North Central Expressway, Dallas: Case Study of Enhancement-Inclusive Urban Freeway Design

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The North Central Expressway (US-75) project in Dallas, Texas, is a total urban freeway reconstruction that provides an excellent case study for the new range of opportunities available to transportation engineers under the new 1991 Intermodal Surface Transportation Efficiency Act. This 10-mi-long, $640 million job was planned from the outset as an innovative project that will expand the envelope of urban freeway design and be a precursor of 21st century ideas. This project encompasses many of the enhancement elements listed in the act (e.g., pedestrian and bicycle facilities, landscaping and other scenic beautification, preservation of rail corridors for bicycle trails, archaeological planning and research). The expressway offers a case study of a new environmentally sensitive "enhancement-inclusive" design approach, methods used to solicit public input into the final design, the end product of this new approach, and advice for others embarking on similar undertakings based on the experiences on this project.

Dallas is a thriving metropolis that boomed to a population (in the city proper) of almost 1,000,000 people during the 1980s. But Dallas is a relatively young city typical of the southwestern United States. It was founded on the banks of the Trinity River in the mid-1800s and enjoyed growth brought by the development of the national rail system in the late 19th century.

Along with the progress in transportation came issues that had to be addressed, such as comfort, safety, and travel speeds. Today, as highways are rebuilt and upgraded throughout the United States, the traveling public, residential communities, and abutting property owners have new demands. There are increased expectations that new urban highways will be an aesthetic enhancement to and sensitively situated within communities, in addition to carrying large volumes of traffic efficiently.

Knowledge and technology are now available to design highways with the same attention that has in the past been reserved for buildings and special theme areas. But doing this well requires a synthesis of all the parts into a comprehensive approach.

A case study that offers an opportunity to address these aesthetic challenges in an existing urban context is the reconstruction of the North Central Expressway (US-75) in Dallas, Texas. This project offers more than surface decoration—it offers the ultimate chance to reevaluate the design of various highway elements.

Texas Department of Transportation, 8150 North Central Expressway, Suite 801, Dallas, Tex. 75206.

Because of the unusually high profile of the project—the existing expressway is infamous across Texas—and this is the first total reconstruction of an existing urban freeway in Texas, the Texas Department of Transportation (TxDOT) designers were given wide latitude to explore new concepts for reconstruction. A tabula rasa, or slate, approach was used, somewhat like the approach General Motors took with its Saturn Division.

In 1911 the Dallas City Planner, George E. Kessler, suggested that the right-of-way of the Houston and Texas Central Railroad be purchased to provide for the construction of a "Central Avenue." It would run north from the heart of downtown Dallas radially out some 5 mi.

On March 3, 1947, almost 40 years after Kessler's first recommendation, construction began on what had by then become "Central Expressway." This was the dawn of controlled-access freeways in Texas.

The existing facility is a first-generation freeway with almost continuous parallel service roads. Traffic volumes have grown to nearly twice the design volume and exceed theoretical capacity by 50 percent or more.

The lower 3 mi of the existing expressway consist of six main through lanes and six parallel lanes of service roads. The upper 7 mi consist of four main lanes and four or six service lanes.

In the 1970s several variations of a plan to construct elevated express lanes to relieve increasing congestion were developed by the Texas Highway Department (TxDOT's predecessor). Most plans met with some skepticism or public criticism. By 1981, a tenuous agreement had been struck to construct new elevated lanes above the existing facility, which would remain in place. However, strong community opposition (commercial and residential) doomed this controversial plan.

In 1984, a community task force (North Central Task Force, or NCTF) developed a publicly supported consensus plan that incorporated a totally reconstructed, depressed-main-lane facility with continuous service roads and in the southern 3 mi, a twin-bored light-rail transit tunnel. In the north 7 mi, light rail would run parallel and adjacent to the expressway in an abandoned railroad corridor. The rail system is a project of the Dallas Area Rapid Transit Authority (DART). After intense discussion and public involvement, the Texas Highway Commission in 1986 approved this consensus plan.

The new facility is an eight-lanes-plus-auxiliary-lanes design with continuous parallel frontage roads, with an expected capacity of 230,000 vehicles/day. In the south 6 mi of the 10-

mi project, the main lanes will be depressed in a "concrete canyon," which will cross under 15 cross-streets. In the north 4 mi, a more typical at-grade or above-grade profile will prevail. This area will have the freeway crossing over four cross-streets (Figure 1).

COMMUNITY IMPACT AND RESPONSIVE MITIGATION

The North Central Expressway, carrying more than 200,000 vehicles/day, will have many of the same environmental impacts any other facility of this magnitude would have—noise, air quality, water quality, visual intrusion, and so forth. In addition, it can be perceived as a neighborhood barrier, segregating communities and disrupting the urban fabric. The perceived barrier effect was one of the strongest rallying points for those who had opposed the elevated-lanes concept. One of the initial goals was therefore to identify communities of interest in the corridor and try to find ways to reknit these areas so that the barrier effect of the facility is minimized. Noise and visual impacts were concerns in two single-family residential areas. The community wanted to be shielded from the freeway.

For TxDOT to truly adhere to its commitment to take a totally new approach to designing highways, an architectural firm was chosen to provide a broad range of new perspectives in design concepts, as well as plan-specific structural and landscaping design. The first step was to study the entire corridor, identify and understand the various socioeconomic communities of interest, and develop an overall project concept. The second step was for a team of architects, landscape architects, and urban planners, accompanied by two TxDOT engineers, to visit the most aesthetically advanced projects in the nation, on the basis of FHWA and other recommendations, to gain firsthand knowledge of the state of the art in highway design. In addition to gaining valuable information, the visits confirmed that the most innovative highways emerged when they were considered as unique opportunities to be good neighbors in their communities, assets to adjoining private property owners, and sources of pride for the communities and the agencies that build them.

THREE TYPES OF EXPRESSWAY ENVIRONMENTS

The planning and architectural analysis determined that many districts of the city abut and sometimes cross the North Central Expressway. The variety reflects the city's northward growth. Neighborhoods of 1930s bungalows in the south give way to 1960s suburban homes in the north, just as rows of low commercial buildings in the south precede freestanding office towers further north.

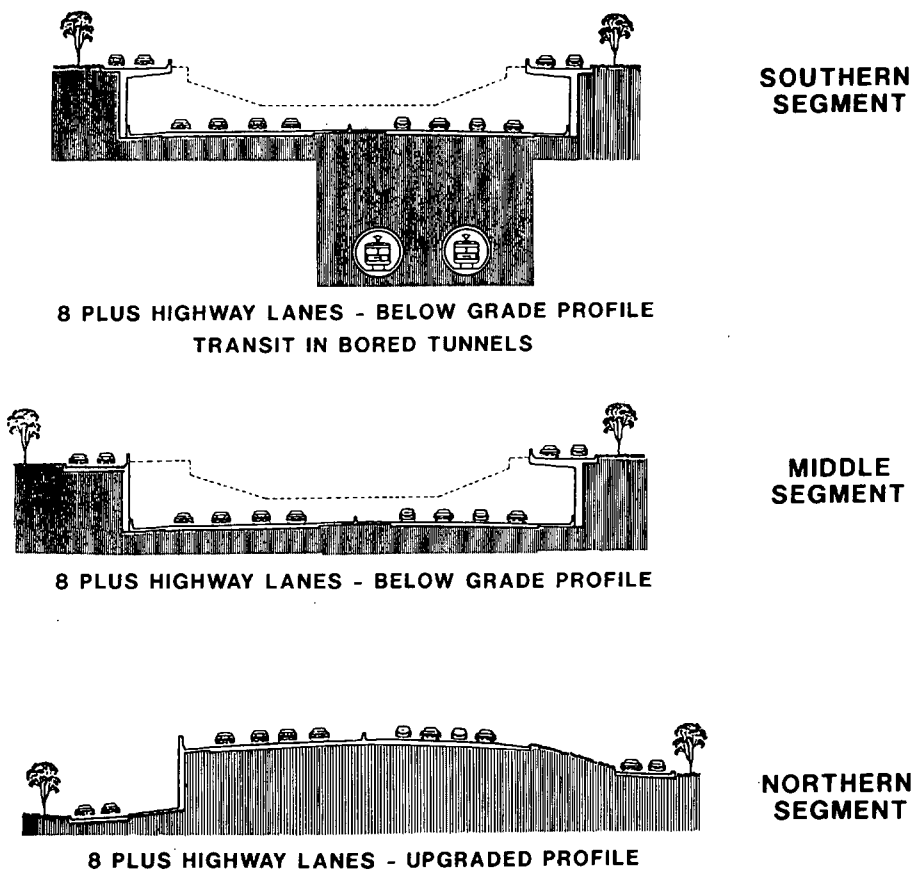


FIGURE 1 Typical sections.

The presence of the railroad had established a boundary, so that near downtown the construction of the expressway created no significant new barrier. As the alignment progressed farther north into then-undeveloped areas, the highway delineated developing neighborhood boundaries. Near residential areas that abut but do not cross it, the expressway's presence created a beneficial boundary to hold commercial development at bay. In other areas, such as older, single-story retail neighborhoods, the barrier may be detrimental. In those areas, the new expressway design for crossings focused on reknitting those communities.

