

= Delhi Metro =

The Delhi Metro is a metro system serving Delhi and its satellite cities of Faridabad , Gurgaon , Noida and Ghaziabad in National Capital Region in India . Delhi Metro is the world 's 12th largest metro system in terms of both length and number of stations . , the network consists of five colour @-@ coded regular lines and the faster Airport Express line , with a total length of 213 kilometres (132 mi) serving 160 stations (including 6 on Airport Express line) . The system has a mix of underground , at @-@ grade , and elevated stations using both broad @-@ gauge and standard @-@ gauge . The metro has an average daily ridership of 2 @. @ 4 million passengers , and , as of August 2010 , had already carried over 1 @. @ 25 billion passengers since its inception.DMRC named second best metro in world

Delhi Metro Rail Corporation Limited (DMRC) , a state @-@ owned company with equal equity participation from Government of India and Government of Delhi , built and operates the Delhi Metro . The Delhi Metro Rail Corporation has been certified by the United Nations as the first metro rail and rail @-@ based system in the world to get " carbon credits for reducing greenhouse gas emissions " and helping in reducing pollution levels in the city by 630 @, @ 000 tonnes every year . DMRC operates around 2000 trips daily between 05 : 30 till 00 : 00 running with a headway varying between 1 ? 2 minutes and 4 ? 10 minutes . The trains are usually of four , six and eight @-@ coach . The power output is supplied by 25 @-@ kilovolt , 50 @-@ hertz alternating current through overhead catenary .

Planning for the metro started in 1984 , when the Delhi Development Authority and the Urban Arts Commission came up with a proposal for developing a multi @-@ modal transport system for the city . Delhi Metro Rail Corporation (DMRC) was incorporated in May 1995 , construction started in 1998 , and the first section , on the Red Line , opened in 2002 . The development of network was divided into phases , Phase I containing 3 lines was completed by 2006 and Phase II in 2011 . Phase III is scheduled for completion by 2016 . Phase IV has been approved by the Delhi government , awaiting cabinet approval , to be completed by 2020 .

Rapid MetroRail Gurgaon which opened in 2013 , whilst linked to Delhi Metro by the Yellow Line is a separate metro system (with a different owner / operator than the Delhi Metro) , although tokens and cards from the Delhi Metro can be used in its network .

= = History = =

= = = Background = = =

The concept of a mass rapid transit for New Delhi first emerged from a traffic and travel characteristics study which was carried out in the city in 1969 . Over the next several years , many official committees by a variety of government departments were commissioned to examine issues related to technology , route alignment , and governmental jurisdiction . In 1984 , the Delhi Development Authority and the Urban Arts Commission came up with a proposal for developing a multi @-@ modal transport system , which would consist of constructing three underground mass rapid transit corridors as well augmenting the city 's existing suburban railway and road transport networks .

While extensive technical studies and the raising of finance for the project were in progress , the city expanded significantly resulting in a twofold rise in population and a fivefold rise in the number of vehicles between 1981 and 1998 . Consequently , traffic congestion and pollution soared , as an increasing number of commuters took to private vehicles with the existing bus system unable to bear the load . An attempt at privatising the bus transport system in 1992 merely compounded the problem , with inexperienced operators plying poorly maintained , noisy and polluting buses on lengthy routes , resulting in long waiting times , unreliable service , extreme overcrowding , unqualified drivers , speeding and reckless driving . To rectify the situation , the Government of India and the Government of Delhi jointly set up a company called the Delhi Metro Rail Corporation (

DMRC) on 3 May 1995 , with E. Sreedharan as the managing director .

= = = Construction = = =

Physical construction work on the Delhi Metro started on 1 October 1998 . After the previous problems experienced by the Kolkata Metro , which was badly delayed and 12 times over budget due to " political meddling , technical problems and bureaucratic delays " , DMRC is a special purpose organisation vested with great autonomy and powers to execute this gigantic project involving many technical complexities , under a difficult urban environment and within a very limited time frame . DMRC was given full powers to hire people , decide on tenders and control funds . The DMRC then consulted the Hong Kong MTRC on rapid transit operation and construction techniques . As a result , construction proceeded smoothly , except for one major disagreement in 2000 , where the Ministry of Railways forced the system to use broad gauge despite the DMRC 's preference for standard gauge .

