

= Bay Area Rapid Transit =

Bay Area Rapid Transit ( BART ) is a public transportation system serving the San Francisco Bay Area . The rapid transit elevated and subway system connects San Francisco with cities in the East Bay and suburbs in northern San Mateo County . BART 's rapid transit system operates five routes on 104 miles ( 167 km ) of line , with 44 stations in four counties ; additionally , BART operates a 3 @. @ 2 @-@ mile ( 5 @. @ 1 km ) AGT line to Oakland Airport which adds a forty @-@ fifth station to the system . Further spur lines under BART jurisdiction within individual counties utilize other rail technologies . With an average of 423 @,@ 120 weekday passengers and 126 million annual passengers in fiscal year 2015 , BART is the fifth @-@ busiest heavy rail rapid transit system in the United States . The name is spoken as an acronym instead of an initialism ; it is referred to as " Bart " , not " B @-@ A @-@ R @-@ T " .

BART is operated by the San Francisco Bay Area Rapid Transit District , a special @-@ purpose transit district that was formed in 1957 to cover San Francisco , Alameda County , and Contra Costa County .

BART combines the aesthetics and carrying capacity of a metro system with the logistics and pricing model of commuter rail . It is an alternative to highway transportation , especially to avoid congestion on the San Francisco Bay Bridge , which connects San Francisco to the East Bay suburbs and the city of Oakland . As of 2016 , the BART system is being expanded to San Jose with the consecutive Warm Springs and Silicon Valley BART extensions .

= = History = =

= = = Development and origins = = =

Some of the Bay Area Rapid Transit System 's current coverage area was once served by an electrified streetcar and suburban train system called the Key System . This early 20th @-@ century system once had regular trans @-@ bay traffic across the lower deck of the Bay Bridge . By the mid @-@ 1950s , that system had been dismantled in favor of highway travel . A new rapid @-@ transit system was proposed to take the place of the Key System during the late 1940s , and formal planning for it began in the 1950s . Some funding was secured for the BART system in 1959 , and construction began a few years later . Passenger service began on September 11 , 1972 , initially just between MacArthur and Fremont .

The new BART system was hailed as a major step forward in subway technology , although questions were asked concerning the safety of the system and the huge expenditures necessary for the construction of the network . All nine Bay Area counties were involved in the planning and envisioned to be connected by BART .

In addition to San Francisco , Alameda , and Contra Costa Counties , Santa Clara County , San Mateo County , and Marin County were initially intended to be part of the system . Santa Clara County Supervisors opted out in 1957 , preferring instead to build expressways . In 1961 , San Mateo County supervisors voted to leave BART , saying their voters would be paying taxes to carry mainly Santa Clara County residents . Although Marin County originally voted in favor of BART participation at the 88 % level , the district @-@ wide tax base was weakened by the withdrawal of San Mateo County . Marin County withdrew in early 1962 because its marginal tax base could not adequately absorb its share of BART 's projected cost . Another important factor in Marin 's withdrawal was an engineering controversy over the feasibility of running trains across the Golden Gate Bridge .

The extension of BART into Marin was forecast as late as three decades after the 1972 start . Initially , a lower level under the Golden Gate Bridge was preferred . In 1970 , the Golden Gate Transportation Facilities Plan considered a tunnel under the Golden Gate or a new bridge parallel to the Richmond @-@ San Rafael Bridge but neither of these plans was pursued .

Extensions were completed to Colma and Pittsburg / Bay Point in 1996 , Dublin / Pleasanton in

1997 , SFO / Milbrae in 2003 , and the automated guideway transit spur line that connects BART to Oakland International Airport in 2014 .

== Modernization ==

Since the mid 1990s , BART has been trying to modernize its system . The fleet rehabilitation is part of this modernization ; in 2009 , fire alarms , fire sprinklers , yellow tactile platform edge domes , and cemented mat rubber tiles were installed . The rough black tiles on the platform edge mark the location of the doorway of approaching trains , allowing passengers to wait at the right place to board . All faregates and ticket vending machines were replaced .

In 2007 , BART stated its intention to improve non peak ( night and weekend ) headways for each line to 15 minutes . The current 20 minute headways at these times is viewed as a psychological barrier to ridership . In mid 2007 , BART temporarily reversed its position stating that the shortened wait times would likely not happen due to a \$ 900 million state revenue budget shortfall . Nevertheless , BART eventually confirmed the implementation of the plan by January 2008 . Continued budgetary problems halted the expanded non peak service and returned off peak headways to 20 minutes in 2009 .

In 2008 BART announced that it would install solar power systems on the roofs of two yards and maintenance facilities in addition to car ports with rooftop solar panels at the Orinda station . The board lamented not being able to install them at all stations but it stated that Orinda was the only station with enough sun for them to make money from the project .

In 2012 The California Transportation Commission announced they would provide funding for expanding BART facilities , through the Santa Clara Valley Transportation Authority , in anticipation of the opening of the Silicon Valley Berryessa Extension . \$ 50 million would go in part to improvements to the Hayward Maintenance Complex .

== Earthquake safety ==

A 2010 study shows that along with some Bay Area freeways , some of BART 's overhead structures could collapse in a major earthquake , which has a significant probability of occurring within three decades . Seismic retrofiting has been carried out in recent years to address these deficiencies , especially in the Transbay Tube .

== Extensions underway ==

Construction of eBART in Pittsburg and Antioch is underway as of 2016 . The extension to Silicon Valley is under construction in Warm Springs , Milpitas and Berryessa .