The closest-in neighborhoods have small businesses and single-family homes of modest dimensions. Farther out, the development of mostly residential areas adjacent to the corridor took place in the 1930s and 1940s. Southern Methodist University (SMU) is located adjacent to and west of the expressway in this area. From about 4 mi and farther out, commercial development, mostly office and retail, paralleled at least one side of the alignment. From Northwest Highway (Loop 12), which the expressway crosses about 5 mi from downtown, north to Interstate 635 (Lyndon B. Johnson Freeway), primarily commercial and office development later occurred on both sides of the highway.

In general, the more affluent areas of Dallas are north of downtown, and the Central Expressway developed over the 1960s, 1970s, and 1980s into a primary commuter route for workers who moved farther and farther north to the burgeoning northern suburbs.

The three general types of environment identified are urbanscape, linear greenway, (geographically within the limits of the urbanscape), and openscape (Figure 2).

Urbanscape

South of Northwest Highway, the expressway is primarily urban in scale and character. An urbanscape is created by office and commercial buildings lining the service roads. Small individual buildings, typically one to three stories high, located directly adjacent to the expressway create a dense urban environment with little open space. This low urban fabric is punctuated by mid-rise office buildings.

A variation of the urbanscape will occur when the DART light-rail line is constructed immediately adjacent to the expressway between Mockingbird Lane and Lovers Lane. The depressed roadway section will be bordered by adjacent partly elevated track, creating a unique urban environment.

The urbanscape will undergo many immediate changes with the new depressed expressway configuration. Frontage road improvements will increase access. In exchange, business and property owners will have reduced visibility from the freeway mainlanes. In addition, right-of-way expansion and reconstruction will remove the mature trees lining the existing urbanscape, changing the environment and increasing the sterile impact of the expressway.

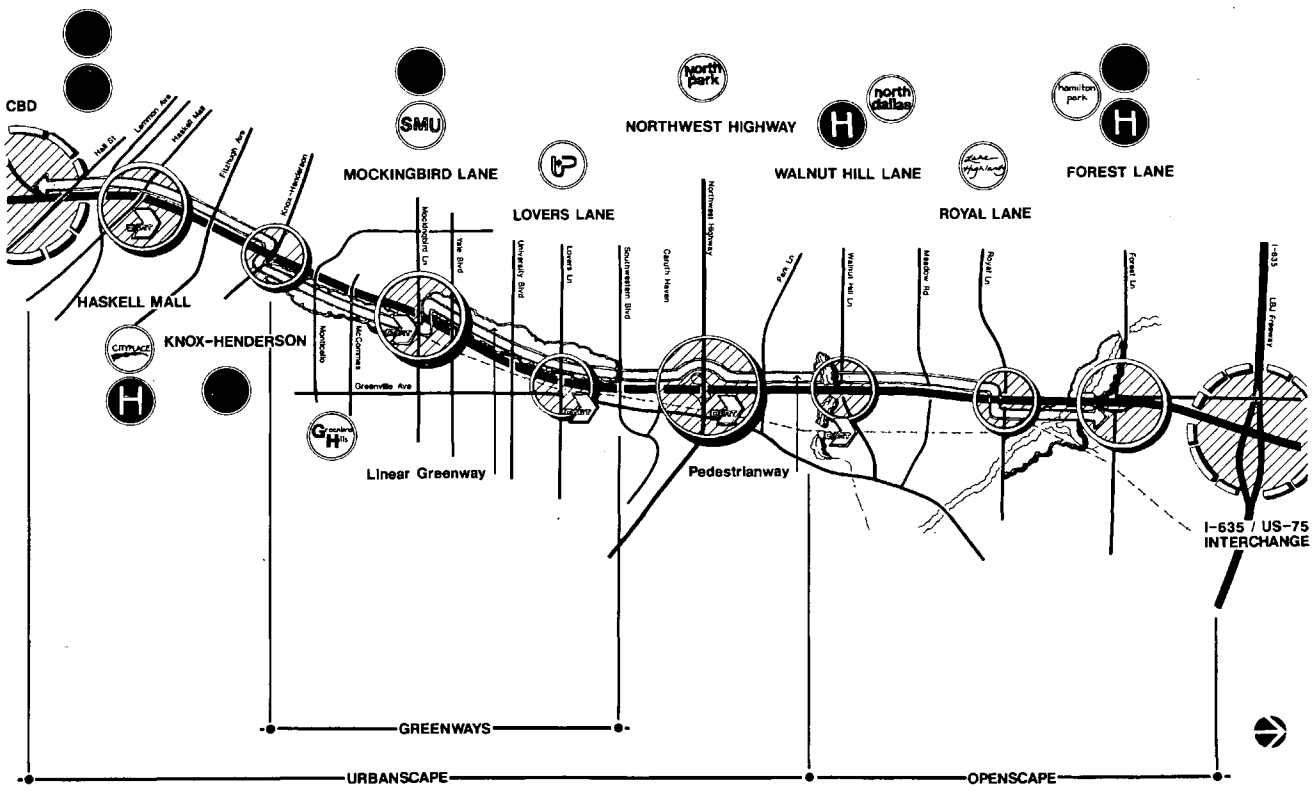


FIGURE 2 Design agenda, final scheme.

Redevelopment of office and commercial buildings can be anticipated following completion of the new expressway. Construction of the DART light-rail line may facilitate high-density office and commercial development in proximity to the light-rail stations at the intersections of Haskell Mall, Mockingbird Lane, and Lovers Lane.

Linear Greenway

The linear greenway is defined by mature vegetation at the edge of older residential areas south of Northwest Highway. Residential neighborhoods line the east side of the expressway from Knox-Henderson to Mockingbird Lane, and the west side from Yale Boulevard to Southwestern Boulevard. The low single-family residences and large trees of the greenway areas currently provide a sharp visual contrast to the other environments.

Although reconstruction of the North Central Expressway will affect the linear greenway areas by reducing the tree cover or eliminating the trees altogether, it will not bring the change in scale of development that can be expected in the other two environments.

The existing stability of both residential areas warrants preservation of their residential character with the assistance of landscape and screening improvements.

Openscape

North of Northwest Highway, the character of the expressway is much different. Although this area is also lined with office and commercial buildings, development is more scattered along the roadway and individual structures are frequently larger than in the southern section. This type of environment can be characterized as an "openscape."

Most changes to the openscape will follow completion of the improved expressway, when reconstruction will serve as a catalyst for new commercial development. The potential exists for the openscape environment to become a corridor lined by mid- and high-rise office buildings, as vacant property is developed and apartments and small commercial buildings are redeveloped.

The new expressway alignment will be approximately the same as the current alignment, both vertically and horizontally. Separated at intersections, the frontage roads and main lanes will often be at roughly the same grade, thereby increasing the impact of the expressway.

PUBLIC INVOLVEMENT

Once the analysis of the highway's urban context was complete, the next step was to create alternative concepts to be presented for public input and acceptance. To do this, a North Central Amenities Task Force (NCATF) was set up under the umbrella of the NCTF. A design symposium was held on the SMU campus early in the process to present the initial concepts to the public in hopes of inspiring community input and participation. Reaction and comments received at the symposium were evaluated by the architectural planners.

Subsequently, the 10-mi corridor was divided into six geographic areas. Smaller meetings, sponsored by TxDOT, were held with interested persons in each area. An exchange of ideas and concepts was led by the architectural consultants.

To better integrate the facility into its environs, one concept was to reflect, through architectural elements, the character of the various neighborhoods in the related stretch of highway. However, a totally neighborhood-reflective approach may result in a somewhat discontinuous effect for the through traveler. In the case of the North Central Expressway, the presence of continuous service roads allows an opportunity to have the best of both worlds in the sense that through-project continuity can be maintained for the main-lane design, and neighborhood-reflective design can be incorporated at the service road and cross-street intersections, which are the actual interface points between the freeway and the community.

ALTERNATIVE CONCEPTS

As a part of the design process, the planning team explored alternative approaches to the design of the North Central Expressway. Three design themes were investigated in a search for the right fit between the expressway and the surrounding environment. The process also allowed testing of individual component designs. The concepts were prepared for presentation to TxDOT, local cities, and the general public with the intent of incorporating their responses into a final design package.

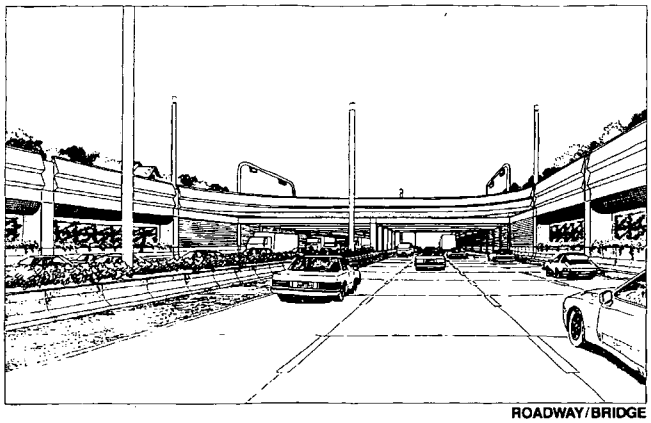
Drawing on three different relationships between the expressway and the surrounding city, the alternatives explored the relationships through design of the key elements.