The first elevated line of the Delhi Metro was inaugurated by Atal Bihari Vajpayee , the Prime Minister of India , on 24 December 2002 & the first underground line was inaugurated by Dr Manmohan Singh on 20 December 2004 , and thus , it became the second underground rapid transit system in India , after the Kolkata Metro . The first underground section of Delhi Metro was Vishwa Vidyalaya - Kashmere Gate section which included 4 @. @ 5 km tunnel & 4 stations namely Vishwa Vidyalaya , Vidhan Sabha , Civil Lines & Kashmere Gate station . This project was constructed by Kumagai @-@ Skanska @-@ HCC @-@ Itochu JV or KSHI @-@ JV , a joint venture between Kumagai Gumi , Skanska , Hindustan Construction Company & Itochu .

The first phase of the project was completed in 2006 , on budget and almost three years ahead of schedule , an achievement described by Business Week as " nothing short of a miracle " .

= = = Construction accidents = = =

On 19 October 2008 , a girder launcher and a part of the overhead Blue Line extension under construction in Laxmi Nagar , East Delhi collapsed and fell on passing vehicles underneath . Workers were using a crane to lift a 400 @-@ tonne concrete span of the bridge when the launcher collapsed along with a 34 @-@ metre (112 ft) long span of the bridge on top of a Blueline bus killing the driver and a labourer .

On 12 July 2009 , a section of bridge collapsed while it was being erected at Zamrudpur , near East of Kailash , on the Central Secretariat ? Badarpur corridor . Six people died and 15 were injured . The following day , on 13 July 2009 , a crane that was removing the debris collapsed , and with a bowling pin effect collapsed two other nearby cranes , injuring six . On 22 July 2009 , worker at Ashok Park Metro station was killed when a steel beam fell on him . Over a hundred people , including 93 workers , have died since work on the metro began in 1998 .

= = Network = =

The Delhi Metro is being built in phases . Phase I completed 58 stations and 65 @. @ 0 km (40 @. @ 4 mi) of route length , of which 13 @. @ 0 km (8 @. @ 1 mi) is underground and 52 @. @ 1 km (32 @. @ 4 mi) surface or elevated . The inauguration of the Dwarka ? Barakhamba Road corridor of the Blue Line marked the completion of Phase I on October 2006 . Phase II of the network comprises 124 @. @ 6 km (77 @. @ 4 mi) of route length and 85 stations , and is fully completed , with the first section opened in June 2008 and the last line opened in August 2011 . Phase III (140 km , 69 stations) and Phase IV (106 km , 51 stations) are planned to be completed by 2016 and 2020 respectively , with the network spanning 436 km (271 mi) by then .

= = = Current routes = = =

As of November 2015 , with the completion of Phase I , Phase II and the beginning of operations on

Phase III , the Delhi Metro network comprises five coloured lines (plus the Airport Express line) , serving 154 metro stations (with 6 more stations on the Airport Express line , for a total of 160) , and operating on a total route length of 213 kilometres (132 mi) .

===== Red Line =====

The Red Line was first line of the Metro to be opened and connects Rithala in the west to Dilshad Garden in the east , covering a distance of 25 @. @ 09 kilometres (15 @. @ 59 mi) . It is partly elevated and partly at grade , and crosses the Yamuna River between Kashmere Gate and Shastri Park stations . The inauguration of the first stretch between Shahdara and Tis Hazari on 24 December 2002 caused the ticketing system to collapse due to the line being crowded to four times its capacity by citizens eager to have a ride . Subsequent sections were inaugurated from Tis Hazari ? Trinagar (later renamed Inderlok) on 4 October 2003 , Inderlok ? Rithala on 31 March 2004 , and Shahdara ? Dilshad Garden on 4 June 2008 . The red line has two interchange stations , the first Kashmere Gate with the yellow line and the second Inderlok with the green line. Starting from 24 November 2013 six coach trains will be inducted in a phased manner in red line .

