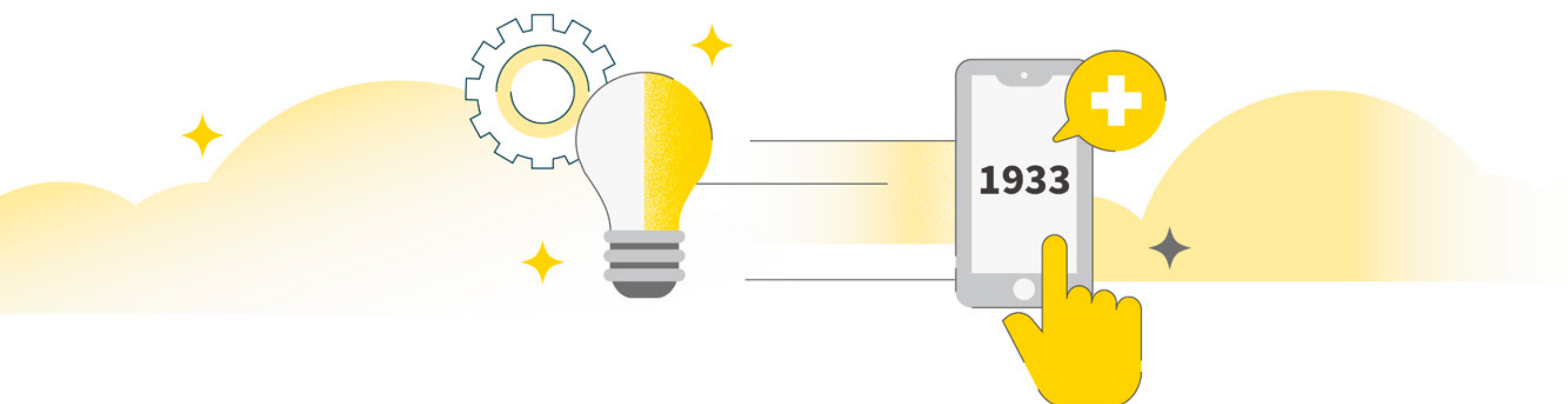
To provide diversified and flexible automatic service functions for passengers and reduce the burden on the staff, we started to replace 432 old vending machines, and by the end of August 2021, 144 machines in 38 stations had been installed and put into service.



Director General Tu Wei demonstrated the use of new ticket vending machines



Interface for new ticket vending machines



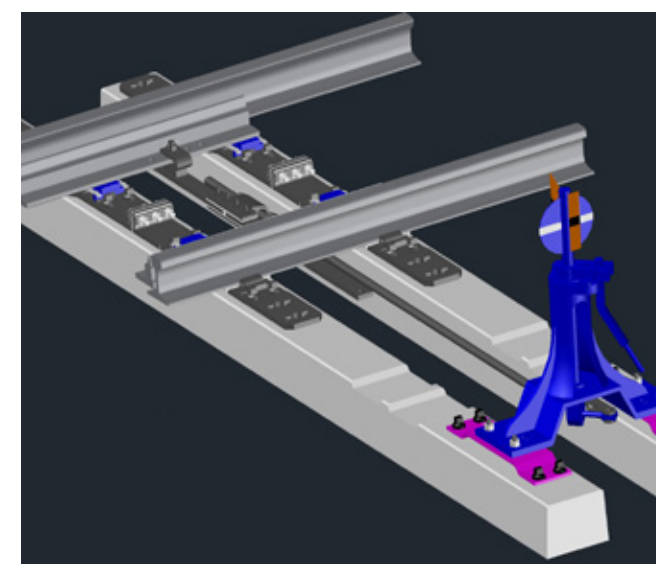
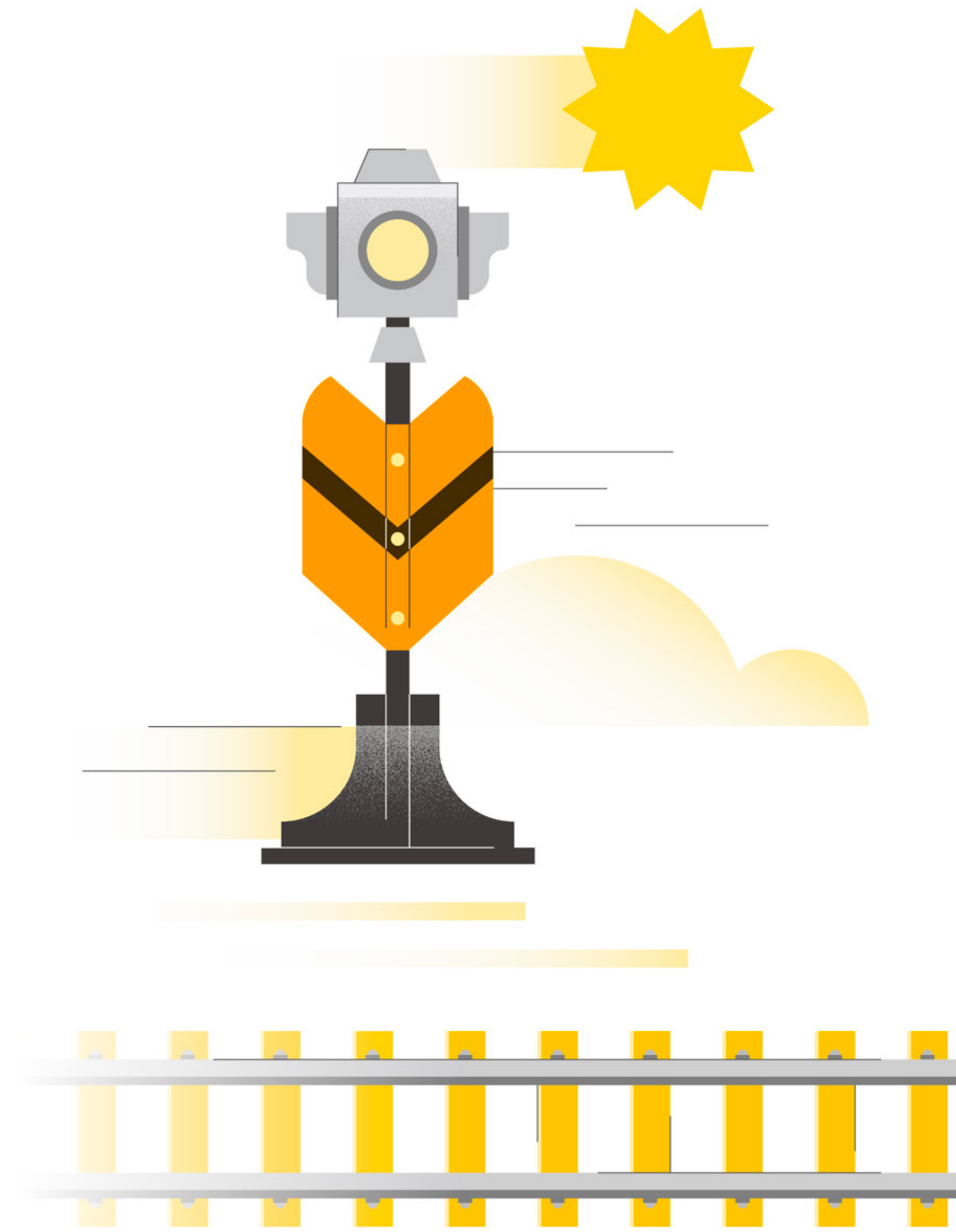
3 Development of the indicator switch for UIC60 turnout

The UIC60 turnout is designed and manufactured by Germany BWG Company, and its connecting rod, PC sleeper, and related accessories can only match with the electric switch currently used by the TRA. However, there is no related equipment such as power supply and electric control system available for use by the electric switch in the laying site. If the electric switch is to be used for newly laid turnout, besides the power supply related equipment, the software and hardware related facilities in the station' train control room and the traffic dispatching center of the TRA shall be modified at the same time, and the related cost upon evaluation is about TWD 20 million; therefore, the team decided to use indicator switches.

Currently, the indicator switch used by the TRA is usually used together with 50N turnout on the side line. The design of both switch and turnout originated from Japan. To enable the UIC60 turnout designed by Germany BWG Company to work with the indicator switch designed by Japan, the design team decided to draw all parts in 3D drawings and carry out simulation assembly on the computer. Designing according to 3D drawings can effectively reduce the design time course and design errors, and there is no need to disassemble the physical turnout parts during the design, which will not affect the train operation.

To successfully complete the design, the Construction Maintenance Corps of the TRA convened personnel of different disciplines such as design and machining to constitute an analysis team, so as to facilitate designers to design various components. The analysis team found that when the design method was no longer restricted by "modifying" the original switch lever, the feasible scheme was directly applied, and all parts were connected. In addition, with 3D CAD available for simulation, the feasible "Japan + Germany" switch lever scheme was born, and then a feasible and easy-to-process design (reducing cost and improving reliability) was proposed after being designed and modified.

In this case, the works from problem finding, investigation and analysis, discussion, and improvement to design drawings were completed by TRA employees, and related parts were manufactured by domestic manufacturers to improve the domestic rail industry. The switches were installed at Hsinchu Station and has been monitored for a year to ensure safety, we have saved about TWD 20 million for this project.



Electric Switch

Indicator Switch

Design Completion

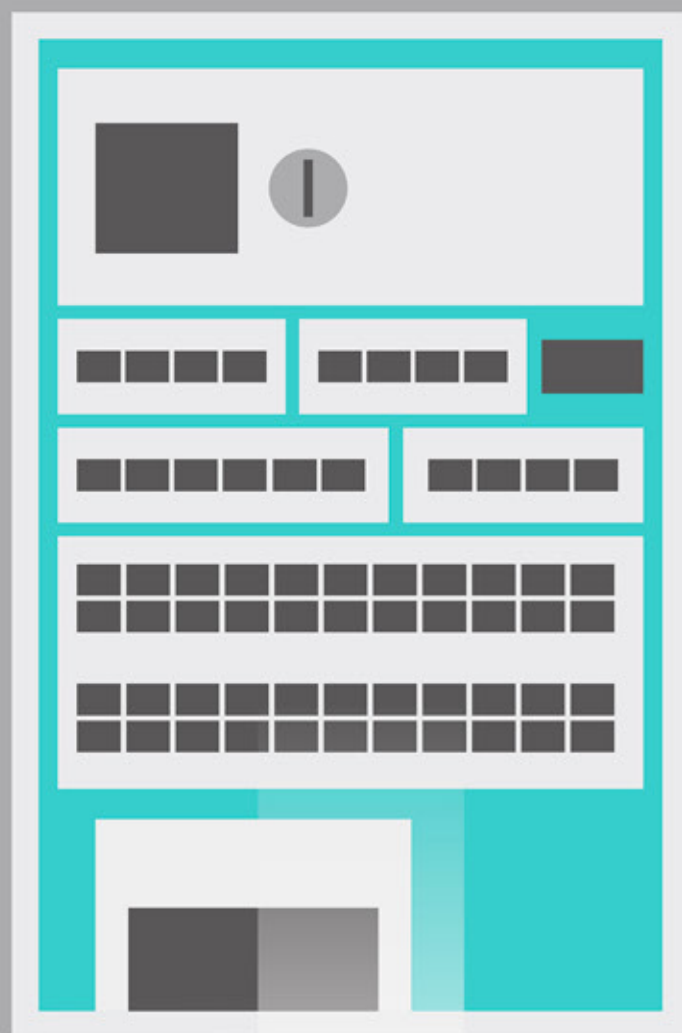
Actual Laying

CHAPTER 04 /



自動售票機

AUTOMATIC TICKET VENDING MACHINE



2021 Operating Performance

4-1 Profit and Loss Analysis

4-2 Passenger and Freight Transport Operating Performance

4-3 Benefits of Subsidiary Businesses

4-1 Profit and Loss Analysis

/ Comparison of Profit and Loss in 2021 and 2020

Unit: TWD 1,000

Item	2021	2020	Comparison with that in 2020 (%)
Total revenue	21,350,307	25,969,137	-17.79
Passenger revenue	11,181,025	14,941,480	-25.17
Freight revenue	534,158	601,405	-11.18
Other operating revenue	7,860,774	8,244,490	-4.65
Nonoperating revenue	1,774,350	2,181,761	-18.67
Total expenditure	33,293,151	32,708,807	1.79
Operating cost	28,539,522	28,403,084	0.48
Operating expenses	1,405,638	1,260,515	11.51
Nonoperating expenses	3,347,992	3,045,208	9.94
Profit and loss	-11,942,844	-6,739,670	Loss increased by 77.20

Note: This table includes the audited and preliminary final account for 2020 and 2021, respectively.

Cause analysis

(1) The TRA earned a total revenue of TWD 21.35 billion in 2021, with a decrease of TWD 4.619 billion (or -17.79%) compared with that in 2020. The passenger revenue decreased by TWD 3.76 billion due to the impact of the COVID-19 pandemic. When Taiwan experienced sharp increases in COVID-19 cases, the number of tickets were reduced and the tickets for the standing room were not permitted for reserved seating trains. People also voluntarily reduced their travel to support the pandemic prevention; therefore, the number of travelers decreased. Other operating revenues declined by TWD 384 million, of which rental revenue reduced by TWD 279 million and catering and travel service revenues decreased by TWD 214 million. Only

the government subsidy revenue increased by TWD 125 million. The nonoperating revenue decreased by TWD 407 million, including TWD 178 million from the disposal of real estate and TWD 183 million from miscellaneous expenses.

(2) The total expenditure of the TRA in 2021 was TWD 33.293 billion, with an increase of TWD 584 million (or +1.79%) compared with that in 2020. The loss and compensation payment increased by TWD 697 million due to the increase of scrapping loss of vehicles such as the maintenance and replacement of railway passengers, freight cars, and rail engineering vehicles and loss of recognition in damaged cars due to the "0402 Taiwan Railways Train No. 408 accident". The cost of materials and supplies reduced by TWD 166 million due to the decrease of the actual consumption of diesel oil and materials in 2021 compared with 2020.

4-2 Passenger and Freight Transport Operating Performance

/ Passenger and Freight Transport Operating Performance of TRA in the Recent Five Years

Year	Number of passengers (ridership in thousand)	Passenger transportation revenue (in TWD 1,000)	Tonnage of freights (in 1,000 tons)	Freight revenue (in TWD 1,000)
2017	232,806	18,132,149	7,764	619,530
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

4-3 Benefits of Subsidiary Businesses

1 Real Estate Development and Revitalization

Recently, the TRA has actively promoted land development to expand the operating performance of affiliated businesses by encouraging private participation in infrastructure projects, urban renewal, and setting superficies, and it has continued to handle asset revitalization business such as traditional business, housing, land, base stations, shopping malls, warehouses, parking lots, advertising, and filming to increase revenue and improve financial condition. In 2021, the total business revenue of the Real Estate Development Center was approximately TWD 4,069,590,000.

/ Business Revenue of Real Estate Development Center in 2021 Unit : TWD 1,000

Item	Business content	Revenue (tax – exclusive)
Traditional business	Cement, limestone, sandstone	1,746
Real estater investment	Zone No.9	49,907
Royalty revenue	Private Participation in Infrastructure Projects, shopping malls, premises, and superficies	688,077
Leasing	Houses, land, base stations, shopping malls, travel service spaces, machines, parking lots, advertising, filming, etc.	2,280,138
Disposal of real estate	Sale of fixed assets	1,030,317
Others	Interests and revenue from miscellaneous	19,408
Total		4,069,593

2 Operation of Subsidiary Business

1. Active expansion of TR Bento

From January 2021 to December 2021, a total of 5,132,123 “TR Bento” boxes were sold (the average daily sales being approximately 14,061) and the total revenue was TWD 362,382,057.

2. Increase of the revenue from licensing fees by developing trademark licensing and image licensing businesses of TRA

Six review meetings were held in 2021. There are 192 registered trademark categories approved by the Ministry of Economic Affairs, and 382 products authorized by trademarks. The total revenue from the licensing fee of trademarks and images (including image use fee) was TWD 3,603,000.

3. Active development of star train fleet products

- (1) The Future Express series products: Limited PAY watches, lightweight pocket cups, mugs, sports towels, carriage-shaped keychain charms, notebooks, ties, stainless steel bento boxes, canvas bento bags and straps, etc.
- (2) EMU900 series products: EMU900 modeling commemorative wine, modeling towel, USB flash drive, tie clip set, tie packaging box, round neck T-shirt, vest, multipurpose travel bag, etc.
- (3) EMU3000 series products: EMU3000 modeling commemorative wine, intercity train double wall glass mug with lid, sleek thermos flask, stainless steel round double-layer bento box, USB flash drive, keychain charms, flash drive pen with laser pointer, L-shaped folder sets, handbag, reusable bag, umbrella, badge, notepaper, etc.
- (4) Series products of Breezy Blue Train: Neck pillows, small schoolbags, mugs, etc.

4. Release of lucky revitalization bags

From October 20, 2021, four types of premium and limited-edition lucky bags were launched, namely cultured youth lucky bag (TWD 500), light travel lucky bag (TWD 500), woman power lucky bag (TWD 1,000), and business lucky bag (TWD 1,000). They are only available in limited quantities at TRA shops and DreamWorks physical and online channels to the customers using Quintuple Stimulus Vouchers in both paper and digital forms.

5. Products from cross-industry cooperation

- (1) The first batch of “EMU900 3D iPass Cards” co-produced with iPASS Corporation was sold exclusively in the TRA DreamWorks E-shop, setting a seckill selling record within 46 seconds. A total of 3,700 set of cards were sold out in the two rounds of marketing activities, with a turnover of TWD 1,665,000.
- (2) “Magic Train Conductor” series products co-produced with Shiba Says were launched, including postcards, paper tapes, amulet, change purse, and other cute articles.

6. The turnover of railway products (including Catering Service Section and restaurants) in 2021 exceeded TWD 21.77 million.



Limited Future Express PAY Watches



Double Wall Glass Mug with Lid and the Image of Intercity Train



EMU3000 Modeling Commemorative Wine

Don't drink and drive, and you'll stay alive.

