3. Route Definition and Evaluation

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3. Route Definition and Evaluation

Route Alternatives Evaluation Process

The first step in the *Central Austin Transit Study* is the conceptual evaluation of alternative routes and alternative vehicle (or modal) technologies. This chapter addresses the **routes** and Chapter 4 considers the **technologies**. The conceptual alternatives recommended by Chapters 3 and 4 are advanced to the detailed evaluation of **investment alternatives** in Chapter 5.

The process for evaluating route alternatives consists of: establishing the evaluation criteria, defining the alternatives, and systematically evaluating the alternatives according to the criteria. At the conclusion of this chapter is the recommended **alignment**, drawn from the highest ranked routes.

Route Alternatives Evaluation Criteria

At the conceptual level, route options were evaluated according to each of the six overall goals, previously described in greater detail in Chapter 2:

1. ***Improve Place Connectivity***
2. ***Improve Transit Connectivity***
3. ***Improve Mobility***
4. ***Maximize Community Benefits***
5. ***Maximize Environmental Benefits***
6. ***Maximize Economic Benefits***

The scoring criteria established for each goal ranges from 1 to 3 based upon how well a route alternative can meet each stated goal, with a score of 1 indicating a neutral or minimal response to the goal and a score of 3 indicating that a corridor is able to respond well to the goal. Table 3-1 details the scoring and criteria for each goal.

Table 3-1. Goals and Scoring Methodology for Conceptual Route Evaluation

Goal	Scoring & Criteria	
1. Improve Place Connectivity	3 =	Connects primary destination to another primary destination.
	2 =	Connects primary destination to existing or future population concentration.
	1 =	Neutral/minimally meets goal.
2. Improve Transit Connectivity	3 =	Connects to major/regional transit facility.
	2 =	Improves access to transit.
	1 =	Neutral/minimally meets goal.
3. Improve Mobility	3 =	Improves access in/out of Central Austin.
	2 =	Improves access along/parallel to a well-travelled corridor.
	1 =	Neutral/minimally meets goal.
4. Maximize Community Benefits	3 =	Support and provide opportunities to build community through placemaking.
	2 =	Provides access for socio-economically disadvantaged population.
	1 =	Neutral/minimally meets goal.
5. Maximize Environmental Benefits	3 =	Maximizes potential for compact, mixed-use development.
	2 =	Along/parallel to a well-travelled corridor.
	1 =	Neutral/minimally meets goal.
6. Maximize Economic Benefits	3 =	Maximizes development potential (community benefit).
	2 =	Along/parallel to a well-travelled corridor (user benefit).
	1 =	Neutral/minimally meets goal.

Route Alternatives Definition

The Central Austin population, employment, educational, and commercial activity centers – Mueller Redevelopment, University of Texas, CBD, Capitol Complex, East Riverside Corridor, and ABIA – used to establish the study area represent the key destinations in need of connection and corridor development. As initiated in the 2006 CMTA *Future Connections Study – Central Austin Circulator – Alternatives Evaluation,* connection needs within the study area were identified according both to historical travel patterns and to the study's six overall transportation investment goals.

