

## **Craig Moore reports from Chongqing in January 2019:**

**Chongqing** is a large city, dominated by rapid, and chaotic, urban development. The city has a stunning location, engulfed by mountains and valleys, with the city centre full of high-rise buildings, located on a tongue-shaped spit of land at the confluence of the Jialing and Yangtze Rivers. It is this topography that makes the city, and its Metro, interesting, necessitating different rail modes and bold infrastructure.

### **System**

The 8-line network is operated by **Chongqing Rapid Transit (CRT)** and offers two Monorail lines (built and operated to Metro standard) and six full Metro lines. It spreads wide across the vast urban area of the city-region with 305.9km of revenue route (181km underground), accommodating 173 stations (99 underground). Whilst station density is high in the congested central area, this diminishes significantly on the outer reaches of some of the lines and overall the CRT system has a relatively high average station gap of 1.8km.

- **Monorail Lines:**

Given the topography of the area, most of the uniqueness and grandeur of the system comes from the two straddle beam monorail lines. **Line 2** is the original urban rail line in the city and is 30.3km (2.4km underground), running from the centre at Jiaochangkou to Yudong in the south. Jianchangkou has a long transfer to Line 1 and from here the route travels underground before elevated running begins at Huanghuayuan. This stretch, on the southern bank of the Jialing, offers impressive views to the north and west. Niujiatuo provides interchange to Line 3 and involves a pleasant walk along an open-sided corridor to the Line 3 platforms above - the views from both stations are spectacular. Further west is Liziba, a station famed for being built into an apartment block. Although the platform and entrance area of this station are not particularly interesting, the notion that you are stood on the 6th floor of a tall apartment block is, and again the views across the river to the north are mightily impressive. The line soon turns south with a short underground section at Daping (connection to Line 6) followed by elevated running above main roads and through dense residential and commercial areas. Some services terminate at Tiantangbao and from here the service becomes less busy as it heads to the terminus of Yudong, a huge two-island station with connection to Line 3.

**Line 3** has even more staggering infrastructure, views and passenger volume. At 68.3km (14.8km underground), it is the longest monorail line in the world and houses 45 stations. From Yudong, the line runs elevated through a dense and hectic urban environment, passing major population areas such as Jiugongli and Sigongli, where some northbound services start. A 2.4km underground section around busy Naping (see below) emerges at Tongyuanju to cross high above the Yangtze on the undulating Caiyuanba Bridge. North of the Yangtze, the line runs underground through the city centre, passing Lianglukou (interchange with Line 1 and Chongqing Rail Station) before becoming elevated again at Niujiatuo (see Line 2) to cross the Yuao Monorail Bridge above the Jialing - the views on this stretch being some of the most spectacular of any metro line in the world. Two meandering underground sections follow, before the line emerges at Tongjiyuanzi. This is a smart station with overhead walkways across the tracks for great views of the stabling facilities. Further north, two more underground sections puncture the route which winds and undulates above busy streets and through dense housing and commercial areas, especially around Yuangyang – here, you

really get a sense of how huge this city is. Approaching Bijin there are great views of the airport to the east and Bijin itself is a two-island station allowing passengers to change trains for the different stopping patterns after the city centre (the airport branch is served by the exterior beams). The 1.2km airport branch is the main line and the destination for most services, with the station (Terminal 2) having quite dull, shallow platforms, and a chaotic entrance hall and facilities unable to cope effectively with demand at peak times. The newer 10.6km northern branch is served only every 18mins and passenger numbers on this section are lower, as is the urban density.

Both monorail lines are of Metro standard with high capacity stock, high frequencies and Metro type stations. The underground stations have mainly island platforms with full screens and are very much of a typical Chinese design. The strip maps on the platform screens are unique with angled station names - Line 3 taking up three panels to cover its entire length. To manage the huge passenger numbers, many central stations have barriers along the platform screens for queuing, although the barrier ends at the centre of the door, with no gap provided for exiting passengers, often causing confusion and conflict. The elevated sections have some steep gradient changes and long curvatures as the routes negotiate natural and man-made barriers and stations are huge, clunky and a little worn, especially on the original sections. They predominantly have side platforms with platform gates, open sides and high roofs - every station providing to aid ventilation. All stations offer interesting views of the immediate urban-ness and/or the distant mountains that surround the city. Both lines use high capacity CNR (Hitachi technology) stock (Line 2 has 4-car sets, whilst Line 3 uses 6/8-car units). Much of the stock is emblazoned with exterior and interior advertising and is quite tatty. Trains have side seating, but much space is taken by the bulky inter-carriage connectors. There are strip maps located above doors and also electronic and audio information in Chinese and English. Headways are impressive - both lines have short-running services allowing lower headways in the periphery to form 3-6min frequencies on busy sections in the main city area. Despite their rather worn appearance and high passenger loads, these lines are an absolute joy to ride.

