DRAFT

Cross-County MetroLink Extension
Segment I
Conceptual Design

Definition of Alternatives
Draft Technical Report

Prepared for the
East-West Gateway Coordinating Council

in association with the
Bi-State Development Agency
Missouri Department of Transportation

By **PARSONS TRANSPORTATION GROUP**
and Associated Consultants

Austin TAD and Associates, Inc.
EDAW, Inc.
Horner & Shifrin, Inc.
David Mason and Associates, Inc.
Parsons Engineering Science, Inc.
Sorrenchein, Nath & Rosenthal
S.T. & T., Inc.
Trivers Associates, Inc.
Henry Weese and Associates, Inc.

Contents

Foreword
Acknowledgments

- Introduction
- Framework for Conceptual Design
- Description of Alternatives
  -- Fully Grade-Separated Alignment
  -- At-Grade/Grade-Separated Alignment
  -- Forest Park Parkway Elevated
  -- Galleria Elevated
  -- Laclede Station Road—
  -- At-Grade/Elevated
  -- Deer Creek Terminal Station
- Access Alternatives at I-44
- Conclusion

List of Illustrations

Figures

- Cross-County Corridor
- Urban Design Framework
- Cross-County MetroLink Extension Segments I, II & III
- Cross-County Metrolink Extension - Segment I Candidate Alternatives
- Vertical Alignment

Exhibits
(Please note: In the printed document, the exhibits visualize the various options associated with each type of station. To obtain a packet of the exhibits, please contact transportation@ewgateway.org .)

- Sheet C-01 - Plan/Profile - Underground
- Sheet C-21 - Plan/Profile - Underground
- Sheet C-22 - Plan/Profile - Underground
- Sheet C-23 - Plan/Profile - Underground
- Sheet C-24 - Plan/Profile - Underground
- Sheet MP-1 - Forest Park Station-Underground
- Sheet MP-4 - Skinker Blvd. Station -Underground
- Sheet MP-6 - Big Bend Blvd. Station - Underground
- Sheet A-1 - Forest Park Station - Underground
- Sheet A-28 - DeBalivieve Ave. Bridge

List of Illustrations *(continued)*

Exhibits *(continued)*

- Sheet A-4 - Skinker Blvd. Underground
- Sheet A-6 - Big Bend Blvd. Underground
- Sheet A-23 - Prototype Underground Station
- Sheet A-29 - Station Accessories
- Sheet C-25 - Plan/Profile-Underground
- Sheet C-26 - Plan/Profile-Underground
- Sheet C-27 - Plan/Profile-Underground
- Sheet MP-9- East Clayton Underground
- Sheet MP-9A - East Clayton Underground
- Sheet MP-12 - Downtown Clayton Underground
- Sheet A-9 - East Clayton Underground
- Sheet A-10 - East Clayton Underground
- Sheet A-13 - Downtown Clayton Underground
- Sheet C-28 - Plan/Profile - Underground
- Sheet C-29 - Plan/Profile - CMT
- Sheet MP-13 - Galleria Underground
- Sheet A-14 - Galleria Underground
- Sheet C-11 - Plan/Profile - CMT
- Sheet C-12 - Plan/Profile - CMT
- Sheet C-42 - Plan/Profile - CMT/Elevated
- Sheet C-43 - Plan/Profile - CMT/Elevated
- Sheet C-15 - Plan/Profile - CMT Elevated
- Sheet C-16 - Plan/Profile - CMT Elevated
- Sheet MP-16 - Eager Rd. CMT
- Sheet MP-17 - Manchester Rd. CMT
- Sheet MP-22 - Lansdowne Ave.
- Sheet A-17 - Eager Rd. CMT
- Sheet A-18 - Manchester CMT
- Sheet A-22 - Lansdowne Ave.
- Sheet A-25 - Prototype At-grade/CMT
- Sheet L-3 - Streetscape CMT
- Sheet C-02 - Plan/Profile At-grade
- Sheet C-03 - Plan/Profile At-grade
- Sheet C-04 - Plan/Profile At-grade
- Sheet C-05 - Plan/Profile At-grade
- Sheet G-1 Skinker Rd. Geometric w/Underpass
- Sheet G-1A - Skinker Rd. Geometric w/Underpass
- Sheet G-2 Big Bend Geometrics
- Sheet MP-2 Skinker At-grade
- Sheet MP-5 Big Bend At-grade
- Sheet L-5 - Station Cross Sections
- Sheet A-2 - Skinker At-grade

List of Illustrations *(continued)*

Exhibits *(continued)*

- Sheet A-5 - Big Bend At-grade
- Sheet L-1 - Streetscape - Forest Park Parkway
- Sheet L-2 - Streetscape - Forest Park Parkway
- Sheet L-4 - Sheetscape - Millbrook Blvd.
- Sheet A-24 - Prototype At-grade
- Sheet A-26 - Prototype At-grade
- Sheet MP-23 - Median Alternatives
- Sheet MP-24 - Median Alternatives
- Sheet MP-25 - Median Alternatives
- Sheet MP-26 - Median Alternatives
- Sheet C-17 - Plan/Profile At-grade
- Sheet C-18 - Plan/Profile At-grade
- Sheet C-19 - Plan/Profile At-grade
- Sheet C-20 - Plan/Profile Underground
- Sheet MP-3 - Skinker At-grade
- MP-7 Big Bend - Undeground South
- Sheet A-3 - Skinker At-grade
- Sheet A-7 - Big Bend Underground South
- Sheet C-06 - Plan/Profile At-grade
- Sheet C-35 - Plan/Profile At-grade
- Sheet C-36 - Plan/Profile At-grade
- Sheet C-07 - Plan/Profile At-grade
- Sheet C-08 - Plan/Profile At-Grade
- Sheet G-03 - Carondelet Ave. Geometrics
- Sheet G-04 - Carondelet Ave. Geometrics
- Sheet MP-8 - East Clayton At-grade
- Sheet MP-11 - Downtown Clayton At-grade
- Sheet A-8 - East Clayton At-grade
- Sheet A-12 - Downtown Clayton At-grade
- Sheet L-4 - Streetscape - Carondelet Ave.
- Sheet C-09 - Plan/Profile - CMT
- Sheet C-10 - Plan/Profile - CMT
- Sheet MP-14 - Galleria - CMT
- Sheet A-15 - CMT
- Sheet C-13 - Plan/Profile - CMT Underground
- Sheet C-14 - Plan/Profile CMT/Underground
- Sheet MP-19 - Big Bend - CMT At-grade
- Sheet A-20 - Big Bend - CMT At-grade
- Sheet C-30 - Plan/Profile Elevated
- Sheet C-31 - Plan/Profile Elevated
- Sheet C-32 - Plan/Profile Elevated
- Sheet C-33 - Plan/Profile Elevated

List of Illustrations *(continued)*

Exhibits *(continued)*

- Sheet C-34 - Plan/Profile Elevated
- Sheet MP-10 - Clayton Elevated
- Sheet A-11 - Clayton Elevated
- Sheet A-27 - Prototype Elevated Station
- Sheet C-37 - Plan/Profile Elevated
- Sheet C-38 - Plan/Profile Elevated
- Sheet MP-15 - Galleria Elevated
- Sheet A-16 - Galleria Elevated
- Sheet C-39 - Plan/Profile Laclede Station
- Sheet C-40 - Plan/Profile Laclede Station
- Sheet C-41 - Plan/Profile Laclede Station
- Sheet MP-18 - Laclede Station
- Sheet A-19 - Laclede Station
- Sheet C-44 - Plan/Profile Deer Creek
- Sheet MP-21 - Dan Creek Elevated
- Sheet MP-20 - Deer Creek at-grade
- Sheet A-21 - Deer Creek at-grade

(Please note: In the printed document, the exhibits visualize the various options associated with each type of station. To obtain a packet of the exhibits, please contact transportation@ewgateway.org .)

Foreword

This is one of a series of technical reports being prepared as part of the CrossCounty MetroLink Extension Segment I conceptual design study. The Definition of Alternatives Report is intended to describe the highlights of conceptual design prepared for a series of alternatives selected for possible implementation in the crosscounty corridor. By using this document with the ensuing discussion of the alternatives, it is easier to identify desirable adjustments or modifications in the designs to enhance or otherwise improve them.

Acknowledgments

During the course of the work leading to the preparation of conceptual designs for the candidate alternatives, various agencies and organizations contributed important information. Such participation is acknowledged by the design team. The following are especially noted for their contributions:

Metropolitan St. Louis Sewer District
Laclede Gas Company
Ameren UE
St. Louis County Departments of Public Works, Highway, and Planning
Cities of St. Louis, University City, Clayton, Richmond Heights, Brentwood, Maplewood, and Shrewsbury
Sunnen Company

Figure 1

Cross-County Corridor MetroLink Extension
Segment 1
DELMAR
CLAYTON
BRENTWOOD
BIG BEND
MANCHESTER
KINGSHIGHWAY
BIG BEND
170
64
44
1
2
3
4
5
6
7
8
9
LEGEND
1 Forest Park
2 Skinker Blvd.
3 Big Bend Blvd.
4 Carondelet
Clayton Gov't. Ctr.
Clayton
5 Galleria 1, 2, and 3
6 Eager Rd.
7 Manchester Rd.
8 Laclede Station
Big Bend South
Deer Creek
9 Landsdowne Ave.
NOT TO SCALE

1
Introduction

Since its first day of operation, MetroLink has become a valuable asset for the greater St. Louis region. Its initial success has continued unabated, creating a momentum leading to MetroLink expansion. The St. Clair County extension in Illinois is now under construction and will extend high-quality transit service into the eastern portion of the region.

