

Building Bridges: Artists Collaborate as Designers for a Light Rail System

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For the first time on a large public works project (Metro Link, the St. Louis light rail system), visual artists worked as equal partners in a collaboration with engineers and architects to design all aspects of the infrastructure, including the design of new bridge structures. Arts in Transit, the sponsoring organization, is a national model and project of the Bi-State Development Agency. A team of visual artists critiqued preliminary engineering for Metro Link and developed aesthetic criteria for the project. Subsequently the artists worked on design development for all the functional elements of the system. In collaboration with the civil engineers, the artists designed a distinctive new bridge structure featuring a slingshot pier and haunched superstructure. This design is part of a unified concept that ties together various parts of Metro Link and relates them to structures in the St. Louis region.

The Bi-State Development Agency in St. Louis has pioneered a new concept in the building of a large rail system by using visual artists in integrated design collaborations with engineers. This unusual working relationship has produced excellent results and changed the thinking about building infrastructure.

Art has been included as an integral part of the construction of new transit systems for many years. For the most part artists have been commissioned to create objects for specific sites and to decorate or design artwork that complements and relates to the architecture. Both large and small systems, Boston, Pittsburgh, Detroit, Miami, Atlanta, Sacramento, Toronto, and Stockholm, have all been enhanced by the addition of artwork, lately referred to as "plop art."

For the 18-mi, 20-station Metro Link light rail system, which is scheduled to begin operation in mid-1993, an entirely new approach was developed by Arts in Transit, in itself an unusual group to be associated with a public works project. Organized in 1986 Arts in Transit (AIT), a group of entrepreneurial and energetic civic leaders, responded to the request of the regional planning agency then responsible for the light rail system to develop and implement a program that would change the negative perceptions of mass transit that existed in the St. Louis region and to maximize a very limited design budget. As a result of the vision of some 30 volunteers, a very ambitious but highly successful program has developed, part of which is the design collaboration.

Bi-State assumed responsibility for the design, construction, and operation of Metro Link in early 1988 and was committed from the beginning to having artists influence the look of the entire system. At that time, preliminary engi-

neering was complete and final design not scheduled to begin for more than a year.

The journey from the preliminary engineering to the final design (Figure 1) was a complicated one because no practical models existed for a design collaboration of this type. Both the artists and the facilities designers were new to the project. The learning curve was an issue for AIT staff and Bi-State management as well. But most important was the fact that no overall aesthetic criteria or aesthetic goals existed for the system.

Six artists were selected for the design team in a highly publicized national competition many months before requests for proposals were issued to engineers for the project. Grants from the National Endowment for the Arts, a federal agency, and the Regional Arts Commission, a St. Louis agency, paid the fees and expenses for the artists before Bi-State was able to issue contracts under the capital grant from the FTA.

During this interim period the artists critiqued the preliminary engineering design drawings and documents, familiarized themselves with the site, and recommended overall aesthetic design concepts.

The six artists did not know each other before this project and come from different cities with vastly different experiences. But after many days of discussion and debate they were almost of one mind on how they approached this project. Their major concerns with the preliminary engineering were that it seemed fragmented and disconnected, had no sense of place, that it did not relate to St. Louis, and that the system, through its design, was self-contained, emphasizing a linear, unfriendly approach.

Environmental artists are interested in philosophy, metaphor, shapes, forms, relationships, and feelings. "There is something wonderful about Stonehenge," observed Leila Daw, lead artist for Metro Link and primary design collaborator on the new bridge structures. "Most modern bridges are also post and lintel construction, but they almost always look awful." Daw also observed that "highway bridges with curvatures seem more satisfying somehow."

The curve, with the artists' input, has become the strongest design element present in Metro Link. The station canopy shape is a curve. The tunnel station ceiling is curved. Park-and-ride lots have curved contours that follow the natural line of the landscape. According to the artists, repeating the curve gives the system a sense of unity so that not only does it function as a whole, but it also relates to and reminds the public of some of the most familiar and best-liked structures in the St. Louis area—the Arch, Union Station, Eads Bridge, and the Airport Terminal Building, all of which are part of the Metro Link alignment.

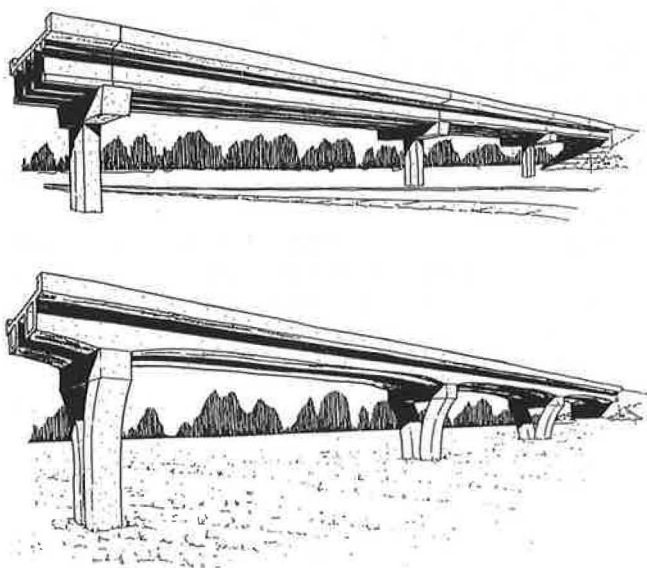


FIGURE 1 Metro Link bridge: (top) preliminary engineering phase—post and lintel bridge with constant depth beam on hammerhead piers; (bottom) final design—cast-in-place slingshot piers with haunched beamed curved superstructure.

