

SECTION IV: CONCEPTUAL DESIGN

A. Design Criteria and Standards

An important part of the study is to determine the existing and future needs of KCATA and evaluate these needs with respect to the existing transit operations. Based upon the evaluation of current and future needs, the study will determine the feasibility of a new facility.

Functional and Space Programming

The methodology used to identify and quantify the 3-Trails Transit Station needs involved an intensive functional programming session. The consultant team met with key representatives from the CID, KCATA, Bannister Mall, 6th District Public Improvements Advisory Committee (KCMO), 3-Trails West, Inc., (on behalf of the various historical trails organizations and the National Park Service), Metro Green, and the Hickman Mills C-1 School District during a session to develop the information required for the feasibility study. The session sought to:

- Provide an understanding of each participant's bus operation needs.
- Identify and understand problems and opportunities.
- Begin to conceptualize the desired facility plan.

The information developed during the programming session was organized and used as a basis for the evaluation of the existing facilities as well as a basis for the design of the new facility. The results of the programming session are detailed in Section III of this report.

Transit Service

The KCATA currently operates four fixed routes within proximity of the Bannister Mall. One of these routes operates as an express service, providing five trips during the A.M. and P.M. peak periods. Two flex routes also operate within the study area.

The Hickman Mills C-1 School District provides school bus transportation services for approximately one third of its students. Based upon existing school district service, "peak period" bus traffic would consist of eight (8) buses that pick-up and drop-off students each day. If educational facilities locate within the former Penney's building, the school district expects it would use a dedicated loading area two (2) times per day for approximately 30 minutes each period.

In the future, the CID, in partnership with KCATA, would like to develop a circulator shuttle service to locations within the District and the surrounding area. If future markets in the area consist of incubator space for start-up businesses, these markets could be favorable for shuttle service.

Design Vehicle

The KCATA uses buses that are approximately 40 feet in length, 9 feet wide, and 11 feet high (bottom of wheels to roof). A large school bus used by the Hickman Mills School District would also be approximately 40 feet in length, although conventional school buses may be shorter (e.g. 36 feet long).

Shuttle vehicles would likely be small buses or vans converted for passenger transportation and small body-on-chassis buses. These vans are approximately 25 feet in length and 9.5 feet high. The small buses are slightly larger.

Tour buses are typically of similar size to the KCATA buses. Vehicle length may vary between 40 feet and 45 feet.

To provide maximum flexibility for the proposed facility, a “typical” bus bay size of 50’ x 10’ will be used as the design standard.

B. Facility Program and Schematic Design

On October 9, 2003, TranSystems met with key representatives of the CID, KCATA, Bannister Mall, 6th District PIAC, historical trails organizations, Metro Green, and the Hickman Mills C-1 School District during a three hour work session to develop the information required for the feasibility study. The work session sought to:

- Provide an understanding of each participant’s bus operation needs,
- Identify the elements that will be included in the facility,
- Identify and understand problems and opportunities, and
- Begin to conceptualize the desired facility plan

The information developed during the programming session was organized and used as a basis for the design of the new facility. The facility purposes include:

- To provide an enhanced area for transferring passengers to wait for buses;
- To focus transit service to better serve area destinations, with an emphasis upon front door destination service and scheduled circulator shuttle service;
- To serve as a connecting point for various transportation modes;
- To elevate the profile of transit in the area; and
- To help foster economic development based upon the principals of transit supportive development.

The functional program of the new transit center must be flexible and accommodate various bus transportation services: KCATA bus service, school bus transportation services for the Hickman Mills C-1 School District, future shuttles, and tour buses. Bus services for the KCATA, school district, shuttles, and tour buses should operate independently of one another.

Table 1-4 shows the facility program and space needs for the 3-Trails Transit Station.

**Table1-1:
3-Trails Transit Station Program and Space Needs**

Transit Center Element	Detail and Standard	Quantity	Space
Bus Bays			
KCATA buses	Design vehicle is 40' X 9"	8 bays	4,800 SF
Paratransit vehicles	Design vehicle is 30' X 9"	1 bay	300 SF
Shuttle	Design vehicle is 30' X 9"	1 bay	300 SF
Sub-Total			5,400 SF
Passenger platforms	Covered waiting areas	1 platform	6,000 SF
Passenger interior space			600 SF
Passenger walkways, etc.			1,500 SF
Auto Passenger Drop-off		2 drop off bays	1,000
Circulation	As needed, 100% minimum		5,400 SF
Open space and buffers	As needed		4,000 SF
Transit Center Total			23,900 SF
Park and Ride lot	Standard stall configuration	200 spaces	87,120 SF
Grand Total			110,420 SF
			2.5 Acres

Table 1-4 shows the minimum space required for the transit center and park and ride lot. For planning purposes, a parcel of approximately three developable acres is required.

The consultant worked with the KCATA and the CID staff to develop the initial concepts to guide the facility design. The design process for the new facility incorporated the fundamental decisions regarding various design options and site design aspects.

The design program serves as the basis for development of the facility design. A preliminary site layout was then produced, based on the unique physical constraints of the site.

Design Concepts

The layout of the transit center evolved from the relationship of the different functions that are to be performed in the facility. Critical design considerations included the following:

- Creation of a comfortable facility for waiting and transferring passengers.
- Creation of an operationally efficient facility for bus staging and circulation.
- Creation of an attractive facility, easily identifiable from the roads serving the facility.
- Creation of a clearly defined entrance to the transit center that will be easily identifiable from parking areas, as well as from Hillcrest Road.
- Site layout to allow for ease of traffic flow from surrounding roads onto the site.
- Site should be planned to allow for bus loading and unloading.
- Layout of the site should also incorporate a connector trail to the historic 3-Trails Corridor.