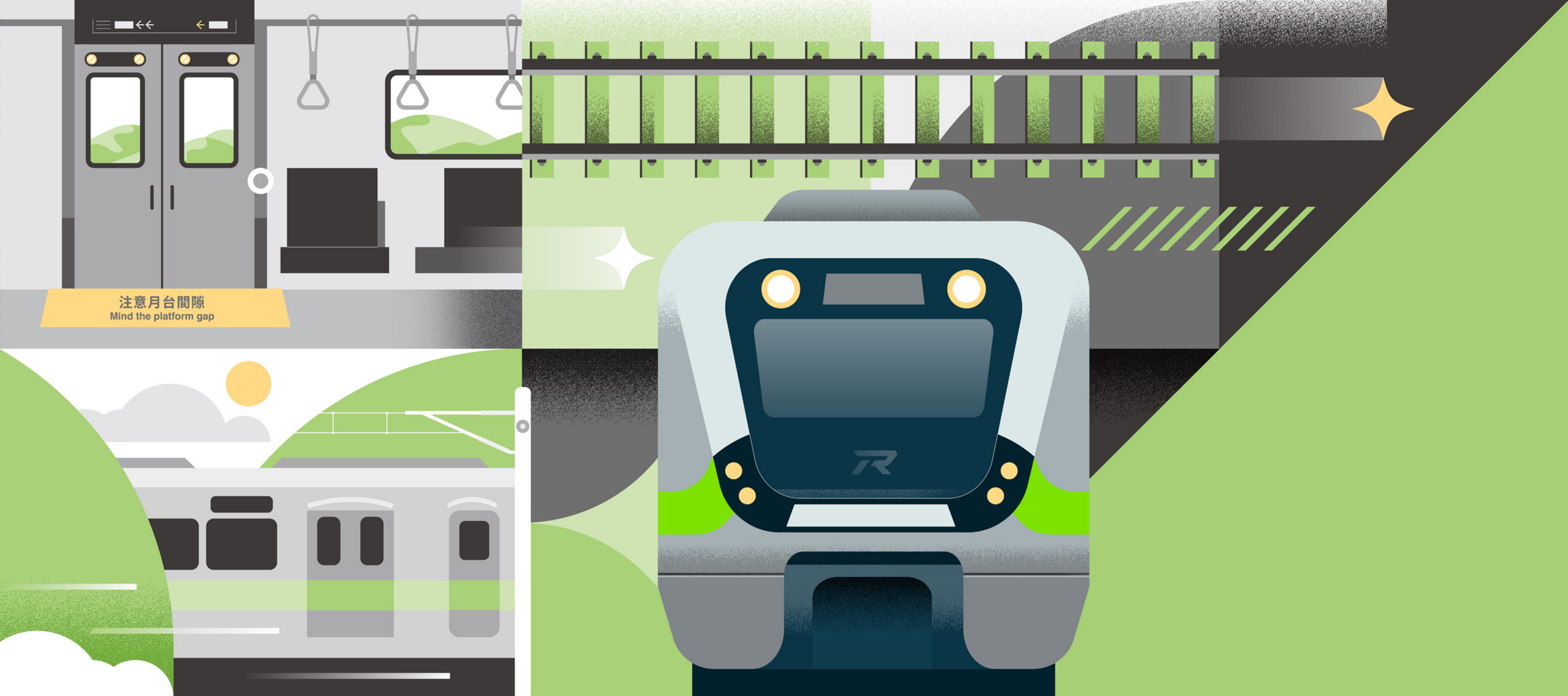


EMU900 3D iPass Card



CHAPTER 05 /





注意月台間隙
Mind the platform gap

Operational Performance

- 5-1 Passenger and Freight Transportation
- 5-2 Asset Development and Revitalization
- 5-3 Procurement
- 5-4 Personnel Affairs
- 5-5 Training of Professionals

- 5-6 Occupational Safety
- 5-7 Railway Safety and Investigation
- 5-8 Mobilization of Disaster Prevention and Preparation
- 5-9 Civil Service Ethics

5-1 Passenger and Freight Transportation

1 Passenger transportation

1. Adjustment of the timetable from December 29, 2021

- (1) The timetable was adjusted for the operation of EMU3000 intercity express trains and EMU900 commuter trains to improve the quality of the service.
- (2) EMU3000 intercity express trains were launched into the Eastern Main Line in priority to replace six direct and semi-direct tilting trains for section Shulin-Taitung. After adjustment, the capacity of the Tze-chiang Limited Express train on the Eastern Main Line increased by 4.6%.
- (3) No. 751 and No. 754 Chu-kuang Express trains for section Changhua-Taitung were replaced by EMU900 commuter trains, which shortened the running time by 35 minutes.
- (4) No. 415 train from Taitung to Taipei in the morning (departs at 9:40 from Taitung) and No. 434 train from Taipei to Taitung in the afternoon (departs at 16:24 from Taipei) (Puyuma Express) were specially added.

2. Provision of safe and accurate transport services

The punctuality rate of passenger trains of the TRA in 2021 was 92.81%, with an increase of 0.47% compared with 92.34% in 2020. The main causes of train delays were train equipment failures (34.6%), natural disasters (27.4%) and derailment (18.6%). TRA will continue to actively plan the upgrade and replacement of train equipment and the purchase of new trains, review and improve the overhaul procedures of train equipment, and strengthen professional training. The number of train equipment failures in 2021 reduced by 14.3%, a significant drop compared with that in 2020. In the future, the TRA will continue to strengthen the maintenance of related equipment, accelerate the replacement of old equipment, enhance the safety management mechanism of construction sites along the lines, and continuously provide services with high levels of safety and accuracy.

3. Intermodal passenger transport of highways and railways in section Taipei—Luodong—Hualien

The TRA has partnered with national highway passenger transport operators (including Capital Bus, Kamalan Bus Inc., Metropolitan Transport Corporation, and Kuo-Kuang Motor

Transportation Company Ltd.) to launch highway-railway services, serving a total of 37,749 passengers in 2021, with an average of approximately 103 passengers per day.

2 Freight transportation

1. We have released the project of a batch (44 sets) of aluminum bridge plates for flatcars, with a construction period of 180 calendar days from the next day of award of the bid, a warranty period of 2 years from the next day of acceptance of the 44 sets, and a contract amount of TWD 2,369,850 (including tax). This project has been completed and accepted on March 9, 2021, and the plates have been distributed to all stations.
2. In line with the amended Article IV of Regulations for Train Driver Qualification, License Issuance and Management of Public and Private Railways on the types of driver's licenses of state-owned railway trains, we added "driver's licenses of shunting vehicle" (Article III of the Amendment). By the end of 2021, 93 original shunt drivers (including 86 TRA employees and 7 drivers of manufacturers) had obtained licenses.
3. The establishment of vehicle registration records (six vehicles in the first, second, and third batches each) and the RAMS analysis of the warranty period (5 (4-1) vehicles (until October 11, 2021) and one vehicle (4-2) in the fourth batch), so as to keep the smooth operation of 24 new diesel shunters.
4. Improving the environment of freight yards
Heavy vehicles may frequently access some freight yards of the TRA, and the road has been damaged or pitted after being constantly crushed over a long term, which not only brings dust when vehicles pass by but also affects driving safety. This is also the case for military transport. In September 2021, the TRA raised funds to construct the fences and improve the pavements on the north side of the military platform of Su'aoxin Station to facilitate military transport and the control of the station, so as to avoid the danger caused by people trespassing the track. In the future, we will also check the demands of other freight yards, and gradually improve the yards to provide a good yard environment for shippers.

5. Knowing the shipper' s demands and adding trains (or coupling cars) as needed

With the spare space and route capacity of the station freight yard, we will continue to add cars or charter trains as per the requirements of shippers to increase the revenue.

6. Updating train weighing equipment to maintain railway safety

In October 2021, we updated the train weighing instruments and surrounding facilities of Yilan Station, so as to facilitate accurate inspection of truck load, avoid overloading and overweight, and maintain railway safety.

7. Transporting construction waste for major government construction projects

We have transported the excess soil of “Suhua Highway Improvement Project of Provincial Highway No.9” in cooperation with the Suhua Improvement Engineering Office of Directorate General of Highways, actively contacted Suhua Improvement Engineering Office to determine suitable places for loading and unloading, and determined the most suitable transportation mode with consideration of environmental protection and transportation efficiency, which have not only promoted the major national policies, but also increased the freight revenue of TRA.

5-2 Asset Development and Revitalization

1 Asset development

In response to socio-economic changes, we have actively made use of the niche of the combination of transportation construction and asset development to maximize the benefits of public construction. Through the mechanisms of asset development and affiliate business management, we have handled various development cases in accordance with laws and regulations such as the Act for Promotion of Private Participation in Infrastructure Projects, the Urban Renewal Act and the National Property Act, and in coordination with the government railway construction plan, the Executive Yuan’s plan for accelerating urban renewal and the local government’s urban development plan.

Up to now, promoting private participation in infrastructure projects, urban renewal, and land development for setting up superficies have achieved remarkable results. From December

2004 (when the Contract for the Development of Zone No.9 of Taipei Main Station District was signed) to May 14, 2021 (when the Contract for the Urban Renewal of Yucheng Section of Taipei Nangang District was signed with Silicon Motion Technology Corp.), the land development and operation performance in 2021 reached about TWD 410.69 million, and revenue details are as follows:

Unit : TWD 1,000

Land development mode	Name of project	Revenue (tax – exclusive) of 2021	
		Land rent	Royalty
Promoting private participation in infrastructure projects	Development of Zone No.9 of Taipei Main Station District	49,907	0
	BOT of Nangang Station Buildings	49,012	83,368
	BOT of Songshan Station Complex and Parking Garage	48,911	49,088
	BOT of Wanhua (East and West) Station Buildings	36,316	2,963
	Construction, Operation and Transfer of Taichung Station Railway Cultural Park	2,560	11,000
Setting up superficies	Build and Operation of International Tourist Hotel (Special Zone II) of Banqiao Station District	8,686	8,431
	Setting up Superficies for Jingxiu Road, Yuanlin Township, Changhua County	331	715
	Setting up Superficies for No. 28 Lot, Qiaobei Section, Yongkang District, Tainan City	97	242
	Setting up Superficies for Fuhe Section, Zhongzheng District, Taipei City	1,485	3,300
	Setting up Superficies for Baoqing Section of Songshan District, Taipei City	4,025	24,200
	Setting up Superficies (No. 126 and No. 127) for Chenggong Section, Zhongzheng District, Taipei City	4,257	10,419
	Setting up Superficies (No. 125 and No. 129) for Chenggong Section, Zhongzheng District, Taipei City	3,100	8,277
Subtotal		208,687	202,003
Total			410,690

Moreover, to revitalize the possessed land assets and construct Hualien as an international tourism portal, we have established a communication platform for the development plan of Hui Lan Twin Cities with Hualien County Government, and signed a Memorandum of Understanding for development cooperation with Hualien County Government on January 14, 2021, which is the first MoU concluded between the TRA and a county government in the Hualien-Taitung region. We hoped to fulfill the requirements for local development to create a new Hualien and benefit the people of Hualien County, Hualien County Government, and the TRA through the signing of the MoU.

The urban design (the first change) approval letter for Nangang Marshalling Yard Urban Renewal Project was obtained on April 16, 2021, the Urban Renewal Review Committee decided to “adopt the proposal after amendment” on August 23, 2021, and the project is estimated to be applied for construction registration in early May 2022. On the other hand, the contract for the Urban Renewal Project of “No. 732 Lot, Sub-section II, Yucheng Section, Nangang District, Taipei” was signed with Silicon Motion Technology Corp. (the optimal applicant) on May 14, 2021. It is estimated to construct an office building with 23 floors above ground and 5 floors below ground, with an estimated development benefit of about TWD 9.3 billion.



Commencement for construction of the diaphragm wall of Nangang Marshalling Yard Urban Renewal Project

The TRA participated in the urban renewal project to return the premises (No. 180 and No. 182, Section III, Shimin Boulevard, Da’an District, Taipei) in Mingribo, which were completely announced for bidding on November 24, 2021, and a total of 17 premises and 41 parking spaces were awarded, with a total bid price of TWD 1,850,687,076.

There were four urban renewal projects being promoted by the government in 2021, as shown in the table below:

Urban Renewal (Government Planning)			
	Name of project	Depot area	Date of signing
Project contract signed	Urban Renewal Project of Yucheng Section, Nangang District, Taipei City	3,392.19 m ²	110.5.14
Project under planning	Urban Renewal Project of Keelung Railway Station	83,000 m ²	—
	Urban Renewal Project of Temporary Stations of Kuo-Kuang Bus in Areas Around Taichung Railway Station	6,400 m ²	—
	Urban Renewal Project of Northern Area of Changhua Railway Station	15,333 m ²	—
	Urban Renewal Project of Areas Around Yuanlin Railway Station	18,364 m ²	—

Setting up superficies				
	Name of project	Depot area	Franchise period	Date of signing
Project contract signed	No. 519-11 Lot and No. 519-88 Lot, Gangshan Section, Gangshan District, Kaohsiung City	2,172 m ²	70 years	110.1.29
	No. 519-28 Lot, No. 519-85 Lot and No. 519-111 Lot, Gangshan Section, Gangshan District, Kaohsiung City	1,854 m ²	70 years	110.8.17

2 Asset revitalization

1. Station shopping mall / travel space

We have revitalized the assets according to the provisions of the Act for Promotion of Private Participation in Infrastructure Projects, and introduced abundant funds and ideas from non-governmental organizations, so as to keep the stations as the business center of the areas, and an excellent place for art and culture and business opportunities by providing complete travel services. The total royalties for promoting private participation in infrastructure projects and shopping malls in Nangang, Taipei, Banqiao and Xinzuoing stations in 2021 were more than TWD 297.35 million.

In addition, there are 53 sections for multiple commercial space and parking lots under the railway viaduct in Taichung, with a total area of about 35,000 ping (115,703 m²). After the announcement of the investment introduction, the bid was awarded on February 9, 2021, and the contract was signed and notarized on March 18, 2021. In the future, car accessories, pet products, special catering, health and leisure, cultural and creative markets, and other facilities will be provided along the route. Besides fully automated equipment, and parking concessions for residents and disabilities, charging piles will also be set in the parking lot section in response to the popularity of electric vehicles, so as to provide complete services for residents in the north and south of Taichung, and meet the diverse needs of citizens.



(Railway Viaduct in Taichung) Stores in Wuquan Station



(Railway Viaduct in Taichung) Parking Lot in Jingwu Station

2. Warehouse and cultural assets transformed into cultural and creative sightseeing spots

We have leased the old warehouses to develop and revitalize the assets of the TRA. In addition, to effectively manage and utilize the cultural assets (historic sites, historical buildings and old houses) managed by the TRA, we have cooperated with the local government to build an exhibition venue for artistic creation and a new landmark for arts and culture, while providing people with an open space. 47 sites were rented in 2021, with a total rental income of TWD 36.31 million.

3. Rental of premises

In the overall planning, the premises around the stations along the railway lines that can be leased are considered, and the vacant land, houses, offices, land and parking lots are developed and utilized in a diversified way without prejudice to the original purpose.

By the end of 2021, rental income for housing / land properties and parking lots was TWD1,198.64 million and 451.5 million respectively.

Hualien City's 6th Redevelopment Zone used to be the transportation and business center of railway and highway passenger transfer in Hualien. It is close to the railway cultural park and on the other side of Tungtamen Night Market and Shiyi Street, so it is an excellent place for business and a key area for the assets revitalization of TRA. The project has been awarded to TK MART in January 2019, and officially put into operation on September 11, 2021 after about one and a half years of design and construction with spacious and bright space as the main idea, so as to provide consumers with a more comfortable shopping experience.



Sight of Hualien TK MART

4. Rental of advertising space

We will continue to announce the bids on the station space for advertising without compromising the aesthetics of stations. For advertisements on carriages, plain frame advertisements, LCD advertisements and painting advertisements on vehicles are adopted, and for advertisements in and out of stations, print advertisements, advertisements on light boxes and multimedia are adopted.

We have announced the bids on a single station or several stations integrated for advertising by taking a “station” as a bidding unit, and the bid winner will plan the advertising location, size and media form, so as to give full play to the advertising creativity. The total advertising rental income is TWD 33.14 million in 2021.

Affected by the pandemic, the advertisements on light boxes and print advertisements in Taipei Main Station were announced online bidding again after the lease was terminated early in mid-September 2020. After many failed biddings, the project was determined on August 3, 2021, with an annual rent of about TWD 13.66 million. The bid winner will arrange advertisements according to the characteristics of the stations to enhance the aesthetics and styles of the stations.

5. Rental of filming site and equipment

We have promoted the cultural industry in accordance with policies to raise the profile of the TRA, and also actively utilized related assets of the TRA for filming in dramas, movies, documentaries, advertisements, etc. Affected by the pandemic (applications were suspended during the pandemic), a total of five projects were concluded in 2021, with a rental income of more than TWD 560,000.

6. Rental of cell site space

To facilitate the travel, improve the communication quality and support the government policy of telecom liberalization, under the principle of not affecting railway safety and train-control communication quality, we have added cell sites along the railway, and open stations, premises and land of TRA to telecom operators to set mobile phone cell sites. The related rental income in 2021 was about TWD 37.37 million.

7. Rental of solar photovoltaic equipment

To implement the policy goal of the Executive Yuan that renewable energy accounts for 20% of the total power generation in 2025, and to provide solar photovoltaic power generation equipment on the roof of public buildings, in addition to the “Lease Project of Solar Photovoltaic Equipment in Chaozhou Depot”, the “Project of Building Roofs in Hualien-Taitung Area” and the “Project of Solar Photovoltaic Equipment on Roofs of Maintenance Plant of Hualien Workshop” bidden off, the “Project of Roofs of Maintenance Garage of Taitung Rolling Stock Sub-Branch” bidden off in 2020 has been completed in 2021. Moreover, the “Project of Roofs of Taitung Station and Surrounding Buildings” bidden off in 2020, the “Project of Roofs of Kaohsiung Workshop (Chaozhou New Workshop)”, the “Project of Roofs of Maintenance Garage of Qidu Marshalling Yard,” the “Project of Roofs of Maintenance Garage of Hualien Rolling Stock Branch”, the “Project of Roofs of Maintenance Plant and Canopy Erection in Parking Lot of Dadu District, Taichung”, the “Project of Roofs of the Warehouse of Jingmei Station in Hualien”, the “Project of Roofs of Surrounding Buildings and Canopy Erection in Parking Lot in Xincheng Station”, the “Project of Roofs of Hualien Port Station and

Surrounding Buildings in Hualien”, the “Project of Roofs of Buildings and Photovoltaic Carport in Luye Station in Taitung”, the “Project of Vehicle Depot Plant in Fugang”, and the “Project of Solar Photovoltaic Equipment on Building Roofs and Land in Miaoli-Chiayi” bidden off in 2021, and Taipei City, Hualien County, Taitung County and Kaohsiung City involved in the “Joint Bidding for Public Roofs of Central Office” undertaken by the Ministry of Economic Affairs in 2021 have been signed. The power generation equipment is leased for 20 years, and the annual rental income from the aforementioned leases is approximately TWD 24.01 million. We will continue to seek suitable sites for the installation of solar photovoltaic power generation equipment to promote the development of the emerging green industry.