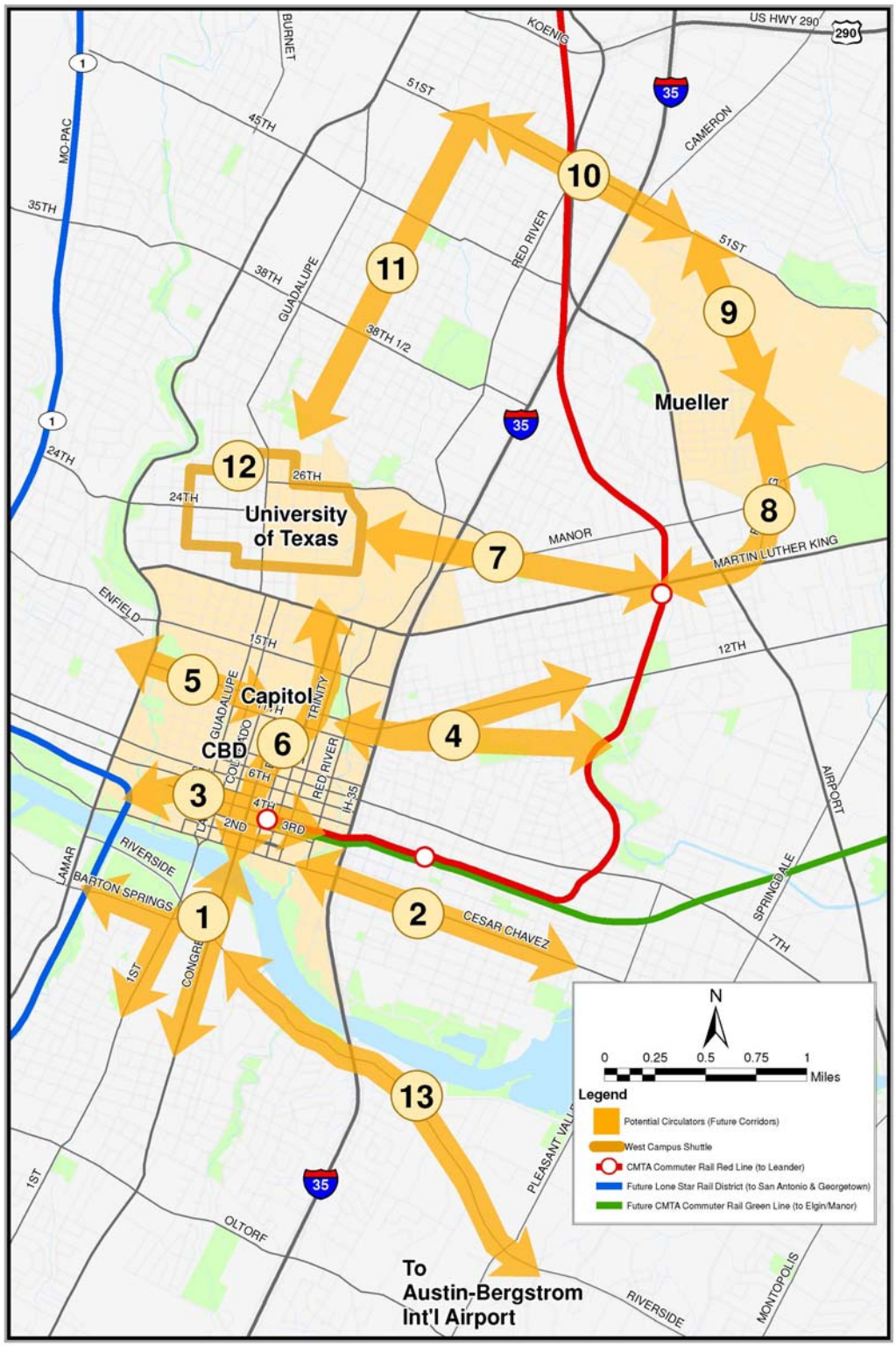
Connection Need Corridors

A list of alternative *Connection Need Corridors* was developed based upon previous studies, historical travel patterns, neighborhood and City plans, and the six overall transportation investment goals noted above and discussed in greater detail below. It is important to note that the Connection Need Corridors are general routes and not necessarily specific alignments along particular streets. For some corridors, potential street alignments are identified due to limited options or defined features. For other corridors (through downtown, for example) several alignment options may be available. Figure 3-1 shows the set of Connection Need Corridors defined and evaluated for this study.

Ultimately, 13 Connection Need Corridors were identified that, when taken together, meet the collection, distribution, and circulation needs expressed by the community. These Connection Need Corridors are:

1. **Downtown (CBD) to South Central Austin (River South)**
2. **Downtown (CBD) to South East Austin**
3. **Downtown Commuter Rail Station (CBD Southeast) to Seaholm Redevelopment/planned Lone Star Regional Rail Station (CBD Southwest)**
4. **Capitol Complex to East Austin**
5. **Capitol Complex to West Central Austin**
6. **Downtown (CBD)/Capitol Complex to University of Texas (UT)**
7. **University of Texas (UT) to MLK, Jr. Commuter Rail Station**
8. **MLK, Jr. Commuter Rail Station to Mueller Redevelopment (South)**
9. **Mueller Redevelopment (Internal) to 51st Street**
10. **Mueller Redevelopment (North) to North Central Austin (Hyde Park)**
11. **University of Texas (UT) to North Central Austin (Hyde Park)**
12. **University of Texas (UT)/West Campus Loop**
13. **East Riverside Drive to Austin-Bergstrom International Airport (ABIA)**

Figure 3-1. Connection Need Corridors



Source: URS, 2010.

Route Alternatives Evaluation

The scoring criteria established for each goal ranges from 1 to 3 based upon how well a route alternative can meet each stated goal, with a score of 1 indicating a neutral or minimal response to the goal and a score of 3 indicating that a corridor is able to respond well to the goal. Table 3-1 details the scoring and criteria for each goal and Table 3-2 includes the actual route alternative evaluation. A discussion of the results follows the table.

