CAPITAL METRO

ALL SYSTEMS GO!

Capital Metropolitan Transportation Authority 2910 East Fifth Street Austin, Texas 78702

Draft
Transit Technologies for Austin Circulator Routes

Introduction

The purpose of this report is to identify candidate technologies to be considered in the All Systems Go Future Connections Study for the identified initial corridor. The next phase of this study will involve a detailed analysis of alternatives within the corridor, identifying both specific routes and specific technology for each section of the corridor.

To date, the study area, goals and objectives, and connection needs have been developed through a community-driven process. Based on those goals and objectives, characteristics of the study area, and the community's connection needs, an initial corridor for analysis has been identified. At this point, some types of transit technologies can be identified as being more appropriate for that corridor and as meeting those goals better. These candidate technologies will be considered for further study.

Background

The purpose of the All Systems Go Future Connections Study is to develop the preferred transit option(s) to provide circulation services within Central Austin. In particular, this study seeks to identify transit services that meet the following goals:

1. **Improve Place Connectivity**
2. **Improve Transit Connectivity**
3. **Improve Circulation within Central Austin**
4. **Maximize Community Benefits**
5. **Maximize Accessibility**
6. **Maximize Environmental Benefits**
7. **Maximize Economic Benefits for the Community**

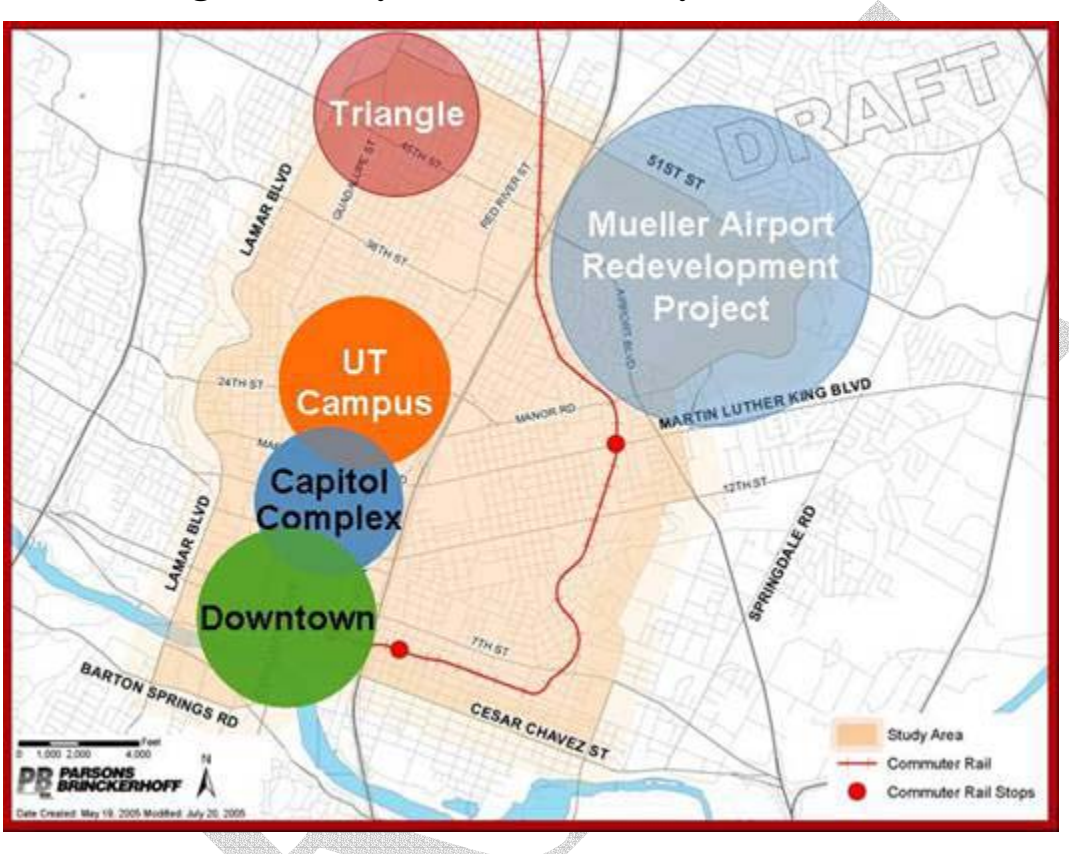
Through a public process, the All Systems Go Future Connections Study has identified a study area as shown in Figure 1. The study area can generally be described as bounded by Barton Springs Road/Congress Avenue/ César Chávez Street on the south; 51st Street on the north; Lamar Boulevard on the west; and Pleasant Valley Road/Webberville Road/ Airport Boulevard/Manor Road on the east. The study area lies entirely within the Austin city limits.

