Value Engineering Unites a Community

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ABSTRACT

Value engineering (VE) has long been recognized as a tool for saving project costs and improving design and constructibility. However, VE has also been used to unite an entire community behind a project and ally the stakeholders in consensus for the good of the community. This is the story of how the City of Des Moines, Iowa employed VE to resolve major differences of public opinion concerning the design of the expanded Martin Luther King Jr. (MLK) Parkway.

INTRODUCTION

The Parkway is planned to join two major regional arteries at the northwest and southeast quadrants of the City. The main purpose of this Parkway is to foster economic development throughout the Central Business District. However, as the project developed over a prolonged period, it evolved to meet new criteria. The community came to feel that the road would divide the central business core of the City rather than unify it and not be aesthetically pleasing or people friendly. But through the innovative application of value engineering and the participation of diverse citizen and governmental groups, the City was able to shape a course correction and achieve community support so the project could continue to fruition.

IN THE BEGINNING . . .

Developing a public works project such as this is usually a long, complicated process due to the myriad "hoops" through which the sponsor must jump to arrive at consensus, meet diverse regulatory, legal, and technical requirements, and obtain the necessary approvals. Planning for the MLK Parkway started in 1979 when the need for an artery connecting I-235 in the City's northwest quadrant to S.E. 14th and 15th Streets in the southeast quadrant was recognized to provide a Central Business District highway loop for improved access and to foster economic development.

Planning envisioned a north-south segment obtained by upgrading the existing MLK Parkway and extending it south, and an east-west segment along a new right-of-way south of the central business district (CBD). The east-west segment would start at the connection of the two north-south pieces, and proceed east again to connect with the S.E. 14th and 15th Street north-south roadway couple, in effect forming a loop south of the CBD, as shown in Figure 1.

The proposed plan was for a parkway-type road, i.e., lanes in each direction separated by a wide landscaped median with at-grade connections to cross streets. In the mid-1980s, an Environmental Impact Statement (EIS) was prepared and the required approvals obtained for this concept. However,