As the above expansion was occurring, planning and investment studies were carried out, focusing on the most heavily traveled section of the region: the crosscounty corridor. These studies culminated in a decision to undertake further expansion of MetroLink in the corridor. In this case, MetroLink would extend from the vicinity of Forest Park west and south into St. Louis County.

Because of the size of the crosscounty corridor, the expansion of MetroLink has been conceived to occur in three stages. The first stage, Segment I, would extend west through the University City/Clayton area and then south through the communities of Richmond Heights, Brentwood, and Maplewood to a terminus in Shrewsbury. The second stage, Segment II, would be a southward extension from Shrewsbury to south St. Louis county in the Butler Hill vicinity. The third stage, Segment III, would connect to Segment I in the Clayton area and extend north to Florissant.

The subject of this conceptual design study is the first stage (Segment I) only.

Overview of Conceptual Design Study

As a conceptual design study, the technical results will include recommendations for the basic elements of the MetroLink extension, i.e., horizontal and vertical alignment, station location and layout, and location of major support facilities. The level of detail will be sufficient to describe where MetroLink would be located and its approximate cost (capital and operating).

However, this level of detail is not to be considered final or even preliminary design. Preliminary and final design activities will be undertaken after a decision is made about a preferred design at the conceptual level of detail.

Within this overall purpose for conceptual design, this report, the Definition of Alternatives, is situated at a central point. In the initial phase of work for this study, previous planning results and additional ideas about MetroLink extension concepts were considered. These possibilities were examined relative to feasibility, from a physical and operational perspective. The results were a set of candidate alternatives to be explored in further detail. The Definition of Alternatives is the result of such exploration, taking the form of conceptual design for each alternative.

As noted in the foreword, the designs described herein are to be reviewed and discussed. This dialogue may identify the need to make adjustments and modifications

to the design. Such changes would be intended to improve the conceptual design relative to the design objectives (see Chapter 2). Subsequent to making these changes, the alternatives will be evaluated in detail, including the preparation of capital and operating/maintenance cost estimates. The results of the evaluation will be the information resource for the recommendation of a preferred alternative, which will then be selected and approved by the EastWest Gateway Coordinating Council Board of Directors. BiState Development Agency will then be authorized to proceed with the preliminary, final design and construction of the preferred alternative.

Selection of Candidate Alternatives

As shown in Figure 1, the Cross-County Segment I Cross-County Corridor extends from the existing Forest Park MetroLink Station west along Forest Park Parkway, Millbrook Boulevard, and Forest Park Parkway into and through downtown Clayton. From downtown Clayton, the corridor generally follows the previous Terminal Railroad right-of-way—now owned (or via easement) by Citizens for Modern Transit (CMT)—south to the vicinity of I44 in Shrewsbury.

For this corridor, a complete range of alternatives were examined, considering possible right-of-way locations and the alternative vertical alignments (elevated, atgrade, and below ground). Landuse relationships, possible station locations in relation to development opportunities, and overall urban design principles were assessed to identify the set of possible design options.

These alternatives were examined relative to operational and physical feasibility. The latter employed the appropriate MetroLink design standards to assess overall constructibility. Information about potentially available rightofway was evaluated with regard to operational considerations, i.e., was there sufficient space to accommodate MetroLink and other traffic uses existing in such rightsofway.

This screening process led to the identification of candidate alternatives, which were to be translated into conceptual designs.

In parallel with design activities, preliminary operations have been considered. Operations of MetroLink serving and supporting bus service were examined to identify needed facilities. This also included assessment of traffic operations in streets where MetroLink could be located at-grade and for access to proposed stations.

Important Background Information

The conceptual design activities have used a wide variety of information resources and guidance that form an important background for understanding the results described in the following chapters of this report.

Design standards and policies, as used by the BiState Development Agency, were the basic design guide.

Basic mapping has employed the aerial mapping available through the Metropolitan

Sewer District (MSD). Accuracy of horizontal and vertical dimensioning, elevations, rightofway locations, etc., are limited by this mapping resource. Supplemental ground surveys were undertaken to identify centerline pavement elevations in downtown Clayton and Ameren UE transmission tower locations in the CMT right-of-way.

Utility inventories were assembled based on published data. Some field investigations were completed by MSD relative to sewer location and depth.

2
Framework for Conceptual Design

The development of conceptual designs has been undertaken within a framework defined by both transportation system and corridor urban design considerations. Such a framework establishes important relationships that are manifested in the design in terms of location of a transitway relative to adjacent land use, location of stations and connections to stations from the community, design characteristics and qualities in relation to the surrounding area, and performance of transit in relation to the distance traveled (travel time) and the increased trade area or access area that the new transit line creates.

Existing Corridor

The CrossCounty/Segment I corridor is approximately eight miles in length. It is largely a builtup area traversing a very heterogeneous landuse area that ranges from residential to institutional to commercial to industrial. These activities include significant land uses in terms of their history, density or level of activity, and regional economic impact.

The geographical organization of the corridor recognizes highly distinctive subareas:

Forest Park/University City. Area dominated by the presence of existing upscale residential neighborhoods, educational institutions, and Forest Park.

Clayton. This is a mixeduse subarea that includes downtown Clayton; major commercial/retail areas, including the Galleria; and residential uses. Downtown Clayton is a place of work for more than 20,000 persons and has a compact, high- density core. It is second only to the St. Louis CBD in its concentration of office activities.

South/I44. This subarea is the most diverse, with many types of development. It includes business/industrial uses, significant commercial centers, and residential neighborhoods. The alignment follows a potential rightofway that is very different from those in the other two subareas in that it will use mostly an old railroad right-of-way. This is in contrast to the Forest Park and Clayton subareas which largely use public street rightsofway. From an urban design perspective, these locations present very different relationships between the transit facility and adjacent land-uses.

Urban Design Concept

Because of these corridor characteristics, the recommended urban design concept (see Figure 2) incorporates strategies to appropriately integrate a transit facility on highvalue residential neighborhoods and strategies that would seize upon the new transit accessibility to promote desirable growth and development. The elements of these

strategies would be carried out in connection with three relationships to be captured in the design: (1) landuse change/development opportunities, (2) transit/landuse relationships, and (3) qualities and unique characteristics.

Land Use Change/Development Opportunities

The following scenario depicts the location where changes are expected or desired, defining the relationship to MetroLink:

Forest Park Station

New development opportunity along DeBaliviere Avenue north of the tracks.

Create transitoriented development (TOD); include more off-street parking.

Enhance access via better pedestrian links to both sides of street (to new development) as well as into Forest Park to the south.

Incorporate symbolic design features in relation to its view to the History Museum and the main entrance to Forest Park and the community to the north.

East Downtown Clayton Station

Substantial development sites exist in the area east from Hanley Road to Forest Park Parkway at Forsyth Boulevard.

Track alignment needs to preserve or anticipate reasonable parcel size/ shape.

Station platform to be positioned to optimize pedestrian linkage to entire development area.

Galleria Station

Potential redevelopment sites exist in areas east of the CMT to along Brentwood Boulevard from Clayton Road south.

Various alignment alternatives should incorporate strong linkages/visibility with the Galleria Shopping Center.

Opportunity exists for a major TOD project near the University Club Towers building and/or just south of Galleria Parkway along Brentwood Boulevard.

Eager Road/Brentwood Station

Potential redevelopment site at station and north to Eager Road.

Expansion of Promenade retail center west of site is possible; strong pedestrian connections are needed.

Linkages to other significant redevelopment in the Hanley Industrial Court to be considered and to the residential areas to the south and east.

There is a potential for an additional Brentwood Station located just north of Hanley Road; the need for it would be related to continued redevelopment at the Hanley Industrial Court.

Laclede Station Road Station

Substantial growth occurring in Sunnen Business Park, which is a major asset for the City of Maplewood.

Expect to encourage more commercial/industrial growth along Hanley Road.

Deer Creek Shopping Center has recently benefited from new investment; linkage is needed to this area.
Station would be positioned to facilitate access to all these redevelopment areas.

Lansdowne Avenue Station

Logical terminus for MetroLink line would greatly increase activity at this location.
New activity to be used to leverage new desirable redevelopment in this location.
Station site could be joint development project (using TOD principles).