- **Full Metro Lines:**

Lines 1, 4, 5, 6, 10 and the Loop Line have typical Chinese station layout with underground facilities having island platforms, full platform screens, line maps in Mandarin and English and RTI; whilst elevated stations are generally side platforms with half screens and broad arched roofing. They use standard gauge with overhead power supply. These lines opened in two phases (2011-14 and 2017-19), resulting in two distinct styles.

**2011-14 Phase:** The original full metro services serve the west and northwest of the urban area. **Line 1** is the busiest line on the system and was the first full Metro line to be built in Chongqing (2011) and has 37.1km of revenue track (22.1km underground), operating 5min base headways with 6-car CNR stock. Running west from chaotic Xiaoshizi (for the Yangtze Cable Car) in the main retail area of the city, the line runs in deep tunnel and there is a rather formulaic look and feel to stations and environment. After Lieshimu, the line has an elevated alignment (with the exception of a tunnel after Shuangbei) which runs above busy roads in dense housing areas and has noise reduction panelling. As the longest line on the CRT network, **Line 6** is 59.8km with an 11.8km International Expo Line' branch from Lijia. It operates 5min base headways with 6-car CNR stock on the main route with short-running services delivering only 10min headways in outer areas and the branch line. From Chayuan

in the southeast, the line runs through low density areas and in a long tunnel under Chongqing South Mountain before crossing the Yangtze at Shangxinjie and entering the city centre at the narrow tip of the promontory. After Xiaoshizi (see Line 1) the line emerges from tunnel to cross the Qiansimen Bridge above the Jialing to Grand Theatre station. This is a partly open station with great views of the river and the rail traffic on the bridge itself. The underground stations on this line have glazed tiling and pale pink line identifier. At Dazhulin, there is a 5.3km elevated section before the line returns underground at Lijia. Here, the International Expo Line runs a 10min frequency shuttle from parallel platforms, with co-ordinated arrivals and departures on both lines. This part of the city is less densely populated and the line continues northwest with longer station gaps, running underground with the exception of the second crossing of the Jialing and at Longfengxi, where there are large shedding facilities.

**2017-19 Phase:** The more recent expansion of the system has brought some changes to station and stock design and is mainly focused in the north and east of the city. **Line 4** (15.9km/11.1 underground) opened in late 2018 and runs from Minan Ave, with cross platform transfer to the Loop Line. The line uses new CRRC Changchun stock in 6 car sets with orange and black (angled black door colouring) colours. It runs with 10min headways easterly, mainly under Haier Road on the north bank of the Yangtze. There are two above ground stations with side platforms affording great views of river activity, and noise reduction tubing on the short elevated sections. The underground stations have typical Chinese layout but bold orange and white glazed tiling, metallic topped platform screens, very neat information boards and elegant calligraphic platform station names. **Line 5** (16.1km) is a fully underground line that opened its first section in late 2017. After the newly opened Dashiba station (late 2018) the line heads north to Dalongshan where it offers cross platform transfer with Line 6 (N/S or S/N transfer) and runs parallel to Line 6 to Ranjaiba (stacked station with cross platform transfer N/N or S/S) before heading north east to Garden Expo Centre at 8min headways. Stations have smart entrance levels and uniform arched ceilings with bold blue tiling on stairwalls and platform pillars, the overall structure, though, remaining the standard station layout. The platforms on this line are designed for longer services but 6 car CRRC Qingdao sets operate currently.