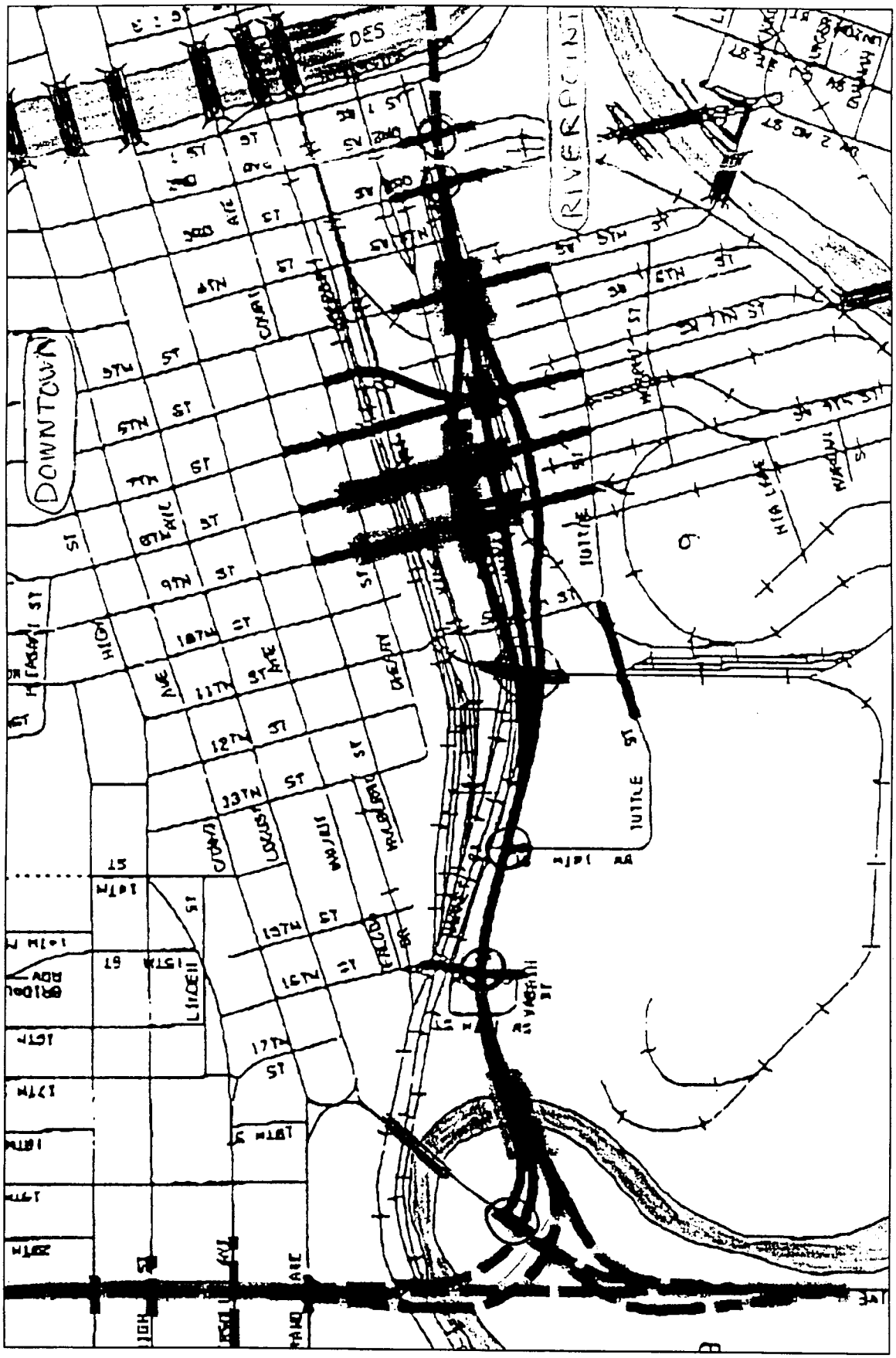

FIGURE 1 - Original Plan

funding was unavailable. Some funds became available in the early 1990s allowing for additional planning and the acquisition of right-of-way along the proposed route.

As with most projects that extend over time, conditions changed. In the early 1990s, as a more definitive design became necessary to tap available federal, state, and local funding sources, new traffic projections were incorporated and the project deviated from the original plan. The reasons for this were several:

- First, a project to significantly expand capacity on I-235 was reduced in scope. Thus, the proposed excess traffic would have to go somewhere else, i.e., the MLK Parkway.
- Second, because the EIS had been completed in 1985, by the mid-1990s the planning horizon had to be extended from the year 2000 to 2020.
- Third, the Metropolitan Planning Organization (MPO) adopted a "balanced growth" scenario which changed the traffic distribution throughout the planning area.

With this background, a definitive Parkway plan was assembled by the City and its design consultant, Rust Environment & Infrastructure, for submission to the MPO, the Federal Highway Administration (FHWA), the Iowa Department of Transportation (IDOT), and the City Council to obtain funding.

The plan included a six-lane divided parkway section along the existing north-south MLK Parkway extending under and over bridges to connect to Fleur Drive and the east-west section with a three-level interchange.

From this interchange, a four-lane east-west section would continue east as an at-grade divided highway with a wide median all the way to S.E. 15th Street. Along the route, there would be at-grade intersections, bridges, and a split diamond interchange. With this arrangement, vehicles traveling east-west and vice versa could move swiftly past the Central Business District at high service levels even during peak traffic periods.

The project was planned for completion in three phases and presented to the government agencies. Funding was obtained for Phase I and included a Revitalizing Iowa's Sound Economy, or RISE, grant which was obtained for the specific purpose of developing the RiverPoint area of the City located due south of the current CBD. The funding was predicated on the above-described plan which deviated from the original plan because of the interchanges that were created.

OPPOSITION DEVELOPS

In the latter part of 1996, the plan was shown to the at-large community and the many formal community organizations. A ground-swell of opposition developed. In addition to the three-level intersection, the proposed plan incorporated a roller coaster-type alignment along the east-west section from SW 16th Street to the Des Moines River, using earth embankments to allow the road to cross over a railroad spur and create the ramps for the split diamond interchange with two existing viaducts. Negative articles about the project started to appear in the local newspapers.

To mitigate the situation, Harold Smith, the City Engineer, engaged several one-day mini-value engineering studies using a team composed of members of the business community and outside consultants to review the project. The team focused on the Phase I project and found a solution to eliminate the bridging of the railroad spur and nine other modifications which were felt to address the concerns of the time. The results of these efforts were incorporated into the final preliminary design and presented to the community in March 1997.

Although the changes resolved some important issues, many of the community's concerns were not ameliorated, specifically:

- First, the three-level interchange was not considered appropriate for this region. The very tall structure contrasted sharply with the flat landscape around it, and was considered too interstate highway-like a design for a location that was considered a primary entrance to the Central Business District.
- Second, the embankments creating the exit/entrance ramps to the viaducts were viewed as both physical and visual barriers. They did not enable a smooth transition from the main business area to the RiverPoint development area to the south.
- Third, some of the bridges were judged to be unfriendly to pedestrians.

- Fourth, access to the baseball stadium south of the Parkway at the Des Moines River was poor.

These features were vividly depicted by a model of the proposed roadway commissioned by the Downtown Partnership, a group of Des Moines business leaders. More adverse newspaper articles appeared and community groups were questioning City Council members about the value of proceeding with the Project.

HEALING BEGINS

The widespread community dissatisfaction with the Project, prompted Eric Anderson, the City Manager, in concert with the City Council and City Engineer, to establish a seven-member MLK Parkway Task Force to try to resolve the conflict.

