

SYSTEMS FACTFILE

No. **165** Manchester,
United Kingdom

Opened in 1992, Greater Manchester's Metrolink has grown substantially - with the promise of more to come. Neil Pulling takes a slightly different view of Britain's biggest light rail system.



Manchester is about 255km (160 miles) north-west of London; trains from the capital take just over two hours from London Euston to arrive at the city's Piccadilly station. For many this is the gateway to Metrolink which has ground-level tracks beneath the elevated main line platforms. The first of the UK's second-generation light rail systems, Metrolink is now the country's biggest at 101km (63 miles) with 99 stops, carrying 45.6m in 2019.

Metrolink has a presence in seven of Greater Manchester's ten metropolitan boroughs, together having around 2.8 million residents.

There is a span of around 29km (18 miles) between the system's extremities, with several arms converging in Manchester city centre. Rising population and a building boom point to long-term economic confidence. Greater Manchester Combined Authority was formed in 2011 and exercises transport responsibilities through Transport for Greater Manchester (TfGM - formerly Greater Manchester Passenger Transport Executive).

An archetype of 19th Century industrial expansion, the area which was mainly in the historic counties of Lancashire and Cheshire diversified from textile manufacture to other activities with an emphasis on

▲ **Metrolink's Second City Crossing (known locally as 2CC) opened in 2017 with one intermediate stop, Exchange Square, seen here on 22 July 2019. This short line increased capacity through central Manchester and reduced disruption risks across the system.**

technical innovation. This has included rail and road vehicle production, food processing, aviation and computing. The polycentric area served by today's Metrolink once hosted several interconnected corporation tramways: Manchester and adjoining Salford had particularly intensive coverage, with horse-drawn services from 1877 and electrification from 1899. The region's last first-generation tram services were in Stockport during 1951. Trolleybus replacements ceased operations by 1966, with local transport focused around bus-based services until Metrolink's launch in April 1992.

Created and expanded in mature urban surroundings, Metrolink drew heavily upon railway alignments, a

All images by Neil Pulling.

THE FLEET

The AnsaldoBreda stock had a shorter than anticipated service life due to estimated overall costs being greater if they were retained in a mixed-type fleet, as opposed to total replacement. Since 2014 the Metrolink fleet has consisted wholly of double-ended Bombardier *M5000* vehicles with Kiepe electrical equipment. Numbered from 3001 and by far the UK's most numerous tram type, they are based upon Cologne's high-floor *K5000* LRV, classified in the *Flexity Swift* range. There are two main sections with a short connection over the central articulation. They are 28.4m long and 2.65m wide, have a continuous floor and a capacity of 206; there are minor differences in seating configurations between batches.

Mainly assembled in Vienna, several batches have been delivered since 2009. The latest are from an order (3122-47) placed in July 2018, with deliveries originally due for completion in 2021. They operate as both single and double units across the network.

One of two depots, the original Queens Road facility is visible from the Bury line. Initially a rudimentary staff halt, Queens Road opened as a normal stop in December 2013. Incorporating the operational headquarters, Trafford depot opened in 2011. It is in the fork of the Altrincham and South Manchester lines, with separate connections to each also being visible from revenue services on both lines.

▲ **TOP LEFT:** Despite reduced passenger numbers in the pandemic, paired trams have been used to assist social distancing: 3107+3074 leaves Rochdale Interchange on 15 April 2021.

◀ **LEFT:** The main stop for Manchester City's football stadium is Etihad Campus which has crowd handling facilities. On the opposite side of the site, 3106 approaches the more conventional Velopark stop.

▼ **BELOW:** For southern access to central Manchester, Victorian railway engineers had to account for an existing canal basin and the pioneering Bridgewater Canal (left). Metrolink occupies the 1877 Cornbrook Viaduct; the lower structure is in main line use.





◀ FAR LEFT: Metrolink's original tram type: an AnsaldoBreda T-68 pair with a Bury - Altrincham service on 29 March 2010 at St Peter's Square, then with a two-platform configuration.



◀ LEFT: Recently rebuilt to add a turnback facility for future use as a terminus, Crumpsall on the Bury line retains many original railway features, yet illustrates the works needed to improve access for light railway use.



◀ LEFT: Metrolink's current Victoria railway station presence is much changed from the original installation. It is one of the few fully-covered stops.



▲ ABOVE: Much of the first extension, the Eccles line, shares road space. This underpass avoids conflict at an intersection between Ladywell and Eccles terminus.