- Alternative A considered the expressway as part of a regional transportation network that passes through the city. Designed as a major state-of-the-art freeway, Alternative A is inspired by a streamlined freeway focus (Figure 3).
- Alternative B considered the expressway as a boulevard through the city, reflecting the character of each district it passes through. In this scheme, the character of individual neighborhoods is expressed along the expressway (Figure 4).
- Alternative C considered the expressway as a municipal monument, a statement unique to Dallas. This alternative presented the expressway as a major public facility, designed with the same attention that might be given to an important municipal structure, such as a city hall or a public library or an international airport (Figure 5).

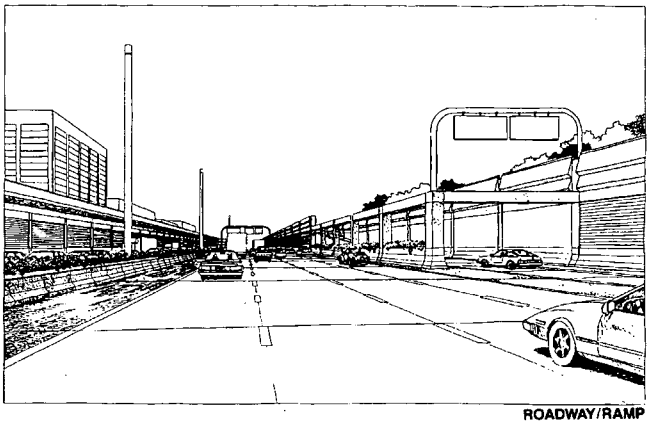
Each alternative focused attention on different aspects of the corridor. The emphasis on particular components changed with each alternative. The end product of the three concepts produced varied results.

DESIGN OBJECTIVES

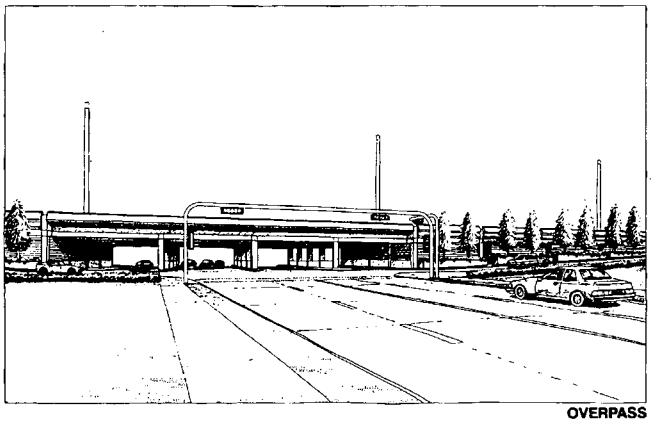
Designing a freeway necessitates special interpretation of traditional engineering, architectural, landscape, and urban design principles. The unusually large scale and high speeds present a challenge requiring a unique set of design objectives.



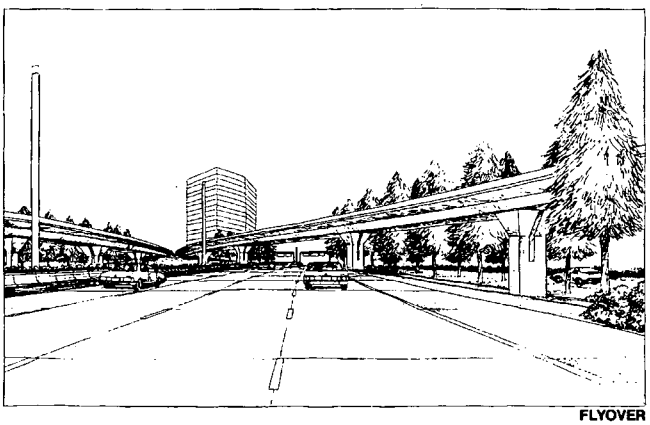
ROADWAY/BRIDGE



ROADWAY/RAMP

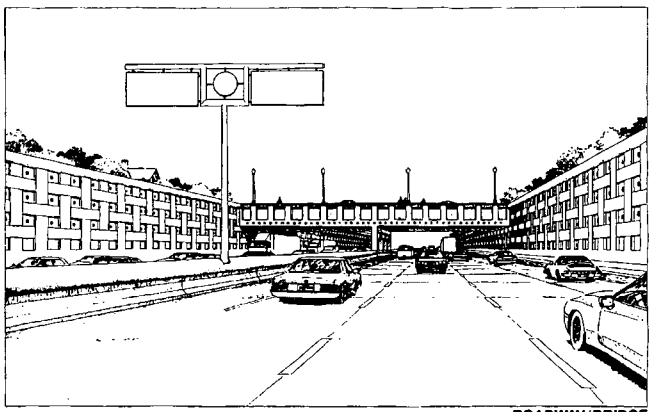


OVERPASS



FLYOVER

FIGURE 3 Perspectives, Scheme A.



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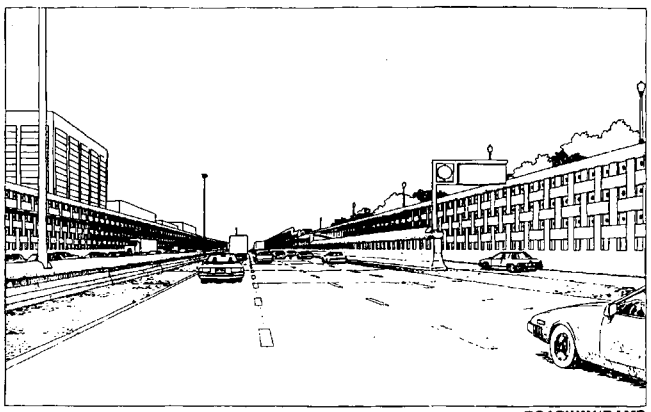

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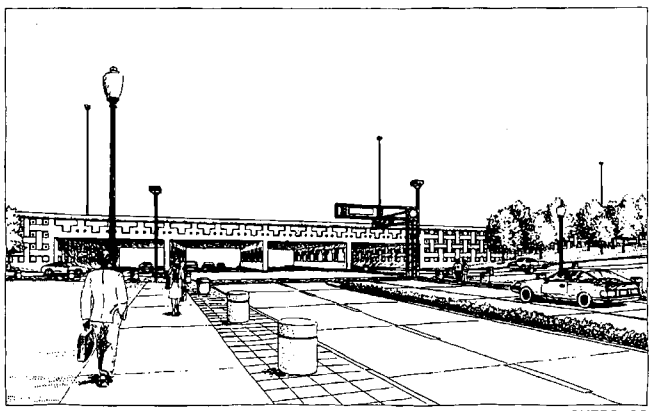

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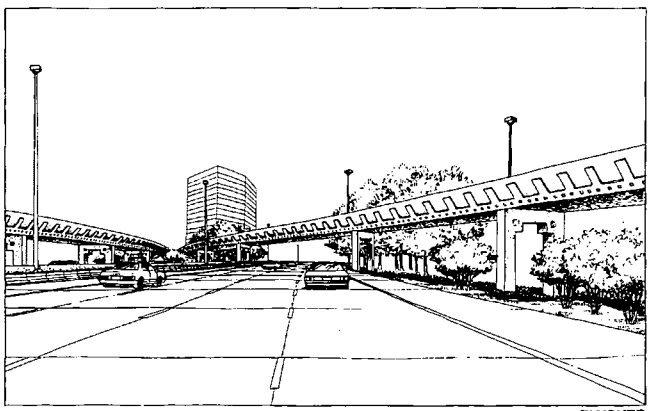

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FIGURE 4 Perspectives, Scheme B.