**Line 10** (26.1km) is the second line on the system to serve the airport (both terminals). From Liyuchi the line heads north toward CQ North Station (both north and south squares are served) with its huge, gleaming ticket hall before moving north east toward the airport area. On this stretch lies the 6km elevated section, housing the lines' only elevated station at Changhe with island platform and half screens, glass side walls and a flattened arched roof. Terminal 3 station (newer terminal) is well signed from the terminal and services continue from here, running under the airport to Terminal 2. Both airport stations are standard but have larger profiles, wider platforms and larger entrance areas to cope with high passenger numbers. In addition, Terminal 2 provides interchange to Line 3 and these are most definitely two separate stations. Transfer is lengthy and involves three long upward escalators from the Line 10 entrance hall, followed by a long corridor and then a small escalator down to the cramped and busy platform of Line 3. It takes approx. 8mins to transfer and the difference in appearance between the bright new station and the rather flat, dull Line 3 station is very noticeable. Beyond Terminal 2, 8 min headways are reduced with only 1 in 3 services heading west to Yuelai (providing simple transfer to the Line 6 Expo

branch) and the terminus of Wangjianzhuang. The underground stations are similar to Line 5 with arched ceilings at entrance level and bold colour coded tiles on stair walls and pillars.

As its name suggests, the **Loop Line** is a valuable circular line running around the city area. Opened in late 2018, the line is only partially operational with the south-western section not likely to open until 2020/21. The current 34.4km line crosses the river in both the east and west on impressive bridges (4.8km above ground) and runs at 8min headways. The western section from Chongqing Library to North Station is the busier section, especially around Ranjiaba (Line 5/6 transfer) where the station has a different style. The eastern section has more elevated running on its way to HaiXiaLu, with the segment around Sigongli (a partially underground station) affording great views of the city south of the Yangtze. Here there is a flying junction to the sheds and a long transfer to the Line 3 station above. The line runs very slowly, and currently gives the appearance of being opened in a rush with station signs taped to pillars and having temporary wayfinding. Nonetheless, the station designs are smart with white and pale brown colouring. Stations are longer than currently required for the 6 car CRRC stock which is similar to Line 4 trains.

In addition to the bolder and brighter station hues, colour surrounds at transfer corridors to aid wayfinding, clearer directional signage and platform information, and interesting ceilings at ticket hall level, the stock on the newer lines is also improved. The smart frontage and livery is complimented by stylish interiors, metallic lateral seating, informative dynamic strip maps and colour coded seating end plates and grab handles. The newer CRRC stock (Line 4/Loop) has also overcome the flaw evident on Lines 5/10 stock on which the ceiling bars supporting the grab handles continue across the doors and block vision of the line maps for seated passengers.

### **Using the CRT system**

Services run from 0630-2230 and fares are distance-based at 2-9 Yuan. A CRT Day Pass is also promoted in the tourist literature. On introduction, though, the CRT can appear a little frustrating. Many station entrances in the centre merge into the plethora of street furniture and general activity - with awareness of a station location only coming from nearby, thanks to the often concealed totem topped by green CRT logo (surely one of the least elegant urban rail logos around). This is most evident at stations which form part of large retail centres (e.g. Nanping) where there is very limited signage to the stations amongst the complex corridors of the buildings. On the older lines, stations are not particularly stylish and, whilst the newest openings are an improvement, they have not witnessed the leap forward in style illustrated in other systems. Although there has also been an improvement in wayfinding on newer openings, the prominent older lines have basic and somewhat confusing wayfinding (facilitated by the exclusive path CRT original took in using a unique design for signage etc). This is no doubt added to by the long and sometime convoluted transfer between lines in the centre and the high passenger volumes.

Mappage provision is also mixed. Whilst all trains now have the new 'future-proofed' schematic, the platform maps differ. The older map is still in evidence on platforms across the system which does not show the four recent line openings. This schematic map is in square form, compressing the system considerably in the north and south, but it is smart and functional and quite different in style from the usual Chinese map. The newer lines have the new schematic which is quite awkward and graceless, especially around the central

areas/north station where line density and complex alignments make the map confusing. And so the only maps offered in stations, and on trains show a system that does not currently operate - it is either too old (doesn't include post 2017 expansion) or too future-proofed. Added to this, there is no hard copy mappage available and all maps are solely in Chinese and only platform and in train strip maps have English titles, although all audio information is in both languages. Stations are identified by line and station number, following the Japanese/Korean approach (e.g. Niujiatuo is 2-06 and 3-19). One interesting point to note is that the logo identifying the long distance rail stations, is that of British Rail (if only the BR system were as modern, slick and inexpensive as CRH!).

### **Summary**

The irritations with using the CRT are tiny and are dwarfed by the joy of riding the system. The new lines have witnessed some design and wayfinding advancements, and, with excellent coverage across the city, impressive infrastructure, different modes, amazing views, and great service levels – the system really puts on a show. What a great metro experience.