The study area encompasses the most dense employment, residential, educational, and cultural centers within the region, including:

- The central business district (CBD), or Downtown Austin
- The State Capitol Complex
- The University of Texas at Austin main campus

In addition to existing major destinations, two significant emerging population and employment centers are in the study area: Mueller Airport Redevelopment Site (Mueller) and the Triangle development. Both of these sub-areas are planned as transit oriented developments.

Figure 1 Study Area and Primary Destinations



Functional Characteristics of Circulator Routes

The future transit system in Austin will need special purpose routes linking new services—Urban Commuter Rail and Rapid Bus— to major activity centers. In addition, the major centers within Central Austin need to have good circulation linkages. The trips on these circulation services will be of short to medium length, and may include many trips by passengers who did not previously use transit. Passengers served by these special-purpose circulator routes will represent both local residents of the Capital Metro service area as well as regional residents making connections between the regional or suburban services and one of the primary destinations within the study area.

The characteristics required of a circulator technology include:

- Moderate maximum speed – high speed is not needed because of the short distances between stops, operating on-street and in mixed traffic, and the nature of neighborhoods being served.

- Moderate capacity, because passenger peak loads are not likely to be extremely high and should be well distributed along the route.
- Convenient, quick boarding and alighting including efficient means of fare payment. Passengers will be attracted by these features and operating efficiency will be enhanced.
- Good acceleration and braking, to minimize travel time for the anticipated station spacing, and to provide safety wherever the route may entail exposure to other traffic or pedestrians.
- Attractive, distinctive vehicles offering a quiet, comfortable ride. The service should be easy to recognize, and minimize noise impacts.

These characteristics tend to eliminate some transit technologies for meeting the study's goals and objectives. Other technologies can be eliminated due to cost and physical constraints.

Transit Technologies

Transit technologies are defined by the vehicle and the guideway. Some vehicles require specific guideway characteristics; others can operate in more than one type of guideway. The four basic types of guideway are shown in Figure 2:

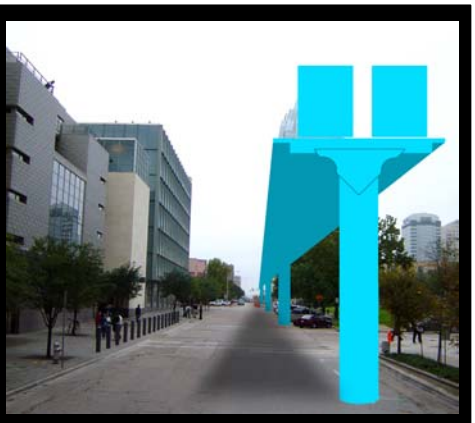
- **Elevated Reserved Guideway**
- **In-Street Non-Reserved Guideway**
- **In-Street Reserved Guideway**
- **Tunnel Reserved Guideway**

For any transit vehicle, the ideal right-of-way is the tunnel guideway – entirely separated from other traffic and out of the weather—because this provides the greatest efficiency in terms of transit operations. Any dedicated guideway promotes safety and offers unimpeded movement of the transit vehicles. However, the tunnel option is the most expensive option, especially in urban areas such as Central Austin. Any dedicated guideway will cost more where there is development intensity; generally, in these areas, a separated guideway will require either an underground or an elevated system. Elevated transit is typically two to three times more expensive than surface transit, and underground transit is likely to be two to three times more expensive than elevated.

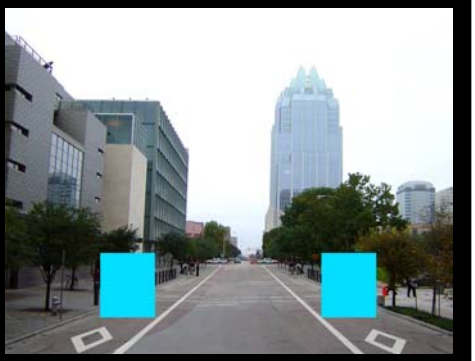
In the proposed corridor, there are physical impediments to successfully deploying either an elevated or tunnel reserved right-of-way. This impediment is Interstate 35 between 15th Street and 51st Street. In this portion of I-35, the highway is double decked, with freeway lanes elevated above the natural ground surface and freeway lanes below the natural ground surface. An elevated guideway across this barrier would likely have to span the elevated freeway lanes, necessitating a very long approach track. Similarly, a tunnel would have to pass well beneath the depressed freeway lanes, placing the transit service deep underground.