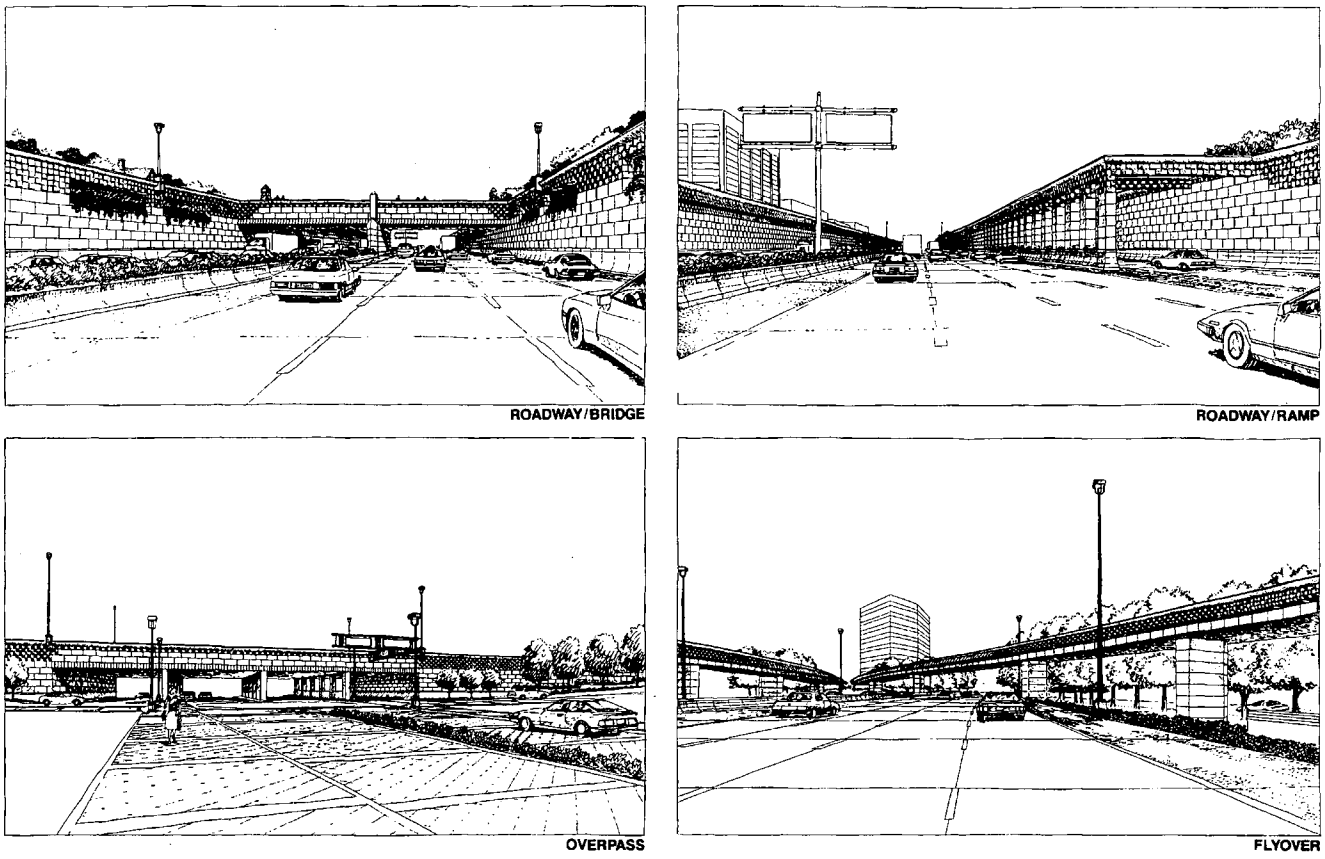


FIGURE 5 Perspectives, Scheme C.

The following objectives served as guidelines for the designers on the North Central Expressway project:

- Visual organization,
- Timeless design,
- Appropriate scale and speed for two environments, and
- Views to and from the road.

Visual Organization

Much of the challenge of this project lay in the task of organizing the engineering of the expressway and subtracting the clutter. TxDOT standards strictly govern the design of highways, but they do not preclude or assure a visually appealing design. Organization and coordination of all the elements in the expressway corridor are very important objectives.

Timeless Design

With a life expectancy of many decades, the North Central Expressway must endure time and trends. Designing the expressway as a public facility to serve many generations requires a timeless approach, one that will weather changes in style and public opinion.

Appropriate Scale and Speed for Two Environments

The expressway actually involves two separate design problems. The main lanes and the frontage roads are different environments, the scale and speed of each requiring special attention.

Driving at 55 mph on the main lanes, a driver will not have time to study the details of the expressway. Textures and patterns must be at a scale that will not become lost or confusing. In contrast, when traveling on the frontage road, the driver will be able to absorb a more intricate scale of design.

Views to and from the Road

Views from the expressway will be dominated by the wall structures in the southern 6-mi "canyon" section. Several concerns with this configuration were readily apparent. One was driver disorientation because of being visually cut off from the roadside landmarks. The harsh concrete environment, particularly in a hot Texas summer, was another.

In the northern section, the new highway will be viewed from high-rise office buildings, one-story shopping centers, and automobiles. The expressway must fit comfortably into the fabric of the city as a good neighbor when viewed from these perspectives.

After the concepts were presented and public response was evaluated, design goals were established and a final cohesive plan developed. The goals were that the facility was to be sensitive to its urban environment, respond effectively to user demands, be aesthetically pleasing to the motorists and adjacent residents and businesses, and be as technically "leading edge" as possible, providing for 21st century smart highways (IVHS) technology.

DESIGN ELEMENTS

Although the design of the North Central Expressway involves the execution of a total design concept, the expressway environment is composed of several distinct elements. These elements are repeated over the expressway's length, providing a rhythm and identity.

- Structures/built elements: bridges, retaining walls, and barriers/railings;
- Signs: structures and panels;
- Lights
- Traffic signals
- Streetscape: stamped tinted concrete, concrete unit pavers, bollards, planters, and special features;
- Landscape: urbanscape, openscape, and linear greenway.

Structures and Built Elements

Bridges

Low-profile bridge structures will be achieved through the use of precast concrete boxes. Although their unit costs are more than some other systems, the boxes represent an actual cost savings systemwide because of the decrease in required depressed-section excavation and retaining-wall height. An aesthetic benefit to the precast boxes is the clean appearance they will give to the edge and underside of bridges. Bridge profiles will be further streamlined by the shadows created from cantilevered overhangs. The angled cap of the retaining walls curving onto the bridge face will reinforce the impression of a sleek structure. Street names located on bridge facades will be a unique orienting device along the expressway. Columns with flared capitals will form a graceful transition to the bridges (Figure 6).

Retaining Walls

Refining the beam-on-column framework developed in Alternative A, the retaining walls establish an organizational motif for the expressway. Their regular pattern is repeated over the length of the expressway, providing a system for the

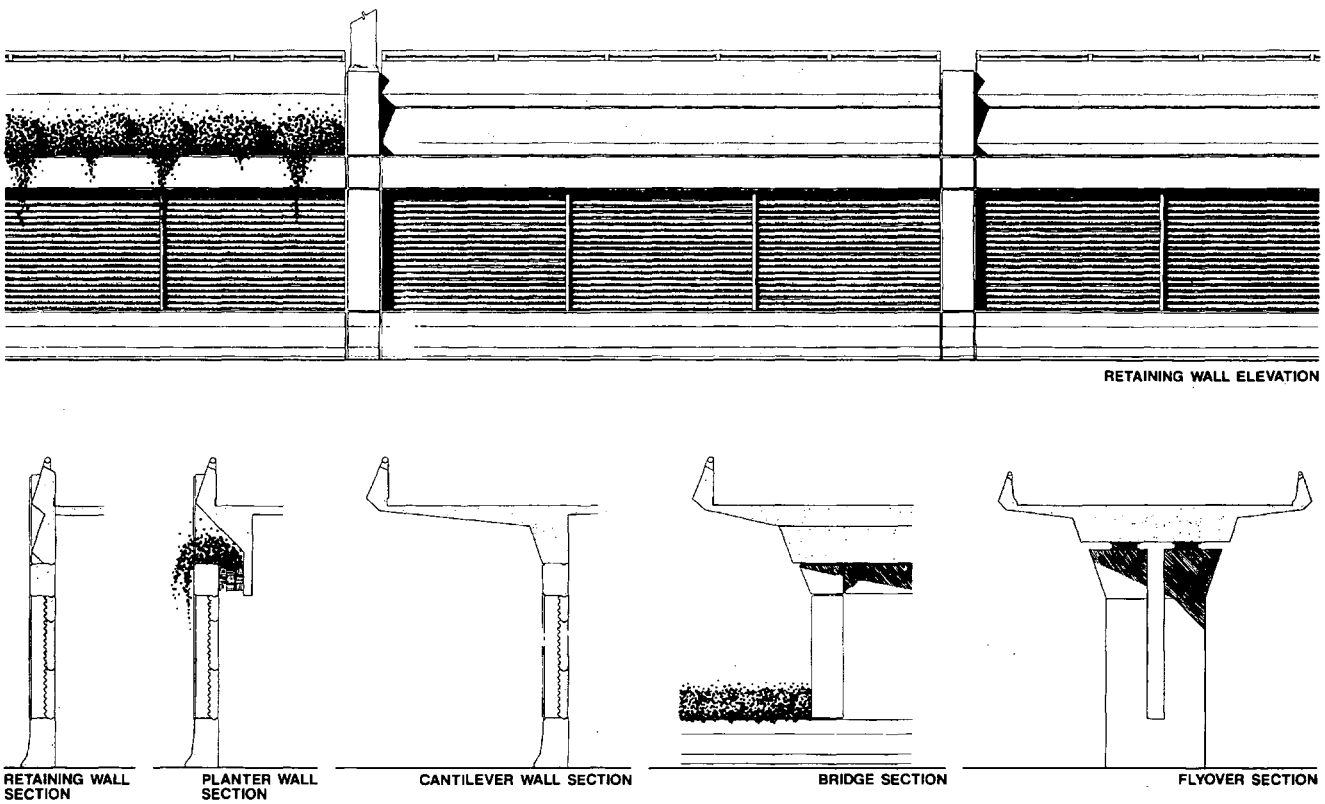


FIGURE 6 Built elements, final scheme.

introduction of all the elements. The retaining walls are designed for maximum efficiency of construction. Changes in the main-lane roadway grade are absorbed by a cast-in-place concrete base that incorporates the Jersey barrier. The precast panels installed on top of the base will be constructed in modular heights, allowing the necessary flexibility to accommodate the varying wall heights.