NETWORK FACTS

- ▶ **Opened:** 1992
- ▶ **Length:** 101km (63 miles)
- ▶ **Lines:** 8
- ▶ **Depots:** 2
- ▶ **Approx. weekday hours:** 06.00-23.30
- ▶ **Line frequency:** 10 minutes
- ▶ **Gauge:** 1435mm
- ▶ **Power:** 750V dc, overhead supply
- ▶ **Fleet:** 147 delivered or on order
- ▶ **Authority:** Transport for Greater Manchester - www.tfgm.com
- ▶ **Operator:** KeolisAmey Metrolink - www.keolis.co.uk/our-brands/keolisamey-metrolink
- ▶ **Regional network:** Transport for Greater Manchester - www.tfgm.com
- ▶ **Civic information:** www.greatermanchester-ca.gov.uk
- ▶ **Tourist information:** www.visitmanchester.com



◀ LEFT: The ramp near Manchester Central (to the right) connects street level with Metrolink's elevated former railway alignment. The area's building boom is evident in the background.

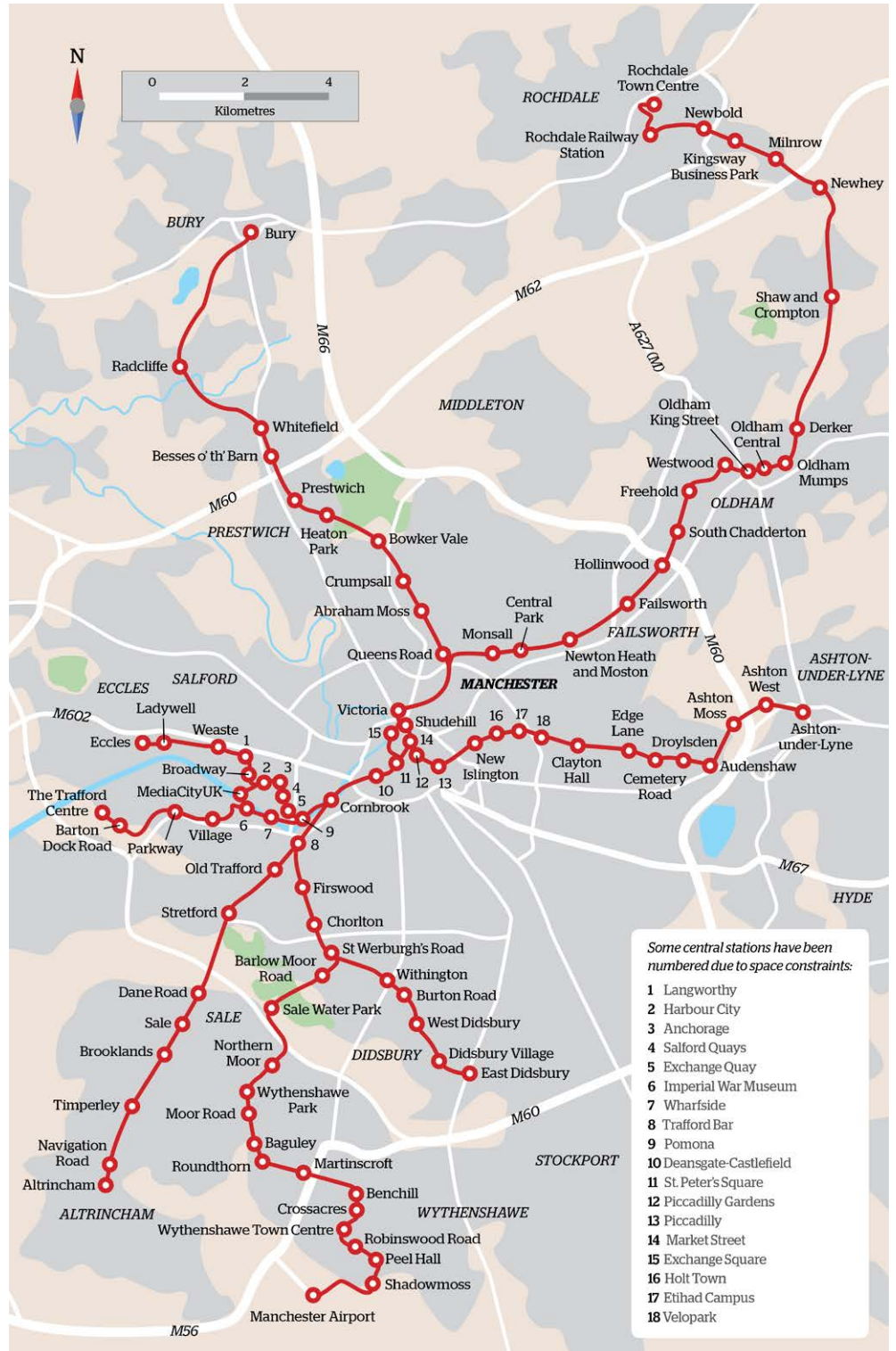
mixture of converted active routes and abandoned trackbeds. There are street sections in central Manchester and outer communities, with other off-road rights of way. As railway conversion originally predominated and stations were adopted with relatively minor initial changes, this led to high platforms being built for the street tracks in order to integrate the formats in the most time- and cost-effective manner.