Table 3-2. Results of Route Alternatives Evaluation

CNC/Route	Goals						
	Goal 1. Improve place connectivity	Goal 2. Improve transit connectivity	Goal 3. Improve mobility	Goal 4. Maximize community benefits	Goal 5. Maximize environment -tal benefits	Goal 6. Maximize economic benefits	TOTALS
1. CBD to River South	3	2	3	1	2	3	**14**
2. CBD to South East Austin	1	1	1	3	2	2	**10**
3. CBD Southeast to CBD Southwest	2	3	3	3	3	3	**17**
4. Capitol to East Austin	2	1	1	3	2	2	**11**
5. Capitol to West Central Austin	1	1	1	1	2	2	**8**
6. CBD/Capitol to UT	3	2	3	3	3	3	**17**
7. UT to MLK, Jr. Station	3	3	3	2	2	3	**16**
8. MLK, Jr. Station to Mueller South	3	2	3	3	2	3	**16**
9. Mueller Internal	3	1	2	3	3	3	**15**
10. Mueller North to Hyde Park	1	1	2	2	1	1	**8**
11. UT to Hyde Park	2	1	2	1	3	2	**11**
12. UT Loop	1	1	3	2	2	2	**11**
13. East Riverside to ABIA	3	3	2	3	3	3	**17**

Discussion of Evaluation Results

The results show that the route alternatives **1, 3, 6, 7, 8, 9, and 13**, as highlighted in Table 3-2, ranked highest according to the project's goals. Discussions for each route alternative's evaluation are included below. The highest ranking routes are noted with an underline and their scores are in parentheses ().

1. **CBD to River South (14)** – This route scores high in improving place connectivity as it connects the south end of the CBD to South Austin commercial corridors along South Congress, South 1st Street, and South Lamar (and potentially on to Zilker Park), and to the Palmer/Long Centers. This route also scores high in improving mobility and economic benefits because it provides access to the East Riverside Corridor (route 13), as well as a potential TOD on the south shore of Lady Bird Lake. This route can also serve a potential maintenance facility site at One Texas Center.

However, this general corridor already has a substantial mix of modes and is well-served by conventional bus.

2. **CBD to South East Austin (10)** – Due primarily to lower density population and employment along this Connection Need Corridor, the route does not score well when compared to the other alternatives. A notable and developing place along this corridor is the Waller Creek District, which may make this a more viable route for future consideration.
3. **Downtown Commuter Rail Station to Seaholm Redevelopment (17)** – This corridor scores very well due to the transit connectivity provided between the Capital Metro Commuter Rail Station and the proposed Lone Star Regional Rail Station, just west of the existing UPRR wye. This route also connects the Convention Center to the east with the nascent cultural and residential Seaholm Redevelopment/District to the west, which includes the proposed New Central Library, the Shoal Creek Hike & Bike Trail, Lance Armstrong Bikeway (LAB), redeveloping former Green Water Treatment Plant, the Austin Music Hall, and three new high-rise condominium towers, among other amenities.
4. **Capitol Complex to East Austin (11)** – This route does not score well compared to others because it does not connect with the Red Line, nor does it connect medium to high density population or employment to the east with the employment center at the Capitol Complex. Ultimately, this corridor presents future opportunities with the 11th and 12th Street corridors, which have been a long-running redevelopment target for the community.
5. **Capitol Complex to West Central Austin (8)** – This route does not connect to a proposed Lone Star station (nearest are Seaholm and 35th Street), nor does it connect medium to high density population or employment to the west with the employment center at the Capitol Complex. However, like the Capitol to East Austin route, this corridor has tremendous potential should the University of Texas proceed with a large-scale redevelopment of the 345 acre Brackenridge Tract to the far west of the corridor.
6. **Downtown/Capitol Complex to University of Texas (17)** – This corridor scores among the highest and is the logical backbone of any Central Austin transit system. Connecting the Red Line and Rapid Bus commuter services at the south end to major employment centers (CBD, Capitol, and UT), this route links places and transit services; provides access in/out of Central Austin (by way of the commuter connections); improves circulation within Central Austin; and, can catalyze redevelopment along the east and north sides of the Capitol Complex.
7. **University of Texas to MLK, Jr. Commuter Rail Station (16)** – This route alternative scores very well because it links the main UT campus to Commuter Rail (at the MLK Jr. Station), which links to UT's Pickle Research Campus in north Austin (at the Braker Station). This improves both place and transit connectivity, along with mobility, which has significant environmental benefits due to the many frequent trips between UT campuses.
8. **MLK, Jr. Commuter Rail Station to Mueller Redevelopment (South) (16)** – This route connects two transit-oriented developments (TODs): one smaller-scale, partially constructed TOD adjacent to the Red Line station and the other a large-scale mixed-use "urban village" at Mueller. In fact, Mueller was developed for rail transit and has even incorporated general design geometric criteria into its street network. This route provides transit connectivity, place connectivity, and support for economic development at Mueller, given its two dedicated employment centers (one defined by the Dell Children's Medical Center), substantial retail component, and planned 42-acre mixed-use town center.