The deeply ribbed texture of the panels contrasts with the smooth structural framework, a contrast that is reinforced by the use of two colors of paint. Indented planters in the retaining walls provide for cascading plantings. Visible to drivers on both the main lanes and the frontage roads, the greenery in the windows will relieve the monotony of the depressed freeway walls. In addition, where space allows, tree planting will be introduced in shelves that are stepped to the top of retaining walls. The grid pattern of the walls will be extended into the expressway with a freestanding grid between the main lanes and ramps (Figure 6).

Signs

The design of signs for the expressway involves a system functioning on many levels and providing different types of information (Figure 7).

Guide Signs

A principal criterion for locating guide signs in this system is the consolidation of information on single supports wherever possible, thereby eliminating unnecessary supports, which create visual confusion. In addition, signs will not be attached to bridge structures.

As part of the overall expressway design, guide sign supports are a major architectural element. Formed of rectilinear tubing, the supports are an extension of the beam-on-column pattern of the expressway. A field of metal mesh provides a surface to which to attach the guide sign and exit number sign.

Regulatory and Warning Signs

Design criteria result in a large number of individual signs on single supports. Where locations are not limited by specific standards, signs will be consolidated on sign bridges or traffic control supports. Individual supports for these signs are smaller-scale versions of the guide signs and use compatible materials and colors.

Lighting

The North Central Expressway lighting system will use a vertical lamp design, setting an important new standard for highway lighting. The foot-candle level achieved with the vertical lamp is an improvement over conventional highway lighting (Figure 8).

Disc-shaped fixtures with a domed top will be attached to square posts. Mounted closely to the posts, these fixtures are less obtrusive than the typical "cobra head" fixtures used on

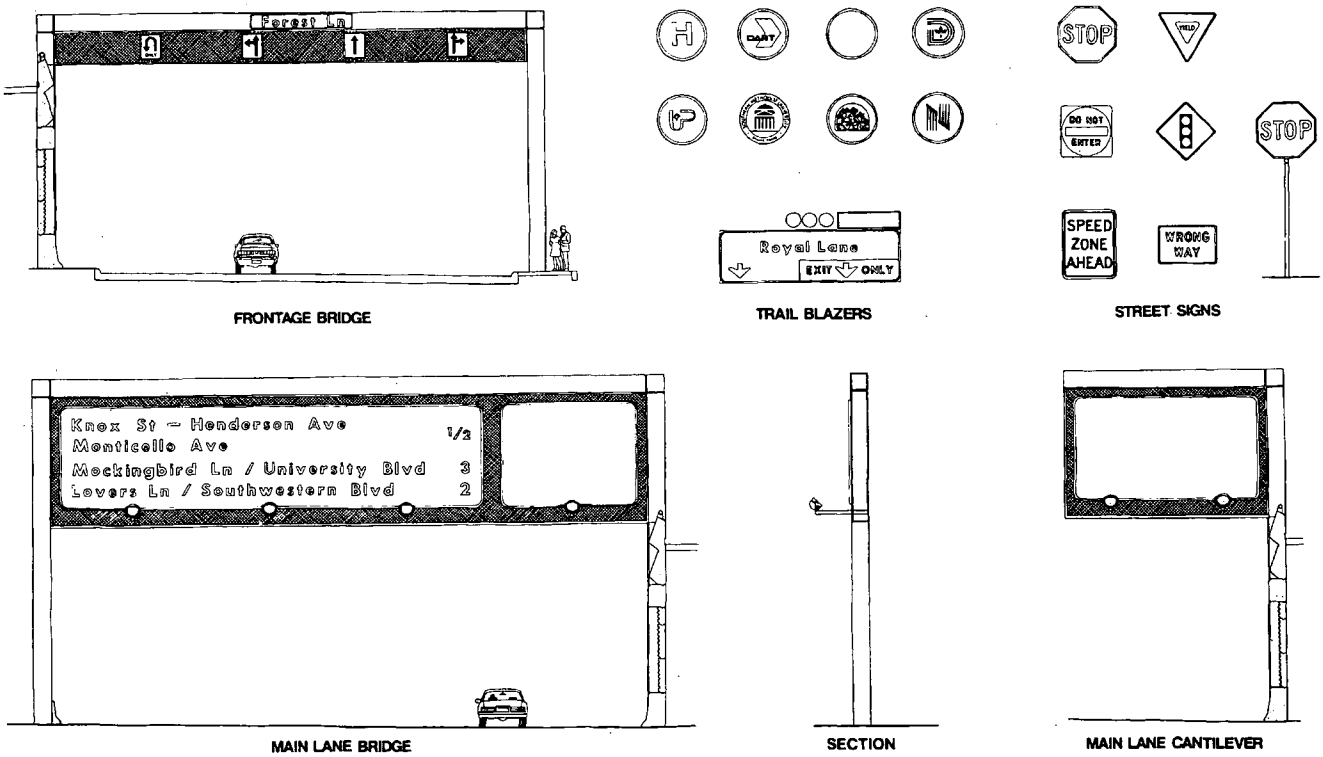


FIGURE 7 Signage, final scheme.

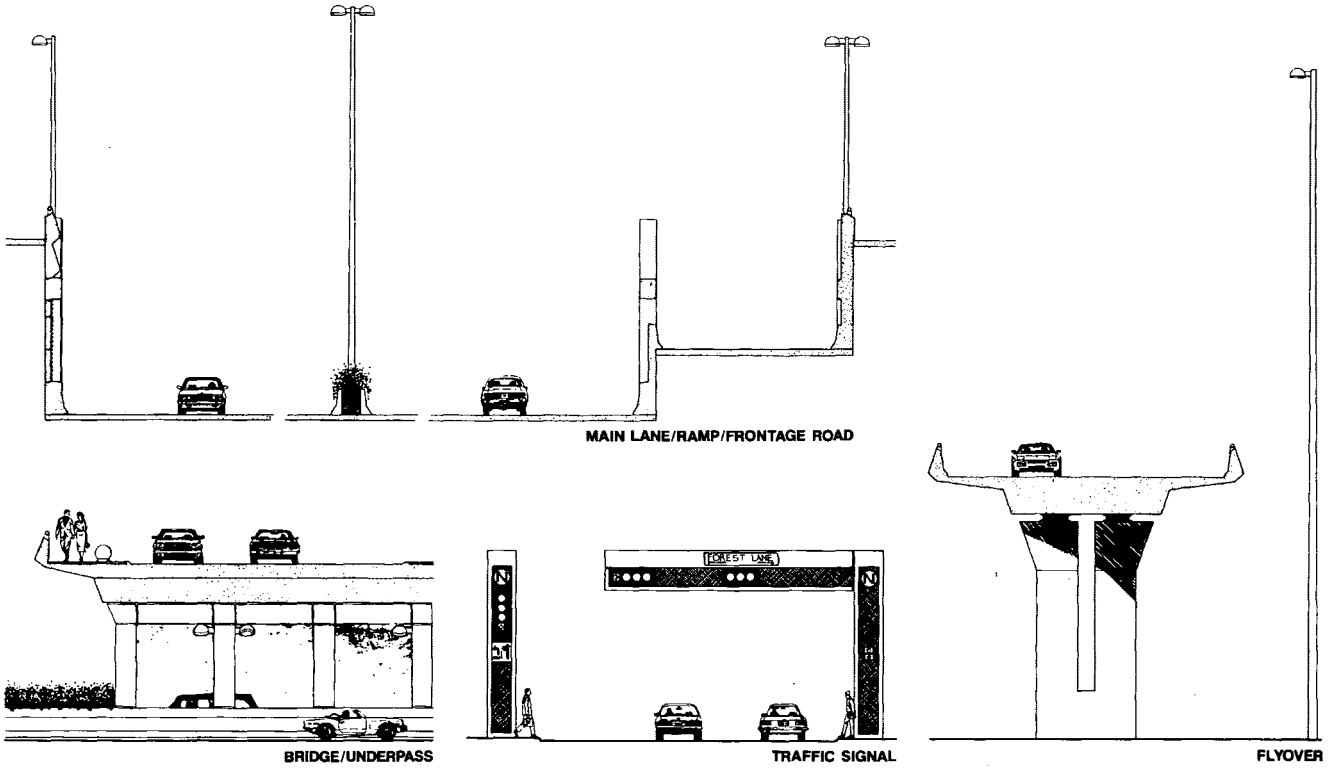


FIGURE 8 Final lighting scheme.

many highways. The dome shape of the standard fixtures will be repeated in fixtures under bridges, on high masts, and on sign supports. Compatible with the rectilinear sign supports, the square posts are part of the "family" of North Central Expressway components.