== Expansion strategy and proposals ==

BART 's current focus is on improving service and reliability in its core system ( where density and ridership is highest ) , rather than extensions into far flung suburbia . In 2007 , these plans included : a line that would continue from the Transbay Terminal through the South of Market , northwards on Van Ness and terminating in western San Francisco along the Geary corridor , the Presidio , or North Beach ; a line along the Interstate Highway 680 corridor ; and a fourth set of rail tracks through Oakland . However , BART maps still show a planned extension to Livermore , in the fringe of Alameda County , and the Antioch eBART extension is under construction .

Further expansion has been proposed , contingent upon the allocation of funding . This includes the second phase of the Silicon Valley extension to downtown San Jose and Santa Clara , the Livermore extension , and ' wBART ' : I 80 / West Contra Costa Corridor ( extension to Hercules ) ; in addition , at least four infill stations such as Irvington and Calaveras have been proposed .

As of 2013 , long @-@ range plans included a new four @-@ bore Transbay Tube beneath San Francisco Bay that would run parallel and south of the existing tunnel and emerge at the Transbay Transit Terminal to connect to Caltrain and the future California High Speed Rail system . The four @-@ bore tunnel would provide two tunnels for BART and two tunnels for conventional / high @-@ speed rail . The BART system and conventional U.S. rail use different and incompatible rail gauges and different loading gauges .

= = Infrastructure = =

The entirety of the system runs in exclusive right @-@ of @-@ way . BART 's rapid transit revenue routes cover 104 miles ( 167 km ) with 44 stations . On the main lines , approximately 37 miles of lines run through underground sections with 23 miles on elevated tracks . The main system uses a 5 ft 6 in ( 1 @, @ 676 mm ) Indian gauge and mostly ballastless track . It also uses flat @-@ edge rail , rather than typical rail that angles slightly inward . ( A new spur line will utilize conventional 4 ft 8 1 / 2 in ( 1 @, @ 435 mm ) standard gauge rail in the future . ) This has complicated maintenance of the system , as it requires custom wheelsets , brake systems , and track maintenance vehicles .

DC electric current at 1 @, @ 000 volts is delivered to the trains over a third rail . In stations the third rail is on the side away from the passenger platform , except the middle platform at the San Francisco International Airport station . This reduces the danger of a passenger falling on the third rail or stepping on it to climb back to the platform after falling off . On ground @-@ level tracks , the third rail alternates from one side of the track to the other , providing breaks in the third rail to allow for emergency evacuations . Underground tunnels , aerial structures and the Transbay Tube have evacuation walkways and passageways to allow for train evacuation without exposing passengers to contact with the third rail , which is located as far away from these walkways as possible .

The maximum speed trains can travel is 80 miles per hour ( 130 km / h ) , but BART does not typically operate trains at that speed except to help a train make up time . The maximum speed BART uses during normal operations is 70 mph .

Trains length ranges from four cars to a maximum of ten cars , which fills the 700 @-@ foot ( 213 m ) length of a platform . At its maximum length of 710 feet ( 216 m ) , BART has the longest trains of any metro system in the United States . The system also features car widths of 10 @. @ 5 feet ( 3 @. @ 2 m ) ( the same width as a Budd Metroliner ) , a maximum gradient of four percent , and a minimum curve radius of 394 feet ( 120 m ) on the main lines .

Systemwide headways are limited due to the merging of four lines through the Transbay Tube and San Francisco , as well as the lack of sidings necessary for overtaking trains .

Many of the original system 1970s @-@ era BART stations , especially the aerial stations , feature simple , Brutalist architecture , while the newer stations are a mix of Neomodern and Postmodern architecture . The additional double tracked four mile long upper deck of the Market Street Subway and its four underground stations were built by BART for the S.F. Municipal Railway as specified by the system 's original plan .

An automated guideway transit line and a 45th station were opened in 2014 and utilize off @-@ the @-@ shelf cable car technology developed by DCC Doppelmayr Cable Car : the Cable Liner .

= = = Routes = = =

All routes pass through Oakland , and all but the Richmond ? Fremont route pass through the Transbay Tube into San Francisco and beyond to Daly City . Most segments of the BART system carry trains of more than one route .

Trains regularly operate on five routes . Unlike most other rapid transit and rail systems around the world , BART lines are generally not referred to by shorthand designations ? they are only occasionally referred to officially by color names . However , future train cars will display line colors more prominently .

The five BART lines are generally identified on maps , schedules , and signage by the names of their termini :

Richmond ? Fremont : Follows a former Atchison , Topeka and Santa Fe Railway right @-@ of @-@ way from Richmond to Berkeley , and a former Western Pacific Railroad right @-@ of @-@ way from Oakland to Fremont . Operates daily .

Pittsburg / Bay Point ? SFO / Millbrae : Follows SR 4 , a former Sacramento Northern Railway right @-@ of way , and SR 24 from Pittsburg to Oakland , and extends beyond Daly City to San Francisco International Airport . This is the longest point @-@ to @-@ point line in the BART system . Operates daily , with the line extending from the airport to Millbrae on weeknights and weekends .

Fremont ? Daly City : Coincides with the Richmond @-@ Fremont line from Fremont to Oakland . Operates until early evening Mondays through Saturdays .

Richmond ? Daly City / Millbrae : Coincides with the Richmond @-@ Fremont line from Richmond to Oakland , and extends beyond Daly City to Millbrae following a former Southern Pacific Railroad right @-@ of @-@ way , which is also served by Caltrain beyond San Bruno . Operates until early evening Mondays through Saturdays , with the line terminating at Daly City on Saturdays .

Dublin / Pleasanton ? Daly City : Follows Interstate 580 via Castro Valley to San Leandro , where it coincides with the Fremont @-@ Daly City line . Operates daily .

In addition BART also operates a separate automated guideway transit line :

Coliseum ? Oakland Int 'l Airport : Travels along Hegenberger Road from the Oakland International Airport to the BART system at Coliseum station . Operates daily .