Solar photovoltaic equipment on roofs of maintenance garage of Taitung Rolling Stock sub-branch

8. Introduction of pandemic relief measures to pull the operators through

In response to the impact of COVID-19, TRA announced the rent deferral policy on May 28, 2021, and the lessee could apply in writing for deferral of the rent payable and fixed royalty. In addition, we released the relief measure of reduction of rent and fixed royalty on June 23, 2021, so as to provide real rent relief assistance to the lessee, which was handled by the TRA on its initiative. A total of 1,086 operators have benefited from the relief policy, with a rent reduction of TWD 317 million (tax included).

5-3 Procurement

1 Statistics of procurement

We completed a total of 700 procurement projects in 2021, including 205 construction work procurement projects, 303 service procurement projects, and 192 property procurement projects, with a total award amount of TWD 21,513,180,000: including the train-control 4.0 system based on the multi-communication architecture, the TRA Breezy Blue tourist train renovation project, 1,424 gate barrier (including installation), 50kg-N PC turnout sleeper and 39 equipment and materials; the intelligent upgrade plan of TRA electrical engineering (turnkey project of signal interlocking system renewal), infrastructure improvement plan of TRA Jiji branch - turnkey project of tunnel and slope improvement, the Six-year Plan of Railway Safety Improvement (Chaiwei Qiao Reconstruction Project) and Emergency Project of Huang Deji Drainage (2k+100 – 2k+400) Right Bank Protection Under the Commission of Yilan County Government, electrical engineering intelligent upgrade plan of TRA (power supply cooperation project of electronic interlocking relay room) and other projects; rail vehicle sweeping and cleaning, signage erection, onboard and premises cleaning of the TRA, MOTC in 2021, 2022 and 2023, the Project of Kaohsiung Workshop Relocation to Chaozhou and Original Workshop Development - CL361 standard vehicle maintenance information management system, multi-electronic stored value cards service on the round-the-island railway network in 2022-2024 (multiple award), ticketing system maintenance in 2021, and maintenance of automatic ticket checking system and electronic stored value cards checking machines in 2022 and 2023.

2 Revision of operation regulations to comply with laws and regulations and improve the efficiency of procurement and material management

1. Full adoption of electronic bidding to streamline internal administrative workflow in response to the high prevalence of internet

The electronic bidding was fully adopted since April 1, 2021, and relevant operation instructions were supplemented and revised on May 17, 2021 according to the actual conditions after the implementation of full electronic bidding.

2. Revision of the process flow of scrap selling bidding to improve its efficiency

On March 9, 2021, the TRA revised and issued the Guidelines for Selling Excess Materials and Scraps, Instructions for Bidding for Selling Excess Materials and Scraps, and Procedures for Scrap Selling Bidding on Site, and abolished the List of Items Authorized to Each Department to Dispose the Scraps on Site in Appendix 7 of Material Management Instructions of the TRA.

3. Revision of procurement bidding instructions and contract terms to meet the actual needs in accordance with the regulations of the Public Construction Commission of the Executive Yuan

- (1) In January 2021, the Procurement Contract of Public Construction Technical Services, Service Procurement Contract, Public Construction Project Management Procurement Contract and Information Service Procurement Contract were revised.
- (2) In February 2021, the Construction Procurement Contract, and Turnkey Project Procurement Contract were revised.
- (3) In March 2021, the Construction Procurement Contract, Turnkey Project Procurement Contract, Instructions to Bidders, and Bidding Instructions for the Most Advantageous Tender on below the Announced Amount but above Its One Tenth of the Announced Amount were revised.

- (4) In April 2021, the Information Service Procurement Contract, Construction Procurement Contract and Turnkey Project Procurement Contract were revised.
- (5) In May 2021, the Instructions to Bidders, and Bidding Instructions for the Most Advantageous Tender on below the Announced Amount but above Its One Tenth of the Announced Amount were revised.
- (6) In June 2021, the Property Procurement Bidding Instructions and Contract Terms (the edition concluded in June 2021) was revised, and the contact information of the unit handling violation reports was updated.
- (7) In July 2021, the Construction Procurement Contract, and Turnkey Project Procurement Contract were revised.
- (8) In August 2021, the Instructions to Bidders, and Bidding Instructions for the Most Advantageous Tender below the Announced Amount but above Its One Tenth of the Announced Amount were revised.
- (9) In September 2021, the Construction Procurement Contract, Turnkey Project Procurement Contract, Service Procurement Contract, Public Construction Technical Service Procurement Contract, Public Construction Project Management Procurement Contract and Information Service Procurement Contract were revised.
- (10) In September 2021, the appendix of contract terms was updated in accordance with the Guidelines of Safety and Health Management of Procurement and Delivery Contracts of Taiwan Railways Administration, MOTC (the edition concluded in July 2021).
- (11) In November 2021, the Construction Procurement Contract, and Turnkey Project Procurement Contract were revised.

4. Formulation of the Implementation Measures for Reward and Punishment of Key Train-control Materials for Rolling stock branch

To strengthen the control and rolling review of key train-control materials for rolling stock branch and maintain the railway safety, the "Implementation Measures for Reward and Punishment of Key Train-control Materials for Rolling Stock was issued and implemented from May 18, 2021.



③ Benchmark learning, on-the-job training, and business audit

1. The basic training for all procurement personnel of the TRA was administered in March 2021, with totally 71 employees studying the procurement laws and operation regulations, improving their professional knowledge and skills.
2. In September 2021, the material audit, top ten risk factors and their preventive measures, and audit of small procurement were conducted in the Northern Region Supply Workshop and Central Region Supply Workshop. We audited the risk factors according to the business characteristics of each workshop, and supervised the workshop to implement relevant operation regulations to ensure the quality of purchased materials and the safety of storage management.
3. In February 2021, the benchmark learning of documents and file management was implemented in an institution with excellent performance of Archives Management Quality Award - Tamsui Land Office. In this learning, the excellence of archives management in this office was used as the basis for improving archives management and documenting process, and the archives strategy and word processing quality were improved.
4. From March to May 2021, we audited the bidding, reviewed the new control mechanism, and organized the experience sharing forum, improving the quality of procurement and promoting the uniformity of all bidding units.
5. From April to November 2021, we organized a lecture on new regulations of scrap selling bidding on site of the TRA, and conducted the training in the Northern, Central, Southern and Eastern Region Supply Workshops to strengthen the local disposal of scraps in each workshop.
6. In October 2021, training on the “Public Construction Cost Estimate System” to improve the knowledge of the engineering procurement personnel of the TRA on the procedures and construction codes of the system.
7. In November 2021, we organized the Procedures and Guidelines for Most Advantageous Tender, Legal Analysis of Civil Litigation of Purchase Liquidated Damages and Government Procurement and Audit Seminar in 2021 with MOTC via online video, with a total of 103 participants.



Materials to be Inspected are Properly Stored in Special Areas



Materials are Properly Stored According to Types and Properties



Material Management, Top Ten Risk Factors and Their Preventive Measures, and Audit of Small Procurement in Northern Region Supply Workshop



Audit of Management and Control Mechanism of Procurement Bidding



5-4 Personnel Affairs

1 Seminar on employee assistance program

1. March 23, 2021 - employees assistance and caring awareness training - “Cultivation and Application of Empathy in Life”.
2. March 24, 2021 - exchange and sharing symposium in Eastern Region Supply Workshop - “Crisis Management and Care Measures”. Wen-Chung Yan, the Chief Secretary of the TRA, organized the members of employee assistance program promotion team and heads of branches in Eastern Region Supply Workshop to share and exchange the crisis cases, and invited Shi-Sheng Luo, a psychological counselor, and Shih-Kun Lin, a counseling psychologist, to attend and provide professional advice; cooperated with the Personnel Department and Social Affairs Department of Taitung County Government, and implemented local care in combination with the advocacy of county and city government resource network.
3. March 25, 2021 - Caregiver intensive training - “Role of Caregiver, Professional Ethics and Self-care”.
4. September 1, 2021 - EAPs Symposium - “Taking Care of Yourself While Caring for Others - Recognition and Prevention of Vicarious Trauma”.
5. November 11, 2021 - Team of employee assistance program after the 0402 Taiwan Railways Train No. 408 accident - “Advocacy Lecture for Local Resources in Hualien”.
6. November 12, 2021 - Team of employee assistance program after the 0402 Taiwan Railways Train No. 408 accident - “Care and Healing Course of Accident Trauma”.
7. November 22, 2021 - Front-line caregiver relief group against the 0402 Taiwan Railways Train No. 408 accident - “Rescue Psychological Trauma, Spiritual Reconstruction from the Crisis - Freefromcare Cafe”.
8. November 30, 2021 - Thematic relief growth group for core business executives - “Stay True to the Mission: Regaining Enthusiasm and Energy for Work” and “Coaching - Good Leadership and Unblocked Communication” courses.
9. December 21 - 22, 2021 - “Caring and Supports for You by TRA’ Warm-Hearted and Gratitude Event and Special Lecture Sharing” for front-line caregivers and emergency repair employees to share special cases.
10. December 23, 2021 - Award Ceremony of “Be Grateful to You” and the Special Lecture “Enjoy a Loving and Happy Life”.

11. December 28 - 29, 2021 - thematic consultation of employee assistance program – “Efficient Team - Importance of Empathy and Communication” and “Mind spa - Self-care After Crisis”.

2 2012 Award ceremony for model civil servants

The award ceremony for 2021 model civil servants of the MOTC was held on Tuesday, September 7, 2021, at the auditorium on the 5th floor of the Ministry, presided over by Minister Wang Kwo-tsai of MOTC. At the ceremony, 36 model civil servants were praised. Five members of the TRA, including Deputy Director Huang Guorong, Deputy Director and Chief Liu Chuanyan, Associate Engineer and Deputy Chief Chen Zhouyu, Senior Executive Officer Hu Yafang and Director Yang Zunren, attended the award ceremony.



Wang Kwo-tsai (the Minister of MOTC) and Model Civil Servants of TRA

3 2021 “Presidential Cup” slow pitch softball championship

The TRA slow pitch softball team is composed of elite players from Transportation, Construction, Rolling Stock and Electrical Engineering departments, and participated in the 2021 “Presidential Cup” Slow Pitch Softball Championship on behalf of the TRA. To inspire the morale of the TRA team, unite the cohesiveness and encourage the team to win, Director General Tu Wei presented the flag to the players.



Director General Tu Wei and All Players

4 2021 Cultural and recreational activities of the TRA headquarters

To foster the affection among employees at the TRA and allow them to relax their body and mind after their busy work, on December 4, 2021, we organized the cultural and recreational activities in the headquarters, and created opportunities for interaction and communication and strengthened the cohesion among colleagues through singing in the train, handicraft experience and raffles. All activities were successful.

5 Industry-academy cooperation between TRA and quality senior high schools

To realize the localization of talent cultivation, the TRA actively expanded the cooperation with senior high schools and vocational and technical schools in each region in 2021, expecting to jointly promote the industry-academy cooperation by combining school resources, so as to cultivate railway grassroots professionals such as local track maintenance, vehicle maintenance and electrical engineering signaling, and jointly improve the overall rail transportation service environment.

1. The TRA signed an industry-academy cooperation contract with St. Joseph Technical Senior High School on October 1, 2021, and the ceremony was held at 9:00 a.m. in St. Joseph Technical Senior High School in Taitung County. Feng Hui-sheng, the Deputy Director General of the TRA, and Huang Sue-ying, the President of St. Joseph Technical Senior High School, exchanged the industry-academy cooperation contract in the signing ceremony.



2. The TRA signed an industry-academy cooperation contract with National MinShyong Vocational High School of Agriculture & Industry on October 22, 2021, and the ceremony was held at 10:00 a.m. in National MinShyong Vocational High School of Agriculture & Industry in Chiayi County. Feng Hui-sheng, the Deputy Director General of the TRA, and Zhong Shun-shui, the President of National MinShyong Vocational High School of Agriculture & Industry, exchanged the industry-academy cooperation contract in the signing ceremony.



3. The TRA signed an industry-academy cooperation contract with National PingTung Industrial Vocational High School on October 25, 2021, and the ceremony was held at 1:30 p.m. in National PingTung Industrial Vocational High School in Pingtung County. Feng Hui-sheng, the Deputy Director General of the TRA, and Ke Chao-tu, the President of National PingTung Industrial Vocational High School, exchanged the industry-academy cooperation contract in the signing ceremony.



4. The TRA signed an industry-academy cooperation contract with National Sha-Lu Industrial Vocational Senior High School on November 10, 2021, and the ceremony was held at 10:00 a.m. in National Sha-Lu Industrial Vocational Senior High School in Taichung County. Feng Hui-sheng, the Deputy Director General of the TRA, and Huang Shang Yu, the President of National Sha-Lu Industrial Vocational Senior High School, exchanged the industry-academy cooperation contract in the signing ceremony.



5. The TRA signed an industry-academy cooperation contract with National LoTung Industrial Vocational High School on November 22, 2021, and the ceremony was held at 2:00 p.m. in National LoTung Industrial Vocational High School in Yilan County. Feng Hui-sheng, the Deputy Director General of the TRA, and Liao Junren, the President of National LoTung Industrial Vocational High School, exchanged the industry-academy cooperation contract in the signing ceremony.



5-5 Training of Professionals

1 Training mission and task

In addition to continuously promoting the six core values of “safety, accuracy, service, innovation, unity, and honor”, the staff training goals in 2021 also included the training of various track professionals to provide high-quality railway transportation services and diversified operations, so as to enable sustainable development of the TRA. In addition, to solve the problem of insufficient training in the Employees’ Training Center of the TRA and strengthen the local training mechanism, and to promote the regional training, the preparatory offices of training centers in Northern Region (Hsinchu Rolling Stock Branch), Central Region (Wuri Construction Maintenance Corps), Southern Region (Chaozhou Depot) and Eastern Region (Hualien Workshop) have been set to offer practical or retraining courses on the existing equipment and local internship needs to enhance their functional competency. Moreover, a series of digital courses with the theme of accident prevention (pain point learning) are actively produced, including microfilm and digital courses, so as to gain new insights through reviewing old material, shorten training hours and deal with emergencies quickly.

2 2021 Training programs

Due to the impact of the COVID-19 pandemic, training programs were suspended from May to September 2021, and the TRA Employees’ Training Center conducted staff training programs in 2021, totaling 38 classes, 1,514 person-times and 29,646 person-days. Detailed information on the training programs is as follows:

1. Orientation training for new recruits- To enable new recruits to have a comprehensive preliminary understanding of the overall business of the TRA as soon as possible, the on-the-spot operation training (training for rolling stock inspection) for new recruits passing special railway examination was conducted in 2020, and the orientation training for vehicle service attendant was conducted in 2021, involving 2 classes, 114 person-times and 1,055 person-days.
2. Track expertise training- To improve the professional skills of employees, transportation classes, operation classes and dispatcher classes are organized to ensure the railway safety and pass on professional skills, involving 20 classes, 783 person-times and 25,460 person-days.

3. Procurement expertise training - basic training courses for procurement professionals, involving 1 class, 75 person-times and 1,050 person-days.
4. Knowledge and competency training for occupational safety - The safety and health education training for first-aid personnel was conducted to prevent occupational disasters and improve workplace safety, involving 2 classes, 118 person-times and 354 person-days.
5. Professional functional training of personnel affairs and anticorruption- To enhance the professional functions of personnel and ethics employees, relevant training, such as the seminar for personnel affairs and the review meeting on ethics affairs, were conducted, involving 3 classes, 146 person-times and 292 person-days.
6. Lecturer training- To promote the certification of lecturers and improve the teaching quality, an external specialized agency was appointed for the certification of internal lecturers' teaching skills, involving 5 classes, 104 person-times and 221 person-days.
7. Other training - specialized courses offered to meet the needs of national construction policies and the development of affiliated businesses, such as the training for railway construction route blockade class for the Railway Bureau and asset development class, involving 5 classes, 174 person-times and 1,214 person-days.



Orientation training for Vehicle Service Attendant in 2021



Graduation photo of the 54th Transportation Class



Second training on internal lecturers' teaching skills in 2021

5-6 Occupational Safety

1 Enhancement of safety culture of TRA

In view of 2 major occupational accidents, namely, shunting collision at Chaozhou Depot and turnout maintenance collision at Haiduan Station, directors at all levels of branches were specially arranged to receive education and training on hazard identification and risk assessment in 2021. Employees at the TRA are required to regard safety as an important core value and deepen safety culture, so as to reduce occupational accidents. In 2021, 10 training programs were conducted at the TRA headquarters and northern, central and eastern region, with a total of 560 participants. The Occupational Safety and Health Office of the TRA will continue to conduct education and training on hazard identification and risk assessment in all regions.

2 Promotion of physical and mental health of employees

1. The on-site health consultation of occupational safety and health was conducted once a month, each time for 3 hours, and totally 12 times.
2. On April 29, 2021, a clinical psychologist was invited to give a lecture on "Post-traumatic Self-health Care" in response to the accident of Taroko Express.

3. Operating environment detection has been conducted once every six months. The detection of carbon dioxide concentration in offices of TRA headquarters has been conducted once every six months because the offices are equipped with central air-conditioners, and the detection results all conform to relevant regulations.

3 Continuous promotion of the occupational safety and health management system (OHSAS 18001 & ISO 45001)

System audit verification and training of system lead auditors were continuously conducted to systematically manage and effectively control the hazards caused by various facilities and environment. Affected by the pandemic in 2021, the tracking audit verification of TRA headquarters and 35 Transportation, Construction, Rolling Stock and Electrical Engineering branches originally scheduled by the end of 2021 was postponed to the end of April 2022. The courses for lead auditor were originally scheduled to train 40 auditors in 2021 and 20 auditors in 2022. By the end of 2021, 20 people had been trained, and 40 auditors are expected to complete training by the end of April 2022.

4 Improvement of the safety and health standards of construction projects

For major construction projects, safety and health audits were carried out at least 3 times every quarter, and there were 15 audits of major construction projects in 2021. The prevention of collision, electric shock and falling hazards is the key point of the audit, and the risk assessment and control measures of construction, planning, and design are also key aspects of the audit.

