

Here is a very helpful description of the distinctions between the various rail modes by Thomas A. Rubin, CPA, CMA, CMC, CIA, CGFM, CFM, a mass transit consultant in Oakland, California. He served as Controller-Treasurer of the Southern California Rapid Transit District from 1989 until the SCRTD/LACTC merger that formed the Los Angeles County Metropolitan Transportation Authority in 1993. Prior to joining the SCRTD, he was a partner in and National Transit Services Director for Deloitte Haskins & Sells (now Deloitte & Touche). He earned his BSBA from the University of Nebraska-Lincoln and his MBA from Indiana University-Bloomington.

TAR: I start with a brief explanation, with the official FTA definitions of all transit modes following for anyone who wants it.

The terms, "heavy rail" and "light rail" have absolutely nothing to do with the weight of the vehicles; in fact, most light rail vehicles are significantly heavier than most heavy rail vehicles. There are a number of different stories about the origin and derivation of the light and heavy rail terms, and where they originated, but the general consensus is that the term "light rail" was created during the reinvention of the streetcar into what we now term light rail over three decades ago and the "light" referred to its carrying capacity, compared to the subway systems of the day (see reference to this in the FTA definition of "light rail" below).

To define by example, BART is "heavy rail." Caltrain and ACE are "commuter rail." Capital Corridor is NOT "commuter rail," it is "intercity rail" (which, by definition, is not transit and, therefore, the Bay Area and Sacramento lose over \$6 million a year in Federal "formula" funds).

To add a few other characterizes to the FTA descriptions below:

1. Heavy rail is always electrically powered, commuter rail can be electrically powered, and often is, particularly in the East, but can also be powered by freight railroad-style locomotives.
2. Heavy rail generally has all-day, evening, and weekend/holiday service at a fairly high level, commuter rail is very peak oriented, generally has relatively little, or even no, off-peak, evening, and weekend/holiday service.
3. Heavy rail has dedicated, totally grade-separated track (with two minor exceptions in the U.S.), commuter rail generally has many at-grade crossings.
4. Heavy rail generally has only a train operator on-board (some older systems still have a second employee who operates the doors); commuter rail almost always has conductors.
5. Heavy rail generally has fare gates and uses electronic passes, fare cards, tokens, or cash at the entry and sometimes exit points; commuter rail has manual tickets or passes, which are checked (sometimes electronically) – and often sold – by conductors. (LA MTA Red Line currently has a self-service, barrier free system with fare inspectors similar to what is now

common in U.S. light rail systems; the MTA Board, in one of its dumber decisions, has decided to replace this with a gated system similar to other U.S. heavy rail systems.)

6. Heavy rail generally has stations spaced approximately one mile apart; commuter rail stations are generally several miles apart on average.

7. Heavy rail average trip length is generally well under ten miles (BART, at 12.5 miles, is by far the longest in the U.S.; the NYC subway is 4.0), most commuter rail systems have average trip lengths over 20 miles and over 30 miles is common.

8. Heavy rail systems are all at least two-track; many commuter rail lines are single track for significant portions of their alignments.

9. Heavy rail headways are generally no longer than three to five minutes during peak periods and generally less than 15 minutes any time the system is operating; commuter rail peak service is rarely under 20 minute headways during peak (during the peak of the peak, Caltrans gets down to about 15 minutes at some stations, if you count all the trains on the different stop configurations) and often one hour or longer off-peak.

10. Heavy rail track is used ONLY by heavy rail trains and the heavy rail system always owns the track; commuter rail systems frequently share track with freight railroads and Amtrak, including sometimes during the middle of the day. The commuter rail system may or may not own all, or even any, of the track it operates on.

It is not always totally black-and-white which mode a particular service falls under. For example, there are now at least three light rail systems in the U.S. (New Jersey Transit "River Line," North San Diego County "Sprinter," and Portland Tri-Met "WES") that are operating with diesel multiple units (aka, "railbus"), without any electric catenary, on what used to be – and still is, sometimes – freight railroad lines, with very long headways – which are all characteristics of commuter rail. The Los Angeles MTA's Green Line is totally grade separated, which makes its operation very much like heavy rail systems, but is treated as light rail.

The San Juan Tren Urbano is very much like the Green Line in many ways – a grade-separated urban rail system – and even operates with what were originally light rail vehicles, which had their pantographs replaced with paddles, and the juice is delivered via a third rail, rather than a catenary – but it is defined as heavy rail.