= = = = Discontinued = = = =

San Francisco : Between the openings of the Market Street Subway on November 5 , 1973 and the Transbay Tube on September 16 , 1974 , a dedicated line was run from Montgomery Street to Daly City . This was discontinued with commencement of through service to Oakland after the opening of the Transbay Tube .

Millbrae ? SFO Shuttle : When service to the SFO station began on June 22 , 2003 , there was originally a shuttle service connecting the Millbrae and SFO stations . This service facilitated a direct rail link between Caltrain and the airport . The shuttle trains usually had 5 cars and ran every 20 minutes . The shuttle line was discontinued in 2004 due to poor ridership . BART changed its routing so that existing lines ran to the airport and to Millbrae . Direct service between these two stations is not always available , but they can be reached via transfer .

= = = Automation = = =

BART was one of the first U.S. systems of any size to have substantial automated operations . The trains are computer @-@ controlled via BART 's Operations Control Center ( OCC ) and headquarters at the Kaiser Center in Downtown Oakland and generally arrive with regular punctuality . Train operators duties may include , but are not limited to , the following :

Monitors console and radio communications to ensure that vehicles are operating within established guidelines ;

Observes and detects problems with passengers entering and exiting train doors and takes corrective action ; observes and detects hazards on the track , in the station or platforms , or the train itself , reports them to Operations Control Center personnel via radio , and take necessary corrective action ;

Make announcements to passengers regarding station arrivals , transfer points , delays , and emergencies and answers passenger questions ;

In yards , on test tracks , turntables and wash facilities , follows directions from Tower personnel and operates console to move trains as directed ;

Takes prescribed action such as evacuating passengers , administer first aid , and using a fire extinguisher during emergencies ;

Reports basic equipment malfunctions of mechanical or electrical nature to Operations Control Center ; works with foreworkers and technicians to isolate reported problems ;

Maintains logs of work activities ; completes forms to report unusual circumstances and action taken ;

Uses a variety of communication equipment , including a public address system , two ? way radios and emergency telephones ;

Monitors and learns to apply changes in operating and emergency procedures ;

Maintains and upgrades knowledge of policies and procedures as required .

= = Rolling stock = =

= = = Car types = = =

BART operates four types of cars , built from three separate orders , totaling 662 cars .

To run a typical peak morning commute , BART requires 579 cars . Of those , 535 are scheduled to be in active service ; the others are used to build up four spare trains ( essential for maintaining on @-@ time service ) . At any one time , the remaining 90 cars are in for repair , maintenance , or some type of planned modification work .

The A and B cars were built from 1968 to 1971 by Rohr Industries , an aerospace manufacturing company that had recently started mass @-@ transit equipment manufacturing . The A cars were designed as leading or trailing cars only , with an aerodynamic fiberglass operator 's cab housing train control equipment and BART 's two @-@ way communication system , and extending 5 feet ( 1 @. @ 52 m ) longer than the B- and C @-@ cars . A and B cars can seat 60 passengers comfortably , and under crush load , carry over 200 passengers . B cars have no operator 's cab and are used in the middle of trains to carry passengers only . Currently , BART operates 59 A cars and 389 B cars . The BART A cars have a larger cab window than the C cars , allowing riders to look out of the front or the back of the train .

The C cars feature a fiberglass operator 's cab and control and communications equipment like the A cars , but do not have the aerodynamic nose , allowing them to be used as middle cars as well . This allows faster train @-@ size changes without having to move the train to a switching yard . C cars can seat 56 passengers and under crush load accommodate over 200 passengers . The first C cars , referred to as C1 cars , were built by Alstom between 1987 and 1989 . The second order of C cars , built by Morrison @-@ Knudsen ( now Washington Group International ) , are known as C2 cars . The C2 cars were identical to the C1 cars but featured an interior with a blue / gray motif . At the time of their construction , the C2 cars also featured flip @-@ up seats which could be folded to accommodate wheelchair users ; these seats were later removed during refurbishment . Currently , BART operates 150 C1 cars and 80 C2 cars . The " C " cars have a bright white segment as the final approximately two feet ( 61 cm ) of the car at their cab end .

= = = Refurbishments = = =

Prior to the introduction of the C2 cars , the seats and carpeted flooring in all the cars were brown . In 1995 , BART contracted with ADtranz ( acquired by Bombardier Transportation in 2001 ) to refurbish and overhaul the 439 original Rohr A- and B @-@ cars , updating the old brown fabric seats to less @-@ toxic and easier @-@ to @-@ clean , light @-@ blue polyurethane seats and bringing the older cars to the same level of interior amenities as the C2 fleet . The project was completed in 2002 . The A , B , and C cars were all given 3 @-@ digit numbers originally , but when refurbished 1000 was added to the number of each individual A / B car ( e.g. car 633 would become 1633 ) . The C2 cars are numbered in the 2500 series ; the C / C1 cars still have 3 @-@ digit numbers .

Because one of the original design goals was for all BART riders to be seated , the older cars had fewer provisions such as grab bars for standing passengers . In the late 2000s BART began modifying some of the C2 cars to test features such as hand @-@ straps and additional areas for luggage , wheelchairs and bicycles . These new features were later added to the A , B , and C1 cars

• Prior to 2012 , all BART cars featured upholstered seats . It was reported in 2011 that several strains of molds and bacteria were found on fabric seats on BART trains , even after wiping with antiseptic . These included bacteria from fecal contamination . In April , BART announced it would spend \$ 2 million in the next year to replace the dirty seats . The new seats would feature vinyl @-@ covered upholstery which would be easier to clean . The transition to the new seats was completed in December 2014 .

Originally all the cars had carpeted flooring . Due to similar concerns regarding cleanliness , the carpeting in all of the cars has been removed . The A and B , and C2 cars now feature vinyl flooring in either grey or blue coloring , while the C1 cars feature a spray @-@ on composite flooring .