British railways were mainly built by different companies, limiting connectivity between those lines converging in urban areas. The installation of Metrolink addressed this legacy challenge by replacing and joining separate commuter lines to Altrincham in the south-west and Bury in the north. Street-running connections included a fixed link between Manchester's principal stations, Piccadilly and Victoria, running via Piccadilly Gardens, an established central focal point.

This first Metrolink service totalled approximately 30.5km (19 miles) and introduced a common overhead electrification format. Previously terminating within Manchester Victoria station, the railway line from Bury had used a third-rail supply. The Altrincham line, already cut-back from a presence at Manchester Piccadilly, was an early British example of overhead supply. Some masts were re-used by Metrolink, amongst many reminders of heavy rail origins between the two outlying communities.

Replacing the Warwick Road station, Old Trafford stop adjoins the cricket ground that shares its name. It is more distant from Manchester United's football stadium, previously with its own railway halt and now more closely served by Metrolink's latest Trafford Park line addition at Wharfside. Both stops feature crowd control installations. Nearing Altrincham, Metrolink is segregated from heavy rail on the same alignment, accounting for the bi-directional single track at Navigation Road.

The first expansion of Metrolink's 'main line' was 6.4km (four miles) between Cornbrook and Eccles. Here a constricted site has a single platform, still an unusual system feature. The line opened in 1995 as a wholly new rail service with an emphasis on urban renewal. This is apparent along the routing around the north of dock basins for the Manchester Ship Canal, here closed to commercial traffic by 1982. The Eccles line added lustre and traffic due to a short spur between Harbour City and Broadway which opened in 2010. The MediaCityUK terminus is overlooked by the BBC's northern headquarters and studios. It also serves a growing waterside retail and leisure district.



The two-stage third expansion phase was justifiably termed 'The Big Bang', adding 57 stops. This turned Metrolink into a comprehensive metropolitan service, an aim that was in the very early planning. It also brought a fleet transition with complete withdrawal of the Italian-built AnsaldoBreda/Firema T-68 (1001-26) that had launched the service and T-68A (2001-06) added for the Eccles line. Foreshadowed on T-68 1003, it was the Bombardier M5000 trams delivered from 2009 that most

projected a new (and still-current) corporate identity with a dominant yellow and silver livery. A T-68 legacy is the slightly wheezy but distinctive warning alert, retained as a recorded clip on the M5000.

The north-eastern Metrolink arm completed in 2014 includes some long gaps between stops and views of open countryside. It was largely a re-engineering of the southern railway route to Rochdale via Oldham, closed in that format in late 2009. Rochdale retains main line services, with



▲ ABOVE: MediaCityUK is on a short spur from a delta junction on the Eccles line. As here in April 2021, reversal at the terminus allows for integration with Eccles services.

➤ RIGHT: An M5000 pair approach Oldham Mumps soon after the town centre line opened in January 2014. The stop replaced a temporary counterpart (background right) on the railway briefly used by Metrolink.



▲ ABOVE: Seen from an as-yet undeveloped commercial zone and with Pennine moorlands in the distance, Rochdale-bound 3016+3086 are near Kingsway Business Park, Milnrow.

Metrolink present outside the elevated station, with the 0.88km (0.5-mile) extension into Rochdale town centre being the line's final stage. Indicating the effect of conversion of under-utilised routes to light rail, 6.13m trips were made on Rochdale via Oldham Metrolink line in 2019-20, a 532% increase on the 2008-09 figure (1.15m) when operated as a heavy rail service.

Despite extending from beneath Piccadilly station, the 9.7km (six-mile) East Manchester line completed in 2013 has little railway inheritance. On the initial section to Droylsden, tracks are integrated with the City of Manchester Stadium structure (Etihad Stadium, named in a sponsorship deal with the UAE-based airline) which is served by Etihad Campus (equipped for crowd handling) and Velodrome stops. The line overall has varied surroundings, showing differing approaches to renewal following the decline of local industries.

Extending to the present East Didsbury terminus in 2014, the South Manchester line was another railway re-working, in this case the already closed Midland main line. Branching near St Werburgh's Road, the later Airport line was however a

wholly new 14.5km (nine-mile) route serving diverse southern suburbs that exemplify Manchester's 20th Century expansion. The joint tram/heavy rail terminus is between the terminals at Manchester Airport, normally the UK's busiest airport outside London.

The 1.3km (0.8-mile) Second City Crossing opened in February 2017, running between junctions added near Victoria station and St Peter's Square. Normally designated for Oldham - East Didsbury services and adding Exchange Square stop in a prime commercial area, the line reduced reliance of the system upon the original route via Market Street, reducing bottlenecks on the expanding system and increasing system resilience.