9. **Mueller Redevelopment (Internal) to 51st Street (15)** – Unlike the other routes, this alternative is focused on circulation within a single neighborhood/development. Despite its limited reach, the Mueller Internal route provides direct connections to multiple activity centers within Mueller, including the first residential phase, the Medical Center, the 20-acre Austin Film Studio complex, and the first two retail phases.

10. **Mueller Redevelopment (North) to North Central Austin (Hyde Park) (8)** – This corridor is more compelling for the potential for a route loop than for direct connectivity along its route. This corridor does begin with major employment at the north end of Mueller but links to only low to medium density residential the general Hyde Park area. A notable destination at the west end of the route is UT's Whitaker (Intramural) Fields at 51st Street and Guadalupe Street, which hosts intercollegiate events, along with intramurals. This route does intersect Airport Boulevard, for which the City intends to initiate a corridor master planning effort. Redevelopment of this corridor would benefit from and provide support to a higher-capacity transit corridor along 51st Street. Also worth noting is that a Red Line Commuter Rail station at 51st Street would be a viable alternative to the lightly used Highland Station to the north, which has been problematic due to its proximity to the nearby Crestview Station. A 51st Street station offers better spacing between MLK, Jr. to the south (~2.5 miles) and Crestview to the north (~1.9 miles) and better connectivity with a higher-capacity transit service in this corridor.

11. **University of Texas (UT) to North Central Austin (Hyde Park) (11)** – The strength of this corridor lies with its proximity to three well-travelled north-south corridors in Lamar Boulevard, Guadalupe Street, and Red River Street, which are all commercial/retail routes connecting to UT. However, this route lacks significant place or transit connectivity and passes through only low to medium density residential neighborhoods.

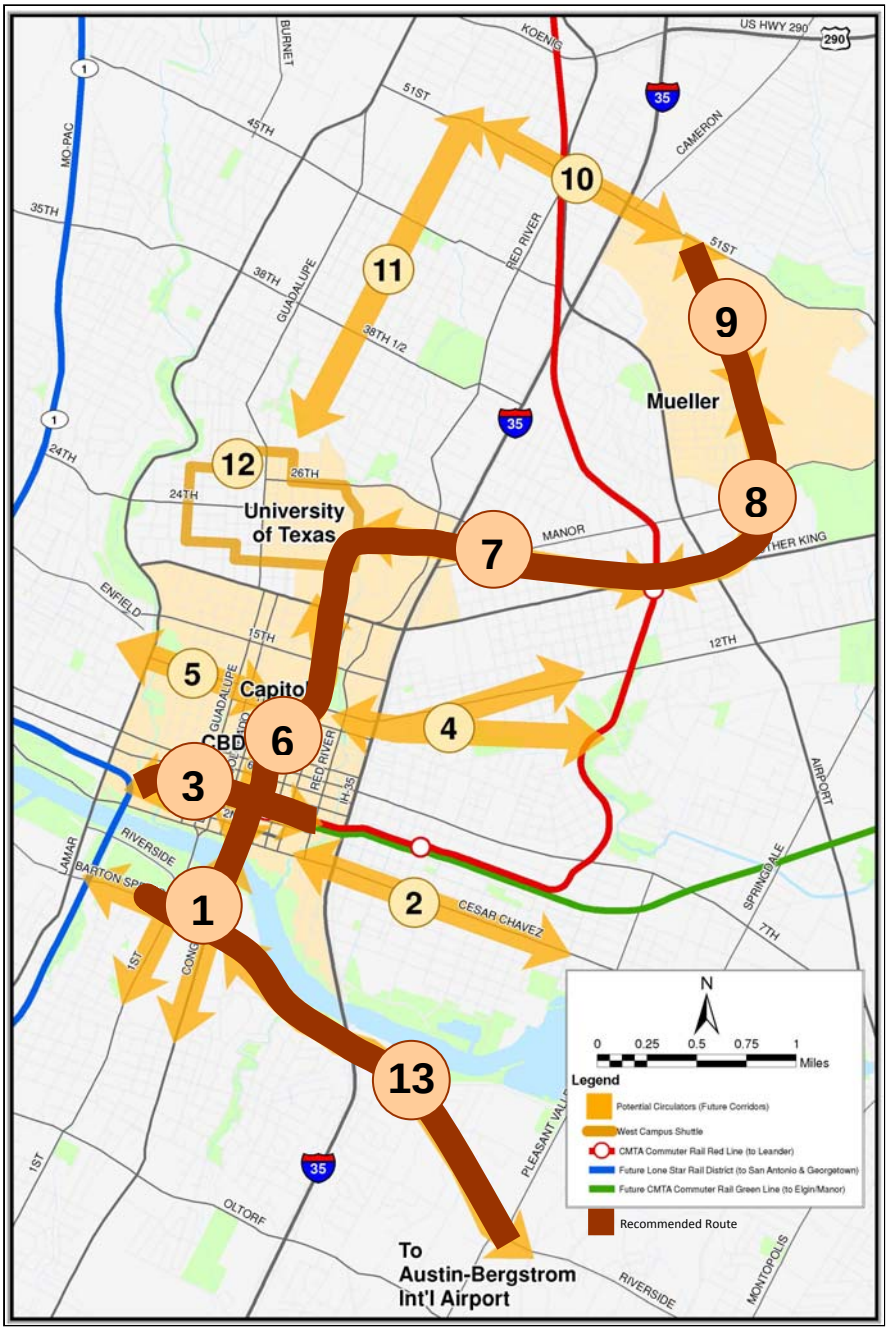
12. **University of Texas (UT)/West Campus Loop (11)** – This circulation route would provide improvements in mobility through this portion of Central Austin, which is currently served by a shuttle bus route. Currently, there is limited parking in West Campus and new developments incur substantial costs in order to provide structured parking, which could be potentially mitigated with the introduction of higher-capacity transit. Much of the mobility along this route is achieved via bicycle and pedestrian, so environmental benefits are somewhat limited though travel time reductions would be achieved for this segment of the population.