= = = Traction motors = = =

Prior to rebuilding , the Direct Current ( DC ) traction motors used on the 439 Rohr BART cars were model 1463 with chopper controls from Westinghouse , who also built the automatic train control system for BART . The Rohr cars were rebuilt with ADtranz model 1507C 3 @-@ phase alternating current ( AC ) traction motors with insulated @-@ gate bipolar transistor ( IGBT ) inverters . The Westinghouse motors are still in use on the Alstom C ( C1 ) and Morrison @-@ Knudsen C2 cars and the motors that were removed from the Rohr cars were retained as spare motors for use on them . Cars have a starting accelerating of 3 @-@ 0 mph / s or 4 @-@ 8 km / ( h · s ) and are capable of holding that acceleration up to 31 mph ( 50 km / h ) . Residual acceleration at 80 mph ( 130 km / h ) is 0 @-@ 78 mph / s or 1 @-@ 26 km / ( h · s ) . Braking rates range from 0 @-@ 45 mph / s or 0 @-@ 72 km / ( h · s ) up to 3 @-@ 0 mph / s or 4 @-@ 8 km / ( h · s ) ( full service rate )

• The HVAC system on the Rohr BART cars before rehabilitation were built by Thermo King , when it was a subsidiary of Westinghouse ; it is now a subsidiary of Ingersoll Rand . The current HVAC systems on the rebuilt Rohr @-@ built Gen 1 cars were built by Westcode and possibly also ADtranz who had subcontracted the HVAC system to Westcode .

= = = Noise = = =

Many BART passengers have noted that the system is noisy , with a 2010 survey by the San Francisco Chronicle measuring up to 100 decibels ( comparable to the noise level of a jackhammer ) in the Transbay Tube between San Francisco and Oakland , and still more than 90 decibels in 23 other locations . According to BART , the noise in the tunnel used to be " compared to banshees , screech owls , or Doctor Who 's TARDIS run amok " .

However , then @-@ chief BART spokesperson Linton Johnson stated that BART averages 70 ? 80 dB , below the danger zone , and according to a 1997 study by the National Academy of Sciences , BART ranks as among the quietest transit systems in the nation . Critics have countered that this study analyzed straight , above @-@ ground portions of different systems throughout the country at 30 mph ( 48 km / h ) , which is not representative of actual operating conditions . Much of BART is under ground and curvy , even in the Transbay Tube , and has much higher peak operating speeds than many other systems in the country .

Train noise on curves is caused by the wheels slipping along the rails . This slippage also causes noise and surface damage called corrugation . The process by which the noise and corrugation occur is :

Pairs of wheels are attached to one another with an axle such that they must have the same rotational speed , but on a curve the distances the outer and inner wheels travel are different . As a result , the wheels must slip along the rails .

This slippage causes the wheel and track to wear and become uneven ( corrugated ) .

This corrugation causes more noise and corrugation , not only in the original location but elsewhere in the system .

In 2015 , after replacing 6 @-@ 500 feet ( 1 @-@ 981 m ) and grinding down ( smoothing ) 3 miles

( 4 @. @ 8 km ) of rail in the tube , BART reported a reduction of noise there and positive feedback from riders . BART also announced that the new train cars expected to enter service in December 2016 ( see below ) will be quieter , thanks to " ' micro @-@ plug ' doors [ that ] help seal out noise " .

= = = AGT fleet = = =

The Coliseum ? Oakland International Airport line uses a completely separate and independently operated fleet as it uses cable car @-@ based automated guideway transit technology . It uses four Cable Liner trains built by DCC Doppelmayr Cable Car , arranged as three @-@ car sets , but the system can accommodate four @-@ car trains in the future .

= = = Future railcars = = =

To speed up rider entry and exit at stations , BART is preparing to introduce new 6 @-@ door cars . BART received proposals from five suppliers , and on May 10 , 2012 awarded a \$ 896 @. @ 3 million contract to Canadian railcar manufacturer Bombardier Transportation with an order for 410 new cars , split into a base order of 260 cars and a first option order of 150 additional cars . The car was designed by Morelli Designers , an industrial design firm based in Montréal , Canada . On November 21 , 2013 , BART purchased 365 more cars , for a total fleet size of 775 new railcars , while also accelerating the delivery schedule by 21 months ( from 10 cars per month up to 16 cars per month ) and lowering procurement costs by approximately \$ 135 million . According to the contract , at least ? of the contract ? s amount must be spent on U.S.-built parts .

There will be two different types of car configurations for the new fleet ; a cab car ( D @-@ cars ) , which will make up 40 % of the fleet , or , 310 cars , and a non @-@ cab car ( E @-@ cars ) , which will make up the remainder of the fleet , or , 465 cars . All cars are to be equipped with bike racks , new vinyl seats ( 54 per car ) , and a brand new passenger information system which will display next stop information .

Due to potential access issues for people with disabilities , the pilot car layout was modified by the BART board in February 2015 to include two wheelchair spaces in the center of the car , as well as alternative layouts for bike and flexible open spaces . The first test car was unveiled in April 2016 . Upon approval , the first 10 cars were expected to be in service in December 2016 , and at least 60 by December 2017 . Delivery of all 775 cars is expected to be completed by September 2021 .

The vehicle procurement for eBART includes eight Stadler GTW trains , with two options to procure six more . The first will be delivered in June 2016 . The Stadler GTW trains are diesel multiple units with 2 / 6 articulated power units , and are based on models previously used in Austin , Dallas and New Jersey .