===== Yellow Line =====

The Yellow Line was the second line of the Metro and was the first underground line to be opened . It runs for 49 kilometres (30 mi) from north to south and connects Samaypur Badli with HUDA City Centre in Gurgaon . The northern and southern parts of the line are elevated , while the central section passes through some of the most congested parts of Delhi is underground . The first section between Vishwa Vidyalaya and Kashmere Gate (built by Kumagai @-@ Skanska @-@ HCC @-@ Itochu Joint Venture) opened on 20 December 2004 , and the subsequent sections of Kashmere Gate ? Central Secretariat opened on 3 July 2005 , and Vishwa Vidyalaya ? Jahangirpuri on 4 February 2009 . This line also possesses the country 's deepest Metro station (the second deepest metro station in the world) at Chawri Bazaar , situated 30 metres (98 ft) below ground level . On 21 June 2010 , an additional stretch from Qutub Minar to HUDA City Centre was opened , initially operating separately from the main line . However , Chhatarpur station on this line opened on 26 August 2010 . Due to delay in acquiring the land for constructing the station , it was constructed using pre @-@ fabricated structures in a record time of nine months and is the only station in the Delhi metro network to be made completely of steel . The connecting link between Central Secretariat and Qutub Minar opened on 3 September 2010 @. @ re on 10 November 2015 , the line was further extended between Jahangirpuri and Samaypur Badli in Outer Delhi . Interchanges are available with the Red Line and Kashmere Gate ISBT at Kashmere Gate station , Blue Line at Rajiv Chowk Station , Violet Line at Central Secretariat , Airport Express (Orange) Line at New Delhi , Rapid MetroRail Gurgaon at Sikandarpur and with the Indian Railways network at Chandni chowk Delhi Junction Railway station and New Delhi New Delhi railway stations . Yellow line is the first line of Delhi Metro which has phased out all four coach trains with six and eight coach configuration . The Metro Museum at Patel Chowk Metro station is a collection of display panels , historical photographs and exhibits , tracing the genesis of the Delhi Metro . The museum was opened on 1 January 2009 .

===== Blue Line =====

The Blue Line was the third line of the Metro to be opened , and the first to connect areas outside Delhi . Mainly elevated and partly underground , it connects Dwarka Sub City in the west with the satellite city of Noida in the east , covering a distance of 47 @. @ 4 kilometres (29 @. @ 5 mi) . The first section of this line between Dwarka and Barakhamba Road was inaugurated on 1 January 2006 , and subsequent sections opened between Dwarka ? Dwarka Sector 9 on 1 April 2006 , Barakhamba Road ? Indraprastha on 11 November 2006 , Indraprastha ? Yamuna Bank on 10 May 2009 , Yamuna Bank ? Noida City Centre on 12 November 2009 , and Dwarka Sector 9 ? Dwarka

Sector 21 on 30 October 2010 . This line crosses the Yamuna River between Indraprastha and Yamuna Bank stations , and has India 's second extradosed bridge across the Northern Railways mainlines near Pragati Maidan . A branch of the Blue line , inaugurated on 8 January 2010 , takes off from Yamuna Bank station and runs for 6 @. @ 25 kilometres (3 @. @ 88 mi) up to Anand Vihar in east Delhi . It was further extended up to Vaishali which was opened to public on 14 July 2011 . A small stretch of 2 @. @ 76 kilometres (1 @. @ 71 mi) from Dwarka Sector 9 to Dwarka Sector 21 was inaugurated on 30 October 2010 . Interchanges are available with the Yellow Line at Rajiv Chowk station , Green line at Kirti Nagar , Violet line at Mandi House , Airport Express (Orange) line at Dwarka Sector 21 and with the Indian Railways network and Interstate Bus Station (ISBT) at Anand Vihar station , which connects with Anand Vihar Railway Terminal and Anand Vihar ISBT .

===== Green Line =====

Opened in 2010 , Green Line (Line 4) is the fifth line of the Delhi Metro network and the first line on standard gauge , as opposed to previous broad gauge lines . It runs between Inderlok (station on the Red Line) and Mundka with a branch line connecting the line 's Ashok Park Main station with Kirti Nagar station on the Blue Line . The completely elevated line , built as part of the Phase @-@ II of Delhi Metro runs mostly along the busy NH 10 route in West Delhi . The line consists of 17 stations including an interchange station covering a total length of 18 @. @ 46 km. This line also has the country 's first standard @-@ gauge maintenance depot at Mundka . The line was opened in two stages , with the 15 @. @ 1 km Inderlok ? Mundka section opening on 3 April 2010 [1] and the 3 @. @ 5 km Kirti Nagar ? Ashok Park Main branch line on 27 August 2011 . On 6 August 2012 , in a step that will improve commuting in National Capital Region , the Union government has approved extension of Delhi Metro from Mundka to Bahadurgarh in Haryana . The 11 @. @ 18 km metro stretch will have seven stations at Mundka Industrial Area , Ghevra , Tikri Kalan , Tikri Border , Modern Industrial Estate , Bahadurgarh Bus Stand and City Park between Mundka and Bahadurgarh .