Transit/Land Use Relationships

Forest Park Station

Station has the benefit of two MetroLink routes providing access, i.e.,

Figure 2
Design Objectives

In harmony with the above design concept, the MetroLink alternatives have been designed according to the following design objectives:

1 Transportation	Provide high-quality public transportation service to improve mobility and accessibility and to enhance the attractiveness of MetroLink as a mode of choice without diminishing the performance of the regional transportation system.
2 Urban Design	Design facilities that are compatible with the character of the corridor and that are coordinated with and contribute to existing and planned land use in areas generally contiguous with MetroLink and the region as a whole.
3 Economic	Contribute to desirable economic and community development in the corridor and the region.
4 Environmental Impact	Have maximum positive and minimum negative impacts on the environment in the neighborhoods and institutions in the corridor, and do not have disproportionately high and adverse human health or environmental effects on children or on minority and low-income populations.
5 Cost and Finances	Make cost-effective investments that are affordable relative to anticipated financial resources and that do not compromise the potential for future extensions.
6 MetroLink Compatibility	Design facilities that are consistent and compatible with the existing and future MetroLink system.

becomes a location of high regional accessibility.
Leverage access in increased development intensity.
Creates enhanced gateway to Forest Park; provide linkage to new Forest Park circulator service.

DeBaliviere to Skinker Boulevard

Very little access along route.
Enhance transit performance via minimizing conflicts with other traffic movements.

Skinker to Pershing Avenue

Each station (Skinker and Big Bend) to have linkages to the community (north) and to the Washington University campus (south).
Campus linkages for pedestrians; connect in coordination with new campus development.
Pedestrian access is perpendicular, not parallel, to Millbrook Boulevard in this area.
Envision no change in community type or scale.

Downtown Clayton Stations

Each station to have linkages to the downtown sidewalk system.
Leverage added transportation capacity for increased downtown development.
Concentrate accessibility to form a pattern consistent with downtown Clayton planning strategy.
For the core station, establish visible and convenient linkage to the downtown Clayton transit center.

Galleria

Enhance the accessibility of the Galleria Shopping Center via adding transportation capacity and regional access.
Provide highly visible and convenient eastwest pedestrian linkage through the station area from the CMT to the west side of Brentwood Boulevard.
Leverage added transportation capacity to encourage increased development density along Brentwood Boulevard.

CMT—Galleria to I-64

Insulate transitway from adjoining residential neighborhoods.
Provide added use of rightofway via bicycle/pedestrian trail linked to the neighborhoods.

CMT—I-64 to Lansdowne

Leverage added transportation capacity into increased development in the Eager to Hanley Road section and the Flora to Big Bend Boulevard section and to Lansdowne Avenue.
Provide for necessary local access for adjoining industrial land.
Provide maintenance access for utilities along rightofway.
Fence transitway to limit access where required.

Design Characteristics

DeBaliviere to Pershing

Recognize historic design aspects of the surrounding land use, especially

as represented by Forest Park.

Except at stations, use design concepts that blend transitway into the existing environment.

Downtown Clayton

Utilize design concepts that create high visibility of transit facilities.

Incorporate high-quality streetscape elements.

Use design elements to clarify safe separation of transit, vehicular, and pedestrian functions.

Use design vocabulary consistent with downtown.

Galleria

Use design concepts that create high visibility for transit.

Use materials that depict a high- quality environment consistent with existing and potential levels of development investment.

CMT

Use design concepts that blend the transitway into the environment.

Quality of materials at station should be consistent with adjacent land uses.

Lansdowne station should have a gateway character with high visibility.

3
Description of Alternatives

With reference to the framework for the candidate alternatives, conceptual designs have been developed. These are explained in this chapter on a sectionbysection basis. First, however, a summary is provided highlighting the alternatives.

Summary

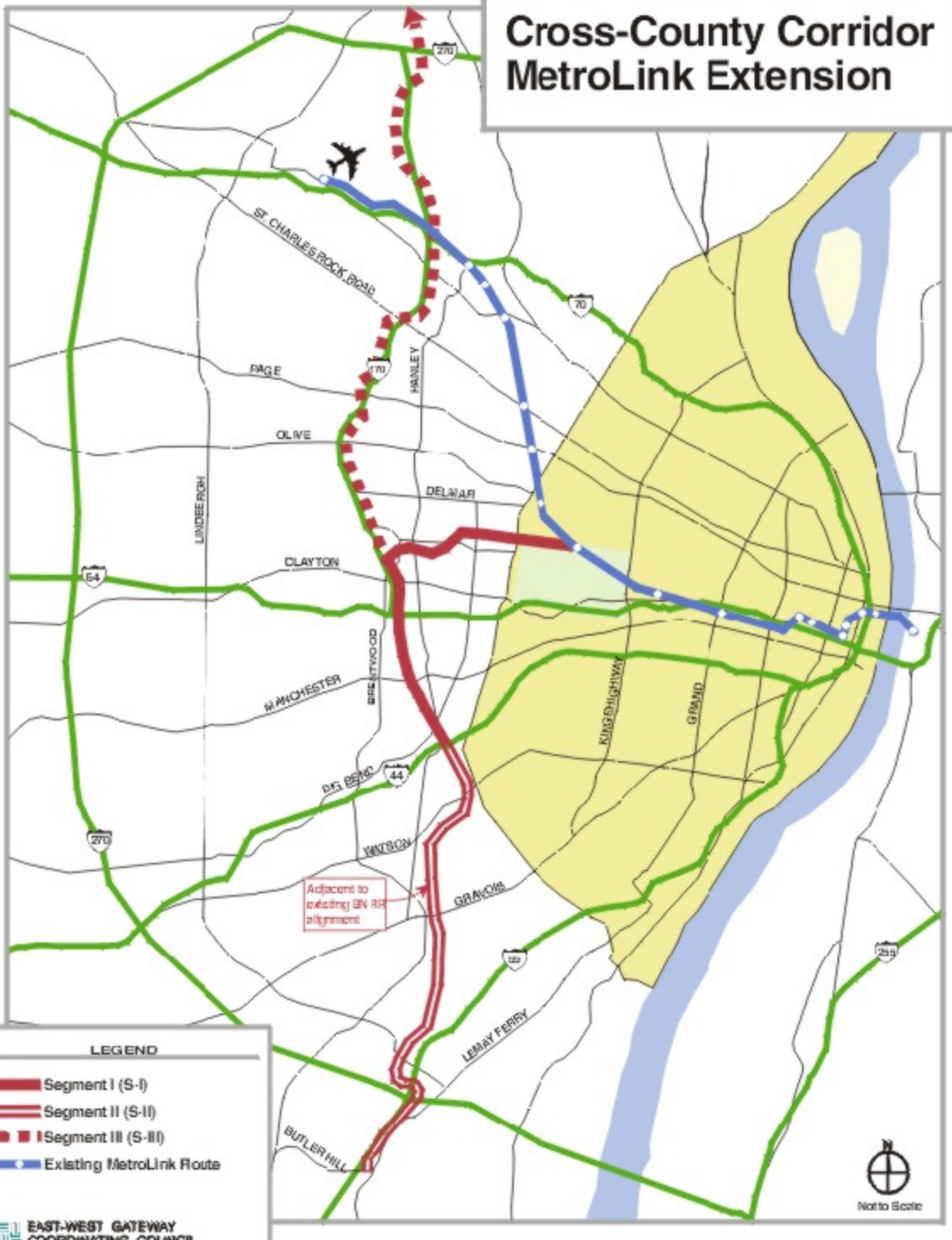
The Cross-County MetroLink Conceptual Design Project is an extension of the existing system into the central and south portions of St. Louis County. As shown in Figure 3, the plan is to implement three stages or segments of MetroLink extensions. This report deals only with Segment I, from the Forest Park MetroLink station to Shrewsbury.