5 Occupational safety improvement measures

1. The TRA analyzed the causes and serious consequences of major occupational disasters in all units, and exchanged preventive measures with supervisors at all levels.
2. The TRA strengthened the feedback after occupational accidents to improve the occupational safety management system

For the unit with occupational accidents, special audits were conducted by the occupational

safety management verification unit to find out the basic reasons after the occupational accidents.

- (1) The special audit of “Shunting Collision Accident at Chaozhou Depot on January 18, 2021” in Kaohsiung Transportation Branch was conducted on March 30, 2021.
- (2) The special audit of “Collision Accident at Haiduan Station on February 23, 2021” in Taitung Construction Branch on April 16, 2021.
- (3) On April 27, the special audit review meeting of Chaozhou accident on March 30 and Haiduan accident on April 16 was held. In view of both accidents, the verification audit consultant company explained the audit results and assistance to the branches to the department-level management.



On August 19, 2021, Taitung Rolling Stock Branch managed the change of operating environment caused by electrification of South Link Line, and absorbed the experience of other rolling stock branches in preventing electric shock, so as to avoid occupational accidents caused by electric shock.

3. Improved the implementation of cross-audit, and entrusted experts to review about 21 cross-audit reports of branches every quarter.
4. Reminded all units to keep proper change management. Both environmental changes and operation method changes can only be conducted after the change education and training to avoid occupational accidents.



5-7 Railway Safety and Investigation

To strengthen railway safety of TRA and the inspection of vehicle order, the Operation Safety Department of TRA carried out the 75th Railway Safety Week of TRA from November 2, 2021 to November 8, 2021, and expanded the level crossing safety advocacy and related examinations to maintain railway safety of TRA.



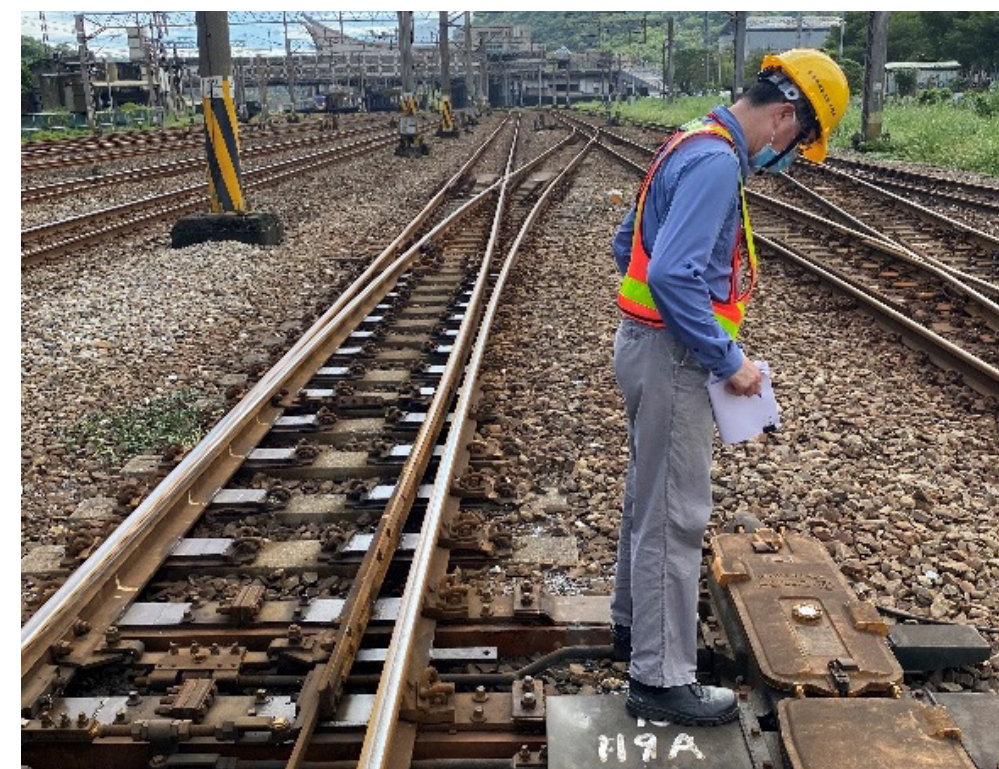
Examination of the preparation in railway safety week in Hsinchu Station



Examination of the preparation in railway safety week in Kaohsiung Rolling Stock branch



Examination of the preparation in railway safety week in Yilan Construction branch



Examination of the flatness detection in railway safety week in Su'aoxin Station

5-8 Mobilization of Disaster Prevention and Preparation

The railway mobilization preparation system is set according to the Transportation Mobilization Preparation Plan, under the jurisdiction of the TRA, Taipei Rapid Transit Corporation, New Taipei Metro Corporation, Taoyuan Metro Corporation, Kaohsiung Rapid Transit Corporation, Taichung Mass Rapid Transit Corporation and Ali Mountain Forest Railway of the Forestry Bureau, Council of Agriculture, Executive Yuan. Relevant operating procedures are set according to the All-Out Defense Mobilization Preparation Act and its implementation rules, Annual All-Out Defense Mobilization Preparation Plan, Annual Transportation Mobilization Preparation Plan and Annual Policy Plan, so as to implement various railway mobilizations.

In addition, according to the Disaster Prevention and Protection Act and railway mobilization, we implemented disaster prevention and protection and contingency measures, and cooperated with the Ministry of National Defense, governments of municipalities and counties (cities) to organize various drills and training programs, so as to strengthen the reorganization and operation of various systems, and achieve the goal of “supporting disaster emergency rescue in peacetime and military operations in wartime”.

1 “Mobilization, disaster prevention and counterterrorism” railway safety drill

The railway safety drill was held at Su’ao Station in Yilan District and Jialu Station in Kaohsiung District on May 12 and 14, 2021 respectively. The drills originally scheduled in Hualien District, Taichung District and TRA Corps were canceled due to the pandemic.

To effectively control the COVID-19 pandemic and cooperate with the government’s current pandemic prevention and disaster prevention measures, the drill was performed specially with measures related to pandemic prevention, and was compact, realistic and true, fully demonstrating the spirit of implementing drills as a formal disaster relief.

In 2021, the mobilization joint offices of the TRA conducted large-scale comprehensive drills for the emergency response and rescue (repair) of various railway disasters and accidents for 2 times, with 390 personnel dispatched, including 128 external support units, with 518 people

participating in the drills. A total of 50 vehicles, namely 28 vehicles and large machinery, and 22 external vehicles and helicopters, participated in the drill. We will strengthen the ability of the teams in various districts to take refuge, escape and evacuate, rescue the wounded, rescue and recover from various disasters by the drills.



Drills in various regions

2 Perennial training of civil defense teams

To enhance the knowledge of civil defense, cultivate the concept of civil defense, and improve the operational functions of civil defense teams, TRA has established the disaster prevention and rescue, counterterrorism, self-defense and self-rescue in peacetime, and implemented the mobilization preparation for total defense, so as to effectively support military service in wartime and ensure homeland security. Perennial training of civil defense teams: 6 training sessions were conducted, involving about 282 people, and lecturers from civil defense, fire protection and health units were employed to provide comprehensive training on civil defense formation, disaster prevention and rescue, first aid for the wounded, and general knowledge of fire control for on-site personnel.

No.	Unit	Training date
1	TRA Corps	October 6, 2021
2	Team of Taipei District	August 20, 2021
3	Team of Taichung District	November 2, 2021
4	Team of Kaohsiung District	September 28, 2021
5	Team of Yilan District	October 27, 2021
6	Team of Hualien District	September 9, 2021

3 Designated drill of critical infrastructure at Taipei Main Station in 2021

By simulating the failure of core functions of critical infrastructures through drills, the TRA tested the feasibility and effectiveness of protection energy of critical infrastructures in Taipei Main Station and related emergency response procedures, backup and replacement mechanisms. The TRA tested the notification mechanism, the target operation of the response center and the decision-making command of senior managers in the impact such as natural disasters, information communication security and man-made disasters.

We took a specific area in Taipei Main Station as the drill field, and examined the current disaster risks. Relevant units such as TRA, THSR, Metro Taipei, Taoyuan Metro Corporation, Station Front Metro Mall, Taipei City Mall, Taipei Station K Underground Mall, Zhongshan Metro Mall and Breeze Center carried out task grouping and division of labor, and implemented the disaster contingency according to the conditions, so as to strengthen the ability of the Joint Disaster Prevention Center to prevent and prepare in peacetime and mobilize, rescue, logistics support, contingency decision-making and recovery during disasters. Affected by the pandemic, the drill was conducted by deduction on the table.



Local team deduction on table



CI team deduction on table



Central team deduction on table



5-9 Civil Service Ethics

1 Anti-corruption platform

Combined with the supervisory power of external organizations such as the Agency Against Corruption, Ministry of Justice and the Department of Civil Service Ethics, MOTC, the TRA has specially set up the “Anti-corruption Platform for Vehicle Procurement Projects” and “Anti-corruption Platform for Electrical Engineering Smartification Upgrade Project”. By taking various preventive measures such as holding regular contact meetings, setting the webpage of administrative transparent zone, integrity advocacy, and strengthening social participation, improper interference from outside can be eliminated, so that the procurement can be successfully completed, and a quality administrative environment can be constructed to shape an efficient and incorruptible government. On April 28 and October 14, 2021, the 19th and 20th contact meetings of the Anti-Corruption Platform for Vehicle Procurement Projects were held, with 10 consensuses reached; affected by the pandemic, only the 7th contact meeting of the Anti-Corruption Platform for Electrical Engineering Smartification Upgrade Project was held on October 20, 2021, with 3 consensuses reached.

2 Anti-corruption campaigns

1. Integrity advocacy

For the government employees, we planned, advocated and promoted the integrity education, and strengthened the public servants’ understanding of relevant laws and regulations. In 2021, the TRA organized two sessions for law and discipline advocacy, co-organized 10 legal education training sessions and 1 quiz competition, and issued six integrity bulletins to deepen legal literacy among the staff.



Seminar on integrity advocacy



2. Social participation

Aiming at individuals and organizations other than the public sector, we strengthened the understanding and support of all walks of life for the integrity policy in diverse manners. In 2021, the TRA Civil Service Ethics Office set up stalls near the offices, and held advocacy campaigns during local festivals or during the cooperation with local governments, so as to enhance the attention of the outside world to integrity issues and achieve anti-corruption for the whole people. A total of two activities were held, with more than 600 participants.



Social participation in advocacy activities

3 Special audit

In 2021, the TRA audited the Railway Cultural Asset Management Operations project, and inspected whether there was room for improvement from “collection”, “preservation”, “report and registration” and “revitalization and reuse” of railway cultural asset management operations. During the audit, about 330 people were mobilized to participate in the visit and exchange, pre-term consultation, preparation meeting, inventory and collection, written on-site audit and research and discuss of the promotion meeting. The TRA publicly praised the outstanding units observed in the audit as a token of encouragement, and studied and discussed 13 reform proposals in terms of regulations, systems and implementation according to the audit results, so as to complete the system, improve the management efficiency and effectively carry forward the railway culture of the TRA.

4 Integrity report meeting

To implement the integrity and improve the efficiency of administration, the TRA held an integrity report meeting on September 20, 2021. In this meeting, an external female member was appointed to implement gender equality. In the meeting, apart from commending the integrity model, we also discussed the promotion of civil service ethics affairs in different offices. Relevant matters and the contents of the chairman's commands were sent to all units by official document, and the management examination was carried out to strengthen the risk control of institutions. In addition, to maintain close regional contact, seven regional integrity report meetings were conducted in 43 branches, so as to improve the level of integrity and build consensus among employees.



External Members attend the meeting



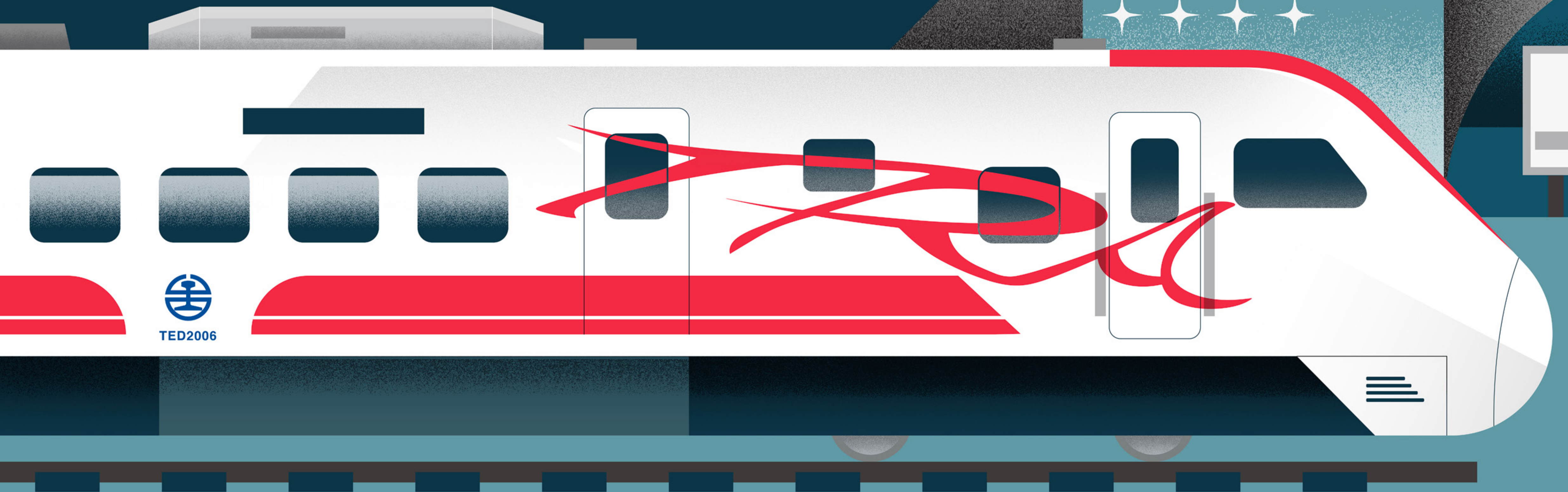
Awards for integrity model

5 Information usage management

In 2021, the TRA audited the information utilization management of the "Fourth Generation Ticketing System", carried out self-audit and on-site audit from June to August, 2021 according to the audit schedule, and carried out on-site audit of five fields and written audit of 50 fields in four aspects, namely, user record (Log File) building, abnormality of system access and account usage, system access abnormality notification and network application security management, thus to find out whether each unit complies with relevant laws and regulations such as Personal Data Protection Act, Cyber Security Management Act, and related regulations and information security management system in the course of business, so as to effectively prevent the leakage of official secrets and personal data and improper use of information, and ensure the security of data, systems, equipment, and network.



CHAPTER 06 /




TED2006



Major Construction and Investment Projects

- 6-1 Safety Reform
- 6-2 Six-Year Improvement Plan for Railway Safety
- 6-3 Forward-looking Infrastructure Development Program
- 6-4 Safety Improvement Plan of Track Structure
- 6-5 Plan for Feasibility Study of Route Improvement Project of Section Guishan-Wai'ao of Yilan Line
- 6-6 TRA General Plan for Vehicle Procurement and Replacement
- 6-7 Plan for Workshop Relocation from Kaohsiung to Chaozhou and Development of Original Site
- 6-8 Phase II Construction Project Plan of Kaohsiung Workshop and Chaozhou Depot
- 6-9 Train Control System (TC4.0)
- 6-10 Various Construction Projects

6-1 Safety Reform

After the 0402 Accident, the Safety Performance Indicator of each unit was revised. Through rewards and punishments system, we developed a motivational plan to improve railway safety in second and third quarter (June – August and September - December). From June to December, no major accident occurred, and the number of general accident decreased by 8 cases (excluding accidents caused by natural disasters) compared with that of the same period in 2020. The preliminary result of the plan was successful; however, there is still room for improvement.

The TRA continuously reviews and examines safety improvement in three aspects- employees, rail vehicles and rail tracks: we draft a comprehensive implementation plan to improve safety; meanwhile, we also accelerate the implementation of the Safety Management System (SMS) and actively address to cause instead of the symptoms through risk management. Each operation guideline is announced and promoted to the grassroots and executed by the employees in order to create a safety culture. The improvement measures of the safety reform are as follows:

1. Strengthen construction site management: rebuild safety management system of constructions near rail tracks, reinforce competency and practice of monitoring and establish emergency reporting mechanism.
2. Improve high-risk railway sections: reinforce slope protection and constructions of foreign object intrusion.
3. Improvement of rail tracks: track alignment on curved sections and intelligent track inspection.
4. Increase rail track maintenance capacity.
5. Strengthen assessment of train drivers and install onboard speed limit back systems: amend assessment regulation for automatic train protection (ATP) and install onboard speed limit back systems.
6. Establish TRA horizontal communication team and regional coordination centers: shorten chain of commands and reinforce efficiency in supervision.
7. Initiate technical meetings of management level: change accident analysis and review into prevention and quality assurance measures.
8. Establish a reward and punishment mechanism: effectively motivate and supervise train operation and maintenance staff



Simulation exercise and observation seminar

0402臺鐵408次事故專區



謹向110年4月2日第408次列車事故之罹難者、受傷旅客、家屬以及全國民眾致上最深忱之歉意。臺鐵局對此憾事已深切檢討，除向事故關係者盡最大關懷之力，未來將推動安全改革，建立周嚴制度，採取主動積極作為，杜絕行車及公安風險。後續相關改革措施，亦將透明公開俾便公眾檢視，並廣納各界建議，以臻周延。「安全」是臺鐵的核心價值，我們致力以「行車運轉零事故」為目標，積極規劃執行各項安全措施，建構優質運輸服務，各級主管與全體員工均負推動之責，自局長開始，

我們承諾：

- 一、建立安全無虞的營運環境，確保旅客及員工之安全與健康。
- 二、積極辦理安全危害辨識及風險管理，消除安全危害因子。
- 三、推動安全管理系統(SMS)，持續加強管理行車安全。
- 四、確保員工獲得充分的安全資訊及訓練。
- 五、落實安全設備檢查及安全管理規章。
- 六、加強安全文化活動，提升工作安全及效率。
- 七、全員一致落實執行安全政策，確保行車運轉安全。

臺鐵局局長 杜微

0402 Accident area on the Taiwan Railways official website

6-2 Six-Year Improvement Plan for Railway Safety (2015—2022)

1 Construction

1. Main content of the plan

- (1) Retrofitting and improvement of level crossing signals: optical fiber utilization for level crossing remote monitoring transmission and automatic obstacle detection.
- (2) Installation of additional fences and noise barriers walls for perilous railway sections: construction of new 175 km fences and noise barriers.
- (3) Bridge reconstruction and reinforcement meeting existing laws and regulations: reconstruction of 15 bridges, including the Wencuobu Creek Bridge.
- (4) Establishment of early warning systems for slope sliding, debris flow and strong winds: improvement of slopes, subgrade and drainage facilities of high-risk railway sections and establishment of early warning systems for slope disaster prevention.
- (5) Facilities update of stations in accordance with the law: raise of station platforms, improvement of male and female toilets, barrier-free facilities, and other safety facilities of all TRA railway stations.
- (6) Renewal of track facilities: replacement of 50 kg rails for 250 km, 50 kg head hardened rails for 60 km, and 50 kg PC sleeper turnouts for 600 sets, and improvement of Xinma Curve.

