

SCENARIOS DETAILS: DEVELOP PREMIUM SERVICES

LIGHT RAIL TRANSIT (LRT)

Light rail transit (LRT) is electric urban rail service that typically operates in exclusive rights-of-way. Most often, it uses one to three car trains and is designed to serve high volume corridors at higher speeds than a local bus or streetcar service. Design and operational elements of LRT include level boarding, off-board fare payment, and traffic signal priority. Stations are typically spaced farther apart than those of local transit services and are usually situated where there are higher population and employment densities. While longer stop spacing can increase walking distances for some riders, people are typically willing to walk farther to reach transit if service is fast and frequent.

LRT is popular with passengers for a number of reasons, the most important of which are that service is fast, frequent, direct, and operates from early morning to late night. These attributes make service more convenient—much more convenient than regular bus service—and more competitive with travel by automobile. A key reason that service is fast is the use of exclusive rights-of-way—exclusive lanes in the medians of roadways, in former rail rights-of-way, and in subways—and that stations are spaced further apart than with bus service, typically every half mile (although stations are often spaced more closely within downtown areas). Characteristics of LRT service include:

- **Frequent service**, typically every 10 minutes or better
- **Long span of service**, often 18 hours a day or more
- **Direct service** along major corridors
- **Fast service**

LRT offers high-quality service that provides some of the flexibility of bus systems with many of the attractive features of rail systems. These elements include special vehicles, exclusive running ways or grade-separated right-of-way, transit signal priority, LRT stations with amenities and level boarding, and pre-paid fare collection. These measures work together to make service fast and reliable, to make it convenient and comfortable, and to establish a strong customer demand for service. For additional information on light rail service, see nMotion2015.com/wp-content/uploads/2015/10/nMotion-LRT-151012_FINAL.pdf.

FIGURE 1 | MAX LIGHT RAIL (PORTLAND, OR)



THE T LIGHT RAIL (PITTSBURGH, PA)



Key elements of light rail service include:

- **Special Vehicles** that provide greater comfort, run on electricity (with overhead catenary wires and poles), have a greater carrying capacity, and can reach higher speeds (65 mph) than regular buses.
- **Exclusive Running Ways** that allow light rail vehicles to run on tracks. This may be either dedicated right-of-way on existing roads or a grade-separated, off-street right-of-way. Depending on the topographic conditions of the corridor, a light rail system can be engineered to run through tunnels, above ground, and at street level to best optimize route performance.
- **Transit Signal Priority** to reduce delays at traffic signals.
- **Attractive Stations** that provide an attractive and comfortable place to wait.
- **Level Boarding** through the use of high-platform stations to reduce dwell times and facilitate boardings and alightings by people with disabilities.
- **Pre-Paid Fare Collection** via either pre-paid passes or the sale of tickets from ticket vending machines at stations and stops eliminates delays associated with on-board fare collection.
- **Real Time Passenger Information** to inform passengers when the light rail vehicle will actually arrive or depart from stations, which reduces much of the uncertainty that is associated with transit service.
- **Effective Connections** with other transit and surrounding areas.

Note, however, that the development of light rail would also include some changes that some passengers may not like:

- Many bus routes that now operate near LRT lines would be converted from downtown routes to LRT feeder routes. Thus, some riders who now have one-seat rides would instead need to transfer to and from LRT. The specific routes that would be converted to feeders have not been determined as part of scenario development, but this is how all light rail lines are developed, and the same would be the case with the development of light rail in Nashville.
- Stops would be spaced significantly farther apart than with existing bus routes. Most riders prefer longer walks to faster service to shorter walks to slower service, but not all do.
- Light rail vehicles are electric vehicles that powered by an overhead catenary system (overhead wires). This infrastructure is widely accepted; however, some consider the overhead wires to be unsightly.

Overall, most riders and potential riders prefer light rail to BRT, Rapid Bus, and regular bus. However, as with any potential change, some riders may prefer existing bus services for the reasons described above.

SUMMARY OF SCENARIO SERVICES

Light rail service is only included in Scenario 1. The lines that would be light rail in Scenario 1 would be BRT in Scenario 2 and Rapid Bus in Scenario 3 (see Table 1).

TABLE 1 | LIGHT RAIL SERVICE BY SCENARIO

Route/Corridor	Scenario 1 Comprehensive Regional System	Scenario 2 Bus-Focused Expansion	Scenario 3 Modest Improvements
12 Nolensville Pike	LRT	BRT	Rapid Bus
50 Charlotte Pike	LRT	BRT	Rapid Bus
55 Murfreesboro Pike	LRT	BRT	Rapid Bus
56 Gallatin Pike	LRT	BRT	Rapid Bus

Note: On maps, the route numbers include a suffix if they are light rail (L), BRT (B), or Rapid Bus (R). For example, Route 12 Nolensville is light rail in Scenario 1 and labeled as Route 12L, BRT in Scenario 2 and labeled as 12B, and Rapid Bus in Scenario 3 and labeled as 12R.

SCENARIO 1: COMPREHENSIVE REGIONAL SYSTEM

Scenario 1 includes a network of 20 High Capacity Transit (HCT) routes, four of which would be light rail lines (see Figure 2):

- Route 12L Nolensville light rail in the Nolensville Pike corridor
- Route 50L Charlotte light rail in the Charlotte Pike corridor
- Route 55L Murfreesboro light rail in the Murfreesboro Pike corridor
- Route 56L Gallatin light rail in the Gallatin Pike corridor

Light rail would operate frequently and for long hours (see Table 2).

TABLE 2 | SCENARIO 1 LIGHT RAIL LEVELS OF SERVICE

	Span of Service	Service Frequencies (Minutes)			
		Peak	Midday	Evening	Early/Late
Light Rail					
Weekday	5 AM – 1 AM	10	10	10	20
Saturday	5 AM – 1 AM	15	15	15	30
Sunday	6 AM – 11 PM	15	15	15	30

Note: Peak = approximately 6 AM to 8:30 AM and 3:30 PM to 6:00 PM, Midday between those times, Evening from 6 PM to 11 PM, and Early/Late before 6 AM and after 11 PM.

SCENARIO 2: BUS-FOCUSED EXPANSION

In Scenario 2, the four lines that would be light rail in Scenario 1 would be BRT. See the BRT Scenario Details paper for more information.

SCENARIO 3: MODEST IMPROVEMENTS

In Scenario 3, the four lines that would be light rail in Scenario 1 would be Rapid Bus. See the Rapid Bus Scenario Details paper for more information.

FIGURE 2 | SCENARIO 1 METRO AREA BRT SERVICES (PLUS LIGHT RAIL AND RAPID BUS)