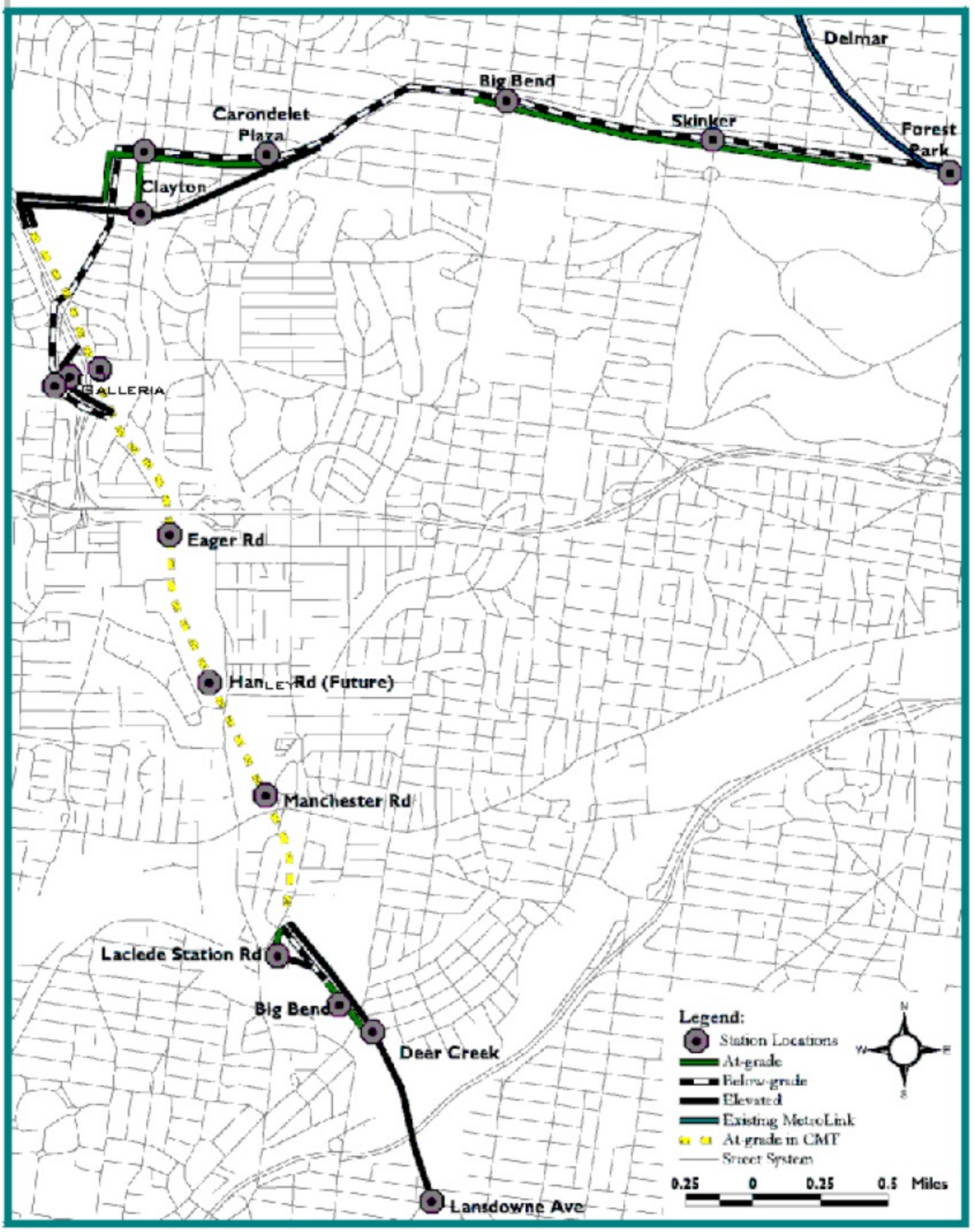
Because of the anticipated implementation of Segments II and III at some point in the future, the conceptual design of Segment I needs to provide for future junctions of trackway. For Segment II, this would occur in the vicinity of I44. The plan concept for Segment II is to follow the BNSF rail rightofway south to the Butler Hill area. The alignment of Segment I tracks needs to be designed to readily permit this southward extension. For Segment III, junction would occur in the Clayton vicinity along the CMT, potentially at Forest Park Parkway and/or at Galleria Parkway. Rightofway space for switches and other elements needs to be planned at these locations.

As an extension of the existing MetroLink service, the CrossCounty transit project represents the emergence of a system with multiple tracks and train routes. The junction at the Forest Park station will include switches between two sets of tracks and provision for safe crossing of MetroLink routes. In the vicinity of the Forest Park station, there will be four tracks in parallel for a modest distance.

The system aspects would be reflected in the design of the communication and control facilities and in the need for yard/maintenance facilities. For the CrossCounty extension, a train storage yard with minimum maintenance facilities would be located in the vicinity of I44/Shrewsbury.

Cross-County Corridor MetroLink Extension




Delmar
Big Bend
Carondelet Plaza
Skinker
Forest Park
Clayton
GALLERIA
Eager Rd
Hanley Rd (Future)
Manchester Rd
Laclede Station Rd
Big Bend
Deer Creek
Lansdowne Ave
Legend:
Station Locations
At-grade
Below-grade
Elevated
Existing MetroLink
At-grade in CMT
Street System
0.25 0 0.25 0.5 Miles
N
W
E
S

Vertical Alignment Alternatives
Figure 5

Within this overall MetroLink system perspective, the candidate alternatives (see Figure 4) have been developed; they involve various vertical alignment concepts (See Figure 5). As shown in Figure 4, these corridor alternatives are organized as follows:

- Fully GradeSeparated
- At-Grade/Grade-Separated Combination
- Section Alternatives
  - Forest Park Parkway Elevated
  - Galleria Elevated
  - Laclede Station Road
- At-grade/Elevated
- Deer Creek Terminal Station

Following are highlights of these alternatives.

- Fully GradeSeparated
  - Below-ground alignment using cut-and-cover design from the Forest Park Station (at DeBaliviere) to the east edge of downtown Clayton (near Forsyth Boulevard) at Forest Park Parkway; facility to be located within the existing rightofway of Forest Park Parkway and Millbrook Boulevard.

  - Within downtown Clayton, below-ground alignment, using cut and cover design, extends under Forsyth Boulevard and follows an alignment under Carondelet Plaza and Carondelet Avenue to Brentwood Boulevard to Galleria Parkway, then east under Galleria Parkway to the CMT right ofway; facility would be located within existing street rightofway except in the east edge of downtown Clayton where the alignment would cross through existing private (undeveloped) property.

  - Along the CMT rightofway, the facility would be built at ground grade from Galleria Parkway to Flora Avenue. At Flora Avenue, the alignment would ascend on an elevated structure through the Sunnen Business Park, over Big Bend Boulevard, Deer Creek, and I44 to the Lansdowne Avenue Station.

- At-Grade/GradeSeparated Combination
  - Below-grade alignment at the Forest Park Station extends west below Forest Park Parkway (cut and cover), transitions upward to existing ground level at a point approximately 1,000 feet west of DeBaliviere Avenue, continues 600 feet west of Big Bend Boulevard, where the alignment transitions back down to below ground and extends below ground (cut and cover) to the east edge of downtown Clayton. The atgrade section would be designed with two optional locations: one in the median of Forest Park Parkway and Millbrook Boulevard and one along the south edge of these

streets. The atgrade section along the south edge would transition into the below-ground location at a point east of Big Bend Boulevard because of existing utility facilities.

- Within downtown Clayton, the design would transition up to ground level at Forsyth Boulevard and continue west along the north edge of Carondelet Plaza to Hanley Road, along Carondelet Avenue through the downtown core following one of two options: (1) turn south along Meramec Avenue with tracks along the west side of the street, south of Bonhomme Avenue, the tracks would elevate over Forest Park Parkway; (2) continue west along Carondelet Avenue to Brentwood Boulevard, south along the west side of Brentwood Boulevard to Shaw Park Drive, west on Shaw Park Drive ascending to an elevated alignment to pass over Forest Park Parkway just east of I170, curving southward and descending into the CMT rightofway. The alignment would cross existing private property in the section east of Hanley Road. It would follow the centerline of Carondelet Avenue, staying within the rightofway; it would be located in public rightofway for the remainder of this section, with some use of land along the edges of Shaw Park.

- Along the CMT rightofway, the alignment would be at ground level from Forest Park Parkway south to Flora Avenue. At Flora Avenue, the alignment would descend to a below- ground (cut and cover) alignment through the Sunnen Business Park, passing under the Union Pacific (UP) railroad; south of the UP, the alignment would be at grade, crossing Big Bend Boulevard and Oxford Avenue. From this point south, the alignment would be on elevated structure over Deer Creek and I44 to the Lansdowne Avenue Station.

♦ Section Alternatives

For certain limited sections within the two corridor alternatives described above, there are additional alternatives or design options.

Forest Park Parkway Elevated. Within downtown Clayton from Forsyth Boulevard (east edge) to the CMT right-of-way, the option entails an elevated transit structure following the north edge of Forest Park Parkway. From Hanley Road to Meramec Avenue, the structure would be over Shaw Park Drive; at Meramec Avenue, the alignment would cross over Forest Park Parkway and run parallel to the south side of the parkway until curving southward into the CMT rightofway.

This option would be a substitute section for the atgrade/gradeseparated combination alternative.

Galleria Elevated. In the Galleria area from approximately Clayton Road to Galleria Parkway, the alignment would ascend from the CMT rightofway

over I170 to follow an alignment parallel with Brentwood Boulevard; at Galleria Parkway, the alignment curves east back over I170 to the CMT right-of-way.

This option would be a substitute section for the atgrade/gradeseparated combination alternative.

Laclede Station Road At-Grade/Elevated. In the section from Flora Avenue to Big Bend Boulevard, the alignment would leave the CMT following Laclede Station Road atgrade from Flora Avenue south past Sunnen Drive. At this point, the alignment would become elevated, curving eastward and parallel to the north edge of the UP tracks, back toward the CMT right-o-fway. At the CMT, the transit alignment ascends over the UP tracks and follows the CMT over Big Bend Blvd.

This option would be a substitute for the fully gradeseparated alternative.

Deer Creek Terminal Station. As an option to extending the alignments to Lansdowne Avenue, the transitway could end north of Deer Creek in a location just east of Big Bend Boulevard.

This option would be a substitute for either alternative.

In the following section of this report, each of the above alternatives is described in detail, and a set of design drawings is presented that include the plan and profile for the alignment, proposed station area and site layouts, and architectural details. Highlights are provided to help explain these design materials.

Fully Grade-Separated Alignment

Section: DeBaliviere Avenue to Pershing Avenue

Perspective

This section begins at the Forest Park station. The existing station will be rebuilt and expanded. Riders will have easy access to the platforms from both sides of DeBaliviere Avenue, Banners, new signs, and landscaping will provide a high-quality visual experience in addition to increased convenience.