Here are the "official" Federal Transit Administration definitions of various transit modes (the references are to the detailed National Transit Database reporting instructions at the same website for those having real trouble getting into their morning naps):

Aerial Tramway (TR) Mode

A transit mode that is an electric system of aerial cables with suspended powerless passenger vehicles. The vehicles are propelled by separate cables attached to the vehicle suspension system and powered by engines or motors at a central location not on-board the vehicle.

Reporting manual reference: B-10, MR-10, S&S Introduction, S&S-10

Alaska Railroad (AR)

In recognition of the special Federal relationship with the Alaska railroad (AR), a segment of the passenger service portion of the Alaska railroad (AR) is considered to be eligible for certain FTA funding under the Fixed Guideway Modernization program. The service encompasses only those lines operating within the Anchorage, Alaska, urbanized area (UZA) where passenger service is provided and only includes car miles for passenger cars; car miles for freight cars are specifically excluded. Reporting manual reference: B-10, MR-10, S&S Introduction, S&S-10, RU-10

Automated Guideway (AG) Transit

A transit mode that is an electric railway (single or multi-car trains) of guided transit vehicles operating without vehicle operators or other crew onboard the vehicle. Service may be on a fixed schedule or in response to a passenger activated call button. Automated guideway (AG) transit includes personal rapid transit, hroup rapid transit, and people mover systems. Reporting manual reference: B-10, MR-10, S&S Introduction, S&S-10, RU-10

Bus (MB)

A transit mode comprised of rubber-tired passenger vehicles operating on fixed routes and schedules over roadways. Vehicles are powered by diesel, gasoline, battery, or alternative fuel engines contained within the vehicle. Reporting manual reference: B-10, MR-10, S&S Introduction, S&S-10, RU-20

Cable Car (CC)

A transit mode that is an electric railway with individually controlled transit vehicles attached to a moving cable located below the street surface and powered by engines or motors at a central location, not onboard the vehicle. Reporting manual reference: B-10, MR-10, S&S Introduction, S&S-10, RU-10

Commuter Rail (CR)

A transit mode that is an electric or diesel propelled railway for urban passenger train service

consisting of local short distance travel operating between a central city and adjacent suburbs. Service must be operated on a regular basis by or under contract with a transit operator for the purpose of transporting passengers within urbanized areas (UZAs), or between urbanized areas and outlying areas. Such rail service, using either locomotive hauled or self-propelled railroad passenger cars, is generally characterized by multi-trip tickets, specific station to station fares, railroad employment practices, and usually only one or two stations in the central business district.

It does not include heavy rail (HR) rapid transit, or light rail (LR) / streetcar transit service. Intercity rail service is excluded, except for that portion of such service that is operated by or under contract with a public transit agency for predominantly commuter services. Predominantly commuter service means that for any given trip segment (i.e., distance between any two stations), more than 50 percent of the average daily ridership travels on the train at least three times a week. Only the predominantly commuter service portion of an intercity route is eligible for inclusion when determining commuter rail (CR) route miles. Reporting manual reference: B-10, MR-10, S&S Introduction, S&S-10, S&S-40, RU-10

Demand Response (DR)

A transit mode comprised of passenger cars, vans or small buses operating in response to calls from passengers or their agents to the transit operator, who then dispatches a vehicle to pick up the passengers and transport them to their destinations. A demand response (DR) operation is characterized by the following a) the vehicles do not operate over a fixed route or on a fixed schedule except, perhaps, on a temporary basis to satisfy a special need, and b) typically, the vehicle may be dispatched to pick up several passengers at different pick-up points before taking them to their respective destinations and may even be interrupted en route to these destinations to pick up other passengers.

The following types of operations fall under the above definitions provided they are not on a scheduled fixed route basis:

- Many origins — many destinations
- Many origins — one destination
- One origin — many destinations, and
- One origin — one destination.

Reporting manual reference: B-10, MR-10, S&S Introduction, S&S-10, RU-10

Ferryboat (FB)

A transit mode comprised of vessels carrying passengers and / or vehicles over a body of water that are generally steam or diesel powered.