The riders will relate to the surrounding topography and perceive the new bridge structures in a dynamic way as they ride on the train or go gently up and down the hills along Interstate 70, which parallels the train tracks. Equally important are the perceptions of the viewers from the highway as they see the slingshots cropped to existing groundlines, giving a sense of movement as the grade changes.

Leila Daw has worked in a variety of media in sizes ranging from small paper objects to temporary outdoor pieces encompassing many acres. Her work focuses on concepts of time travel and motion. Other artists on the team include St. Louisan Michael Jantzen, who has received considerable attention for innovative designs in living and recreational structures; environmental sculptors Alice Adams and Gary Burnley from New York; Anna Valentina Murch from San Francisco; and Jody Pinto, also from New York. Pinto is best known for her steel footbridge in Pennsylvania, also a collaboration between artist and engineer.

The engineering community knew from the requests for proposals (RFPs) and a series of meetings Bi-State had with firm principals that artists would have a major role in design development. The scope of work for the artists, with their range of responsibilities, was included in the RFP and hours for the collaboration were included in all design consultant contracts. Also mentioned in the RFPs was the existence of an external design review committee that advised Bi-State on aesthetic issues.

All of the artists were involved in preliminary engineering review and aesthetic criteria development. They were also assigned in pairs to station finishes, systems design, and facilities design. These work assignments enabled them to cover most of the functional elements of Metro Link and at the same time preserve the sense of the whole in design, which was the most important of their design criteria.

Engineers from Booker Associates, Inc. (the design consultant) and their subconsultants and Sverdrup Corporation (the Metro Link project management consultant) worked with Leila Daw and Anna Murch in analysis and facilities design. In their 30 percent review report, which also evaluated cost, Booker Associates included the following: "There is a consensus that the bridge structures as proposed in preliminary engineering, although structurally functional and cost effective, are not aesthetically attractive." Through numerous meetings between the design engineers and AIT, several objectives and goals were developed:

- The structures should have a dynamic, flowing appearance.
- The structures should have a neat, clear, uncluttered appearance.
- A central theme should be used for all structures throughout the project.
- The proposed alternatives should carry no more than a minimal increase in cost.
- Structural shapes should be distinctive so as to be identified as part of the Metro Link system.
- The structures should present a three-dimensional appearance.

Leila Daw participated as a team member until the construction package went out for bidding. Sometimes, during the later stages of design, she felt her role had changed from designer to defender of the basic concept. Value engineering produced ideas for saving money on the superstructure that would have destroyed the delicate balance between it and the piers. Other requirements for earthquake protection and maintenance were incorporated late in design development. These involved considerable compromise, but did not negate the essential concept.

The Metro Link bridges weave through a spaghetti interchange of highways with significant changes in grade. The slingshot form of the bridge piers (Figure 2) is the appropriate solution because it is functional, distinctive, and aesthetically balanced with the existing environment. Because of the light

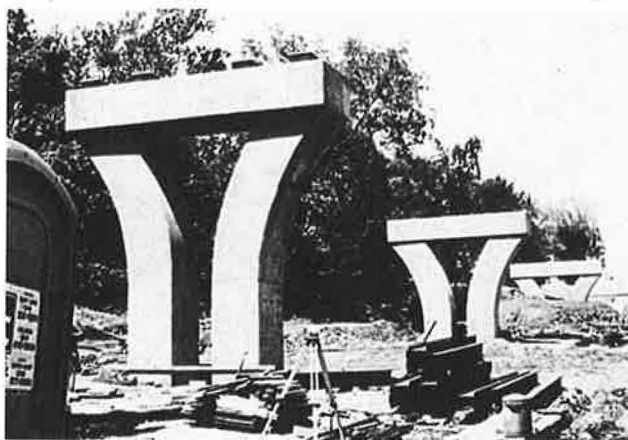


FIGURE 2 Metro Link bridge piers at University of Missouri-St. Louis.

rail construction schedule, the bridge piers were the first highly visible sign that Metro Link was a reality. Their aesthetically pleasing and unusual shape received positive media attention and considerable community response and have served as a marketing tool.

Arts in Transit also markets Metro Link through a series of public arts projects that for 2 years have marked station neighborhoods and the alignment. AIT will continue its marketing efforts with a program based on other elements of the system design besides the new bridge structures.

Metro Link is starting its system with an 18-mi, 20-station route. Much of this alignment has been recycled, using the Eads Bridge railroad deck and tunnel and 9 mi of existing

railroad right-of-way. But more than four very visible miles are new construction and include 10 new bridge structures. The bridge going into the main terminal of the airport is three-quarters of a mile long and will utilize a modification of the slingshot pier. Because of site constraints the haunched superstructure could not be used on this section but other elements, such as handrails, were designed to give the sense of the curve.

"The infrastructure of St. Louis will look different in the future," said Stephen E. Willis, P.E., deputy general manager of Metro Link. "I knew we had started something by having engineers work with artists, but I was cautious with my expectations. I was wrong. It's terrific!"