



Light Rail Is Not Rapid Transit A White Paper

If you are like many, you hear the term "rapid transit" and think of RTD's light rail. In some towns in Colorado, you hear the term "rapid transit" and think of AMTRAK. In the ski areas, you might here the term "rapid transit" and think of the monorail. All three impressions are wrong. Rapid transit is as different from light rail and trains, as night is from day.

Geographic Extent Covered

Trains, such as AMTRAK, traditionally supply transportation between states. One train that arrives at Union Station in Denver daily, for example, is the AMTRAK train from Oakland in California to Denver.

Light rail, such as that installed by RTD, traditionally carries passengers within a city or a small transportation district. The new line being constructed between Littleton and Union Station is an example of a light rail line.

Rapid transit is positioned between the two. Rapid transit connects urban centers to major population centers, sports centers, and business centers. A rapid transit line between Boulder (downtown and CU stadium stops) and Denver (Union Station and Mile High stops) would be one example of a rapid transit line.

Car Sizes and System Capacity

AMTRAK trains run on tracks that are 4'-10" wide, which helps stabilize cars for a smooth and safe ride. Cars are wide enough so full, comfortable seats can be placed two on each side facing forward, with enough room in the aisle for a conductor to collect tickets. Because trips by train often exceed eight hours in length, dining cars, and room to walk or sleep are provided. In general advance reservations must be made to secure a ride on a train.

Light rail runs on tracks that are 3'-4" in width. That width allows cars to be narrow enough to share streets with traffic. Two seats can be placed in each side, both pairs facing forward, but they must be narrow to allow for a standing-room aisle. Light rail cars can hold about 50 passengers seated, or 75 seated and standing. Light rail usually runs two cars per train, but can run four cars when stations are enlarged. A four car light rail train can carry 300 passengers per train maximum. With ten minute headway (time between trains) light rail can carry 1800 passengers per hour.

Rapid transit runs on tracks that are 5'-6" in width, which provides stability and safety at high speeds. Cars are wide enough for full comfortable seats to be placed two on each side facing forward, with enough room in the aisle for passengers to pass each other, or for passengers to stand back to back when all seats are occupied and standing room is full. A rapid transit car carries 75 seated passengers or 150 seated and standing. Rapid transit trains are typically limited to a maximum of ten cars, so the maximum capacity of rapid transit train is 1500 passengers. With 10 minutes headway, rapid transit can carry 9000 passengers per hour.

Cost of Capital Construction

AMTRAK runs on tracks that were installed by other railroads, so cannot be compared. It should be noted, however, that those railroad tracks, in many cases, have existed for over 100 years without need for major expansion or reconstruction.

Light rail costs \$20 million dollars per mile on average to construct its track with associated stations and parking. Where track runs on an exclusive right-of-way (does not share roads) that track should last for a century without major expansion or reconstruction. Where track shares roadways with traffic, that track will degrade more rapidly because of a poor track bed and because of periodic highway maintenance. The life cost for light rail can be \$200,000 per mile per year.

Rapid transit is constructed on a totally exclusive right-of-way. Its tracks should last for a century without major expansion or reconstruction. Even though rapid transit costs \$40 to \$60 million per mile, its long life makes it a sound investment. The life cost for rapid transit can be \$400,000 per mile per year.

To complete the picture, consider "bus rapid transit." Two special lanes are constructed down the middle of the freeway and buses run along that corridor stopping at special stations. Those lanes only cost about \$8 million per mile to construct. But consider that a freeway has a life on average of ten years (the time between major lane additions, or reconstruction). Over one hundred years those bus lanes will be reconstructed ten times. The life cost for bus-rapid-transit can be \$800,000 per mile per year.



Rapid Transit is Safe

AMTRAK trains wreck periodically. They do so because AMTRAK trains run on track provided by other railroad companies. A Florida bound AMTRAK train derailed because it was using improperly maintained tracks owned by the BNSF railroad company. A California bound AMTRAK train collided with a freight car because AMTRAK shares tracks with freight trains.

A light rail train in Denver hit and killed a 12 year old girl and an elderly woman in a wheel chair. It did so because light-rail shares surface roads with automobiles and pedestrians.

Rapid Transit runs on an exclusive right of way that is entirely district owned. Rapid Transit maintains its own tracks so avoids track failure. Rapid Transit runs only its own trains on its own track, so cannot collide with other types of trains. Rapid Transit is totally isolated from roads and pedestrian ways, so cannot collide with other traffic or pedestrians.

In addition, Rapid Transit has its own district police force. It is able to patrol its trains and insure rider safety no matter through which towns or counties the train travels.

Rapid Transit is Fast

AMTRAK runs what are called Diesel/Electric trains. One or two engines pull a long line of passive cars. Here in the west, AMTRAK runs low speed trains and can only average 40mph on its run through Colorado. The AMTRAK trip from Grand Junction to Denver, for example, takes 9 hours.

Light rail uses overhead electric cables to power each car separately. Light rail runs on narrow gauge tracks, so can only average 55mph on its limited sections of exclusive right of way. If light rail were to run from Denver to Fort Collins, such a trip would take 1-1/2 hours.

Rapid Transit is powered by an electric third rail. Rapid transit runs on wide gauge rail, so can safely average speeds of 80 to 110mph. If rapid transit were to run from Denver to Fort Collins, such a trip might only take 45 minutes, and could take as little as 30 minutes.

Rapid Transit is Proven

Rapid Transit must not be confused with the mountain monorail. The two are completely different.

The mountain monorail plans to employ a linear induction motor to power 20 car trains on a single inverted 'T' style monorail. No system of this kind has been built anywhere in the world to date. Because the system is untested and un-built, the proponents of the monorail solution tout speeds that seem unbelievable.

Rapid Transit uses widely spaced rails with an electrified third rail. Identical systems have been running in the San Francisco area and the Washington, DC area for over 40 years. No new technology needs to be developed. Trains in Japan and Europe have solved the problem of over 200mph train travel, and those same solutions can be easily applied to a Colorado Rapid Transit solution. Proven technology not wrongfully surprise the public.

Rapid Transit is Needed Now

When BART was built in the San Francisco Bay Area, the population density at that time was very similar to what the population of the Front Range is now. As the population in the Bay Area grew, many more miles of track were added to BART. With the continued growth in the Bay Area, BART is now running at near capacity and is considering adding new lines and new bay tunnels to increase capacity.

If a rapid transit district were formed in Colorado today, it would take 4 or more years to develop a plan, a budget, and a proposal to fund the project. Construction would probably not start for 6 to 10 years following establishment of the district. Once construction starts, a district covering the front range from Fort Collins to Pueblo, and from the airport to Glenwood Springs would take 20 to 30 years to complete.

Most major studies concerning the transportation needs of this area conclude that high-speed rail will be needed no sooner than the year 2020. Clearly a vision that includes Rapid Transit needs to be formed now. If such a system were to begin today, the first trains on it might begin to run by 2010, and a significant part of the need high speed rail could be in place by 2020, when it is expected to be first needed.