With several community organizations represented, the Task Force's mandate was to host a community forum, define the community's desires, achieve consensus, and offer a plan of action to the City Council. At the suggestion of City Engineer Smith, the Task Force extended the bounds of the traditional value engineering process and conducted a value engineering/design review (VE/DR). This effort encompassed the entire project from I-235 all the way around to SE 15th Street.

Lewis & Zimmerman Associates, Inc. (LZA) was retained to perform the effort. Working closely with the Task Force and the City Engineer's office, LZA developed the approach to the work which commenced with a community forum.

The community forum was held in the City's Convention Center. More than 150 people participated in the event. Using the multidisciplinary VE team approach, the attendees were randomly assigned to groups of about eight people. Each group was guided by a facilitator. The Project Design Team then presented the history and concepts of the Project to the assembled group. By describing the model and artist- and computer-generated concepts of the proposed roadway and associated development projects, the assembly was quickly able to understand the Project. The teams were then asked to discuss the following question:

"If we had to start at the beginning, with the knowledge we have today of the business, industrial, and residential needs of tomorrow, what would be the preferred design of the M. L. King, Jr. Parkway to serve as a means to accommodate the City's economic development and transportation plans?"

At the end of the session, the facilitators reported to the assembly on the outcome of their table discussions. The evening culminated with a clear message to the Task Force and VE/DR Team that the citizens wanted a true "parkway," meaning:

- A wide median
- Relatively slow traffic speeds
- Signalized intersections with cross streets
- No major structures (read as no multilevel interchanges)
- Bridges that would enhance the aesthetics of the City and provide a gateway to the City with a potential "signature" bridge across the Raccoon River, and
- A "pedestrian and bicycle friendly" roadway

Concurrent with the forum planning effort, the VE Team assembled. Composed of organizational management, planning, design, and construction professionals from the HNTB Corporation, HDR Engineering, Inc., and Hanifan Associates, Inc., the VE/DR Team consulted with the City's project staff, its design consultant, and the City's traffic consultant. They were informed of IDOT's requirement for the Parkway, specifically that the parkway must move the traffic the MTO area-wide traffic model assigned to the road for the 2020 design year at a level of service commensurate with other State highways in order to be designated a State highway. The City considered the State highway designation mandatory since it intends to transfer ownership of the Parkway to the State which will then assume maintenance responsibility.

Clear goals were coming into focus. The VE/DR Team began work as a group in earnest.

During the first week, the Team gathered detailed project information from documents provided by the City's design team, Rust Environment & Infrastructure, and Jim Thompson, the City's traffic consultant. The Team worked with the Task Force to define the **project's function** as:

"access activity centers"

This function definition contrasted sharply with the then-current **perceived function** of the roadway to:

"bypass City"

The project's function clarified, the team brainstormed ideas, evaluated them, and generated alternative concepts. These were reviewed with the City Engineer, the design team, and the Task Force to obtain their thoughts and general concurrence on the approach.

During the second week, the VE/DR team refined its ideas and generated a basic plan that maintained the same alignment, but kept everything at-grade with only a two-level interchange at Fleur Drive. In the VE team's concept, access to the CBD was achieved using signalized intersections with existing cross streets and local streets to access the viaducts via simulated "at-grade clover leafs", and to the proposed RiverPoint development area by using these same cross streets and an upgraded City street south of the new parkway. This approach would enhance traffic movement in RiverPoint, as well.

The north-south segment of the Parkway as originally conceived was judged sufficient for performing the identified function. Likewise, the east-west segment east of the Des Moines River was considered appropriate for performing the required function with some minor changes. The VE/DR plan suggested extending the project to the east by constructing a partial-capacity bridge over the Des Moines River and extension to SE 14th Street. These modifications were made possible because of the simplified "T"-intersection on structure with Fleur Drive and the elimination of the ramps and bridges used to create the split-diamond interchange with the viaducts. Interim solutions were also developed in the event of a shortfall in Phase I funding.

This approach was then presented to City, the MTO, IDOT, the FHWA, and the Task Force. While the reaction to the plan was, in general, positive, doubts remained particularly with regard to:

- the Project's ability meet the conditions of the RISE grant
- the capacity of the proposed roadway
- the safety of the "T" intersection on structure because of winter ice conditions

However, each group agreed to review the concept in greater detail and report to the City Manager and Task Force with their comments and proposed improvements on the concept.

CONSENSUS ACHIEVED

The technical reviews did, in fact, confirm problems with the proposed concept. However, the overall concept seemed to meet the citizens' and governmental agencies' desires. To achieve consensus on a course of action, a workshop was convened with the stakeholders. During this meeting, the problems with both the VE/DR concept and the original concept were discussed, and a brainstorming session produced two alternatives to the VE/DR concept that could potentially overcome the objections. The VE/DR Team, working with the Project Design Team, improved upon the alternatives and ultimately developed a solution that met everyone's requirements as shown in Figure 2.