Set on 50- to 65-ft poles, main-lane fixtures will be located within the center median. Frontage road lighting along the depressed roadway section will be on the pilasters of the retaining wall. The vertical lamp allows wider light distribution with sharp cut-off, eliminating the need for additional edge lighting at on- and off-ramps. Light intended for the roadway will remain on the roadway, reducing intrusive light into the neighborhoods.

Signal Lights

Specially designed traffic signals will be used at all intersections. Repeating the mesh-on-tubular-frame construction of the guide sign supports, traffic signal supports will integrate frontage road signs, street signs, and traffic signals (Figure 8).

Streetscape Development

Streetscape development of the frontage roads and cross streets will continue the highly ordered framework of the North Central Expressway design. The streetscape will also respond to the character of the surrounding city. Elements unique to the expressway are repeated at intersections over its length. These human-scaled elements have been introduced to define spaces and create a sense of place. Streetscape improvements include paving, planters, signs, lighting, and bollards (Figure 9). Some improvements extend throughout the corridor; others are allocated to specific locations.

Pedestrians crossing the expressway corridor will be accommodated by sidewalks on all cross streets. Bridges without U-turns will have 8-ft sidewalks, and bridges with U-turns will have 16-ft sidewalks. Bollards lining the sidewalks will define the edge between pedestrians and vehicles and provide a pedestrian-friendly environment.

Landscape Development

Landscape in and on Structures

Many cross-street bridges will incorporate special landscape developments. These improvements are allocated by bridge location and driving lane configuration.

Median and Edge Plantings

In the median between lanes of expressway traffic, a double row of the safety barriers will be separated to allow planting in between. With provisions for drainage and irrigation, the utilitarian safety barriers will create a pocket for plant material that will soften the environment, shield drivers from oncoming headlight glare, and cut down on rubbernecking at incidents.

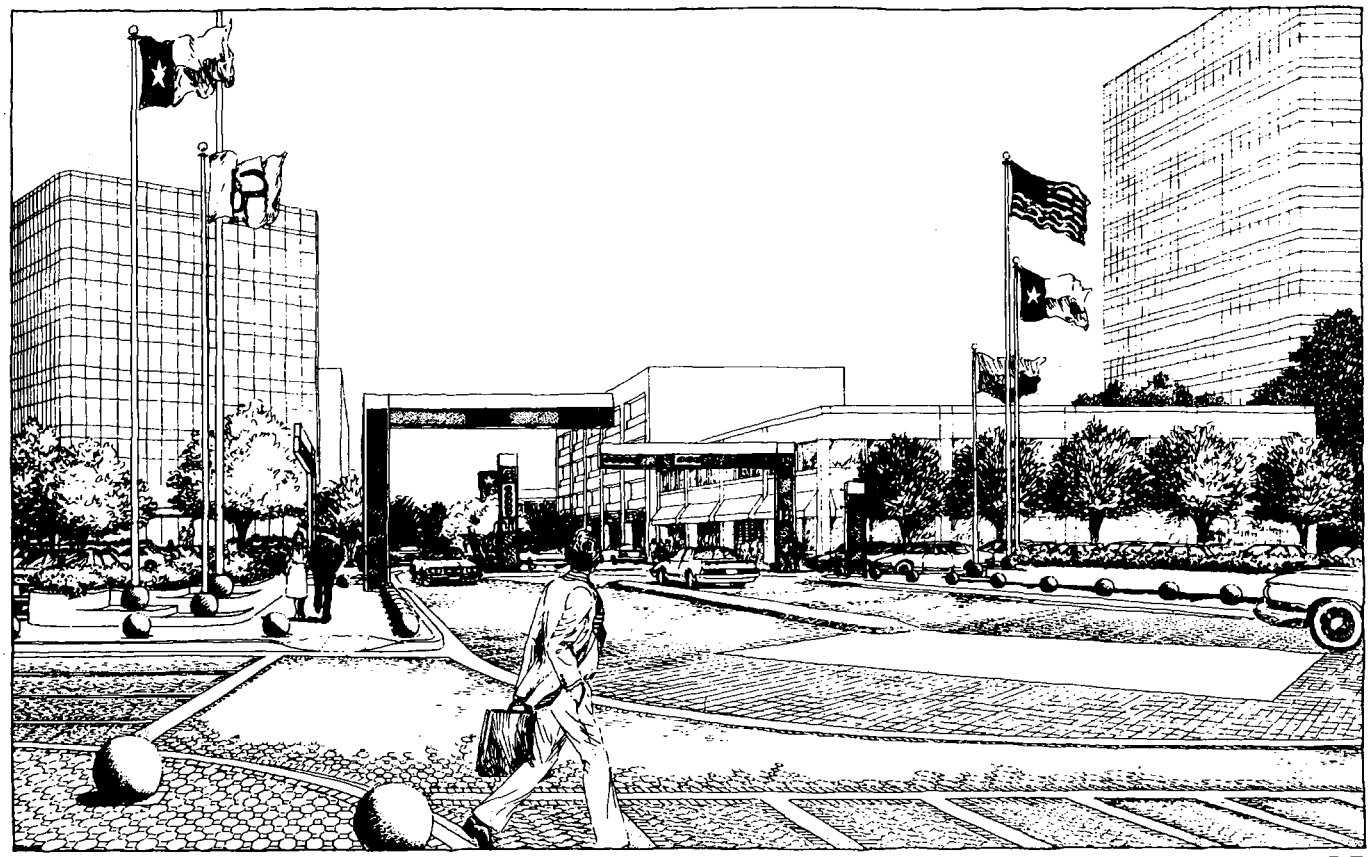


FIGURE 9 Cross Street bridge.

Frontage Road Landscape

Landscape opportunities along the frontage roads are narrow. Planting patterns and materials for the expressway are bold and sometimes highly organized. Where trees and shrubs are adjacent to vehicular traffic (but outside safety clear zones) and particularly vulnerable to being hit, planting patterns are more informal. One tree removed from a cluster of trees will be much less noticeable than a tree removed from a formal planting.

Irrigation and Maintenance

Installation of a maintainable irrigation system is essential to the successful development of the corridor.

MULTIMODALITY

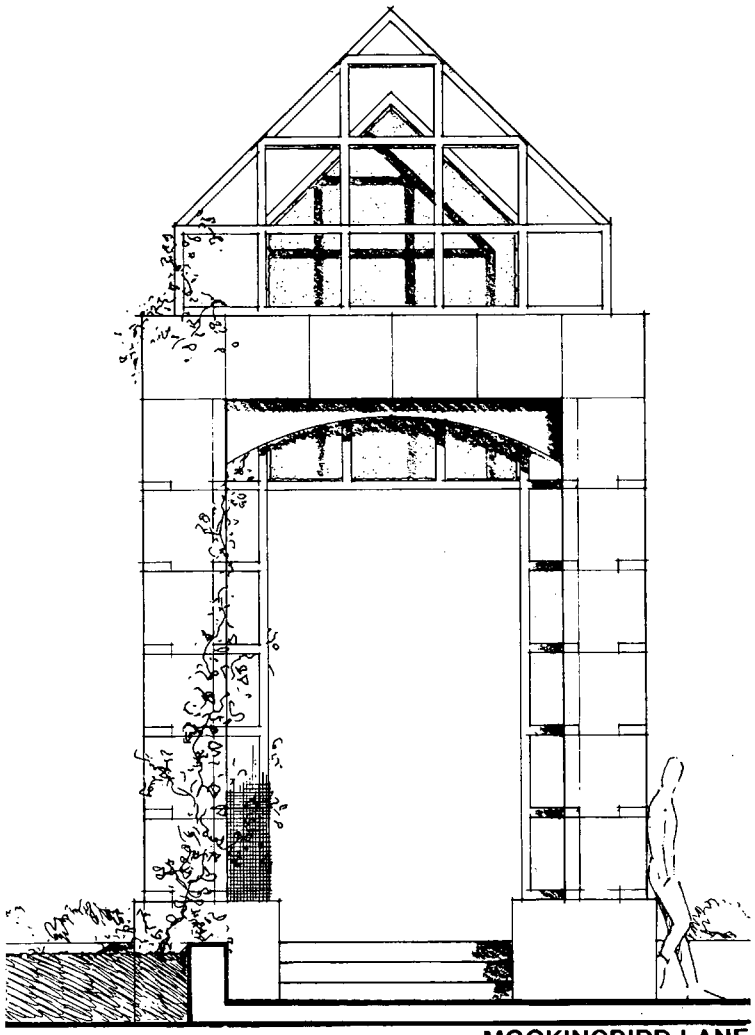
Concern for other transportation users of the expressway received strong attention. Capacity and user-friendliness for nonmotorized traffic—pedestrians, bicyclists, wheelchair users, and so forth—were considered. All the street crossings, including the 15 on bridge structures (where the main lanes are depressed below), are very wide. This is good for vehicles, but can be intimidating for pedestrians, bicyclists, and others. To bring a sense of order and safety to the crossings, tinted concrete pavers, bollards, and irrigated, raised planters were designed. These features create an ambiance of pedestrian-friendliness, which should make pedestrians and cyclists less apprehensive about crossing the expressway.