===== Violet Line =====

The Violet Line is the most recent line of the Metro to be opened , and the second standard @-@ gauge corridor after the Green Line . The 37 km (23 mi) long line connects Escorts Mujesar in Faridabad to ITO , with 22 @. @ 8 km (14 @. @ 2 mi) being overhead and the rest underground . The first section between Central Secretariat and Sarita Vihar was inaugurated on 3 October 2010 , just hours before the inaugural ceremony of the 2010 Commonwealth Games , and connects the Jawaharlal Nehru Stadium , which was the venue for the opening and closing ceremonies of the event . Completed in just 41 months , it includes a 100 m (330 ft) long bridge over the Indian Railways mainlines and a 167 @. @ 5 m (550 ft) long cable @-@ stayed bridge across an operational road flyover , and connects several hospitals , tourist attractions , and a major industrial estate along its route . Services are provided at intervals of 5 min . An interchange with the Yellow Line is available at Central Secretariat through an integrated concourse . On 14 January 2011 , the remaining portion from Sarita Vihar to Badarpur was opened for commercial service , adding three new stations to the network and marking the completion of the line . The section between Mandi House and Central Secretariat , was opened on 26 June 2014 . After that a 971 @-@ metre section between ITO and Mandi House was opened on 8 June 2015 . The latest addition to the line , an 14 km (8 @. @ 7 mi) extension southwards till Escorts Mujesar in Faridabad was inaugurated by Prime Minister Narendra Modi on 6 September 2015 . All the nine Metro stations of the Badarpur ? Escorts Mujesar (Faridabad) section of Delhi Metro 's Phase 3 , have been awarded the highest possible rating (platinum) for adherence to green building norms , by the Indian Green Building Council (IGBC) , which has devised a rating mechanism for Metro stations and buildings on a scale of platinum , gold , silver etc. for following the green building specifications . The awards for these stations were given to DMRC 's managing director , Dr. Mangu Singh by Dr. P C Jain , Chairperson , IGBC in the presence of DMRC 's directors and senior officials on 10 September 2015 . Currently

the Faridabad corridor of Delhi Metro Violet Line is the longest metro corridor outside of Delhi , consisting of 9 stations and the total length of corridor being 14 km .

===== Airport Express =====

The Airport Express line runs for 22 @. @ 7 km (14 @. @ 1 mi) from New Delhi Railway Station to Dwarka Sector 21 , linking the Indira Gandhi International Airport . The line was operated by Delhi Airport Metro Express Pvt. Limited (DAMEL) , a subsidiary of Reliance Infrastructure , the concessionaire of the line till 30 June 2013 and is now being operated by DMRC . The line was constructed at a cost of ₹ 57 billion (US \$ 850 million) , of which Reliance Infrastructure invested ₹ 28 @. @ 85 billion (US \$ 430 million) and will pay fees on a revenue @-@ share model . The line has six stations (Dhaula Kuan and Delhi Aerocity became operational on 15 August 2011) , with some featuring check @-@ in facilities , parking , and eateries . Rolling stock consists of six @-@ coach trains operating at intervals of ten minutes and having a maximum speed of 135 km / h (84 mph) . Originally scheduled to open before the 2010 Commonwealth Games , the line failed to obtain the mandatory safety clearance , and was opened on 24 February 2011 , after a delay of around 5 months . After 16 months of commencement of operations , the line was shut down for repairs of the viaducts on 8 July 2012 . The line reopened on 22 January 2013 . On 27 June 2013 Reliance Infrastructure Ltd intimated DMRC that they are unable to operate the line beyond 30 June 2013 . Following this DMRC took over operations of Airport Express line from 1 July 2013 with an Operations and Maintenance team of 100 officials to handle the line . In Jan 2015 , DMRC reported that Airport Metro has recorded about 30 per cent rise in its ridership following the fare reduction of up to 40 per cent in July last year . On 14 September 2015 DMRC announced to reduce fares even further to improve the ridership of the line , the new fare structure will have maximum fare of Rs 60 and minimum of Rs 10 instead of Rs 100 and Rs 20 charged earlier , a reduction of about 40 % . DMRC has stated that this was done to reduce the crowding on Blue line , diverting some of the Dwarka @-@ bound passengers to Airport Express Line , which is underutilised and faster compared to the Blue Line .