13. **East Riverside Drive to Austin-Bergstrom International Airport (ABIA) (17)** – This corridor scored among the highest as it meets all – and exceeds many – of the goals for this investment study. The East Riverside Corridor links high density populations east of I-35 with medium to high density downtown employment centers south of Lady Bird Lake, including City of Austin and Austin Energy (a City-owned electric utility) offices, Austin American-Statesman office and production facilities, and TxDOT Division headquarters. Also located near the western end of this route are major cultural facilities, such as the Long Center for the Performing Arts and the Palmer Events Center, along with recreational destinations like Auditorium Shores and the Lady Bird Lake Hike & Bike Trail, and even two civic event locations (South First Street, or Drake, Bridge and the Ann W. Richards Congress Avenue Bridge). East of I-35 the corridor is already redeveloping, even as the City just completed the East Riverside Corridor Master Plan, which envisions a vibrant, mixed-use, transit-oriented destination, complete with multiple rail transit stations. Other destinations along this corridor include an Austin Community College (ACC) campus, large metropolitan parks, and an international airport. This corridor is currently served by more than a half-dozen conventional bus routes, including an airport route and multiple UT

shuttle routes. Benefits of higher-capacity transit in this corridor include the ability to reduce the intensity of bus service and reduce travel times. Additionally, given the low-rise, lower density auto-centric development and vast tracts of undeveloped property along the corridor, there is substantial redevelopment potential with corresponding economic benefits to the City.

Figure 3-2 below shows the recommended route comprised of the seven highest scoring alternatives.

Figure 3-2. Recommended Route



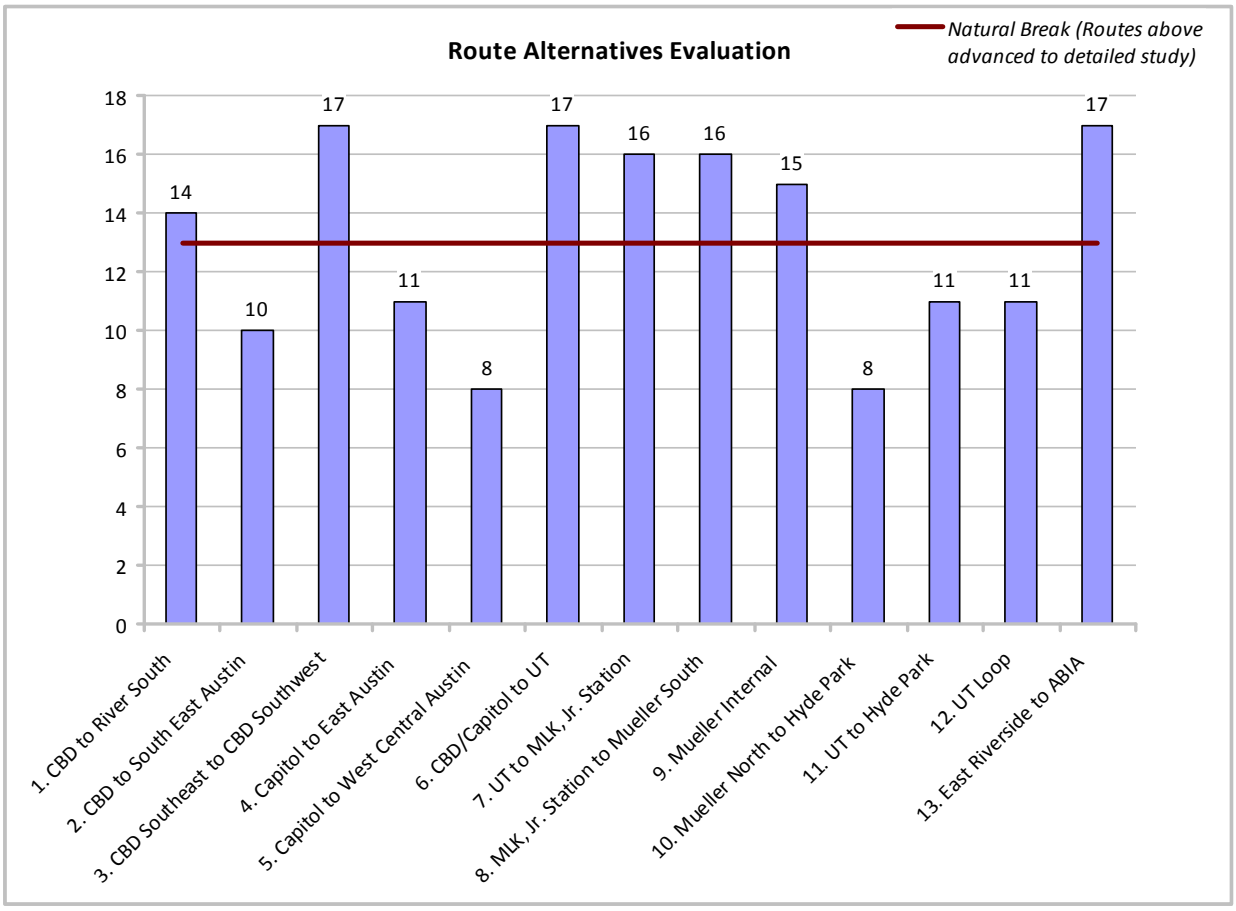
Source: URS, 2010.