= = Travelling = =

= = = Hours of operation = = =

BART has five rapid transit lines ; most of each line 's length is on track shared with other lines . Trains on each line run every 15 minutes on weekdays and 20 minutes during evenings , weekends and holidays ; stations on the section of track between Daly City and West Oakland are serviced by four lines and therefore see 16 trains an hour on each track .

BART service begins around 4 : 00 am on weekdays , 6 : 00 am on Saturdays , and 8 : 00 am on Sundays . Service ends every day near midnight with station closings timed to the last train at station . Two of the five lines , the Fremont ? Daly City and Richmond ? Daly City / Millbrae lines , do not have night ( after 7 : 00 pm & 9 : 00 pm , respectively ) or Sunday service , but all stations remain accessible by transfer from the other lines . The separate Coliseum ? Oakland International Airport AGT line runs every 6 minutes , with approximately the same operating hours as the five

rapid transit lines .

All Nighter bus service runs when BART is closed . 30 out of 44 BART stations are served either directly or within a few blocks . BART tickets are not accepted on these buses , with the exception of BART Plus tickets ( which are no longer accepted on AC Transit , Muni , SamTrans , or VTA beginning in 2013 ) , and each of the four bus systems that provide All @-@ Nighter service charges its own fare , which can be up to \$ 3 @.@ 50 ; a four @-@ system ride could cost as much as \$ 9 @.@ 50 as of 2007 .

= = = Fares = = =

Fares on BART are comparable to those of commuter rail systems and are higher than those of most subways , especially for long trips . The fare is based on a formula that takes into account both the length and speed of the trip . A surcharge is added for trips traveling through the Transbay Tube , to Oakland International Airport , and / or through San Mateo County ( which access to includes San Francisco International Airport ) , which is not a BART member . Passengers can use refillable paper @-@ plastic @-@ composite tickets , on which fares are stored via a magnetic strip , to enter and exit the system . The exit faregate prints the remaining balance on the ticket each time the passenger exits the station . A paper ticket can be refilled at a ticket machine , the remaining balance on any ticket can be applied towards the purchase of a new one , or a card is captured by the exit gate when the balance reaches zero ; multiple low value cards can be combined to create a larger value card but only at specific ticket exchange locations , located at some BART stations .

BART relies on unused ticket values on discarded low @-@ value cards for additional revenue , as much as \$ 9 @.@ 9 million . The paper ticket technology is identical to the Washington Metro 's paper fare card , though the BART system does not charge higher fares during rush hour . Both systems were supplied by Cubic Transportation Systems , with contract for BART being awarded in 1974 .

Clipper , a contactless smart card accepted on all major Bay Area public transit agencies , may be used in lieu of a paper ticket .

The minimum fare is \$ 1 @.@ 95 ( except San Mateo County trips ) under 6 miles ( 9 @.@ 7 km ) . The maximum one @-@ way fare including all possible surcharges is \$ 15 @.@ 70 , the journey between San Francisco International Airport and Oakland International Airport . The farthest possible trip , from Pittsburg / Bay Point to Millbrae , costs less because of the \$ 4 additional charge added to SFO trips and \$ 6 additional charge added to OAK trips . Entering and exiting the same station within three hours accrues an excursion fare of \$ 5 @.@ 75 . Passengers without sufficient fare to complete their journey must use a cash @-@ only AddFare machine to pay the remaining balance in order to exit the station .

BART uses a system of five different color @-@ coded tickets for regular fare , special fare , and discount fare to select groups as follows :

Blue tickets ? General : the most common type

Red tickets ? Disabled Persons and children aged 4 to 12 : 62 @.@ 5 % discount , special ID required ( children under the age of 4 ride free )

Green tickets ? Seniors age 65 or over : 62 @.@ 5 % discount , proof of age required for purchase

Orange tickets ? Student : special , restricted @-@ use 50 % discount ticket for students age 13 ? 18 currently enrolled in high or middle school

BART Plus ? special high @-@ value ticket with ' flash @-@ pass ' privileges with regional transit agencies . Effective January 1 , 2013 , the SFMTA ( Muni ) , as well as SamTrans and VTA , no longer participate in the BART Plus Program . AC Transit stopped participating in the BART Plus program in 2003 . The BART Plus ticket is being phased out in favor of the Clipper system , as the only Bay Area transit agencies that still participate in the BART Plus program do not yet accept Clipper cards .

Unlike many other rapid transit systems , BART does not have an unlimited ride pass , and the only discount provided to the public is a 6 @.@ 25 % discount when " high value tickets " are purchased with fare values of \$ 48 and \$ 64 , for prices of \$ 45 and \$ 60 respectively . Amtrak 's Capitol



Corridor and San Joaquins trains sell \$ 10 BART tickets on board in the café cars for only \$ 8 , resulting in a 20 % discount . A 62 @. @ 5 % discount is provided to seniors , the disabled , and children age 5 to 12 . Middle and high school students 13 to 18 may obtain a 50 % discount if their school participates in the BART program ; these tickets are intended to be used only between the students ' home station and the school 's station and for transportation to and from school events . The tickets can be used only on weekdays . These School Tickets and BART Plus tickets have a last @-@ ride bonus where if the remaining value is greater than \$ 0 @. @ 05 , the ticket can be used one last time for a trip of any distance . Most special discounted tickets must be purchased at selected vendors and not at ticket machines . The Bart Plus tickets can be purchased at the ticket machines .

The San Francisco Muni " A " monthly pass provides unlimited rides within San Francisco , with no fare credit applied for trips outside of the City . San Francisco pays \$ 1 @. @ 02 for each trip taken under this arrangement .

Fares are enforced by the station agent , who monitors activity at the fare gates adjacent to the window and at other fare gates through closed circuit television and faregate status screens located in the agent 's booth . All stations are staffed with at least one agent at all times .