Operations and maintenance are currently under a ten-year concession from July 2017 held by a Keolis-Amey joint venture.

Colour-coded on diagrams, services are identified by destination. This is further distinguished according to the route taken, as for example via Market Street or Exchange Square. Real-time platform displays distinguish between services with single or double trams. Organisation



▲ ABOVE: Navigation Road's separate tracks for Metrolink and national rail. The latter hosts freight and infrequent Manchester - Chester passenger services; a similar single Metrolink platform operation exists at Newton Heath and Moston stop.

ESSENTIAL FACTS

Local travel: The only central Manchester staffed information point ("Travelshop") is at Shudehill Interchange. All Metrolink stops have machines to provide the ticketing most visitors are likely to use.

Under a four-zone structure, introduced in January 2019, single journeys in one zone cost GBP1.40 (EUR1.60). Single-zone, one-day, off-peak tickets from GBP1.90 (EUR2.20); all zones at GBP4.90 (EUR5.70). There are various 7- and 28-day options as well as annual travel passes. See www.systemonetravel.co.uk/travelcard-finder for the many permutations for combined tram/train/bus fares.

Revenue protection includes large teams, often at locations where trams and platforms can be contained. Metrolink has many park-and-ride sites, some with good access from Manchester's encircling motorways. These are free to network users, but capacity in advance is recommended as some have few spaces.

What is there to see: Any visitor to Manchester will notice the impressive civic architecture around St Peter's Square and Albert Square; Castlefield Basin illustrates engineering prowess and commercial heritage. In a profusion of galleries and museums, those with a transport content include the Science and Industry Museum (www.scienceandindustrymuseum.org.uk), Manchester's own Museum of Transport (www.motgm.uk) and the heritage Heaton Park Tramway (www.hptramway.co.uk) - information on opening times and public transport access can be found on their websites.



▲ ABOVE: The Trafford Park line which opened in March 2020 follows the southern Salford Docks either side of Wharfside, the closest stop to Manchester United's Old Trafford stadium.

into eight lines has seen modifications in response to 2020-21 pandemic conditions. Route overlaps between St Peter's Square and Cornbrook make this the most intensively-used section. Deansgate-Castlefield is a vibrant point of Metrolink operations offering service transfers and the walkways to a main line station. Set amongst leisure venues, it is also next to the convention centre in the former Manchester Central station.

Since 2008 new projects have been designed and delivered by a consortium of Laing O'Rourke, VolkerRail and Thales (now M-Pact Thales) that includes all civil and rail infrastructure, as well as electrification and systems integration.

The latest network addition is the 5.5km (3.4-mile) Trafford Park line. Opened in March 2020, its name is drawn from the world's first planned industrial estate which borders the line. Leaving the Eccles line at the elevated Pomona stop, the trams and paths provide views of dock basins and the surrounding modern buildings. Old Trafford football stadium, Imperial War Museum North and the Trafford Centre retail park have had patronage drastically reduced during the pandemic; the line currently operates as a shuttle between Cornbrook and the Trafford Centre terminus.

Metrolink has many direct or close interchanges at railway stations, although TfGM recognises constraints in the present network. *The Greater Manchester Transport Strategy 2040* illustrates high ambitions, including further Metrolink expansion such as a radial route between Bury and Rochdale, extended Salford coverage, a second route to Manchester Airport and west from the Trafford Park line to Port Salford.

Tram-trains are seen as offering a potential way to improve connectivity and frequencies for outer areas. Examples would be through-running for the eastern towns of Glossop and Marple, also extending beyond Metrolink's present Altrincham limit. In part related to better integration, TfGM is pursuing London-like control over bus services through route franchising to replace the present de-regulated arrangements.

Plans for a tunnel link between Cornbrook and Piccadilly have also been mooted, further reducing the pressure from Metrolink's two surface cross-city routes.

Following re-election in May 2021, Greater Manchester Mayor Andy Burnham has committed to seeking central Government funding for Metrolink expansion in the coming decade; this includes extensions to Bolton, Middleton and Stockport. The overarching vision is that by 2040, half of all daily trips in the UK city-region will be by public transport, cycling or walking. **TfGM**



“The Greater Manchester Transport Strategy 2040 illustrates high ambitions, including further Metrolink expansion... such as an extension of the Trafford Park line to Port Salford.”

▲ **ABOVE:** City-bound 3081 leaves Barton Dock Road (designated 'EventCity' during planning), one of two stops for the Trafford Centre retail and entertainment area.



▲ **Busier times at Manchester Airport in 2015:** extreme reduction of flights in 2020-21 has affected demand for trams and trains at this joint station.



▲ **Completed in 2013,** the South Manchester Line redeployed the Midland Railway route where tracks had been removed in 1970. East Didsbury terminus adjoins a park-and-ride.