===== Planned extensions =====

Delhi Metro was planned to be built in phases spread over around 20 years as with each phase having a target of five years and end of one phase marking the beginning of another . Phase I (65 km) and Phase II (125 km) were completed in 2006 and 2011 , respectively , and Phase III and Phase IV are scheduled for completion in 2016 and 2021 , respectively . Work on Phase III started in 2011 while planning for Phase IV has begun . Ex @-@ chief of DMRC hinted that by the time Phase IV is completed , the city will need Phase V to cope with rising population and transport needs .

===== Phase III =====

The deadline for completion of Phase 3 is 2016 . Out of 2 new lines and 11 route extensions proposed for Phase III , cabinet approvals have been obtained for 2 new lines and 10 route extensions totalling 167 @. @ 27 km , with an estimated cost of ₹ 350 billion (US \$ 5 @. @ 2 billion) . Construction has already begun on many of these . In April 2014 the Delhi Lt. Governor gave approval for two further extensions . All the approved lines are :

Phase III will have 28 underground stations covering 41 km . More than 20 tunnel boring machines are expected to be simultaneously used during construction of Phase III . Delhi Metro is expecting a ridership of 4 million after completion of Phase III . DMRC has decided to use communication based train control (CBTC) for signalling which will allow trains to run at a short headway of 90 seconds . Keeping this in mind and other constraints , DMRC changed its decision to build 9 car long stations for new lines and instead opting for shorter stations which can accommodate 6 car trains .

For the first time Delhi Metro will construct ring lines in Phase III . Till Phase II , Delhi Metro focused

on expanding the reach of metro and thus built long radial lines . However , in Phase III , Delhi Metro is aiming to interconnect existing lines by ring lines to improve connectivity . This will not only help in reducing distances but will also relieve radial lines of some congestion .

== Phase IV ==

Phase IV has a 2021 deadline , and tentatively includes further extensions to Sonia Vihar , Burari , Mukundpur , Reola Khanpur , Palam , Najafgarh , Narela , Ghazipur , Noida sector 62 , extensions of Violet line , Green line , Line 8 , having a total length of over 100 km . There might be some changes in plan before actual construction starts on these lines . Delhi metro phase 4 got delhi government approval awaiting union cabinet approval . The proposed corridors : Rithala Narela (21 @. @ 73 km) Inderlok Indraprastha (12 @. @ 57 km) Tughlakabad Terminal 1 (22 @. @ 20 km) Lajpat Nagar Saket G @- @ Block (7 @. @ 96 km) Janakpuri (west) RK Ashram (28 @. @ 92 km) Mukundpur Maujpur (12 @. @ 54 km) Along with that the haryana government planning a metro corridor between gurgaon and faridabad . As well as gurgaon will soon see a multiple extension of rapid metro and delhi metro . Some of are a metro corridor between dwarka to ifco chowk line , A new mutiple lines covering old and new gurgaon region like gurgaon railway station and bus stand and various sectors like sector 10 , basai chowk , farrukhnagar connecting dwarka expressway metro line etc , yellow line extension from huda city centre to manesar via rajiv chowk (gurgaon) interchanging with old gurgaon metro line , connecting with delhi regional rapid rail system (delhi gurgaon alwar corridor) , pod taxi system . Dwarka expressway metro line . As well as plans have been mooted to construct a new line from Noida Sector 62 to Greater Noida which will intersect Indraprastha ? Noida Sector 32 line . The Ghaziabad Development Authority is planning to extend Delhi Metro lines deeper into Ghaziabad through extension of the Blue Line from Vaishali to Mehrauli via Indirapuram . The independently operated Gurgaon Metro , opened in November 2013 , will also interchange with the Delhi Metro at Sikandarpur station on Yellow line . For the year 2012 ? 13 , Noida development Authority has allocated Rs 5 billion for Metro extension , with City Centre Metro line being extended till the crossing of Sector 71 and 72 . After phase 4 , delhi metro will focus on phase 5 covering outer region of delhi . And phase 6 , 7 and many more plan according it .