The ride to the west will be swift, smooth, and uninterrupted. MetroLink will glide into the Kinker station. Riders will have access to both sides of Millbrook Boulevard. To the north, the passageway will lead to the neighborhoods nearby. To the south, the linkage extends into the Washington University campus. Access points will be clearly signed, lighted for nighttime, and constructed of quality materials to be inviting to riders.

Farther to the west, the same experience will occur at the Big Bend station. Beyond this station, MetroLink will travel swiftly toward downtown Clayton.

1. Alignment (See Sheets C-01, C-21, C-22, C-23, C-24)
   Existing MetroLink tracks at the Forest Park station moved to north edge of right-of-way to make room for new tracks.

   Switches to be located east of DeBaliviere Avenue.

   Existing DeBaliviere Avenue bridge to be reconstructed with wider portal for tracks.
   Tracks under Forest Park Parkway at DeBaliviere following an alignment just north of the centerline of the existing Forest Park Parkway right-of-way.

   Tracks would be over the Des Peres River tunnels at Des Peres Avenue, but still underground.

   Cut-and-cover design will be used for this section in order to install streetscaping in the median and because of the need to minimize underground utility impacts.

   Depth of tracks is coordinated with station design relative to the need for underground pedestrian concourses to link the center platform with surface access along the sides of Forest Park Parkway and Millbrook Boulevard. The presence of existing major utilities, especially an MSD sanitary sewer in the south half of the Millbrook Avenue right-of-way, requires tracks to be deep.

2. Roadway Geometric Design:
   Roadway geometrics remain the same as existing.

3. Right-of-Way Needs:
   No added right-of-way anticipated within this section.

4. Stations
   Section will have three stations: DeBaliviere Avenue, Skinker Boulevard, and Big Bend Boulevard.

   Community setting for each station has certain features:

   DeBaliviere
   Coordination with possible development along west side of street north of the tracks.Enhanced linkage to Forest Park.
   Linkage to residential neighborhood to the north.

   Skinker
   Enhanced linkage to Washington University campus to the south; create "front door" quality as the prime transit access to the campus.
   Sidewalk linkage to the north to residential neighborhoods.

Big Bend
Enhanced linkage to Washington University campus, especially in relation to possible development at the southeast corner of Millbrook Boulevard and Big Bend Boulevard.
Sidewalk linkage to the north and south to residential neighborhoods.

Stations have intersections with other transportation modes:

DeBaliviere
Enhance bus/rail linkage along DeBaliviere.Forest Park circulator (shuttle) stops on DeBaliviere
Accessible (ADA) pedestrian linkages on both sides of the street to platforms.
Existing parking lot with possible future parking structure on joint development site (west side of DeBaliviere).
Kiss-n-ride vehicle access on both sides of DeBaliviere.

Skinker
BSDA bus stops on both sides of Skinker.
Accessible (ADA) pedestrian linkages on both sides of Skinker to platforms.
Kiss-n-ride access along the west side of Skinker south of Millbrook Boulevard.

Big Bend
BSDA bus stops on both sides of Big Bend.
Accessible (ADA) pedestrian linkages on both sides of Big Bend to the platforms.
Kiss-n-ride vehicle access along Big Bend Boulevard.

Section: Pershing Avenue into and through Downtown Clayton

Perspective

The train would continue under Forest Park Parkway entering downtown Clayton. Two stations would provide highly visible access to the east and central sections in the downtown.

The east station may be linked directly to new, exciting development, potentially including new residential buildings. People may be able to walk directly to MetroLink station platforms within the buildings. The Central station is in the heart of downtown Clayton. Access will bring people directly into a new plaza amid the St. Louis County complex of buildings. The station will be a short walk from retail, hotels, and restaurants. The station will be highly visible through the use of streetscape facilities.

1. Alignment
   MetroLink would be located under the westbound lanes of Forest Park Parkway. At a point approximately 600 feet north of Forsyth Boulevard, the alignment veers

slightly to the west to follow the west and north edges of the parkway.
As the alignment approaches Forsyth Boulevard, it swings into a more east-west orientation to align with Carondelet Plaza.
Tracks follow Carondelet Plaza to Carondelet Avenue and along Carondelet Avenue to Brentwood Boulevard. At Brentwood, the tracks follow Brentwood to the Galleria area.
Cut-and-cover design is used for all sections.
Through the core section downtown Clayton, the alignment would generally be the center of the existing street right-of-way.
The depth of the tracks would be coordinated with station design access needs and the location of underground utilities.
Because of the existing hilly topography in Clayton, vertical grades will be selected to balance grade and depth (i.e., avoid steep grades without becoming so excessively deep in the ground that cut- and-cover construction techniques are unworkable).

2. Roadway Geometrics
Existing street geometrics remain the same; it is anticipated that Carondelet Avenue, between Central Avenue and Merimec Avenue will be closed to vehicle traffic as a pedestrian plaza.

3. Right-of-way Needs
Right-of-way will be needed across (underground) private property in the east section of Clayton both north and south of Forsyth Boulevard and along the north side of Carondelet Plaza.

4. Stations
Section will have two stations: at Carondelet Plaza and Carondelet Avenue/Central Avenue.

Community setting for each station has certain features.

Carondelet Plaza
Coordination with major development sites in this vicinity in the area north and south of Forsyth Boulevard (along Carondelet Plaza).
Two optional platform locations would be possibilities spanning Forsyth to Carondelet Plaza or across Carondelet Plaza.
Pedestrian linkages would extend to the Ritz Carlton Hotel site, north to Forsyth Boulevard, and west to Hanley Road.
Design qualities would need to be compatible with the hotel and the plan/strategy for development in this vicinity.

Carondelet/Central Avenue
Coordination with plaza redesign being considered for the St. Louis County building complex, including the proposed downtown Clayton transit center along Meramec Avenue (north of Carondelet).
Access locations will facilitate linkages to the downtown pedestrian circulation system.

Quality of access design (scale, materials, theme) would be appropriate to articulate the prominent role of this station in the Cross-County corridor.

Stations have interconnections with other transportation modes:

Carondelet Plaza

BSDA bus stops on Forsyth Boulevard.
Accessible (ADA) pedestrian linkages at Forsyth Boulevard and Carondelet Plaza.
Potential direct vertical linkages in new development.

Carondelet Avenue /Central Avenue

Major new BSDA bus transfer center on Meramec Avenue.
Accessible (ADA) pedestrian linkages to both the Central Avenue and Meramec Avenue intersections.
Potential underground pedestrian concourse linkages to the county administration center and/or courthouse.

Section: Downtown Clayton into the Galleria Area

Perspective

Moving from downtown Clayton, train would enter another major activity area associated with the Galleria shopping center, University Club Tower, and other development. Passengers exiting the station will be a short distance from Dillards department store and the shopping center. other access will lead directly east to development on the east side of the street. In the future, the station will become part of continuing high-quality development in the Brentwood Boulevard corridor.

1. Alignment
   Tracks to be under the west part of the Brentwood Boulevard right-of-way, passing under the I170 roadway structure.
   South of Clayton Road, the tracks veer slightly to the west to follow an alignment along the west right-of-way line at the edge of the Galleria shopping center site.
   At Galleria Parkway, the alignment turns to the east following the right-of-way to the old Terminal Railroad right-of-way (now Citizens for Modern Transit, CMT (Right-of-way).
   Cut-and-cover design to be used for this section. A transition structure, where tracks will rise from underground to surface, will be located just east of the intersection of Galleria Parkway and the I170 interchange.
   The depth of the tracks will be coordinated with underground utility locations, especially at Brentwood Boulevard/Galleria Parkway.

2. Roadway Geometrics
   Some impact on layout of parking lot in the Galleria Shopping Center.
   Existing roadway geometrics to remain unchanged.

3. Right-of-way Needs
   Right-of-way or easement needed in Galleria Shopping Center site for section from Clayton Rd to Galleria Parkway.

4. Stations
Section will have one station near Galleria Parkway.

Community setting for this station has certain features.
Coordination with potential new development along the east side of Brentwood Boulevard.
Access coordination with the Galleria shopping center, including modification of the existing parking lot on Brentwood Boulevard.
Pedestrian access (ADA-compatible) will be located on the west side of Brentwood Boulevard; improved crosswalks will link to the east side of the street.
Pedestrian linkage to the University Club Tower site and toward Clayton Road.
Station has interconnection with BSDA bus routes along Brentwood Boulevard.
Bus stop bays would be included in the street at a point just north of the University Club Tower access road intersection.

Section: Galleria Area to Shrewsbury

Perspective

MetroLink will travel along the CMT through a mixed land use area with some residential neighborhoods, but mostly a commercial/industrial landscape. Tracks are mostly in an elevated setting so that passengers will have vistas to the surrounding area. The four stations along the route will be busy locations, especially at Eager Road and Lansdowne Avenue. These will be significant mode change locations, with many people transferring to and from MetroLink. The Lansdowne station will form the nucleus for new urban redevelopment in this corner of Shrewsbury.