Recommended Alignment for Investment Evaluation

Following selection of the recommended route alternatives, a specific alignment within the routes, or Connection Need Corridors, was identified for use with the recommended **technologies** from Chapter 4 to define the **transit investment alternatives** for evaluation in Chapter 5.

The recommended alignment was selected from the complete set of 13 route alternatives, or Connection Need Corridors, by identifying a natural break in the results tabulation. As shown below in Figure 3-3, six routes, **1, 3, 6, 7, 8, 9, 13**, scored noticeably higher than the other seven.

Figure 3-3. Routes Selected for Recommended Alignment by Evaluation Results



The sections below describe the various alignment **segments** comprising the recommended alignment.

1. Downtown to South Central Austin

This alignment segment provides a critical linkage across Lady Bird Lake, which is vital for access to the potential maintenance facility site and to ABIA, via the East Riverside Corridor. This segment has two elements:

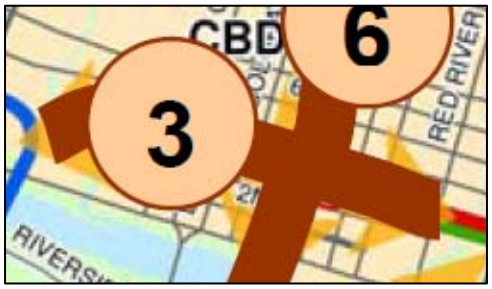
Lady Bird Lake Crossing

This short segment is currently a 'gap' in the alignment, as there is no recommendation for a specific Lady Bird Lake crossing. This issue is discussed in detail in Chapter 6. In summary, there are two basic options: retrofit one of the two existing bridges or construct a new, possibly multi-modal or transit-/pedestrian-/bike-only, crossing between South 1st Street and Trinity Street, off of Colorado, Brazos, or Trinity Street. Issues for consideration in making a recommendation include transit and traffic operations, construction cost, construction impacts, development times, structural capacity, and others.

Palmer/Long Center Spur

This short segment of the alignment is drawn from part of route alternative 1 and would also start from the south touchdown of the LBL crossing, but turn westbound on Riverside Drive, depending upon the crossing location. The alignment would head west on Riverside Drive to Barton Springs Road where it would turn west onto Barton Springs Road. From Barton Springs Road the alignment provides direct access to a potential maintenance facility at the City of Austin offices at 505 Barton Springs Road (refer to Chapter 6 for detailed discussion), where it could be truncated if necessary. Beyond this potential maintenance facility site the alignment crosses South 1st Street and reaches an off-street terminal station in front of the Palmer Events Center, also providing access to the Long Center for the Performing Arts.