2. Implementation results

- (1) Platform raising projects were concluded at 37 stations (including Nanzi Station) in 2021, bringing the cumulative total of stations completing such construction to 72.
- (2) New barrier-free elevators were installed at eight stations (including Yongjing Station) in 2021, bringing the cumulative total of stations completing such construction to 17.
- (3) Male and female toilets were improved at 24 stations (including Changhua Station) in 2021, bringing the cumulative total of stations completing such construction to 44.
- (4) Phase I of Dounan Cross-Station Building Construction Project started on September 5, 2020, and in Phase II, a barrier-free elevator and an escalator will be added on the platform, and station public art will be added. New facilities are scheduled to be put into

service in 2022.

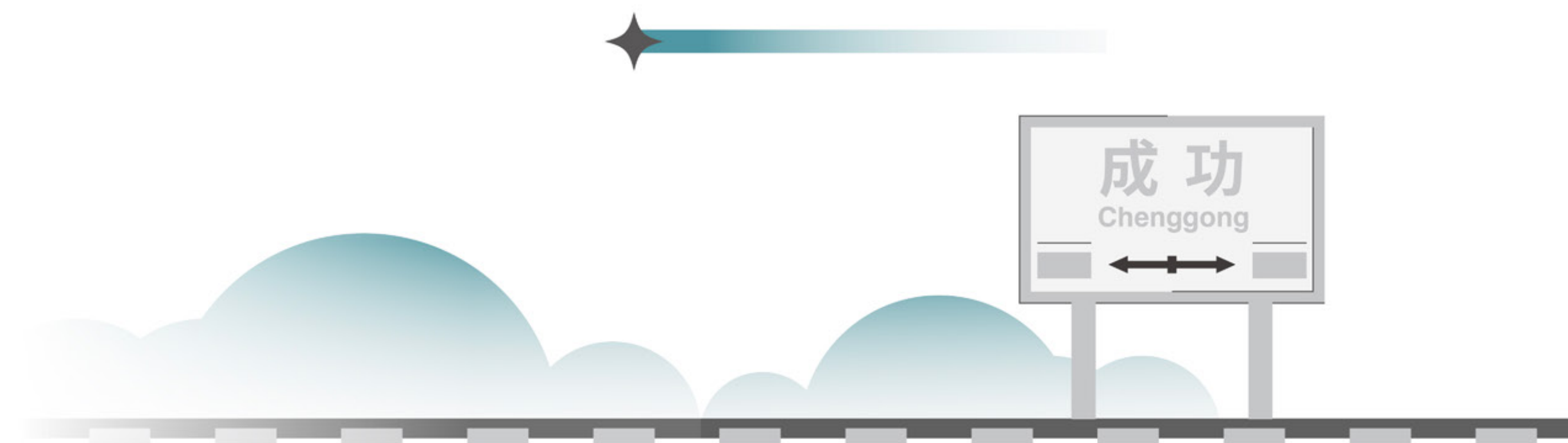
- (5) One bridge reconstruction project was completed in 2021, with a cumulative total of three bridges reconstruction projects.
- (6) The Slope Maintenance Manual was reported to the MOTC for reference in June 2020, and has been promulgated and implemented since January 1, 2021, based on which the slope maintenance and management will be conducted.
- (7) The slope improvement works have been subcontracted successively and are under construction.
- (8) For the total life cycle maintenance and management of slopes (Early Warning and Management System Turnkey Project), the detailed design was completed in August 2021; 11 places were equipped with slope rockfall warning system in 2021, and it is expected that the system will be installed at 15 more places by the end of 2022, which will bring the cumulative total of locations completing such work to 26.



New barrier-free elevator for Chenggong Station



Completed platform raising project of Mudan Station



3. Reconstruction project of First Minxiong bridge

The Project was implemented near a flood-prone area. Over the years, several typhoons and rainstorms have caused flooding in this region. In September 2013, legislator Wong Chung-Chun convened relevant units to investigate and discuss for improvement. In addition, according to the drainage system planning report for Beizitou Village (which is under the jurisdiction of Chiayi County) under the Flood Control Plan for Flood-prone Areas established by the government of Chiayi County, the three bridges, namely the First Minxiong Bridge, Tai'an Bridge and Dongshihu Bridge, were included in the Six-year Improvement Plan for Railway of the TRA for reconstruction because their drainage sections were insufficient and the bottom height of abutment beams did not meet the flood control plan. After the bridge reconstruction project is completed, the bridge length will be extended and the beam will be raised to increase the watercourse flow section and improve the flood discharge performance, so as to improve the flooding situation of TRA route and surrounding areas caused by typhoon and heavy rain around Minxiong Village, Chiayi County; thus strengthen the bridge structure, meet the current earthquake-resistant and flood-resistant regulations, as well as promote and ensure railway safety. The Reconstruction Project of the First Minxiong Bridge was completed in July 2021, and that of Tai'an Bridge and Dongshihu Bridge is expected to be completed by the end of April 2022.



Completed First Minxiong bridge



Construction of new box culverts of Dongshihu Bridge



Construction of new box culverts of Tai'an Bridge

2 Rolling stock

1. Stairless transformation of carriages

For the safety of passengers, it is planned to eliminate the height difference between the floor of railway passenger carriages and the platform of stations. Due to the need to take into account train operations, such an improvement plan was initiated in 2015, and the renovation for 1,208 vehicles has been completely accomplished by 2021.

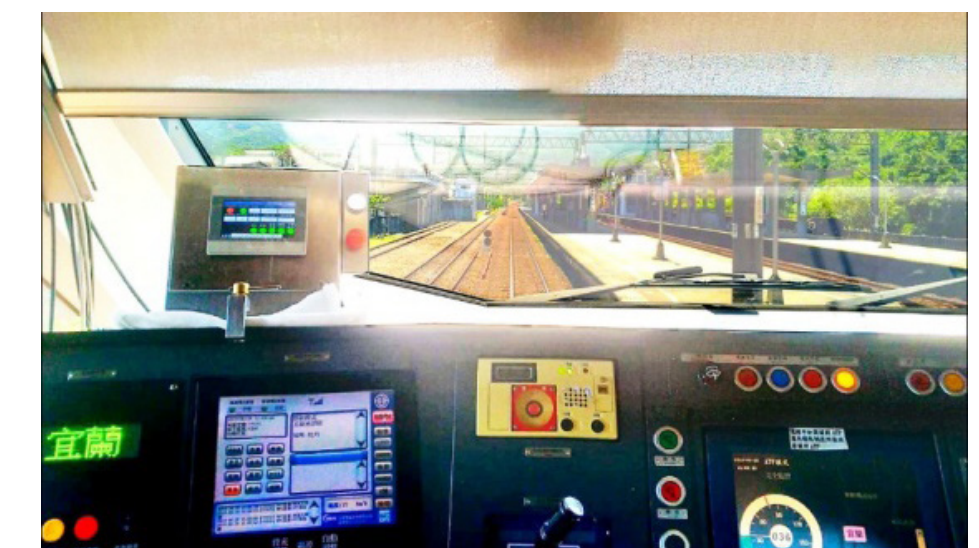


Entrance is flush with the platform after stairless construction



2. Train speed limit backup system

To improve the railway safety, the TRA and the National Chung-Shan Institute of Science and Technology implemented the addition of the "Train Speed Limit Backup System", and have installed 52 sets of such systems on Taroko Express and Puyuma Express in 2021.



3. Renewal of power system and static inverter (SIV) system of 252 local trains (EMU500)

The construction was undertaken by Shihlin Electric & Engineering Corporation, by the end of 2021, the renewal for 36 EMUs had been completed, and the project is scheduled to be completed in 2023.

4. Transformation of vehicle video recording and information display device

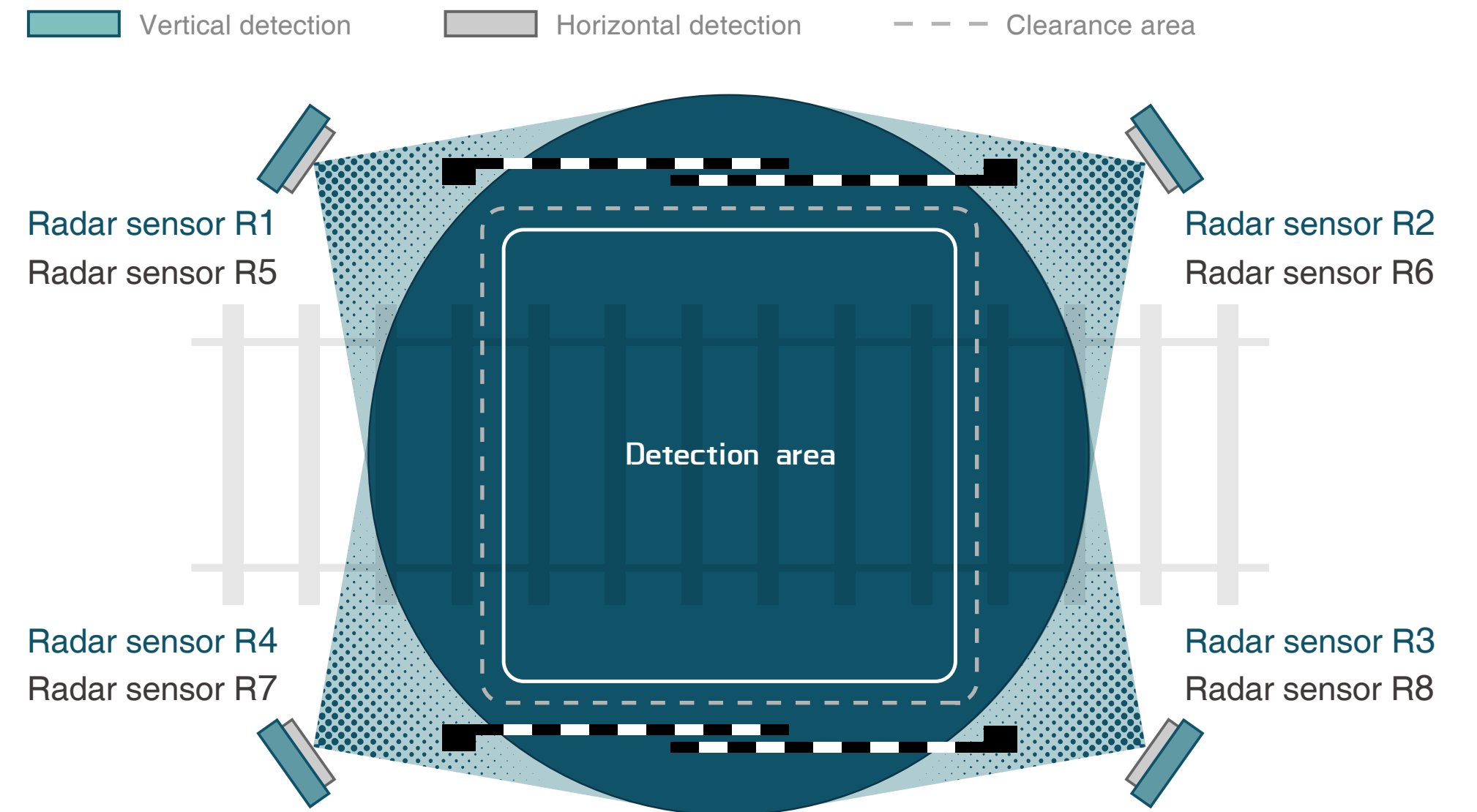
For the transformation of vehicle video CCTV and information display device of EMU600 units, there are 560 vehicles (including EMU600, EMU700 and EMU800) will be transformed in total, and by the end of 2021, 544 vehicles had been transformed.

3 Electrical engineering

1. Obstacle detection system

To prevent the road vehicles from breaking down at the level crossing, which will affect railway safety, an automatic obstacle detection system for level crossings has been added to the main line. When obstacles are detected in a level crossing, the emergency warning system of the TRA is activated, and the signals can be transmitted to train drivers for timely response, so as to reduce the accident occurrence at level crossings.

A total of 260 level crossings along the main line of round-the-island railway have been equipped with the “Automatic Obstacle Detection System for Level Crossing”. In 2020, 103 systems were put into service by stages, and all of them were put into service in 2021, which will timely alert the train driver for danger, and detect violations and intrusions fully and actively, so as to avoid the intrusion of human and vehicles, and the level crossing safety protection will be further improved. The project has established important guidelines and foundation engineering for localization. In the future, it will combine the digitalization of boom barrier at level crossings with the integration of the level crossing trackside device and the central monitoring system, and then analyze the behavior of human and vehicles passing through the level crossing through AI big data analysis, so as to enhance the early warning capability and response mechanism and to achieve the goal of intelligent level crossing.



Schematic Diagram of Installation Locations and Detection Areas of Radar Sensors



Schematic Diagram of the Real-time Monitoring of Level Crossings by the System Managing the Computer Image Management Platform

2. Renewal project of 95-mm² messenger wire of electric traction line

The project features a budget of TWD 867 million, with a total construction distance of 1,260 km. The renewal project was fully completed in October 2021, by which the carrying capacity and tensile strength of messenger wires can be improved, their disconnection probability can be reduced, and the reliability and stability of power supply can be achieved.

3. Purchase plan of 17 operating and 11 railway engineering maintenance vehicles on electric traction lines

On July 19, 2021, all vehicles were delivered and put into service, which will strengthen the maintenance of electrical equipment and improve the efficiency of emergency repair.

6-3 Forward-looking Infrastructure Development Program

1 Transfer and connection plan between THSR Changhua Station and Taiwan Railways

1. Contents of the plan

The plan for seamless transfer between THSR Changhua Station and Taiwan Railways, and connect operation with Jiji Line to provide sightseeing services has been reached, with a total expenditure of TWD 2.992 billion and a planned period of about 7 years. The main contents include: the construction of single track elevated structure of Tianzhong Branch Line, with a route length of about 3 km, of which the viaduct section is about 1,350 m, and the embankment section and plane approach section are about 1,650 m; connect operation with Jiji Line, adding the function of transfer in Jiji Line.

2. Implementation results

The final report for the feasibility study on transfer and connection between THSR Changhua Station and Taiwan Railways was reported by the MOTC to Executive Yuan on August 29,

2019 and approved by Executive Yuan on September 27, 2019. The comprehensive planning operation started on July 17, 2020, and the initial report was approved on March 8, 2021. The final report was approved on August 5, 2021 and submitted to the MOTC and Executive Yuan for deliberation. In addition, the MOTC conducted the on-the-spot investigation and preliminary preview on September 28, 2021, and the revised report was reported to the MOTC on November 19, 2021, with the hope of being approved by the Executive Yuan at the end of 2022.

2 Plan for new double-track project of Taiwan Railways Chenggong-Zhuifen Sub-branch

To solve the single track operation bottleneck of Chenggong-Zhuifen Sub-branch, the double-track construction of Chenggong-Zhuifen Sub-branch were implemented, hoping to provide convenient, fast, comfortable and efficient rail transport services for people in Taichung. In 2016, a total expenditure of TWD 1,540.5 million was approved by Executive Yuan for the plan. The main objectives of the plan include increasing the route capacity, shortening the train headway, meeting the commuter travel demand and improving the bottleneck sections in Taichung.

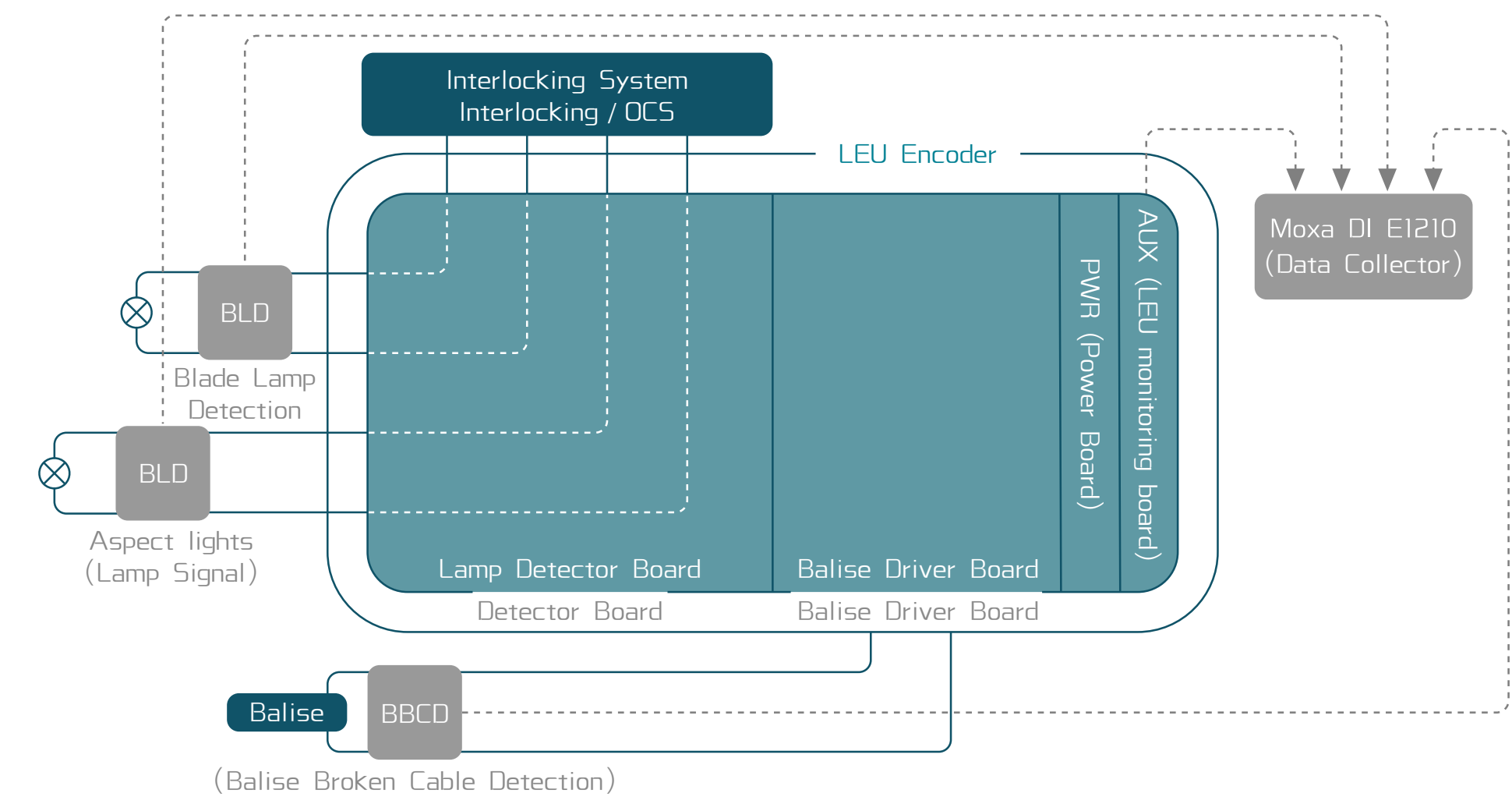
The plan includes subgrade, civil engineering, track, signal, communication and electric power engineering. The design and construction began in 2017, the double-track project was completed at the end of December 2019, and it was opened to traffic on January 3rd, 2020; on March 18th, 2010, the electronic interlocking of Xinwuri Station was put into service, and the supporting works such as the improvement of station travel facilities were continuously improved.

