

**Application for Outstanding Transportation Project Award
(OTPA)**

Taipei Intelligent & Multipurpose Intercity Bus Stations

Taipei Bus Station & Taipei City Hall Bus Station

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1. Name of the Project

Taipei Intelligent & Multipurpose Intercity Bus Stations (Taipei Bus Station & Taipei City Hall Bus Station)

2. Outline of the Project

Taipei Bus Station & Taipei City Hall Bus Station opened in 2009 and 2010 respectively. The projects all adopted the build-operate-transfer (BOT) approach with fifty -year contracts. The two intercity bus stations are considered to be the most successful in Taiwan, R.O.C., in terms of bus station service/operation and real estate investment. Major facts and characteristics of the two stations are listed as follows.

- Taipei Bus Station

- A US\$ 363 million eighteen-story multipurpose complex with a bus station occupying the east part of the first floor to fourth floor; other facilities including a department store, shops, restaurants, a multiplex cinema, hotels, offices, apartments, and parking area located on the rest part of the complex.
- The land area is 21,363 m². Total floor area is 245,634 m², including bus station 25,997 m².
- Thirty eight intercity bus routes run by eleven bus companies servicing fifty thousand passengers per day.
- Forty eight platforms in total on the second, third and fourth floor. Twenty-six ticket offices on the first floor (ground floor).
- Operate 24/7 with advanced RFID-based intelligent bus station management systems.
- With underpass connecting the Taipei Main Stations of the Taiwan Railway, the High Speed Rail and the local metro.
- Brief history:
 - ◆ Merchants notice issued in July 2003
 - ◆ Contract signed in December 2004
 - ◆ Construction began in February 2005
 - ◆ Opened in August 2009

- Taipei City Hall Bus Station

- A US\$ 273 million thirty-one-story multipurpose complex with a bus station occupying part of the first floor; other facilities including a department store, shops, restaurants, a hotel, and parking area located on the rest part of the complex.

- The land area is 16,280 m². Total floor area is 144,034 m², including bus station 8,066 m².
- Eighteen intercity bus routes run by fourteen bus companies servicing twenty thousand passengers per day.
- Sixteen platforms and thirteen ticket offices.
- Operate twenty hours daily with advanced intelligent bus station management information systems.
- With underpass connecting the Taipei City Hall metro station.
- Brief history:
 - ◆ Merchants notice issued in August 2002
 - ◆ Contract signed in August 2004
 - ◆ Construction began in May 2005
 - ◆ Opened in August 2010

3. Impact of the Project

(1) Economic Impact

It is estimated that the two stations can generate US\$ 360 million annual revenue from their shopping malls, restaurants, office renting, cinema box office, and platform fees. Taipei City Government didn't pay or invest in the two projects; while the government can collect royalties, rents and taxes and other revenue up to US\$ 2.58 billion in total.

(2) Social Impact

- Promoting the development and revitalization of the neighboring area

Taipei Bus Station is located at the old town of Taipei. With the open of the station, the landscape near the station changed greatly and tens of thousands passengers have promoted the development of the area.
- Facilitating the movement of people between Taipei and other cities in Taiwan

More than 28 million passengers per year will use the two bus stations. The coming and going of passengers brings out closer relationship between the citizens of Taipei and those of other cities in Taiwan.
- Providing job opportunities

The open of the two bus stations, including transportation facilities, shopping centers, and hotels, provides more than 3,500 jobs.

(3) Transportation Impact

- Providing a comfortable & easy-to-transfer bus taking environment for

passengers

Before the operation of bus stations, passengers taking intercity buses needed to wait on the road-side and were exposed to the sun and rain. With the operation of the bus stations, more than 28 million passengers per year can enjoy a much better service. Besides, the same route may be run by different bus companies in the stations. This not only provides passengers more choices, but it also encourages service competition among bus companies. With the easy connection with local city bus and the metro system, passengers can easily transfer between different modes of transportation.

- Intelligent bus station operation management generating high performance from efficient usage of limited space

There are 48 platforms in Taipei Bus Station, which serves the maximum of 6,667 buses per day in and out. There are 16 platforms in Taipei City Hall Bus Station, which serves the maximum of 1,352 buses per day in and out. With the intelligent operation management in the limited space, every platform in bus stations can serve more than 9 buses per hours.