1. Alignment
Tracks are located in the CMT right-of-way or easement from Galleria Parkway to the vicinity of Deer Creek. At Deer Creek, tracks would follow an alignment over I44 in a position east of the Laclede Gas Company property and east of the BNSF railroad in the vicinity of Lansdowne Avenue.

In the segment from Flora Avenue south, the tracks rise on an elevated structure to cross through Sunnen Business Park, go over the Union Pacific Railroad tracks, and over Big Bend Boulevard and Deer Creek.

Along the CMT, tracks are generally at ground grade and are located both east and west of the Ameren UE transmission towers, depending on the available width of the right-of-way or easement.

Inclusion of special at-grade access points for industrial land uses from Hanley Road to south of Manchester Road.

New bridges for the tracks will be built over streets at Linden Avenue, Hanley Road, Manchester Road, Big Bend Boulevard, and Oxford Avenue.

2. Roadway Geometrics
Anticipated widening of Eager Road in section from I-170 to Healy Road.
Anticipated widening of Manchester Road at station site to provide left-turn lane.
New I-44 access (see section later in report for discussion).
Anticipate (as part of MoDOT highway program) significant improvement of I-64 in this general area.

3. Right-of-way Needs
Access easement or right-of-way needed for Eager Road station - from Eager Road and extension of Dale Avenue.
Need right-of-way for Eager Road, Manchester Road, and Lansdowne Avenue station sites.
Right-of-way over I-44 to Lansdown Avenue.

4. Stations
Section will have three stations at Eager Road, Manchester Road, and Lansdowne Avenue.

Community setting for each station has certain features.

Eager Road
Coordination with new joint development north of the station site along Eager Road.
Linkage to the expansion of the Promenade development west of the tracks.
Possible linkage to Hanley Industrial Court redevelopment to the south.
Pedestrian (community) access to the east and south.

Manchester Road
Coordination with potential redevelopment north of Manchester Road.
Linkage to the Sunnen site south of Manchester Road.

Lansdowne Avenue
New major redevelopment area, including station site, with possible redevelopment on south side of Lansdowne Avenue.
Linkage to existing residential and industrial land use on west side of BNSF railroad.
Site to be planned as joint development, including possible commercial land use, major transportation center, and MetroLink maintenance/storage facility.

Stations have interconnections with other transportation modes.

Eager Road
Major park-n-ride facility with approximately 1,000 parking spaces to be developed; will be as a parking ramp, coordinated with other development.

Access from I64 to be enhanced via connections from both Hanley Road and Eager Road.
BSDA bus access to be included.
Sidewalk linkages east to Hanley Road and west to the Promenade Center.
Kiss-n-ride to be included in site layout.
Station is at ground grade, with suitable ramps to platforms.

Manchester Road
BSDA bus transfer facility to be incorporated in off-street site east of the MetroLink tracks and north of Manchester.
Kiss-n-ride facilities to be included, but no park-n-ride.
Manchester Road to be widened to include left-turn lane for access.
Elevator access to platform to be available on site.

Lansdowne Avenue
New major park-n-ride facility with approximately 800 spaces.
New major BSDA bus transfer/mode interchange facility to be included in off-street site north of Lansdowne Avenue.
Accessible (ADA) pedestrian linkage to the site and Lansdowne Avenue.

5. Streetscape
Various design treatments can be used along the CMT right-of-way.
For locations with adjacent residential areas, concentrated landscaping can be included; the right-of-way may also permit inclusion of bicycle/pedestrian trail.

For locations in industrial areas, the extent of landscaping would be less than in residential areas.

At-Grade/Grade-Separated Alignment

Section: DeBaliviere Avenue to Pershing Avenue
Perspective
This alternative begins in the same way as described for the fully grade-separated alternative. The connection occurs at the existing Forest Park MetroLink station. The tracks will be under DeBaliviere Avenue and will extend underground (cut and cover) for about 1000 west of DeBaliviere Avenue. A transition structure of 800 feet in length will occur in the west part of this distance in which the tracks will rise from underground to grade level.

For the at-grade portion, two optional alignments have been designed: one in which the MetroLink tracks would occupy the median of Forest Park Parkway/Millbrook Boulevard, and one in which the MetroLink tracks would be located along the south edge of these roadways. The following highlights describe these options in this same order.

The perspective for these at-grade options would be roughly the same. This alternative would be a more visible concept. Riders would have a view of this part of the corridor,

including high-quality institutions, residential areas, and landscaping. The transitway would include streetscape improvements in order to blend into the area and yet to create an appropriate level of visibility.

At-Grade in Median

1. Alignment
   The median trackway would be 32 feet wide; four lanes of roadway plus a 5-foot landscape zone on each side will fit in the existing 90-foot-wide right-of-way along Forest Park Parkway and along Millbrook Road west of Big Bend Boulevard. However, along Millbrook Boulevard between Skinker Boulevard and Big Bend Boulevard, the right-of-way narrows to 80 to 90 feet, so that up to an additional 10 feet of new right-of-way would be needed along the south edge of the existing right-of-way to accommodate this option.

   All existing local street intersections to be kept open.
   At a point about 600 feet west of Big Bend Boulevard, a transition begins in which tracks would descend to an underground alignment for the remaining west portion of this section.

   Intersections would be controlled by standard traffic signals. At the local intersections of Des Peres Avenue, Hoyt Drive, and Throop Drive, railroad gates will be installed in the median to prevent traffic from crossing the tracks.

2. Roadway Geometric Design

   Forest Park Parkway and Millbrook Boulevard modified to create wider median; existing number of traffic lanes retained.

   Skinker Boulevard intersection cross-section (no. of lanes retained) with potential to consider including only one eastbound right turn lane; possible option to include a north-south through lane and underpass (one lane in each direction) to augment traffic capacity.

   Big Bend Boulevard intersection cross-section retained.

   All existing intersections to remain open including Des Peres Avenue, Hoyt Drive and Throop Drive.

3. Right-of-way Needs
   Along Forest Park Parkway, no new right-of-way needed except in approach to Skinker Boulevard, where widening along south edge needed for station.

   Along Hillbrook Boulevard (Skinker to Big Bend up to 10 feet of right-of-way along south required; at stations an additional 15 to 20 feet of right-of-way required.

West of Big Bend Boulevard 15 to 20 feet of right-of-way needed at the station location.

4. Stations
Section will have two stations at Skinker Boulevard and Big Bend Boulevard.

Community setting will be the same as described for the fully grade-separated alternative.

Stations have connections with other transportation modes. Basic activities will be the same as described for the fully grade-separated alternative, except for the following design differences:

Side platforms will be used rather than center platforms.

Side platforms will be split so that the eastbound and westbound platforms will be in their respective far side of the intersection.

Rider access will be from standard (north-south) crosswalks in the intersection.

5. Landscape and Streetscape
Along Forest Park Parkway, Streetscape will consider various options that incorporate limited landscaping, use of ornamental street lighting and side fencing.

Catenary support system could employ a span-wire design to create more visible space; span wire could be used as a space frame to form an "arch-type" structure over street.

Accent lighting could be incorporated along route.

Median transitway could employ a variety of designs that involve different treatments for the barrier and trackway surface; the design vocabulary would be selected to be compatible with area.

At-Grade in South Edge

1. Alignment
With the transitway located in the south 32 feet of the right-of-way, the roadway pavement would be shifted to the north; this would affect mostly the eastbound lanes, with the existing median being reduced to five feet.

At all intersections, the tracks would cross through the south approaches. Railroad crossing gates and signals would be used at these locations.

Because of the need to position the transition to the underground alignment 600

feet west of Big Bend Boulevard, and because this transition needs to be in the center of the right-of-way (due to the existence of a major sanitary sewer in the south part of the right-of-way), the alignment needs to be moved from the south edge to the center at a point approaching the Big Bend Boulevard intersection. Such an at-grade relocation would not be acceptable for operational reasons; hence, this alignment (at-grade, south edge) would be transitioned into an underground alignment, with the transition beginning midway between Hoyt Drive and Throop Drive in order to have the trackway completely underground at Throop Drive.

2. Roadway Geometrics
Forest Park Parkway and Millbrook Boulevard pavement to be moved slightly to north; this will be accomplished by reducing width of existing median and relocating eastbound lanes; the same number of traffic lanes to be provided, potential to add 1-2 east-bound right turn lanes.

At Skinker Boulevard tracks cross in south approach, gates and warning lights to be installed; existing cross-section to be retained.

At Big Bend Blvd, existing cross sections to be retained without change.

3. Right-of-way Needs
Right-of-way needs are largely the same as described for the at-grade in the median option.

Potential addition of eastbound right-turn lanes will require more right-of-way.

4. Stations
The same two stations noted above would be included, except their locations would be different.

At Skinker Boulevard, the station would have a center platform with sidewalk access to Millbrook. The platform would be positioned west of Skinker Boulevard to link more directly to campus pedestrianways.

At Big Bend Boulevard, the station would be underground just east of Big Bend; it would be a center platform with elevator and stairway access on the campus side of Millbrook Boulevard.