3 Taiwan Railways electrical engineering smartification upgrade project

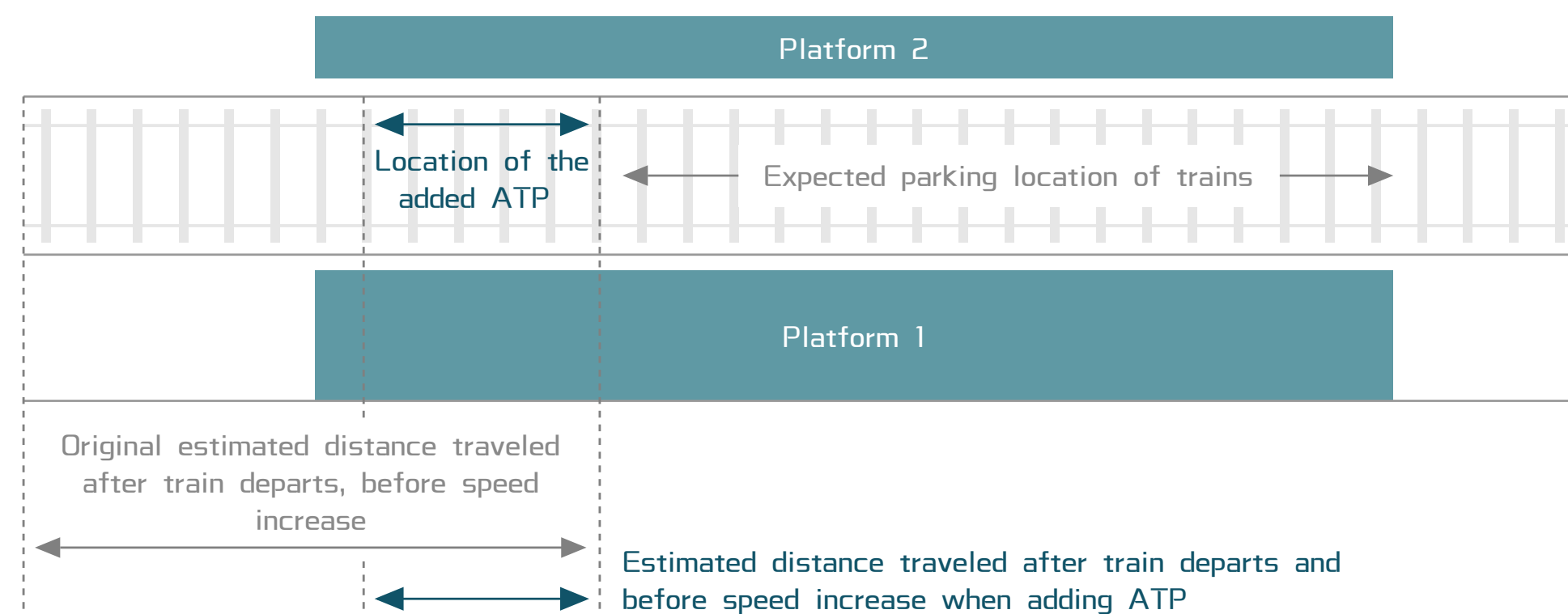
1. The optimization of radio communication system for train dispatching of 29 stations was fully completed in 2021 (including 13 relay stations, 15 repeaters, and 1 antenna improvement — Nangang Station, Dongshan Station, Sicheng Station, Dingpu Station, Wudu Station, Shulin Station, Xinfu Station, North of Puxin Station, Sanxingqiao Station, South of Qiding Station, North of Miaoli -Zhunan Tunnel, Qingshui Station, North of Huatan Station, Douliu Station,

South of Douliu Station, Jiabei Station, Xinshi Station, Daqiao Station, Rende Station, Luzhu Station, Nanzhou Station, Fangliao Station, Jialu Station, Chaozhou Depot, Dongli Station, North of Ruibei Station, Pinghe Station, North of Minxiang Level Crossing, and West of Heping Power Plant), which improved the coverage probability of radio field strength and improved the radio reception rate to 100%.

- For the laying project of the second ring of 96-core optical fiber cable, the laying length of the optical fiber cable is about 556 km, of which the construction started on June 28, 2019, with a construction period of 500 business days. By the end of 2021, a total of 502 km had been completed in total. After the completion of the entire project, the physical protection of the double loops optical fiber cables can be achieved, so as to improve safety.
- The efficiency of ATP overground device has been improved for 297 stations, which started on November 21, 2018, with a total construction period of 880 calendar days. The whole project (optimization and monitoring) has been fully installed in 2021, and at present, the follow-up acceptance procedures are actively handled, so as to obtain the updated signal information as early as possible and grasp the system operation status in real time, thus improving the train operation efficiency and operation management.



Extraction of ATP Monitoring Signal



Schematic Diagram of Efficiency Improvement of Added ATP Sensor Node

4 Infrastructure improvement plan of Taiwan Railways Jiji Line

This plan involves the hardware construction, track alignment and slope stability detection and improvement of stations along Jiji Line, so as to enhance the overall service intensity of the branch line and enhance the convenience, safety and tourism service quality for passengers. The total budgeted expenditure is TWD 2.363 billion, and the scheduled construction period is from August 23, 2019 to July 31, 2026.

This plan was approved by the Executive Yuan on August 23, 2019, in which the civil engineering “Checheng Station Platform Addition and Track Strength Enhancement Project” was completed on September 24, 2021; the track construction started on April 30, 2020, and the works such as rail and PC sleeper replacement and mud splash reduction were continuously conducted. The main items include:

- Platform elevation and extension at each station.
- Station appearance beautification and travel facilities improvement.
- Improvement of fences and drainage facilities along the line.

4. Slope stability reinforcement and remote monitoring.
5. Bridge and tunnel reroute and reconstruction.
6. Curve track alignment improvement.
7. Depot track function strengthening.
8. Level crossing relocation.



Platform addition and track strength enhancement project of Checheng Station



Improvement project of Jiji Line and surrounding level crossings

6-4 Safety Improvement Plan of Track Structure

1 Plan content

This plan was approved by the Executive Yuan according to the Official Letter (No. 1080199278) on January 21, 2020, with a total expenditure of TWD 9.9003 billion and a construction period from 2020 to 2025. The project mainly includes the following:

Replacement of 1,946 sets of wooden sleeper turnout by PC sleeper turnouts; replacement of 250 km of rails; update of maintenance machinery, and procurement of 74 pieces (sets) of maintenance machinery.

2 Implementation results

1. The turnout materials have been accepted for 239 sets in 2021 and are being delivered continuously.
2. The rail materials have been accepted for 139 km in 2021 and are being delivered continuously.
3. On April 23, 2021, the department-level approval of maintenance machinery procurement specification was completed, and on August 2 and November 24, the meeting of administration-level validation team was held.
4. On August 25, 2021, the department-level discussion on maintenance machinery procurement specification was completed, and on October 14 and November 22, the administration-level seminar was held.

6-5 Plan for Feasibility Study of Route Improvement Project of Section Guishan–Wai'ao of Yilan Line

The main content of the plan is as follows: after departing from Guishan Station, long tunnel structure with alignment curvature greater than 1,000 meters will be used to avoid disaster-prone areas and houses at the tunnel exit, and then reconnect to the existing line at the north of Wai'ao Station, and the existing curves at Wai'ao Station and the north of Wai'ao Station will remain unchanged, with a total cost of TWD 1.95 billion, which will be completed in 3.5 years after the plan is approved. This plan started on October 19, 2020, the interim report has been approved on November 1, 2021, and the final report was submitted on December 30, 2021. The interim report of environmental impact assessment has been approved on November 29, 2021, and the first draft of the environmental impact statement was scheduled to be submitted within 150 calendar days. The entire report is schedules to be completed and submitted to the MOTC in December 2022.

6-6 TRA General Plan for Vehicle Procurement and Replacement (2015—2024)

The total budgeted expenditure is TWD 99.73 billion for the procurement of 1,307 rolling stocks. Procurement items include the following:

- (1) 600 intercity electric multiple units, the first batch of 12 trains was delivered on July 30, 2021, and it is planned to deliver 84 trains by the end of 2021.
- (2) 520 commuter electric multiple units, the first batch of 12 trains was delivered on October 24, 2020, and it is planned to deliver 160 vehicles by the end of 2021.
- (3) 127 locomotives (102 locomotives will be purchased in advance, and the rest will be purchased and supplied by means of subsequent expansion); on November 21, 2019, a contract for 68 Group A electric locomotives was signed with Toshiba Infrastructure System & Solution Corporation (Japan), and delivery is expected to begin in 2023; and on November 1, 2019, a contract for 34 Group B diesel-electric locomotives was signed with Stadler Bussnang AG (Switzerland), and delivery is expected to begin in 2022.
- (4) 60 passenger trains of branch lines, the bidding preparations are under way, the bid will be awarded in 2022 and delivery will begin in 2024.

6-7 Plan for Workshop Relocation from Kaohsiung to Chaozhou and Development of Original Site

In this plan, in response to the underground railway requirements in Kaohsiung downtown, it is necessary to relocate the Kaohsiung Workshop, Southern Region Supply Workshop and Port of Kaohsiung Maintenance Sub-branch to Chaozhou, so as to maintain the smooth supply for passenger and freight train maintenance and spare parts repair and manufacture, ensure steady operation of passenger and freight transport and railway safety, fulfill the vehicle maintenance needs of Taiwan Railway, and make the newly-built Chaozhou Depot the vehicle maintenance center in the south. The vacated original land will be changed for development and utilization through urban planning. The 1st revised plan was approved by the Executive Yuan in 2017, the total planned expenditure was revised to TWD 13,481.8 million, and the construction period was adjusted to August 13, 2013 ~ December 31, 2021. Since the implementation of the plan, the building use permits have been obtained, and the acceptance, inspection, equipment testing, education and training are under way.



Aerial Photos of Kaohsiung Workshop and Chaozhou Depot

6-8 Phase II Construction Project Plan of Kaohsiung Workshop and Chaozhou Depot

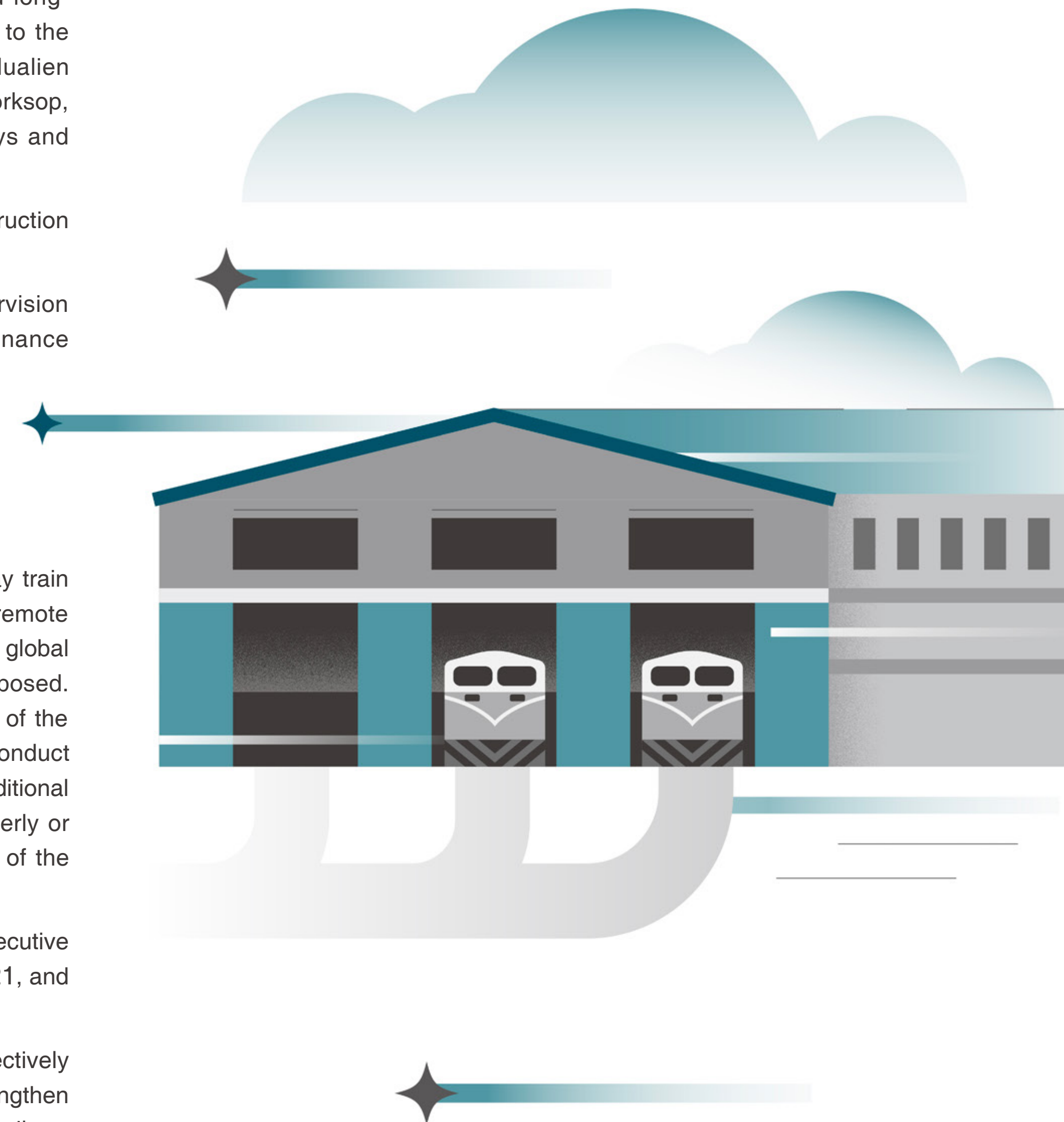
In line with the Overall Vehicle Procurement and Replacement Plan of Taiwan Railways (2015–2024), the newly purchased long-marshalling electric multiple units have been delivered for operation since 2020. Since the new vehicles are required to return to the depot for Classes 3 and 4 maintenance after operated for 3 years, and the maintenance capacity of Taipei Workshop and Hualien Workshop is full, the intercity electric multiple unit maintenance workshop will be expanded in the reserved land in the original worksop, and additional maintenance equipment will be purchased, as so to ensure the depot maintenance function of Taiwan Railways and guarantee the railway safety.

This plan is verified and approved by the Executive Yuan, with a total planned expenditure of TWD 12,147.7 million, and a construction period from September 27, 2021 to December 31, 2025.

This is a new plan, by which the budget preparation and procurement preparation for planning, design and construction supervision technical service project are under way, and main content includes the construction of intercity electric multiple unit maintenance workshop and the procurement of additional maintenance equipment.

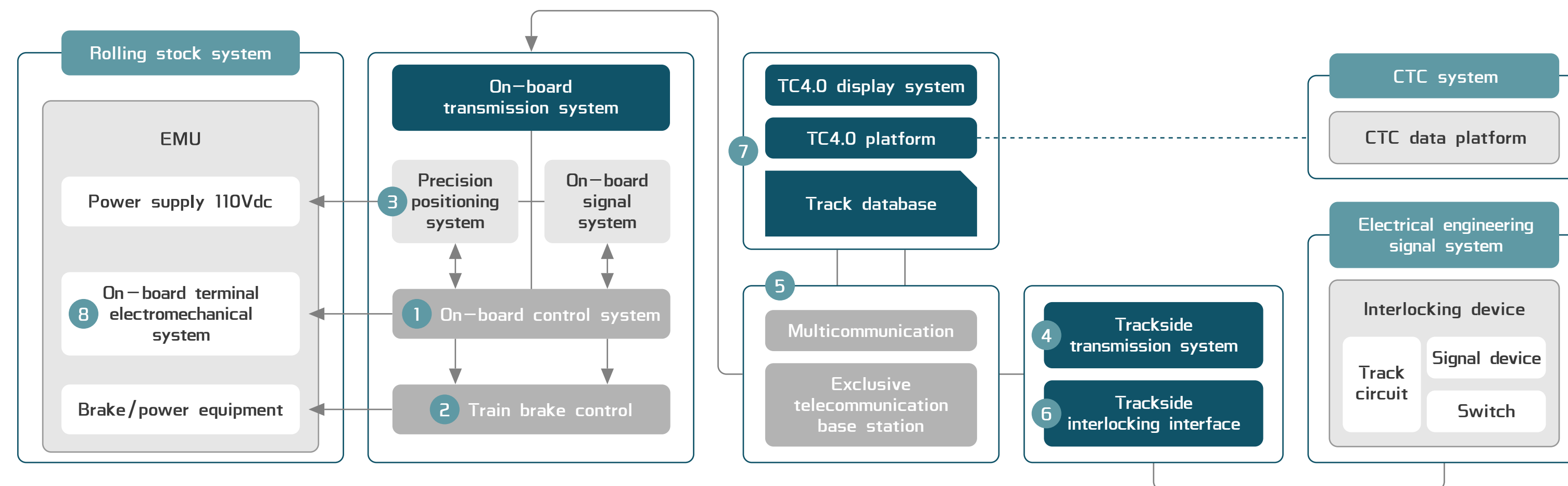
6-9 Train Control System (TC4.0)

1. The TRA has been committed to improving railway safety. After study and analysis, it is found that the existing traditional railway train control system in Taiwan is still limited to passive monitoring of train status, which cannot provide protection and control for remote continuous monitoring of real-time train status. To effectively ensure railway safety, the software and hardware architectures of the global system have been comprehensively checked, and the research and development plan of TC4.0 has been examined and proposed. The specific action plan for development is to add the following four functional requirements in the existing train-control system of the TRA: real-time broadband radio communications, continuous train control, precision positioning and cab signaling, that is to conduct comprehensive and continuous train status control by radio message transmission, with the goal of upgrading the security of traditional railway train-control system, and preventing the occurrence of major accidents caused by vehicle equipment failure and disorderly or improper driving operation. It is expected that through the technological innovation, research and development, the functions of the existing train-control system can be improved, and both safety and efficiency can be maintained.
2. We have applied for the subsidy from the National Science and Technology Development Fund Management Committee under Executive Yuan, and it was approved on December 30, 2020. The implementation period was from December 1, 2020 to November 30, 2021, and the planned construction site was Liujia Branch Line.
3. The expected short-term and medium-term effects of this project include: establishing a TC4.0 that is verified and feasible, effectively improving railway safety and operational efficiency; the long-term strategy is to integrate the local railway industry ecosystem, strengthen the strategic cooperation of international manufacturers, take into account the international market and become a world-class railway exporter.