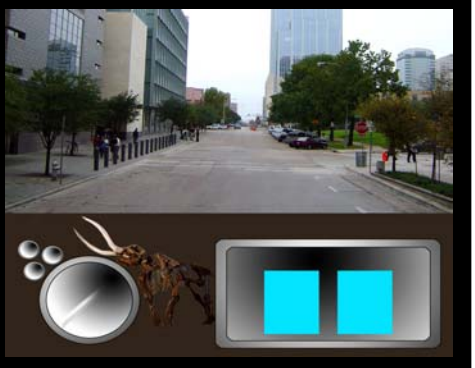
Both the elevated and the tunnel options would make the proposed system less accessible for the average user as well as for persons with disabilities. These factors do not meet the goals and objectives of the All Systems Go Future Connections Study. Furthermore, the extreme construction techniques that would likely be necessary to accomplish an elevated or tunnel crossing of I-35 in the vicinity of the identified priority corridor would increase costs substantially. This extra cost is not considered financially feasible. In addition, significant public opposition to the introduction of elevated transit structures in certain areas has been noted in public comments. Systems requiring exclusive or reserved right-of-way are at least problematic in Central Austin. There are no known rights-of-way not already dedicated to street use, and street capacities are regarded as critical in most

locations, to the extent that it would be difficult to reserve lanes for the exclusive use of transit vehicles. Hence, an at-grade reserved guideway approach for implementation of transit technologies within the identified study area and proposed priority corridor is infeasible at this time. There may be some sections of the circulation service that can operate within a reserved right-of-way; the circulation system as a whole cannot do so. Vehicles that require reserved guideways are not appropriate for this service.


Elevated Reserved ROW


In-Street Non-Reserved ROW


In-Street Reserved ROW


Tunnel Reserved ROW

Eliminated Technologies

The inherent characteristics required of a circulator system, plus cost reasonableness, indicate that the following transit technologies should not be studied further for circulation service:

- Automated guideway transit, which requires total separation from pedestrians and other traffic;
- Manually operated special-guideway transit, such as monorail, which requires total separation from pedestrians and other traffic;
- Heavy rail rapid transit, which requires total grade separation and provides unneeded high capacity and speed, at high cost;
- Commuter rail which operates mainly on existing railroad rights-of-way and typically lacks the acceleration, deceleration, maneuverability and ease of boarding/alighting needed in a circulator system (note: the exception may be in limited applications where the Diesel Multiple Unit vehicle may serve as an extension of the existing system being implemented by Capital Metro); and
- Light rail transit, which usually operates in a reserved right-of-way, often at speeds higher than would be useful in this circulator application with less maneuverability.

Recommended Technologies

The following transit technologies will be analyzed further because they can satisfy the basic requirements:

- operating in shared right-of-way,
- providing the required capacity,
- allowing convenient, quick boarding and alighting of passengers, and,
- having the needed performance capability.

Three technologies are recommended for further analysis.

Streetcar is a fixed-guideway technology similar to light rail but usually with smaller vehicles and lower maximum speed capability, and most often employed as a transit operation in mixed traffic. Track construction may be simpler and cheaper than normally employed for light rail, and involve shallower excavation of the street.

"Better Bus" is a technology offering enhanced convenience to passengers by incorporating a variety of features distinguishing it from traditional bus, including, for example, employment of intelligent transportation system (ITS) technologies and other priority measures to minimize delay, use of special stops or stations to distinguish the service and add visibility (prominence) to the route, and the use of special, distinctive vehicles, possibly with added passenger amenities.

Traditional Bus is a familiar technology with the required characteristics. As a circulator service, this technology would operate as a special-purpose service, such as a shuttle, offering frequent service, using traditional traffic lanes and signals, with distinctive signage and buses.

These three modes will be evaluated for the circulation routes within the identified corridor. In addition, there may be particular opportunities to extend the Urban Commuter Rail system to meet specific needs. This study also recognizes that multiple transit modes may operate within the same corridor as well as consider the use of dual-powered vehicle options. The analysis will include exploring the feasibility of operating more than one type of vehicle on the same tracks as part of the analysis of the streetcar technology option.

In addition to analyzing the technology and route options, the study will explore the need for and feasibility of transit centers. In some locations, it may be desirable to have a facility that allows multiple transfer options at the same time. A transit center, whether a designated part of the curb lane on a street or an off-street facility, can improve service significantly in some circumstances.

Conclusion

In light of the goals and objectives of the Future Connections Study, as well as the physical/financial constraints imposed by the configuration of Interstate 35 in the study area, there are three technologies that will be analyzed further in this study. In addition, the feasibility and desirability of a transit centers will be studied as part of determining the best circulation services for the Central Austin study area.