3. Downtown Commuter Rail Station to Seaholm Redevelopment



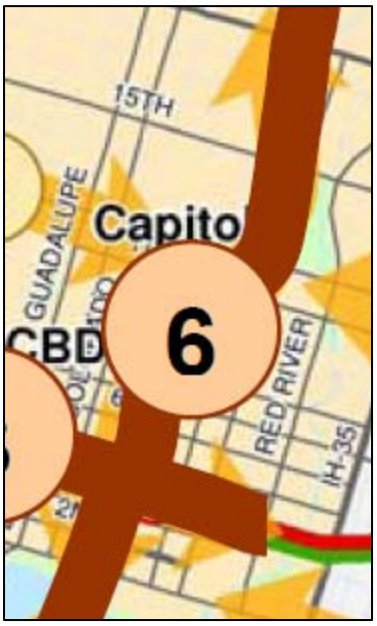
In Downtown Austin, the proposed alignment starts on 4th Street at the MetroRail Downtown station. Currently served by an interim station at Trinity Street, adjacent to the Convention Center, Capital Metro plans to relocate to a permanent location possibly at Brazos Street. The future terminus/transfer station will likely depend upon where this proposed alignment ultimately turns south from 4th Street to cross Lady Bird Lake, as discussed below. The alignment then continues west on 4th Street, a City-designated transit corridor, and across Congress Avenue to the Nueces-San Antonio Street couplet. The proposed alignment turns south onto the Nueces-San Antonio Street couplet in order to shift to 3rd Street, where it can cross Lower Shoal Creek through City right-of-way. Now in the Seaholm District, the alignment heads west to its west terminus adjacent to the Union Pacific Railroad (UPRR) wye, between West Avenue and Bowie Street. Just east of Bowie Street, an intermodal transit station redeveloped out of the former Seaholm power plant would provide a direct connection to the future Lone Star regional rail system planned for operation in the current UPRR corridor.

6. Downtown/Capitol Complex to University of Texas

The conceptual evaluation above scored the route from Downtown through the Capitol Complex to UT among the highest. Given this critical function as the hub of any recommended alignment, it is also recommended that the following two alignments through Downtown/Capitol/UT be pursued: Congress-San Jacinto (East CBD) and Lavaca-Guadalupe Couplet (West CBD). Two routes through Downtown can provide vital operational flexibility, greater economic potential, and geographic equity:

- Operational Flexibility – Congress Avenue is considered the "Main Street of Texas" and was the backbone of Austin's original streetcar system of the first half of the 20th century. This special status

enjoyed by Congress Avenue makes it ideal for a higher-capacity transit investment. However, as Congress Avenue continues to serve as the focal point for Downtown, it is also the site of many special events throughout the year that require street closures. Therefore, the City proposes a second alignment through Downtown that will allow for uninterrupted higher-capacity transit service. Two routes also provide for multiple service options and can accommodate Downtown circulation in addition to collection-distribution service.



- Economic Potential – Whereas Congress Avenue is a more developed corridor with limited redevelopment potential, Lavaca-Guadalupe offers significant redevelopment opportunities due to its lower-rise buildings, lower-density, and scarce retail, despite being anchored on the south by City Hall and the redeveloped Second Street District.
- Geographic Equity – As Downtown redevelops to the east, along the Waller Creek District, and to the west, with the Seaholm District and potential Travis County consolidation, it is anticipated that demand for higher-capacity transit will grow along both corridors.

Experience of other systems, notably DART in Dallas, shows that system expansion plans can be hampered by constrictions within the core of the system. Therefore, it is vital to plan for two north-south corridors through Downtown in order to ensure long-term system sustainability. The two sub-segments of the recommended alignment are East CBD and West CBD:

East CBD

The East CBD segment runs north on Congress Avenue from 4th Street to the 9th - 10th Street couplet, where it shifts east to San Jacinto Boulevard along the east side of the State Capitol Complex. San Jacinto Boulevard is a one-way southbound street and it is proposed that the right lane be dedicated as a contra-flow lane in which the higher-capacity transit system would run northbound. The alignment then crosses East Martin Luther King, Jr. Boulevard, where it becomes two-way, as it continues north on San Jacinto Boulevard through the University of Texas campus, past the Recreational Sports Center, Darrell K. Royal Texas Memorial Stadium, and Performing Arts Center to East Dean Keeton Street.

An alternate alignment to the Congress Avenue segment was considered along Brazos Street. Refer to Chapter 7 for a detailed discussion of this evaluation.

West CBD

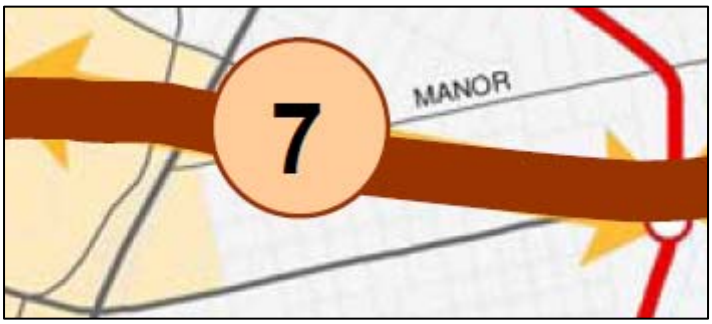
The West CBD segment runs on the Lavaca-Guadalupe couplet from 4th Street at the south end to the 17th – 18th Street couplet at the north end, along the west side of the Capitol Complex. At the 17th – 18th Street couplet the alignment shifts west to double-track on San Antonio Street. From there, the alignment crosses West Martin Luther King, Jr. Boulevard and enters UT's West Campus area as a single-track alignment, terminating at 23rd Street.