4. The award of the bid of this project has been announced on October 15, 2021, contract signed on October 22, 2021, and started on October 27, 2021, and the relevant site investigation and construction planning are under way.

/ Architecture of TC4.0



Integration function of TC4.0

- (1) On-board control system
- (2) Train brake control
- (3) Precision positioning
- (4) Instant transmission
- (5) Reliable message transmission
- (6) Trackside interlocking interface
- (7) TC4.0 platform
- (8) Integration of on-board terminal system

Legend :

- TC4.0 input system
- Trackside or train equipment
- Original equipment of Taiwan Railways
- Correlation between TC4.0 and original system of Taiwan Railways
- Data flow



6-10 Various Construction Projects

1 Improvement of accommodation facilities

With a hundred-year history, the TRA has arranged most of its working sites in small and crude spaces to accommodate to the existing station environment, and these sites have been put into service for long years, especially the accommodation facilities for standby and on call train crews (drivers and conductors) and the station lounges, which were not properly planned in the early stage. Therefore, it is proposed to build new accommodation, which shall be in the form of single suites, installed with airtight windows, in separate toilet and bathroom design and set up lounge area, so as to improve the quality of on-duty and standby space for train crews.

Since November 2018, the accommodation facilities improvement project has been included in the “Meeting on Working Environment Improvement of TRA” for implementation, and by 2021, 26 stations had been improved, with a total of 194 houses.



Accommodation facilities for Hsinchu Subsection

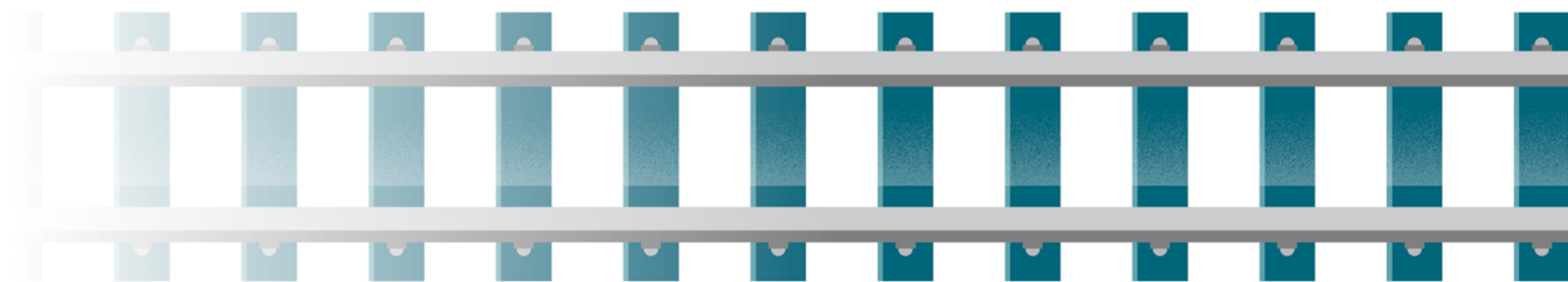


Inside of the accommodation for Hsinchu Subsection

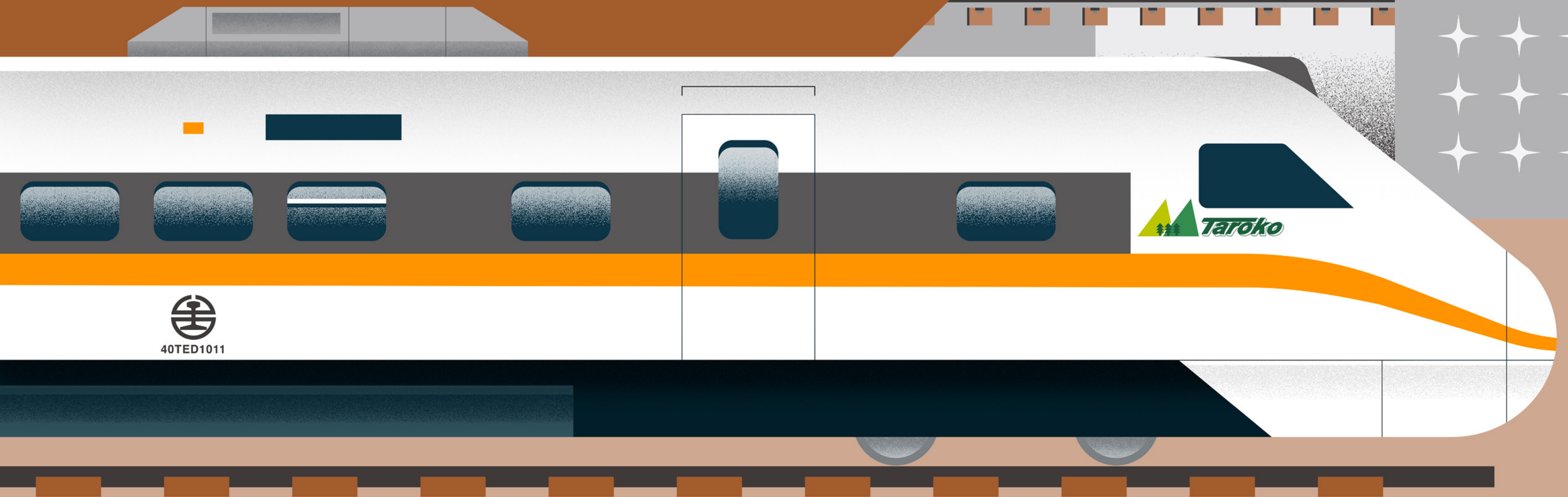


2 Route maintenance

The Construction Department of the TRA carried out improvement work for the whole track route in 2021, with a total of 4,899 sleepers and 85,154 meters of rail replaced; 22,332 cubic meters of replenishing ballast was used and 98 sets of turnout were replaced.



Appendix /




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Major Events in 2021

Appendix – Major Events in 2021

01.01	<p>Successfully completed the transportation task during the New Year's Day holiday.</p> <p>A total of 158 additional trains of all levels and 436 additional carriages were added to successfully complete traffic dispersion during the New Year's Day holiday (with a total of five days) from December 31, 2020, to January 4, 2021. Passenger transportation revenue totaled TWD 261.71 million and average daily revenue was TWD 52.34 million, with a decrease of 22.29% compared with that in the same period in 2019. The number of transported passengers totaled 2,964,000 and the average number of passengers per day was 592,800, with a decrease of 22.62% compared with that of the same period in 2019. (Comparison of the number of passengers during the same period of adjacent two years).</p>	01.21	<p>Chen Yen-po, the Deputy Minister of MOTC, inspected the progress of the emergency slope repair work of the west main line of Houtong.</p>
01.06	<p>MOTC held the "excellent performance award evaluation activity among franchising and cooperative units on the Transport Data eXchange, TDX" in 2021, and the TRA won the award for special excellent performance unit.</p>	01.27	<p>Lin Chia-lung, the Minister of MOTC, inspected the progress of the emergency slope repair work of the west main line of Ruifang-Houtong.</p>
01.06	<p>Director General Zhang Zhengyuan inspected the Taipei train team and comforted and encouraged the staff.</p>	02.02	<p>Lin Chia-lung, the Minister of MOTC, inspected the progress of the emergency slope repair work of the west main line of Ruifang-Houtong, and traffic in both directions across the whole line was restored.</p>
01.07	<p>2021 book launch of TRA (Train For Change).</p>	02.17	<p>Successfully completing the transportation task during the Spring Festival holiday in 2021.</p> <p>During the Spring Festival holiday (with a total of 10 days) from February 8 to February 17, 2021, a total of 288 additional trains of all levels and 904 additional carriages were added for the whole line. The number of transported passengers totaled 5,443,000 and the average number of passengers per day was 544,000, with a decrease of 10.6% compared with that of the same period in 2020. Passenger transportation revenue totaled TWD 530.89 million and an average daily revenue TWD 53.089 million, with a decrease of 11.8% compared with that of the same period in 2020.</p>
01.12	<p>Commencement and groundbreaking ceremony for the construction of the diaphragm wall of the Nangang Marshalling Yard in the urban renewal project.</p>	02.23	<p>Chi Wen-jong, the Acting Director General, convened the 1st meeting of occupational safety & accident improvement supervision group of TRA.</p>
01.14	<p>TRA signed a memorandum of cooperation and development with Hualien County Government to promote the Huilan Twin Cities Development Plan.</p>	02.25	<p>Chi Wen-jong, the Acting Director General, convened the 2nd meeting of occupational safety & accident improvement supervision group of TRA.</p>
01.16	<p>On this day, Chi Wen-jong, the Deputy Minister of MOTC officially took over as the Acting Director General of the TRA and went to the slope repair site of the west main line of Ruifang-Houtong to encourage the relevant staff members.</p>	03.02	<p>Chi Wen-jong, the Acting Director General, convened the 3rd meeting of occupational safety & accident improvement supervision group of TRA.</p>

03.02	Successfully completing the transportation task during the Peace Memorial Day holiday in 2021. During the Peace Memorial Day (with a total of 5 days) from February 26 to March 2, 2021, a total of 123 additional trains of all levels and 390 additional carriages were added for the whole line. The number of transported passengers totaled 3,186,000 and the average number of passengers per day was 637,000, with an increase of 18.96% compared with that of the same period in 2020. Passenger transportation revenue totaled TWD 266.62 million and an average daily revenue TWD 53.32 million, with an increase of 15.74% compared with that of the same period in 2020.
03.17	Chi Wen-jong, the Acting Director General, inspected the supporting measures of barrier-free elevator work on the second platform of Yingge Station.
03.18	Held the Commendation Conference of 2021 Labor Day.
03.19	Test ride experience activities of EMU900 commuter train.
03.23	TRA held the experience activities of new generation ticket vending machines.
03.25	The Transportation Committee of the Legislative Yuan deliberated the amendment of the Railway Law.
04.01	Lin Chia-lung, Minister of MOTC, inspected the preparation of the transportation during the Tomb Sweeping Day holiday.
04.01	Organizing the maiden trip ceremony of EMU900 commuter trains at Keelung Station.
04.02	President Tsai Ing-wen inspected the disaster response center of the TRA for the 0402 Taiwan Railways Train No. 408 accident.

04.05	TRA set up a support group for the rights and interests guarantee for the 0402 Taiwan Railways Train No. 408 accident.
04.06	Successfully completing the transportation task during the Tomb Sweeping Day holiday in 2021. The TRA completing the transportation task during the Tomb Sweeping Day holiday from April 1 to 6, 2021 (with a total of 6 days), a total of 164 additional trains and 565 additional carriages were added for the whole line. The number of transported passengers totaled 3,854,000 and the average number of passengers per day was 642,000, with an increase of 50.62% compared with that of the same period in 2020. Passenger transportation revenue totaled TWD 355.56 million and average daily revenue was TWD 59.27 million, with an increase of 46.32% compared with that of the same period in 2020.
04.17	Wang Kwo-tsai, the Deputy Minister of MOTC, inspected the preparation of Chongde-Heren section (Qingshui Tunnel) before opening to traffic.
04.19	Lin Chia-lung, the Minister of MOTC, took the first train to pass through Qingshui Tunnel of the east main line to restore traffic.
04.26	Feng Hui-sheng, the Deputy Director General of TRA, led related personnel to visit Aerospace Industrial Development Corp. (Taichung factory).
04.27	Wang Kwo-tsai, the Minister of MOTC, visited injured passengers in hospital in the accident of 0402 Taiwan Railways Train No. 408
04.27	Handover ceremony of the outgoing director (Chi Wen-jong) and new (Tu Wei) director of TRA, MOTC.
05.04	The National Development Council organized the meeting on “Discussion on the Operation Status and Financial Model of TRA and the Amendment of Taiwan Railways Company Establishment Bill Draft” , and Deputy Director General Feng Hui-sheng led related personnel to attend the meeting.

05.05	Wang Kwo-tsai, the Minister of MOTC, held the communication meeting to negotiate with the Taiwan Railway Labor Union on “TRA Transformation and Reform”.
05.06	Wu Tse-cheng, a member of the Executive Yuan Officials, held the meeting on “TRA Speeding Up the Train Speed Limit Backup System”.
05.08	Chi Wen-jong, the Deputy Minister of MOTC, presided over the symposium of families of the victims in the accident of 0402 Taiwan Railways Train No. 408 (Taitung session).
05.08	Hu Hsiang-ling, the Deputy Minister of MOTC, presided over the symposium of families of the victims in the accident of 0402 Taiwan Railways Train No. 408 (Hualien session).
05.09	Wang Kwo-tsai, the Minister of MOTC, presided over the symposium of families of the victims in the accident of 0402 Taiwan Railways Train No. 408 (Taipei session).
05.11	The Operation Safety Department held the 18th meeting of the “Safety Management Reform Group”.
05.12 05.13	Feng Hui-sheng, the Deputy Director General of TRA, presided over the communication meeting on “TRA Reform and Transformation”.
05.14	Director General Tu Wei inspected the slope renovation work of Luye Station and Shanli Station on Hualien-Taitung Line.
05.14	Wang Kwo-tsai, the Minister of MOTC, inspected the coordination center in the eastern region, accompanied by Director General Tu Wei.
05.14	MOTC held the meeting on the topic of “TRA Reform and Transformation”, Deputy Director General Feng Hui-sheng led related personnel to attend the meeting.

05.14	Wang Kwo-tsai, the Minister of MOTC, inspected the slope work of TRA.
05.19	Wang Kwo-tsai, the Minister of MOTC, inspected the construction progress of “SMS Contact Tracing System” of Taipei Main Station.
05.20	MOTC held the 2nd meeting of the support and supervision group for the rights and interests guarantee for the accident of 0402 Taiwan Railways Train No. 408.
05.26	Hu Hsiang-ling, the Deputy Minister of MOTC, inspected the site renovation work in Taitung.
06.09	Hu Hsiang-ling, the Deputy Minister of MOTC, presided over the meeting on “Problems in Train Failure and Maintenance of Taiwan Railways”.
06.11	Hu Hsiang-ling, the Deputy Minister of MOTC, presided over the meeting on “Rail Safety Review of Taiwan Railways”.
06.15	<p>Successfully completing the transportation task during the Dragon Boat Festival holiday in 2021.</p> <p>To coordinate with the nationwide level 3 epidemic alert of the Central Epidemic Command Center, no additional trains were added for the whole line, tickets were sold in a staggered way, and no tickets for the standing room were sold during the Dragon Boat Festival holiday (a total of 5 days) from June 11 to June 15, 2021. Therefore, the passenger transportation revenue totaled TWD 30.4 million and average daily revenue was TWD 6.08 million, with a decrease of 90% compared with that of the same period in 2020. The number of transported passengers totaled 470,000 and average number of passengers per day was 94,000, with a decrease of 85% compared with that of the same period in 2020.</p>
06.18	MOTC held the 4th meeting of a support and supervision group for the rights and interests guarantee for the accident of 0402 Taiwan Railways Train No. 408, and Deputy Director General Feng Hui-sheng led related personnel to attend the meeting.

06.18	Hu Hsiang-ling, the Deputy Minister of MOTC, presided over the meeting on “TRA Rail Safety Review”.
06.22	TRA implemented rent relief measures in response to the epidemic situation of Severe Pneumonia with Novel Pathogens.
06.25	Feng Hui-sheng, the Deputy Director General of TRA, presided over the communication meeting on “TRA Reform and Transformation”.
06.25	MOTC held the 5th meeting of the support and supervision group for the rights and interests guarantee for the accident of 0402 Taiwan Railways Train No. 408, and Director General Tu Wei led related personnel to attend the meeting.
06.28	MOTC held the 3rd meeting of spokesperson of the subordinate agencies of MOTC.
06.28	Feng Hui-sheng, the Deputy Director General of TRA, presided over the communication meeting on “TRA Reform and Transformation”.
07.07	Wang Kwo-tsai, the Minister of MOTC, held the 1st meeting on “Train Speed Limit Operation of Trains on Taiwan Railways East Line”.
07.09	MOTC held the 6th meeting of the support and supervision group for the rights and interests guarantee for the accident of 0402 Taiwan Railways Train No. 408, and Deputy Director General Feng Hui-sheng led related personnel to attend the meeting.
07.21	MOTC held the meeting on the topic of “TRA Reform and Transformation”, Director General Tu Wei led related personnel to attend the meeting.
07.21	Wang Kwo-tsai, the Minister of MOTC, held the 2nd meeting on “Train Speed Limit Operation of Trains on Taiwan Railways East Line”.