Intercity ferryboat (FB) service is excluded, except for that portion of such service that is operated by or under contract with a public transit agency for predominantly commuter services. Predominantly commuter service means that for any given trip segment (i.e., distance between any two piers), more than 50 percent of the average daily ridership travels on the ferryboat on the same day. Only the predominantly commuter service portion of an intercity route is eligible for inclusion when determining ferryboat (FB) route miles. Reporting manual reference: B-10, MR-10, S&S Introduction, S&S-10, RU-10

Heavy Rail (HR)

A transit mode that is an electric railway with the capacity for a heavy volume of traffic. It is characterized by high speed and rapid acceleration passenger rail cars operating singly or in multi-car trains on fixed rails, separate rights-of-way (ROW) from which all other vehicular and foot traffic are excluded, sophisticated signaling, and high platform loading. Reporting manual reference: B-10, MR-10, S&S Introduction, S&S-10, RU-10

Inclined Plane (IP)

A transit mode that is a railway operating over exclusive right-of-way (ROW) on steep grades (slopes) with powerless vehicles propelled by moving cables attached to the vehicles and powered by engines or motors at a central location not onboard the vehicle. The special tramway type of vehicles have passenger seats that remain horizontal while the undercarriage (truck) is angled parallel to the slope. Reporting manual reference: B-10, MR-10, S&S Introduction, S&S-10, RU-10

Intercity Bus (IB)

Regularly scheduled public service using an over-the-road bus that operates with limited stops between two urbanized areas or connecting rural areas to an urbanized area. Intercity bus mode should only be used by private, intercity bus providers. Reporting manual reference: RU Introduction, RU-20

Jitney (JT)

A transit mode comprised of passenger cars or vans operating on fixed routes (sometimes with minor deviations) as demand warrants without fixed schedules or fixed stops. Reporting manual reference: B-10, MR-10, S&S Introduction, S&S-10, RU-10

Light Rail (LR)

A transit mode that typically is an electric railway with a light volume traffic capacity compared to heavy rail (HR). It is characterized by passenger rail cars operating singly (or in short, usually two car, trains) on fixed rails in shared or exclusive right-of-way (ROW), low or high platform loading, and vehicle power drawn from an overhead electric line via a trolley or a pantograph. Reporting manual reference: B-10, MR-10, S&S Introduction, S&S-10, RU-10

(TAR: As far as FTA is concerned, streetcar is now part of light rail mode and is reported as such. To subdivide, streetcars generally operate in mixed traffic lanes – you can literally have a car in a lane, followed by a streetcar, followed by a bus, all going over exactly the same territory on the street, while light rail generally has a unique alignment – even when light rail lines are literally in the middle of a street, there are usually physical barriers and traffic laws that prohibit “rubber tire” vehicles from running where the streetcar is – and there may not be pavement there, either. Streetcars almost always run as single-car trains, while light rail is generally operated as two-car trains, three-car trains are not uncommon, and there are even some four-car trains. Streetcar trains have to be short because they are sharing the lanes with “rubber tire” vehicles

and, therefore, it can never be known when a longer train would not be able to cross a street without blocking it when it couldn't move far enough towards the next street with a traffic signal. Since light rail doesn't share lanes, the maximum train length is determined by the minimum block length on the route.)

Monorail (MO)

A transit mode that is an electric railway of guided transit vehicles operating singly or in multi-car trains. The vehicles are suspended from or straddle a guideway formed by a single beam, rail or tube. Reporting manual reference: B-10, MR-10, S&S Introduction, S&S-10, RU-10

Publico (PB)

A transit mode comprised of passenger vans or small buses operating with fixed routes but no fixed schedules. Publicos (PB) are a privately owned and operated public transit service which is market oriented and unsubsidized, but regulated through a public service commission, state or local government. Publicos (PB) are operated under franchise agreements, fares are regulated by route and there are special insurance requirements. Vehicle capacity varies from eight to 24, and the vehicles may be owned or leased by the operator. Reporting manual reference: B-10, MR-10, S&S Introduction, S&S-10, RU-10

Trolleybus (TB)

A transit mode comprised of electric rubber-tired passenger vehicles, manually steered and operating singly on city streets. Vehicles are propelled by a motor drawing current through overhead wires via trolleys, from a central power source not onboard the vehicle. Reporting manual reference: B-10, MR-10, S&S Introduction, S&S-10, RU-10

Vanpool (VP)

A transit mode comprised of vans, small buses and other vehicles operating as a ride sharing arrangement, providing transportation to a group of individuals traveling directly between their homes and a regular destination within the same geographical area. The vehicles shall have a minimum seating capacity of seven persons, including the driver. For inclusion in the NTD, it is considered mass transit service if it is operated by a public entity, or is one in which a public entity owns, purchases, or leases the vehicle(s). Vanpool(s) (VP) must also be in compliance with mass transit rules including Americans with Disabilities Act (ADA) provisions, and be open to the public and that availability must be made known. Other forms of public participation to encourage ridesharing arrangements, such as the provision of parking spaces, use of high occupancy vehicle (HOV) lanes, and coordination or clearing house service, do not qualify as public vanpools. Reporting manual reference: B-10, MR-10, S&S Introduction, S&S-10, RU-10