There are eight designated on-street bike routes crossing the expressway. For all the designated crossings, exterior lanes of 14 or 15 ft are provided.

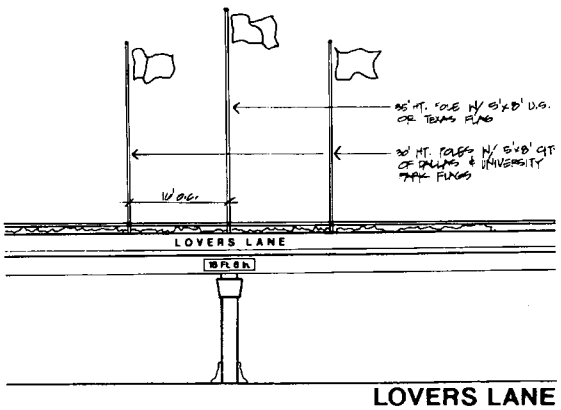
"Intermodality" is the transportation buzzword of the 1990s. The potential for students to bike to the suburban DART rail station, stow the bike on board, travel the rail line, disembark at the DART Mockingbird Station, and then bike a mile across the expressway to the SMU campus seems to be a perfect example of functional intermodalism that is successfully incorporated in this design.

In addition to the on-street bike routes, two hike and bike trail crossings of the expressway are being accommodated. In the reconstruction of the existing trail at White Rock Creek, the plans established a maximum number of calendar days of safety-related trail closure allowed to the contractor in the 3-year contract.

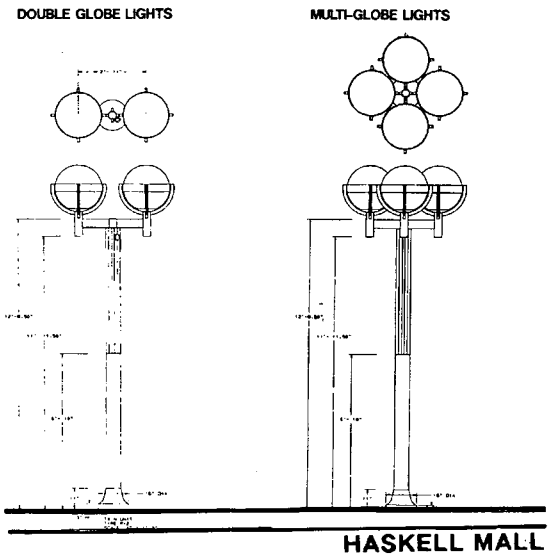
The impacts and requirements of the Americans with Disabilities Act are still being analyzed, but extensive use of sidewalks with handicapped-accessible ramps has already been included in the design. The pedestrian-friendly intersection design is expected to be advantageous for handicapped users.



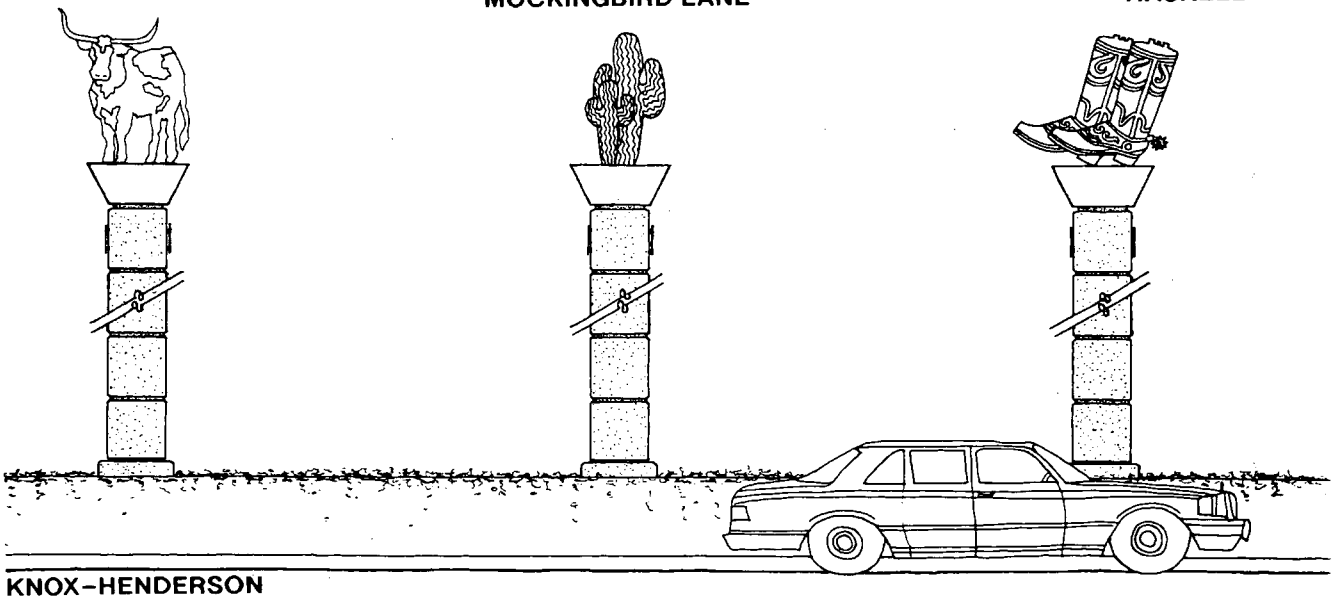
MOCKINGBIRD LANE



LOVERS LANE



HASKELL MALL



KNOX–HENDERSON

FIGURE 10 Special features.

SPECIAL FEATURES

In addition to the usual pedestrian-friendly design, five intersections also have special architectural features to highlight the major crossings, provide architectural interest for motorists and pedestrians, provide visual (and somewhat subliminal) landmarks to prevent disorientation for drivers in the 6-mi concrete canyon, and allow an expression of the community within the expressway.

Each special feature is different. At Haskell Mall, the enhancement will be decorative lighting reflecting special lighting in a planned development either side of the expressway (Figure 10). At the Knox-Henderson structure, the special feature is lighted twin colonnades of five columns on each side situated in a deck planter. Each column will be topped by a metal sculpture reflecting the electric mix of neighborhoods near this crossing (Figure 10).

The next special-feature crossing is Mockingbird Lane, another community "node." At opposing diagonal corners of the deck in the planter areas, twin pavilions will be constructed. The pavilions are purely architectural. They will be lighted at night and provide a gateway effect for motorists crossing the expressway in either direction on Mockingbird Lane (Figure 10).

At Lovers Lane, three flagpoles with up-lights will be installed in each bordering deck planter (Figure 10).

The Northwest Highway Interchange creates significant open landscape areas around the interchange ramps. A major developer is expected to participate (at his expense) in additional enhancements to the interchange landscaping. Two 130-ft-tall vertical sculptural elements are planned for diagonally opposite sides of the interchange (Figure 11). A sculptor will design these elements to provide a focal point for travelers along the expressway and along Loop 12. A major regional shopping center is located at this intersection and it is a significant areawide traffic generator.

The archaeological relocation of approximately 1,500 Civil War–era graves from one of the largest African-American cemeteries in the United States is also being done on this project. The archaeological research will open a window into an important unrecorded aspect of Dallas's past.

ADVICE BASED ON EXPERIENCE

Any time new concepts are incorporated into complex construction activities, resistance can be expected. And any deviation from long-accepted standard practice opens up opportunities for construction glitches. In general, the more dramatic the new concepts, the greater the resistance and the opportunity for problems. Some measures can be taken to mitigate these difficulties.