Subsequently, the proposed solution was presented to and accepted by the community and governmental agencies. Having achieved consensus, City Engineer Smith offered the final design concept to the City Council for approval and authorization to begin final design. A unanimous vote approved the measure.

In summary, in two months' intense consultation and collaboration among the Project's stakeholders produced a solution to a dispute that had evolved over a decade. Through innovative application, value engineering united a community. The Value Methodology provided the framework to achieve results, but it took positive attitudes, commitment, and intense participation by the MLK Parkway Task Force, the City Engineer and his professional staff, the Design Consultant, the MTO, IDOT, the FHWA, the VE/DR Team, and the community at large to make it happen.

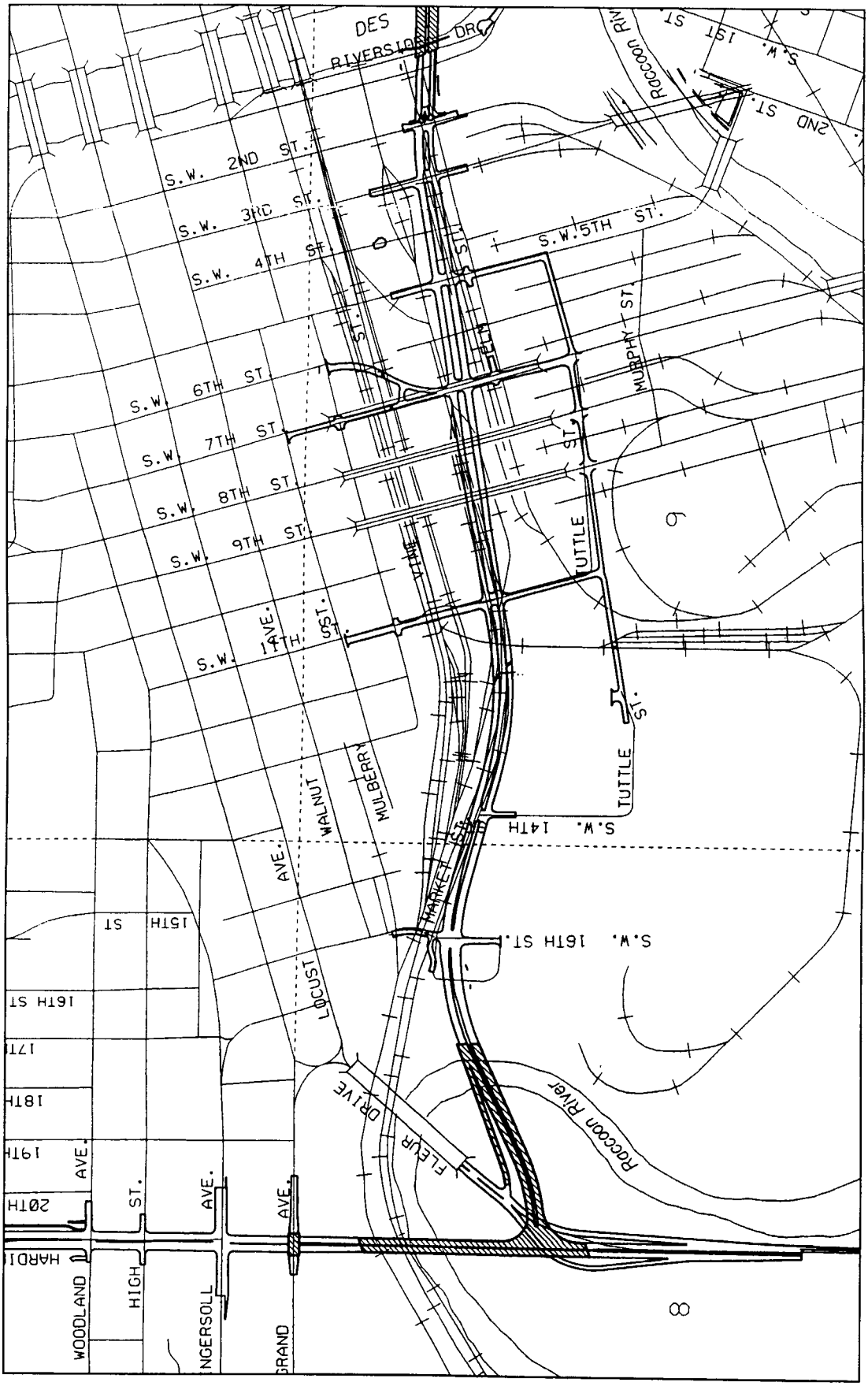

FIGURE 2 - Final Plan