== Finances ==

== Summary financials ==

The table below is based on the 2014 ? 15 Annual Report .

EBITDA stands for " Earnings before Interest Taxes Depreciation & Amortization "

EBT stands for " Earnings Before Tax "

Of note , Delhi Metro has been operating with a loss on an EBT basis for the past few years . EBITDA margin declined from 73 % in Fiscal 2007 to 35 % in Fiscal 2015 . That said , Debt to Equity improved from 1 @. @ 43 in FY07 to 1 @. @ 15 in FY15 .

== Funding and capitalisation ==

DMRC is owned equally by the Delhi government and the Government of India . As of March 2015 , total debt stood at ? 246 billion (US \$ 3 @. @ 7 billion) , while equity capital was ? 214 billion (US \$ 3 @. @ 2 billion) . Cost of the debt is 0 % for Govt of India and Delhi government loans , and between 0 @. @ 01 % and 2 @. @ 3 % for Japan International Cooperation Agency loans . Of the equity capital , ? 163 billion (US \$ 2 @. @ 4 billion) is paid @- @ up capital and rest is reserves and surplus .

== Operations ==

Trains operate at a frequency of one to two minutes to five to ten minutes between 05 : 00 and 00 : 00 , depending upon the peak and off @-@ peak hours . Trains operating within the network typically travel at speed up to 50 km / h (31 mph) , and stop for about 20 seconds at each station . Automated station announcements are recorded in Hindi and English . Many stations have services such as ATMs , food outlets , cafés , convenience stores and mobile recharge . Eating , drinking , smoking and chewing of gum are prohibited in the entire system . The Metro also has a sophisticated fire alarm system for advance warning in emergencies , and fire retardant material is used in trains as well as on the premises of stations . Navigation information is available on Google Transit . Since October 2010 , the first coach of every train is reserved for women . However , last coaches are also reserved when the train changes tracks at the terminal stations in the Red , Green and Violet Lines . To make travelling by metro a smoother experience , Delhi Metro has launched its own official app for smartphone users , (iPhone and Android) that will provide information on various facilities like nearest metro station , fare , parking availability , tourist spots near metro stations , security and emergency helpline numbers .

= = = Security = = =

Security on the Delhi Metro is handled by the Central Industrial Security Force (CISF) , who have been guarding the system ever since they took over from the Delhi Police in 2007 . Closed @-@ circuit cameras are used to monitor trains and stations , and feed from these is monitored by both the CISF and Delhi Metro authorities at their respective control rooms . Over 3500 CISF personnel have been deployed to deal with law and order issues in the system , in addition to metal detectors , X @-@ ray baggage inspection systems , and dog squads which are used to secure the system . About 5 @, @ 200 CCTV cameras have been installed , which cover every nook and corner of each Metro station . Each of the underground stations has about 45 to 50 cameras installed while the elevated stations have about 16 to 20 cameras each . The monitoring of these cameras is done by the CISF , which is in charge of security of the Metro , as well as the Delhi Metro Rail Corporation . Intercoms are provided in each train car for emergency communication between the passengers and the train operator . Periodic security drills are carried out at stations and on trains to ensure preparedness of security agencies in emergency situations . DMRC is also looking at raising the station walls and railings for the safety of passengers .

= = = Ticketing and recharge = = =

For the convenience of customers , Delhi Metro commuters have three choices for ticket purchase . The RFID tokens are valid only for a single journey on the day of purchase and the value depends on the distance travelled , with fares for a single journey ranging from ? 8 (12 ¢ US) to ? 30 (45 ¢ US) . Fares are calculated based on the origin and destination stations using a fare chart . A common ticketing facility for commuters travelling on Delhi Transport Corporation (DTC) buses and the Metro was introduced in 2011 . Travel cards are available for longer durations and are most convenient for frequent commuters . They are valid for one year from the date of purchase or the date of last recharge , and are available in denominations of ? 200 (US \$ 3 @. @ 00) to ? 1 @, @ 000 (US \$ 14 @. @ 90) . A 10 % discount is given on all travel made on it . A deposit of ? 50 (74 ¢ US) needs to be made to buy a new card which is refundable on the return of the card any time before its expiry if the card is not physically damaged . Tourist cards can be used for unlimited travel on the Delhi Metro network over short periods of time . There are two kinds of tourist cards valid for one and three days respectively . The cost of a one @-@ day card is ? 150 (US \$ 2 @. @ 20) and that of a three @-@ day card is ? 300 (US \$ 4 @. @ 50) , besides a refundable deposit of ? 50 (74 ¢ US) that must be paid at the time of purchasing the card . According to new regime , the maximum permissible time limit for stay within the Metro system ? 170 minutes at present ? will now be 180 minutes for those buying tickets of Rs . 23 or above , 100 minutes for tickets costing Rs . 19 ? 23 , and 65 minutes for tickets up to Rs . 18 .