Proposals to simplify the fare structure abound . A flat fare that disregards distance has been proposed , or simpler fare bands or zones . Either scheme would shift the fare @-@ box recovery burden to the urban riders in San Francisco , Oakland and Berkeley and away from suburban riders in East Contra Costa , Southern Alameda , and San Mateo Counties , where density is lowest , and consequently , operational cost is highest .

= = = Ridership levels = = =

During the fiscal year ending June 30 , 2015 , BART recorded an average weekday ridership of 423 @, @ 120 , the highest in its history , making BART the fifth @-@ busiest heavy rail rapid transit system in the United States . During fiscal year 2015 , the busiest station was Embarcadero with 45 @, @ 460 average weekday exits , followed by Montgomery Street with 44 @, @ 333 . The busiest station outside of San Francisco was 12th Street Oakland City Center with 13 @, @ 921 riders , followed by Downtown Berkeley with 13 @, @ 744 . The least busy station was North Concord / Martinez with 2 @, @ 766 weekday exits .

BART 's one @-@ day ridership record was set on Halloween of 2012 with 568 @, @ 061 passengers attending the San Francisco Giants ' victory parade for their World Series championship . This surpassed the record set two years earlier of 522 @, @ 198 riders in 2010 for the Giants ' 2010 World Series victory parade . Before that , the record was 442 @, @ 100 riders in October 2009 , following an emergency closure of the Bay Bridge . During a planned closure of the Bay Bridge , there were 475 @, @ 015 daily riders on August 30 , 2013 , making that the third highest ridership . On June 19 , 2015 , BART recorded 548 @, @ 078 riders for the Golden State Warriors championship parade , placing second on the all @-@ time ridership list .

BART set a Saturday record of 419 @, @ 162 riders on February 6 , 2016 , coinciding with Super Bowl 50 events and a Golden State Warriors game . That easily surpassed the previous Saturday record of 319 @, @ 484 riders , which occurred in October 2012 , coinciding with several sporting events and Fleet Week . BART set a Sunday ridership record of 292 @, @ 957 riders in June 2013 , in connection with the San Francisco Gay Pride Parade , surpassing Sunday records set the previous two years when the Pride Parade was held .

High gasoline prices pushed ridership to record levels during 2012 . Prior to 2013 , five of BART 's top ten ridership days of all time occurred in September and October 2012 .

= = = Connecting services = = =

Two BART stations have connections to Amtrak regional rail services : Coliseum / Oakland Airport and Richmond . Capitol Corridor trains run from Sacramento to San Jose from both stations . Additionally , Richmond has connections to the San Joaquin and nationally @-@ serviced California

Zephyr .

Caltrain , which provides service between San Francisco , San Jose and Gilroy , has a cross @-@ platform interchange at the Millbrae Station .

Connections to San Francisco 's local light rail system , the Muni Metro , are facilitated primarily through the twin @-@ level Market Street subway . Plans from 1960 called for BART trains to traverse the Twin Peaks Tunnel , but the upper level of the subway was turned over to Muni and both agencies share the Embarcadero , Montgomery Street , Powell and Civic Center stations . Some Muni Metro lines connect with ( or pass nearby ) the BART system at the Balboa Park and Glen Park stations .

Complimentary shuttle bus service connects BART to the Altamont Commuter Express commuter rail at the Fremont , Dublin / Pleasanton and West Dublin / Pleasanton stations .

Under @-@ construction extensions will allow for a connection to Santa Clara County 's VTA light rail in 2017 . Future , unfinalized plans call for further rail connections in San Jose and Santa Clara .

= = = Connecting services via bus = = =

Bus transit services connect to BART , which , while managed by separate agencies , are integral to the successful functioning of the system , including the San Francisco Municipal Railway ( Muni ) , AC Transit , SamTrans , County Connection , and the Golden Gate Bridge , Highway and Transportation District ( Golden Gate Transit ) . Until 1997 , BART ran its own " BART Express " connector buses , which ran to eastern Alameda County and far eastern and western areas of Contra Costa County ; these routes were later devolved to sub @-@ regional transit agencies such as Tri Delta Transit and the Livermore Amador Valley Transit Authority ( WHEELS ) or , in the case of Dublin / Pleasanton service , replaced by a full BART extension .

Other services connect to BART including the Emery Go Round ( Emeryville ) , WestCAT ( north @-@ western Contra Costa County ) , San Leandro LINKS , Napa VINE , Rio Vista Delta Breeze , Dumbarton Express , SolTrans , Union City Transit , and the Santa Clara Valley Transportation Authority in Silicon Valley .

Several commuter and interregional bus services connect to BART , including the San Joaquin RTD Commuter ( Stockton ) , Tri Delta Transit ( Contra Costa County ) , Greyhound , California Shuttle Bus , Valley of the Moon Commute Club , Amtrak Thruway Motorcoach , and Modesto Area Express BART Express .

= = = Cars = = =

Many BART stations offer parking , however , under @-@ pricing causes station parking lots to overflow in the morning . Pervasive congestion and under @-@ pricing forces some to drive to distant stations in search of parking .

BART hosts car sharing locations at many stations , a program pioneered by City CarShare . Riders can transfer from BART and complete their journeys by car . BART offers long @-@ term airport parking through a third @-@ party vendor at most East Bay stations . Travelers must make an on @-@ line reservation in advance and pay the daily fee of \$ 5 before they can leave their cars at the BART parking lot .

= = = Airports = = =

BART connects directly to the San Francisco International Airport ; connections are available to AirTrain for those not departing or arriving from the international terminal .