First, conceptual design and architectural input must have sufficient lead time to develop the range of optional ideas that may be placed "on the table." Then, additional time is needed for soliciting public input regarding the magnitude of

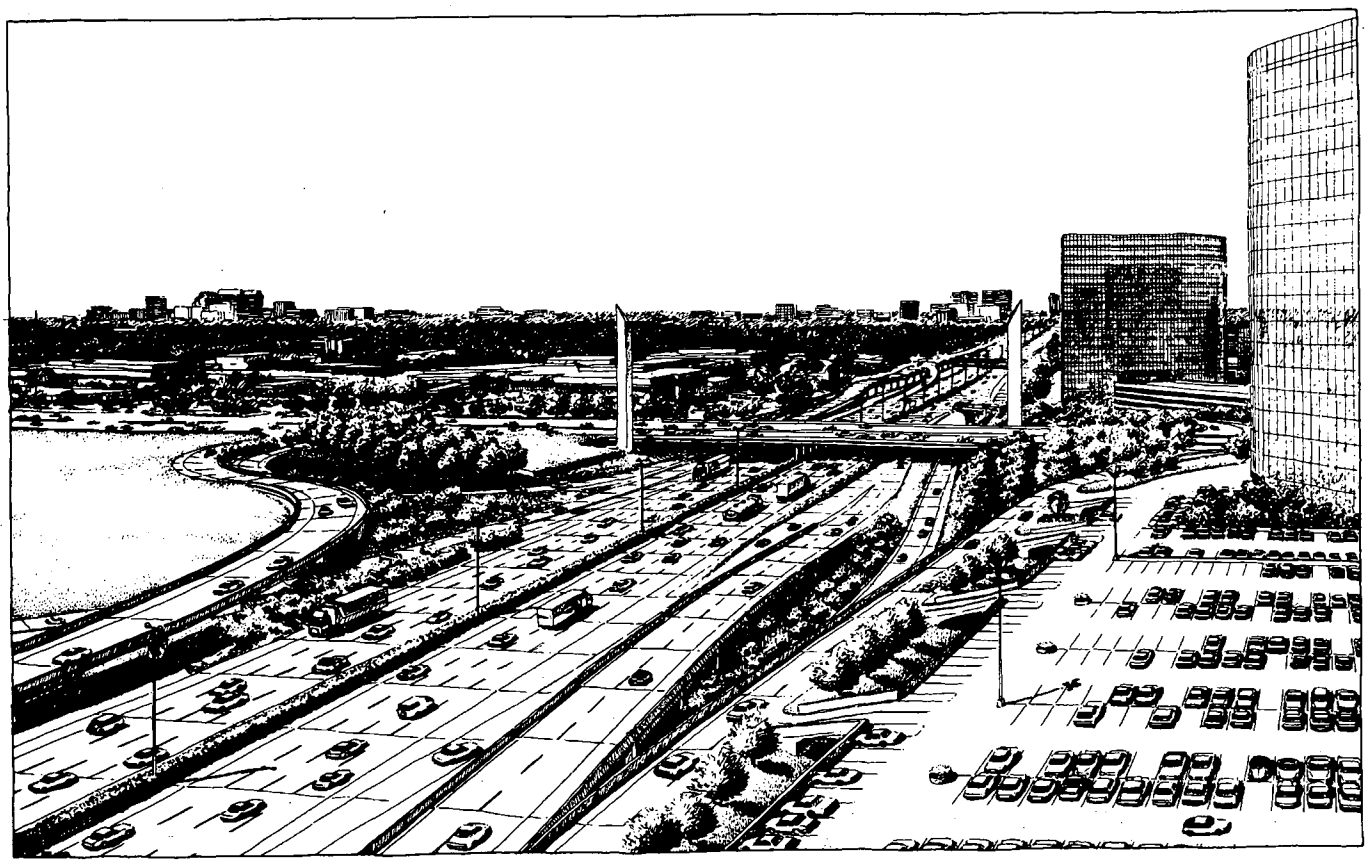


FIGURE 11 Loop 23 interchange.

enhancements and the specific designs favored. Effectively soliciting the input of the community can often be difficult. A professional-level public affairs program is needed for most large urban areas to develop the type of sophisticated audience targeting wanted. It is of particular importance that all interest groups are included (e.g., bicyclists, environmentalists). In general, some competing goals will arise between commercial and residential interests. Good political skills are needed within the project management and public affairs staffs. Only after the project concept and architectural and landscaping ideas have jelled should the engineering designs begin. Simultaneous architectural and engineering work starts will inevitably result in numerous revisions for both disciplines, which is inefficient and costly, and also can create an adversarial relationship between the architects, planners, and the design engineers.

It is also very important to bring in construction and maintenance personnel for their input regarding new concepts and modifications of existing design/construction practice. Input from construction personnel can be valuable in reviewing constructability issues and can often provide good suggestions on how modifications can improve constructability. Maintenance forces usually have ultimate responsibility for upkeep of the finished facility, so their input can also be valuable in creating concepts that work for the long term.

Most major highways pass through several local jurisdictions. It is critical to consult with appropriate local staffs to apprise them of various concepts under consideration and solicit their concurrence and support. In many areas, local jurisdictions will have a role in maintenance and upkeep of the facility, and it is important that the plan has their blessing.

In addition to the official local jurisdictions, adjacent commercial and residential property owners are often interested in and willing to participate in installation and maintenance of special features such as landscaped areas. Ideally, the level of such participation will have been ferreted out in the public involvement process. It is also important that the ultimate plan include a fall-back maintenance level in case early private-sector enthusiasm dwindles or financial circumstances change.

CONCLUSION

The area of enhancements gives a new and exciting opportunity for transportation projects if approached with enthusiasm and a positive attitude. Unquestionably, the status quo may be disturbed by these new ideas. But the traveling public, whether traveling on foot, by wheelchair, by bicycle, by car, by bus, or by truck will benefit from these efforts. It should

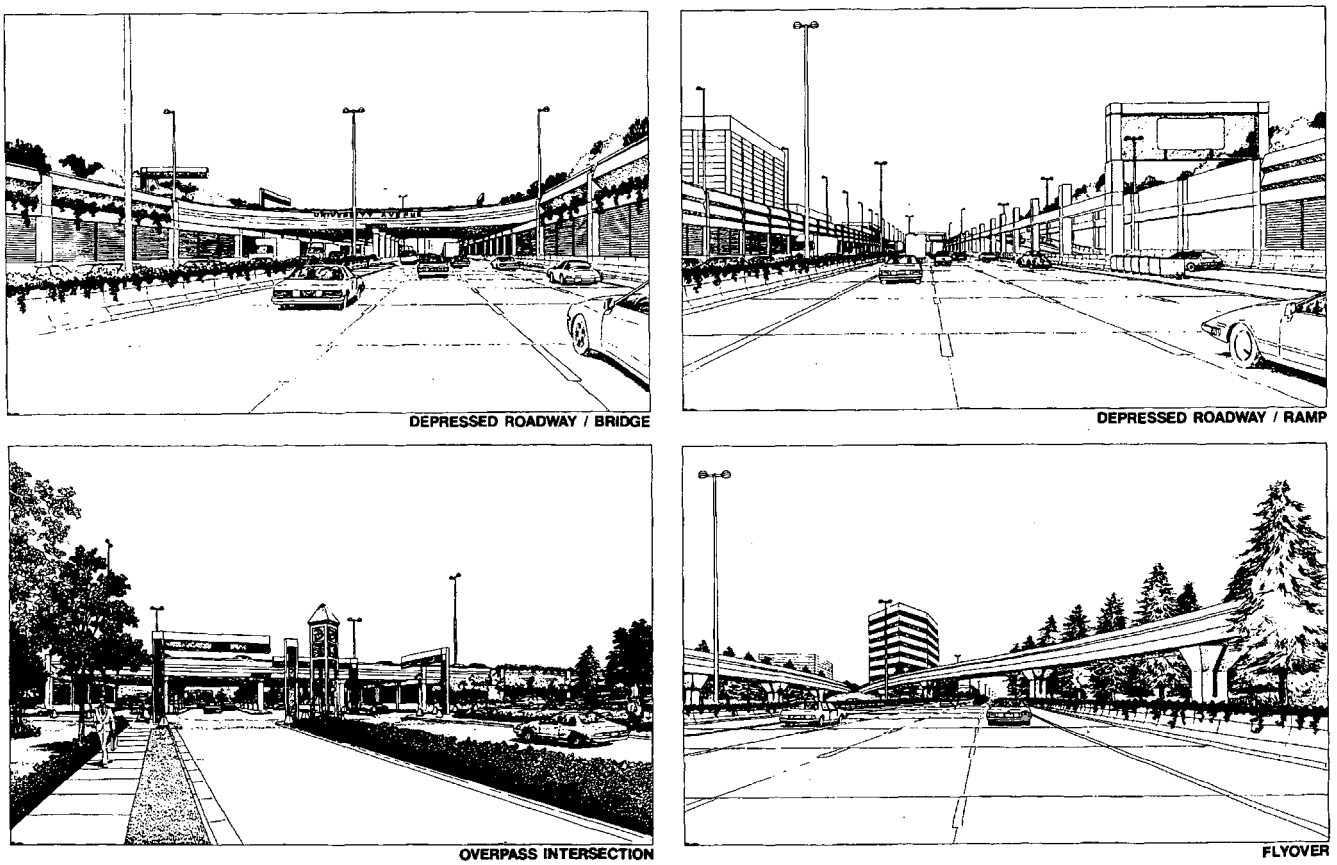


FIGURE 12 Perspectives, final scheme.

be recognized that major transportation facilities have a significant impact on the urban fabric. All residents and users are affected by the quality of these facilities and by the sensitivity with which they have been placed in their environment. Years ago, Main Street was the focal point of a community, usually built wider and with fancier street lights than the more mundane thoroughfares. These streets helped give communities a sense of place. Today, and in the future, the same attention to the importance of new or rehabilitated transportation facilities as a source of civic pride can be achieved by proper application of enhancements (Figure 12).

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