- Alleviating the traffic problems caused by intercity bus road-side boarding and aligning

Without the road-side boarding and aligning of intercity buses, vehicles on road can run more smoothly. It is estimated that one bus boarding or aligning taken by 5 minutes, 180,000 hours per year impact to the road can be reduced.

- An exemplary business case encouraging (other) governments to initiate more bus station projects

Taipei Bus Station and Taipei City Hall Bus Station are the most successful BOT projects in Taiwan. With these two bus stations, more and more cities are planning bus station projects.

4. Method/Technology of Construction

(1) Building construction method

Both Taipei Bus Station and Taipei City Hall Bus Station located in the busiest area in Taipei. During the construction period, the major challenge was how to build the towers without any major impact to the traffic. Therefore, most of the construction works had to be done at night. Facing such limitations, the companies adopted the Top-Down Construction Method, which is characterized by shorter construction period. In addition, Taipei Bus Station

also faced the challenge to integrate existing metro construction and control center underground.

(2) Traffic Congestion Alleviation

Both Taipei Bus Station and Taipei City Hall Bus Station are located at the busiest region in Taipei. To separate buses and other vehicles to accelerating the traffic flow, an exclusive lane was designated for buses to enter the Taipei Bus Station. There is an exclusive ramp built to link the third floor of Taipei Bus Station exit with the elevated expressway to reduce the impact on the ground traffic.

Also, in order to reduce the impact of buses getting into the expressway, the merging ramp from bus station to expressway has extended the length to 180 meters. Through such strategies, the impact to the main lane traffic of the expressway has been reduced to none.

(3) Intelligent Bus Station

With the limited space in the bus stations, the intelligent management system is implemented to increase the capacity and efficiency of the stations and to reduce human cost. Intelligent management system in the bus station was developed by local companies. The system includes RFID, license plate recognition (LPR), CCTV, and sensors. The system in Taipei Bus Station costs about US\$1.96 million, and about US\$1.13 million in Taipei City Hall Bus Station respectively.

Intelligent system uses active RFID and LPR for vehicle identification and station management. Its control system allows administrators to map the station and take all advantage of the situation and abnormal traffic conditions. Readers in the station can identify each bus in and out of the bus station, as well as the location of the vehicle in the station.

Video cameras were set up to monitor and record the real-time station condition. Customized systems and screens are used to display the bus information such as bus companies and number of the license plate over every platform. Specifically, a warning system would activate red flashing light to remain staff that possible vehicle violations against the station regulations might happen. Intercom system is well constructed to make efficient connections between attendants at platforms and central-controlled center in case of emergencies or accidents. It takes only one or two people at the control center can easily oversee all the operation of the station. It is estimated up to 30%~40% of human cost can be saved.

5. Financing and Management

(1) Financing

The contractors of the two projects have to provide their own funds during the whole construction and operation period. During the construction period, Taipei City Government provided assistance for them to acquire loans from banks. The government also granted land tax exempted for five years, and building tax can be abated by 50% for five years counting from the date the exemption is approved by the taxation agency. Land rents have been deducted for US\$0.5 million and US\$5.26 million in Taipei Bus Station and Taipei City Hall Bus Station projects separately.

(2) Management

During the construction period, the contractors had to conduct necessary quality control measures to make sure the quality met the requirement of the contract and law. In order to supervise the construction quality, periodical inspections and auditing were conducted by Taipei City Government.

During the operation period, the government reviews both the financial and operation conditions annually. .

6. Uniqueness of the Project

Compared with other bus stations in countries, Taipei Bus Station and Taipei City Hall Bus Station introduced brand-new and customized intelligent station management systems developed by themselves. Taipei Bus Station was also the first station in Asia to apply RFID technology to station monitoring and management. These advanced intelligent station management systems really create an incredible high efficiency and manpower savings for bus station operation.

Both these two bus stations faced extremely tough construction difficulties because both stations located in the busiest area in Taipei. However, these two stations completed construction as schedule and reduced the neighboring area traffic impact through appropriate construction method and comprehensive traffic maintenance plans. The construction of these two stations has established a marvelous model, not only in Taiwan but the world.

Finally, the government could offer a comfortable environment for bus users without any investment. The BOT investors would make profits from the crowd of people attracted by bus station and other commercial facilities. Obviously, these two projects created a win-win situation for government, citizen and BOT investors.