The Coliseum ? Oakland International Airport line , or BART to OAK Airport , is an automated guideway transit line that directly connects BART and Amtrak at the Coliseum station to the terminal buildings at Oakland International Airport . Unlike similar services at other airports , it is integrated into the BART fare system but with BART ticket gates located at the Coliseum end of the people mover . The connector 's automated guideway transit ( AGTs ) vehicles are cable @-@ propelled

and operate on a fixed , elevated guideway 3 @. @ 2 miles ( 5 @. @ 1 km ) long . The people movers arrive at the Coliseum BART station every 6 to 20 minutes , and are designed to transport travelers to the airport in about eight minutes .

== Facilities ==

==== Cell phone and Wi @-@ Fi ====

In 2004 , BART became the first transit system in the United States to offer cellular telephone communication to passengers of all major wireless carriers on its trains underground . Service was made available for customers of Verizon Wireless , Sprint / Nextel , AT & T Mobility , and T @-@ Mobile in and between the four San Francisco Market Street stations from Civic Center to Embarcadero . In 2009 , service was expanded to include the Transbay Tube , thus providing continuous cellular coverage between West Oakland and Balboa Park . In 2010 , service was expanded to all underground stations in Oakland ( 19th Street , 12th Street / Oakland City Center , and Lake Merritt ) . Uninterrupted cellular coverage of the entire BART system is a goal . As of 2012 passengers in both the Berkeley Hills tunnel and the Berkeley subway ( Ashby , Downtown and North Berkeley ) received cell service . The only section still not covered by cell service is a short tunnel that leads to Walnut Creek BART , and San Mateo County subway stations ( including service to SFO and Millbrae ) .

In 2007 , BART ran a beta test of Wi @-@ Fi Internet access for travelers . It initially included the four San Francisco downtown stations : Embarcadero , Montgomery , Powell , and Civic Center . It included above ground testing to trains at BART 's Hayward Test Track . The testing and deployment was extended into the underground interconnecting tubes between the four downtown stations and further . The successful demonstration provided for a ten @-@ year contract with WiFi Rail , Inc. for the services throughout the BART right of way . In 2008 the Wi @-@ Fi service was expanded to include the Transbay Tube . BART terminated the relationship with Wi @-@ Fi Rail in December 2014 , citing that WiFi Rail had not submitted an adequate financial or technical plan for completing the network throughout the BART system .

In 2011 during the Charles Hill killing and aftermath BART disabled cell phone service to hamper demonstrators . The ensuing controversy drew widespread coverage , that raised legal questions about free speech rights of protesters and the federal telecommunications laws that relate to passengers . In response , BART released an official policy on cutting off cell phone service .

==== Library @-@ a @-@ Go @-@ Go ====

Since 2008 the district has been adding Library @-@ a @-@ Go @-@ Go book vending machines . The Contra Costa County Library machine was added to the Pittsburg / Bay Point station in 2008 . The \$ 100 @, @ 000 machine , imported from Sweden , was the first in the nation and was followed by one at the El Cerrito del Norte station in 2009 . Later in 2011 a Peninsula Library System machine was added at the Millbrae Station .

== Organization and management ==

==== Governance ====

The San Francisco Bay Area Rapid Transit District is a special district consisting of Alameda County , Contra Costa County , and the City and County of San Francisco . San Mateo County , which hosts six BART stations , is not part of the BART District . A nine @-@ member elected Board of Directors represents nine districts . BART has its own police force .

While the district includes all of the cities and communities in its jurisdiction , some of these cities do

not have stations on the BART system . This has caused tensions among property owners in cities like Livermore who pay BART taxes but must travel outside the city to receive BART service . In areas like Fremont , the majority of commuters do not commute in the direction that BART would take them ( many Fremonters commute to San Jose , where there is currently no BART service ) . This would be alleviated with the completion of a BART @-@ to @-@ San Jose extension project and the opening of the Berryessa Station in San Jose .

= = = Budget = = =

In 2005 , BART required nearly \$ 300 million in funds after fares . About 37 % of the costs went to maintenance , 29 % to actual transportation operations , 24 % to general administration , 8 % to police services , and 4 % to construction and engineering . In 2005 , 53 % of the budget was derived from fares , 32 % from taxes , and 15 % from other sources , including advertising , station retail space leasing , and parking fees . BART reported a farebox recovery ratio of 75 @. @ 67 % in February 2016 , up from 2012 's 68 @. @ 2 % . BART " train operators and station agents have a maximum annual salary of \$ 62 @, @ 000 with an average of \$ 17 @, @ 000 a year in overtime pay " . ( For its part , BART management claims that in as of 2013 , union train operators and station agents average about \$ 71 @, @ 000 in base salary and \$ 11 @, @ 000 in overtime annually , and also pay a \$ 92 monthly fee for health insurance . )

= = Comparison with other rail transit systems = =

BART , like other transit systems of the same era , endeavored to connect outlying suburbs with job centers in Oakland and San Francisco by building lines that paralleled established commuting routes of the region 's freeway system . The majority of BART 's service area , as measured by percentage of system length , consists of low @-@ density suburbs . Unlike the Chicago " L " or the London Underground , individual BART lines were not designed to provide frequent local service , as evidenced by the system 's current maximum achievable headway of 13 @. @ 33 minutes per line through the quadruple interlined section in San Francisco . Within San Francisco city limits , Muni provides local light rail surface and subway service , and runs with smaller headways ( and therefore provides more frequent service ) than BART .

BART could be characterized as a " commuter subway , " since it has many characteristics of a regional commuter rail service , somewhat similar to S @-@ Bahn services in Germany , Denmark , Austria and Switzerland , such as lengthy lines that extend to the far reaches of suburbia , with significant distances between stations . BART also possesses some of the qualities of a metro system in the urban areas of San Francisco and downtown Oakland ; where multiple lines converge , it takes on the characteristics of an urban metro , including short headways and transfer opportunities to other lines . Urban stations are as close as one @-@ half mile ( 800 m ) apart , and have combined 2 ½ - to 5 @-@ minute service intervals at peak times .