07.22	Wang Kwo-tsai, the Minister of MOTC, inspected the slope work of Taiwan Railways in Houtong accompanied by Director General Tu Wei.
07.23	MOTC held the 7th meeting of a support and supervision group for the rights and interests guarantee for the accident of 0402 Taiwan Railways Train No. 408, and Deputy Director General Feng Hui-sheng led related personnel to attend the meeting.
07.26	Deputy Director General Feng Hui-sheng inspected the dormitory repair and the design of educare service center in Yilan.
07.28	TRA signed a “Letter of Intent for Cooperation” with Industrial Technology Research Institute, National Kaohsiung University of Science and Technology and National Taipei University of Technology.
07.29	Implementing the drill and observation of “Site Management and Safety of Construction near Tracks”.
07.30	Wang Kwo-tsai, the Minister of MOTC, supervised the delivery of EMU3000 intercity train to Taiwan.
07.31	Wang Kwo-tsai, the Minister of MOTC, held the 2nd symposium of families of the victims in the accident of 0402 Taiwan Railways Train No. 408.
08.03	Deputy Director General Feng Hui-sheng inspected the new depot in Chaozhou.
08.06	Director General Tu Wei inspected the work safety and flood control measures for the third Shuangxi Bridge on Yilan Line.
08.06	Ho-Ting Huang, the Chief Secretary of MOTC, visited families of the victims in the accident of the 0402 Taiwan Railways Train No. 408, accompanied by Director General Tu Wei.

08.11	Wang Kwo-tsai, the Minister of MOTC, inspected the reconstruction project of the third Shuangxi and Xinshe Bridge of Yilan Line in the "Six-year Improvement Plan for Railway Safety", accompanied by Director General Tu Wei.
08.13	Deputy Director General Chu Lai-shun presided over the "Observation and Study on Train Dispatching" drill meeting organized by the Transportation Department.
08.13	Deputy Director General Feng Hui-sheng inspected the preliminary locations of the "Passenger and Freight Train Maintenance Relay Station" and "Temporary Train Depot for Train Replacement in Longjing" at Dadu Station.
08.16	MOTC held the "Counseling Meeting on Taiwan Railways Reform and Transformation", Director General Tu Wei led related personnel to attend the meeting.
08.17	Hu Hsiang-ling, the Deputy Minister of MOTC, held the meeting on "Safety Management of Foreign Object Intrusion along Taiwan Railways Lines".
08.19	The Public Construction Commission of the Executive Yuan held the meeting on "Matters Related to General Inspection of Slope Safety in Transportation Construction".
08.21	TRA implemented the railway safety and dispatching safety, and Deputy Director General Chu Lai-shun, visited Heping, Heren, and Xincheng stations along the North Link Line on holidays.
08.22	Director General Tu Wei inspected the improvement for the safety of stations and vehicle facilities in Kaohsiung underground railway line.
08.23	The Executive Yuan held the meeting for discussion on "Flood and fire prevention drill with Abandoned Tunnels of TRA", with the participation of Deputy Director General Chen Shih-chi of TRA.

08.24	Wang Kwo-tsai, the Minister of MOTC, held a meeting on slope protection mechanism and method of THSR and TRA and general survey plan of the slope.
08.26	Chen Ou-po, a member of the Legislative Yuan, inspected the improvement work of six stations such as Shicheng Station to Dingpu Station, accompanied by the Director General Tu Wei of TRA.
08.27	Deputy Director General Feng Hui-sheng led related personnel to visit President Huang Sue-ying of St. Joseph Technical Senior High School in Taitung.
08.28	The first communication meeting on safety reform for the accident of 0402 Taiwan Railways Train No. 408.
08.30	Chiu Chen-Yuan, a member of the Transportation Committee of the Legislative Yuan, inspected the slope protection work of Houtong section of Yilan Line, accompanied by Feng Hui-sheng, Deputy Director General of TRA.
09.01	Hu Hsiang-ling, the Deputy Director of MOTC, held the meeting on "Improvement, Early Warning, Maintenance and Management System for Foreign Objects Invasion Risk Sections and Risk Slopes of Taiwan Railways and Implementation of Warning System".
09.03	Maiden trip ceremony of the upgraded cruise trains was held at Nangang Station.
09.05	Final track switching of the South Link Line plan and opening of new route and platform at Fangliao Station.
09.07	Chi Wen-jong, the Deputy Minister of MOTC, held the "Meeting on Intensive Care for the accident of 0402 Taiwan Railways Train No. 408", and Deputy Director General Feng Hui-sheng led related personnel to attend the meeting.

09.07	Two new functions of “Apple Pay Ticket Service” and “Online Deduction of Member Points” have been added to Taiwan Railways E-Booking App.
09.08	Feng Hui-sheng, the Deputy Director General of TRA, led related personnel to visit Taiwan International Ports Corporation, Ltd. to exchange views on the transformation and governance of Taiwan Port Authority.
09.09	TRA set up the “Intelligent Railway Development Advisory Committee” to launch digital transformation in an all-round way.
09.10	Director General Tu Wei inspected the progress of site construction of slope warning system.
09.14	Completion ceremony of “Six-year Improvement Plan for Railway Safety (First Minxiong Bridge)”.
09.16	Organizing the 4th meeting of TRA subregional horizontal communication team.
09.16	Luo Bingcheng, a member of the Executive Yuan Officials, held the meeting to review the amendment draft to the “Railway Law”.
09.22	The Executive Yuan held a closing meeting of the cyber security service team, and Deputy Director General Feng Hui-sheng led related personnel to attend the meeting.
09.22	Wu Tse-cheng, a member of the Executive Yuan Officials, held the “Meeting for Discussion on Flood and Fire Prevention Drill through Using Taiwan Railways Abandoned Tunnels by the Ministry of the Interior”.

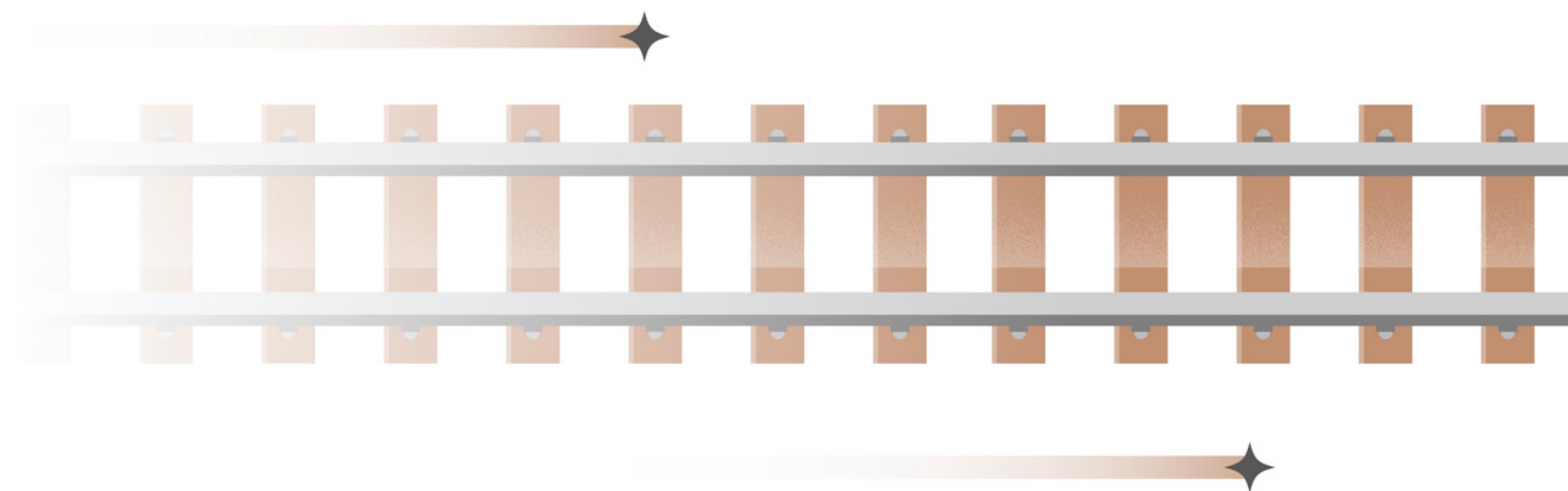
	Successfully completing transportation task during the Mid-Autumn Festival holiday in 2021. A total of 138 additional trains and 396 additional carriages were added for whole line during the Mid-Autumn Festival holiday from September 17 to September 22, 2021. The number of transported passengers totaled 2,566,324 and the average number of passengers per day was 427,221, with a decrease of 36.8% compared with that of the same period in 2020. Passenger transportation revenue totaled TWD 246,707,066 and average daily revenue was TWD 41,117,844, with a decrease of 35.7% compared with that of the same period in 2020.
09.22	
09.23	Yang Hong-tsu, the Chairperson of the Taiwan Transportation Safety Board, and Li Gang, the convener of the board, led experts and scholars to visit TRA.
09.30	The 3rd negotiation meeting of “TRA Reform and Transformation”.
10.01	TRA signed the contract of “Industry-academy Cooperation” with St. Joseph Technical Senior High School in Taitung.
10.01	Hu Hsiang-ling, the Deputy Minister of MOTC, held the “2nd Meeting on the Implementation of General Inspection of Water-related Factors for Slope of TRA and THSR”.
10.02	Deputy Director General Feng Hui-sheng held the second explanation session on “injured passengers in the accident of 0402 Taiwan Railways Train No. 408”.
10.05	Chi Wen-jong, the Deputy Minister of MOTC, held the “2nd Meeting on Intensive Care for the accident of 0402 Taiwan Railways Train No. 408”, and Deputy Director General Feng Hui-sheng led related personnel to attend the meeting.

10.12	<p>Successfully completing the transportation task during the National Day holiday in 2021.</p> <p>A total of 122 additional trains and 84 additional carriages were added for the whole line during the National Day holiday (a total of 5 days) from October 8 to October 12, 2021. The number of transported passengers totaled 2,569,840 and the average number of passengers per day was 513,968, with a decrease of 22.23% compared with that of the same period in 2020. Passenger transportation revenue totaled TWD 234,852,890 and average daily revenue was TWD 46,970,578, with a decrease of 19.37% compared with that of the same period in 2020.</p>
10.15	<p>Director General Tu Wei held the 3rd explanation session on “injured passengers in the accident of 0402 Taiwan Railways Train No. 408”.</p>
10.16	<p>The barrier-free elevator of Yongjing Station in “Improvement Plan for Railway Safety” was completed and put into use.</p>
10.18	<p>Press Conference on the maiden trip of Breezy Blue Sightseeing Train.</p>
10.22	<p>TRA signed the contract of “Industry-academy Cooperation” with National Minshyong Vocational High School of Agriculture & Industry in Chiayi .</p>
10.23	<p>Maiden trip of the “Breezy Blue Sightseeing Train” of TRA.</p>
10.25	<p>TRA signed the contract of “Industry-academy Cooperation” with National PingTung Industrial Vocational High School .</p>
10.26	<p>Hu Hsiang-ling, the Deputy Minister of MOTC, held the meeting on “Review of the Construction Plan of Vehicle Access Barrier Facilities and Warning System”.</p>
11.01	<p>Wang Kwo-tsai, the Minister of MOTC, inspected the purchase progress of the new EMU3000 intercity express trains by TRA.</p>

11.03	<p>Hu Hsiang-ling, the Deputy Minister of MOTC, held a report meeting on the management practices and mechanisms of dangerous trees along the railway line of TRA according to SMS operation guidelines.</p>
11.04	<p>The TRA X Seibu Railway Company co-branded “Travel bento” was released at Taipei Main Station.</p>
11.05	<p>Chi Wen-jong, the Deputy Minister of MOTC, held the “3rd Meeting on Intensive Care for Accident of 0402 Taiwan Railways Train No. 408”, and Deputy Director General Feng Hui-sheng led related personnel to attend the meeting.</p>
11.10	<p>TRA signed the contract of “Industry-academy Cooperation” with Taichung Municipal Shalu Industrial High School .</p>
11.11	<p>Hu Hsiang-ling, the Deputy Minister of MOTC, inspected the construction of warning systems for K48 and K51 in the North-Link Line.</p>
11.12	<p>Chen Ju, the President of the Control Yuan, led 13 members to inspect the Hualien Station and Hualien Rolling Stock Branch.</p>
11.19	<p>Wu Tse-cheng, the Minister of the Public Construction Commission of the Executive Yuan, held the meeting for discussion on “General Inspection results of Slope Safety in Transportation Construction”.</p>
11.22	<p>TRA signed the contract of “Industry-academy Cooperation” with National LoTung Industrial Vocational High School .</p>
12.03	<p>Static display for Tengyun cabin of the new EMU3000 intercity express train was completed on the platform of Shulin Station.</p>
12.06	<p>Chen Yen-po, the Deputy Minister of MOTC, inspected the Yuli and Ruisui Stations in Hualien.</p>

12.06	Legislator Fu Kun-chi invited the Transportation Committee of the Legislative Yuan to inspect the progress of transportation construction projects in Hualien.
12.07	Chi Wen-jong, the Deputy Minister of MOTC, held the “4th Meeting on Intensive Care for Accident of 0402 Taiwan Railways Train No. 408”, and Deputy Director General Feng Hui-sheng led related personnel to attend the meeting.
12.08	Members of the Transportation Committee of the Legislative Yuan were accompanied by Director General Tu Wei to inspect Taitung Station and participate in the test ride of the new EMU3000 intercity express train.
12.08	Hu Hsiang-ling, the Deputy Minister of MOTC, inspected the site safety of the ground anchor and slope improvement project in Fulong and Shicheng along Yilan Line and the reconstruction project of the third Shuangxi Bridge and Xinshe Bridge.
12.09	TRA and TOBU Railway of Japan jointly launched the “Fun Bento” at Taichung Station.
12.12	Hu Hsiang-ling, the Deputy Minister of MOTC, inspected the site safety of the slope renovation work in Luye and Shanli along the Taitung line.
12.14	Wang Kwo-tsai, the Minister of MOTC, invited Lai Pin-yu, a member of the Legislative Yuan, to jointly investigate the improvement of Xike Station.
12.14	Hu Hsiang-ling, the Deputy Minister of MOTC, held the meeting on the “Review of the Construction Plan of Vehicle Access Barrier Facilities and Warning System” of TRA.
12.21	Hu Hsiang-ling, the Deputy Minister of MOTC, inspected the site safety of the slope improvement project between Xinfeng and Zhubei along the Western Trunk Line.

12.21	Director General Tu Wei inspected the implementation results of the slope warning system within the jurisdiction of Kaohsiung Construction Branch.
12.23	Kaohsiung Catering Service Office launched the “TRA Bento” and “elegance” for limited sales in Chiayi.
12.24	MOTC held the “2nd Counseling Meeting on TRA Reform and Transformation”, and Director General Tu Wei led related personnel to attend the meeting.
12.26	Maiden trip ceremony of new EMU3000 Intercity Express Train was held at the Taitung Station.
12.30	Achievement presentation on the promotion of the TRA’s Six Sigma Project.
12.30	Wang Kwo-tsai, the Minister of MOTC, listened to the progress of TRA transformation and reform.



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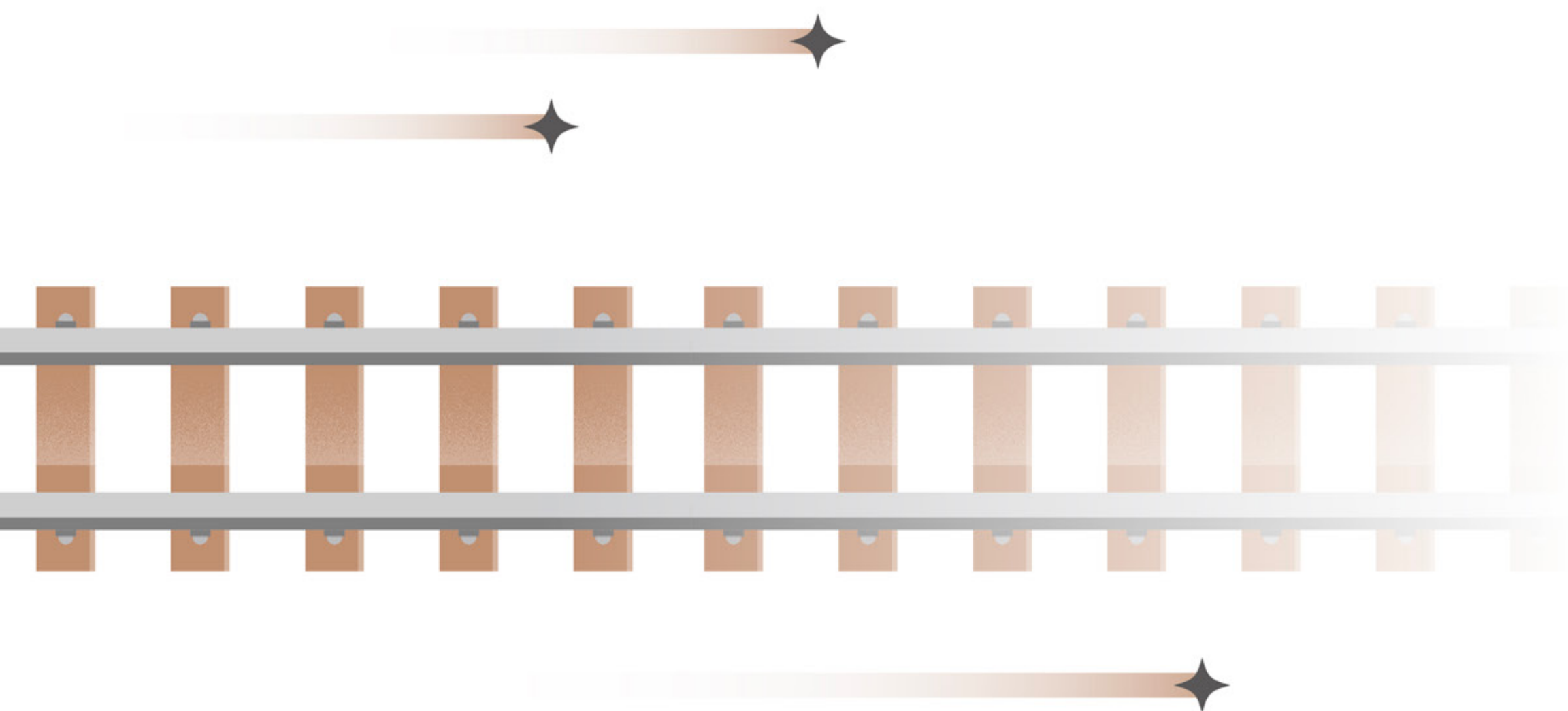
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