Section: Pershing Avenue through Downtown Clayton

Perspective
The at-grade alternative would become a significantly visible element of downtown Clayton. The facility would incorporate major streetscape improvements. Riders would have multiple vistas as they travel through the downtown. The alignment is simple and would be user-friendly in terms of understanding how it works. As a modern transit facility, it would contribute to downtown Clayton's image as a significant urban center.

1. Alignment

Similar to the grade-separated alternative, the Forest Park Parkway link to the east edge of downtown Clayton would be underground.

At the east edge of downtown Clayton, the alignment would veer away from Forest Park Parkway to be aligned with Carondelet Plaza and Carondelet Avenue in a location similar to the one described for the grade-separated alternative.

Because of the vertical grades, the only opportunity for an at-grade station would be a position due north of the Ritz Hotel along the north edge of Carondelet Plaza. This location would require changing the elevation or location of Carondelet Plaza, i.e., the existing street connection to Forsyth Boulevard would be lowered or moved about one-half block to the west in order to reconcile the track and street grades. Access for the hotel and parking garage would be maintained.

West of the Ritz Hotel, the alignment would swing across the westbound lanes of Carondelet Plaza to line up with the center of Carondelet Avenue at the Hanley Road intersection.

The alignment would continue along the centerline of Carondelet Avenue with two options for the westerly end: (1) continue west to Brentwood Boulevard and curve south along the west side of Brentwood Boulevard. At a point south of Bonhomme Avenue as the existing street grade descends toward Shaw Park Drive, the tracks will stay level in order to transition to an elevated alignment on Shaw Park Drive west of Brentwood Boulevard. The alignment would curve around the southeast corner of Shaw Park, requiring some new right-of-way; (2) turn south along Meramec Aenue with tracks located along the west side of the street towards Shaw Park Drive at a point about 200 feet south of Bonhomme Avenue the tracks would rise to become elevated passing over Shaw Park Drive and Forest Park Parkway.

2. Roadway Geometrics

As noted above, the configuration of the east end of Ritz Drive would be modified.

Along Carondelet, the cross-section would be changed to have one lane in each direction with space for emergency stopping but no curb parking.

At all north-south street intersections, space for turn lanes provided on Carondelet, cross-section for Hanley Road, Berniston, Meramec, and Brentwood to be as existing.

Along Meramec Avenue between Carondelet and Bonhomme Avenue, two lanes in each direction provided; south of the Bonhomme these would be only one northbound and two southbound lanes.

Central Avenue would have same lanes, except vertical profile of street to be changed, affecting locations of pedestrian crosswalks.

3. Right-of-Way Needs
Right-of-way needs for crossing of private property in the east section of downtown - north and south of Forsyth Boulevard and along Carondelet Plaza.

For option extending to Brentwood Boulevard right-of-way needed along east edge of Shaw Park and the south edge.

For option turning at Meramec Avenue new right-of-way required at southwest corner of Carondelet/Meramec.

4. Stations
This section would have two stations: one along Carondelet Plaza and one on Carondelet Avenue between Central Avenue and Meramec Avenue. The comments provided for the grade-separated alignment would apply here, except that the at-grade configuration would have greater visibility.

For the core station, the elevation of the track and need to change the profile of the Central Avenue pavement will require careful coordination between platform elevation and sidewalk access.

5. Streetscape
Use of span-wire for catenary support allows for some narrowing of trackway to permit more streetscape features.

Trackway would use barriers with design treatment.

Landscaping areas would be located along side of street with sidewalk extensions at regular intervals.

Catenary support poles could serve multiple functions for street lighting and banners.

Section: Downtown Clayton into the Galleria Area

Perspective
The perspective is that riders will have an elevated view from the CMT right-of-way. The facility will be seen by others in highly visible locations.

1. Alignment
The alignment follows Shaw Park Drive west of Brentwood Boulevard, ascending over Forest Park Parkway and then descending into the CMT right-of-way on the west side of the Clayton Corporate Center. For the Meramec option, alignment crosses over Forest park Parkway to follow along south side to curve into CMT right-of-way.

The alignment follows the CMT right-of-way to the Galleria area.

.2. Roadway Geometrics
All existing roads remain unchanged.

New drive development from east end of Galleria Parkway to access station along west side of CMT right-of-way.

Also, same access drive modifications in existing developed area along east side of CMT right-of-way at platform.

3. Right-of-way Needs
Easement required in development area to access site from Clayton Rd. (east of CMT right-of-way)

Right-of-way may be needed to develop access drive from Galleria Parkway.

4. Stations
The section has one station between Clayton Road and Galleria Parkway.

Community setting for this station has certain features:

Coordination with development on both sides of the CMT/I170 rights-of-way.

Potential redevelopment along the east side of the CMT and the Clayton Road district; station site has direct linkage.

Linkages to the Galleria shopping center and University Club Tower area would need to rely on improved pedestrianways along Galleria Parkway (some consideration could be given to a pedestrian skywalk over I170 into the University Club Tower site.

Linkage to residential neighborhoods could be developed via a pathway south along the CMT with the ramp down to Linden Avenue.

The station would have connections with other transportation modes:

A limited kiss-n-ride and bus transfer facility would be included in an off-street site at the east end of Galleria Parkway.

BSDA buses will have transfer bus stops accessible from Clayton Road to the east side of the station.

Pedestrianways will extend west, south, and north.

Section: Galleria Area to Shrewsbury

Perspective
This is the same as described for the grade-separated alternative.

1. Alignment
   The alignment for this section is the same as described for the grade-separated alternative and contains a variation relative to the Sunnen Business Park. From Flora Avenue south, the tracks would be underground beneath Flora Avenue, Laclede Station Road, the business park, and the UP railroad tracks.

   Because of existing topography, as the tracks clear the UP right-of-way they would cross Big Bend Boulevard and Oxford Avenue at grade.

   East and south of Oxford Avenue, the tracks would become elevated over Deer Creek and I44 to the Lansdowne Avenue station.

2. Roadway Geometrics
   All existing roadways would be retained.

   New I-44 access

   Aanticipate (as part of MoDOT highway program) significant improvement of I-64 in this general area.

4. Stations
   Highlights about the stations are the same as described for the grade-separated alternative, with one difference: the Big Bend Boulevard station would be at-grade rather than elevated.

Forest Park Parkway Elevated

This alternative would be an option for the downtown Clayton section.

Perspective

With an elevated alternative, the rider will have excellent views of downtown Clayton. The alignment represents the least intrusive presence for downtown activities. Significant effort to overcome the added walking distance of two blocks between the downtown core and the station would be focused on streetscaping and coordinated development activities.

1. Alignment
   The tracks would extend over Forsyth Boulevard at the east edge of downtown. In order to achieve this vertical elevation, two alignments are possible:

Provide necessary length for the underground transition by "looping" the alignment through the parking lot and Bally Health Club site.

Initiate the transition from underneath Forest Park Parkway (from Pershing Road) at a point near Maryland Avenue. This requires additional right-of-way along the west edge of the parkway (30 feet) in order to move the alignment to the side of the parkway.

Once past Forsyth Boulevard, the alignment would follow the north edge of the parkway to the west; in the section along the Ritz Hotel site to Hanley Road, the tracks would need to be over the parkway westbound shoulder and lanes.

West of Hanley Road, the alignment would veer slightly north to be over the frontage road, Shaw Park Drive.

At Meramec Avenue, the alignment would cross over Forest Park Parkway and follow the south edge of the parkway, curving southward into the CMT right-of-way.

2. Roadway Geometrics
For the alignment option through parking lot at Bally's, parking lot configuration would be changed.

For the alignment option that begins the vertical transition north of the Bally site, some geometric changes may be necessary for local streets in the vicinity of the Maryland Ave. and Pratt Avenue intersection.

3. Right-of-way Needs
For the option through the parking lot, the Bally Building and parking lot would need to be acquired.

For the option to begin the transition near Maryland Avenue at Pratt Avenue new right-of-way (25 to 30 feet) needed along west side of Forest Park Parkway.

Right-of-way or easement may be needed along south side of Forest Park Parkway from the Meramec Avenue crossing west to the CMT.

4. Stations
One station would be included in this section, i.e., over Shaw Park Drive just west of Central Avenue.

The community setting for this station has certain features.

The station would be attached to the side of a proposed new St. Louis County parking garage.

The linkage to the downtown core would be critical; the pedestrianway would be

made level and as inviting as possible through design features.

The station would have linkage with other modes.

The pedestrianway would be developed along the west side of Central Avenue to the north.

The adjacent parking garage offers park-n-ride opportunity, especially for non-weekday/daytime trip purposes (i.e., special events).

The downtown Clayton bus transfer center is two blocks to the north.

Galleria Elevated

This alternative would be an option for the Galleria area.

Perspective
The comments from the previous alternative would apply, with the addition that this option would carry riders directly into a new building. This would be a unique and highly innovative experience.

1. Alignment
   The tracks would follow an alignment that would veer off the CMT right-of-way in the vicinity of Clayton Road to penetrate a potential development zone lying between University Club Tower and Brentwood Boulevard, and then swing back to the CMT right-of-way via Galleria Parkway.

   The tracks would cross over I170 at Clayton Road and at Galleria Parkway.

   The alignment would parallel Brentwood Boulevard approximately 100 feet east of the east right-of-way line of Brentwood Boulevard.