= = Incidents = =

= = = Automatic Train Control failure = = =

In the 1970s , three BART engineers developed concerns about the safety of the Automatic Train Control ( ATC ) system , but were unable to get their supervisors to consider them . Together , they went to the BART Board of Directors . An investigation started , and the BART management retaliated by firing the engineers . Investigation into the ATC and related design and management issues was still underway when , on October 2 , 1972 , a BART train overran a station due to ATC failure and injured several passengers . During the litigation process , the IEEE filed an amicus curiae brief in support of the engineers , and in 1978 the IEEE recognized the engineers with an ethics award . The " BART case " is now widely used in courses on engineering ethics .

= = = Fatal electrical fire = = =

In January 1979 , an electrical fire occurred on a train as it was passing through the Transbay Tube . One firefighter ( Lt. William Elliott , 50 , of the Oakland Fire Department ) was killed in the effort to extinguish the blaze . Since then , safety regulations have been updated .

= = = Death of worker James Strickland = = =

On October 14 , 2008 , track inspector James Strickland was struck and killed by a train as he was walking along a section of track between the Concord and Pleasant Hill stations . Strickland 's death started an investigation into BART 's safety alert procedures . At the time of the accident , BART had assigned trains headed in opposite directions to a shared track for routine maintenance . BART came under further fire in February 2009 for allegedly delaying payment of death benefits to Strickland 's family .

= = = Shooting of Oscar Grant III = = =

On January 1 , 2009 , a BART Police officer , Johannes Mehserle , fatally shot Oscar Grant III . Eyewitnesses gathered direct evidence of the shooting with video cameras , which were later submitted to and disseminated by media outlets and watched hundreds of thousands of times in the days following the shooting . Violent demonstrations occurred protesting the shooting .

Mehserle was arrested and charged with murder , to which he pleaded not guilty . Oakland civil rights attorney John Burris filed a US \$ 25 million wrongful death claim against the district on behalf of Grant 's daughter and girlfriend . Oscar Grant III 's father also filed a lawsuit claiming that the death of his son deprived him of his son 's companionship .

Mehserle 's trial was subsequently moved to Los Angeles following concerns that he would be unable to get a fair trial in Alameda County . On July 8 , 2010 , Mehserle was found guilty on a lesser charge of involuntary manslaughter . He was released on June 13 , 2011 and is now on parole .

= = = Shooting of Charles Hill = = =

On July 3 , 2011 , two officers of the BART Police shot and killed Charles Hill at Civic Center Station in San Francisco . Hill was allegedly carrying a knife .

On August 12 , 2011 , BART shut down cellphone services on the network for three hours in an effort to hamper possible protests against the shooting and to keep communications away from protesters at the Civic Center station in San Francisco . The shutdown caught the attention of Leland Yee and international media , as well as drawing comparisons to the former Egyptian president Hosni Mubarak in several articles and comments . Antonette Bryant , the union president for BART , added that , " BART have lost our confidence and are putting rider and employee safety at risk . "

Members of Anonymous broke into BART 's website and posted names , phone numbers , addresses , and e @-@ mail information on the Anonymous website .

On August 15 , 2011 , there was more disruption in service at BART stations in downtown San Francisco . The San Francisco Examiner reported that the protests were a result of the shootings , including that of Oscar Grant . Demonstrations were announced by several activists , which eventually resulted in disruptions to service . The protesters have stated that they did not want their protests to result in closures , and accused the BART police of using the protests as an excuse for disruption . Protesters vowed to continue their protests every Monday until their demands were met .

On August 29 , 2011 , a coalition of nine public interest groups led by Public Knowledge filed an Emergency Petition asking the U.S. Federal Communications Commission ( FCC ) to declare " that

the actions taken by the Bay Area Rapid Transit District ( ? BART ? ) on August 11 , 2011 violated the Communications Act of 1934 , as amended , when it deliberately interfered with access to Commercial Mobile Radio Service ( ? CMRS ? ) by the public " and " that local law enforcement has no authority to suspend or deny CMRS , or to order CMRS providers to suspend or deny service , absent a properly obtained order from the Commission , a state commission of appropriate jurisdiction , or a court of law with appropriate jurisdiction " .

In December 2011 BART adopted a new " Cell Service Interruption Policy " that only allows shutdowns of cell phone services within BART facilities " in the most extraordinary circumstances that threaten the safety of District passengers , employees and other members of public , the destruction of District property , or the substantial disruption of public transit service " . According to a spokesperson for BART , under the new policy the wireless phone system would not be turned off under circumstances similar to those in August 2011 . Instead police officers would arrest individuals who break the law .

In February 2012 , the San Francisco District Attorney concluded that the BART Police Officer that shot and killed Charles Hill at the Civic Center BART station the previous July " acted lawfully in self defense " and will not face charges for the incident . A federal lawsuit filed against BART in January by Charles Hill 's brother was proceeding .

In March 2012 , the FCC requested public comment on the question of whether or when the police and other government officials can intentionally interrupt cellphone and Internet service to protect public safety .

= = = Employee fatalities = = =

On the afternoon of October 19 , 2013 , a BART employee and a contractor , who were inspecting tracks , were struck and killed near Walnut Creek by a train being moved for routine maintenance . A labor strike by BART 's two major unions was underway at the time , which caused a significant disruption to Bay Area commuters ' daily lives and cost millions of dollars in lost productivity . The operator of the train was a BART manager and had been a train operator two decades prior .

= = = Berkeley Hills Tunnel breakdown = = =

On December 4 , 2013 , a BART train suffered mechanical braking problems and made an emergency stop in the Berkeley Hills Tunnel near Rockridge station . Eleven people were treated for smoke inhalation .