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### Kaohsiung Urban Rail

Given the cultural, political and economic dominance of Taipei, Taiwan's second city, **Kaohsiung**, is not widely known outside of the region, despite having a metropolitan population of 2.8mil. Located on the southwest plain, the city has an interesting ethnic mix, a warm, sunny climate, and some attractive post-industrial regeneration areas. Part of this regeneration has been supported by recent urban rail developments, with Kaohsiung now boasting an impressive multi-modal network of Metro, Tram and Suburban Rail.

#### MRT

Kaohsiung's MRT began operations in 2008 and is a two line system of 41.8km (revenue Km). Although structured in a typical '+' type arrangement, the geography of the city, with the centre radiating from the port, means the lines are somewhat unbalanced, with the southern and western legs being shorter, and thus the interchange station of Formosa Boulevard, is located in the southwest of the system. The **Red Line (R)** (28.7km/17.6km UG-24 stations) runs from Siaogang in the southeast, past the airport and under Jhong Shan through the centre of the city (Central Park-Kaohsiung Main Station). Continuing northeast under Bo Ai Road, the line becomes elevated after Zuoying where transfer is provided to TRA and THSR services. The viaduct meanders through less dense areas to Gangshan Nan. This is the busiest line on the system calling at the TSHR and TRA main stations, along with the commercial districts and the airport (station separated from terminals with access via lift and walkway). The **Orange Line (O)** (13.1km/12.7km UG-14 stations) also opened in 2008 and runs on a west-east trajectory from the port area at Sizihwan along the main commercial corridor of Jhong Jheng Road and through Fengshan and the eastern suburbs to Daliao, the only above ground station on the line where the huge stabling facility is located.

Given the close proximity of opening, the **stations** on both lines have many similarities. There is a nice street totem topped by the blue and white 'K' logo, and smart entrance porticos at main junctions. Most stations are accessed by stairs but some have escalators. The mezzanines are quite rudimentary with ticket machines barriers, station information/location board and customer office. These areas are bright and clean but there are only occasional examples of decorative features. This is also the case for the platform level. Although there are a couple of side platform stations, most underground stations have island platforms. These have full platform screens in dark tinted glass topped by metallic casing with line strip and station name, seating, platform information board and stair/escalator access. RTI is available with next train information, weather and public interest news. Platforms are built for six car trains but only three car units operate and the alternate ends of platforms are cordoned off with yellow chains/barriers. In many cases, the stairs/escalators are located at one end of the platform and so passengers are required to walk the length of the platform to access or exit the train/platform. Moreover, the station name plates are smart but quite small and directional signage is sometimes lacking clarity. On entering the platform from the stairs there are no signs to state which side of the platform is for which terminal and the station name is sometimes unclear with the sheen of the metallic screen trim and so finding the line map is often the only well-defined indication of travel direction. In some cases these are obscured by the RTI screens which lie flat on the platform screens, rather than perpendicular. Elevated stations again follow the basic theme with clear street access, bright ticket hall and stairs/escalators to the platforms. There is a mix of side and island platforms with some design elements in roof style.

The general cleanliness, functionality and unadorned environment of stations is fine, but the system also has a few gems that bring the system to life. There are occasional impressive roof designs on the elevated stations (e.g. World Games) and the four Red Line stations from Kaohsiung Railway Station to Sanduo Shopping District offer some interesting colour and structural differences. This is particularly the case at the transfer station of Formosa Boulevard and Central Park. The former has a wonderful Dome of Colour at the entrance level (See Photo) and the latter has an impressive entrance to/from the park with an interesting shaped canopy and cascading waterfall and terraced surrounds along with the stairs/escalators.

The Siemens **stock** is the same on both lines. The trains are composed of three cars and have a metallic exterior with a bright green side band and black and green flat frontage – the trains are powered by third rail supply. The train interiors is bright and clean with green side-seating and grab bars. The doors are topped either by a system-wide strip map in sticker form or electronic information in Traditional Chinese and English. There is also audio information in Mandarin, Hokkien, Hakka, Japanese (occasionally) and English. The shorter trains highlight how the system is quite underused and the whole system appears generally uncrowded. **Operationally**, services run from 0600-0000 with 8min base headways that more than adequately meets demand. There are hard copy schematic maps available at most stations and staff are helpful and friendly. Individual tickets cost 20-60NTD (€0.57-€1.70), although a range of period tickets are also available. These have to be purchased at the information office (1 Day/24Hr/48Hr) (24Hr-€4.25) and offer good value. In addition, there are two MRT shops selling Metro related stationary and souvenirs (Zuoying/Formosa Boulevard).

To add to the coverage of the MRT, an 8.7km tram line (branded **LRT**) was opened in 2015 and is unique in that it is completely catenary free. Like the MRT, the tram is operated under the umbrella organisation (Kaohsiung Rapid Transit Corporation-KTRC) and has representation on system maps and some elements of physical integration. It is, however, not fully integrated with the MRT and different tickets are required (not valid on day tickets). The first phase of the line runs from the southeast at Lizihnei and passes the large regeneration area around the port and Love River before using a former TRA alignment to reach Hamasen, where it connects to the Orange Line terminal station at Sizihwan. Once completed, the line will be 22km in length and will form a useful loop around the central area, connecting with other MRT stations and the TRA suburban rail network. The line uses CAF urbos stock and operates from 0700-2230 with 15min headways. Although branded LRT, this is a modern tram line with grade running on segregated sections at the sides of roads. There are traffic conflicts along the route and only around the port area (Glory Pier/Love Pier) is there elevation and a genuine light rail feel. The stations have shallow side platforms (no RTI) and some have impressive design elements – the pick being Love Pier. There are no barriers at the stations and an honour system applies with tickets purchased from machines located on the platforms at a cost 30NTD (€0.85).

The most recent urban rail development in Kaohsiung is the 2018 opening of the Passante under the central area for **TRA regional/commuter trains**. The route lies below the previous grade alignment with the tunnel starting north of Zuoying, heading southwest to Gushan and then east to Fengshan where the line once again emerges to grade (the original grade alignment is now being converted to commercial/housing developments). The twin track tunnel is 14.1km and houses 10 underground stations. These are long and quite basic with pale wall coverings, limited information and few passengers. The one exception is the busy and more atmospheric Kaohsiung Railway Station, which

was moved underground and lies below the renovated MRT station, within the same complex. This station, and Fengshan, have two island platforms. Services through the Passante are formed of a combination of regional services which run around the southern tip of Taiwan (e.g. Chu-Kuang Express services), and twice hourly TRA Local Services that stop at all stations between Chiayi/Houli/XinZuoying and Chaozhou/Pintung. Together these form 10/15mins headways through the Passante, although stopping patterns and times are irregular and not all stations in the Passante are served regularly. Many trains are old but more modern Nippon Shayro stock is also used on some services. Tickets are distance based and cost approx 30NTD through the tunnel. It is understandable that this Passante does not have the headways nor passenger numbers and atmosphere of Taipei, but it is, nonetheless, a usefully addition to the urban rail network.

In **summary**, Kaohsiung has slowly created an interesting and comprehensive urban rail environment. Whilst this might not be fully integrated nor have the buzz of larger systems, it works well and has a couple of 'stand out' stations and sections of infrastructure that make it noteworthy.