== Problems ==

As the network has expanded , high ridership in new trains have led to increasing instances of overcrowding and delays on the Delhi Metro . To alleviate the problem , 8 coach trains have been introduced in Yellow line and Blue line and an increase in the frequency of trains has been proposed . Infrequent , overcrowded and erratic feeder bus services connecting stations to nearby localities have also been reported as an area of concern .

== Ridership ==

Delhi Metro has been registering a continuous increase in ridership since its inception . When Metro services were introduced in 2002 , the average ridership was 80 @, @ 000 passengers per day . As of 2015 , daily ridership has risen to 2 @. @ 6 million , with the latest ridership record set on 28 August 2015 . On 4 August 2014 daily ridership crossed the 2 @. @ 7 million figure . Since then the highest ridership has kept on surpassing the previous best , compelling metro authorities to keep increasing the services on busy routes . Most recent Delhi Metro daily ridership record of 3 @. @ 175 million passengers was reached on the eve of the Rakshabandhan (28 August 2015) , when commuters poured in large numbers throughout the day . On 25 December 2014 , it was reported that the ridership of the Airport Express had almost doubled in the past year to almost 600 @, @ 000 passengers per month now , as compared to just above 300 @, @ 000 at the beginning of the calendar year . Currently , Delhi Metro has about 220 trains of four , six and eight coaches totalling 1 @, @ 290 coaches . It is further planning to add 421 more coaches on the existing route before the completion of phase 3 . During the financial year 2015 , DMRC on an average pressed 1 @, @ 083 coaches in an hour (during peak hour) , in 2012 ? 13 , the number was 819 . On an average trains make 2 @, @ 880 trips per day .

== Infrastructure ==

== Rolling Stock ==

The Metro uses rolling stock of two different gauges . Phase I lines use 1 @, @ 676 mm (5 @. @ 499 ft) broad gauge rolling stock , while three Phase II lines use 1 @, @ 435 mm (4 @. @ 708 ft) standard gauge rolling stock . Trains are maintained at seven depots at Khyber Pass and Sultanpur for the Yellow Line , Mundka for the Green Line , Najafgarh and Yamuna Bank for the Blue Line , Shastri Park for the Red Line , and Sarita Vihar for the Violet Line . Maglev trains were initially considered for some lines of Phase 3 , but DMRC decided to continue with conventional rail in August 2012 .

== Broad gauge ==

The rolling stock is manufactured by two major suppliers . For the Phase I , the rolling stock was supplied by a consortium of companies comprising Hyundai Rotem , Mitsubishi Corporation , and MELCO. The coaches have a very similar look to MTR Rotem EMU , except with only 4 doors and use sliding doors . The coaches were initially built in South Korea by ROTEM , then in Bangalore by BEML through a technology transfer arrangement . These trains consist of four 3 @. @ 2 @- @ metre (10 ft) wide stainless steel lightweight coaches with vestibules permitting movement throughout their length and can carry up to 1500 passengers , with 50 seated and 330 standing passengers per coach . The coaches are fully air conditioned , equipped with automatic doors , microprocessor @- @ controlled brakes and secondary air suspension , and are capable of maintaining an average speed of 32 km / h (20 mph) over a distance of 1 @. @ 1 km (0 @. @ 68 mi) . The system is extensible up to eight coaches , and platforms have been designed accordingly .