Site Design Analysis and Concepts

Error! Reference source not found. shows the preliminary site layout that was developed based upon the conceptual design elements. Layout of the site was based on the functional relationship of the components of the facility and on the site's physical characteristics. Figure 1-4 is an architectural rendering showing how the transit center and related amenities would fit into the preferred site.

Circulation

Circulation is designed to allow buses and other transit related traffic (e.g., park and ride patrons) to enter and exit the site at 93rd and Hillcrest utilizing the high design of this signalized intersection. The intersection has a traffic signal and left turn lanes from both the north and the south having been designed to handle high traffic volumes associated with the Mall when it was fully occupied.

D. Opinion of Probable Cost

The consultant team, using current unit costs for the type of construction contemplated, prepared the opinion of probable cost shown in Table 1.5. The costs are based on the conceptual design discussed previously. The costs are for the “architecturally enhanced” design which includes a full canopy over the passenger waiting areas and walkways, significant site enhancements, incorporating L.E.E.D. (Leadership in Energy and Environmental Design) and L.I.D (Low Impact Development) principles. The distinctive design theme is reminiscent of a historic railway station reinforcing the CID’s marketing theme of “from trails to rails and roadways”. The cost estimate includes estimated construction costs, along with design and construction administration costs. The cost estimate includes a 20% contingency which is appropriate for this preliminary level of design. The opinion of probable cost is \$1,437,000 in 2004 dollars.

**Table 1-2:
Opinion of Probable Cost**

Item	Qty.	Unit	2004 Unit Cost	Total
Canopy (max./size)				
Substructure	12,250	SF	\$ 1.50	\$ 18,375
Superstructure	12,250	SF	\$ 26.00	\$ 318,500
Elect./Lighting	12,250	SF	\$ 2.50	\$ 30,625
Drainage	1,000	LF	\$ 30.00	\$ 30,000
Water	1	LF	\$ 10,000.00	\$ 10,000
Canopy (max.) Subtotal				\$ 407,500
Concrete Work				
Transit Center paving (7" conc.)	47,740	SF	\$ 5.00	\$ 238,700
6" raised curb	5,000	LF	\$ 14.00	\$ 70,000
Concrete Subtotal				\$ 308,700
Driveways				
Transit Center paving (5" conc.)	30,570	SF	\$ 4.25	\$ 129,923
Striping	--	--	--	\$ 5,000
Driveways Subtotal				\$ 134,923
Drainage				
Structures	3	EA	\$ 4,000.00	\$ 12,000
Piping	400	LF	\$ 35.00	\$ 14,000
Drainage Subtotal				\$ 26,000
Landscaping				
		LS	\$ 75,000.00	\$ 75,000
Landscaping Subtotal				\$ 75,000
Exterior Lights				
	1	LS	\$ 20,000.00	\$ 20,000
Exterior Subtotal				\$ 20,000
Demolition				
	9,184	SY	\$ 4.00	\$ 36,738
Demolition Subtotal				\$ 36,738
Earthwork				
Subgrade prep.	9,184	SY	\$ 2.50	\$ 22,961
Earthwork Subtotal				\$ 22,961
Sub-total Construction				\$ 1,031,821
Contingency		20%		\$ 206,364
Total Construction				\$ 1,238,186
Geotech, survey, testing etc.				\$ 25,000
Design		8%		\$ 99,055
Construction Administration		6%		\$ 74,291
Total Cost				\$ 1,437,000

C. Project Funding

A complete funding plan was not included in the feasibility study; however, information on possible financing strategies for the proposed new transit center was developed.

Transit centers of the type contemplated for the 3-Trails Station are eligible for funding through the Federal Transit Administration (FTA). FTA has several categorical funding programs that could be used. These funding programs include the Section 5309 capital program and CMAQ (Congestion Mitigation Air Quality) funds. Section 5309 funds are discretionary funds eligible for use for a wide range of bus transit-related purposes. Section 5309 funding can be used to cover up to 80 percent of the total cost of a project. CMAQ funds are made available through the Mid America Regional Council (MARC) and are also eligible to fund up to 80% of a project's cost. Local funding or some other eligible matching funding would be required to cover the non-federal share of the project cost. In addition, the CID, as a governmental entity with dedicated revenues, has funding that can be directed towards the project. One source may be PIAC (Public Improvement Advisory Committee) funds.

Currently, KCATA, in conjunction with CID support, has committed \$368,000 in CMAQ funding to the project. Other possible funding is shown in Table 1-3 below. The KCATA has not committed the additional \$125,000 in FTA funding at this time.

**Table 1-3:
Possible Funding Sources**

\$368,000	CMAQ
<u>\$92,000</u>	CID Local Match
\$460,000	Subtotal
\$500,000	Potential PIAC
\$960,000	Subtotal
\$125,000	Additional FTA funding through KCATA
<u>\$31,250</u>	Required Local Match
\$156,250	Subtotal Additional Funding
\$1,116,250	Total Potential Funding

Thus, to fund the proposed transit center estimated to cost \$1,437,000 the project would require the additional \$125,000 FTA funding from KCATA, secure the additional local match and the project would still have a funding gap of \$320,750. Additional funding would be required, or the transit center program could be reduced, thereby reducing the cost. Additionally, certain elements could be phased to allow for future funding.