2. Roadway Geometrics
   Existing streets would be retained.

   In order to permit excellent access for buses and kiss-n-ride, new access drive to be linked to Galleria Parkway (east of Brentwood Boulevard).

3. Right-of-way
   Substantial right-of-way and/or easement for alignment through the development area.

4. Stations
   One station would be included in this section: immediately north of the existing University Club Tower access drive.

   The community setting and mode interface comments made about the

underground Brentwood Boulevard station would generally apply to this station. However, for this station, the concept is to physically integrate the station with new development.

Laclede Station Road At-Grade/Elevated

This alternative would be an option for the other alternatives that follow the CMT through the Sunnen Business Park.

Perspective
This would be the same as the previous comments for this section. The Laclede Station Road option would create a close visual relationship with existing and future quality commercial development. The at-grade location would create visibility and make it an active station.

1. Alignment
   The tracks would cross Flora Avenue at grade and turn onto the Laclede Station Road right-of-way at the edge of the existing Sunnen Business Park.

   The track would be at grade to a point about 200 feet south of the extended Sunnen Drive. At this point, the existing topography drops substantially to the south; the tracks would stay at a level elevation on an elevated structure.

   The tracks would continue south along Laclede Station Road and turn to the east to parallel the UP tracks (adjacent to and north of tracks). At this point, the tracks would be at grade again.

   The tracks would continue at grade to near the southwest corner of the Sunnen Business Park, where they would ascend to an elevated structure over the business park rear parking area and continue east to the CMT right-of-way.

   At the CMT ROW, the tracks would extend over the UP tracks and follow the CMT ROW over Big Bend Boulevard, Oxford Avenue, and Deer Creek, continuing over I44 to the Lansdowne Avenue station.

2. Roadway Geometrics
   Laclede Station Road would be substantially changed; it would terminate into the Sunnen Business Park just south of Flora Avenue for vehicle circulation/access purposes.

   The existing intersection of Laclede station Road and Hanley Road .would be changed to incorporate bus transfer and kiss-n-ride facility on the east side of Hanley Road.

3. Right-of-way Needs
   The existing Laclede Station Road right-of-way (south of Flora Avenue) would be

closed to auto traffic and used for transit.

New right-of-way will be required along the north edge of the U.P. tracks, partially in Sunnen Business Park; and for station site and Hanley Road access facilities.

4. Stations
There would be one station in this section along Laclede Station Road (south of Sunnen Drive). This station would be a substitute for the Big Bend Boulevard station.

Community setting for this station would have certain features.

Linkage to Sunnen Business Park and to major industrial/commercial redevelopment areas in the Hanley Road corridor.

Linkage to the residential area to the north.

Linkage to Deer Creek Center to the south.

Station has interconnection with other transportation modes.

A bus transfer facility would be located off Hanley Road near the existing Laclede Station Road intersection.

Buses would be rerouted from Big Bend Boulevard to access the station.

A kiss-n-ride facility is included in the Hanley Road site.

Pedestrianways would be developed to the north, east, west, and south.

With Hanley Road at a lower level, pedestrian (ADA) access to the station platform would be provided.

Deer Creek Terminal Station

This alternative would be an option for the Lansdowne Avenue station. The previously described track alignment would apply to this option. The difference is that the park-n-ride, bus transfer, and yard/maintenance facilities would be placed on a site north of Deer Creek.

Depending on the alternative to the north, the Deer Creek station would be either at grade or elevated.

The tracks would be positioned to allow for the future extension to the south. The yard facility would be located generally at grade in a position southeasterly of the station. Sheet C-44 illustrates the location of the yard tracks and the connecting tracks from the

at-grade station. For an elevated station, the yard would still be generally at-grade. But, because of the needed transition from an elevated to at-grade alignment, the connecting tracks would follow a somewhat difference alignment (along the CMT right-of-way) with the connection occurring at the sough end of the yard (not shown on Exhibit C-44).

The total facility would include the land area from the CMT ROW to Deer Creek from just east of Big Bend Boulevard.

The track alignment would extend diagonally through the site; the eastern portion (north of the mainline MetroLink tracks) would be the yard space, with the western portion (south of the mainline) as the bus transfer and parking area.

If the alignment from the north would cross Big Bend Boulevard at-grade, then this terminal station would replace the Big Bend at-grade station. If the alignment from the north is elevated over the U.P{. tracks and Big Bend Boulevard, then a new elevated station would be located east of Big Bend Boulevard, east of Oxford Avenue.

Bus and auto access would be from Oxford Avenue, linked to Big Bend Boulevard, and existing driveways accessing Big Bend Boulevard. This site plan would be the same for elevated or at-grade station alignments.

Right-of-way would be required for the station and yard site. This would generally encompass the area between the CMT ROW, Deer Creek, and Big Bend Boulevard.

4
Access Alternatives at I-44

An optional element of the design concerns the provision of new access to I44. As noted previously, the terminal station for Segment I, whether at Lansdowne Avenue or Deer Creek, would benefit from improved access to the station site for park-n-ride kiss-n-ride, bus to rail transfer, (vice versa) purposes. The existing interchange at Shrewsbury Avenue has ramps to and from the east only. There would be a need for new I44 ramps to and from the west. Currently, such westward-oriented ramps only exist at the Laclede Station Road interchange, a significant distance from the proposed MetroLink station.

As part of required transportation system development, the Missouri Department of Transportation is considering overall improvements to the I-44 corridor. Part of this MoDOT plan could be enhancements or upgrades of interchanges that could also serve the Cross-County MetroLink extension corridor.

The following optional design concepts could be part of these plans.

Option No. 1

Modify the existing Shrewsbury Avenue interchange by adding ramps to and from the west. This could require additional right-of-way. There is limited space, and retaining walls would probably be required. This option would be suitable for access to a Deer Creek station, but not Lansdowne Avenue.

Option No. 2

Inasmuch as the existing Shrewsbury Avenue interchange has substandard design elements with limited traffic capacity, this option would entail the rebuilding of the interchange. Existing ramps would be replaced, and new westward ramps would be added.

The configuration would be a modern diamond interchange. Some right-of-way, especially in the northeast quadrant, would be required.

Option No. 3

Because of the potential need for improved accessibility in this area, this option would entail developing a new interchange to replace the Shrewsbury Avenue interchange. The interchange would be positioned according to a new arterial street connection that would link the intersections of Big Bend Boulevard/Oxford Boulevard and River Des Peres Boulevard/Lansdowne Avenue. The interchange would have a diamond configuration. This option would provide access to either the Deer Creek or Lansdowne Avenue MetroLink stations.

Option No. 4

New ramps would be located east of Shrewsbury Avenue, extending directly into the Lansdowne Avenue station site. The ramp terminal would be aligned with River Des Peres Avenue. The existing Shrewsbury Avenue ramps would be retained. In combination, four ramps would be available to provide access to the east and west along I44. Because the ramps would be separated, there would be minimal risk that new volumes of regional traffic would be attracted to this area. This option would be suitable only for the Lansdowne Avenue MetroLink station.

Each of these options represents a significant regional transportation system improvement. For coordination with the MetroLink project, Options 1 and 4 would represent the simplest, most direct means for achieving access to new transit stations.

5
Conclusions

As stated at the beginning of this report, the purpose has been to describe a series of alternatives that would be candidate conceptual designs for the Cross-County MetroLink Extension, Segment I. These descriptions have been put forward with the intention of educating readers as to the design possibilities and to, subsequently, provide a basis for discussion and decision-making.

While the location for this Segment I MetroLink line was closely defined by prior planning decisions (except for the alignment through downtown Clayton), the conceptual designs described herein represent a range of choices. These choices described herein focus on vertical alignment, station location, and urban design/architectural details. It is recognized that these choices result in to different levels of cost, transit performance, and quality of facilities. Such a range of possibilities needs to be demonstrated so that decisions about the Segment I project lead to the wisest investment.

Each alternative has been addressed with an equivalent level of design effort. All are equal at this point and any one or combinations could be selected as the preferred design. Each accomplishes the design objectives, notwithstanding differing levels of achieving individual objectives. Each represents feasible alternatives. Appropriate design standards have been applied in each case. Data, as to available right-of-way resources, has been interpreted to verify that the alignment designs are feasible.

The alternatives have been depicted in terms of two basic corridor concepts plus a series of design options that could be inserted in limited sections of the corridor. This organization of alternatives reflects a performance/level of investment theme. The fully grade-separated alternative potentially offers the best performance, but at probably the highest capital cost. The at-grade/grade-separated combination offers good performance with a potentially lower capital cost.

The various options fit into these alternatives, achieving certain purposes—better station location, lower capital cost, improved performance, increased benefit, or reduced impact.

This organization of candidate alternatives has been used as a convenient way to describe them. However, the selection of a preferred alternative would not be constrained by this organization. It should be anticipated that the preferred alternative will be a combination of alternatives and options. Consideration of such combinations will be possible after evaluation of the alternatives, including cost estimates, has been completed. The requirement at this time is to make sure that the candidate alternatives represent the best set of potential designs that should be considered for the Cross-County corridor, Segment I.