The rolling stock for Phase II is being supplied by Bombardier Transportation , which has received an order for 614 cars worth approximately US \$ 1 @. @ 1 billion . While initial trains were made in Görlitz , Germany and Sweden , the remainder will be built at Bombardier 's factory in Savli , near Vadodara . These trains are a mix of four @-@ car and six @-@ car consists , capable of accommodating 1178 and 1792 commuters per train respectively . The coaches possess several improved features like Closed Circuit Television (CCTV) cameras with eight @-@ hour backup for added security , charging points in all coaches for cell phones and laptops , improved air conditioning to provide a temperature of 25 degrees Celsius even in packed conditions and heaters for winter .

= = = = Standard gauge = = = =

The standard gauge rolling stock is manufactured by BEML at its factory in Bangalore . The trains are four @-@ car consists with a capacity of 1506 commuters per train , accommodating 50 seated and 292 standing passengers in each coach . These trains will have CCTV cameras in and outside the coaches , power supply connections inside coaches to charge mobiles and laptops , better humidity control , microprocessor @-@ controlled disc brakes , and will be capable of maintaining an average speed of 34 km / h (21 mph) over a distance of 1 @. @ 1 km (0 @. @ 68 mi) .

= = = = Airport Express = = = =

Eight 6 @-@ car trains supplied by CAF Beasain were imported from Spain . CAF held 5 % equity in the DAME project , and Reliance Infrastructure held the remaining 95 % before DMRC took over the operations . The trains on this line are of a premium standard compared to the existing metro trains and have in @-@ built noise reduction and padded fabric seats . The coaches are equipped with LCD screens for entertainment of the passengers and also provide flight information for convenience of air travellers . The trains are fitted with an event recorder which can withstand high levels of temperature and impact and the wheels have flange lubrication system for less noise and better riding comfort .

= = = Signalling and Telecommunication = = =

The Delhi Metro uses cab signalling along with a centralised automatic train control system consisting of automatic train operation , Automatic Train Protection and automatic train signalling modules . A 380 MHz digital trunked TETRA radio communication system from Motorola is used on all lines to carry both voice and data information . For Blue Line Siemens Transportation Systems has supplied the electronic interlocking Sicas , the operation control system Vicos OC 500 and the automation control system LZB 700 M. An integrated system comprising optical fibre cable , on @-@ train radio , CCTV , and a centralised clock and public address system is used for telecommunication during train operations as well as emergencies . For Red and Yellow lines ALSTOM has supplied signalling system and for line Green and Violet Bombardier Transportation has supplied CITYFLO 350 signalling system .

The Airport Express line has introduced WiFi services at all stations along the route on 13 January 2012 . Connectivity inside metro trains travelling on the route is expected in the future . The WiFi service is provided by You Broadband . A fully automated , operatorless train system has been offered to Delhi Metro by the French defence and civilian technologies major Thales .

= = Environmental Impact = =

The Delhi Metro has won awards from vipul environmentally friendly practices from organisations including the United Nations , RINA , and the International Organization for Standardization , becoming the second metro in the world , after the New York City Subway , to be ISO 14001 certified for environmentally friendly construction . Most of the Metro stations on the Blue Line

conduct rainwater harvesting as an environmental protection measure . It is also the first railway project in the world to earn carbon credits after being registered with the United Nations under the Clean Development Mechanism , and has so far earned 400 @, @ 000 carbon credits by saving energy through the use of regenerative braking systems on its trains . To reduce its dependence on non @-@ renewable sources of energy , DMRC is looking forward to harness solar energy and install solar panels at the Karkardooma , Noida Sector @-@ 21 , Anand Vihar and Pragati Maidan Metro stations and DMRC 's residential complex at Pushp Vihar .

The Metro has been promoted as an integral part of community infrastructure , and community artwork depicting the local way of life has been put on display at stations . Students of local art colleges have also designed decorative murals at Metro stations , while pillars of the viaduct on some elevated sections have been decorated with mosaic murals created by local schoolchildren . The Metro station at INA Colony has a gallery showcasing artwork and handicrafts from across India , while all stations on the Central Secretariat ? Qutub Minar section of the Yellow Line have panels installed on the monumental architectural heritage of Delhi . The Nobel Memorial Wall at Rajiv Chowk has portraits of the seven Nobel Laureates from India : Rabindranath Tagore , CV Raman , Hargobind Khorana , Mother Teresa , Subrahmanyam Chandrasekhar , Amartya Sen and Venkatraman Ramakrishnan and provide details about their contribution to society and a panel each on Alfred Nobel and the Nobel Prizes .