The Lavaca-Guadalupe couplet is designated by the City as a transit corridor and will see the introduction of Capital Metro's MetroRapid service beginning mid-2012. It is currently proposed that this higher-capacity transit system, MetroRapid bus, and conventional (or local) bus service will all share

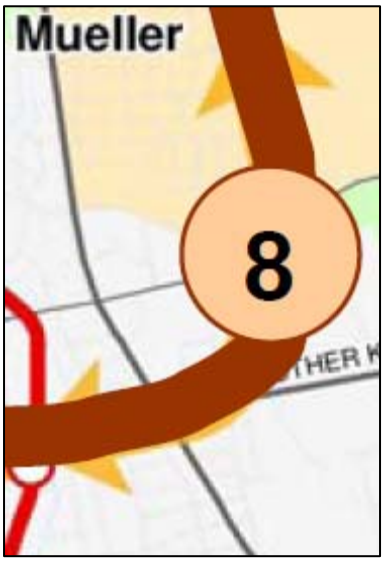
the right-most travel lane (converted to transit-only). The details of this joint-use operation have not been finalized and will require further study. Another issue for continued study of this segment is the presence of the sharrow bike facilities (currently in both left and right outside lanes), given the concerns about the interaction between bikes and rails, as noted in Chapters 2 and 7.

It should also be noted that West Campus/University is an important route because it has a large ridership base that already uses alternate modes at high proportions and it is close to a major trip generator (i.e., ACC-Rio Grande and University of Texas). The selection of San Antonio Street as the alignment along this route represents: 1) a balance between proximity to campus and to the high-density (for Austin) residential neighborhood and 2) a tradeoff between access to campus and The Drag's vibrant retail with impacts to traffic on Guadalupe Street. Guadalupe Street is a high volume four-lane undivided arterial with high frequency local bus service and, as acknowledged above, will also have to accommodate MetroRapid service.

7. & 8. University of Texas to MLK, Jr. Commuter Rail Station/Mueller South



At the intersection of San Jacinto Boulevard and Dean Keeton Street at the northeast corner of the UT campus, the proposed alignment turns east on Dean Keeton, crosses under I-35, and continues into the Manor Road corridor, also known as "Restaurant Row". The alignment then continues east on Manor Road to its intersection with Capital Metro's Red Line. At the intersection of the Red Line and Manor Road, a potential new transfer facility is recommended at this crossing. Alternately, a routing from the west approach to the Manor Road crossing south on Alexander could also provide direct transfers at the MLK Jr. Station. The proposed alignment then continues east from the Red Line crossing along Manor Road and across Airport Boulevard to Berkman Drive, where it enters the Mueller Redevelopment.



This routing along Manor has been recommended previously over the use of East Martin Luther King, Jr. Boulevard because of its lower traffic volumes and more favorable roadway grades.

9. Mueller Internal

Within the Mueller Redevelopment the proposed alignment runs north along Berkman Drive, turns west on Robert Browning Street, and north on Mueller Boulevard. The alignment would end at 51st Street with the terminal station located on Mueller Boulevard. This alignment is preferred through Mueller as it connects the residential neighborhoods in the south to the (planned) Town Center, Dell Children's Medical Center, and UT's Health Research Campus.

13. East Riverside to Austin-Bergstrom International Airport (ABIA)

This segment of the alignment would start from the south touchdown of the Lady Bird Lake (LBL) crossing and, depending upon the location, likely continue east on West/East Riverside Drive, crossing over I-35 on the existing structure into the East Riverside Corridor (ERC). Between any of the possible LBL crossings and I-35, East Riverside Drive is a four-lane divided arterial. East of I-35 East Riverside Drive is a six-lane divided arterial with wide rights-of-way which can likely accommodate a dedicated, or semi-exclusive, transit guideway (in which other vehicles may not travel in, but can cross at-grade for left/right turns, intersections, etc). The alignment continues along East Riverside Drive over SH 71, on a new structure currently being designed by TxDOT to accommodate a fixed guideway system, and over US 183, on a new structure, and onto ABIA property. Within ABIA the alignment proceeds around the perimeter to Spirit of Texas Drive and into the terminal area, before looping back to Spirit of Texas Drive.

This alignment is recommended for use with the recommended **technologies** from Chapter 4 to define the **transit investment alternatives** proposed for evaluation in Chapter 5.

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