7. Pictures and Drawings on the Project

(1) Taipei Bus Station



Fig.1 Taipei Bus Station

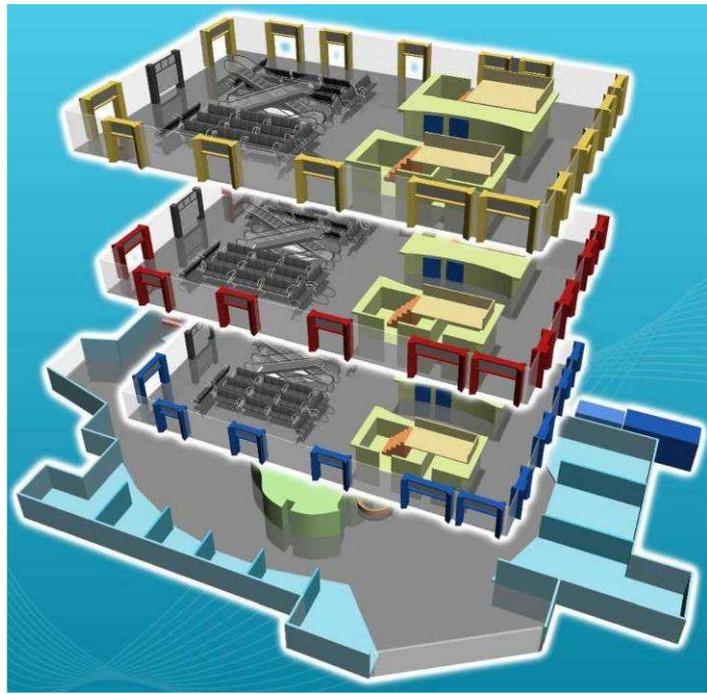


Fig.2 The structure of Taipei Bus Station



Fig.3 The exit on the third floor



Fig4. Ticket counter



Fig5. Operation control center

(2) Taipei City Hall Bus Station



Fig.1 Panorama picture of Taipei City Hall Bus Station



Fig.2 Buildings introduction of the project

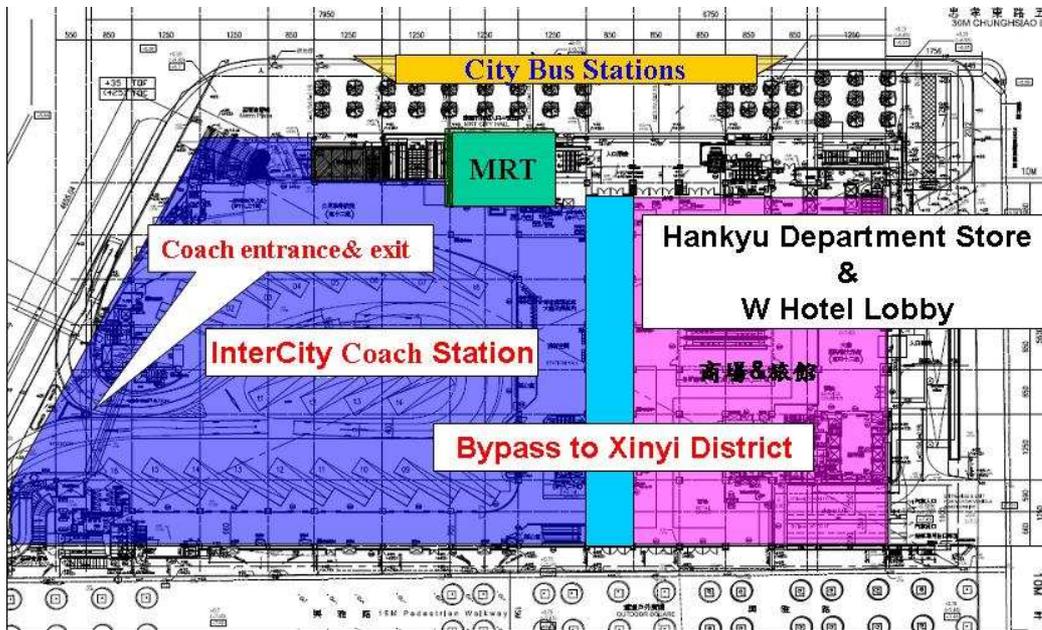


Fig.3 1F floor plan



Fig4. Transportation improving



Fig5. Ticket counter



Fig6. Platform

8. Point of Contact : Telephone, Facsimile, e-mail

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